

In this biography of Charles Holmes Herty (1867–1938), Germaine M. Reed portrays the life and work of an internationally known scientist who contributed greatly to the industry of his native region and who played a significant role in the development of American chemistry.

As president of the American Chemical Society, editor of its industrial journal, adviser to the Chemical Foundation, and as a private consultant, Herty promoted southern industrial development through chemistry. On a national level, he promoted military preparedness with the Wilson administration, lobbied Congress for protection of war-born chemical industries, and sought cooperation and research by business, government, and universities. In 1932, he established a pulp and paper laboratory in Savannah, Georgia, to prove that cheap, fast-growing southern pine could replace Canadian spruce in the manufacture of newsprint and white paper. As a direct result of Herty's research and his missionary-like zeal, construction of the south's first newsprint plant was begun near Lufkin, Texas, in 1938.

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Germaine M. Reed is an associate professor of history at the Georgia Institute of Technology. She is the author of *David Boyd, Founder of L.S.U.*, and coauthor of *Engineering the New South: Georgia Tech, 1885–1985* (Georgia).

The University of Georgia Press
Athens, Georgia 30602
www.ugapress.org

ISBN-13: 978-0-8203-3552-0
ISBN-10: 0-8203-3552-5

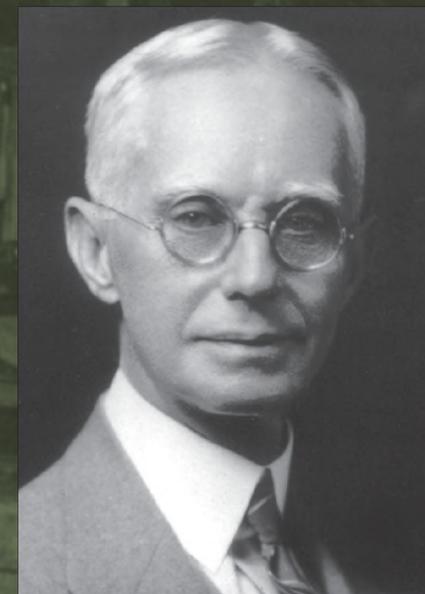


REED

THE PROFESSIONAL CAREER OF CHARLES HOLMES HERTY
Crusading for Chemistry

for Crusading Chemistry

THE PROFESSIONAL
CAREER OF
Charles
Holmes
Herty



GERMAINE M. REED

GEORGIA

Crusading for Chemistry



for Crusading
Chemistry

* * * * *

The Professional Career
of Charles Holmes Herty

GERMAINE M. REED

FOREST HISTORY SOCIETY, INC.

DURHAM, NORTH CAROLINA

THE UNIVERSITY OF GEORGIA PRESS

ATHENS AND LONDON

Paperback edition, 2010
© 1995 by the University of Georgia Press
Athens, Georgia 30602
www.ugapress.org

The Forest History Society is a nonprofit, educational institution dedicated to the advancement of historical understanding of human interaction with the forest environment. The Society was established in 1946.

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Designed by Erin Kirk New
Set in 10 on 14 Electra by Tseng Information Systems Inc.
Printed digitally in the United States of America

The Library of Congress has cataloged the hardcover edition of this book
as follows:

Library of Congress Cataloging-in-Publication Data
LCCN Permalink: <http://lccn.loc.gov/94025816>

Reed, Germaine M., 1929–
Crusading for chemistry : the professional career of Charles Holmes Herty
/ Germaine M. Reed.

xiii, 474 p., [6] p. of plates : ill. ; 25 cm.

ISBN 0-8203-1671-7 (alk. paper)

Includes bibliographical references (p. 447–455) and index.

1. Herty, Charles H. (Charles Holmes), 1867–1938.
2. Chemists—United States—Biography.

QD22.H43 R44 1995
540'.92 B 20 94-25816

Paperback ISBN-13: 978-0-8203-3552-0

ISBN-10: 0-8203-3552-5

British Library Cataloging-in-Publication Data available

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Preface

Several years ago, having just published a biographical study, I was casting about for a new project when a colleague suggested that I look into the Charles Holmes Herty Papers at Emory University. The more I looked, the more convinced I became that Herty deserved a full-scale biography. Historians of the South know something about the Georgia-born chemist's work to save the naval stores industry from extinction and his efforts to prove that southern pine could replace Canadian spruce in the manufacture of newsprint and white paper. But the full story of Herty's contributions and significance to American chemistry, the American chemical industry, and the economic future of his nation and his native region appears nowhere in the brief published accounts of his life and work.

Trained at Johns Hopkins University under Ira Remsen, Herty shifted early in his career from "pure" to "applied" or industrial chemistry. He also moved easily from the classroom to government service and the private sector, reflecting trends in the science professions that were increasingly common at the beginning of this century. But on campus or off, Herty always stressed the importance of and the need for fundamental research; without it, he warned, there could be no real industrial progress.

Herty served two terms as president of the American Chemical Society (1915–16) and five years as editor of its *Journal of Industrial and Engineering Chemistry* (1917–21), using both positions as a "bully pulpit" to "preach" chemistry and to promote his conviction that cooperation by business, government, and academe was essential to the nation's health, security, and material welfare. He also enrolled chemistry in the forefront of the preparedness campaign and the war effort

by offering President Woodrow Wilson the full cooperation of organized chemistry, by naming prominent members of the profession to the Naval Consulting Board, by representing the ACS in the organization of the National Research Council, by serving as an adviser to the U.S. Bureau of Mines and the government's Nitrate Supply Committee, and by chairing the advisory committee of the National Exposition of Chemical Industries. The chance to enhance the public image of his profession while serving his country was not something the super-patriotic and press-conscious Herty was likely to overlook. As editor of the *JIEC* and founder and director of the ACS News Service, he had plenty of opportunity to exercise his talent for what friendly critics in the ACS referred to as propaganda but he called education.

The role Herty played in the establishment of a domestic coal-tar chemical industry constituted one of his most important contributions to American chemistry. Concerned by the nation's chemical dependence on foreign (particularly German) sources of materials vital to the manufacture of textiles, pharmaceuticals, and munitions, Herty joined a group of prominent chemists and industrialists dedicated to the achievement of "national self-containedness." Beginning in 1915 and continuing throughout his service as president of the Synthetic Organic Chemicals Manufacturers' Association, he lobbied tirelessly for the enactment of steeply protective tariff legislation which would guarantee a fully developed chemical industry in the United States.

Herty had few peers in the ability to lobby Congress, the executive branch, and the public. He played a major role in mobilizing support for the continuation of the Chemical Warfare Service after World War I, and he spent much of his time in the later 1920s working for the enactment of the law that created the National Institutes of Health in 1930. Evolved from a simpler idea Herty conceived in 1918, the NIH had the strong financial support of Francis Garvan and the Chemical Foundation, which Herty joined as an adviser in 1928.

Late in his career Herty resumed an effort begun as a young man to work toward the material improvement of his native region. Convinced that chemistry was the key that could unlock progress in a region suffering from the one-two punches of the boll weevil and the Great Depression, Herty set about proving that his first love, the southern pine, could bring new industry, new wealth, and new hope to a people bereft of all three. Against the advice of experts, the active opposition of northern industrial leaders, and the apathy of many he was trying to help, Herty proved that young southern pine could be substituted for northern

spruce in the manufacture of newsprint and white paper, thus freeing the country from dependence on Canada and Scandinavia, providing impoverished farmers with a market for a “waste” crop, and achieving at last what so many had promised but so few had delivered: a new industry that could help to establish at last a “New South.”

* * * * *

Acknowledgments

Of the many people and institutions who deserve my thanks for their help and encouragement during the research and writing of this book, I will mention only a few. Robert McMath, my friend and colleague at Georgia Tech, first made me aware of Charles Holmes Herty and the existence of the Herty Papers. He read an early draft of the manuscript and gave me some sound advice. Linda Matthews, Director of Special Collections at the Robert W. Woodruff Library of Emory University, together with her excellent staff, provided me with invaluable assistance during the extended period I spent working through the huge Herty collection and provided the photographs that appear in this book. I also want to thank Jack Oden of Troy State University for his help and the editors of the *South Atlantic Quarterly*, *Forest and Conservation History*, and the *Georgia Historical Quarterly* for permission to quote from articles published in those journals. Finally, I extend special thanks to my editor, Trudie Calvert, and to Harold K. “Pete” Steen and the organization of which he is executive director, the Forest History Society, Inc., for their cooperation in the publication of this volume.

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Crusading for Chemistry

CHAPTER ONE

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The Formative Years

On November 15, 1864, General William Tecumseh Sherman left a smoldering and destroyed Atlanta and began the first leg of his famous march to the sea. Milledgeville, Georgia's capital city, lay defenseless in the path of the army's left wing. Entering the town on November 22, 1864, Federal troops destroyed the state penitentiary, the railroad depot, and a few war-time industrial facilities. They left two days later after holding a mock legislative session to "repeal" Georgia's ordinance of secession.

Physically restored by the fall of 1867, Milledgeville fully expected to resume its role as the political center of Georgia. But developments elsewhere intervened. In March 1867 Congress assumed control of the Reconstruction process, enacting the First Reconstruction Act, which reimposed military rule in the former Confederate states and required the generals in charge of each to oversee the registration of all "loyal" adult males, black as well as white. Registrants could then elect delegates to conventions that would rewrite state constitutions and arrange for the establishment of new state governments. Because of rumors that Milledgeville innkeepers would not house black delegates, General John Pope ordered Georgia's convention to assemble in Atlanta on December 9, 1867. Enterprising Atlantans quickly took advantage of the opportunity. When the new constitution was finally adopted, Atlanta, not Milledgeville, was the capital of Georgia. As one historian explained it, "Atlanta was enjoying a bustling growth and prosperity which few Georgians had ever imagined. Her people believed in the city's future and became its incurable boosters. Milledgeville, on the other hand, remained unchanged and her friends felt that they were custodians of the Old South and its finest traditions. They saw in Atlanta's rhetoric only boastful arrogance and vulgar ostentation."¹

Vulgar or not, Georgia's new political capital soon attracted national attention as the economic model for the entire region, thanks largely to the tireless efforts of *Atlanta Constitution* editor Henry W. Grady. Before responsive northern audiences Grady proclaimed the emergence of a dynamic New South, humming with industry and commerce and eager to welcome new residents and new development. His promotional rhetoric exaggerated considerably the level of industrialization actually present in the 1880s. But his message and the New South spirit it engendered had tremendous impact on his own and succeeding generations. One young southerner who certainly was influenced by that spirit was Charles Holmes Herty of Milledgeville. Born soon after the war and educated as a chemist at the University of Georgia and the Johns Hopkins University, Herty embarked on a professional career that included service as a university professor, government expert, journal editor, trade association president, industrial consultant, and director of a research laboratory. Much of his life was spent outside the South, but wherever he was, he never stopped working for the modernization and economic development of his native region. He was convinced that his own discipline, chemistry, was the key to that development, and he played a vital role in bringing it about.²

Charles Holmes Herty was born on December 4, 1867, the first of Bernard Richey and Louise Holmes Herty's two children. His mother came from a prominent Macon family that moved to Columbus, Georgia, after her father's death in the Mexican War, and the Hertys, originally from Fauquier County, Virginia, migrated to Milledgeville in the 1830s. Bernard Herty was born there in 1844 and at seventeen joined the Baldwin Blues, a volunteer company that later became part of the Fourth Georgia Regiment, C.S.A. Wounded at Spotsylvania in May 1864, he worked briefly as a druggist in Atlanta after the war, but two disastrous fires led him to locate in Milledgeville, where he practiced pharmacy until his death in October 1878. A prominent businessman, captain of the local militia company, and treasurer of the state asylum for the insane, Bernard Herty had been a widower for two years. His children, eleven-year-old Charles and nine-year-old Florence, became the legal wards of their grandmother, Mrs. James (Frances Ann Lawler) Herty.³

Until Charles was sixteen, he and his sister continued to live in their parents' home on Hancock Street under the care of their mother's sister, Florence I. Holmes. Then they moved in with their grandmother on Jefferson Street. Besides "Bomma," as the children called Mrs. Herty, the household included Mary

Herty, an unmarried aunt, and three first cousins who were the orphaned children of Bernard Herty's brother James. Years later one of them remembered pleasant outings, games, and picnics the five cousins shared as children. Charles Herty, or "Buddie," seems to have been the natural leader of the little group, especially when baseball was involved. Besides organizing teams, he made them all ardent fans, instructing everyone in the fine points of the game.⁴

The Herty children and their cousins may have received their earliest schooling from their aunt Mary Herty, who, like several local teachers, conducted private classes in her home. Or they may have attended the town's first public schools, financed meagerly after 1873 by the state's common school fund and student tuition. All of them subsequently attended the Middle Georgia Military and Agricultural College, established in 1880 as a branch of the University of Georgia, and Charles Herty was graduated with the class of 1884. He won a medal for scholastic achievement, but it was his "soldierly bearing" on the parade ground that made one observer comment, "I could but feel that the boy was a man, a thorough soldier and a hightone young gentleman."⁵

Young Herty had not always been a model student. At one point he was nearly expelled by the college authorities, but his schoolteacher aunt, Florence I. Holmes, then caring for him and his sister, managed to take the delinquent in hand. For the rest of their lives the two shared a very close relationship.⁶

At least as important as school and family in shaping Charles Herty's youthful character was the influence of his minister, James M. Stoney. The Reverend Stoney came to Milledgeville as rector of St. Stephen's Episcopal Church in 1876. He was a close friend of Bernard Herty's and an adviser to the Herty children after the deaths of their parents. When Charles thought briefly about becoming a druggist, Stoney allegedly talked him out of it, advising him to use the money from his father's small estate for his education.⁷

Stoney's counsel and free tuition at the University of Georgia settled Charles Herty's immediate future. In the fall of 1884 he left Milledgeville for Athens, Georgia, to spend two years studying chemistry under Professor H. C. White. White was a fixture of the university and something of a power in academic politics. Besides holding the chair of chemistry and geology in the liberal arts college, he was head of the State College of Agriculture and Mechanic Arts, one of the several units that made up the university. The latter post was particularly important because the State College of Agriculture received the lion's share of Georgia's Morrill grant funds, which at times accounted for half of the univer-

sity's income. White would play a crucial role in Herty's professional career, but that lay years ahead. Meanwhile, not yet seventeen, the young Charles Herty immersed himself in undergraduate activity. He played center field for the university nine, sang and danced, bicycled, and courted young women. Reminiscing about student days fifty years later, Professor C. M. Strahan described Herty as one of the "jellies" of the day. "At a square dance, party or any social gathering," Strahan explained, "Charlie would take the leading role. He had all the girls around here crazy about him, and he was one of the best dancers to trot a step."⁸

Franklin College, the liberal arts component of the University of Georgia, boasted only eight professors and one tutor when Charles Herty was an undergraduate. It had a small library of some 15,000 volumes, inadequate laboratory facilities, and fewer than 150 students, an enrollment that had not increased for many years. The number studying chemistry almost doubled in 1884, however, clear evidence, according to Professor White, "of a rapidly growing demand for technical and practical education."⁹

Herty graduated from the University of Georgia in July 1886 with a Bachelor of Philosophy degree. Again the Reverend Stoney encouraged him to continue his education, this time at the Johns Hopkins University. He wrote the authorities asking upon what terms his "ward," Charles Herty, might enter the school to pursue his education in "the general field of science." Notice of his admission reached Herty in Milledgeville a few days later, and by October 4 he was in Baltimore, ready to begin graduate work in chemistry and biology. A questionnaire filled out on that date indicated that he planned to study under Professor Ira Remsen. "My purpose," the new graduate student declared, "is to become a teacher."¹⁰

Herty chose well. Remsen's reputation as a great teacher and the outstanding facilities for scientific study at Hopkins were well known throughout the country. Southerners were particularly attracted; of 202 Ph.D.'s in chemistry produced in the Remsen era (1879–1913), 95 came from states below the Mason-Dixon line. According to some historians of chemistry, "The impoverished South . . . perceived the role of advanced training in chemistry as a means of upward social mobility." Whether Herty's decision to enter Hopkins was influenced by such considerations is not clear, but the Baltimore experience certainly had that effect.¹¹

Herty spent four years at Hopkins studying inorganic chemistry, "chemistry of the compounds of carbon," "theoretical" chemistry, and the history of chemis-

try. After two semesters he changed his minor field from biology to mineralogy and geology, completing work for the Ph.D. in the spring of 1890. His dissertation, "The Double Halides of Lead and the Alkalai Metals," was directed by Ira Remsen, who encouraged him to continue his research in the same field. Later, Remsen published the results of that research in the *American Chemical Journal*, a prestigious quarterly that he founded and edited.¹²

Life for Herty in Baltimore was not all toil and test tubes. He played baseball, participated in gymnastics and track, sang in the glee club, and appeared in at least one student theatrical. According to one account, he also earned a few dollars as a "super" with a local opera company. Some of his professors expressed concern because he spent so much time in extracurricular activities, but Herty thought they provided experiences he would need to be a successful teacher. He enjoyed music, sports, and the performing arts, and he did well at all of them.

Only twenty-two when he left Hopkins, Herty was temperate, mature, and well disciplined. He was willing to assume responsibility and ready to share his newly acquired expertise with aspiring young chemists. All that was missing was a setting. More than a year would pass before Herty could make his classroom debut. Meanwhile, he marked time as an assistant chemist in the laboratory of the Georgia Agricultural Experiment Station, then temporarily operating at Athens, Georgia. He was in a university community if not yet officially a part of it.¹³

When Charles Herty arrived in Athens in 1890, the town was in the midst of a major rejuvenation. Electric streetlights had just been installed, and the days of the horsecar were numbered. Further proof that the "Classic City" was "shaking off the yoke of fogyism and taking her place among the progressive cities of the age" included recently paved sidewalks and several handsome new buildings. Less than a year later, more physical evidence of improvement included new electric streetcars, new schools, free postal delivery, a paid fire department, a new bridge over the Oconee River, and underground sewers. Best of all, the city had begun to pave the streets with belgian blocks. "Athens," gushed the local paper, "has flourished like the rose within the last twelve months."¹⁴

Even the severe depression of the 1890s did not stunt cultural and economic progress. By 1897, besides the university, the State College of Agriculture, and the recently established state normal school, Athens boasted two fine female finishing schools, the Lucy Cobb Institute and the Home School, as well as a flourishing public school system. There were churches of every major Protestant denomination for both races and a synagogue. Business was "steadily on the increase," and

manufacturing establishments, all operating full-time, were paying “handsome dividends.” In and around Athens, according to the local newspaper, six cotton mills, two foundries, two knitting mills, two bobbin mills, and several factories produced, among other things, shoes, pants, furniture, cotton gins, doors and window sashes, brooms, buggies, cottonseed oil, and fertilizer. In addition, fine waterpower sites along the many nearby rivers and creeks and a climate suited to all agricultural and industrial pursuits made Athens the most attractive city in “all the Piedmont escarpment.” “When all of the natural advantages for manufacturing in and around Athens shall have been utilized,” proclaimed this second-generation Henry Grady, “then will she become the Lowell of the South.”¹⁵

A parallel commitment to progress and material growth was not apparent on the university campus. In fact, the limited “reorganization” proposals announced by Chancellor William E. Boggs soon after his installation in 1889 came to very little during his ten-year tenure. The institution remained essentially as it had been, a classical liberal arts college to which an agricultural appendage had been attached for political and economic reasons. In 1897 the faculty consisted of approximately a dozen professors and several instructors who offered a traditional curriculum composed of English, ancient and modern languages, mathematics, physics, chemistry, biology, and history. The chancellor (president) taught mental and moral philosophy, and as a concession to those who demanded more “practical education,” the roster included professors of engineering and agriculture. Essentially their presence served to justify continued university control over the State Agricultural and Mechanical College and the Morrill grant funds that came with it.¹⁶

Physical change in the university was even harder to detect. By 1894 the campus still consisted of thirty-seven acres, ten buildings, and a farm of sixty acres. All of the buildings had been there for twenty years or more. The library claimed twenty thousand volumes, but nobody was prepared to make a “reliable estimate” of their value. Only one new building, Science Hall, was constructed during the 1890s, leading the usually extravagant local newspaper to remark that “the buildings of the university are not what they should be.”¹⁷

Despite its conservative nature, the university was the favorite whipping boy of various interest groups throughout the state. Denominationalists damned it as a hotbed of vice which tolerated “public hugging” (dancing); they also lobbied against it in the legislature because it was tuition free and therefore perceived as a competitor of sectarian institutions. Agricultural interests attacked it because

the “mismanaged” State College of Agriculture enrolled practically no students although its Morrill grant funds supplied more than half of the university’s income, and self-proclaimed spokesmen for the masses denounced it as a finishing school for the rich. Still other critics of no particular socioeconomic category pilloried the authorities for allowing intercollegiate athletics.

Even the student body, or a part of it, considered the university fair game. In 1893 and again in 1897, a secretly produced publication, the *Bumble Bee*, was distributed at commencement. Composed by some of the graduating seniors, the papers blasted the administration and some of the faculty for incompetence, favoritism, tyrannical rule, and suppression of free speech and thought. Fifty years later, a member of the class of 1897 insisted that the illicit publication initiated a series of events which forced the resignation of Chancellor Boggs and resulted in the appointment of Walter B. Hill in 1899. Hill’s brief tenure marked the beginning of Georgia’s conversion from a small and parochial college to a modern university.¹⁸

The pleasant and progressive nature of the Athens community, if not of the university, may have compensated Charles Herty somewhat for the routine nature of his new job. He was more than qualified by education and experience for the position of assistant chemist of the Georgia Agricultural Experiment Station, having served at least one summer in the same capacity in North Carolina while a graduate student. He was also young, popular, and athletic, which probably explains why he quickly established social and recreational relations among the junior faculty and the student body of the university.¹⁹

One of the new friends Herty made in the fall of 1890 was William D. Hooper, whom the board of trustees had just appointed instructor of ancient languages at the university. The son of a Presbyterian minister, Hooper was born in Virginia in 1868 and educated at Hampden Sydney College, from which he graduated in 1889. He taught for a year at Southwest Georgia Agricultural and Mechanical College in Cuthbert, Georgia, before moving to Athens, and in 1894 he married Herty’s sister Florence (called Bunxie), who had come to live in Athens with her brother a few years earlier. Herty gave the bride away, and the Reverend James M. Stoney performed the ceremony. The rest of the large wedding party included at least four university professors and some of the most popular Athens belles. One of the latter, Sophie Schaller, was Florence’s maid of honor. When Sophie married Charles Herty a year later, many of the same people participated in the ceremony.²⁰

Sophie Schaller Herty was the daughter of Sophie Sosnowski and Franz Emil Schaller and the granddaughter of yet another Sophie Sosnowski. The first Sophie, styled Madame Sosnowski by the Athens citizenry, emigrated to the United States from eastern Europe with her husband, Joseph Sosnowski, who died of wounds received years earlier in the Polish revolution of 1835. Madame Sosnowski then opened a girls' school in Columbia, South Carolina. She was assisted by her two daughters, Caroline (Callie) and Sophie. In 1863 the younger Sophie met and married Franz Emil Schaller. German-born and educated, Schaller was also a teacher, but immediately after the wedding he entered Confederate service. After the war the family moved to Athens, where Madame Sosnowski and her two daughters operated the Home School for Young Ladies. Schaller taught at the Lucy Cobb Institute in Athens, moving later to Sewanee, where he remained for several years. Meanwhile, Sophie Schaller died in childbirth, leaving Madame Sosnowski and her daughter Callie to run the Home School and to bring up the infant Sophie and her older sister, Ida. By the time Charles Herty returned to Athens in 1890, Sophie and Ida Schaller were prominent members of the city's younger set.²¹

During the summer of 1891 the university's board of trustees formally appointed several instructors and teaching fellows to positions for the coming academic year. Charles Herty became an instructor of chemistry at \$1,200 a year, and three years later he and his brother-in-law, Will Hooper, were both advanced to adjunct professor at \$1,500. After the School of Ancient Languages was divided in 1896, Hooper became a full professor of Latin at \$2,000 a year. Herty's rank and salary remained unchanged, but his duties increased when the board of trustees made him temporary director of the newly created department of physical culture in 1894. The board granted him \$50 to purchase equipment, and the following year it thanked him for a job well done. By 1896, however, Herty's status as director of physical culture seems to have become permanent. In addition to a small departmental budget, the board voted him \$150 in salary, doubling that amount the following year.²²

An increment of \$300 a year hardly reflects the importance of Charles Herty's contribution to organized athletics at the University of Georgia. When he arrived in 1890, intramural baseball and something styled "football" existed, but it scarcely resembled the game then being played at the major colleges of the Northeast. "We had a football," recalled a Georgia student of the 1880s. "It was a round inflated rubber ball about eight inches in diameter and the main con-

test was seeing how far it could be kicked.” Herty proceeded to change all that. Besides reactivating the moribund Athletic Association, he spearheaded student fund-raising efforts for the improvement of the athletic field and the purchase of used gymnastic equipment, he oversaw the creation of intramural and varsity baseball teams, and he extracted a few dollars from a niggardly university board for the construction of four tennis courts. But his most significant contribution to the university’s athletic program was the introduction of football in the fall of 1890. Until brought to Georgia by Herty and to Auburn, Alabama, by his friend George Petrie, both of whom had first seen the game played while graduate students at Johns Hopkins, modern football had not penetrated the states of the Deep South.²³

It took a while for players, spectators, and “Coach” Herty to master the rules of the new sport, but on January 30, 1892, Georgia won its first varsity game against Mercer by 50 to 0. A month later the team played a more evenly matched Auburn eleven in Atlanta, losing by 10 to 0. By that time enthusiastic fans were avidly following detailed if sometimes confusing accounts of the new game in the columns of their daily newspapers.²⁴

Despite Herty’s best efforts, the problem of “professionalism,” or the hiring and use of nonstudents in collegiate athletics, soon bedeviled the Georgia athletic program. So did what he called “college politics”—the attempt of certain fraternities to control all student elections, especially the election of Athletic Association officers. To deal with the first problem, Herty became a prime mover in the organization of the Southern Intercollegiate Athletic Association (SIAA), which held its initial meeting in Atlanta on December 22, 1894. Composed of representatives from Johns Hopkins, Vanderbilt, Sewanee, Georgia Tech, and the Universities of North Carolina, Alabama, and Georgia, the association pledged itself to “purify and elevate the tone of sport by concerted action.” Overcoming college politics on Herty’s own campus, however, proved more difficult. Herty was still wrestling with the problem when he left Athens for a sabbatical in Europe in 1899.²⁵

Herty did not devote all his time at Georgia to athletics. An excellent and dedicated teacher whose better students continued their work at major graduate schools, he managed to inspire even those who had no talent for chemistry, thanks to his understanding, amiable manner, and high principles. In 1894 he helped concerned students develop a plan to combat cheating and placed among the top three in the “most popular professor” contest, sharing honors with a mathematician and his brother-in-law, Will Hooper.²⁶

Herty also managed to research and publish several scholarly articles while at Georgia, something practically unknown at the university since the days of the Le Contes just before the Civil War. Considering the inadequate library and laboratory facilities, not to mention the somewhat strained relationship between Herty and his immediate superior, Professor H. C. White, it is surprising that he published as much as he did. But a natural ambition to achieve recognition from his peers and encouragement from his mentor, Professor Ira Remsen, seem to have inspired the young chemist. In 1892 Remsen wished him "Good luck in your work! I am interested in the plans described in your letter . . . and it seems to me that, if you follow them, you are pretty sure to get something of value." Two years later, after Herty submitted two articles for publication in Remsen's journal, the older man commented, "Your results are interesting and seem to settle the case. I am glad you find time, inclination and courage to keep up your work. You have started right, and I congratulate you."²⁷

H. L. Wells of the Sheffield School of Science at Yale University may also have provided a stimulus for Herty's research and writing. In October 1892 Remsen advised Herty that Wells was "working over the ground covered by you while here [at Hopkins]." Wells had written Remsen that he fully expected to find some error in Herty's work, to which Remsen replied, "Go ahead, and . . . let me know when . . . [you find it]." Wells did find some mistakes and published his results early in 1893. The challenge may have spurred Herty to spend less time on athletics and more on chemistry. In any case, he submitted one manuscript for publication in March and had two more in preparation by the end of the year. In time, Herty and Wells began a professional correspondence that turned into a warm personal relationship lasting until Wells's death in the 1920s.²⁸

Herty's publications in Remsen's *American Chemical Journal* and the *Journal of the American Chemical Society* attracted attention as far away as California and the Netherlands from chemists working on similar problems. They also led to invitations to appear on programs at meetings of the American Association for the Advancement of Science (AAAS) and the American Chemical Society (ACS). Invited to address the "chemical section" at an AAAS meeting in August 1895, Herty first declined but then accepted, which pleased the program chairman, who wanted to "boom" inorganic chemistry. A report on Herty's particular area of research, "the double halide salts and the perhalides," he thought, would show that inorganic chemistry "has really living problems to solve which are

quite as important and interesting as any that the physical or organic chemist is working out.”²⁹

As time passed, conditions at the University of Georgia made Herty increasingly dependent upon friends and acquaintances elsewhere. H. L. Wells at Yale and H. N. Morse at Hopkins helped him as much as possible by providing copies of journal articles not available at Georgia as well as with the answers to technical questions that could not be solved in Herty’s laboratory. To complete some work for which he did not have the necessary equipment, Herty had to appeal to the University of Pennsylvania, where Edgar Fahs Smith, one of the founders of the American Chemical Society, was director of the laboratory. Unfortunately, the man Smith proposed to run some tests for Herty was so busy with his own work that Herty’s went undone.³⁰

By the spring of 1898 Herty must have been discouraged as well as frustrated. He was thirty years old, married, and the father of two small sons. But his rank and salary had not changed since 1894 and would not unless his department head, H. C. White, were promoted or retired. Meanwhile, limited research facilities at the university hampered his scholarly efforts and college politics had nullified much of what he had tried to achieve as director of physical culture. Herty was ready for a change. In June 1898 the board of trustees granted him a leave for the academic year 1899–1900 during which he planned to study “technical” or “applied” chemistry in Europe. He would have to scrimp and borrow on an insurance policy, but compared to marking time in Athens, going into debt seemed a small price to pay. Herty spent most of the 1899 spring term securing letters of introduction from notable American chemists such as William McMurtrie, Ira Remsen, Edgar Fahs Smith, and Francis P. Venable. Venable sympathized with his eagerness to get away. “May you speedily throw off the miasma of college scheming,” he wrote, “and fill your lungs with good sea air.”³¹

CHAPTER TWO

* * * * *

Saving the Naval Stores Industry

When Charles Holmes Herty decided to spend a sabbatical year in Europe, he was following a path taken by thousands of American scholars throughout the nineteenth century. German universities held particular attraction for students who wished to pursue scientific studies because they emphasized original research, maintained well-equipped laboratories, and received generous support from the state. What attracted Herty in 1899, however, was not Germany's universities but her *technischen Hochschulen*, or polytechnical schools. Chemical training at the universities was almost exclusively in "pure" or organic chemistry, whereas the *Hochschulen* concentrated on "applied" or industrial chemistry. Modeled after Napoleon's Ecole Polytechnique, the *Hochschulen* were originally founded to produce mechanical, civil, and military engineers. Later in the nineteenth century they were expanded and upgraded to offer training in electrical and marine engineering, economics, architecture, advanced mathematics, physics, and chemistry. By the time Herty went to Europe, the *Hochschulen* had achieved quasi-university status, in part because the leaders of Germany's burgeoning chemical industry considered their graduates more thoroughly trained and up-to-date than chemists from the universities.¹

At Johns Hopkins, the acknowledged pioneer among American research universities in the late nineteenth century, Herty had been trained in the traditional German manner as a "pure" chemist. His mentor, Ira Remsen, was renowned for his production of future chemistry professors; he had little interest in or contact with industry, and the overwhelming majority of the 107 Ph.D.'s he turned

out between 1879 and 1913 stayed in academe throughout their careers. Herty was still an academic in 1899, but his decision to spend a postdoctoral year at polytechnical institutions in Germany and Switzerland suggests that he did not necessarily share the biases of his famous teacher.²

The Herty family left Baltimore aboard a German ship bound for Bremen on June 1, 1899. Herty welcomed the early sailing date, for which he had to obtain special permission from the university, because it gave him more time to work on his German. Sophie Herty spent the voyage caring for the couple's two sons, Holmes and Frank, both then under three years old.³

When Herty planned his sabbatical, he expected to concentrate on electrochemistry, then one of the fastest-growing areas of chemical specialization. He wanted to spend half of his leave at the *Technische Hochschule* at Charlottenburg in Berlin and the rest in Zurich at the Swiss Federal Polytechnic and the university. In addition, he hoped to visit industries to observe the chemical processes he learned about in lectures and laboratory under plant conditions. Some of his friends thought the plant trips would be hard to arrange because German chemical works were "dreadfully inhospitable" and "even more careful of trade secrets" than their counterparts in the United States.⁴

But Herty seems to have encountered no difficulties. At least, he did not mention any in the small notebooks he kept to record his impressions of professors, lecture and laboratory technique, and visits to industrial firms. Choosing carefully, he attended a wide-ranging series of lectures and laboratory sessions conducted by some of the foremost chemists of the day. His letters of introduction proved especially valuable, enabling him to establish social as well as professional contacts with such chemical luminaries as Herman Walter Nernst, an expert in electrochemistry; G. Lunge, a world-renowned authority on the manufacture of inorganic acids and alkalies; Otto N. Witt, a well-known dyestuffs chemist; and Alfred Werner, who lectured in Zurich on stereochemistry. Werner and Herty published an article in a Swiss chemical journal in 1901, and they were still corresponding twelve years later when Werner won the Nobel Prize.⁵

Though brief, Herty's notebooks indicate clearly the significance of his postdoctoral year in shaping the rest of his career. For example, in one entry headed "Thoughts for the Future," he jotted down some ideas for additional work on halides, with specific reference to platinum. Another note read, "work up popular scientific article for *Atlanta Constitution*" and "good subject for lecture to students—development of coal tar industry in Germany." Still another referred

to a "pretty test" for cottonseed oil with a memorandum to "look up what has been done on cottonseed oil extraction." Finally, Herty noted that the Germans used the sulfite process to make paper in those parts of Germany where "the tannenbaume" flourished. "Perhaps," he speculated, "the pines in the Blue Ridge could also be used for this purpose: paper (from wood) industry established in Georgia."⁶

When he returned to America, Herty did do some work on the double halides of platinum, but a publication in the *Journal of the American Chemical Society* in 1908 was his last contribution to theoretical or pure chemistry. Well before then, he began to view his discipline as a means of preserving and improving existing southern industries and encouraging the development of new ones to free the region from economic dependence and to improve the material conditions of the southern people. He also began using his remarkable ability to make difficult technical material intelligible to popular audiences. In 1901, as suggested in the German notebooks, he prepared and delivered a lecture on the German coal-tar industry at Georgia Tech, taking great care before and after the speech to stimulate public interest through newspaper coverage. It was a sign of things to come. When he became president of the American Chemical Society in 1915, Herty used his office to launch a major campaign of "public education" designed to make the American people "chemically conscious." The notebook entry that speculated about the possibility of making paper from southern pine seems prophetic. Herty spent the last nine years of his life working in the laboratory and through the media for the establishment of a southern newsprint industry. He did not live to see it, but two years after his death in 1938, the South's first newsprint mill began operations at Lufkin, Texas.⁷

Ironically, the subject that seems to have impressed Herty most during his European sojourn is mentioned nowhere in the German notebooks. In a casual conversation, his favorite lecturer at Charlottenburg, Otto Witt, dismissed the American naval stores industry as a "butchery." Unless drastic changes occurred soon, Witt predicted, the longleaf pine, upon which the industry depended, would be wiped out. Herty knew nothing about naval stores when Witt made the remark in 1900 even though south Georgia and neighboring Florida were then the center of United States production. In little more than a year, however, naval stores and finding a way to prevent Witt's prediction from coming true became the center of Herty's professional life.⁸

Soon after the Hertys left Zurich, Professor Witt sent his erstwhile American student a note which contained another, more optimistic forecast:

As to yourself, I think the time when you will reap the true harvest of your year in Europe is yet to come. Don't think that I am so conceited as to imagine that we have been able to teach you things which you might not have learned just as well in America. But I know from my own experience the wonderful spiritual effect of a complete change of scenery and surroundings. Such a change leaves its indelible mark on a man's mind and makes it broader and deeper. See in what a different light your own country will appear . . . and how much broader the prospect of your own activity will be before you after you return home. . . . It will be then that you will be truly grateful for your stay in Europe. Let me hope that I may live to see you again as one of the leading technologists of America—you want such men on the other side of the Atlantic. With best wishes for a safe journey.⁹

Witt's thoughtful message, together with letters received from Georgia about university affairs and the accession of a new chancellor, Walter B. Hill, gave Herty reason to look homeward with optimism. Unfortunately, only a few months after his return to Athens, he realized that a long-sought promotion was as far away as ever.

Disillusioned, Herty began job hunting, contacting chemist friends in December 1900 at Yale, Pennsylvania, Hopkins, Vanderbilt, North Carolina, and Washington and Lee. He also wrote to the president of the American Chemical Society, William McMurtrie, who promised to keep him posted about possible openings. Charles Baskerville at the University of North Carolina was sorry that Herty "was so side-tracked by Dr. W[hite]," his department head at Georgia. He sympathized with Herty's "restless feeling" but advised him not to be discouraged; something always turned up for the man who worked "honestly and faithfully." James Lewis Howe was equally sympathetic, having suffered a similar experience before securing his professorship at Washington and Lee. He too thought a man who worked hard would sooner or later find the position he deserved. "The work you have done may not have had any effect right at home [Georgia]," wrote Howe, "but there are plenty outside who know of it, and it is doubly appreciated when it is known to have been done under unfavorable conditions."¹⁰

Herty's hopes revived early in 1901, when he learned that Chancellor Wal-

ter Hill intended to recommend him for promotion when the board of trustees convened in June. Meanwhile, his training under Remsen, reinforced by the European experience and his association with Professor Witt, led him to investigate various research possibilities in pure as well as industrial chemistry. Remsen thought Herty had made good progress in his work with the double halides and should stick to it. "Do not give up this line of work unless you have something better to take its place," he advised. To support continued research on platinum, Herty applied successfully for a grant from the C. M. Warren Fund of the American Academy of Science. But electrochemistry and its industrial applications, which Herty had studied in Europe, also interested him. Together with a close friend, physics professor A. H. Patterson, he began offering a course on the subject to seniors during the academic year 1900–1901. He also investigated the possibility of manufacturing salable minerals using an electrolytic process that would involve harnessing waterpower at certain sites in Georgia. Finally, recalling Professor Witt's remark about the "butchery" practiced by American turpentine producers, he began gathering data from a variety of sources on every facet of the naval stores industry. Interested in the preservation of the longleaf pine, upon which the timber and turpentine interests of south Georgia depended, Herty also hoped to encourage the naval stores men to distill "the higher products of turpentine" in the producing area rather than sending crude turpentine out of the region, where others derived the lion's share of profit from its refinement.¹¹

In all of his deliberations about what line of investigation to pursue, Herty was influenced by still another "Witticism." During his study in Berlin, Herty had carefully copied into his notebooks some lines written by Professor Witt for the catalog of the Chicago World's Fair of 1893. Witt attributed the thriving condition of the German chemical industry to the energy, hard work, and perseverance of certain prominent manufacturers. But he asserted that its basic success was the direct result of "pure scientific chemical research" conducted in numerous laboratories operated by "eminent investigators" and supported liberally by the several state governments of the empire. It was the laboratories, Witt declared, that produced the important discoveries and inventions that later proved to be of so much value to the manufacturers. And it was also the laboratories that turned out the "host of able young chemists" who, upon entering industry, "imparted to it new strength and new life." Inspired enough to copy Witt's pronouncement verbatim, Herty never forgot it. The necessity for "pure research" as a basis for every

technical advance appears in some form in every one of his published speeches between 1901 and his death in 1938.¹²

Herty's hoped-for promotion did not come in mid-1901, despite the best efforts of Chancellor Hill, who singled him out for special praise in his report to the board of trustees. It was a great disappointment, but by that time Herty was deeply involved with plans to spend his summer vacation conducting field research on naval stores somewhere in south Georgia.

Months of careful planning preceded the actual fieldwork. First—good scientist that he was—Herty searched the literature to learn as much as he could about the turpentine industry. Next, he visited southern Georgia to see what effect recent government studies had produced among naval stores operators. And finally, to confirm his own limited observations, he wrote to men engaged in every branch of the naval stores industry from North Carolina to New Orleans.

What he learned was discouraging. Herty found that longleaf pine (*Pinus palustris*), the chief source of crude turpentine from which spirits of turpentine and rosin were distilled, once grew in abundance from southern Virginia to East Texas. Depletion of this resource, however, was rapidly driving the naval stores industry, once centered in the Carolinas, to the south and west. By 1900 the bulk of America's turpentine came from Florida, and significant inroads were already being made in Alabama, Mississippi, and Louisiana. Finally, Herty's research indicated that despite efforts by government to encourage reforms, the ruinous box system was universally employed throughout the turpentine belt. Along with inefficient distillation and overproduction, that wasteful and destructive method of collecting turpentine practically guaranteed the extinction of the naval stores industry. Half of the virgin longleaf pine was already gone; the rest, according to conservative estimates, might last another fifteen years. And no one even thought about reforestation. "We are not only killing the goose that laid the golden eggs," Herty concluded, "we are actually failing to pick up all of the wealth during the dying process."¹³

Box cutting, everyone agreed, was the worst evil besetting the naval stores industry. The first step in the process of turpentine collecting, it involved chopping a cuplike cavity into the base of the tree to catch the resin or crude turpentine, which flowed from a scarified "face" on the trunk above. Cut during the winter months, usually by black laborers, a box was about fourteen inches wide, seven inches deep, and three and a half inches from front to back. Large trees some-

times carried as many as four boxes. The box added nothing to the tree's yield, but it weakened it at its most vital spot, rendering it vulnerable to windstorms and disease. The box also became a veritable tinderbox in a region where people regularly ignited the woods each spring because they thought that burning made the grass more abundant for their unfenced stock.

Box cutting was followed by cornering, a two-man operation requiring a left-handed and a right-handed laborer. Each made an upward-slanting cut through the bark and sapwood, starting from the top of the back of the box at its center and extending to a point perpendicular to the corners of the box. Then, with a side blow of his ax, the laborer split the wood out between the cut and the rounding edge of the back of the box. The object of cornering was to provide a surface suitable for scarification, or chipping, and to direct the resulting resin flow into the box below.

Chipping, designed to open fresh resin ducts, was the next step. Begun early in the spring, it continued weekly until November. Using a special tool called a hack, the chipper removed a strip of bark and sapwood just above the exposed surfaces produced by cornering. Laterally inclined strokes from the left and right penetrated the sapwood about an inch at the deepest point, exposing surfaces of sapwood called streaks on each half of the face. The streaks met just above the center of the box, forming an angular point known as a peak. With each weekly chipping, the distance between the box and the fresh resin-producing streak increased, finally requiring the chipper to replace his hack with another tool, the puller, when he could no longer reach his work.

Immediately following each chipping, fresh resin appeared, flowing slowly into the box below. After three or four weeks, the resin or "dip" had to be gathered from the box, transferred to large buckets, then to barrels, and hauled to the still. "Scrape" or hardened resin was removed from the exposed faces when the chipping season ended in November. Finally, a space at least three feet from the base of the tree was raked to reduce the possibility of fire.¹⁴

Herty was by no means the first to look for ways to replace the box. Besides severely damaging and destroying timber, the box also produced turpentine whose quality, because of evaporation, discoloration, and atmospheric action, deteriorated markedly as the distance between streak and box increased and as chipping proceeded from year to year. Consequently, numerous devices to replace it were introduced in America—more than a dozen of which were patented by 1900—but none proved practical. In France, however, to overcome the severe naval

stores famine caused by the American Civil War, a conservative and economical system had been developed. The box or hole at the base of the tree was replaced with a clay cup and a zinc gutter, both of which were raised each year. The gutter, positioned just below a very small and shallow streak, directed resin into the cup, which rested on a nail. Under this system, trees in France were worked for decades whereas those in the United States were usually abandoned after three or four years.¹⁵

Could the French system be adopted in America? W. W. Ashe, a forester with the North Carolina Geological Survey, began a limited experiment with it in 1894, but other commitments kept him from completing his work. When Herty contacted him in 1900, Ashe was still a believer. "If you could get someone to try it on a ten-acre orchard, on two or three-year-old boxes, and have a correct account of the labor and other costs kept," Ashe wrote, "you could establish the practicality of the system in this country."¹⁶

Ashe's letter of December 14, 1900, seems to have determined Herty's next move. By mid-January, with Ashe's experimental data in hand and, as he put it later, "the French system in mind as a point of departure," Herty began looking for someone who would let him use a turpentine orchard to test his theories in the field. Through John M. Egan, president of the Central of Georgia Railroad, Herty made contact with the leading naval stores factors in Savannah. One of them, J. P. Williams, arranged for Herty to conduct his experiments at Statesboro, Georgia, during the summer of 1901. Herty was to receive no pay for his work other than the \$150 raised among a few factors to defray equipment costs.¹⁷

Meanwhile, Herty was in contact with Gifford Pinchot, chief forester in the Bureau of Forestry, United States Department of Agriculture (USDA). On a visit to Washington in the spring of 1901, he called at Pinchot's office to describe his plans for the Statesboro experiment. Pinchot was so intrigued that he asked Herty to join the bureau as "collaborator." The pay was only \$300 a year, paid monthly, but the appointment guaranteed Herty the use of scientific instruments, travel vouchers, stationery, and the publication of his results. Like Herty, Pinchot was interested in seeing the turpentine industry made more efficient. Above all, both wanted to save the forests.¹⁸

Unlike the French system, which Herty rejected after careful study because it required trained foresters, cheap labor, unfamiliar tools, new techniques, and extensive retraining, the method Herty introduced at Statesboro was simplicity itself. The apparatus consisted of two galvanized iron gutters, each two inches

wide and from six to twelve inches long, which served to conduct the crude turpentine into an earthen cup hung below the gutters on a nail. Each gutter was crimped lengthwise through its center at an angle of about 120 degrees to form a v-shaped trough. The cup, designed to hold about the same amount of resin as the standard box, resembled a flowerpot with a half-inch nail hole in its rim.

Herty's system worked on "round" (never boxed) as well as on previously boxed trees. To install it on round timber, a right-handed and a left-handed laborer working together produced two flat faces using cornering axes. The first strokes made were the same as those used in cornering a box, the object being to provide the proper surface for the subsequent process of chipping. Next, with sidestrokes of the cornering ax, each man removed only enough bark and sapwood to make a flat face one-half the width of the full face, the whole corresponding in width to that of the box, which would have been cut in the tree.

Switching to broadaxes with straight edges twelve inches long, each man then made a downwardly inclined incision about one-quarter of an inch deep on his half of the tree's face. The inclined gash on one side was placed about an inch below that made on the other, and both were positioned about three inches below the chipping surface so that enough space remained to use the hack when the chipping operation began. Next, the gutters were inserted into the incisions made by the broadaxes, usually by slipping each endwise into the upper end of the cut and pushing it down the full length of the cut. The upper gutter was forced to the center of the face and the lower gutter slightly beyond the center, forming a spout to direct the resin into the cup below. On trees previously boxed, the gutters were placed on the surface left by chipping done the year before. From this point, the usual procedures were followed. But at the end of the season, cups and gutters were raised, thus avoiding the loss by evaporation and discoloration that routinely occurred with the box system in the second, third, and fourth years.¹⁹

Not everyone appreciated Herty's efforts at Statesboro. One Savannah factor refused to support the experiment because he "did not believe any new method could be invented to take the place of the old way" at a reasonable cost. Local citizens, especially the black laborers, were also skeptical. They thought the cups Herty used to catch the turpentine were "novel and ludicrous." But he was undismayed. When the time came for him to go back to the university, Herty had learned a great deal and was convinced that the apparatus he had devised at Statesboro could be used successfully on a commercial scale.²⁰

Herty was already busy convincing others. Before ever entering the woods, he used a speech to Georgia Tech students as a forum to stir interest in reforming the naval stores industry. Advance copies were sent to the *Atlanta Constitution*, and follow-up articles appeared in a popular magazine. He also asked for and got extra funds from the Bureau of Forestry to travel throughout the turpentine belt of southern Georgia and to attend the first annual Turpentine Operators Association meeting at Jacksonville, Florida. His goal was to talk with as many of the “best” operators as possible. The turpentine people were beginning to “get frightened over the condition of their industry,” Herty advised the bureau. “It is a good sign. . . . Indifference, hitherto, has been the great stumbling block to any effort at reform of methods.”²¹

Herty set out to devise equipment for the naval stores industry that was cheap, profitable, easily operated by turpentine laborers, adapted to the system of chipping common in the South, and, above all, likely to improve the quality of the product while at the same time preserving the naval stores industry. He made no claim to having originated the first cup-and-gutter system, although local boosters and the press often claimed that honor for him. What he *did* contribute was a new *type* of cup-and-gutter system—one that worked.²²

Herty’s preliminary and promising results at Statesboro were received enthusiastically in Washington. On October 8, 1901, Gifford Pinchot asked him to think about joining the Bureau of Forestry full-time. Another offer came from the Bureau of Soils. Underpaid and still frustrated, Herty did not take long to make up his mind. By late November he had resigned his professorship, and on January 1, 1902, he was officially an “Expert” in the Bureau of Forestry.²³

Herty’s resignation from the University of Georgia stimulated an outpouring of regret among the trustees, students, and Athens townspeople. At least five trustees expressed their sorrow in personal letters to him but sympathized with his reasons for leaving. Chancellor Hill was especially sorry to see him go. “Dr. Herty is not only making for himself the reputation which has led to the call for his services elsewhere,” he reminded the chairman of the Prudential Committee, “but his work in original research has brought honor to the University of Georgia.”²⁴

Even before his resignation, Herty was busily organizing the comparative commercial-scale tests he expected to conduct during the 1902 turpentine season. This time he would be operating at Ocilla, Georgia, on turpentine property under the control of Powell, Bullard and Company. The Bureau of Forestry fur-

nished the equipment and placed it on the trees; the firm provided the labor, kept meticulous records, and received any profits that might result. All findings were to be published by the bureau.

The goal was to ascertain the relative yield and resulting market value of turpentine collected by the two systems. Four crops (or tracts of 10,500 boxes each) were selected by John H. Powell, the manager of Powell, Bullard and Company. The first had never been turpented; the second, third, and fourth had been worked by the box system respectively one, two, and three years. One-half of each crop in 1902 would be worked by the box system, the other half by the cup system. In each crop crude turpentine would be collected separately from cups and boxes, distilled separately, and carefully labeled. The rosin was to be sent to the Southern Naval Stores Company in Savannah, where each lot would be graded separately and the report returned to Ocilla.²⁵

When the results of the Ocilla experiment began to come in, Herty was pleased with the improved quality of turpentine produced by his cup-and-gutter system on trees worked for the second, third, and fourth years. In two respects, color and loss from evaporation, it surpassed that from boxes. But what really encouraged him was the outcome of experiments on "virgin," or never boxed, timber. On these trees the two systems had been applied under exact conditions. To ensure accuracy Powell, Bullard put their most experienced man in charge of selecting the timber and arranged for one man to do the chipping on both cupped and boxed trees and for dipping to be done every three weeks simultaneously in both halves of the crop. The company also arranged to collect the gum in separate barrels, to distill it separately, and to keep separate records of the amount of spirits obtained and the price received for the rosin when it was sold in Savannah. Herty expected and found no difference in rosin quality because the distance of flow of gum was the same in each virgin set. Because of the special care taken to equalize conditions in setting up and conducting the experiment, however, any differences in quantity could be explained only by the severe wound of box cutting and its effect on the tree's productive powers.²⁶

Herty's letters to the Bureau of Forestry reporting significantly higher yields from the cupped trees stirred great excitement. He was urged to prepare a quick summary of his preliminary work so that Gifford Pinchot could include it in his annual report. W. C. Powell, president of the Savannah firm receiving and grading the cupped rosin, was so impressed by the results that he visited Ocilla to see for himself. So did another member of the firm, and knowing a good thing when

he saw it, he asked where he could buy a machine to manufacture cups for the coming season.²⁷

Herty did not wait for the gum to stop flowing at Ocilla before publicly announcing his success. A carefully orchestrated campaign in newspapers and trade journals declared his intention to address the second annual Turpentine Operators Association meeting at Jacksonville on September 10, 1902. There he reported that on first-year trees the cup system outproduced boxes by 23 percent. He also presented figures showing that the increase in first-year profits more than offset the cost of purchasing cups and gutters. Specifically, the sale of rosin from cupped virgin timber produced \$449.44 to \$363.93 from boxed trees, a net gain of \$85.51 or 23.5 percent per half crop. More dramatically, during the first year cupped trees yielded 1,509.3 gallons of turpentine spirits per half crop as compared to 1,288.4 gallons from those that were boxed. At forty cents per gallon (the going rate in 1902), that meant a net gain of \$120.76 to an operator using the Herty system. Finally, he told his audience, just to make sure that the 1902 Ocilla experiments on virgin timber were not a fluke, the bureau intended to work the trees for two more years.²⁸

Herty's report to the Turpentine Operators Association caused what he later described as a "veritable sensation." Nevertheless, many questioned whether the results at Ocilla could be duplicated on an industry-wide scale. Notoriously stubborn and tradition bound, the operators would have to be "re-educated" before they were willing to try a method that promised to increase profits and preserve the industry at the same time. Fortunately, enough were convinced by the Ocilla data and Herty's persuasive rhetoric to create a "commercial demand" for the necessary equipment. Supplying metal gutters presented no problem. But finding a pottery willing and able to produce enough cups of the right design at a reasonable price and in time for the 1903 season proved almost impossible.²⁹

Herty had to address several other problems before he could make his system a viable alternative for the ruinous box. The first involved initial cost to the operator for cups and gutters, labor, and transportation. After months of negotiation with suppliers and railroad managers, he estimated that an operator could adopt the new system in 1903 for approximately \$350 per crop (10,500 cups).³⁰

When the Ocilla results were finally published, they justified his estimates: increased profits per crop on cupped trees ranged from \$341.54 for the second-year crop to \$516.48 for the fourth-year crop. "In other words," Herty explained, "the cost of the equipment is more than paid for during the first year and a handsome

balance of profit left." The profit picture was even more attractive for the first-year crop because the cost of box cutting and cornering was eliminated. "Clearly," Herty pointed out, "it is to the operator's advantage to place cups on virgin timber even more than on old boxes."³¹

Another obstacle Herty had to overcome was the operators' firm conviction that turpentine laborers could not be trained to use his cup-and-gutter system. Initially, Herty's experience at Statesboro and Ocilla seemed to support that judgment. But later he found that if the new system was introduced with "patience, tact and enthusiasm," labor would adjust. What counted most during the "critical first stage" was the personality of the operator or his woodsman (foreman). If he "pushed" the work, it succeeded; if he handled it with "scepticism" or negligence, it would probably fail. "After all is said," Herty concluded, "this remark will apply to any other line of human endeavor."³²

Racism may also explain the operators' reluctance to try anything new. In 1900 operators and woodsmen were white while laborers were overwhelmingly black and, in some cases, convicts as well. Herty's principal assistant at Statesboro and Ocilla, Frank Klarpp, was an able and hardworking young man in his late teens or early twenties. It is clear from his correspondence that he was intelligent and skillful, if only marginally literate. It is also clear that he had a low opinion of the average turpentine laborer. In August 1902 he wrote Herty that it was "hard to get the negroes to work with so much cotton to pick and it is the lazy time of year with them anyway." Somewhat later and with more scorn, he reported to Herty that the "fool negroes—you can show them anything and they can do it OK and in less than five minutes they are as sorry as ever." And a few days later: "The best man I've got hasn't got as much sense as the crazy negro you tried to learn at Green Cove [Springs, Florida]." Perhaps the most remarkable feature in Klarpp's letters is his consistent use of the word "negro." Herty's other assistant, Pat Woolfolk, was probably more typical. A note to Herty from somewhere in Florida reported that his "green" work force had hung 2,850 cups in a single day, a prodigious amount. It was signed "All of us niggers."³³

Herty's own dealings with turpentine laborers, free or convict, were remarkably effective. Early in 1903 he wrote an operator about his successful instruction of a convict work force: "You would have been delighted had you seen how the convicts, within three hours after starting work, carried it on like old . . . [hands]." He certainly did not coddle laborers; in fact, he thought some operators were too lenient. To the W. C. Jackson Company, which adopted his system in

1903, he tactfully proposed, "Another hour added to your day's work would mean about four hundred more cups put up. I make this suggestion to you for what it is worth."³⁴

In the early years of this century, the average turpentine worker earned about \$1 for a nine-and-a-half- or ten-hour day, depending upon the task and how fast he was willing or able to perform it. A typical work crew might include box cutters, chippers, dippers, scrapers, wagoners, and a woodsman. If the operation had a still, there would also have to be a still operator, a stiller's helper or two, and someone to make barrels. As the season progressed, and depending on his skills, a worker might shift from one task to another. According to one source Herty consulted before launching his experiments at Statesboro and Ocilla, chippers were paid \$22.50 for four streaks (a month's pay); dippers earned thirty-three and a third cents per barrel filled while scrapers were paid twelve and one-half cents per one hundred pounds collected. Box cutters made one and one-half cents per box, and cornering brought anywhere from \$11.25 to \$12.50 per crop. Woodsmen and still operators were the elite members of the work force, earning between \$30 and \$40 per month. Wagoners made about half that and still hands least of all, about seventy-five cents a day.³⁵

Most operators thought costs were getting out of hand in 1902. At the second annual meeting of the Turpentine Operators Association they pledged to refrain from enticing away the laborers of others, to fix wage rates, and to combat a glutted market by limiting production. How well any of it worked in practice is questionable. When naval stores prices rose precipitously in 1903, most operators forgot all about conservation, self-imposed limits on production, and labor costs so that they could take advantage of the improved market.³⁶

From the beginning of his fieldwork in 1901, one of Herty's biggest problems involved the location of a pottery willing and able to produce a satisfactory turpentine receptacle as a replacement for the box. He had to use galvanized iron cups at Statesboro during the summer of 1901 because no pottery was willing to fill his small order (about 200) for a specially designed earthen cup. After joining the Bureau of Forestry full-time, he sent the specifications for a clay cup to several potteries, advising them that he planned to use 31,500 cups of that design in a commercial-scale test at Ocilla, Georgia, during the coming season. D. P. Montague, president of the Chattanooga Pottery Company of Daisy, Tennessee, was the successful bidder, but the cups he supplied were not precisely what Herty ordered: they had flat rather than oval bottoms, they arrived a week late, and

the agreed-upon price of \$1.50 per thousand, plus freight charges, was practically doubled. Nevertheless, Herty took delivery so that the experiment could proceed.³⁷

By September 1902 Herty knew his system was practical, although experience convinced him that a larger cup with an oval bottom would be more efficient because it would require fewer dippings during the season. He asked what the pottery would charge to make the larger vessel, but Montague's reply that he expected to recover what he had "lost" on the first order and that he would have to charge two and one-half cents per cup because oval-bottomed cups would be considerably more difficult to make clearly annoyed Herty. On September 16, 1902, he rejected Montague's arguments and began looking for other suppliers. Unfortunately, inexperience, the lack of machinery, or unsuitable clay soon eliminated each from consideration.³⁸

In the end, Herty pursued a plan suggested by C. L. Krager, manager of the Chattanooga Pottery Company. On September 4, 1902, Krager wrote Herty that he could manufacture the larger cup if given sufficient notice and enough orders. He sent an acceptable sample to Herty and in a follow-up letter estimated that similar cups could be manufactured and crated for shipment at a penny apiece and sold to the trade for a cent and a half. If a plant were built in the turpentine belt, near a source of good clay, Krager thought there would be plenty of profit for all concerned. "I ask you therefore," he wrote Herty, "if in your judgment you think it possible for a man like myself to interest capital sufficient to put up a plant somewhere in the heart of the turpentine section to manufacture these pots?"³⁹

Krager thought that \$6,000 would be enough to build a modest pottery, but Herty and John H. Powell, manager of the firm whose land Herty was using at Ocilla, decided to raise at least \$10,000 or \$12,000 for a larger plant. Each subscribed \$1,000 to the project, managing after considerable effort to secure the rest from prominent naval stores interests in Savannah and Jacksonville. Rather than building a new pottery, however, the principal investors decided to buy out the Chattanooga Pottery Company, retaining Krager as general manager and naming John H. Powell as president.⁴⁰

John H. Powell, a member of a large family with sizable interests in all phases of the naval stores industry, managed the turpentine interests of the Savannah-based Powell, Bullard and Company in Ocilla, Georgia. He was also president of the Bank of Ocilla, which held a small note of Herty's late in 1902 and loaned him the \$1,000 to buy twenty-five shares of stock in the newly acquired Chattanooga

Pottery Company. W. C. Powell of Savannah was president of Powell, Bullard and Company and the Southern Naval Stores Company, commission merchants in Savannah, and yet another family member, Jonathan C. Powell, was secretary of the Turpentine Operators Association. Jonathan C. ran his businesses from a base in Jacksonville. Finally, the Powells and several other factors and operators were officers and shareholders of the Consolidated Naval Stores Company, which became a major stockholder of the Chattanooga Pottery Company when that firm was reorganized in 1904.⁴¹

Having masterminded the acquisition of the Chattanooga Pottery Company, Herty left Georgia with his family to spend the month of December 1902 in Washington. Presumably, Sophie and the children amused themselves sightseeing while Herty worked diligently on his report of the Statesboro and Ocilla experiments. Speedy publication of the comprehensive document as an official bulletin of the Bureau of Forestry was vitally important to Herty. He counted on it to stimulate interest in the cup system among operators who had not heard his speech at the turpentine operators' convention or read the stories about it printed in newspapers and trade journals such as the *Weekly Naval Stores Review* and the *Industrial Record*, published respectively in Savannah and Jacksonville. Back in the turpentine belt by late January 1903, Herty was disturbed to find that interest among the operators seemed to be waning. He urged the bureau to rush his bulletin into print, but a brief circular published early in February was the best it could do. Meanwhile, he asked for photographs of the work done at Ocilla, not for publication but "to do missionary work with the operators" who showed some inclination to adopt the cup system.⁴²

Missionary work was precisely what Herty was doing in the first three months of 1903, traveling all over south Georgia and Florida to help purchasers install the new equipment. Everywhere he went he found encouraging signs. One operator thought that there was "no power in the world could stop the cup question in the South." Others, having read news accounts about the system, wrote the Bureau of Forestry asking how they could "get in on it." Herty reported to John Powell, "I think the ball has started to rolling and now we must keep it up." And to George Sudworth, his contact in the bureau: "Since last writing you I have made a complete convert of an operator who last year worked 3,000,000 boxes. A few more steps of this kind will put us on easy street."⁴³

The message was preached from several pulpits. Besides spending twelve-hour days wading through swamps while instructing laborers how to hang cups, Herty

also addressed groups such as the Florida and Georgia Manufacturers' Association and the Chautauqua of DeFuniak Springs, Florida. He enjoyed getting back into the woods but found that five months of sedentary activity had left him "pretty soft." He was glad to talk to any group if it would serve the cause. Only the continued delay in the publication of his bulletin distressed him. When Herty thought about how hard he had worked to get it ready for the printer and how slow the government had been to issue it, he felt "heartsick." Without it, "the whole burden" of spreading the word about the cup-and-gutter system had fallen on his shoulders. Failure to get the report into the operators' hands, he wrote George Sudworth, "may have queered our work."⁴⁴

Sudworth regretted the government's delay in issuing the bulletin, but as a longtime member of the bureaucracy, he was probably accustomed to red tape. He begged Herty not to be discouraged and promised to do all he could to expedite the publication. And he did. *A New Method of Turpentine Orchardng* by Charles Holmes Herty, Expert, appeared as Bulletin 40, Bureau of Forestry, United States Department of Agriculture, sometime late in May 1903. Its distribution stimulated demand throughout the turpentine belt, but so did reports of the results that some of the early converts were circulating. At the end of the 1903 chipping season (November), Herty informed the Bureau of Forestry that the Chattanooga Pottery Company had sold every cup it could possibly turn out until the following April and that it had had to turn down requests for an additional three million because there was no way to produce them. Operators were "begging" for cups, Herty reported, some even trying to purchase them from those who ordered early.⁴⁵

Herty regretted having to turn orders away. But after several visits to the plant at Daisy, Tennessee, and conferences in Savannah and Jacksonville with company officers and major stockholders, he was forced to agree with those who opposed immediate expansion of the pottery. Any change introduced when the factory was operating at capacity would interrupt production and make matters worse. Furthermore, at Herty's insistence, the factory had been selling cups at a price which experience indicated was too low; the company had made no money. Nevertheless, plant manager Krager was still confident in October 1903 that the investors could make a "reasonable income" and wanted a chance to prove that his original estimate had not been unrealistic. If Krager was right, Herty thought, there would be no trouble in raising capital for expansion later. But John Powell was not so sure. He referred to the pottery as "our elephant at Daisy, Tenn." and

reminded Herty that Krager “always found something in the way of an excuse” to defend his original estimate about the cost of producing cups. It did not help that Krager periodically resigned because he thought he was overworked and insufficiently appreciated by a management that refused to provide him with the equipment needed to do his job. Krager was urged to remain at his post, at least until the contracts already made were honored. Herty felt “very strongly on this point” and thought Krager would agree that it was “the only right thing to do regardless of anything else.”⁴⁶

Besides Krager’s hypersensitivity and the pottery’s failure to meet its commitments or make a profit, other problems associated with the introduction of the cup-and-gutter system arose during 1903. Some customers complained that they were losing turpentine because the cups were too porous. Later, in the winter of 1904–5, a hard freeze destroyed thousands of cups in which rainwater had accumulated. Herty investigated the first complaint but found that only one customer was really dissatisfied; most of the others realized that it took a while to perfect any new product. Little could be done about the cups lost because of the freeze. Herty suggested that in the future operators remove them at the end of each season and invert them on the ground. There might be a slight loss of gum during the winter months, but it would be insignificant compared to the cost of buying unbreakable cups or settling for the lesser yield produced by boxed trees. Not everyone appreciated that proposal; one large Alabama firm that Herty had been trying to interest commented, “We are much further from conversion than we ever were. When you have had time to turn your clever mind to the development of an unfreezable cup, we might consider the subject again.”⁴⁷

Until April 1904 Herty’s employer was the Bureau of Forestry, not the Chattanooga Pottery Company. But unless that company met its commitments to the hardheaded businessmen who financed it or depended on its product, the cup-and-gutter system would never replace the box, and Herty’s larger goal, prolonging the naval stores industry, would never be achieved. Consequently, with bureau approval, he spent most of his time between September 1902 and June 1903 as a troubleshooter, traveling salesman, and service representative for the company rather than as an expert engaged in field research.

A chance to leave all that for more European study came in the summer of 1903. Money was a major problem because Herty had no income beyond his salary of \$2,250 a year. In addition, bureau rules required experts to advance their own funds for bureau projects and apply afterward for reimbursement. He

could not afford to do that for the European venture and at the same time cover his ongoing expenses in the turpentine belt. Furthermore, he hoped to take his family with him.

What Herty referred to as the "financial snag" might have ended the trip before it began, but George Sudworth knew his way through the bureaucratic jungle and arranged through Gifford Pinchot and the secretary of agriculture to have the secretary of the treasury appoint Herty a "Special Disbursement Officer of the Department of Agriculture" with \$1,000 to his credit. All Herty had to do was furnish a bond to the Treasury Department, send in the appropriate forms properly filled in, and draw against the account.⁴⁸

At Sudworth's suggestion, Herty submitted an itinerary and a general outline of what he wanted to do in Europe. First, he intended to study the effects of turpentine on timber growth in the forests of southern France. Next, he wanted to learn about French methods of distillation. He also hoped to examine European methods of extracting resin from wood, and he expected to visit Professor A. Tschirch of Bern, Switzerland, a researcher whose work on turpentine formation was internationally recognized. Finally, Herty wanted to "get in touch" with major firms handling American naval stores in Antwerp, Bremen, Hamburg, and London. "You will at once see the bearing of all of these subjects on the future usefulness of our work," he wrote Sudworth.⁴⁹

The Hertys sailed for Europe on May 30, 1903, planning to return on August 19. Herty devoted six weeks to an examination of the timber and naval stores industry in southwestern France before going on to Bern. He spent only a couple of days on the small-scale and rather primitive Austrian industry and two more on visits with the leading importers of American naval stores in Holland and Belgium. That left a week to study the London naval stores market, where serious inroads into the sale of the American product had recently been made by the inferior but less costly Russian spirits of turpentine.⁵⁰

In November 1903 Herty presented an informal report on his European trip to Gifford Pinchot. He noted that French naval stores production was conducted along with lumbering operations and careful reforestation, "consequently there is no depreciation of the forest area." In contrast, American naval stores men usually leased their timber, made no attempt to restrict their activities to trees of a given size, did no reforestation, and usually moved on to new timber within three or four years. The trees they left behind were often unfit for lumbering. Herty described the apparatus used in the French turpentine orchards: a glazed

clay cup holding about a pint; a rectangular zinc gutter to direct the resin into the cup; and a nail on which the cup rested, its upper edge held in place by the gutter. Photographs of the tool used to scarify the trees and the small (four-inch), shallow wounds it produced accompanied Herty's report because both were quite different from the tools and practice common in the United States.

Herty noted that turpentine began on some trees when they were fifteen years old. These were trees marked for removal because of poor shape or too dense growth. Other trees meant to mature for timber were not turpentine until about thirty years of age. Then a single scarified surface was worked for four years; no scarification occurred in the fifth year, but the next season a new four-year cycle was begun about one-third of the circumference away from the first. After another year of rest, a third four-year sequence was begun and so on. Finally, when trees were about fifty-five to sixty years old, intensive turpentine (with many cups) took place, after which the tree was cut for timber. "Bled" timber, Herty noted, was in great demand for construction because scarification slowed the growth rate of the trees, making their annual rings smaller and the timber heavier and stronger. Herty purchased a complete set of French tools and equipment to take home with him. Unfortunately, after reaching the United States they were lost in transit and unavailable for his scheduled presentation at the Turpentine Operators' convention.

Herty also made a careful study of French turpentine stills. Three types were employed, but the most common was essentially the same as that used in the United States: distillation in copper alembics with naked fire aided by injection of hot water. A second method employed steam distillation, both direct and indirect, but this was used in only a few places. A third or intermediate type used naked fire under the copper alembic with distillation aided and the temperature regulated by a mixed injection of hot water and steam. Steam distilleries were too costly to be common, even in France, where the industry was stable. They were out of the question in the United States because the industry shifted constantly from point to point. The mixed injection system seemed to Herty to offer a real advance over American methods. Only slightly more expensive, it eliminated the personality of the stiller from the process because a thermometer immersed in the molten resin allowed the temperature to be kept constant by varying the injection of water or steam.

Finally, Herty noted that French rosins were of an "admittedly finer" quality than the American product. At one distillery he found seven grades of rosin su-

perior in color to the best grades produced in the United States. The explanation lay not in distillation methods but in the French practice of pouring the product into shallow trays and bleaching it in the sunlight.

The principal reason for Herty's investigation of the French turpentine industry was to establish what methods, if any, might be borrowed advantageously by American operators. He concluded that the system's introduction into this country was not practical under existing economic conditions for several reasons: French timberland averaged about \$300 per acre while in Florida the going price was \$4; French labor averaged thirty to fifty cents a day whereas American workers earned anywhere from \$1 to \$1.50 per day; and finally, yield per crop in the United States averaged 350 barrels in a given season compared to the French yield of 72 barrels. Eventually trees turpented under the French system would greatly outproduce those in America, but unless timber and land values skyrocketed and labor costs fell, the French system was not practical in the United States in 1903. Applied to American timber, the French system might yield more than it did in France because of the warmer climate and the nature of the trees, but only experiments could establish that. If the bureau thought it worthwhile, Herty's correspondence indicated, it would be easy to get French *resiniers* to run such an experiment in the United States.

Herty left France for Bern, Switzerland, to visit Professor Tschirch, a noted investigator who had done numerous studies to determine how resins were formed in conifers. His work "demonstrated beyond doubt," Herty reported, "the existence in untapped trees of primary resin ducts; while in trees which had been wounded, there are formed immediately after the wounding large numbers of secondary resin ducts in the new wood and it is from these latter that the main portion of the commercial resin is obtained, such resin being a true pathological product." Tschirch's explanation for resin formation in the cambium layer of the tree provided Herty and the Bureau of Forestry with the theoretical bases for experiments they hoped to conduct in the 1904 season. The plan called for measuring the relative yield of resin from trees scarified to various depths to determine whether less destructive shallow chipping could be practiced without unduly sacrificing yield. Professor Tschirch was unable to answer definitely several other questions about resin formation. But the interview was still valuable, Herty reported to Gifford Pinchot, because it "demonstrated clearly the need of further experiments on our part which should prove valuable from both a scientific and commercial standpoint."⁵¹

The Hertys were back in America by late August 1903. After a stopover in Washington, Herty visited the bureau's ongoing experiments at Ocilla, Georgia, left in the capable hands of his assistants, and then traveled to Jacksonville to address the third annual meeting of the Turpentine Operators Association. Using lantern slides prepared from his photographs, Herty explained the French system of turpentine to the naval stores men. They were very interested, and although he knew they were not likely to adopt it, his lecture did make them realize that the days of their industry were numbered unless more conservative practices were introduced.⁵²

In September 1903 the Bureau of Forestry moved Herty's headquarters to Jacksonville, Florida. From that point he could oversee operations at Ocilla, where Frank Klarpp continued to monitor the comparative experiments of cups versus boxes begun the previous year. He could also continue his travels throughout the turpentine belt promoting the cup-and-gutter system and helping operators install it. Above all, he was close to the area where he and the bureau expected to launch new investigations during the 1904 turpentine season.⁵³

Originally Herty hoped to locate the new experiments on government-owned timberland near Green Cove Springs, Florida, only a short distance by rail from Jacksonville. The alternative was to lease timber from a private owner in the same vicinity, a move the bureau would have to approve. While he waited for a decision, Herty asked George B. Sudworth to order forty thousand cups for the experiments and to begin looking for experienced chippers. Unfortunately, the Department of the Interior refused to make the government land available and Gifford Pinchot did not make a decision regarding a lease arrangement in time to acquire cups or labor by March 1, 1904. "I am very much disappointed," Herty wrote Sudworth, "that the experiments will have to fall through, simply for the lack of cups."⁵⁴

It is ironic that Herty, who invented the cup-and-gutter system, and the Bureau of Forestry, which underwrote its development, turned out to be the victims of their own successful campaign to promote its large-scale adoption. The Chattanooga Pottery Company had orders for over two million cups in September 1903. Two months later Herty told Sudworth that "every cup that is in sight between now and April 1st has been sold, while orders for nearly three million . . . have had to be declined. You would laugh . . . if you could see some of the operators begging for cups."⁵⁵

Near the end of 1903 Herty began thinking about leaving the Bureau of For-

estry. Several factors influenced his final decision, which was not made until he was sure that he had discharged his duty to the bureau and was acting in the best interest of the stockholders and customers of the Chattanooga Pottery Company, his family, and himself. When Herty joined the bureau in January 1902, he planned to make it and naval stores research a life work. Elimination of the box from turpentine practice in favor of a more conservative and profitable substitute was simply the first, though absolutely essential, step in the work he expected to do. By 1904 George Sudworth agreed with Herty that that first step had been completed, that acceptance of the cup-and-gutter method had become almost a "fixed fact," and that by April 1 all of the "moral obligations" he had assumed when he joined the bureau would be fully discharged. Consequently, Herty thought he could resign in good conscience and devote his attention to other responsibilities.⁵⁶

High on the list of those to whom Herty felt a sense of obligation were the stockholders and customers of the Chattanooga Pottery Company. Herty had persuaded both groups to take a chance with his new system, and neither had been adequately compensated for their good faith. The company had earned nothing for the stockholders by 1904, and unless its efficiency and output increased soon, it would go on disappointing the operators too. To satisfy demand and "earn a reasonable profit" for the investors, Herty felt compelled to devote his full attention to the "manufacturing problem."⁵⁷

Finally, Herty decided that the time had come to think about his family and himself. Since February 1902 the Hertys had been living in rented rooms and boardinghouses. Sophie Herty spent much of her time with only the children for company while Herty was traveling all over the Southeast or working in the woods. The pace for him was particularly exhausting early in 1904, which led George Sudworth to write sympathetically: "I am exceedingly sorry that you personally have to go through privation, including the eating of cold cabbage to 'teach those niggers how to put up the cups and gutters.' I know just what it means and we all appreciate the uncomplaining fortitude with which you are doing your work."⁵⁸

Money worries made matters worse. The government paid Herty \$2,200 a year, but he usually had a cash flow problem because bureau rules required employees to advance their own funds for expenses and apply afterward for reimbursement. With no other source of income, Herty had to borrow frequently from banks or on his insurance policy, the only savings he possessed in 1904. All that could change if he left the bureau, and on March 9, 1904, he submitted his resignation.⁵⁹

When Herty was in the midst of the Ocilla experiments in the spring of 1902, he began thinking about securing a patent for his cup-and-gutter system. George Sudworth, his immediate superior at the bureau, encouraged him. "There is forethought and wisdom in the suggestion you make," he wrote Herty on June 6, 1902, "and of course we do not want anyone to block us by tying up your invention which could be easily stolen." After consulting with Gifford Pinchot and other government officials, Sudworth wrote Herty that he could legitimately seek a patent in his own name for the cup-and-gutter system provided it had been devised before he joined the bureau. Next, he put Herty in touch with James Newton, an official in the U.S. Patent Office. Newton, a native of Madison, Georgia, helped Herty prepare his patent application and overcome an examiner's objections to one of its claims. On February 3, 1903, the United States Patent Office approved letters patent for "An Apparatus for Collecting Crude Turpentine" to Charles H. Herty of Ocilla, Georgia.⁶⁰

That Herty expected to earn something from his invention was certainly no secret from the naval stores operators. In his correspondence with them he regularly noted that he planned to collect an "annual royalty of .25 cts. per thousand [cups] direct from the operators." He thought the bureau was aware of his plan, too, but an urgent telegram from Gifford Pinchot on January 20, 1903, declared, "Impossible for you as Bureau official to make any charge whatever for application of your system." A follow-up letter indicated that Pinchot had just learned of Herty's intention. He thought they had agreed that Herty should patent the device for three reasons: to prevent someone else from doing so, to secure "the free use of the system to the public," and to secure Herty's interest later on if he left the bureau. He realized that the "essentials of the system" were devised before Herty joined the bureau, and he recognized Herty's right to patent it. But as long as he worked for the service, he "must make no charge whatever for the application of the system, nor must any charge be made by anyone to whom any rights might be assigned by you."⁶¹

Whatever hopes Herty may have had of augmenting his income and retiring his debts had to be put aside. He answered Pinchot immediately, "submitting promptly" to his "demand" about the royalties but including in his letter an explanation and justification for all his actions since the patent question first arose in June 1902. Herty agreed with Pinchot's recollections about the first two reasons for seeking a patent; they were his suggestions. But the third reason for getting it, to protect his interest in case he left the bureau, had never entered his mind until he got Pinchot's letter. When he left the academic world, he thought a life's

work was before him, not “simply a temporary investigation.” He also thought that the bureau’s approval of his application for a personal patent “carried with it the right to charge a royalty and was truly grateful that this new turn would bring me revenue additional to my salary.” In a letter to Sudworth he had remarked that the increased yield from the cup system would make the operators happy, bring “plenty of glory” to the bureau, and allow him to “save something for those dependent upon me.” Herty could not cite the date of the letter because he was away from his files, but he had never failed to tell anyone who asked that he expected to charge a royalty. On a recent trip to bureau headquarters in Washington he also made that clear. Yet Pinchot’s telegram was the first indication he had received in the six or seven months since the patent question came up that he had no right to charge a royalty. Finally, Herty was sorry that Pinchot felt compelled to include in his letter the sentence “nor must any charge be made by anyone to whom any rights might be assigned by you.” “I have never been given to evasion,” Herty declared. “The matter is either right or wrong. I thought I had the right. You state that I have not. I submit to your decision. That is all.”⁶²

Herty concluded his letter to Pinchot by assuring him that the royalty question would in no way affect his “zeal” for his work, the basis of which was the conservation of the southern pine forests, not the devising of “a patentable substitute for the box.” He would continue to push it with “utmost energy.” Nevertheless, he asked Pinchot for a statement, separate from the January 20, 1903, letter, to the effect that his right to charge a royalty for his system would be “in no wise restricted when I am no longer an officer of the Bureau.” Pinchot responded a few days later, expressing relief that Herty had no plans to leave the service. He was sorry that his letter conveyed the impression that he thought Herty was capable of evasion: “Your conduct in this whole question has been straightforward and manly . . . in a high degree . . . and your work . . . among the most useful things the Bureau ever undertook.”⁶³

Pinchot had included the offensive sentence, he continued, because of his concern for the bureau and the damage it might have suffered if royalties had been charged for a project the government was promoting. He wanted to talk the whole thing over with Herty the next time he was in Washington, “and one of the things I want to consider with you then is greater compensation to you by the government.”⁶⁴

Just a year later (January–March 1904), Herty was wrestling with the question of resigning. Again Pinchot expressed his high regard for Herty’s work, and again he offered him a sizable raise to remain with the Bureau of Forestry. But Pin-

shot could not change his position on the royalty question, and with regret Herty submitted his resignation on March 9, 1904, to take effect on the first of April.⁶⁵

When Herty's assistants learned that he had resigned, they were devastated. "I can hardly write any more realizing that you won't be with us any more," wrote Pat Woolfolk. Frank Klarpp had worked with Herty since the first day at Statesboro and in 1903 named his first child after him. "I don't think I ever had anything to make me feel as bad in a long time," he told Herty. "Would like ever so much to see you and have a long talk . . . could tell you things better than I could write them."⁶⁶

Herty also regretted the end of his association with Klarpp and Woolfolk as well as the formal termination of his relationship with the Bureau of Forestry. Above all, he would miss working with George Sudworth, who from their earliest correspondence had been a strong advocate in Herty's behalf and, more important, a warm personal friend. The two men saw each other rarely but corresponded extensively until Sudworth's death in 1927.⁶⁷

Before Herty made his decision to leave government service, he spent weeks attempting to work out satisfactory arrangements with his prospective employer, the Chattanooga Pottery Company. In January 1904 the company was struggling to fill its cup contracts with the naval stores operators in time for the opening of the turpentine season in March. C. L. Krager, the temperamental manager of the inadequate plant at Daisy, Tennessee, agreed to remain at his post until then, and John H. Powell reluctantly consented to stay on as president of the company. But only days after the January 11 stockholders' meeting at which these decisions were made, Krager made a new proposition to Herty. He claimed to have found an investor in Chattanooga who was willing to build a new factory capable of turning out seven million cups a year. Krager would supervise construction and manage the new plant; all Herty had to do was sign a contract with the new company giving it the exclusive rights to manufacture the Herty cup and agreeing to sue any party who tried to use his system with some other cup. The proposed company would turn over its entire output to Herty at an agreed-upon price, and he was free to market it at whatever figure he chose. Krager thought the proposal was very generous because it relieved Herty of having to raise capital for a new plant. As for defending the patent, Krager predicted that there would be no trouble considering the opinion of the "best patent attorneys in Washington," whose judgment on the question Herty had unveiled at the recent stockholders' meeting.⁶⁸

Herty informed Krager that he could not respond at once because some of

the naval stores people had made another proposition that would also have to be considered. When he had time, Herty thought it would be worth a trip to Chattanooga for an interview with the capitalist. Meanwhile, the Chattanooga Pottery Company was inundated with orders. "The thing is taking like wildfire," Herty informed Krager. "The only thing now is to give them the cups, just as many as they wish, and see that the cup furnished is a good cup."⁶⁹

Krager continued to press Herty for a quick decision, increasing his estimates of what a "first class" plant would cost and stating the price he expected to charge per thousand cups. Herty thought Krager's price was "very fair," although he still thought it best to raise the capital for a new plant from "the naval stores people on account of their interest in pushing the matter." But there was "a little complication here [Jacksonville] at present which must be straightened out before matters can take definite shape."⁷⁰

Krager's proposition was moot by January 30, 1904, because his Chattanooga capitalist did not want to buy out the existing factory, which Herty considered obligatory to compensate the original investors of the Chattanooga Pottery Company. The only other "capitalist" Krager thought he could interest was D. P. Montague, the original owner of the cup factory, but he "would rather not ask him for any favors." Krager hoped Herty would do something soon—either put up a plant of his own or get the Chattanooga Pottery Company to expand the present one so that they could meet the demand at a "reasonable" price. The quoted price of \$8 per thousand cups was still good "whenever a plant is furnished me equipped as I want it." A few days later Krager followed up his January 30 letter with a full breakdown of what it would cost to expand the existing pottery. The estimate, about \$10,350, compared to \$20,000 or more for a new plant, appealed to Herty, as did Krager's price per thousand cups. He asked Krager to outline the whole proposition, including the terms of the contract he would expect, so that they could get things "in more definite shape." "Matters are being straightened out at this end," Herty told Krager on February 6, "and I hope there will be something definite to say very soon."⁷¹

What Herty was waiting for appears in a letter he wrote to J. W. Callahan, a stockholder of the Chattanooga Pottery Company, on February 12. Because no dividends had been paid to investors and demand for cups was growing steadily, Herty thought it was his duty to give his personal attention to the "manufacturing problem." He could not do this as an employee of the Bureau of Forestry so he would have to resign. "I would feel unjustified in taking this step unless I can secure at least half of the stock of the Chattanooga Pottery Company," he told

Callahan. He wanted to know if Callahan would sell his 25 shares “at the value paid for the stock plus 8% interest since purchase of the Pottery, taking my note for six months at 6% interest . . . with [the] stock as collateral.” Powell, Bullard and Company had already agreed to sell Herty their 125 shares on those terms, and within a day or two, Callahan did too.⁷²

Herty tried to purchase the ten shares held by C. L. Krager as well, but Krager preferred to hold his unless it became “absolutely necessary” for Herty to have them to complete his arrangements. Other stockholders, convinced that the pottery had a great future, also declined to sell. McNeill and Young, a Savannah firm, approved Herty’s goal of securing a half interest but thought the company’s stock should be increased to reflect the larger business and Herty should acquire his half from the new stock.⁷³

On February 23, 1904, the directors of the Chattanooga Pottery Company met in the offices of the Consolidated Naval Stores Company, principal stockholder of the pottery company, at Jacksonville, Florida. After listening to C. L. Krager’s presentation, they voted to improve the plant for approximately \$12,000 and make a contract with him to produce cups at \$8 per thousand. The directors also made two proposals to Herty: first, if Herty obtained 50 percent of the pottery company’s stock by purchase, Consolidated Naval Stores Company, for a consideration of 10 percent of gross sales of turpentine cups and gutter iron, would guarantee payment of the accounts of its customers (the operators) to the Chattanooga Pottery Company; it would also give its “good will” to the Chattanooga Pottery Company and the Herty cup system. Or, second, if Herty did not get controlling stock by purchase, the pottery company would give him 25 percent of the paid-up stock in exchange for the exclusive right to manufacture under his patent, and Herty must agree to defend the patent against all infringements. Herty was not required to accept either proposal made at the meeting, but Krager urged him to choose one or the other, both of which he thought were fair and provided plenty of protection for Herty’s interests. After getting back to Chattanooga, Krager discussed the situation with D. P. Montague, who also thought Herty should accept one of the offers because it would be “poor policy” to defy the Consolidated Naval Stores Company. Krager agreed. He estimated that Herty could clear \$15,000 a year and “not be burdened with any debts or the financing of the business. . . . I am sure that with the stock distributed as it now is everybody will work nicely together without a hitch.” Krager, whose future depended on Herty’s decision, wanted to know as soon as possible what he planned to do.⁷⁴

A few days later Krager wrote to Herty again. He had just seen Montague, who

now wanted to buy a controlling interest in the Chattanooga Pottery Company, improve it, pay Herty a royalty (unspecified) for using his patent, and arrange with the Consolidated Naval Stores Company to take the plant's total output in exchange for 10 percent of the pottery's gross earnings. Krager did not know what Montague planned to offer Herty in royalties but advised him to have nothing to do with Montague. "He [Montague] plainly stated to me," Krager wrote, "that he did not think your patent was worth much and that it could be beaten in the courts, and I should think that if he had this opinion he would . . . not be any too liberal with you."⁷⁵

On March 9, 1904, Herty submitted his resignation to Gifford Pinchot. He also wrote the Consolidated Naval Stores Company, rejecting its "several propositions" made at the Chattanooga Pottery Company's directors' meeting on February 23. Another letter went to his friend in the U.S. Patent Office, James Newton. After apologizing for not writing sooner, he explained that his plans to "utilize" his patent had hung fire for several weeks "owing to the greed of those who should naturally have come to my assistance." The reference was to the controlling interest in the pottery company whose proposals he had just turned down.⁷⁶

Not until April 1, 1904, the effective date of his resignation, were Herty's relations with the Chattanooga Pottery Company finally spelled out. Herty granted the pottery sole and exclusive right to manufacture and sell his patented cup-and-gutter system until December 31, 1910. The pottery agreed to pay him a royalty of \$20 for each ten thousand cups and gutters manufactured and sold, as well as an annual salary of \$2,400. In exchange, Herty had to give his full time to the pottery from April 1, 1904, through April 1, 1908. He was also required, at his own expense, to defend the pottery if it were sued and to initiate action against any party if his patent were infringed. If he did not, the company could act, deducting the costs from Herty's royalties. Finally, when the contract expired on December 31, 1910, the pottery had the right to sell the entire plant to Herty. He pledged to buy it at an agreed-upon price or, if no settlement could be reached, at a figure fixed by a board of arbiters. With agreement finally achieved, Herty notified Krager that he and John H. Powell planned to visit the cup factory. "I am glad that these preliminaries are at last settled," he wrote, "and that we can now get down to good hard work."⁷⁷

Herty's activities as an employee of the Chattanooga Pottery Company were not appreciably different from those for the Bureau of Forestry. He traveled constantly, visiting turpentine operators to interest them in cups and gutters; negoti-

ated with railroads; sent out notices to operators urging them to order cups in time for the coming season; helped purchasers to install the system; and taught their workers how to use it. To his old friend at the bureau, George Sudworth, he wrote on June 14, 1904, "I know you will be interested to . . . [learn] that a half million cups have already been sold for next year's use." Herty was especially pleased that his first order came from A. D. Covington, president of the Turpentine Operators Association. Covington's adoption of the system was the best advertising the pottery could possibly get. But just to make sure, Herty bought space in several issues of the *Manufacturers' Record*.⁷⁸

At least one phase of Herty's work for the Chattanooga Pottery Company was new to him—the defense of his patent against infringement by consumers, other manufacturers, and rival inventors. Herty's patent was granted in February 1903, but as long as he worked for the government, anyone was free to manufacture, use, or sell the system without payment of a royalty. "This was not as a matter of law but as the policy of the Bureau," he explained to one operator. The bureau always recognized his ownership of the patent, however, and his right to make whatever disposition of it he might care to once he left government service. Well before resigning, Herty hired a prestigious firm of Washington patent attorneys to review the claims in his patent against those made for all other turpentine-gathering devices. The goal was to make sure that his system could withstand all legal challenges by other patentees. In every case the lawyers found Herty's system to be sufficiently different from or superior to other inventions that they were sure he would prevail in court. Furthermore, the attorneys pointed out, "Under the doctrine of contributory infringement, it has been held that persons who manufacture parts of any machine for an apparatus, knowing that these are intended for use in an infringing machine or apparatus, are themselves liable as infringers." This part of the attorneys' opinion was soon put to the test.⁷⁹

In the fall of 1904 an Alabama pottery asked Herty if it could lawfully manufacture his cups. He explained that he had given the exclusive right to manufacture and sell his apparatus to the Chattanooga Pottery Company. But he would refer the request to the company, which, if it chose, could legitimately make an arrangement with the inquiring firm. Others did not ask first. After a hastily called meeting of Chattanooga Pottery Company executives, Herty was directed to send out a form letter warning consumers not to purchase or use an "inferior" cup then being offered to the trade. Buyers and users of cups not made by the Chattanooga Pottery Company were "infringers" of his patent, Herty wrote, and he would take

vigorous legal action against them to protect himself and the Chattanooga Pottery Company. Next, the company's lawyers hired a private detective to locate the infringer, who turned out to be a shady operator in Philadelphia. The threat to the pottery seems to have faded before any serious damage was done.

Other challenges came from inventors who claimed to have developed patented apparatus superior to Herty's. For a consideration they were willing to make a deal with the Chattanooga Pottery Company to the advantage of all concerned. One of these "improvements" consisted of a treated paper cup and a wire to conduct the gum along the gutter and into the cup. Another involved an ax with a curved blade that made a cut in the tree designed to take a curved rather than straight gutter, thereby eliminating the need to make two flat faces for Herty's two straight-edged gutters. Herty usually responded to such proposals politely, offering to discuss the apparatus with the inventor, but after investigation generally confirming his suspicions that the "improvements" were impractical and their developers either dreamers or charlatans.⁸⁰

The most serious threat to the Chattanooga Pottery Company's domination of the cup market came early in 1905 from the American Can Company. During a severe cold snap in the winter of 1904–5, pottery cups left hanging on the trees filled with water, froze, and broke by the thousands. Complaints poured in from all over the turpentine belt, and some major operators began buying galvanized metal cups from the American Can Company as replacements. The president of the Chattanooga Pottery Company asked Herty whether such purchases constituted an infringement of his patent, to which Herty replied in the negative. No infringement occurred if an operator simply replaced his broken pottery cups with metal ones because the patent claim described the cup as a "vessel" without specifying the material of which it was made. But if an operator in future bought galvanized cups *and* gutters to "constitute new apparatus for use as described in [Herty's patent, it] would constitute an infringement if purchased from any other party than the Chattanooga Pottery Company." Meanwhile, the American Can Company was sending circulars throughout the entire turpentine belt offering to provide a lighter, more practical, weatherproof cup at special prices to large-scale purchasers.⁸¹

When customers of the Chattanooga Pottery Company began canceling orders for clay cups, the management became truly concerned. Herty wrote his friend in the U.S. Patent Office, James Newton, asking for several copies of his patent, and Newton sent as many as he had, remarking, "If you are planning a suit, don't let your opponent know that I drew up your claims."⁸²

Herty planned to send marked copies of his patent with a covering letter to those canceling orders from the pottery. The letter explained under what conditions the recipient might be guilty of infringement. But news seems to have reached the American Can Company quickly. Before Herty could act, its Atlanta branch manager visited the president of the Chattanooga Pottery Company. Claiming that he did not know the Herty system was patented, he declared that he had no desire to infringe anyone's rights. Instead he hoped to sell metal cups to the operators through the Chattanooga Pottery Company. Herty saw nothing "objectionable" in such an arrangement, and after considerable correspondence and a few conferences, the Chattanooga Pottery Company and the American Can Company worked out a satisfactory agreement.⁸³

The internal affairs of the Chattanooga Pottery Company were more difficult to adjust. At a directors' meeting in June 1904, John Henderson, an employee of Consolidated Naval Stores Company, was elected to replace John H. Powell as president. At the same meeting the directors opened an office in Jacksonville, requiring that all Chattanooga Pottery business be handled there rather than through Daisy, Tennessee, where C. L. Krager and the factory were located. Rena Bouchelle, an accomplished secretary and bookkeeper who worked for Herty when he was still with the bureau, was asked to work for Henderson in the Jacksonville office. She declined unless it would do Herty some good. Henderson was a good man, with plenty of sense, but she would not have put him at the head of the pottery company, not because he would do anything dishonorable but because she believed that he would be unduly influenced by those "who are least friendly to you [Herty]." The reference was to the management of the Consolidated Naval Stores Company, especially its president, W. C. Powell. Bouchelle thought that somebody would have to pull a few more wires and bring about another change in the company's management before Herty would have things the way he wanted them. Like Ella Wheeler Wilcox, she felt that "no question is ever settled until it is settled right." Meanwhile, if Consolidated Naval Stores ran the company by themselves for a while, she thought things would soon get so tangled that they would be glad to turn it over to Herty.⁸⁴

One man Rena Bouchelle did think Herty could trust was P. L. Sutherland, a landowner and turpentine operator with many business interests around Green Cove Springs and Jacksonville, Florida. It was Sutherland's property on which Herty and the bureau had planned to conduct the shallow chipping experiments in 1904. That project fell through, but the warm friendship between the two men continued. Sutherland was Herty's closest ally when the latter was trying

to negotiate his contract with the Chattanooga Pottery Company in the spring of 1904. He continued to support Herty's interests in subsequent clashes with W. C. Powell and others who did not see eye to eye with Herty regarding how the problems of the pottery company ought to be addressed.

A major problem concerned the continuing inability of the pottery company to meet demand. Despite one expansion, the plant still had to turn away orders. Even those it accepted were not always delivered, leading some disgruntled operators to look for substitutes as far away as St. Louis. Other complaints came from users who found the product too soft from insufficient burning in the kiln or too susceptible to breakage during cold weather. The hard freeze in January 1905 set off howls of discontent from users who lost as many as 50 percent of their cups. "To make a long story short," wrote one operator in south Georgia, "I want you to replace 15,000 cups and I want them at once." But President John Henderson saw no way that the pottery could satisfy such demands. In desperation, he asked Herty if he knew another firm that might make a few hundred thousand cups to placate the irate customers.⁸⁵

The weather cleared up, but the pottery's inability to turn out enough cups continued. Even the agreement with the American Can Company to sell metal cups could not satisfy the demand. Herty was worried. "We must remember," he wrote Henderson, "that our limited capacity will tend to force other methods into use. Merit will determine the final outcome . . . but we have a fine position . . . just now and it seems unfortunate to have to yield . . . simply because we are unable to satisfy the demand."⁸⁶

Rather than invest more capital, some Chattanooga Pottery Company directors, including W. C. Powell of Consolidated Naval Stores, preferred to turn away orders. Other officers of Consolidated were more flexible. Herty asked P. L. Sutherland to speak with the vice-president, W. F. Coachman, because "I'm afraid our friend 'W. C.' [Powell] has put that nickel so close to his eye that he can't possibly see the dollar beyond." John Henderson, president of the pottery company, agreed with Herty about expansion but had little control over policy. "I wish that I had the money, and could buy the Consolidated Stock," he told Herty in confidence. "I would . . . move the office to Chattanooga, or Daisy, and give it [the pottery] my individual attention." But he did not have the money and doubted that Consolidated would sell "at a price that one could afford to pay."⁸⁷

Perhaps Herty's biggest, or at least most annoying, problem with the Chattanooga Pottery Company was its plant manager, C. L. Krager. Originally he was

secretary-treasurer of the pottery as well, but when John Henderson became president in June 1904, the company's business affairs were conducted from Jacksonville. Krager had a contract with the company to produce cups at a rate he set. But it soon proved to be too low and led to extreme dissatisfaction on his part. He asked to be released from his obligation, a request Henderson refused to consider unless Krager signed an agreement not to interfere in any way with the Chattanooga Pottery Company in the future. This was a shrewd move on Henderson's part because Krager was hatching a scheme to get financing from D. P. Montague, the pottery's original owner. Montague thought Herty's patent could be successfully challenged in court. Consequently, he was willing to open a competing cup factory, with Krager in charge, if the officers of Consolidated Naval Stores agreed to guarantee the purchase of a million cups a year. If successful, the scheme would have left Herty completely out in the cold. But Consolidated turned Montague down and Krager withdrew his request to be released. That did not make him less bitter toward Herty, whom he considered to be grossly overcompensated by the pottery while he was going bankrupt.⁸⁸

Some aspects of Herty's career with the Chattanooga Pottery Company were more rewarding. When he left the bureau in April 1904, he and his family moved to Green Cove Springs, Florida, a small town about thirty-five miles west of Jacksonville. Sophie Herty was happy there, and "the little boys are crazy about the freedom they enjoy." For the first time in two and a half years the family was using its own household goods, which had been stored in Athens since Herty left the University of Georgia. New friends among Florida naval stores operators and businessmen also made life more pleasant. Herty went bird hunting with the turpentine operators, joined the Green Cove Springs Skeet Shooting Club, and took his wife to dances at the Florida Yacht Club in Jacksonville.⁸⁹

Financially, Herty was better off than he had ever been with the bureau. By late August 1904 the Chattanooga Pottery Company had remitted his first royalty check, which allowed him to pay the Washington lawyers who helped defend his patent against would-be infringers. He was also able to send several small checks to Jim Stoney at the University of Georgia. Stoney was the son of the Reverend James Stoney, who served as Herty's informal guardian after the death of his parents. Young Stoney's mother, widowed and desperately poor, had three other children to support and educate. Consequently, Herty's help was vital to her son. So was the free room and board he received at the Athens home of Herty's sister and brother-in-law, Will Hooper. By the end of 1904 Herty was also able to pay

off a debt, invest in a newly chartered bank, and hire a servant for his wife, who suffered severely from asthma and bronchitis attacks and was often sick enough to require Herty's personal care.⁹⁰

Another rewarding feature of life in Green Cove Springs was the continuation of Herty's relationship with the Bureau of Forestry. Despite his resignation, he and George Sudworth proceeded with plans to conduct shallow chipping experiments somewhere in the vicinity. Because a lack of cups had forced postponement of the work in 1904, Herty urged Sudworth to order some quickly for the coming season. The Chattanooga Pottery Company was already sold out through December 1904, and new orders were coming in every day. After considerable correspondence, Sudworth visited Green Cove Springs to complete arrangements for the new work. Frank Klarpp, having finished the third and last year of the Ocilla experiments, would conduct the new investigation for the bureau under Herty's general direction. "I shall be very glad to have Frank near me again," Herty wrote Sudworth. "I am truly very fond of Frank. He was with me from the very start in my work and I have seen him under all sorts of conditions . . . he is just about as true and faithful a boy as I have ever seen."⁹¹

Ironically, when Herty made that comment he was seriously considering a change that would take him away from Green Cove Springs. Only two months after joining the Chattanooga Pottery Company in April 1904, he received a bid to chair the chemistry department at the University of North Carolina. Startled but pleased, he turned the offer down "with great regret" because of "obligations to others." But the university's president was persistent, and by the end of 1904, things were going so well in the turpentine belt that Herty thought he could honorably leave the business world for the classroom. To his close friend and adviser P. L. Sutherland, he explained:

I am now at the parting of the ways. All of my life has been spent in training for teaching and research. I have had no training in financial matters. I wish to place myself, if it can be honorably done, and with justice to those dependent upon my efforts, where I can be of greatest assistance to my fellow men and I believe this place is as a teacher of southern boys.

If I felt that such a change in my work would endanger in any way the full success of the work which has been so much to me during the past three years I would not think of making it, but the momentum of the movement is such now that it is bound to succeed.⁹²

Herty's assessment of the naval stores industry late in 1904 and his prediction about its future proved accurate. By the time he left the Chattanooga Pottery Company, the cup-and-gutter system was becoming a common sight in the forests of longleaf pine. Large-scale adoption of his system meant a measure of economic independence for him, but for the turpentine industry it constituted what one trade journal later described as the "first forward step in American naval stores technology in a hundred years." American turpentine operators continued to work trees for the usual three or four years, but the significant increase in quality and quantity of the product, not to mention in profits, convinced them to abandon the box for the more conservative cup system. More important, the trees they left behind, less vulnerable to the ravages of fire, disease, and windstorms, survived to maturity, thus ensuring increased profits from sawtimber as well as significant reforestation through natural reseeded. Above all, by forestalling the destruction of the turpentine forests, Herty's cup-and-gutter system sparked continued pure and applied research by the United States government at the Forest Products Laboratory (FPL) in Madison, Wisconsin, established in 1910, and at government experiment stations in Florida and Louisiana. Meanwhile, enlightened turpentine men, influenced by government bulletins reporting that research, proved increasingly interested in more conservative methods of operation. By 1927, Herty's cup-and-gutter system, or some variation or improvement of it, was ubiquitous; second-growth longleaf and slash pine in Georgia and Florida, again the center of the industry, supplied 78 percent of America's naval stores production; and the total United States output earned more than \$50 million a year. To Herty and others who shared his self-confessed love affair with the pine tree, the future of one of America's oldest industries at last seemed secure.⁹³

CHAPTER THREE

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The Chapel Hill Years, 1905–1916

Herty's career with the Chattanooga Pottery Company had scarcely begun when he received a letter from Francis Venable, a fellow chemist and president of the University of North Carolina. Venable wanted to know whether Herty had "any desire to return to college work." Three days later, the president wrote again, and in detail. Charles Baskerville, head of North Carolina's chemistry department, had just resigned to accept another position. The university needed an able replacement, and although the salary was small, \$2,000, the new head would have an associate professor and four or five instructors and assistants under him. Herty knew about the chemical work done at Chapel Hill, as well as the "opportunity that is given a man to develop himself and the department." "I honestly believe," Venable continued, "that the opportunity is the best in the South." He could not make a firm offer of the job, but if Herty were interested Venable wanted to hear from him at once because the university board would convene in three days.¹

Herty responded by wire: "Impossible to consider because of obligations to others. Am writing you." "With great regret," Herty had to decline consideration for the North Carolina position, which he rated as the ideal chair of chemistry in the South. Venable's research activity and his "broad views concerning the place of research in educational work" attracted Herty immensely, but the chance to join the faculty at Chapel Hill came at just the wrong moment. His efforts to save the naval stores industry through the introduction of the cup-and-gutter system had been so remarkably successful that the turpentine belt was "in the midst of

an important industrial revolution.” He had resigned from the Bureau of Forestry and joined the Chattanooga Pottery Company to devote his full time to the completion of that revolution. Financially, of course, he was much better off, but that was not why he declined Venable’s proposal. “I feel and everyone else insists,” he explained, “that my personality is essential in the present stage of the work. . . . [To desert it now] would largely undo the good which has already been done.”²

Venable was not put off. “I have spent too much of my life building up the Chemical Department here to take any risks,” he wrote Herty on June 2, 1904. “You are the man I . . . [want] and I am willing to wait a reasonable time if there is any hope of securing you.” He thought the state would soon appropriate funds to construct a new laboratory, which, together with the fine work already being done by the department, would make Chapel Hill “the ideal place for an ambitious man.” Ten days later, another letter urged Herty to visit the campus because there were many things Venable could say in person that he could not in a letter.³

Deeply touched by Venable’s confidence in him, Herty went to Chapel Hill on July 24, 1904. Clearly, the president’s persistence and the university ambience caused him to reassess his position. So, too, perhaps, did letters from two close friends, Professors A. H. Patterson and Will Hooper, of the University of Georgia. Patterson, a physics professor, had attended undergraduate school at Chapel Hill and visited relatives there every summer. He thought Herty would fill Baskerville’s place better than Baskerville had, and Chapel Hill, he pointed out, was a “pleasant and healthy place for the Frau and kinder.” Will Hooper, just back from a year in Germany, where his third child, Charles Herty Hooper, had been born, was just as eager to see his brother-in-law return to academe. “I don’t know your business,” he admitted, “but isn’t there a chance, old man? You are too good a man merely to make money.”⁴

It was not money that made Herty hesitate. As he explained to Hooper and President Venable, the Chattanooga Pottery Company had gone through serious internal problems during the summer of 1904. Conditions improved by mid-August, but Herty did not want to ask to be released from his contract until “everything gets thoroughly settled down.” Venable appreciated the situation, agreeing to hold the professorship open, even though it meant he would have to teach chemistry in addition to running the university.⁵

Convinced by late December 1904 that the company was out of danger, Herty asked his good friend and fellow stockholder P. L. Sutherland, to renegotiate

his contract with the company's directors. Because the cup system was so firmly established, Herty argued, his personal services were no longer essential. A low-salaried replacement could be hired to help install cups for new customers, and the company could save the \$2,400 a year it had been paying him in salary. As for legal problems and potential competitors, Herty thought that the worst was over. "I have been through the hardest year of all so far as the [defense of the] patent is concerned," he declared, "and I think the Company can feel secure in the exclusive right to the manufacture and sale of the cups and gutters."⁶

Sutherland spoke to the principal officers of the pottery company, they agreed to Herty's request, and by late January 1905, the University of North Carolina trustees made his appointment official. The new Smith Professor of Applied Chemistry was directed to assume his duties sometime in July.⁷

Between February and July 1905 Herty worked frantically to fulfill existing obligations to the Chattanooga Pottery Company and the Bureau of Forestry.⁸ He also had to find a place to live in Chapel Hill. Housing was scarce there, and negotiating for it by mail was frustrating. In late May, however, he managed to buy the home of the professor he was hired to replace. That left him about a month to wind up his affairs with the Chattanooga Pottery Company, to deposit certain correspondence and legal documents with his attorney, and to pack the family's possessions for shipment to Chapel Hill. On June 30, 1905, the Hertys left Green Cove Springs, Florida, for a short visit with family in Athens, Georgia, and by the middle of July they were happily situated in their new home.⁹

Located in the North Carolina piedmont near the geographical center of the state, Chapel Hill was a small, somewhat isolated village of about a thousand permanent residents and six hundred students when the Hertys moved there in 1905. From the branch line located at Carrboro, which connected Chapel Hill with the outside world, arriving passengers either walked or rented a hack to reach Franklin Street, the town's principal thoroughfare. Unpaved and tree-lined, it formed the northern boundary of the university campus as well as the hub of Chapel Hill's business and residential district. Besides a barber shop, a livery stable, a general store, two hotels, two churches, a bank, the post office, and the town hall, there were a drugstore and an all-purpose emporium that stocked everything from school supplies and clothing to jewelry and jelly beans.¹⁰

Life in Chapel Hill moved slowly, on campus and off. But the pace quickened noticeably when Francis P. Venable became president of the university in 1900. In fourteen years he doubled the size of the school's physical plant, intro-

duced a modern and efficient administrative structure, reorganized and expanded curricula and degree programs, encouraged research and scholarly activity, and diligently recruited the best faculty that the institution's meager salaries could attract.

Developments in the chemistry department, which Venable headed for twenty years before becoming president, illustrate his administrative style. After years of lobbying, he secured a \$50,000 appropriation for a new chemical laboratory in 1905. Course offerings were expanded to meet the growing demand for chemical engineers and industrial chemists, and the chemistry department was grouped with other scientific disciplines in the School of Applied Science. A physicist, J. W. Gore, became its first dean in 1901. In research and publication, Venable set the standard for the chemistry department and the university as a whole. Between 1880 and 1900 he published four books and sixty-eight articles. Yet another book appeared in 1904, and the following year he was elected president of the American Chemical Society. Clearly, the chance to work with and for someone of Venable's scholarly caliber attracted promising young instructors and established scholars even though they could earn more elsewhere. The successful recruitment during Venable's tenure of such able chemists as A. S. Wheeler, J. M. Bell, and Charles Holmes Herty are cases in point. In sum, President Venable inaugurated a series of reforms which in time would transform a good nineteenth-century southern college into a modern twentieth-century university of national repute.¹¹

Herty arrived at Chapel Hill in the midst of Venable's tenure and quickly became a part of his reform program. As head of the chemistry department (1905–16), dean of the School of Applied Sciences (1908–11), and one of a select three-man executive committee, a sort of "kitchen cabinet," Herty worked closely with Venable on everything from recruitment, promotion, and salary issues, to curricular reform and student discipline.¹²

For the chemistry department, Herty had to oversee day-to-day operations of the laboratory, recruit faculty and graduate students, prepare annual reports, sit on committees, expand the library's chemical holdings, raise funds, arrange special lectures, and teach. He was also expected to conduct research, publish, and play an active role in professional organizations. Finally, the job called for service to the university and the community, which could mean anything from sponsoring student clubs to holding public office.

In his first year at the university, Herty worked hard to dislodge "the chemical

rust [which] has accumulated . . . during my sojourn in the woods." He missed the good-natured "guying and kidding" of the life he left behind, but the pressure of ordering textbooks, equipping the laboratory, and lecturing to large classes soon overcame his homesickness. So did the cordiality of the Chapel Hill community and his discovery that he still possessed "my old love and sympathy and interest in college boys."¹³

Like administrators everywhere, Herty recruited new faculty and prospective fellowship recipients through the "old boy" network. He had contacts through colleagues or former students at every southern university and a host of friends in the American Chemical Society who held influential positions throughout the country in government and business as well as in academia. When searching for promising graduate students to fill a couple of fellowships or a one-year replacement for a professor going on leave, Herty usually found them at places like Auburn, the University of Mississippi, Georgia Tech, or Clemson. One prospect was eager to give up an assistant professorship and \$1,500 a year at Clemson for a temporary position and much less money because he wanted to do research under Herty's direction. "In the two years of my being marooned here at Clemson," he confided, "I have not been permitted to undertake any [research] work at all."¹⁴

To fill an associate professorship in physical chemistry, Herty cast a somewhat wider net. He contacted personal friends at the University of Chicago, Cornell, Columbia, Michigan, Harvard, and the Massachusetts Institute of Technology. T. W. Richards, head of the chemistry department at Harvard, suggested the perfect candidate: besides having a Cambridge degree, an instructorship at the University of Illinois, and outstanding letters of recommendation, he was southern-born. Herty wooed him warmly, urging him to "come back South and [assist] . . . us in the work of training Southern boys and increasing the output of research work for which this institution has acquired a unique position among Southern [schools]." But appeals to regional patriotism could not offset low pay and a heavy class load. Herty finally settled for a Canadian, trained at Cornell but then working for the United States Department of Agriculture's Bureau of Soils.¹⁵

Besides performing routine tasks, Herty spent some of his administrative energy on fund-raising and expanding the chemical holdings of the university library. During his first months as department head he tried to raise \$15,000 from North Carolinians active in the turpentine industry of other states. Addressed to some of his friends in Florida and south Georgia, Herty's letters explained that the student body had grown from two hundred to seven hundred in recent years and

that the legislative appropriation of \$50,000 for a new chemical laboratory would provide a building but no equipment for it. More than 50 percent of the students worked their way through school, he continued, in many cases borrowing money to be repaid following graduation. Herty thought that determination deserved to be encouraged. "I have thrown my whole life into the effort to do all I can for the young men of this state," he challenged, "but no matter how hard I work I can not accomplish the greatest good for them unless the laboratory is properly equipped. As an old North Carolinian, won't you help us?"¹⁶

The initial response was discouraging, but Herty persisted. He tried to enlist the editor of a naval stores trade journal in his campaign, offering to address the turpentine operators at their next convention if the editor thought it would do any good. Another scheme involved raising money to purchase photographs of famous chemists; the photographs would be suitably framed and displayed in the laboratory as an inspiration to the students. Finally, he persuaded friends in New York and Florida to endow graduate fellowships or to donate chemical materials for use in the laboratory and the university museum.¹⁷

One of Herty's favorite projects as department head was the expansion of the chemical library. Within days of his arrival in Chapel Hill he was working hard to locate missing issues of some journals to complete the university's collection. Besides American publications, he tried to purchase British, German, and French journals. The university was particularly deficient in French chemical literature, in Herty's opinion, a situation he planned to remedy by digging into his own funds. "The purchase is in the nature of an investment," he told a friend, "[one] in which my family can realize most readily . . . in case of my death." By 1913 Herty thought the University of North Carolina had the best chemical library in the country. "This sounds a little like bragging," he confessed to a former student, "but I think it is a plain statement of the truth."¹⁸

Herty's administrative duties increased in April 1908, when J. W. Gore, dean of the School of Applied Sciences, died suddenly and Herty was appointed to succeed him. Besides the routine burdens of the office, Herty had to struggle with major revisions in the school's curricular and degree requirements, changes in its organization and equipment, expansion of its staff, and significant increases in the number of both graduate and undergraduate students. Most of these developments began under Herty's predecessor and would continue after he stepped down in 1911.¹⁹

Herty's reasons for giving up the deanship are not clear. He may have found

that it required too much time away from research and teaching. One history of the university suggests another possibility. As dean of the School of Applied Sciences Herty also became a member of President Venable's executive committee, an appointive body that dealt with sensitive issues such as faculty appointments, salaries, and promotion in rank. In 1910 action by the committee touched off severe criticism among the faculty, which in turn led to an investigation by the board of trustees. The result was the adoption by the trustees of a fixed salary schedule and the creation of a new committee to administer it. Besides the president, the new committee consisted of one faculty member named by the board and one elected by the faculty.

Herty was among those given a substantial salary increase in 1910, but in a letter to the secretary of the board of trustees he turned it down. "I am deeply grateful of this recognition . . . of my efforts in behalf of the University," he wrote, "but as I explained to President Venable . . . after careful consideration of the matter from every standpoint, I beg to decline the offered increase." Less than a year later, Herty resigned, his administrative ambitions apparently satisfied by his position in the chemistry department.²⁰

In spite of the tensions and jealousies caused by the executive committee's alleged favoritism, relations among the faculty and between it and the administration appear to have been generally harmonious. Certainly Herty got on well with practically everybody. When the Hertys went to Europe in the summer of 1909, President Venable and Dean Edward Kidder Graham sent them off with gifts and warm messages. Junior members of Herty's staff kept him abreast of their activities when on vacation or sabbatical and ran the department for him when he had to be away. Herty was just as generous with his friendship, if not with his letter writing. He apologized for being a poor correspondent but made up for it by cheerfully assuming a great deal of added work and responsibility so that others were free to leave Chapel Hill.²¹

In 1914 Herty's warm regard for a colleague was clearly demonstrated when a move developed in the board of trustees to oust President Venable. At the time, Venable was on leave in Europe seeking to recover from the strains of office which in 1912-13 included the death of one student in a hazing incident, the expulsion of several others for gambling, and dismal records by the football and debate teams. The pro-ouster faction hoped to replace Venable with the popular acting president, Edward Kidder Graham. Herty was a close personal friend of both men, which no doubt explains why R. H. Lewis, a Venable supporter on the

board, appealed to him to help block the action against Venable. Both Herty and Lewis wanted to avoid anything that would injure Venable or Graham or bring discredit on the university. Working behind the scenes, they managed to build support for a plan whereby the university would create a new professorship in the chemistry department and Venable would give up the presidency to occupy it. It was not a new idea; Herty and Lewis had made a similar proposal before Venable went on leave, but he was a proud and sensitive man and would not consider giving up the presidency while under attack. After considerable correspondence and meetings involving Herty, Lewis, and other board members, Lewis wrote Venable on May 7, 1914, “advising him in so many words for his own sake as well as for that of the University to resign *before* he came back.” Ten days later, Venable wrote Herty that he had taken the advice; the only reason he had not stepped down earlier was because he hated to quit under fire, especially unwarranted fire, and he disliked burdening the university with the cost of another professorship.²²

When the Venables reached New York, Herty’s welcome home message was waiting for them. “Loving greetings to each of you from Sophie and me,” he had wired. “Our department enriched last night by creation of the Francis P. Venable Chair of Chemistry to which you were unanimously elected. We will have some good times together in the laboratory.”²³

The loyalty, tact, and understanding that characterized Herty’s relations with colleagues were even more pronounced in his dealings with students. University enrollment ranged from about five hundred to more than a thousand during his tenure, and after 1908 every student was required to take at least one course in chemistry. Even so, the numbers were small enough so that Herty probably knew most of them by sight, if not by name. He certainly knew the relatively few chemistry majors and graduate students very well and served many of them as adviser, confidant, friend, and even substitute parent.²⁴

Occasionally Herty’s students needed more than academic or personal counseling. Many were poor and had to work their way through school. Herty found them part-time jobs and in some cases even loaned them money. Most were profoundly grateful and repaid him as soon as possible, but a few abused his generosity. In 1911, for example, Herty refused to endorse a note for purchase of an automobile for one former student, and the next year he lost patience with another who borrowed \$60 but made no effort to repay any of it during the next six months.²⁵

One of Herty’s principal tasks as head of the chemistry department was to find

jobs for its graduates. Coal and iron companies in Alabama and fertilizer plants in North Carolina were eager to hire University of North Carolina chemists for routine analytical work. So were such agencies of the state government as the department of agriculture and the board of health. But the pay for entry-level jobs in both the public and private sectors was low, only about \$50 to \$60 a month, which led one former student to chastise Herty for letting college graduates accept wages usually paid to common labor. Herty took the complaint in good spirit. Noting that "the true picture" could be obtained only by getting reports from men in the field, he promised to do what he could to dissuade young men from accepting low-paying jobs. "This is in exact accord with what my policy has been ever since I reached here," he explained, "to try to build up our Graduate Department, and by keeping the men here for a year longer, I think they will be in a better position to command higher salaries."²⁶

Herty did build up the graduate department, but he also sent some of the most promising students to the nation's premier schools for their doctoral or post-doctoral training. The Massachusetts Institute of Technology had the country's best chemistry department, in Herty's opinion, and he placed several Ph.D. candidates there after 1909. For other graduate students, those less academically oriented or more eager to join the "real world," Herty found jobs in major electrical and chemical industries of the Northeast. One man, already employed by General Electric Company, wanted Herty to get him a job at du Pont. "They treat their chemists well," he explained, "if they don't blow them up."²⁷

Above all, Herty wanted to help his students as well as his junior colleagues achieve professionally all they possibly could. In 1907 he worked hard to place a woman graduate student with the North Carolina State Board of Health. "I do not hesitate to pronounce Miss [Daisy] Allen to be the best worker in our laboratory, careful, accurate and rapid in her work, pleasant in her manner. . . . Don't let the fact that she is a woman stand against her," Herty urged the prospective employer, "for I consider her a very remarkable woman, with remarkable skill in manipulation and of a very clear mind. She is very industrious and very ambitious." By today's standards that endorsement may sound chauvinistic; in 1907 it was positively enlightened.²⁸

Herty's concern for male students was just as keen. When one man found himself in a dead-end job, Herty recommended him for something better, explaining to the disgruntled original employer, "I went through the experience once, as a young man, of being held down in a minor position by my superior, and . . . [it]

was such a bitter one that I made up my mind always to try to help the under fellow along." As proof that he practiced what he preached, he cited the case of his assistant, R. O. E. Davis, whom he helped get a better, higher-paying job with the federal government even though it inconvenienced him and the chemistry department.²⁹

Herty's students never forgot the excellent chemical training they received from him or the special interest he took in them, both personally and professionally. Even those who went on to MIT and Johns Hopkins considered themselves well prepared to meet the competition. One young man promised to work very hard so that Herty's department, well thought of at MIT, would not be "disgraced." Another, taught by Herty at the University of Georgia and urged by him to pursue the Ph.D. at Hopkins, thought he owed everything to Herty. "It was your influence . . . more than anything else which gave me the necessary incentive to follow out the course I have pursued," he wrote, "and it gives me pleasure to acknowledge the credit I owe you." Those who left Chapel Hill for industry or government service were just as grateful for the interest Herty took in their careers. "I never could have had the courage to do things if it hadn't been for your inspiration and training," wrote one former student. She promised to "work my head off" because he expected her to do her best. Even those who did not plan to use their chemical training valued their association with Herty. From Trenton, New Jersey, where he was playing professional baseball, a former student wrote, "Dr., you can never know how much I appreciate your many kindnesses. . . . It was simply due to you that I ever graduated. College was not serious to me . . . until you seemed to take [an] interest in my work. . . . It was all due to you and I want to thank you for it a thousand times."³⁰

By the time Herty resigned his professorship in 1916, he had become an institution at Chapel Hill. Former students as far away as Texas and southern California could not believe he was leaving. "I have just heard to-day that you are going to leave the Hill," wrote one. "I can't take it in. I don't know what the Department will do without you." Recalling the many times he had visited the Herty family in their home, he could not imagine Chapel Hill without them. "I don't know when I've heard anything that sounds so like the destroying of old ties and associations," he continued. "We hate to give you up but the privilege is great to have had you so long."³¹

Outside the lecture room and the laboratory, Herty spent much of his time serving on various campus committees. President Venable named him to the

faculty advisory committee on athletics during his first year at Chapel Hill, a logical appointment considering his experience in organizing intercollegiate and intramural athletics at Georgia. Later, as chairman of the committee, he used his contacts with former students and professional athletes to recruit baseball and football coaches for the university. Other campus duties involved sponsoring student clubs; arranging schedules and selecting judges for intercollegiate debates; lecturing to student, faculty, and community groups in Chapel Hill and elsewhere; organizing faculty receptions at commencement ceremonies; and hosting visiting dignitaries who could not be expected to stay in what passed for hotels in Chapel Hill.³²

Far more rewarding and certainly far more significant for Herty, his students, and the university was the work he did in its new chemical laboratory. Herty came to Chapel Hill pledged to continue his cooperation with the Bureau of Forestry (renamed the United States Forest Service in 1905) by preparing technical reports of its ongoing shallow chipping experiments at Green Cove Springs, Florida. But soon he was suggesting more sophisticated lines of research that might be pursued at the university to complement those experiments and proposing that one of his graduate students be employed to carry it out. Washington liked the idea and by 1906 a master's candidate under Herty's direction was doing comparative analyses of gum samples taken from various species of pine, comparing samples taken from trees of the same species but of different ages, and analyzing samples taken from specific trees at different times in the same chipping season. The specimens, carefully collected and labeled, were shipped to Chapel Hill by Herty's trusted former assistant, Frank Klarpp, in charge of the Forest Service fieldwork at Green Cove Springs. Herty visited Washington from time to time to discuss results with George Sudworth and also traveled to Florida to look over the work in the woods. Plans called for him to present a summary of both field and laboratory findings at the annual turpentine operators' convention, but eventually Sudworth asked Herty to prepare a full-scale report to be issued by the Forest Service as a bulletin. "You are the only man who can put it into shape," he insisted.³³

Herty's cooperation with the work at Green Cove Springs continued until early in 1909, when, after some infighting in the Forest Service, it was decided to end the fieldwork "for lack of funds." At Sudworth's request, Herty had supplied cogent arguments against the decision but to no avail. Finally, as agreed to earlier, Herty prepared a formal bulletin which presented a full account of the shallow chipping experiments in Florida and the laboratory work at the University of

North Carolina. Sudworth apologized for the paltry \$450 he was paid for writing it, but Herty replied that he had not taken the job to make money. The only reason he agreed to do it at all was out of friendship for Sudworth and his own interest in any good the experiment might do for the southern people.³⁴

Herty's research activity at the University of North Carolina was based on various aspects of the pine tree, with a few exceptions. In June 1907, for example, he read a paper at an American Chemical Society meeting in Toronto which was the result of what he called "a nice little piece of work on the platinum salt." The next year he and a colleague published a paper titled "The Character of the Compound Formed by the Addition of Ammonia to Ethyl Phospho Platino Chloride," an effort which, according to a recent history of the university chemistry department, "crowned" Herty's contributions to "pure" chemistry.³⁵

Herty also spent considerable time in 1908 developing and perfecting an inexpensive, quick, and simple method for determining the amount of oil in cottonseed products. A perfect example of applied chemistry, the new test was designed to help southern mill men achieve more control over the quality of the various products they manufactured from cottonseed. After successful trials under commercial conditions, Herty's method was publicized in trade journals and demonstrated before such groups as the Georgia Association of Cotton Seed Crushers. But interest in it was so widespread that Herty decided to issue a pamphlet explaining how to use the new method and where to purchase the simple equipment it required. *Per Cent Tables for Oil in Cottonseed Products, with Method of Analysis* was a best-seller, not only in the United States but in Europe and Asia as well. Herty copyrighted his booklet, but he made no financial profit from its sale or from the sale of the equipment needed to employ his method. As he explained to his brother-in-law, his only interest was "the promotion of more efficient operation of all our industrial plants in the South, especially where the matter of chemical control can increase that efficiency."³⁶

Other than the work on platinum compounds and cottonseed oil, all of Herty's publications and scholarly presentations between 1905 and 1916 underscore his determination "that the name of this laboratory should be chiefly associated with all matters pertaining to turpentine." Delivered initially to groups of chemists, turpentine operators, or "paint and varnish people," the papers were technical but appropriately edited for specific audiences. Subsequently, they were usually published in one or the other of the American Chemical Society's journals.³⁷

Some of the most interesting work Herty started at North Carolina was never

completed during his tenure there. Committed to the idea that basic research must underlie any real advance in the applied sciences, Herty was deeply interested in learning exactly how resin was formed in the pine tree, particularly after his trip to Europe in 1903, when, besides inspecting the French system of turpentine, he visited Professor A. Tschirch at the University of Bern. Tschirch gave Herty a sketch illustrating his theory of resin formation, a theory based on his own experiments with the local pines. According to it, normal pines had ducts containing resin scattered throughout their wood. These ducts and the resin therein were the result of normal growth, a strictly physiological process. Called "primary ducts" by Tschirch, they yielded only small amounts of resin when the tree was wounded. But, Tschirch theorized, after the tree was wounded, a large number of secondary resin ducts formed above and below the wound in the tree's outer wood. It was these secondary resin ducts that poured out the great quantities of crude turpentine which acted on the tree as a healing balsam. Tschirch regarded the formation of secondary ducts as a pathological process, which took four to six weeks to complete.

Herty's interest in the Tschirch theory had a practical as well as scientific basis. In the woods, operators noted that the first dippings from cupped timber never matched those from boxed trees. If Tschirch was right, it was because box cutting (severe wounding) was done in the winter, whereas the chipping season, which on cupped trees constituted the first significant wounding, did not begin until spring. Boxed timber, therefore, had several weeks' head start over cupped trees in forming secondary ducts and hence provided a full flow of gum on the first chipping. As a result, Herty proposed to several operators that they put "one good wide streak" on the trees at least four or five weeks before regular chipping began. It seemed to work. But Herty still had no laboratory evidence so in the winter of 1906-7 he contacted Tschirch asking for any additional information he could give him, and later he got the Forest Service to send him sections of unturpented longleaf and slash pine trunks, as well as microscopic sections, both cross and longitudinal, of the scarified "faces" of trees of the same species, worked for one, two, and three years respectively. The plan was to study and compare the development of "resin tubes." Unfortunately, there was no student in the University of North Carolina's biology department available to do the work, and Herty wanted it done on his campus under his direction.³⁸

Herty continued to subscribe to Tschirch's theory and his own practical experience regarding the formation of secondary ducts and resin until May 1916.

Only two months earlier the Franklin Institute of Philadelphia published a lecture he had given which incorporated the Tschirch explanation. But in May Eloise Gerry, a young microscopist from the Forest Products Laboratory at Madison, Wisconsin, came to see him at Chapel Hill. She brought her slides and microscope along and the next day a convinced Charles Herty wrote George Sudworth that they would have to find a new theory. Gerry's slides showed no secondary resin ducts formed above the preliminary streaks applied to trees before the first chipping. "Evidently," he said, "there is some other reason for the beneficial effect of this preliminary streak."³⁹

Herty and Gerry maintained a warm friendship for the rest of his life. He admired her skill and did everything he could to see that her superiors at the Forest Products Laboratory supported her investigations of resin formation, which he considered "the real scientific basis for all further work on the production of naval stores."⁴⁰

One other dimension of Herty's work with southern pine while at North Carolina should be mentioned. In some instances he served as catalyst rather than reactant, bringing some of the most enlightened naval stores men into contact with northern businessmen and research and industrial chemists. In 1912, for example, W. F. Coachman, chairman of the board of Consolidated Naval Stores Company of Jacksonville, Florida, asked Herty what he knew about synthetic rubber made from isoprene, a derivative of spirits of turpentine. Herty immediately contacted one of his old professors in Germany, where the *Badische Anilin und Soda Fabrik* and one other firm were busily developing rival processes. There was no doubt that both had good methods, replied the German scientist. It was simply a question of which one could obtain isoprene at the lowest cost. Herty translated the reply for Coachman, who was, of course, looking for new markets for southern spirits of turpentine.⁴¹

Another request from Coachman in the summer of 1915 was more urgent. By that time World War I and the British blockade had practically destroyed the European market for American naval stores. Coachman, whose firm controlled thousands of acres of turpentine timberland, was looking for some way to relieve the industry's desperate situation. Herty interrupted a vacation in Maine to meet Coachman in New York and subsequently put him in touch with Arthur D. Little, Incorporated, of Boston, a famous firm of research and industrial chemists. Herty and Little, a recent president of the American Chemical Society, were old friends and had often discussed ways to diversify the South's economy

through chemistry, particularly by introducing more efficient techniques in the naval stores industry and developing new products from southern pine. In 1913 Little's firm had done some work on the use of southern pine to manufacture paper, in which Herty was deeply interested.

In 1915, however, Little's advice was being sought regarding Coachman's plan to set up a new and efficient centralized naval stores distillation operation. Herty had seen similar operations in France in 1903 and 1909 and immediately contacted his French connection for the latest data. If crude turpentine could be brought by railroad car to such a plant, not only could spirits of turpentine and rosin be produced more efficiently, but a host of by-products might be developed as well. This would require a well-appointed laboratory and trained chemical personnel. But Herty thought it feasible and so did Little, who added that "any comprehensive plan for utilizing their [Consolidated's] timber holdings must include a papermaking proposition." Coachman had to decide where the initial research work should be done—in Little's Boston facility or in a laboratory set up in connection with the proposed distillation plant in Florida. Either would cost plenty of money, Herty concluded, but it would be money well spent. Many years passed before anything resembling the plant Coachman had in mind materialized, but it was encouraging that important men in the industry were beginning to recognize the need for research and new product development.⁴²

Under Herty's direction, the department of chemistry at the University of North Carolina continued to follow the admirable course charted for it by Francis P. Venable and his successor, Charles Baskerville. Enrollment increased, course offerings expanded, and the quality of chemical training and research activity available at Chapel Hill began to attract considerable attention elsewhere. In 1915, for example, R. M. Bird, a chemist at the University of Virginia, asked Herty "as a friend" for a breakdown on the size of his staff, the number of students served, the courses offered, and the amount of research carried on so that he could compare it with the situation in Charlottesville. The administration, he explained, was "after them," comparing the Virginia chemistry department unfavorably with Herty's, especially in the area of research. "I should honestly like some confidential advice regarding the wisdom of 'neglecting' teaching to a reasonable degree in order that a certain amount of research work may be done," concluded Bird. Herty sent the requested information, but on the research question his answer may not have been totally satisfying to the Virginia chemist. "I do not think it is necessary to 'neglect' teaching in order that research work may

be done,” Herty wrote. “We find time to look after the research in between other classes, and . . . [that] has its influence in the quickened spirit of zeal and interest in all classes. It vitalizes everything.”⁴³

Herty’s response reflected his view of what university education was or ought to be. Even after he left academia for other challenges, he continued to work closely with universities and to insist that research, wherever carried out, constituted the necessary first step along the pathway of all human and industrial progress.

When Herty reentered academic life in 1905, he also resumed active participation in professional organizations. Besides the American Chemical Society and the American Association for the Advancement of Science, he belonged to British, German, and French chemical societies, and, with the exception of the German organization from which he resigned during World War I, he retained those memberships until his death. Herty also held several major offices in the ACS and the AAAS. He was president of the North Carolina section of the ACS in 1906 and chairman of the society’s newly created Division of Physical and Inorganic Chemistry in 1909. He was elected councillor-at-large the same year and held that post until he became president of the ACS in 1915. Beginning in 1908 Herty served a five-year term as secretary of Section C (for chemistry) of the AAAS. For many years the two organizations met jointly in December, but in 1912 the ACS decided to break away. Thereafter it held its two annual meetings in April and September.⁴⁴

Herty’s growing professional reputation soon attracted the attention of groups beyond his own discipline. Besides receiving bids to join the Franklin Institute of Philadelphia, the Washington Academy of Sciences, and the American Philosophical Society, he was showered with requests for lectures, proposals from commercial publishers, and job offers. A gifted speaker who could make complex material intelligible to almost any audience, Herty was in constant demand by groups as diverse as the Moravian Brotherhood of Winston Salem, North Carolina, and the New York Chemists’ Club. Publishers also appreciated his ability to communicate, but propositions to author or edit chemical texts did not appeal to Herty, who was too busy with other projects. The first job offer (to occupy the University of Georgia’s new Chair of Forestry) came only six months after he arrived in Chapel Hill. Others included research positions in the USDA Bureau of Soils and the Forest Products Laboratory at Madison, Wisconsin, and directorships of laboratories or experiment stations at the University of Virginia and the Massachusetts Institute of Technology. With the possible exception of the MIT

post, Herty was not seriously interested in any of them. As late as 1914 he told the director of the Forest Products Laboratory that "my line is teaching work, to which I expect to devote the rest of my days." Yet during the summer of 1916 he was apparently growing restless in Chapel Hill, and by October he had resigned to become editor of the *Journal of Industrial and Engineering Chemistry* (JIEC) one of three publications then issued by the American Chemical Society.⁴⁵

Despite his busy academic career, Herty had an active interest in business and civic life in Chapel Hill and elsewhere. The Chattanooga Pottery Company, well launched when he left it in 1905, continued to occupy his attention. By 1907 it was selling almost six million cups a year and hoping to expand into Mississippi, Louisiana, and Texas as the center of the naval stores industry moved steadily westward.⁴⁶

Herty's contractual relations with the company, negotiated in 1904 and renegotiated in 1906 and 1909 to consolidate all interests in what finally became the Herty Turpentine Cup Company, were good enough that he told a friend in 1910 that things were at last "in splendid shape." In fact, the most serious threat to the company's well-being came the next year when the Herty Company decided to sue the Baker Turpentine Company of Pensacola, Florida, for infringement of its patent. After considerable delay, the case reached federal court, but before the judge could rule, Baker's attorney proposed a settlement. The two sides submitted their agreement to the court, and in September 1913 the judge issued an interlocutory decree finding that Herty's patent and "all of the claims therein are good and valid in law," sole ownership of the patent was vested in the Herty Turpentine Cup Company, the Baker company was guilty of infringement, the Herty company could recover damages, and finally, Baker must pay all costs.⁴⁷

Some of Herty's friends outside the turpentine business thought that he was coining money from it. They did not appreciate the somewhat erratic nature of the industry. In good years Herty might earn as much as \$10,000, but sometimes the company had a cash flow problem and he had to wait for his money until delinquent customers paid up. For example, business was better than ever in 1911, but the following year the Herty Turpentine Cup Company paid no dividends. Its pottery had "practically shut down" and did not expect to sell half of what it had on hand. Nor did things improve with the outbreak of World War I and the subsequent Allied blockade of Germany, the principal foreign consumer of American naval stores. A chemist friend in the Bureau of Soils was sorry to learn from Herty's letter of December 5, 1914, that "the war has hit you person-

ally in a financial way.” He hoped the naval stores business would soon “pick up” so that Herty could resume his normal life-style. Unfortunately, the war did not end quickly, and Herty, who held an overdue \$5,000 note for the president of the Herty Turpentine Cup Company, was going through what he called “some pretty hard financial ‘sweats’” early in 1915.⁴⁸

Herty often professed to be unschooled in financial matters, but in fact he seems to have had a natural talent for business. He also had the good judgment to diversify his investments. In January 1906 he turned down a chance to acquire more stock in the pottery company, questioning “the wisdom of putting practically all of my money back into the same business in which I have made it.” Instead, he bought shares in a Georgia textile mill, a naval stores exporting firm, a Greensboro, North Carolina, life insurance company, and a couple of banks. He also invested in real estate. Besides his own home on Franklin Street and the house next door to it acquired in 1910, he owned part of an inexpensive rental unit in another part of Chapel Hill, six residential lots in Durham, and twenty-five shares of stock in an exclusive residential subdivision then being developed in Charlotte.⁴⁹

His balanced portfolio and the general prosperity of the era enabled Herty and his family to enjoy many amenities between 1905 and 1916 which his university salary alone could not have supported. Bird hunting, an activity Herty began in Green Cove Springs, became one of his favorite pastimes when the family moved to Chapel Hill. He introduced Sophie Herty to the sport by presenting her with her own shotgun, and in the spring of 1906 he helped to organize a trap shooting club among the Chapel Hill sportsmen. Billiards provided Herty with another recreational outlet, especially after 1908, when he installed a table at his Franklin Street residence. Like baseball, his favorite sport, the game remained a passion with Herty for the rest of his life.⁵⁰

In the small village of Chapel Hill the university and its personnel naturally played leading roles in community affairs. Herty certainly did his duty to both church and state. Dedicated Episcopalians, the Hertys belonged to the Chapel of the Cross, where Herty was a senior warden and therefore considerably involved materially as well as spiritually in parish affairs. He also sang in the church choir and represented his parish on various laymen’s committees.⁵¹

By 1911 Episcopalian leaders well beyond Chapel Hill had discovered Herty’s special organizing talents and his extraordinary ability to reach an audience, even one that was initially reluctant. Consequently, they recruited him to raise money

for the General Clergy Relief Pension Fund of the Episcopal Church. Starting at the parish level, he soon expanded his activities to the diocese and with so much success that he attracted the attention of the fund's national treasurer. By 1913 he was working closely with national headquarters to raise the consciousness of congregations and diocesan conventions of clergy, not only in North Carolina but in Georgia, Florida, and South Carolina as well. His efforts proved so effective that Monell Sayre, in charge of the national campaign, asked him to take a leave of absence from the university so that he might organize fund-raising throughout the South. But Herty had to draw the line. As president of the American Chemical Society he was simply too busy and the hot weather was "beginning to tell" on him so that he feared taking on any more work. "I will pull out for Maine just as quickly as is possible," he wrote Sayre on May 8, 1916. "I cannot afford to have a breakdown this spring, with so many important matters pending in the chemical line."⁵²

Herty's services to the secular community were just as extensive. Reflecting the spirit of the age, dedicated campus professionals left their libraries, laboratories, and living rooms to share their expertise with their neighbors in the interest of improvement, uplift, and progress. Herty's career as a civic leader is a case in point. In 1908 he became part owner of the Chapel Hill Telephone Company, a small operation consisting of only 120 subscribers and one ten-party line. Until he and his partner sold out in 1912, Herty had to locate and arrange for the purchase and installation of equipment, keep the books, and act as secretary besides serving the company as chief executive officer.⁵³

Another enterprise Herty supported from its organization in 1907 was the Chapel Hill Bank. Originally he held only seven shares of stock in it, but when he became its unsalaried president in 1911, he decided to increase his investment. "As there is no salary," he told his broker, "I thought it best to have enough invested in it to make my work worth while."⁵⁴

Herty's interest in community affairs was not restricted to those in which he had a material interest. Like many progressives everywhere, he worked with and through the local political and economic structures to upgrade and improve municipal services and the public schools. As a member of the Chapel Hill board of aldermen and chairman of its finance committee, and later from a seat on the Orange County Commission, he worked to secure fire protection, an improved sewer system, and interurban trolley service to Durham for the citizens of Chapel Hill.⁵⁵

Finally, Herty did what he could to improve the quality of Chapel Hill's public school. There was much to be done. In 1908, for example, he was dismayed to discover that the authorities wanted to spend money he donated for a boys' privy on something else. At the time, the state was running a major campaign to teach rural North Carolinians how important privies were in the control of soil pollution and the prevention of disease. "Is it not a reflection on our community," he asked, "that in our public school no provision is made for [male students]?" The privy was soon built, but the experience may have convinced Herty to take a more active role in school affairs. By 1910 he was president of the school board, a post he held until he left Chapel Hill six years later.⁵⁶

Politically, Herty was a Democrat during the Carolina years, but not the brass-collar variety. Like many progressives, he seems to have cast his ballot for the man or the issue rather than the party. If he shared the strong opinion of his brother-in-law about Theodore Roosevelt ["this blackguard!"], he did not record it, but both men voted for Republican William Howard Taft in 1908 rather than the Democrat, William Jennings Bryan. Soon after the election, Herty described himself as a "great admirer of Mr. Taft," but it is unlikely that he still felt that way after Gifford Pinchot was fired. Certainly by 1912 he was solidly behind Woodrow Wilson, who had the added advantage of being a college professor and a southerner.⁵⁷

In spite of the many demands made upon Herty by his career and his community, he still found time to enjoy a warm and loving home life in Chapel Hill and to maintain close ties with his relatives in Georgia. He contributed the lion's share to the cost of erecting a suitable monument over family graves in Milledgeville; he corresponded regularly with his devoted aunt, Florence I. Holmes, or Aunt Fornie, who was a school principal in Columbus, and whenever possible he visited his sister Florence Hooper and her family in Athens. Will Hooper was extremely fond and proud of his brother-in-law, perhaps more than ever in 1912, when Herty advanced him the money for a serious operation required by his wife.⁵⁸

Between 1905 and 1912, the Herty family in Chapel Hill consisted of Charles and Sophie Herty, their two sons, Holmes (Charles Holmes Herty, Jr.) and Frank, and "Miss Callie," Caroline Sosnowski. Miss Callie, Sophie's aunt, split her time between Chapel Hill and Athens, where Sophie's only sister, Ida Peacock, lived. In 1912, however, the Hertys had a third child, Sophia Dorothea Herty, or Dolly as she was promptly nicknamed. The Hertys were in their forties and their sons

were fourteen and fifteen when Dollie appeared to the utter delight of everyone in the household.

The Herty family lived comfortably in a large two-storied house that boasted such modern conveniences as electricity and central heating as well as a spacious yard and a rose garden. But domestic help was hard to get locally and so were furniture and clothing, which had to be imported from Raleigh, Baltimore, or Washington. Bicycles, phonograph records, and reading material also came through the mail or railway express service, as did the Cuban cigars and Home Run cigarettes favored by Herty and the wine and spirits consumed by Sophie and Miss Callie. Herty was a lifelong teetotaler, but he did indulge in the occasional ginger ale or sarsaparilla.⁵⁹

In 1910 the family's horizons expanded literally when Herty purchased his first automobile, a dark green seven-passenger Rambler touring car. Cars were still a novelty in Chapel Hill, which boasted neither an automobile dealership nor a machine shop. There were some gifted amateur mechanics around, however, and Herty hired one as his chauffeur. During the summer of 1910, while he traveled to the west coast for an extended sightseeing tour and an American Chemical Society meeting in San Francisco, the rest of the family and the chauffeur embarked on a visit to relatives in Athens, Georgia. Unfortunately, some thirteen miles north of Charlotte one of the car's rear wheels was caught in the tracks at a defective grade crossing and could not be extricated in time to avoid being struck by a Southern Railway passenger train. No one was injured, but the wreck left young Frank Herty almost heartbroken.⁶⁰

Bad roads, poor service facilities, and train wrecks did not dampen the Hertys' enthusiasm for "automobiling." Like the rest of America, they were in love with their cars, and by the spring of 1913 they were planning an extensive summer tour through New England and the maritime provinces of Canada.⁶¹

Family vacations were no novelty for the Herty family. During the Chapel Hill years they visited the mountains and the seashore in North Carolina and Virginia and spent two summers in Europe and a Christmas holiday in Cuba. Dolly's birth and a serious attack of asthma and bronchitis suffered by Sophie kept them at home in 1912, but the following year they motored to Willoughby Beach near Norfolk, Virginia. Miss Callie joined them there, then they and the automobile traveled to Boston by boat. From there they began driving through Maine en route to the maritime provinces, but on reaching Camden, Maine, on Penobscot Bay, they decided to settle down for the rest of the summer. Charmed

by the scenery and the bracing climate, the Hertys spent the next three summers in the same general area, shifting their residence after the first year from the town to the shores of Lake Megunticook, some two miles away. The place was idyllic, allowing the family to enjoy the best features of both the mountains and the sea-shore. On a hill behind the cottage Herty pitched a tent to which he could retreat whenever scholarly or professional duties demanded his attention. Otherwise, the family fished, swam, and took rides in the surrounding countryside.⁶²

The summer of 1916 was not the last one spent in Maine, but life was never the same after that year. Herty's decision in late October to leave the University of North Carolina for New York and America's declaration of war early in 1917 ended what for the Herty family had indeed been "la belle époque."

CHAPTER FOUR

* * * * *

Herty and the American Chemical Society

When Herty resigned from the University of North Carolina in the fall of 1916, he was nearing the end of a second term as president of the American Chemical Society. Founded in 1876, the society had been through chaotic early years, but in 1892, after considerable reorganization and consolidation with other chemical associations, it began to expand steadily, both geographically and numerically. By the time Herty left the presidency it boasted sections, or local chapters, from coast to coast and claimed almost 8,400 members.¹

Herty joined the American Chemical Society in 1893, the same year the United States played host to its first significant international conference of chemists. Meeting in Chicago in connection with the Columbian Exposition, the ACS welcomed some one hundred distinguished foreign chemists to the World's Congress of Chemists. Among those chairing sessions or delivering addresses to open the meetings were Professors Otto Witt and G. Lunge, two of the men whose lectures Herty would attend in 1899–1900 when he spent his sabbatical year abroad. In 1893, however, it was probably the World's Fair as much as the world-renowned chemists that attracted him to Chicago and the membership rolls of the American Chemical Society.²

From the beginning Herty developed close friendships with many of the chemical fraternity's most distinguished leaders. He already knew such luminaries as Ira Remsen, of course, and he soon came to know others, including Edgar Fahs Smith, William McMurtrie, and Francis Venable, all of whom served as presidents of the ACS between 1895 and 1905.³

Charles L. Parsons was another friend Herty found when he joined the American Chemical Society. The two men had several things in common. Parsons was the same age as Herty, bore the same first name, and spent part of his adolescence in a small Georgia village, Hawkinsville. And like Herty, he began his professional career as the junior chemist in a two-man department of a state university, in Parsons's case, the University of New Hampshire. After achieving recognition for his work in the chemistry of beryllium, Parsons became secretary of the American Chemical Society in 1907, a paid half-time position held previously by W. A. Noyes, editor of the *Journal of the American Chemical Society (JACS)*. The job put Parsons in touch with every prominent chemist in the country and enabled him to advise his closest friends about society politics.⁴

Herty and Parsons often worked together for the election of councillors-at-large and prospective presidents of the ACS. Late in 1907, for example, Parsons urged Herty to support Marston Bogert for a second term as president of the society. Bogert was a professor at Columbia University, a "scientific" as opposed to an "industrial" man, but Parsons thought he had been an excellent president and extremely responsive to the industrial members. "He has been very anxious that the industrial journal [then being planned] should become a success and that the industrial chemists should find out that the scientific men had their interests at heart as really [*sic*] as their own."⁵

By 1909 Herty was a councillor-at-large and, still working with Parsons behind the scenes, he was actively engaged in trying to win the ACS presidency for Wilder Bancroft of Cornell. The two friends agreed to disagree on which candidates to support for the 1911 presidential term, however. Herty supported Professor Alexander Smith of the University of Chicago that year because he wanted Arthur D. Little, the president of a Boston research, engineering, and management consulting firm, to be elected in 1912, the year the Eighth International Congress of Applied Chemistry would meet in New York and Washington. Parsons had no quarrel with Smith, but he voted for Little because, as a director of the society, Little was "thoroughly in touch" with everything. Furthermore, Parsons was concerned about growing "sectionalism" in the ACS. "The Chicago people have been putting out mighty hard work for a *sectional* ticket headed by Smith who would himself be an honor to any society," Parsons commented. "I have nothing against him except that he thinks W. A. [Noyes] is a little God." Smith was elected, and Little served in 1912 and again in 1913. By that time a strong movement was developing to elect Herty, an effort he deeply appreciated but thought was probably premature.⁶

Herty was too modest. In fact, he was highly regarded by some of the most influential members of the society. Many who knew him only professionally before 1910 became his personal friends following the long train trip to and from San Francisco, where the chemical society met that year.⁷

One early Herty supporter for the ACS presidency was Harrison E. Howe, a chemist for Bausch and Lomb Optical Company in Rochester, New York. At Howe's request, Herty addressed a banquet when the ACS met in Rochester during the fall of 1913. The speech was so well received that Howe promptly vowed to deliver "the nominating ballots of the boys here [for] . . . Herty for our next president." Support was growing elsewhere as well, but in the final tally Herty lost by a mere three votes to T. W. Richards, director of the Wolcott Gibbs Laboratory at Harvard. "Considering that you had such a man as T. W. Richards against you," Parsons commented, "you may well be proud." Herty sent Richards a congratulatory note, and the new president thanked him graciously. "I particularly appreciate your cordiality," Richards wrote, "because, as you doubtless know, you were a very close competitor." He hoped the council would elect Herty the following year, and so did Wilder Bancroft of Cornell. "I should have been more enthusiastic if the election . . . had turned out differently," he wrote Herty in February 1914. "We may have better luck another time."⁸

In late 1914 Herty won the presidency by what one admirer described as a "handsome majority." Congratulations poured in from Herty's family, friends, and colleagues throughout the chemical community. Parsons sent Herty official notification of his election, adding a postscript which declared simply, "I sure am tickled." So was Duncan MacRae, a former University of North Carolina student studying at MIT. "It is a high honor both for yourself and the University," he wrote Herty. "Of course, we know that we have one of the best departments in the country, but it is nice to know that other people recognize the type of men at the head of it. Charles [Venable] and I are very proud of coming from a place that has produced two presidents of the Society." A year later Herty won a second presidential term, polling nearly twice the number of votes cast for his nearest competitor, Professor Julius Stieglitz of the University of Chicago.⁹

As the thirty-second president of the American Chemical Society, Herty took office at a critical moment for America and American chemistry. Both would be challenged as never before, and both would have to mobilize every resource to meet the challenge. But routine duties also went with the office, and Herty prepared to immerse himself in them almost as soon as he learned of his election.

On December 22, 1914, he arranged to have a long conference in Washington with ACS secretary Charles Parsons, who by 1912 had become chief mineral technologist for the Bureau of Mines. Parsons had the society's files handy, and together they could plan for the coming year. Outgoing president T. W. Richards was also helpful. He sent Herty a summary of several unsettled matters that would require attention in the next few weeks, as well as his own opinions about who should become the permanent editor of *Chemical Abstracts*, one of the society's three journals, and what should be done regarding a confidential report on the reorganization of the society's business management.¹⁰

One of the duties required of every president of the American Chemical Society was public speaking. For Herty it presented no problem. He liked to give speeches, and he was effective before almost any group. In April 1915, for example, he agreed to make an informal address to faculty and businessmen at Tulane University when the ACS visited New Orleans for one of its two annual meetings. Later, following a lecture at the Franklin Institute in Philadelphia, he undertook a whirlwind tour of upstate New York, speaking to chemists in Buffalo, Rochester, Syracuse, and Ithaca and stopping in New York on the way back to Chapel Hill for a meeting of the advisory board of the National Exposition of Chemical Industries. The schedule was exhausting, but Herty agreed to it because he would be talking about something he considered supremely important: the need for America to achieve "self-containedness," or total chemical independence from the rest of the world.¹¹

During 1916 Herty spoke before local sections of the ACS, but he also visited several college campuses and at least one major chemical plant. Whenever possible he scheduled speaking engagements to coincide with trips on ACS business. In April 1916, for example, he visited the Dow Chemical Company at Midland, Michigan, on his way back from an ACS meeting at Urbana, Illinois. Dow was experimenting with the manufacture of synthetic indigo, one of the dyestuffs textile manufacturers were clamoring for but were unable to acquire because of the war. If successful, the Dow effort would constitute an important first step toward what Herty was urging in his speeches: American chemical independence.¹²

Besides making speeches, presidents of the American Chemical Society routinely had to appoint delegates to represent the society at government conferences and meetings of other societies; name committees for specific tasks within the society; attend or preside over meetings of the ACS board of directors and the council; make arrangements for the two general meetings held annually; and de-

liver a presidential address. Much of this could be delegated by a president who knew how to work closely with the society's secretary and who understood how to make the most of the committee system. Herty knew how. With a close friend in the secretary's post and with men such as Leo Baekeland, Arthur D. Little, W. R. Whitney of General Electric Company, and New York chemical consultant Bernhard C. Hesse willing to accept important committee assignments, he could leave much of the detail to others and concentrate on more sensitive issues confronting the society from within and without.¹³ Among the internal challenges facing the ACS during Herty's tenure were an attempt by one section to oust a member from the society; the need to respond to tensions caused by sectionalism and chemical specialization; whether and in what ways the society's business management should be changed; and how to handle one of its publications, the *Journal of Industrial and Engineering Chemistry*.

In June 1915 Herty received a copy of a letter addressed to Charles Parsons and a clipping from a popular magazine, *Ladies World*. The letter noted that the St. Louis section of the ACS had passed a resolution demanding the expulsion of Lewis B. Allyn from the society. Allyn had written several articles for popular magazines which the St. Louis section thought threw "much suspicion on the prepared foods and beverages sold in this country." The articles also aroused fear and influenced an "uninformed" public to buy (or not to buy) certain items, which the section believed constituted an attack on the integrity of public boards of scientific experts or government officials, manufacturers, and industrial chemists. In sum, St. Louis thought Allyn was unethical and wanted him thrown out of the society.

Allyn's article in *Ladies World* was titled "Your Child and the Soda Fountain." It began by describing what a "pure" soda was made of: fruit or fruit extract, sugar, and carbon dioxide gas and water, all of which was perfectly harmless if served by a clean establishment. But in the interest of profit, Allyn contended, the prepared syrups sold at fountains often contained no pure fruit juice or sugar. Instead, they were extracts made from "rotting, spoiled fruit, sweetened with saccharin and colored with coal tar dyes." "Adulteration," Allyn warned, "has become a science." He then listed the chemicals employed to make "strawberry," one of the most popular flavors—alcohol, ascetic ether, tincture of orris root, butyric ether, acetate of amyl, and other things produced the flavor. Red coal-tar dye provided the color and saccharin or glucose the necessary sweetness. The big advantage was cost. "Flavor so produced," Allyn advised his readers, "costs less than juice

or extract of fresh fruit. . . . Chemicals are cheap, four dollars' worth of saccharin (the use of which is forbidden by law in the United States and certain European countries) will sweeten as much syrup as thirty dollars worth of sugar."¹⁴

Parsons contacted Herty immediately. "You may be sure there is going to be some real 'fun' over this matter. Wiley [H. W. Wiley, former head of the USDA Division of Chemistry and father of the Pure Food and Drugs Act of 1906] and those who are with him are going to fight for Allyn." Others were on Allyn's side also. In July the secretary of the Cornell section wrote Herty that the ACS ought to encourage full discussion of everything connected with the Allyn case, even if the "shortcomings and misdeeds" of private interests were exposed. The Cornell section had considered the Allyn articles thoroughly and saw no reason to expel him. Meanwhile, Herty notified the St. Louis people that the case would be taken up when the council convened at the upcoming ACS meeting in Seattle. One problem was that the society had no ethics code in 1915. Arthur D. Little and a committee were drafting one but it had not yet been presented to the council, and in any case, as Herty pointed out, the Little committee was not designed to be a board of appeals. The matter would have to be fought out in council. At Seattle Herty named a committee to investigate the Allyn case, but before he got back to Chapel Hill at least two members asked to be excused. W. D. Bigelow pointed out that the society had no ethical standard against which Allyn's conduct could be measured. Furthermore, among those in the society most critical of Allyn were those whom Allyn had attacked in his articles. Marston Bogert of Columbia also declined to serve. Herty urged Bogert to reconsider, but he was adamant. "I would do almost anything for the society and its distinguished president," Bogert replied, "but it is really impossible for me to do as you request." Not until January 1916 did Herty find someone willing to chair the committee. Julius Stieglitz, whom Herty had just defeated in the 1916 presidential election, agreed to take on the task. One man on his committee wanted to hold public hearings, but Stieglitz objected, arguing that the less publicity the ACS received over the Allyn matter the better.¹⁵

Lewis B. Allyn was part of a group centered in Massachusetts known as the Westfield Campaign that used popular magazines to wage war against adulterated products in the marketplace. Critics, like the Indiana section of the ACS, charged that the "so-called Westfield Mvt. (Pure Food) and other movements or propaganda of like nature" existed solely to promote one group of products at the expense of another in a cynical bid by unscrupulous magazines to rake in

advertising revenue. Writing for the Indiana chemists, Frank Eldred of Eli Lilly and Company argued that such magazines misled the public and unjustly injured manufacturers of food products. It was the duty of the American Chemical Society, he informed Herty, to “enlighten the public” and point out the harmful effects of such muckraking. If it brought unwanted publicity to the society, so be it; Allyn’s article in a recent issue of *McClure’s* had already done so by implying that a majority of the membership agreed with his charges. He urged Herty and the society to ignore the “personal element,” Allyn, and attack the Westfield movement. Failure to do so, Eldred reiterated, would be damaging to the society and a neglect of its duty to the public.¹⁶

But Stieglitz and his committee moved ahead quietly and without fanfare. They interviewed Allyn, concluding that he seemed to be “honest and frank . . . but of poor scientific training and narrow scientific horizons,” a fanatic genuinely convinced that he was doing a public service. Nevertheless, they could find no grounds for expelling him from the society. Next, they visited the magazines that printed articles promoting the Westfield movement, decreeing that the magazines were “wrong in principle” because they were more likely to be influenced by advertisers than by an impartial regard for the facts. Third, the Stieglitz report urged government agencies to blacklist products that were illegal and to approve those that were “legitimate.” The committee found a great public need for government action in this regard, which, it conceded, the magazines had “discovered.” And finally, the committee reassured the public by expressing unqualified faith in the competence and integrity of chemists employed by state and federal agencies.¹⁷

Stieglitz turned in his report to Herty in early April 1916, noting that Herty should decide whether to invite Allyn to appear before the council in his own defense and whether those on the council with a conflict of interest because of financial or other considerations should excuse themselves from deliberations on the report. Apparently Herty managed to avoid a showdown. The summary of council action in the ACS “Proceedings” for the spring meeting at Urbana, Illinois, admittedly brief, says nothing about an appearance by Lewis Allyn or the withdrawal of any councillors when his case was discussed. After “due consideration,” the council simply recommended that no further efforts be made to expel him. The council took a somewhat more stern tone than the Stieglitz report with the magazines that supported the Westfield movement and an even tougher line against the movement itself. Those who ran such campaigns, the councillors declared, did not have the expertise to present the “real” situation. They might

give a “seal of approval” to products that could be harmful. A “hit or miss” sensational drive was no guarantee to the consumer; only disinterested “specialists” in competent government agencies should be in charge of “certifying” consumer products.¹⁸

The Allyn case illustrates the philosophical differences and varied interest groups present in the American Chemical Society and many other professional organizations during the Progressive era. It also reflects some of the specific issues over which academic and industrial members of those societies were likely to divide: ethical conduct, conflict of interest, and “washing the society’s dirty linen in public.” In the name of consumer protection, Allyn was using the popular press to battle the vaunted “interests,” an activity widely applauded by most Americans during the Progressive era. Some ACS members, like Harvey Wiley and the Cornell section, supported Allyn’s goals and found nothing objectionable about his methods. But others, specifically those in Indianapolis and St. Louis, where many were employed by the food, beverage, and pharmaceutical industries, saw Allyn’s activities as a threat to the chemist’s professional image and an attack upon his livelihood. The difficulty Herty faced in trying to appoint an investigative committee (at least six men turned him down) is evidence of the split within the society.¹⁹

Far more threatening to the internal stability of the ACS than incidents like the Allyn case were the philosophical and political tensions created as the society sought to cope with chemical specialization. During the nineteenth century, chemistry, like other fields, became increasingly specialized. The problem existed long before Herty became president in 1915 and would remain after he stepped down. Simply stated, it was a problem of unity versus specialization—that is, whether the American Chemical Society would continue to present only one program at its meetings and issue only one publication, despite growing diversity in the research and occupational activity of American chemists, or would reorganize itself before other, more specialized societies that published specialized journals absorbed the bulk of its members. In 1893 the program at the World’s Congress of Chemists acknowledged the trend toward specialization for the first time by dividing presentations into nine chemical categories with the number of papers in “technological chemistry” outnumbering those in any other division. President H. W. Wiley underscored the point that year when he welcomed foreign visitors to Chicago. There were hazards as well as benefits in specialization, he declared. Everyone agreed it was necessary, but chemists must not let their concentration

on a particular specialty lead them into a narrow-minded contempt for the specialty of someone else. "Because . . . you may be investigating some problem in the domain where physics and chemistry touch," Wiley pleaded, "I beg of you not to despise the labors of him who in the domain of technical chemistry is striving to give a working body to your thought. Take him by the hand, listen to his speech, and it will do you good."²⁰

Wiley's remarks seem to have been a plea in behalf of the industrial or technical men in the profession whose work the pure chemists, usually academics, appeared to value less highly than their own. Pure chemists still dominated the society in 1893, but things were changing. As the twentieth century opened, the number of industrial chemists almost equaled that of university men in the ACS, and they did not always agree on ACS policy. Moreover, some of the academic chemists, interested in new and evolving fields such as electrochemistry and biological chemistry, were also pressing for change. In time, those who felt inadequately served by the American Chemical Society and its single publication began to affiliate elsewhere or to create specialized societies and journals that more nearly met their needs. The British-based Society of Chemical Industry had a New York section by 1896 and claimed 1,503 members in the United States ten years later. One of them was Charles Herty. Newly organized groups like the American Electrochemical Society (1902), the American Leather Chemists' Association (1904), and the American Society of Biological Chemists (1906) also reflected the trend toward specialization. To those in the American Chemical Society who perceived the new organizations as a threat, Joseph W. Richards, a prime mover in the foundation of the American Electrochemical Society, responded: "Differentiation and specialization are the watchword, now, of all progress—industrial, scientific, philosophical. The day is past, we all acknowledge, when one man, even be he Newton, can know all that is to be known; the day is also past when one scientific society can cover satisfactorily the whole field of scientific research. Even more than this, the day is passing when any one society can even cover satisfactorily the whole field of any one science, such as physics, chemistry or medicine."²¹

Some leaders of the ACS, worried that their organization might disintegrate unless it moved to accommodate its disgruntled members, urged internal reform. In 1903 Professor A. A. Noyes of MIT proposed that the major branches of chemistry be organized into divisions within the society. Three years later a committee composed of six men, all interested in industrial chemistry, urged the society to

publish “high class” technical articles in its journal, to solicit more papers from technical schools, and to add two technical chemists to the society’s committee on papers and publication. President W. F. Hillebrand, who chaired the committee, followed up those suggestions by making the present and future of the society the subject of his presidential address. In it, he endorsed the policy of dividing the society into specialized divisions despite his belief that most ACS members thought the time was not ripe.²²

Things moved more quickly than anyone expected. Beginning in 1907, a series of changes in the operations and personnel of the American Chemical Society managed to remove, or at least to smooth over, many of the problems besetting the society. *Chemical Abstracts*, formerly issued as a part of the *JACS*, became a separate society publication. Edited by W. A. Noyes, who also edited the *JACS*, *Chemical Abstracts* went a long way to satisfy specialists who wanted to keep abreast of papers in their fields appearing in other journals, both American and foreign. Noyes resigned his post as secretary of the ACS to concentrate on his editorial duties, and Charles Parsons replaced him in September 1907. Three months later, the society created a third publication, the *Journal of Industrial and Engineering Chemistry*, scheduling its first issue for January 1909. The new journal would have its own editor and editorial board, both to be appointed by the council from a list submitted by the executive committee of the soon-to-be established Division of Industrial Chemists and Chemical Engineers. Arthur Little became the first chairman of the new division, the first of five organized by January 1909. Charles Herty was the first chairman of the Division of Physical and Inorganic Chemistry.²³

The creation of the *Journal of Industrial and Engineering Chemistry* and the formation of specialized divisions did a great deal to placate the discontented within the American Chemical Society. Charles Parsons thought Marston Bogert, an academic who served as president during the two years when the reforms were made, deserved much of the credit. Herty also admired Bogert and was particularly pleased when he made conservation the theme of his second presidential address. At Bogert’s request, he suggested several instances wherein the application of chemical knowledge to an industrial process had resulted in significant conservation of natural resources. But Herty thought the main point Bogert should impress upon his audience was the “added dignity” that technical research enjoyed when it contributed to conservation. He commended Bogert for having taken “such a broad stand in regard to research work” and thought that he more

than any other could “hammer home to the profession *not* only the conservation motive in . . . research but *also* the bringing together of University men and *industrial* chemists.”²⁴

Bogert’s second term and the one served by W. R. Whitney in 1909 seem to have been relatively free of the inner conflict experienced by the society a few years earlier. Reporting to the council late in December 1909, Charles Parsons noted a significant increase in membership (to more than 4,500). “Perfect harmony exists throughout the whole Society,” he declared, “and all of our members appear to be working together with decided enthusiasm.” In fact, some of the tensions between sections and between university and industrial chemists were still there. They surfaced over the issue of the proposed reorganization of the society’s business management.²⁵

Sometime before the 1914 spring meeting of the ACS, President T. W. Richards assigned a five-man committee to make an exhaustive investigation of the society’s business management and to submit its recommendations when the council met in Cincinnati. The aim was to make administration of the society more efficient and to provide for the growth expected over the next three years. A preliminary report was submitted at Cincinnati, but after considerable correspondence the committee members found that they were so divided “in opinion as to fundamental principles that an unanimous report could not be expected.” Consequently, they prepared and submitted majority and minority reports to the councillors in June 1914. Charles Baskerville, Frank Cameron, and Arthur D. Little, from New York, Washington, and Boston, respectively, spoke for the majority. Arthur Lowenstein of Chicago submitted the minority report, subsequently endorsed by Charles Caspari of St. Louis. In brief, the majority proposed to concentrate decision making in the board of directors, to expand the secretary’s duties, and to locate him and the journal editors somewhere east of Pittsburgh, preferably in New York or Washington. The minority objected to any change designed to increase “centralization” at the expense of the local sections, and it proposed to replace the treasurer and the secretary with a “business manager” who did not have to be a chemist.²⁶

Because of a printing delay, the outbreak of war in Europe, and the subsequent cancellation of an ACS meeting at Toronto, discussion in council of the report on business management did not take place until Herty’s second presidential term in September 1916. Meanwhile, councillors and the membership had plenty of time to consider the pros and cons and to engage in society politics. W. A. Noyes,

editor of the *Journal of the American Chemical Society*, former editor of *Chemical Abstracts*, and Charles Parsons's predecessor as ACS secretary, had strong views on some of the proposals in the report. In a confidential letter to President Richards in November 1914, Noyes suggested consolidating the offices of secretary and editor of *Chemical Abstracts* as a way of cutting costs. He even had the man for the job—J. J. Miller, the new editor of *Chemical Abstracts*. Noyes had always opposed the “large salary” paid the secretary, which he thought was out of proportion to that earned by the editors. He made the suggestion in the interest of saving money, he told Richards, not as an attack on Parsons.²⁷

Other leading figures in the society also wanted to save money and increase efficiency. William Brady of Chicago, a member of the board of directors, consulted an efficiency expert who produced an involved scheme to “centralize” all of the society's secretarial, financial, and publishing functions. It would save the society \$5,000 a year, Brady claimed. He sent the paperwork to Parsons, who duly transmitted it to the board, noting that President Herty thought the matter was too complex to handle through the mail. Precisely what Brady was proposing is not clear, but that he was no friend of Parsons is obvious from their correspondence. D. K. French, secretary of the Chicago section, also opposed Parsons. In the summer of 1915 he distributed a circular letter that was so critical of Parsons's work as secretary that Parsons sent him a strong protest and Herty felt compelled to ask French for an explanation.

French's reply was hardly conciliatory, but with the forbearance and tact for which he was well known, Herty accepted it, although he expressed surprise at another part of French's letter which referred to the existence of “great tensions” between the eastern and western sections of the society. This was “news” to him, Herty declared, adding that he had never noticed the “slightest animosity” in the East, which surely he would have in all his travels to New York. Nevertheless, he promised to look into the situation thoroughly on his way through Chicago en route to the 1915 general meeting in Seattle. Meanwhile, he would appreciate any specifics French could supply. Herty's letter, ingenuous in tone, can be interpreted as a mild reprimand, suggesting subtly that French was something of a troublemaker and given to exaggeration. If that is what Herty thought, his talks with prominent Chicago chemists in August and a letter from a friend at Northwestern University in December should have convinced him that the problem of sectionalism was real, at least for the midwesterners. But Herty could not see it. To L. I. Shaw in Evanston he wrote, “Frankly, I think he [one of the prominent

Chicago men Herty interviewed] is laboring under some very erroneous impressions, as in all my talks with the men in the East I hear nothing that would justify the contention that there is any sentiment in the East against the West as a section.”²⁸

Herty may have found no anti-“western” sentiment in the East, but Charles Parsons certainly discerned plenty of anti-Parsons sentiment in the Midwest. Just before the September 1916 New York meeting of the ACS, the secretary wrote Herty that the Chicago section had named a committee to argue before the council in favor of the minority report of the Committee on Business Management. He added a postscript: “Of course you understand that the minority report means a new secretary and has that for its object.” Not everyone who favored the minority report had a hidden agenda. On September 19, 1916, Herty received a letter from a University of California professor who could not attend the New York meeting but did want to comment on the report on business management. He thought the academic and industrial elements of the ACS cooperated very well, but he worried that a society of such size and heterogeneity was vulnerable to disruptive forces unless great vigilance was exercised. Adoption of the majority report, the Californian thought, might tear the society apart. Certainly centralization had some advantages, but speaking for university members of the society, he reported “a profound distrust of certain phases of modern business efficiency.” Academics wanted to be part of a scientific society rather than “shareholders in a big business.” Ironically, when the council met, it was so deeply divided that it could not “tear the Society apart.” It simply tabled both reports and discharged the committee, which Herty considered to be a “preeminently wise action.” If any proposition had real merit, he thought, it could wait until a clear majority recognized its value.²⁹

Of the many internal problems facing the American Chemical Society during Herty’s presidency, none presented a greater challenge than its newest publication, the *Journal of Industrial and Engineering Chemistry*. First issued in January 1909 under the editorship of W. D. Richardson, an industrial chemist with the Swift Company of Chicago, the *JIEC* was criticized for publishing too many articles relating to chemical analysis, foods, and agriculture and not enough about industrial chemistry. By late 1910 the council authorized the appointment of a committee to investigate the journal’s “efficiency.” Headed by Arthur D. Little, the committee surveyed the membership, found it badly split regarding the quality of the journal, and then recommended a thorough overhaul that would involve

going beyond the society's own members to secure suitable articles on developments in the chemical industry and engineering; setting up networks worldwide to secure the latest news of recent developments in industrial processes; reporting the meetings of chemical societies, trade associations, and scientific organizations everywhere; and appointing an editor whose views corresponded with those of the committee on how to reshape the journal. M. C. Whitaker, professor of chemical engineering at Columbia University, replaced Richardson and soon made the *JIEC* an important publication. By early 1913 it had an assistant editor, Leola Marrs, and was earning significant income from advertising. Whitaker had to ask for more clerical assistance and an increased budget two years later, and whereas the journal once had to beg for articles, it now had such a backlog that it was forced to reject some good material. As for his overworked staff, the editor reported, "Miss Marrs has broken down completely on two occasions largely due to the strain of editorial work. Miss Armerding has had to give up completely . . . in fact for the last four weeks she has been in the hospital."³⁰

When he asked for more help in December 1915, editor Whitaker reminded Herty of a conversation they had had three months earlier during which he indicated his desire to resign. Now he was making that request formally so that Herty could relay it to the directors. He would be glad to be relieved at once but if necessary would stay until December 1916 so there would be plenty of time to find a successor. Herty answered that he knew everyone would feel the same regret he did when they learned about Whitaker's intention, but he would honor his request. When the directors convened in New York on December 11, they noted Whitaker's request and replied to his letter about an editorial policy for the journal by asking him and his board of editors to draft one, with recommendations, for presentation at the society's next general meeting.³¹

Whitaker's resignation notice came just as Herty was elected for a second term, providing him and the society with one more problem. Still pending from 1915 were the disposition of the Allyn case, the report on business management, and continuing tensions between sections. Secretary Parsons, at the center of society affairs and the object of some of the controversy, was sympathetic but realistic as well. "I feel that there is nothing more important that you can accomplish for the American Chemical Society this year [1916]," he wrote Herty in February, "than to insure the *right* successor for the Editor of the *Industrial Journal* . . . I know you have this in mind," he added, "but I am simply sending this to worry you a little." Others were also thinking about Whitaker's replacement. W. A. Noyes thought

Arthur D. Little would make an excellent editor and urged Herty to see him in the spring or summer, which Herty was already planning to do. There were several other possibilities, but in Parsons's opinion, they all had "shortcomings." Meanwhile, Herty intended to keep after Little. "I am not going to give up that possibility," he wrote the secretary in late June 1916, "without one good long pull for it."³²

By the end of July, Little had taken himself out of consideration and the search was becoming more desperate. H. E. Howe, an associate of Arthur D. Little, thought the situation was complicated because some felt the editor and the journal had to be in New York. Ralph McKee of Tennessee Copper Company wanted the job, but W. A. Noyes thought his industrial experience was too limited. He proposed W. H. Walker of MIT as more suitable. Herty agreed that Walker had many "strong points" and promised to "sound him out." Meanwhile, he told Noyes, what concerned him most about the *Industrial Journal* was its lack of a strong editorial column, a feature that Whitaker as a part-time editor had not been able to develop and which, like Herty, he considered very important. "We need some strong editorial thought going out to the members each month," Herty told Noyes, "especially in these days of rapid developments, and the *Industrial Journal* furnishes the only opportunity among our publications for material of this character."³³

Whitaker had no illusions about the condition of the journal under his management. He had taken it from near failure to solvency and a reputation among technical publications that, in his opinion, made it worth between \$100,000 and \$250,000 if the society chose to sell it. This was not mere speculation. In December 1915, he sent Herty a proposal made by an entrepreneur who wanted to lease the journal for five years, run its business affairs, let the society retain editorial control, and share its advertising revenues, which could easily be expanded. But Whitaker, whose ambitions for the journal were very high, believed that it could not fulfill its potential unless it had a full-time, well-paid editor, a sound editorial policy, a permanent home in New York, and the society's willingness to spend some of the journal's earnings on its expansion and development.³⁴

W. H. Walker of MIT was not interested in the editorship of the *JIEC*, but in correspondence with H. P. Talbot, head of the chemistry department at the institute, W. A. Noyes learned that Talbot and some of his colleagues thought Herty would make a good editor. Noyes wanted to know if Herty was willing. M. C. Whitaker was thinking along similar lines. "What has happened," he asked one

of the society's directors, "to the plan to get a few of the highlights of the Society together and force this job on Herty?" Herty was flattered and obviously interested, but his location in Chapel Hill was "a major obstacle." He did not know if Leola Marrs would care to "migrate" to such an isolated spot, and furthermore, "to develop the editorial work properly whoever does [it] . . . should be in the heart of things, where he could keep in touch with new developments through personal interviews. I am afraid this handicap makes me out of the question, however much the work itself appeals to me."³⁵

There was another obstacle which Herty did not share with Noyes. MIT and the University of Virginia had both made offers to Herty in the summer of 1916. It is unlikely that he was seriously interested in the Charlottesville job, but the Boston position was intriguing. About to launch a five-year course in chemical engineering in its new School of Chemical Engineering Practice, MIT wanted Herty as director of one of the five programs it would operate with selected industrial plants to provide its students with "hands-on" experience. Herty had been hesitant because he had no formal training as an engineer, but the men at MIT saw that as no problem; they would provide an "understudy" to handle that part of the job. In cordial letters, Talbot and Walker urged him to consider carefully, adding that they also wanted him to take the editorship of the *JIEC*. "I should regard it as a most fortunate circumstance for the Society if you felt that you could take that [the journal] over," Talbot wrote on September 15, 1916. "I am glad to believe that I am one of the 'original Herty men' in this connection." Clearly, if Herty assumed the editorship and went to Boston, he would be "in the heart of things," but the *JIEC* would still be a part-time enterprise and not what he and Whitaker hoped it would become.³⁶

A few days after hearing from Talbot, Herty got a letter from Parsons. The editorship of the journal was still on his mind. "If you will consent to take the Editorship of the *Industrial Journal* on a good salary, giving your time to it with a general oversight of the advertising, I am inclined to think that that will be the outcome," Parsons advised him. "Think this over carefully, for I believe it would be a great thing for the Society." Herty was thinking about it, and he was also keeping his options open. On September 22 he wrote both Talbot and Walker, telling each how much he appreciated the MIT offer and noting that he was thinking "very deeply about the pros and cons of Walker's proposition." To Talbot he added, "I have no idea what the attitude of the Council will be concerning the Editorship," which was not strictly accurate in view of Parsons's letter. But he

hoped both men would come to New York for the council meeting because there were important issues on the agenda besides the election of a new editor.³⁷

When the council convened at the New York meeting of the ACS in September 1916, it was presented with an exhaustive report incorporating a series of recommendations regarding the *Journal of Industrial and Engineering Chemistry*. Prepared by M. C. Whitaker, it began by summarizing the journal's history under his editorship and continued with an assessment of its current condition. The publication was self-supporting and at a point at which, if proper action were taken, it could become "a real factor in molding and directing national policies in which the chemical profession has a right to be heard." Whitaker thought the time had come for the society to accept "the opportunity—almost the obligation [to] . . . put the *Industrial Journal* upon a sound permanent footing, and give it the means to do its best." Then he spelled out the requirements for doing so: the expenditure of some of the journal's earnings on its reorganization and expansion; the development of a sound and consistent editorial policy; the appointment of a full-time editor who could identify and discuss questions of public and national interest in such a way that the journal would be accepted, at home and abroad, as the authoritative voice of the American chemical profession; the establishment of "quarters befitting the dignity of the Society" in New York; the employment of adequate staff; the development of news-gathering facilities so that all technical, engineering, and society meetings could be covered; and the prompt and ongoing review of all foreign and domestic news to keep readers aware of industrial trends and new patent developments.³⁸

On September 27, the council accepted the Whitaker report "in principle" and unanimously elected Charles Holmes Herty as the *JIEC*'s first full-time editor at a salary of \$6,000 a year. The appointment was a ringing endorsement of his achievements as president of the American Chemical Society and a tribute to the high regard he enjoyed among chemists all over the country.³⁹

Among the external projects Herty supported wholeheartedly as president of the ACS and which he intended to continue supporting as editor of the *JIEC* were the National Exposition of Chemical Industries, southern industrial development through chemistry, participation in the nation's preparedness campaign, and the achievement of American chemical independence through an "educational" effort designed to make the public and the government "chemically conscious." In April 1915, Charles Roth approached Herty about an exposition of chemical industries scheduled for New York's Grand Central Palace in September. Roth,

a chemist and one of the show's organizers, was seeking endorsements for it from prominent industrial and academic chemists whose names he wanted to publish on exposition stationery as an "advisory board." The chemists would not have to do any work, Roth promised, and it would not cost them any money. A week later another letter informed Herty that A. D. Little and others had consented to the use of their names. Herty thought it over and early in May agreed to Roth's request because "this year especially is a very appropriate time for holding such an exposition. . . . The European war has brought very vividly to the attention of the country what Chemistry has done for industries and I feel sure that this exposition will strengthen that impression." Many members of the society agreed. In fact, the *JIEC* had already published a guest editorial titled "Why Not a Chemical Show?" Its author pointed out that other professionals, such as lawyers and doctors, enjoyed public understanding and support because they were visible and dealt directly with the people. But chemists, operating largely behind the scenes in "sequestered laboratories," usually were overlooked because their contributions were incorporated in the work or products of others who received the credit. Recent shortages caused by the war made chemistry more valuable than ever, yet newspaper discussions of the dyes situation indicated that the public still had much to learn about the actual accomplishments of chemists since the outbreak of the war. The exposition, concluded the editorial writer, would be an excellent way "to develop appreciation for what the chemist means to society."⁴⁰

Chemical expositions were not unknown in 1915. Turin, Stuttgart, Berlin, and London had all played host to at least one before the first American show opened its doors in New York on September 25. Attended by more than sixty thousand visitors, the exposition included exhibits of chemical products, processes, apparatus, and machinery supplied by industry, government bureaus, and other organizations. Working models, lectures, motion pictures, and informational materials were also provided by the industries and participating chemical and engineering societies. Designed primarily to sell, the exposition served to educate and entertain as well. As the *New York Times* remarked about trade shows in general, "Exhibitions of the products of one industry are likely to be common hereafter. A more practical method of 'booming' an industry could not be devised."⁴¹

In November 1915, Herty joined approximately a dozen men for dinner at the Chemists' Club in New York. Besides Charles Roth and Adriaan Nagelvoort, comanagers of the recent chemical exposition, the group included other mem-

bers of the exposition's advisory committee, which Herty had agreed to chair. The 1915 show had proved so successful, Roth reported, that work on a larger, more elaborate 1916 exposition was already under way. Among other things, the conferees planned to secure more participation by government bureaus and, if possible, an appropriation from Congress.⁴²

Through his work with the National Exposition of Chemical Industries Herty hoped to promote another of his favorite projects: the industrial development of the South through chemistry. That ambition for his native region went back to the early days of his professional career at the University of Georgia. He worked toward it as an expert with the Bureau of Forestry, as an employee of the Chattanooga Pottery Company, and as professor of applied chemistry at North Carolina. As president of the ACS and as chairman of the exposition's advisory committee, he continued to pursue that goal. Immediately after his election in 1915, Herty scheduled the spring meeting of the ACS for New Orleans, the first to be held south of Baltimore since 1905, when Francis P. Venable, also a southerner, welcomed the delegates to the Crescent City. Herty set the tone at the opening session by expressing delight at the dynamic change and new spirit that could be seen and felt "throughout our beloved southland today," much of which he thought could be attributed to the work of famous chemists. But they were not southern chemists, he pointed out, and many of the southern raw materials they had learned how to convert to valuable finished products were being fabricated outside the region. Citing several examples but leaving the full story for Arthur D. Little to present in a formal address, "The Industrial Resources and Opportunities of the South," Herty restricted himself to a prediction and a challenge: that the South would always remain primarily agricultural but that the European war would stimulate industries in the region "undreamed of at present" and that the resulting accumulation of wealth would relieve the "hardship and privation" suffered by the southern masses ever since the Civil War. "Is there reason for aught but optimism? Is not the air vibrant with the conviction that a new day is dawning for the South?" he asked his audience. "What part are we of the South to play in that development?"⁴³

Herty did not rest on his rhetoric. In the summer of 1916, Richard H. Edmonds, editor of the *Manufacturers' Record*, asked him to contribute an article about the South's potential for the development of the chemical industry. He also thought southern business and railroads should be urged to participate in the Second National Exposition of Chemical Industries. Herty complied and then

asked if he could visit Edmonds in his Baltimore office. The two men had been correspondents for years but had never met. When they did, Edmonds was so impressed that he decided to produce a special issue of the *Record*. He wanted articles from leading chemists, including Arthur D. Little and Ira Remsen, and Herty agreed to seek their cooperation. To be published in time for the exposition in September and to be mailed to chemical manufacturers and capitalists all over, the special issue would have as its theme "the chemical potentialities of the South." It would feature an "editorial boost" for the exposition and do everything possible to encourage southern firms to exhibit. In the end, southern awareness of and participation in the 1916 chemical exposition were disappointing. But that did not discourage Edmonds or Herty, who, only weeks after the show closed, were laying plans for the following year.⁴⁴

Preparedness and how the American Chemical Society could contribute to it was another project upon which Herty spent considerable effort, particularly during his second presidential term. Soon after the European war began, the British imposed an effective blockade against the Central Powers. They tightened the supply noose by steadily expanding the list of items that could not be shipped to their enemies; they declared the North Sea a "war zone," sewed it with mines, and ordered neutral ships to enter it only through the Straits of Dover, where they could be searched; and finally, they claimed the right to take "suspect" ships into British ports where they were sometimes detained for months. The Germans promptly retaliated by declaring a war zone of their own, this one surrounding the British Isles, wherein their U-boats would sink all enemy ships. Because the British sometimes flew neutral flags to disguise their vessels, and because the chief advantage of the U-boat was surprise, the Germans did not follow the traditional procedures of issuing prior warning and making provision for the safety of passengers and crew. Obviously, neutral ships operating in the area would also be imperiled.

The Wilson administration formally protested the actions of both Great Britain and Germany, insisting that traditional rules of warfare and respect for the rights of neutrals must be observed. But nothing had been settled when the British liner *Lusitania* was torpedoed by a German submarine on May 7, 1915. Almost 1,200 people died, among them 128 Americans. Outraged by what Theodore Roosevelt described as "an act of piracy," elements of the American public began to demand a stronger army and navy, and in July 1915 President Wilson asked the War and Navy Departments to draft proposals for their expansion. The issue was extremely

delicate because there was a strong pacifist movement in the country, and many progressives, particularly in the South and West, were hostile to the creation of a large military establishment.⁴⁵

Nevertheless, the first small steps toward preparing the country for an emergency were undertaken. One of these became public on July 13, when Secretary of the Navy Josephus Daniels announced the appointment of Thomas A. Edison as head of an advisory group to the United States Navy. Edison's committee, styled the Naval Consulting Board and composed of prominent civilian inventors and engineers, would identify and secure for the use of the navy the product of what the secretary called "the latent inventive genius" of the country. "It is American inventive genius that has made practical the iron-clad, the submarine and the aeroplane," his press release declared, developments Americans were first to devise and make practical but which, "in the press of war," other countries were the first to employ. In view of the European conflict, Americans had to move ahead in the development of "weapons of defense." There were many excellent men to be found in government bureaus, but they could not do the job of inventing, assessing, and developing new devices by themselves. Therefore Edison and his committee, made up of America's "best minds," would help to screen ideas and proposals submitted from all over the country. A few days later, Daniels asked Herty to nominate two members of the ACS for service on the Edison committee and, after polling the council, he appointed Leo H. Baekland and W. R. Whitney of General Electric Company.⁴⁶

Early in 1916 Herty received a letter from President Wilson, commending the American Chemical Society for patriotic service rendered through its members on the Naval Consulting Board. Now Wilson asked Herty to expand the society's usefulness to the government by providing the secretary of the navy with a list of one ACS member from each state "to act in conjunction with representatives from the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Institute of Electrical Engineers, and the American Institute of Mining Engineers." The aim was to help the Naval Consulting Board collect data for use in organizing the nation's manufacturing resources in the event of an emergency. Another facet of the administration's preparedness program then undergoing heated debate in the Congress and the country, the Wilson request seems to have originated with H. E. Coffin, chairman of the Committee on Production, Organization, Manufacture and Standardization of the Naval Consulting Board. Basically, Coffin's plan would create "state muni-

tions boards” charged with collecting detailed information about the productive capacity of every manufacturing firm within their respective jurisdictions. “In most hearty sympathy” with the idea, Herty agreed to nominate qualified ACS members for service on the proposed boards.⁴⁷

Not everyone in the American Chemical Society agreed with Herty about the value of Coffin’s scheme. Bernhard C. Hesse, a New York industrial chemist, called it a “waste of time.” No industry would provide the information requested unless the people asking for it had legal authority, he argued, and in any case, the enterprise should be undertaken by the Census Bureau because failure to answer its questionnaires truthfully constituted a felony. Hesse thought the best service the ACS could render was to frame the right questions for the Census Bureau to ask.⁴⁸

ACS secretary Parsons also had misgivings, initially because one of Herty’s nominees to a state munitions board (now styled a state Committee for Industrial Preparedness) turned out to be a Quaker. His later concerns had more substance. He had just attended a meeting in New York of the parent Committee on Industrial Preparedness during which the first press release was prepared for issuance on March 27, 1916. He sent a copy to Herty, noting that Herty would have to “tactfully get it across” that “not everyone in charge of this organization” was an engineer. “You will notice the word chemist was not used once [in the press release]. . . . They did get the name of our Society in one place, but I feel sure they are going to make this an Engineers’ campaign if they possibly can.” Additional news stories and publicity brochures issued by the central committee seemed to confirm Parsons’s fears. “I find it hard to be contented with the talk of ‘engineers’ doing everything,” he complained to Herty on April 10, 1916. “It is almost as bad as having all lawyers in Congress.”⁴⁹

During Herty’s presidency, one of the major contributions made by the ACS to the preparedness campaign was in helping to solve the nation’s “nitrogen problem.” Before World War I, about nine-tenths of the world’s nitrogen was consumed by agriculture as fertilizer in the form of nitrate, sulfate, or cyanamide, and the rest was used industrially. That situation changed drastically after 1914, when the demand for nitric acid, an essential ingredient in the manufacture of explosives, increased tremendously. As one historian of the chemical industry remarked, “The nitrogen problem as it developed after August 1914 was not simply a choice between guns or grain, but between guns or defeat. Looking back, it is remarkable that despite all the warnings of an impending shortage, no prac-

tical steps had been taken to safeguard nitrogen supplies for military purposes. But few expected the war to last long, and fewer still had anticipated the size of the combined fertilizer and explosives demand. It quickly became a critical factor in all belligerent countries, and in Germany remained the most crucial military-technical problem.”⁵⁰

Even the United States, pledged to neutrality in “thought as well as action,” was soon affected by the nitrogen problem. Because of growing shipments of explosives to the Allies and the country’s heavy dependence on Chilean nitrate deposits as the source of nitrogen for fertilizer as well as munitions, those advocating preparedness inside and outside of government began pushing for the development of a domestic nitrogen fixation program. William H. Nichols, chairman of the board of the General Chemical Company, touched on the question in a speech titled “The War and the Chemical Industry” delivered before the American Association for the Advancement of Science in Philadelphia on December 30, 1914. Noting that Allied control of the seas had so far kept the war from interfering with the flow of nitrates from Chile, he pointed out that someday that source of supply would be exhausted. Therefore, finding an efficient way of securing nitrogen from the air was “one of the problems which the chemist, chemical engineer and electrical engineer must solve . . . within a comparatively few years.”⁵¹

Herty took up the problem in his presidential address delivered at Seattle in September 1915. Citing American dependence on Chile for the sodium nitrate from which nitric acid was manufactured, he called on the government “in these days of talk of preparedness, to consider the question of chemical preparedness.” Specifically, he wanted the government to acquire enough extra sodium nitrate so that, in the event of war, it could supply its munitions requirements until “sufficient plants could be erected for the adequate manufacture of nitric acid from the air.” Annual imports of sodium nitrate averaged about 550,000 tons, which cost about \$15 million. An extra year’s supply might prove invaluable if war came; if it did not, the material could always be used to make fertilizer, and the cost of preparedness would be limited to storage charges. That proposal, together with other concerns raised by Herty in his presidential address, led the ACS council to authorize a letter from Herty to President Wilson. In it Herty urged the chief executive to consider the need for legislation that would promote American chemical independence and protect American producers from unfair foreign competition.⁵²

Herty’s remarks, widely reported in the national press, caught the eye of

Navy Secretary Josephus Daniels, who informed one of the ACS men on his Naval Consulting Board that he heartily agreed with Herty's proposal to stockpile Chilean nitrates. In fact, he had already prepared estimates for Congress which called for the purchase of more sodium nitrate than the amount suggested by Herty. Like Herty, he looked forward to the day when the country had its own nitrogen fixation plants. But that might be a long way off; meanwhile, "we are taking the necessary steps." Months passed during which the Wilson administration had to wage battles on several fronts. The president tried to bring the European belligerents to the negotiating table, but neither side was interested; at home peace advocates challenged Wilson's position on neutral rights and his program to expand the armed services. Leaders in his own party such as Congressman Claude Kitchin of North Carolina forced the president to accept a compromise before grudgingly agreeing to a pared-down National Defense Act in June 1916 and a series of other measures that strengthened the navy and the nation's merchant fleet. Finally, Wilson had to conduct a campaign for reelection against a reunited Republican party, some of whose leading spokesmen had been intensely critical of the administration's preparedness effort for almost two years.⁵³

The National Defense Act, which contained a section called "Nitrate Supply," had not yet become law when Herty received a telegram from Professor A. A. Noyes of MIT inviting him to meet with officers of the National Academy of Sciences (NAS). The academy had been asked by President Wilson to "organize the nation's educational and research resources," and the secretary of war wanted a detailed report on a new government nitrate plant. In "all chemical matters," Noyes explained, the academy wanted to work with the ACS. "Can you meet Hale chairman Academy Comm. and me at Cosmos Club, Wash. next Sunday morning?" Noyes wired.⁵⁴

Established during the Civil War for the purpose of advising the government on scientific matters, the National Academy of Sciences had long been dormant. But in the spring of 1916, the organization became interested in promoting preparedness and offered its services to the country. Leo Baekeland provided Herty with some background detail. Through the secretary of the navy, the Naval Consulting Board had advised the president to "organize" the government's scientific branches so that as much as possible could be learned about the production of "artificial nitrates." Since then, the National Academy had been asked to help, and it responded by appointing a Nitrate Supply Committee under the chairmanship of George Ellery Hale. Baekeland had just dined with Noyes, Hale,

and several other academy members, and he was convinced that they would welcome the cooperation of engineers and chemists. It would be a "delicate matter," but Baekeland thought Herty could propose the names of ACS men whom the academy would then invite to serve on its Nitrate Supply Committee. He also wanted to assure Herty that the academy committee would in no way conflict with work being done on the same subject by the Naval Consulting Board. W. R. Whitney, already serving on the Naval Consulting Board, would probably be asked to serve on the academy committee whether Herty proposed him or not; as for himself, Baekeland complained that he was already too busy and would "just as soon be relieved."⁵⁵

Herty met with Noyes and Hale on May 21, 1916, and a few days later, both men urged him to name himself to the Nitrate Supply Committee. Modestly, he questioned whether he was the "man for the job," but in view of their personal request and a formal letter from William Welch, president of the National Academy, he felt that he could not refuse. Welch's letter is interesting because it indicates that the National Academy of Sciences considered its Nitrate Supply Committee to be only part of the service it expected to render the government in the name of preparedness. In line with President Wilson's request that the academy "organize the scientific resources of educational and research institutions in the interest of national preparedness," its executive committee had already outlined a plan that involved identifying a series of research problems and initiating investigations in various "departments of science." Because of the scarcity of dyestuffs, medicinals, and other chemical materials, a great deal of work in chemistry would be necessary. Therefore, Welch heartily requested the cooperation of the American Chemical Society as the academy moved to implement its plans to help supply "existing national deficiencies," all of which, he pointed out, could not fail to advance the interests of chemistry in America.⁵⁶

Herty submitted his dealings with the National Academy to the board of directors of the ACS through Secretary Charles Parsons. Meanwhile, Parsons discovered that the idea for a National Academy of Sciences Nitrate Supply Committee had begun at a Washington garden party when an academy member proposed it to Secretary of War Newton D. Baker, who replied graciously that he would be glad to receive help from the organization. What bothered Parsons was that the "Nitrate Bill" (actually, the National Defense Act of 1916) was still in the president's hands, unsigned, and the official advisory board called for in that bill had not yet been asked for by the secretary of war. Yet Noyes and Hale seemed

to think, based on "garden party talk," that they had been asked to appoint the board. They were also anxious to get someone from the ACS on their committee "who knew something about industrial work." More recently, Parsons had confirmed his belief that the academy had *not* been asked to choose the board called for by the legislation, and he thought it would be wise for Herty and the ACS to "make haste slowly." Hale and Noyes were acting prematurely, in Parsons's opinion; it was "their funeral, not his," but he did not want anything they did to reflect adversely on the ACS, hence his confidential note to Herty. That threw "a somewhat new light upon this matter," Herty replied to Parsons. Fortunately, he was leaving Chapel Hill by automobile for Maine in two days and expected to be out of touch with his mail for ten days after that; perhaps the situation would be cleared up by that time.⁵⁷

The Nitrate Supply Committee organized by the National Academy of Sciences began holding meetings in mid-June 1916. Besides himself, Herty appointed Baekeland and Whitney to serve as representatives of the American Chemical Society, and Noyes added Warren Lewis, one of his chemist colleagues at MIT. Herty missed the committee's first meeting in Boston, but Noyes summarized its actions in a letter dated June 18, 1916. The committee had drafted a form letter to be sent to all firms involved in the production of ammonia and nitric acid by any process. The letter traced the history of the committee's formation, listed the founding members, and noted that the secretary of war had charged the committee to investigate and make a full report regarding the nation's nitric acid supply and the processes by which ammonia was produced so that the government could "act wisely" in carrying out the recently enacted National Defense Act. Section 124 of the law, titled "Nitrate Supply," authorized the president to begin investigating various processes to produce nitrates and to construct the necessary facilities. The measure also appropriated \$20 million for the purpose. Therefore, the committee was requesting recipients of its questionnaire to cooperate by supplying specific information about the process they employed, including yield, costs, and anything that could aid it in making recommendations to the government. All information would be regarded as confidential, and the committee would be glad to visit plants to consult with company officials.⁵⁸

While the NAS Nitrate Supply Committee was gathering data, action was developing on another front. On June 20, 1916, ACS secretary Charles Parsons contacted Herty, Baekeland, and W. R. Whitney, who constituted an ACS committee appointed three months earlier to advise the Bureau of Mines "on

chemical problems in connection with its investigations.” Parsons, chief chemist of the bureau, informed the three men confidentially that the secretary of the interior had been asked by the secretary of war whether the Bureau of Mines was able and equipped to do the laboratory experiments necessary to demonstrate the practicability on a commercial scale of oxidizing ammonia into nitric acid. These experiments would use not only pure ammonia but ammonia from by-product coke ovens as well. Asked by his chief to prepare the bureau’s reply, Parsons wanted the ACS committee’s advice on several questions: could the work be done in the bureau laboratory; if so, how long would it take and how many chemists would it require, and would building a small plant to carry on experiments be worthwhile and how much would it cost? Baekeland replied that the bureau could and should do the work to take it out of the hands of private companies that had a special interest in promoting one process or another. He also repeated what he had said to General William H. Crozier, chief of ordnance of the U.S. Army, and Professor Noyes of the National Academy of Sciences—that the easiest and least expensive way to get good information was to send a “discreet” man to England, France, and Germany to find out what processes those countries considered to be most efficient. Herty replied in more detail. He did not think all the data could be obtained in the laboratory; a semicommercial plant employing eight to ten men would be needed, and, depending on how much cooperation could be gotten from commercial firms, it would probably take \$90,000 to \$100,000 to set it up. Whatever arrangements were made, Herty cautioned, all experimental work should be kept strictly under the control and direction of the Bureau of Mines. Finally, both Baekeland and Herty urged above all else that officials of the Bureau of Mines and the Nitrate Supply Committee named by the National Academy of Sciences schedule a joint meeting. “It would be most unfortunate,” Herty emphasized, “for two distinct lines of effort to be carried on.”⁵⁹

Parsons sent Herty, Baekeland, and Whitney copies of the bureau’s response to the secretary of the interior, which in turn went to the secretary of war. Essentially, it recommended what Herty and Baekeland had proposed: if the War Department was ready to provide \$100,000 of the funds appropriated in the National Defense Act of June 3, 1916, the Bureau of Mines was prepared to work on the “nitrogen problem.” Wherever possible it would work with commercial firms to save money, and it would try to submit a full report of its results to the War Department in one year.

A. A. Noyes and the NAS Nitrate Supply Committee found out about the ac-

tivity in the Bureau of Mines from Herty, not from Parsons or his superiors. In a letter to Parsons dated July 15, 1916, Noyes wrote that Herty had just shown him a copy of the Interior Department's reply to the War Department. Noyes had not realized when he saw Parsons in Washington recently that Parsons was "actively concerned" with the nitrate question. But since that was the case, Hale, Herty, and Noyes all hoped that their committee could work in harmony with the Bureau of Mines. When the National Academy created its Nitrate Supply Committee, it did not seem "right" to put government representatives on it because the request to form it came from the government. That might have been a mistake, Noyes conceded, "for in the broader research movement represented by the National Research Council, recently initiated by the National Academy, the most important feature is to secure the closest possible cooperation between research men in government bureaus, educational institutions, endowed research laboratories and industrial laboratories." Not formally organized until September 1916, the National Research Council became the focal point for wartime research and was subsequently recognized as a permanent agency. Meanwhile, however, Noyes and his committee wanted to work closely with the Bureau of Mines so that their recommendations to the government would be complementary. He hoped they could have a meeting very soon.⁶⁰

Herty's decision to show Parsons's report to A. A. Noyes and the letter Noyes wrote Parsons as a result seem to have smoothed over a delicate situation, at least temporarily. On July 22, 1916, Parsons sent Noyes a cordial reply, expressing the bureau's willingness to cooperate with the academy's Nitrate Supply Committee and filling him in on what the bureau had been doing.⁶¹

Between August and late December 1916, the NAS Nitrate Supply Committee met several times, formally submitting a full report to the secretary of war on January 20, 1917. Meanwhile, the Bureau of Mines sent Charles Parsons to Europe in the fall of 1916 to visit "nitrogen fixation" plants in Italy, France, England, Norway, and Sweden. His preliminary report, sent to the War Department on January 27, was considerably augmented by a second report presented on April 30, 1917, but in both versions his conclusions differed significantly from the recommendations made by the NAS Nitrate Supply Committee. And the conflict did not end there. Beyond the scientific community, inside and outside of government, there were political and economic interests that hoped to influence whatever body finally selected the process upon which the government would spend the \$20 million appropriation authorized by the National Defense Act. For

example, southerners favored any process that would require the government to construct a major hydroelectric plant somewhere in Dixie; coke manufacturers equipped with by-product ovens pushed a process using ammonia distilled from coal tar; and the president of American Cyanamid Company lobbied for the use of his product because the ammonia derived from it, unlike that from coke ovens, did not need to be purified before its conversion to nitric acid. Even Herty had a contender. He listened to a paper on the fixation of nitrogen in which the author, Professor John E. Bucher, described his cyanide process. Bucher's presentation "set the crowd on fire," Herty wrote Parsons, hurrying off his note so that Parsons could meet with Bucher before submitting his final report to the War Department. Finally, merely trying to establish how the decision-making body should be constituted took more than two months during the spring of 1917.⁶²

After considerable delay and as a compromise, the secretary of war named a Committee on Nitrate Supply composed of men from government, industry, and academe. (Herty was among those appointed.) But the actions it ultimately recommended were taken almost entirely from the two Parsons reports of January and April 1917. Nitric acid, Parsons explained to the secretary of war, could be obtained either directly from the air, burning the nitrogen and oxygen therein by means of the electric arc, or by employing any of several processes that involved the oxidation of ammonia. Of the latter, the Haber process formed ammonia by directly combining nitrogen and hydrogen; the cyanamid process involved the formation of calcium carbide by heating calcium and lime in an electric furnace, then treating the carbide with pure nitrogen to form cyanamid, and finally hydrolyzing the cyanamid by steam in special autoclaves to produce ammonia; by-product ammonia was obtained during the destructive distillation of bituminous coal in the manufacture of coke; and the cyanide process, still experimental, involved the direct combination of nitrogen, carbon, and sodium to form sodium cyanide by heating together "an intimate mixture of carbon, soda ash, and nitrogen in the presence of finely divided iron." All four of the ammonia-producing processes involved the further oxidation of that ammonia to secure nitric acid. Parsons also outlined several oxidation techniques for the information of the secretary. First developed on a commercial scale in Norway, the arc process possessed some real advantages: free raw materials, small labor costs, and direct conversion into nitric acid. But it required an immense amount of horsepower per ton of yield, produced a relatively dilute product that was difficult to transport, and necessitated a plant that would be expensive to construct and largely idle in peace-

time. Consequently, Parsons's January report recommended that the government obtain its nitric acid by the oxidation of ammonia purchased on the open market and that it begin construction of an ammonia oxidation plant of moderate size to train workers and gain experience in the most efficient techniques; proceed slowly in setting up plants to produce ammonia because developments in the Haber and cyanide processes might "render valueless within a short time any large expenditure for the production of cyanamid"; and construct a hydroelectric plant only if the arc or cyanamid processes were adopted. Ammonia oxidation required very little power, and the Haber, cyanide, and by-product ammonia processes could all be operated without great quantities of cheap power. "I seriously doubt whether hydroelectric power will be necessary or desirable three years from now for the most efficient process of fixing nitrogen," Parsons added, "and accordingly I deem it unwise to install such hydroelectric power at great cost with the sole purpose of producing nitrogen." All of this provided a hint of what was to come in his final report.⁶³

On April 30, 1917, Parsons submitted his final "Report on the Nitrogen Industry." By that time, William H. Nichols, chief executive officer of the General Chemical Company, had come forward to offer the government his firm's process for nitrogen fixation. Described as an improvement over the Haber process, General Chemical's method was expected to produce ammonia more inexpensively than the Haber process with the added advantage that General Chemical would charge the government no royalty when its process was used to manufacture munitions; for fertilizer production there would be a small fee, but even that would amount to only a fraction of the cost required by other commercial processes for nitrogen fixation. Furthermore, General Chemical was prepared to turn over its engineering plans to the government together with trained personnel who would supervise construction of the proposed government facility.

When it finally acted on May 11, 1917, the government's Nitrate Supply Committee recommended the following actions: that the government arrange to use the synthetic ammonia process of the General Chemical Company; that \$3 million of the appropriated \$20 million be used by the War Department to build a synthetic ammonia plant using General Chemical's process and that the plant be located "preferably" in southwestern Virginia; that another \$600,000 from the \$20 million appropriated be used to construct a plant for the oxidation of ammonia and that it be set up close to the synthetic ammonia plant; that the government set aside up to \$200,000 for further experiments with the cyanide process if it

could work out a satisfactory arrangement with the company holding the patent; that the government spend another \$100,000 of the \$20 million on research leading to improved processes for the manufacture of fertilizer and munitions; that the government do all it could to promote the installation of by-product coke ovens by industry; that decisions regarding "more extensive installations of nitrogen fixation and water power development in connection with them be postponed until the plans recommended above are in operation or until further need arises"; and, finally, that pending the implementation of the above recommendations, the government move at once to secure a reserve supply of Chilean nitrate of not less than five hundred thousand tons.⁶⁴

Apparently Leo Baekeland, W. R. Whitney, A. A. Noyes, and Herty, all members of the old NAS Nitrate Supply Committee, whose January report had urged government construction of hydroelectric facilities and shown some interest in the cyanamid process, had been converted by Parsons's eloquence. Whether the administration and the Congress would be similarly convinced remained to be seen. Meanwhile, in his new capacity as editor of the *JIEC*, Herty was anxious to print the committee's full report before other technical and popular journals "scooped" him. He urged Parsons to secure permission for him to publish it in the August 1917 issue, and the secretary pulled every wire at his command. But the War Department was unwilling to release the entire report, according to one of Parsons's contacts, because wartime Washington was "obsessed with the fear that any information given out will be helpful to Germany." Herty's August deadline came and went; then in late August Parsons wired, "If I can get short history of nitrate work together with my two reports in your hands by Thursday morning, can you publish September Journal approximately twelve thousand words. Wire reply." Herty was delighted. He arranged to incorporate the nitrate material into the already made-up September issue while Parsons haunted the War Department to secure approval for its release. Herty had other material set up and ready to run in the event permission was denied.⁶⁵

Parsons certainly wanted Herty and the *JIEC* to be the first to tell the official nitrate story, but he also wanted to promote the notion that the committee's decision had been shaped primarily by the need to supply farmers with nitrogenous fertilizers as quickly and as cheaply as possible. In addition, he wanted Herty to "hit strongly" the patriotism of William Nichols for placing General Chemical Company's nitrogen-fixing process at the government's disposal "without recompense of any kind" when it was used to manufacture munitions. The ACS

secretary's insistence that Herty's editorial stress the agricultural advantages of the process chosen was probably designed to play down the fact that a hydroelectric project, something dear to the hearts of many powerful southern Democrats, was not part of the Nitrate Supply Committee's recommendation. Neither was there any provision to employ the cyanamid process, at the time the only fixation process operating successfully on a commercial scale in North America. Years later, Parsons justified his recommendations in favor of the still experimental General Chemical Company (modified Haber) process and against the proven cyanamid process on the grounds of cost. "It was solely a question of cost," he wrote Williams Haynes, a historian of the chemical industry, "and at that time we were supposed to take this factor very seriously into consideration."⁶⁶

The program approved by the government Nitrate Supply Committee in May 1917 turned out to be both costly and ineffective. President Wilson chose Sheffield, Alabama, as the site for nitrate plant no. 1, to be operated by General Chemical Company's modified Haber process, and a plant using the Bucher cyanide process under the direction of Charles Parsons was begun at Saltville, Virginia. By mid-September it was clear that the country's need for ammonia and nitrate had been seriously underestimated and that General Chemical's process, still far from being trouble-free, was unlikely to meet the shortfall. Consequently, the government negotiated an arrangement with American Cyanamid Company for the construction of plant no. 2 at Muscle Shoals, Alabama, and began building a hydroelectric dam at the same place early in 1918. Later two more cyanamid plants (3 and 4) were begun near Toledo and Cincinnati. Only plant no. 2 at Muscle Shoals was ready to operate when the war ended suddenly on November 11, 1918. By that time the federal government had spent well over \$100 million, excluding its investment in dams and power stations, and it had yet to solve the problem of nitrogen fixation.⁶⁷

Besides working hard in the interests of the National Expositions of Chemical Industries, southern industrial development, and national preparedness, Charles Herty devoted much of his two terms as president of the American Chemical Society to the achievement of American chemical independence. The outbreak of war in the summer of 1914 revealed starkly the degree of American economic dependence on Europe. As belligerents rushed to liquidate American assets, borrow from American bankers, and prevent the flow of American goods to their respective enemies, the initial impact on the American economy was profound. Britain's control of the seas, increasingly effective as the war lengthened, reduced

farm exports to the Central Powers from \$169 million in 1914 to only \$1 million two years later. Total exports fell from \$345 million to a mere \$2 million. Even Herty's income, four-fifths of which derived from the manufacture and sale of the Herty cup, was severely affected when the foreign market for naval stores dried up. Overall, however, initial losses suffered during the first several months of hostilities were more than offset by mid-1915 when heavy Allied war orders touched off an unprecedented boom in the American economy.⁶⁸

Nevertheless, severe dislocation continued for those enterprises whose economic well-being depended upon materials produced in Germany. In 1913, for example, American cotton and tobacco farmers consumed three hundred thousand tons of potash salts as fertilizer. All of it came from Germany. Before the war, American textile manufacturers secured only 15 percent of their required coal-tar dyestuffs domestically, and 90 percent of that was produced by firms that imported the semifinished products, or intermediates, from Germany. Similar conditions prevailed in the pharmaceutical and photographic industries, which also depended heavily on German coal-tar chemicals. Finally, most commercial, governmental, and educational laboratories routinely ordered their glassware, porcelain, and scientific instruments from German outlets in this country or directly from the German source. The situation was so critical by the spring of 1915 that Herty was asked to poll ACS directors regarding their views about making an appeal to the British government for permission to import German laboratory equipment. But his letter went out on May 6, the day before a German submarine torpedoed the *Lusitania*. Even before that event, ACS secretary Charles Parsons thought the British would deny the request; after it, he wrote Herty, "I am so wrought up myself . . . from the *Lusitania* action that I feel as though I never want to see anything else from Germany." Still under pressure from university chemists in July 1915, Herty approached British authorities through Canadian and British colleagues. But the Board of Trade was adamant, and Herty did not blame them. To a Toronto friend he remarked, "I feel that the lines are too tightly drawn . . . for even if Great Britain should accede . . . I believe that Germany would forbid the exportation . . . unless some counter importation, such as cotton, et. c. were allowed from this country. At least, that is the German attitude at present regarding the dye stuff situation."⁶⁹

By the middle of 1915 the "dye stuff situation" was uppermost in Herty's mind as he gathered material for his presidential address. Herty was not the first prominent member of the ACS to advocate the creation of a full-scale domestic coal-tar chemical industry, but he was certainly one of the most tireless and articulate

proponents of such an undertaking. Much of his inspiration as well as his rhetorical ammunition came from friends who served as consultants to dyemakers and textile manufacturers. For instance, on October 9, 1914, the New York section of the ACS devoted its first regular meeting of the 1914–15 season to a full discussion of the American dyestuffs industry. A committee chaired by Herty's friend Bernhard C. Hesse, composed of chemists representing manufacturers of heavy chemicals, domestic coal-tar dye producers, dye importers, textile manufacturers, and producers of crude coal tar, was appointed, and on November 6 it submitted an exhaustive report regarding "conditions and needs involved in the enlargement of the coaltar dye industry in the United States." Adopted unanimously by the New York section and subsequently published in the *JIEC*, the report began with a brief account of the committee's procedures. It had explored public suggestions for the improvement of conditions in the chemical industry; it had reviewed the decrees of belligerent countries to determine what formerly imported chemical products, including dyestuffs, had been embargoed or listed as contraband of war; and it had determined that before hostilities began the American chemical industry had been "efficiently exploited" and had made "full use" of the opportunities open to it. Admittedly, some chemicals available domestically had been imported. But the amount usually fluctuated with business conditions, and now that the foreign commodity was cut off, American producers were moving swiftly to fill the gap. The committee thought it would be only a matter of time before they were able to satisfy the market. More drastic action was necessary, however, if public demand and public safety should require "the introduction of the manufacture of explosives and further chemicals and dyestuffs into our home industry, such as coal-tar product explosives, pharmaceuticals, medicinals and other intermediates and finished coal-tar dyes." In that case, the tariff would have to be revised and the increased costs borne by consumers and the public in general. Specifically, the committee recommended that Congress adopt an effective antidumping measure to prevent foreign manufacturers from underselling domestic producers in the United States by "unfair" methods and that the existing 30 percent tariff rate on dyestuffs, which for thirty years had failed to induce the domestic industry to expand, be increased so that "the so-called coal-tar 'intermediates' which are the basis of the coal-tar chemical industry, inclusive of explosives, medicinals and dyestuffs," be assessed one-half of whatever finished dyes were taxed and that all finished coal-tar dyes, without exception, be taxed alike at 30 percent ad valorem and 7.5 cents per pound.⁷⁰

Published in both popular and technical journals and read to the House of Rep-

representatives, the New York section's prescription for the creation of a full-scale domestic coal-tar industry was circulated almost immediately among lawmakers and the chemical industry. But the attention of the general public was harder to capture until rumors of ammunition shortages at the front and the scarcity of dyes and medicines at home began to make an impression. Then, as the shortages assumed famine proportions, newspapers, magazines, civic clubs, and women's groups began seeking out the "experts" for articles and luncheon programs. Bernhard C. Hesse and Leo Baekeland were in great demand as were Professor Grinnell Jones of Harvard, later a chemical adviser to the United States Tariff Commission, and Thomas H. Norton, a special agent of the Department of Commerce, who was an expert on the chemical industries of Europe. Described by a historian of chemistry as "a small band of enthusiasts . . . preaching the chemical gospel," these men participated in a public crusade for "national self-containedness" which sometimes achieved almost evangelical fervor. No one preached the word more ardently than Charles Holmes Herty.⁷¹

In his presidential address to the American Chemical Society delivered at Seattle in September 1915, Herty called for "cooperation in matters chemical"—first, between university and industrial chemists; second, between chemists and the federal government; and finally, "between the American people, through their representatives in Congress, and our chemical industries." Given the conflict in Europe, the possibility that America might be drawn into it at any time, and the vital importance of chemistry in modern warfare, Herty believed that the call of patriotism, if nothing else, required all the cooperation the nation could muster. Commenting on the dislocation in the agricultural and textile industries caused by the inability to secure German potash and coal-tar dyes, Herty asserted, "In these days of rapidly shifting international relations, the only sound and rational policy is national self-containedness." For too long America's rich and varied natural resources and her geographical isolation had blinded her to the problems international upheaval might present. Nor had enough been done to encourage certain struggling young industries, which, "with a fair show," would have been able to supply current needs. Under the circumstances, he asked, "May we not [now] hope for more generous cooperation between Congress and our chemical industries in solving those innate economic difficulties whose temporary correction can be provided for only through adequate tariff legislation?" Herty realized that the recent enactment of the Underwood-Simmons Tariff (the first significant downward revision since 1861) reflected public conviction that corporate

giants often masqueraded in "swaddling clothes." But the European war and the subsequent cutoff of German chemicals had revealed several weak links in America's industrial chain which the country could not afford. " 'National self-containedness' is a more fitting slogan for us now," he reiterated, "than 'Tariff for revenue only.' " ⁷²

The rest of Herty's presidential address dealt specifically with coal-tar dyes. Admittedly, the annual dollar value of imported dyestuffs did not exceed \$14 or \$15 million, not much when compared with the total value of U.S. trade. But dyestuffs were used by so many American industries, many of which employed large numbers of laborers, that the cessation of regular shipments from Germany had caused serious disruption. The only way that disruption could be overcome, Herty continued, was for America to develop her own full-scale synthetic dyestuffs industry. And that would require Congress to provide effective antidumping legislation and, at least temporarily, a substantial increase in tariff protection. For guidance as to specific rates it need look no further than to the excellent report prepared by the committee of experts and unanimously endorsed by the New York section. "Are the people of this country ready to cooperate with the chemists?" he asked. If so, capital would respond positively and the nation could look forward with confidence to the creation of a synthetic dyestuffs industry commensurate with its needs. The issue was not simply economic, Herty emphasized. It affected the nation's health and safety as well because in wartime, dyestuffs plants could be converted easily to the manufacture of explosives. Moreover, the research and production personnel required to make dyes could also contribute to the expansion of our pharmaceutical industries. Thus dyes, explosives, and medicinals, Herty concluded, that "great trio" of industries, could be firmly established in America. At the same time, the great mass of coal tar being burned off wastefully above the nation's coke ovens would be put to useful purpose. "Cooperation," Herty exhorted, "it is a good word, and carries with it a wonderful power of accomplishment." ⁷³

Intended for an audience well beyond the few hundred chemists assembled in Seattle, Herty's presidential address was quickly distributed to trade publications, professional journals, and newspapers all over the country. It also went to the White House, together with a letter from Herty which the council of the American Chemical Society had unanimously endorsed. Noting the country's dependence on Germany for dyes, the severe impact of the dye shortage on America's textile industries, and the reluctance of investors to risk capital in

domestic dyemaking enterprises which the Germans might quickly destroy after the war, Herty urged President Wilson to support antidumping legislation and to consider revision of the existing tariff schedules. "It may be that some changes . . . are desirable," Herty wrote. "The Council of the American Chemical Society will not venture an opinion . . . but would suggest that this is a question which should be carefully considered by disinterested experts."⁷⁴

Herty was also in touch with other branches of the United States government. His initial contact, Thomas Norton, was a special agent of the Department of Commerce, a European-trained chemist, and an expert on the chemical industries of northern Europe. In 1915 Norton began work on a dye census which revealed not only the types and quantities of dyes imported by the United States before the war but also the degree to which Germany had dominated the American market. Ultimately the Norton census had a significant impact on the development of the American dye industry. But in 1915 and 1916, he and his superiors in the Commerce Department differed sharply with Herty and most of the ACS as to the best means for achieving their common goal, American chemical independence. Norton thought a cooperative arrangement between Swiss dye experts and American capital could get the industry well started in the United States, and a stiff antidumping clause would be sufficient to protect it against postwar attempts by Germany to recover the American market. Herty disagreed. The Swiss might be able to relieve the "immediate deficiency," but the creation of a permanent industry, he insisted, required an increased tariff as well as an effective prohibition against dumping. Furthermore, Herty thought textile interests were now ready to support such legislation, whereas in the past they had always fought it. If Congress acted promptly, he was sure the necessary capital to expand the industry would be forthcoming, and "in a very few years we will have practically a complete industry. In that good work," Herty concluded, "I trust that all interests in this country can join."⁷⁵

By the end of October 1915 officials of the Department of Commerce made it clear that Herty's "trust" was misplaced. Thomas Norton and E. C. Pratt, chief of the Bureau of Foreign and Domestic Commerce, delivered addresses to the New York section of the Society of Chemical Industry which endorsed antidumping measures but specifically rejected increased tariff rates. Citing the legislative efforts of Australia, Canada, and South Africa against "unfair dumping" and the thorough investigations of the Department of Commerce and the Federal Trade Commission, Pratt announced the intention to ask Congress for legislation that

would require foreigners to observe the same rules of "fair competition" that the Clayton Act imposed in domestic commerce. As for the "tariff question," Pratt thought raising it would "simply . . . divide those who are interested into two groups, most of whom will be guided not by . . . the few pertinent facts as to the merits of the question," but by judgments based on "irrelevant" or even "hereditary grounds."⁷⁶

Herty read about Pratt's address in the *Journal of Commerce*, which Bernhard C. Hesse sent to him the day after the New York meeting. He was disappointed, he wrote Hesse, "although I really was not surprised in light of Secretary [of Commerce] Redfield's newspaper propaganda during the last few weeks. I thought that Pratt would land just about where he did." Nevertheless, Herty must have entertained some hopes, at least initially, that he could influence Pratt. Three weeks before the speech he had met with the bureaucrat and at his request had sent him a letter "dealing in detail with the . . . measures we ought or ought not to take" to build up the dyestuffs industry in America.⁷⁷

Herty did not give up. Early in November he delivered a series of lectures in the Northeast in which he constantly stressed the need for tariff revision if the United States was determined to establish an independent chemical industry. En route to his engagements in Philadelphia and upstate New York, he tried to see Pratt in Washington, but the official was out of town. Senator Furnifold Simmons of North Carolina, chairman of the Senate Finance Committee, to which any tariff bill would ultimately be referred, was also unavailable. But following a meeting on November 26, 1915, during which he tried to educate the senator about the "dyestuff situation," Herty sent Simmons considerable data about the German coal-tar dye industry, including estimates of its capitalization, declared and paid dividends as of June 30, 1912, and the value of its annual output, about \$80 million, of which the United States purchased between \$9 and \$10 million. Apparently Simmons was not encouraging about the prospects for higher tariff rates. "My only regret," Herty wrote the senator on December 1, 1915, "is that I could not return to Chapel Hill with a light heart regarding favorable conditions for the rapid development of a complete home industry to supply our needs."⁷⁸

In mid-January 1916, only a few weeks after his meeting with Senator Simmons, Herty was back in Washington to testify before the House Ways and Means Committee in behalf of House Resolution 702. Introduced by Congressman E. J. Hill, Republican of Connecticut and a member of the committee, the bill incorporated verbatim the recommendations made by the New York sec-

tion of the American Chemical Society, and during the hearings both producers and consumers of dyestuffs almost unanimously urged the committee to report it favorably. Clearly, the dyestuff famine, together with the persuasive and widely circulated arguments of Herty and other prominent chemists, was beginning to have an effect.⁷⁹

Now that the Hill bill was before Congress, Herty intended to focus attention on it in every way possible. He began by urging southern textile manufacturers, some of whom he knew personally, to write their senators and congressmen, pressing them to support the Hill bill. Next, he tried to see President Wilson after learning from a newspaper account that the president planned to meet with the powerful chairman of the House Ways and Means Committee, Congressman Claude Kitchin of North Carolina, regarding the dyestuffs bill. As a southern Democrat, Herty understood the commitment of both Kitchin and Wilson to the traditional principle of "tariffs for revenue only." But so much "misinformation" was prevalent and the situation was so acute that Herty wanted the opportunity to discuss matters with the president before he made a final decision. Unfortunately, Wilson was too busy to see him and Herty had to submit his arguments in writing. Even worse from his point of view, President Wilson's secretary referred his letter to Secretary of Commerce William Redfield, who simply reiterated his belief that the Hill bill, which he labeled "unscientific," would be no more successful than any other tariff measure in protecting the dyestuffs industry. Experience had convinced him that foreign manufacturers responded to higher tariffs by lowering their prices or refusing to sell American buyers some colors unless they bought the German manufacturers' full line. Not satisfied, Herty wired Redfield for an appointment, but the secretary turned him down. "To be quite candid," Redfield explained, "I have not the time amid many cares to go over and again over phases of the subject which have been enforced upon me through many past months, nor must I make the mistake of taking up the legislative side at the present juncture."⁸⁰

Stymied, Herty tried another approach. Through Fuller Callaway of LaGrange, Georgia, a member of the board of governors of the American Cotton Manufacturers' Association, he secured an invitation to address the group's annual convention in Atlanta on April 4, 1916. Composed almost exclusively of southern textile men, the association, if properly mobilized, could be a major factor in the fight to pass the Hill bill. Herty realized that so far the bill's proponents had failed to "arouse" the southern mill men and southern newspapers, and he planned to do all he could to change that. "I feel that I am particularly

well placed for such an appeal," he wrote a New York dye manufacturer, "as I am a Southerner and have not the slightest financial interest in the matter either as a manufacturer of dyestuffs or as a textile manufacturer."⁸¹

In a hard-hitting speech titled "The Dyestuff Situation," Herty told the textile magnates assembled in Atlanta that billions of dollars worth of American industry and millions of American laborers were faced with a crisis because of the curtailment of dye shipments from Germany. American manufacturers and capitalists were ready to begin developing a self-contained dye industry, he insisted, if only Congress would agree to protect them from the certain destruction a ruthless German industry would subject them to once the war was over. Domestic manufacturers realized they could not hope to meet such competition on even terms for years; yet Congress had withheld the necessary protection, "and the Democratic party, now in control of both the Senate and the House, stands to-day responsible for this humiliating situation. . . . Partisan considerations have prevailed where statesmanship and broad-minded Americanism were demanded." Because it was against his own party, Herty did not make the charge lightly. But he could justify it, and he proceeded to do so, condemning specifically the secretary of commerce and the Democratic majority of the Ways and Means Committee. In his press releases, Herty charged, the secretary had "regaled the country" for months with tales of "remarkable but evanescent new sources of dyestuffs" which never materialized. Yet he continued to oppose any measure "suggestive of protection." The secretary's attitude, Herty commented, contrasted sharply with that of the Chamber of Commerce, which recently endorsed "Industrial Protection for those industries which in the National public interest should be developed."⁸²

Herty was even more critical of the Democratic majority of the Ways and Means Committee. They refused to let the Hill bill go to the floor of the House, which he charged was "trifling with a serious National disaster." If they thought the bill was faulty, why not substitute a better one? Should the whole matter be allowed to drift just because the word "protection" had been introduced? Herty noted that the request for a higher tariff on dyes was in line with recent action taken in Great Britain and Japan, where in addition to favorable tariffs, the governments provided loans at low interest rates: "Are we alone to be left at the close of the war in the hands of the German monopoly of synthetic dyestuffs? Can we hope to build up a great export business in colored cottongoods, or even a satisfactory domestic supply, with England and Japan freed from commercial dependence on the Germans . . . while we, through our representatives in Wash-

ington, deliberately retain the shackles which gall us even now and of whose real enslaving power we have not yet begun to see the possibilities?"⁸³

To convince his audience that his vision of the postwar world was no fantasy, Herty quoted from a recently published German trade journal which outlined the steps that country's dyemakers and textile manufacturers should take to reclaim their prewar markets and eliminate foreign competition. "Is it not time to get busy?" Herty asked. Finally, he reminded the textile magnates that their interests and their workers' welfare were at stake. "Arouse the Southern press to energetic advocacy," he exhorted. "Impress our Southern Democratic Congressmen with the justice and urgency of your cause. . . . In this issue neither Democratic doctrine nor Republican doctrine finds patriotic place—'America First' alone should decide."⁸⁴

Pleased with Herty's speech, the southern textile men voted unanimously to have it printed and sent to every member of Congress. Herty also distributed reprints, especially among newspapers and trade journals circulated nationally such as the *Manufacturers' Record* and the *Oil, Paint and Drug Reporter*. Albert Greene Duncan, president of the National Association of Cotton Manufacturers, which represented New England textile men, was so impressed by his performance in Atlanta that he asked Herty to address that body when it convened in Boston. He could not go, but he was very anxious to get a copy of the remarks made there by Herman Metz, a former New York congressman and the American sales representative of a German chemical firm, *Farbwerke Hoechst*. Metz's views about the need to build an American dyestuffs industry differed markedly from Herty's, but Leo H. Baekeland's did not. Describing himself as a "theoretical free trader," he thought Herty's Atlanta speech proved that a professor could take the "practical side" of an issue. "The fact is," Baekeland wrote Herty, "many of our so-called business men are the *theorists* when it comes to the dyestuffs situation. There has never been an occasion where tariff protection was as well justified as in this instance."⁸⁵

Herty thought critics of the Hill bill were doctrinaire free traders, misinformed, or even un-American. When someone advised him that a few textile manufacturers, initially for the Hill bill, had changed their minds, he traced the story all over the Northeast, finally discovering that Claude Kitchin, chairman of the House Ways and Means Committee, was the source of the report. Not surprised, Herty explained to his informer that he wanted the information so that he could pin the congressman down about the identity of the alleged defectors.⁸⁶

Far more disturbing to Herty were those critics whose opposition to higher dye tariffs he thought arose from ignorance or ulterior motives. When W. L. Saunders, a vice-president of the Naval Consulting Board, published an article in the *New York Times* magazine about industrial preparedness which dismissed the development of a domestic dyes industry as relatively unimportant, Herty felt obliged to "educate" him and the entire board. He reiterated the standard arguments in favor of a domestic dyes industry, and he referred Saunders and his colleagues to the hearings on the Hill bill held before the Ways and Means Committee, a statement by the assistant secretary of war printed in the *Congressional Record*, and above all, to events in Germany, where within weeks the peacetime dyes industry had been converted to the production of drugs, munitions, and poison gases.⁸⁷

Saunders's somewhat chastened response to Herty's informative letter was followed by another quoting a series of statements from an unidentified correspondent who sought to refute Herty's arguments. Essentially the letter writer denied that a domestic dyes industry, adequate to the country's peacetime needs, could be a significant contributor to its wartime requirements for munitions. The entire value of imported dyestuffs amounted to only \$10 or \$12 million per year. If the plants needed to manufacture that much product were converted to munitions making, he argued, "It would not be a 'drop in the bucket!'"⁸⁸

Herty's immediate reaction was to ask Saunders for the name of his correspondent. When he learned that it was Herman Metz, he remarked, "I am free to say that I guessed wrong as to the authorship . . . I had imagined a much more insidious and cunning hand at work in this matter." But now that he knew who wrote the letter, the whole thing was so transparent that it was "almost laughable." As one of the most prominent importers of dyes, Herty continued, Metz had always been affiliated with the German dyestuffs interests. He sent Saunders excerpts of Metz's testimony before Congressman Kitchin's committee which acknowledged the affiliation. In addition, he asked Saunders to reread his (Herty's) letter of March 2, 1916. It did not argue that the proposed American dye plants would, by themselves, satisfy the nation's need for munitions in time of war. It did claim, however, that a fully developed dyes industry could be converted easily to the manufacture of munitions in wartime and in peacetime would consume some of the benzol, toluol, phenol, and other materials recovered during coking operations in retort ovens. Benzol, toluol, and phenol, called "crudes" in the dye trade, were the raw materials employed to make both high explosives and the

intermediates from which finished dyes were manufactured. Furthermore, conversion of these "crudes" into intermediates or finished products required great quantities of sulfuric and nitric acid, also essential in the manufacture of high explosives. A dyes industry, therefore, would keep acid plants operating after peace was restored. It would also provide employment for workmen and superintending personnel familiar with the details of nitration, a basic step in the manufacture of explosives. Anyone with the skill to manufacture dyestuffs could make explosives, Herty asserted, but it did not work the other way. Finally, expansion of the American dyestuffs industry, with the consequent demand it would engender for trained chemists to run it, would pressure universities to produce more graduates with research experience in coal-tar compounds. "We must have such men and they must be our very best," Herty insisted, "for we cannot rest content with simply following the developments of the German laboratories. . . . 'American ingenuity' is a much vaunted phrase, but it must be joined to true scientific training and ability if we are to reap the highest rewards."⁸⁹

Herty was glad that Saunders had sent him the extracts from Herman Metz's letter. He realized the importance of the work being done by the Naval Consulting Board and the Industrial Preparedness Committee, of which Saunders was chairman, and he wanted to cooperate with him in every way possible. He was also convinced that there were forces at work whose motives were not "America First" but something insidious. "I beg, therefore," Herty concluded, "to express the hope that since the cry 'America First' is our mutual standard, you will write me freely whenever again it is sought to make use of you to further unknowingly interests which are not American."⁹⁰

Precisely when Herty began to suspect that Herman Metz was involved in a plot concocted by importers of German dyes and the German propaganda apparatus is not clear. But he certainly thought so by April 1916. On April 8 he met Ellwood Hendrick at the Chemists' Club in New York. Hendrick was a gifted writer whose "nontechnical" articles designed to popularize chemistry often appeared in magazines and newspapers. Herty told Hendrick about his correspondence with Saunders, and Hendrick advised Herty of rumors linking Metz to the activities of the German propaganda machine. A day or two later Herty sent Hendrick the correspondence but asked him not to use it unless Saunders gave his consent.

While in New York Herty also talked with Charles Miller of the *New York Times* about the activities of "certain secret forces . . . difficult to locate," which he thought were trying to block passage of the Hill bill. A follow-up letter to Miller

suggested that Hendrick be asked to write an article for the magazine section, which, without going into specific detail, would let people see how the failure to develop a dyes industry would play into the hands of those hoping to preserve lucrative ties with German firms and would also make clear that such a course might be serving the cause of a potential adversary.⁹¹

There is no indication that the *Times* accepted Herty's suggestion, but that did not dissuade Hendrick from seeking other outlets. He managed to interest the *New York World* in the project, provided Herty could secure permission to use the Saunders-Metz correspondence. Herty asked Saunders to release it for publication, but he declined, despite repeated requests made directly and through Leo Baekeland, who served with Saunders on the Naval Consulting Board.⁹²

While Herty was still trying to establish whether the Hill bill was stalled in committee because of antiprotectionist Democratic pressure or the machinations of some pro-German combination of importers and propaganda artists, it was killed in the House Ways and Means Committee by a strictly party vote. A similar measure known as the Lodge Amendment went down the same way on the floor of the Senate. But all was not lost. As a result of considerable public pressure and conferences composed of Democratic leaders, dyemakers, and dye consumers, a substitute was produced which incorporated the ad valorem rates (30 percent) proposed by the New York section of the ACS but reduced the specific duties recommended by one-third (from 7.5 cents to 5 cents per pound). Furthermore, the new specific rates were to remain in effect for five years only, after which they were to decrease by 20 percent a year. Another feature provided that if, at the end of five years, American dye plants were not producing 60 percent of the value of American consumption, the specific duties were to be immediately repealed by presidential proclamation. Finally, all of these provisions were incorporated in Section V of House Resolution 16763, a general revenue bill, reported to the House by the Ways and Means Committee early in the summer of 1916.

In spite of the lowered duties in the proposed bill, and without waiting for the Ways and Means Committee to make its formal report, some dye producers began to expand their operations. Consequently, they were amazed when the dyestuff section of the general revenue bill finally reached the House floor. Besides the provisions cited above, which they expected, Section V excluded indigo and alizarin and their derivatives from the benefit of the special duty of five cents per pound. About 8 million pounds of indigo were imported annually by the United States before the war; 90 percent of it came from Germany, the rest from England,

Switzerland, and the Orient. In 1916 importers managed to obtain 6.6 million pounds by combing stockpiles worldwide (none came directly from Germany), but the price per pound had quadrupled. Alizarin proved even harder to secure. It had been imported at the rate of 5.5 million pounds a year before the war, but only 1,758 pounds was received in the fiscal year ending June 30, 1916. Together the two dyestuffs constituted 29 percent of the value of American consumption. Herty was shocked by the committee's action. "Such an exception," he protested later, "was fatal to the purposes of the bill. The *ad valorem* duty alone would not suffice to promote and encourage the manufacture of synthetic indigo and alizarin."⁹³

Many people, including some chemists, failed to appreciate the significance of the House exclusion. Pressed to explain why indigo and alizarin had been stripped of the specific duty, Congressman Kitchin declared during the House debate that his committee had acted with the approval of representatives of consumers as well as producers of dyestuffs and that individual dyes manufacturers (whom he named) were not interested in full protection for indigo and alizarin. The full House then adopted the dyestuffs section on a party vote. Immediately briefs were filed with the subcommittee of the Senate Finance Committee to which the dyes section of the general revenue bill had been referred. With the briefs went letters, telegrams, and other exhibits from those individuals cited by Congressman Kitchin, all of whom refuted the claims made by the North Carolinian. Specifically, the protesters charged that the exception of indigo and alizarin from the bill's full protection was not in line with the agreement that had been reached with Kitchin's committee. If allowed to stand, they predicted, the result would be disaster for the entire dyestuffs industry.⁹⁴

Charles Parsons urged Herty to interrupt his summer vacation to appear personally before the Senate committee, noting that "Senator [Furnifold] Simmons of your own State is Chairman of the Comm. . . . and I think you ought to have considerable influence with him. Certainly so when simply endeavoring to straighten matters where they [the House members] have made a grievous mistake." Herty was already preparing a brief, which he submitted to Senator William J. Stone, chairman of the dyes subcommittee, on July 22, 1916, along with his oral arguments. Citing an official report of the U.S. consul in Germany, Herty noted that the major German dye plants had recently integrated all operations for the stated purpose of recovering control of the world dyes market after the war. Consequently, it was "entirely reasonable" for American chemists, dye-

makers, and capitalists to seek protection for themselves from what promised to be a desperately uneven struggle if the war ended quickly. He then proceeded to "correct" some of the statements made by Congressman Kitchin during the House debate on the dyestuffs section of the general revenue bill, to urge the committee to restore the rates recommended by the New York section of the ACS, and above all, to replace the specific duties on indigo and alizarin which the House bill had removed. Herty had to settle for half a loaf: the subcommittee retained the rates set by the House, restored specific duties on the excluded dyestuffs, expanded the bill to cover natural indigo, coal-tar medicinals, and flavors, and stipulated that the rates set would not go into effect until the end of the war. Only one major consumer, a textile manufacturer from Greensboro, North Carolina, registered a protest. Not content with either the House or Senate action, he wanted indigo admitted with no duty at all. The subcommittee rejected his plea.⁹⁵

Endorsed by the full committee and the majority party conference, the completed dye section of the general revenue bill won Senate approval. Late in August 1916, the *Manufacturers' Record* asked Herty for his reaction, but he saw no reason to agitate the issue further because it seemed that everyone, with the possible exception of Senator Oscar Underwood, had finally recognized the need for protection. Privately he confided that though the Senate bill was not "ideal," it was a great improvement over the version sent over from the House. To Senators Simmons and Stone Herty expressed the sincere appreciation of the chemical profession for the "very comprehensive and now thoroughly logical" dye section which their committees had produced.⁹⁶

Still vacationing with his family in Maine, Herty was assured by Bernhard Hesse in late August 1916 that the general revenue bill was expected to become law without "substantial alteration." Relieved, he busied himself with last-minute arrangements for the upcoming joint meeting of the ACS and the second National Exposition of Chemical Industries. To Allen Rogers, chairman of the host New York section's press and publicity committee, he sent notice of his plans for an informal dyestuffs conference to be held during the meetings. The aim was to stimulate discussion and to develop coordination among chemists and dye manufacturers so that a self-contained American industry could be achieved. "National legislation was completed last night," Herty informed Rogers in his letter of September 7, "and the problem is now up to us. My own personal efforts will be directed in that meeting to trying to bring about, as far as possible, a spirit of friendly cooperation among the manufacturers in this field."⁹⁷

When Herty learned that a joint conference of the Democratic party had excluded indigo and alizarin from the special duty in the last hours of a Congress rushing toward adjournment, he was bitter. In his second presidential address delivered in New York on September 27, 1916, Herty summarized the efforts made during the preceding two years to achieve dyes protection and characterized the outcome as "a distressing story, humiliating to all who wish our country freedom in every possible form."⁹⁸

Congressional refusal to enact what Herty considered adequate protection for the dyes industry disappointed him, but it did not dissuade him from continuing the fight. The battles waged in 1916 were merely the opening skirmishes in what proved to be a long war, one Herty would soon be fighting on another front with a host of powerful allies who shared his vision of a chemically independent America. One weapon he learned to use effectively in the long struggle was the popular press. For example, well before he went to Atlanta to address the southern textile manufacturers, he contacted Clark Howell, an old friend from University of Georgia days, who in 1916 was editor of the *Atlanta Constitution*. After thanking him for a recent article endorsing dyes protection, he asked Howell for a "strong editorial follow-up" of the Atlanta speech, expressing a desire to meet with southern newsmen after its delivery. "I know nothing of newspaper organization," Herty demurred. Actually, he had already established contacts with the *Charlotte Observer*, the *New York Times*, and the *Philadelphia Public Ledger* to make the public more "chemically conscious" and to build support for the pending Hill bill.⁹⁹

Perhaps the best evidence of Herty's strong belief in the power of the press came in 1916 with the creation of the ACS Press and Publicity Committee, which led eventually to the formation of the society's News Service. Until Herty's presidency, local sections of the ACS usually arranged whatever press coverage the society received at its twice-yearly meetings. But in 1916 the preparedness drive and the chemists' eagerness to promote their public image made a more structured approach desirable. By mid-May Herty and Ellwood Hendrick, one of three men he had named to the newly created ACS Press and Publicity Committee, were in contact with several New York dailies and Ivy Lee, a prominent public relations expert, who thought he could do a thorough job of "promoting chemistry" for \$10,000 a year. When told that the society *might* spend \$2,500, Lee advised the chemists to forget it. Meanwhile, the New York section of the ACS organized its own press committee. Chaired by Allen Rogers of Pratt Institute, it did the pub-

licity work for the 1916 joint meetings of the ACS and the National Exposition of Chemical Industries, something Herty recognized in December when he added two members to the New York committee and made it the publicity organ for the whole society.¹⁰⁰

Despite its good work, the ACS directors disbanded the press committee late in 1917 because of mounting costs and decreased revenue. Herty, by that time editor of the *Journal of Industrial and Engineering Chemistry*, complained unhappily to a Boston friend, "I think you know my sense of news sufficiently to understand that I am not at all satisfied with the . . . Directors' [action]." But in the end Herty had his way. Charles Parsons, ACS secretary, informed him in April 1918 that the directors had just reactivated the Press and Publicity Committee and awarded it \$2,500. Herty's "advertising committee," Parsons declared, could safely "continue its propaganda" for the rest of the calendar year. Finally, the directors institutionalized the society's public relations activities early in 1919 when the work of the erstwhile publicity committee was turned over to the newly created ACS News Service. The publicity committee continued in an advisory capacity, but a "professional" with both newspaper and laboratory experience ran the News Service under Herty's general direction.¹⁰¹

As president of the American Chemical Society during a critical period in its history, Herty consciously used his considerable skills as an administrator, conciliator, articulator, and advocate to develop "a greater spirit of cooperation" between technical and academic men in the society, universities and industries, chemists and the general public, and chemists and lawmakers, "especially regarding the creation of a self-contained American dyestuffs industry." An academic trained in "pure" chemistry, with postdoctoral and practical experience as an industrial chemist and a businessman, Herty was the perfect bridge to span the gap that sometimes divided the society's membership. The same credentials made him an effective link between the society and the major exhibitors participating in the National Exposition of Chemical Industries, whose advisory board he chaired. Herty's ability to reach people through his speeches was also impressive. Whether addressing turpentine men, undergraduates, industrial magnates, professional chemists, or Protestant laymen, he was always clear and usually persuasive. Especially adept at making technical material intelligible to laymen, he could simplify without sacrificing substance or insulting the intelligence of the specialists in his audiences.¹⁰²

In sum, Herty's two years as president of the American Chemical Society,

which might have marked the pinnacle of his professional life, served instead as an apprenticeship for a dynamic new career. Flattered and challenged by his appointment to the editorship of the *JIEC*, he quickly wound up his affairs in Chapel Hill and prepared to move to New York. Nevertheless, the departure was bittersweet because it meant breaking up an extremely close family. Holmes and Frank, aged twenty and nineteen, were both enrolled in the university and would remain in North Carolina when their parents and four-year-old sister Dolly went north. For Sophie Herty, whose asthmatic condition and frequent bouts with bronchitis were bound to grow worse in the less temperate New York climate, leaving behind the small community, a comfortable home, and a prized rose garden must have been especially difficult. Finally, Herty himself found it hard to say good-bye to close friends, the university, and the state with which he had been intimately connected for so long. To Professor W. A. Withers, who employed him as an assistant in the state agricultural experiment station during his graduate school days, he wrote, "My earliest associations in North Carolina were with you in the old laboratory in Raleigh and it is a great happiness to me to know that the ties I formed in those early days have remained throughout the succeeding years as strong as ever." And to R. H. Lewis, a university trustee and fellow Episcopalian, who had expected Herty's departure for a long time because he was "to [*sic*] big a man for North Carolina to hold," Herty declared, "You have been our very best friend during the eleven years we have lived in North Carolina and . . . while the new call takes us some distance away, as far as bodily presence is concerned, nevertheless you will always be as near and as dear as ever."¹⁰³

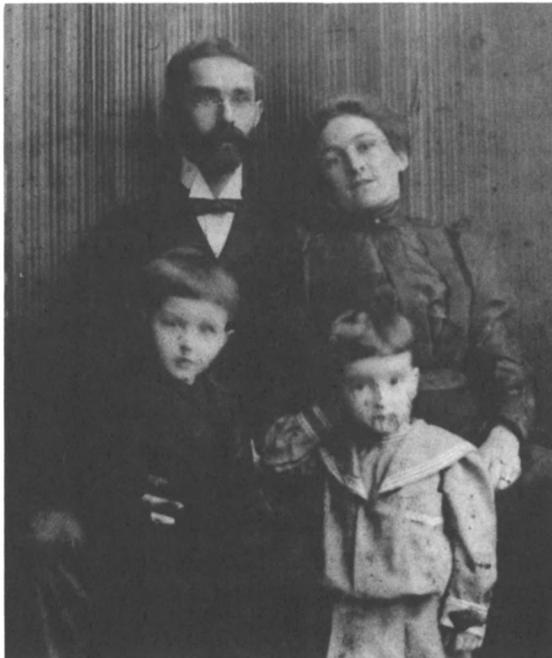


Charles Holmes Herty at age five.



Charles Herty (*upper left*) as an undergraduate at the University of Georgia.

Charles Herty, Sophie Herty, and their sons, ca. 1901.





Side view of turpentine box showing depth of cut.



A turpentine work crew installing cups and gutters, ca. 1902.



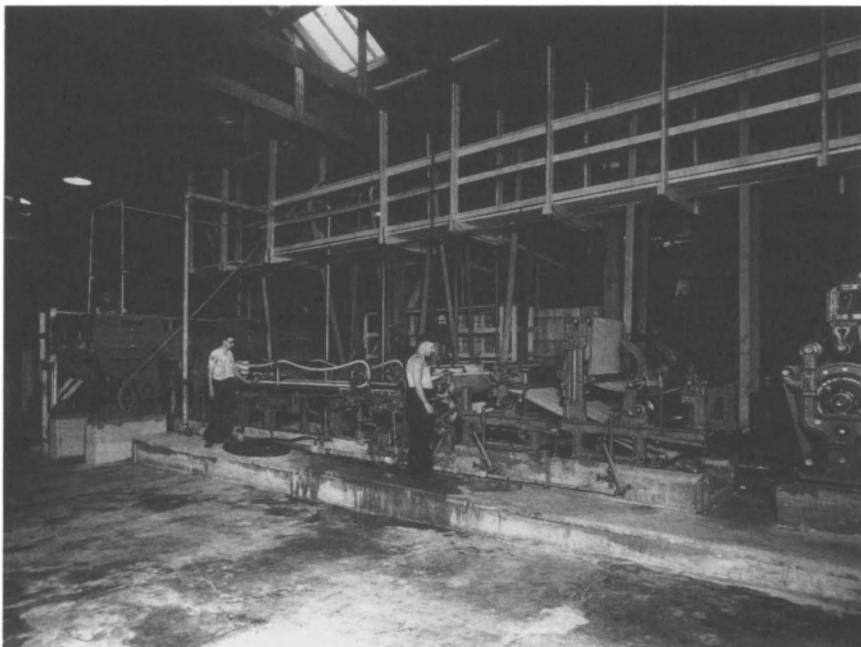
Turpentine still, Ocilla, Georgia, ca. 1903.



Charles Herty as professor of chemistry, University of North Carolina.



Charles Herty (*right*) and
Frances P. Garvan,
president of the Chemical
Foundation, May 1932.



Savannah Pulp and Paper Laboratory, ca. 1935.



Staff of the Savannah Pulp and Paper Laboratory, ca. 1935. Charles Herty is fourth from the left.

CHAPTER FIVE

* * * * *

The Mouthpiece of Chemistry

The five years Herty served as editor of the *Journal of Industrial and Engineering Chemistry* were, in many ways, the most hectic and productive of his career. Already well known in and out of chemical circles, he expanded his contacts among businessmen, industrialists, and lawmakers; he used the columns of the *Journal* to educate and influence the public and the makers of public policy in behalf of chemistry; and above all, he worked tirelessly for what he had long advocated as president of the ACS: “cooperation in matters chemical” by government, industry, and the academy and the liberation of American chemistry from its dependence on foreign sources. As America moved toward war with Germany early in 1917, nothing seemed more important to the new editor than the speedy achievement of both goals.

Herty’s activities from January 1917 through December 1921 were so complex and multifaceted that they will be dealt with in two chapters. The first will cover his editorship of the *Industrial Journal* and his continuing participation in the internal affairs of the ACS; the second will deal with his ongoing commitment to the achievement of chemical independence for the United States, specifically with his efforts to secure complete protection for the coal-tar dyes industry.

Herty went to his new job with no formal training or experience as an editor. But he did have outstanding administrative talent, he was an excellent speaker, and he had the ability to identify and explain complex issues with clarity. Unusually persuasive when he felt strongly about something, he intended to make the *JIEC* the official voice of the American chemical community. As he expressed it to the *Journal*’s Washington correspondent in 1919: “This Journal stands for the full development of the chemical industries of America and for the economic

independence of America in every line in which it can be aided by chemistry. Whatever bears upon the advancement of chemistry and chemical industries in this country we advocate and fight for. In the same way, whatever influence that tries to retard this development we are head and foot against. I think if you keep that policy in mind you will need no other guide . . . 'America First' is our watchword."¹

Soon after assuming the editorship in late 1916, Herty was busily reorganizing the *Journal's* advisory board and presiding over the publication's relocation into more spacious quarters. The first task was handled quickly and painlessly by correspondence; the second took more time and required liberal applications of the vaunted Herty tact to soothe the wounded egos of some of his new associates. Because Herty was still in North Carolina winding up personal and academic affairs, ACS treasurer E. G. Love located and leased the *Journal's* new offices at 35 East 41st Street in New York. Authorized by the society's directors to spend no more than \$1,000 for furniture and equipment, Love balked when Leola Marrs, Herty's editorial assistant, tried to dictate how the money should be spent. It annoyed Love to have someone tell him how to run his business; he wanted to do all he could to help Herty, but he was unwilling to take orders from Marrs. "I only hope you can get as much work out of her as he [the former editor] has," Love fumed, "but she should understand that she is not the boss."²

Herty read Love's letter with amusement, answering that he was sure they would be a "congenial crowd" when things finally settled down. The treasurer must not think about locating his offices elsewhere because of Marrs. "Don't worry about anyone interfering with your work," he soothed. "I think I can preserve harmony in our little household, for I have tackled some harder jobs." But things did not settle down. By mid-November 1917 Marrs had resigned and Herty was looking for a new assistant. This time, he told the members of his advisory board, he wanted a man with "good training in industrial chemistry . . . [who] at the same time has a good command of English." Herty did not expect to find anyone with experience on a technical journal, but he was sure the right man could pick up the necessary skills quickly.³

A male replacement for Leola Marrs was hard to find, but Herty's connections in academia, industry, and government soon yielded some excellent female candidates. Grace McLeod, a graduate of MIT with a master's degree in chemistry, was finally hired as assistant editor. She had formerly been an instructor of chemistry at Pratt Institute, where Herty's friend Allen Rogers was chairman of

the department. McLeod remained with the *JIEC* until September 1919, when she resigned to accept a teaching position at Columbia. By that time Herty had expanded the *Journal's* clerical and editorial staff to include at least one other young woman with a degree in chemistry. Hired as a secretary through H. P. Talbot, chairman of the chemistry department at MIT, Lois Woodford joined the *JIEC* in December 1917. She soon proved to be everything Talbot said she was—careful, loyal, and capable of assuming responsibility. By the spring of 1918 Herty authorized her to find another chemistry major from her alma mater, Mount Holyoke, and fifteen months later he made her acting editor for several weeks when a special assignment took him to Europe. Besides editing the *Journal*, keeping the books, and supervising the staff, Woodford covered the fall meeting of the ACS in Philadelphia. She did such a splendid job in every department that Herty gave her the assistant editor's position left vacant when McLeod went to Columbia. During the next decade and a half, Woodford made herself practically indispensable to Herty. Not until 1935, when he closed his New York office, was the working relationship ended. By that time Herty was devoting virtually all of his time to the Pulp and Paper Laboratory in Savannah and the effort to start a newsprint industry in the South.⁴

As editor of the *JIEC* Herty faced the usual problems of deadlines and budgets, which were compounded because his tenure was served during wartime and the period of economic, political, and social instability that plagued the country for two or three years following the Armistice. Normally, the *Journal* appeared on newsstands and in subscribers' mailboxes on the first of each month. Careful planning and scheduling were important because, although editing and proof-reading took place in the New York offices, printing and mailing were handled by the Eschenbach Printing Company of Easton, Pennsylvania, owned by Harvey Mack. Most of the time Herty's people and Mack's worked well together. But inevitably garbled instructions, missed deadlines, or labor troubles occasionally upset operations. In 1921, reflecting the economic unrest that washed over the country following the war, Mack's printers walked off the job when he refused their demand for a forty-four-hour week at the existing forty-eight-hour rate. Affiliated with the American Federation of Labor, the men had doubled their wages since 1916, according to their employer; to give them what they wanted would raise costs as much as 18 percent. Mack was fighting Herty's battle, he declared, and needed his support.

The printers' strike against job shops everywhere except those in New York

and Chicago, where employers and the union had reached agreement, lasted all summer. Meanwhile, Mack decided to run an open shop, which for Herty meant that the *Journal* appeared at least two weeks late from May through August. Determined to hold out against what he called "this onslaught against the printing industry by Soviet Unionism," Mack found that training a new crew took longer than expected. Consequently, Herty arranged to have the September issue of the *JIEC* printed in New York so that it could be in the mail on August 31. He considered this vital because an international meeting of chemists, which he helped to plan, was scheduled to convene in the city during the second week of September. But when New York printers learned that Herty's journal was normally produced in a nonunion shop, they refused to handle what they called "struck work." Ultimately, Herty found another shop willing to complete the September issue, but moving it without provoking a dispute with the union printers presented another problem, which he solved by having the transfer take place after business hours.⁵

Budget problems stemming from inflation, expanded operations, and increased overhead also competed for Herty's attention. From the beginning he had trouble staying within the limits decreed by the ACS directors, although they usually approved most of his proposals. As the *Journal's* first full-time editor, Herty earned \$6,000 in 1917 rather than the \$1,000 paid to his part-time predecessor. Additional increases in the 1917 budget provided for office rent, salary increments for existing staff, salary for the newly created position of staff correspondent, travel expenses for Herty and the correspondent, expanded press runs, and a 50 percent increase in the price of paper. M. C. Whitaker, the outgoing editor, who prepared the 1917 budget at Herty's request, thought the \$55,000 asked for, an increase of more than \$16,000 over the previous year, would cover the *Journal's* expanded activities adequately, if conservatively. Herty might find it necessary to "redistribute" funds from one category to another, Whitaker commented, but "that is always allowable, the main problem being to keep within the total."⁶

For Herty, keeping "within the total" became a problem almost immediately. In late March 1917, treasurer E. G. Love advised him that he was exceeding his budget by \$300 a month because of the increased amount of editorial material he chose to publish. He was still overspending in July, but after another warning, this one accompanied by a gentle reminder from the ACS president, Herty mended his ways. Beginning with the September issue, he restricted editorial comment to three pages per issue, began charging for reprints of *Journal* articles, and drastically reduced traveling expenses. These economies, together with an additional

\$2,000 appropriated by the directors, enabled him to finish the year in the black.⁷

At least one item in Herty's editorial budget could have been significantly reduced in the opinion of ACS secretary Charles Parsons. "I have been thinking of your troubles about rent in New York. You had really better move your whole office to Washington," he wrote Herty early in 1920. Parsons was referring to the fact that the *Journal's* lease on its offices at 35 East 41st Street was due to expire in a few months. Located on the eleventh floor of a building situated on the corner of Madison Avenue and East 41st Street, Herty's suite cost the society \$3,000 a year. But as of October 1, 1920, the building's new owners planned to raise the rent to \$10,000. Herty realized he would have to move, but he was reluctant to leave the city. It was essential, he believed, to keep the *Journal* in New York, close to the main offices of most chemical industries and in direct contact with the nation's greatest concentration of practicing chemists. He found new quarters on the thirty-fourth floor of the fifty-story Metropolitan Life Insurance Building at Madison and East 24th Street, until 1913 the tallest skyscraper in New York. The Public Library and the Chemists' Club, which Herty visited almost daily, were several blocks farther away from his new offices, but what he lost in convenience was more than offset by a five-year lease at \$5,000 per annum.⁸

Herty's working day usually consisted of two three-hour-long sessions in the *Journal* offices broken by a two-hour luncheon at the Chemists' Club. Situated on East 41st Street, the club was only a few doors from Herty's first office but more than fifteen blocks from his new quarters in the Metropolitan building. Nevertheless, the club's central location, pleasant accommodations, and private meeting rooms made it ideal for what today would be called the working lunch. Herty regularly used the facilities and the lunch break for committee meetings and the transaction of work connected with the *Journal*, activities that kept him so busy that he often had to turn down luncheon bids elsewhere which were purely social in nature.⁹

Herty's busiest time came during the last ten days of each month, when he prepared the *Journal's* editorials. If possible, he accepted no speaking engagements outside of the city, put all other work aside, and devoted himself totally to the task. Even so, there was always a last-minute rush because he wanted to keep his commentary as current as possible.

Preparing the rest of the *Journal* each month was somewhat less harried. Like any good editor, Herty was constantly on the lookout for interesting material. Much of it came in automatically because ACS policy required that papers de-

livered at its annual meetings be submitted for possible publication in its own journals before they could be sent elsewhere. Other articles were solicited from persons engaged in the development of new industrial processes or in pathbreaking research and development in university, government, and industrial laboratories.¹⁰

Among Herty's best sources were the many chemists who left industrial or academic posts for special missions abroad or who entered government or military service when the United States declared war. In March 1917 he asked a Princeton professor bound for England to submit an article on the British chemical industry; he already had one on conditions in France, and he had been promised a third from a chemist in Japan. Wartime Washington also provided grist for Herty's mill. University chemists from Harvard, Cornell, and MIT serving with the United States Tariff Commission, the Government Experiment Station located at American University, and the Edgewood Arsenal in Maryland all supplied Herty with leads or data for articles during 1918. The Harvard man at the Tariff Commission urged Herty to interview a bureaucrat at the Federal Trade Commission who had "splendid ideas" about how to dispose of the licenses on seized German patents under his control. An article about his "liberal policy," wrote Herty's correspondent, would be of great advantage to American industry: "He's disposed to stretch the letter of the law as much as possible to favor the Americans and has found several ingenious ways to do it." Getting material from chemist friends at the American University Experiment Station and Edgewood Arsenal was more difficult because the men involved were officers in the Chemical Warfare Service (CWS) of the United States Army and the work they were doing was classified. It was necessary, therefore, to secure permission from the general in command of the CWS before anything of consequence could be published. By late October 1918, Herty thought the time had come. "Is not this the psychological moment for such an article?" he asked Colonel William H. Walker, formerly of MIT. "It seems to me that during this period of evident demoralization of the German people and the retreat of the German armies it might be a good idea to let them know . . . just what is coming to them if they do not consent . . . to an unconditional surrender."¹¹

The war ended abruptly on November 11, 1918, but Herty's interest in its effect on American chemical development was as keen as ever. As he explained to a chemist in the Bureau of Mines who had recently returned from Italy, he intended to devote much of the *Journal* during 1919 to "all phases of chemis-

try during the war, not only in this country but in Allied countries." Articles on conditions in France and England, together with predictions for the postwar period, had already been promised; an account of the situation in Italy would round out his scheme. Herty was even more interested in learning all he could about chemical conditions in Germany. Here again his wide acquaintance in the chemical fraternity and his contacts in government paid off handsomely. The June 1919 issue of the *JIEC* included accounts submitted by two majors, one who had served as assistant chief of the Chemical Warfare Service of the Allied Expeditionary Forces and another who had been a member of the Inter-Allied Commission. Both had recently visited occupied areas of Germany, where they toured principal industrial installations, particularly those devoted to the manufacture of dyestuffs, medicinal products, and "standard chemicals." Practically all of the factories were "in A-one shape," they reported, ready to resume production the minute the Allies gave their consent. More disturbing was their finding that the Germans made little effort to hide their contempt for the abilities of Americans to compete in dyes manufacture; they fully expected to recapture the lucrative United States market.¹²

Herty's ability to get along with other editors also contributed to the successful operation of the *JIEC*. Besides exchanging journals with them, he often supplied them with source material and the names of writers who could contribute to their publications. In October 1919, for instance, the editor of a weekend supplement to the *New York Evening Post* asked him to suggest an author who could discuss a recent speech on the potential uses of atomic energy. "I don't think the average newspaper reader knows what an atom is. . . . The article I have in mind," he advised Herty, "would have to be written in simple language without the use of unnecessary scientific words and phrases. Could you suggest someone?" Herty could. He could also help popular science writers find source material, particularly when they had to produce an article on dyes. Edwin E. Slosson, on the staff of the *Independent* in 1920, asked Herty for some "basic points" he could make in an article on aniline dyes that he had agreed to write for a publication called *Business*. Herty not only supplied Slosson with sources; he also provided him with arguments for passing the strongly protectionist tariff measure then being debated in Congress. Such editorial courtesy was appreciated. Just before Herty resigned from the *JIEC* in late 1921, a former newspaperman thanked him for his cooperation. "I often recall," wrote William Abbot of Consolidated Steel Company, "how helpful you were to me while I was connected with the *New York Times*."¹³

The only editor with whom Herty seems to have had problems was H. C. Parmalee of *Metallurgical and Chemical Engineering*. Parmalee's journal often competed with Herty's for the same material. Early in 1918 Herty asked H. W. Gillette for an article on some work done for the U.S. Bureau of Mines. Gillette agreed and so did his superiors, chief chemist Charles Parsons and Van Murray, director of the bureau. But in April Parmalee contacted Parsons, asking for an article by Gillette on the same subject. Parsons replied that Herty had been promised a "technical" article; if Gillette wanted to give Parmalee something more general, he was free to do so. At that point someone from Parmalee's parent publishing house, McGraw-Hill, visited Parsons and made it clear that if all journals were not treated equally he would go "over Parsons's head" to the secretary of the interior. He did, but in the end Herty broke the impasse when he notified the director of the Bureau of Mines that he was willing to give up any prior claim so that everyone could report "this truly important development to the technical men of the country."¹⁴

The Herty-Parmalee rivalry did not end there. For the rest of Herty's tenure with the *JIEC* the two men or their representatives continued to go after the same "hot stories" and Parsons and others in Washington continued to look out for the interests of the *Journal of Industrial and Engineering Chemistry*. In 1919 and again in 1920 the ACS secretary gave Herty leads for articles, urging him to contact the sources before Parmalee heard about them. Arthur Lamb, director of the Fixed Nitrogen Research Laboratory in the War Department, seconded Parsons's prodding letters. "I don't like the idea," he wrote Herty, "of them getting anything which you do not have, at least if you want it." Herty was usually alert to the competition, but sometimes circumstances robbed him of a special prize. Early in 1921 a British dyes expert, Victor Le Febure, visited Herty and various American dye manufacturing plants from Delaware to Boston. Le Febure was the author of an article which some of Herty's du Pont friends sent to him for publication without noting who wrote it or whether it had already been published. Herty was away when the manuscript reached his office, and by the time he secured the missing information it was too late—Parmalee had published it in *Metallurgical and Chemical Engineering*. Deeply disappointed, Herty wrote Le Febure, "I am free to say to you that I would rather have published that article than anything else that has come to my desk since I have been editor of the *Journal* and I got left."¹⁵

As editor of the *JIEC* Herty expanded or introduced features that significantly improved the publication's quality. He began the practice of referring articles to

experts for review before publishing them, and he introduced the “symposium,” a feature that involved devoting an entire issue (or the lion’s share of it) to a single topic. Columns or pages listing new publications and government publications, domestic and foreign, were continued and given more space, and in mid-1918 a new feature provided statistical data on the volume of domestic and foreign chemical trade taking place. Supplied by a bureaucrat in the Department of Commerce whom Herty added to his stable of “contributing correspondents,” the material soon attracted considerable attention. When its compiler considered quitting in 1921 because of overwork, Herty urged him to reconsider. By printing his monthly reports, he explained, the *Journal* was “carrying out . . . the very policy which the present Secretary of Commerce [Herbert Hoover] has so deeply at heart, namely, the furnishing of accurate and reliable statistical information on which to build up a steady and healthful [healthy?] industrial development.”¹⁶

One of Herty’s first moves after taking over the *JIEC* was to poll his editorial advisory board about employing a Washington correspondent who would furnish a monthly letter or report dealing with anything of interest to chemists. Specifically, Herty wanted to keep his subscribers aware of “national legislation, pending or completed, and . . . chemical developments in the several government bureaus.” The right man, Herty told the board, should be primarily a chemist, but he should also have a good personality that would secure him “access” and, above all, a “keen sense of news.” Herty had the perfect candidate in mind, but the man who got the job was Paul Wooton, a journalist whose knowledge of chemistry was slight but who knew his way around the Capitol and the government bureaus. Besides working for the *JIEC*, he was the Washington correspondent for several trade journals and the *New Orleans Times Picayune*.¹⁷

Wooton and two successors served the *Journal* well throughout Herty’s editorship. He relied on them to produce a double-columned page of copy by the twentieth of each month, crammed with accurate coverage of congressional hearings, testimony before agencies such as the Federal Trade Commission, interviews with members of important congressional committees, and anything, from whatever source, that had a bearing on chemistry and the chemical industry. The correspondents did more than simply report the Washington scene. They freed Herty from a great deal of journalistic drudgery when he visited the city, leaving him more time to lobby Congress and the executive branch in behalf of chemists’ causes. More important, they provided Herty with insights and behind-the-scenes assessments he might otherwise have missed from his New York van-

tage point. Considering how rapidly government intervention in the economy increased during the Progressive period and World War I, such insights were invaluable to most readers of the *JIEC*. Indeed, their interest did not stop at the water's edge and neither did Herty's. By 1920 he was lining up correspondents in London, Paris, and the Netherlands to keep his subscribers regularly informed about international chemical developments.¹⁸

One of Herty's most significant contributions as editor of the *JIEC* was the role he played in the establishment of the ACS News Service. Herty appointed a three-man committee to devise a public relations bureau for the society in May 1916. A few weeks later the New York section of the ACS created its own publicity committee. This New York body handled press relations when the American Chemical Society and the National Exposition of Chemical Industries met jointly in New York during September 1916. Pleased with the efforts of both committees, the ACS directors authorized their consolidation during the waning days of Herty's presidency, and Allen Rogers, chairman of the New York committee, became chairman of the new ACS Press and Publicity Committee. Herty was appointed to it in January 1917. Temporarily discontinued in 1918, the Press and Publicity Committee was soon revived with Herty replacing Rogers as chairman when the latter entered the army's Chemical Warfare Service.¹⁹

Gradually the activities of the Press and Publicity Committee became an integral part of the regular work performed by Herty and his staff, a relationship he asked the society to formalize in the coming year. Before action could be taken, however, Herty amended his proposal. On December 9, 1918, he met with John W. Harrington, an experienced "special" writer with a background in journalism and public relations. Harrington offered to take charge of the society's publicity work: to formulate policies, develop contacts with the press, and edit material sent in by members, all for \$1,000 a year (less \$265 for office rent) and all to be conducted under Herty's general direction. Harrington was highly regarded among newspaper and magazine writers and had considerable experience in the preparation of articles on chemistry and other technical subjects for major New York dailies. Herty was sure that anything he turned out would far surpass what they, as "inexperienced amateurs," could produce.²⁰

The society's directors approved Herty's proposals, changed the name of the Press and Publicity Committee to the ACS News Service, and before long Harrington was composing articles for the popular press, editing the work of

contributing chemists, and issuing a monthly “clip sheet” to newspapers which contained abstracts of current news and information appearing in the *JIEC*. Judging by reports received from a clipping service, the new system was a decided improvement.

Harrington’s skill in working with ACS publicity committees on the local level was also impressive. But first Herty had to “break the ice.” Dissatisfied with the results of the society’s traditional policy, which allowed local committees to handle public relations during ACS conventions, Herty made a determined effort in 1919 to centralize control. First, he asked Harrington to submit a memorandum outlining how the publicity for an upcoming meeting in Philadelphia should be handled. The memorandum proposed that all publicity work, before, after, and during the meeting, be done under Harrington’s direction, with support and funds supplied by the local section. Next, Herty secured approval from the ACS Advisory Committee, and finally, he submitted the plan, together with a tactful and persuasive letter, to Philadelphian George Rosengarten, a longtime personal friend and a power in the local section and the ACS council. Harrington was the best man to “prepare a machine that will deliver the goods next September,” Herty assured Rosengarten.²¹

Herty’s tactics paid off. The Philadelphians cooperated admirably with Harrington, and H. E. Barnard, a politically powerful member of Herty’s editorial board, commended him for having hired a professional to carry on the society’s public relations. Once the newspapers “back home” got behind the chemical industry editorially, Barnard predicted, Congress would have to pass the extremely protective chemical tariff measure then pending in the Ways and Means Committee.²²

Others in the ACS did not share Herty’s and Barnard’s views about the News Service and how it ought to function. Secretary Charles Parsons had serious doubts about the value of “publicity work,” and the Chicago section announced that it could host the September 1920 convention without having to “burden” Harrington. Herty squelched the midwesterners easily, but resistance from another quarter took him by surprise. In 1920 Wilder Bancroft of Cornell, one of Herty’s closest friends, acknowledged Harrington’s skill and accomplishments but objected to the newsman’s justification for a larger budget on the ground that his publicity work was worth at least \$100,000 in advertising to America’s chemical industry. If so, Bancroft argued, industry and not the ACS ought to support the News Service. Nor was Bancroft impressed by Harrington’s boast that his

work could influence Congress. Finally, he thought some of the material emanating from the News Service was "exactly the kind of thing we are trying to fight; extremely sensational and ninety per cent of it fake."²³

In a long and earnest reply Herty tried to convince the Cornell chemist that the activities of the News Service were not only proper but vital to the well-being of the ACS. Until recently the public had failed to recognize the value of the chemist to society. To change that, the masses had to be educated, which could not be done effectively through chemical publications or public lectures. "The real place . . . for the public to get this understanding," Herty insisted, "is in the press which reaches the entire people." So far, the News Service had "broken into" five or six hundred daily newspapers, but to have a real impact, it was necessary to reach those millions whose only information came from small-town weeklies. It was this audience Herty hoped to tap in the coming year. But to do so, Harrington would need more money and more staff. As for whether the ACS or the chemical industries should fund the News Service, Herty argued that everything so far achieved was a direct result of the fact that all money came from the society, "a national organization [with] . . . no special axes to grind." If the newspapers thought otherwise, they would question what was being disseminated and the ACS would lose "the fine standing we now have."²⁴

Finally, Herty conceded Bancroft's point that the quality of some News Service bulletins could be improved. But the first step was getting newspapers to accept material, and that meant sending editors news to which their readers would respond. Quality could be improved when connections with the newspapers became more secure. Herty realized his letter was too long, but his own "deep convictions" about the importance of the News Service and his desire to secure Bancroft's support for it led him to send it anyway.²⁵

Whether Bancroft was persuaded is not clear. But judging from the expanded scope of Harrington's activities in 1921, the ACS directors supported a larger role for the News Service. Besides significantly increasing the number of newspapers carrying News Service bulletins, Harrington managed to place friendly editorials in several influential journals. Above all, under Herty's general direction he and the News Service produced a well-conducted public relations campaign for an international conclave of English-speaking chemists which met in New York just before the September opening of the seventh National Exposition of Chemical Industries. Pronounced a "brilliant achievement" by New York newspapermen, Harrington's triumph went unrecognized by Herty, despite the praise it received

from the president of the ACS, Edgar Fahs Smith. Herty's oversight, if it was that, was most uncharacteristic. He was normally generous in his praise, very sensitive to the feelings of others, and always polite. But whatever the explanation for his apparent indifference, the close working relationship between him and Harrington was drawing to a close. By the end of 1921 Herty had resigned his editorship and the ACS directors had decided to move the *JIEC* offices to Washington. H. E. Howe, the new editor and director of the News Service, soon chose his own man as Harrington's replacement.²⁶

World War I provided the American Chemical Society with a tremendous opportunity to expand its membership and enhance its prestige. It also gave the organization the chance to move "boldly into the arena of national affairs" through cooperation with government bureaus and other scientific and technical societies during the preparedness campaign and the war itself. All four of the society's wartime presidents (1914–18) contributed to its expanded role, but it was Charles Herty who worked most aggressively to broaden ACS activity in economic and political areas whenever the interests of chemists and chemistry were involved. As editor, Herty continued to take strong stands on national issues in the columns of the *JIEC*, in public speeches, and in formal and informal contacts with Congress. Most of the membership supported his views while the war was in progress; later, opinion in the society was more diverse and some members objected strenuously to Herty's vision of what posture, if any, the organization ought to adopt.²⁷

Privately, Herty deplored the role of Germany in the war as early as November 1914. He respected President Wilson's call for Americans to be neutral but could not understand how German men of science, some of them honorary members of the ACS, could let themselves "be hoodwinked as to the real motive which has been behind the German Military Caste in this whole situation." He was relieved when the United States finally entered the war, and his editorials soon drew favorable comment for putting the "war spirit into the Journal." To a Canadian friend who praised the May 1917 issue he replied, "I feel like a new man since our country has finally taken the stand I have been longing to see it take." He was especially pleased that the United States had acted on moral grounds as well as to protect its rights at sea because he had always believed that as a democracy America "should do our full share in overcoming the world threat of German ideas."²⁸

Convinced more than ever of German "rapaciousness" by the harsh terms exacted from Russia in the Treaty of Brest Litovsk, Herty thought anything short of a "clean-cut military victory would be retrogression." By August 1918 news of the

Allied offensive and the part played by American troops in it encouraged him. But it was still a long way to Berlin, he reminded his readers, and there were many "pitfalls in the form of plausible peace proposals" that had to be avoided if a lasting and just peace, worthy of the sacrifices made for it, were to be secured. Still calling for "Unconditional Surrender!" in his lead editorial for November 1, 1918, Herty was not particularly enthusiastic when word of the Armistice came only a few days later. His December 1918 editorial, headed "A Victory of Arms, Not Yet of Ideals," complained that "the military power of the Teuton has been crushed for generations; but has his heart been changed? We believe not." From remarks coming out of defeated Germany he was forced to conclude that the erstwhile enemy was unrepentant: "No, Germany has not yet gone down through the dark valley of suffering where alone she can cleanse herself for fellowship in the great family of nations. Until that day is reached let us be on our guard. The sacrifices already made for civilization must not be in vain."²⁹

A few months later, Herty was even more disturbed about the peace negotiations then under way at the Palace of Versailles. He was a contributor to, if not an active participant in, the wartime movement known as the League to Enforce Peace, an organization pledged to the defeat of German militarism and the creation of a League of Nations, and by late March 1919 he was disillusioned because he felt the victory supposedly won in November was "rapidly slipping away." To R. H. Edmonds of the *Manufacturers' Record*, an active opponent of the proposed League of Nations, he confided, "Personally, I cannot agree with men like Senator Reed and Senator Borah who favor our withdrawing entirely from the European undertaking. . . . I feel that we have only partly discharged our obligations. . . . [We] must 'carry on' until we can see a stabilized world, not only for the good of others, but for our own good." But he deplored President Wilson's tactic of "holding up" a thorough peace treaty with Germany while trying to organize the League to enforce it. He also thought Wilson was selling the League to Europeans by telling them that Americans wanted it and using the same argument in reverse to win American support. Finally, he had nothing but contempt "for every statement that has come out of Germany since the Armistice." Though not meant for publication, Herty's views were soon widely disseminated when Edmonds asked for and got his permission to print the letter in the April 10, 1919, issue of *Manufacturers' Record*.³⁰

Herty's suspicions of German efforts to influence American economic legislation went back to 1915 and the beginning of his fight to secure protection for

coal-tar dyes. The January 1917 number of the *JIEC*, Herty's maiden issue, reprinted a resolution of the Dyestuff Conference passed during the September 1916 meeting of the ACS which condemned part of the 1916 tariff law as "detrimental to the establishment and development of the American Dyestuff Industry and subversive of the best interests of the American people." Herty was more explicit. In a March 1917 editorial titled "America for Americans," he charged that the offensive portion of the tariff was the work of a single, powerful congressman, Claude Kitchin of North Carolina, influenced by a single powerful constituent, textile manufacturer Caesar Cone. "If Caesar Cone represents himself alone in this matter," Herty concluded, "he has too much influence. . . . If he represents others will he or Mr. Kitchin publicly state who is so represented?"³¹

When Alexander Smith, chairman of the Columbia University chemistry department and former president of the American Chemical Society, challenged Herty's interpretation of the tariff law and his assessment of Cone's motives, Herty published Smith's letter, together with a strong rebuttal. Then he recounted the results of an investigation which he asserted proved a close connection between Smith and H. Meyer, a chemist employed by the Badische Company. Badische was the New York branch of the Badische Anilin und Soda Fabrik, one of the principal components of the German chemical cartel. In 1914, Herty told his readers, Smith had been engaged to prepare a report for the German company in its efforts to amend a patent registered with the U.S. Patent Office. "To my mind," Herty remarked of the results of his sleuthing, "all of this establishes with reasonable certainty a Smith-Meyer-Badische connection and all that goes with it."³²

Herty's public dispute with Smith set off a furor within the ACS. Smith launched a campaign among the membership to have Herty disciplined for engaging in yellow journalism, and Herty's friends responded with numerous letters of which the following is typical: "Writing you simply as an American citizen and a member of the American Chemical Society, I want to express my appreciation of your position in the April issue. I am sure the entire membership is behind you as well as every redblooded American and trust that every member of the society (except Smith) expressed his approval. . . . Why should an American University retain a man like Smith? To h—l with Smith and others who can not place patriotic considerations above every other at such times as these."³³

Feelings against everything German ran very high after April 1917, and chemists, like other Americans, made every effort to demonstrate their patriotism and

loyalty. Herty chaired the New York section of the ACS, which contributed an elaborate float to a Liberty Bond parade held in October of that year. By that time, too, he was an ardent member of the Anti-Disloyalty Committee of the American Defense Society, whose advisory committee included Theodore Roosevelt and whose letterhead featured an American flag with the accompanying caption: "These colors will not run." The Anti-Disloyalty Committee pledged itself to combat "a widespread campaign of disloyalty . . . being waged in the United States by Pro-Germans, Socialists, Pacifists, Anti-Militarists, Conscientious Objectors, Anarchists, so-called Friends of Irish Freedom, I.W.W.s and all the forces of treason." Among other things, it resolved to urge "lawful authorities" to suppress "treasonable orators" and suspend "treasonable newspapers," whether published in English or German. Herty believed wholeheartedly in the committee's objectives. He and his family attended an "Anti-Disloyalty" mass meeting sponsored by the committee at Carnegie Hall, and he helped to defray the deficit when the masses did not show up.³⁴

Herty was by no means the only chemist who was hostile toward Germany, Germans, and German sympathizers. In an editorial titled "The Parting of the Ways" in the April 1918 *JIEC*, he argued that because of its unique facilities and its large nonresident membership, the Chemists' Club in New York was a national institution and therefore must "measure up to the national standard of straight-out Americanism." There were many German members of the club, he noted, most of whom had "quietly absented" themselves from its activities, thereby avoiding the friction that might otherwise arise in such sensitive times. Those who still participated did so discreetly. Nevertheless, Herty believed that lengthening casualty lists and the possibility of "Hun atrocities" committed against American troops were bound to create incidents that would preclude association with anyone whose allegiance lay with Germany. Consequently, he urged the trustees to make the club an "American institution throughout" by dropping "alien enemies" and sympathizers from the membership rolls and dismissing any employees who were pro-German. Herty advised that naturalized citizens who "masquerade behind their naturalization papers" be investigated and, if found wanting, barred from the club. "We are at the parting of the ways," he concluded. "If the Chemists' Club is an American institution—make it truly such."³⁵

Response to the editorial was generally positive, especially from chemists who lived outside of New York. But some of Herty's friends among the club's trustees were upset because he had made his proposals publicly. He answered that he

hoped to achieve quick results. "The editorial function as I see it," he told one supporter, "is not simply to be a recorder of events . . . but to stimulate thought which will lead to action in making events."³⁶

Herty's editorial certainly helped "make events." Within days of its appearance, the trustees of the club voted to prohibit the use of the German language at the club; prohibit all criticism of the United States government and its allies at the club; and request the resignation of any member, resident or nonresident, regardless of ethnic origin or citizenship status, who sympathized with the enemies of the United States or could not conscientiously comply with the first two points.

Adopted under pressure, the new rules did not please everyone involved with the management of the club. Ellwood Hendrick complained that Herty's editorial blast had given the club "a black eye," making it "German in the consideration of those who do not know it." What trouble they had experienced at the club had come from Americans, not Germans or naturalized citizens, he pointed out. And they could not be excluded without risking lawsuits. Hendrick insisted that the trustees were doing their best under difficult circumstances; they needed Herty's help, not his "destructive criticism."³⁷

M. C. Whitaker, Herty's predecessor as editor of the *JIEC* and president of the Chemists' Club, also disagreed with the editorial, but his communication was somewhat more formal. Two days after "The Parting of the Ways" was published, he called a special meeting of the board of trustees because Herty's remarks appeared "to reflect upon the judgment of the Board . . . [and] the management of the Club." A separate note asked Herty to be present, and the new rules adopted were subsequently published in the May issue of the *Journal*. Meanwhile, Whitaker had come to a decision. On May 18 he resigned from the Advisory Board of the *JIEC* because he did not want "to appear to be in the position of a member of the editorial staff of the Journal shooting myself up as president of the Chemists' Club."³⁸

Somewhat more positively, Herty routinely used the editorial columns of the *Journal* to promote the development and allocation of vital materials of war. His interest in nitrogen fixation and dyes manufacture, begun during the preparedness campaign, continued unabated throughout the war because of the obvious importance both developments bore to the production of munitions. But other materials and the need to conserve, extract, and even commandeer them also attracted his attention. For example, in November 1917 Herty called on every member of the ACS to work for cooperation among the War Department, the

gas companies, and the public so that toluol could be recovered from the gas used to heat, power, and illuminate American homes and industry. Of the several high explosives being used for artillery barrages at the front, the War Department had pronounced trinitrotoluol, or TNT, to be the best because it was the easiest to make and the safest to ship. Toluol was required to manufacture TNT, and in late 1917 most of it came from by-product retort coke ovens. But material from that source was already under contract to the United States Navy and the Allies. It would take another year to build enough additional coke ovens to supply the new army; consequently, the only immediately available sources of sufficient toluol were municipal gas plants. Herty had discussed the problem with Brigadier General William H. Crozier, chief of ordnance of the War Department, and he advised that gas plants could be equipped to strip, or remove, toluol from gas within three to four months.

The general did not think toluol recovery from small plants would be worth the conversion cost, but Herty argued that if the army considered TNT the best explosive, an informed and patriotic citizenry would not let cost stand in the way. To that end he arranged to have editorials advocating toluol collection published by the *New York Times* and the *Manufacturers' Record*, he referred interested parties to the appropriate federal officers for more information, and he kept prodding General Crozier. Finally, the ACS Press and Publicity Committee issued an abstract of the *JIEC* editorial to some three hundred newspapers all over the country.³⁹

Beginning with the May 1917 issue of the *JIEC*, Herty threw himself into one of his most spirited wartime campaigns. The issue was platinum and the need for the government to locate, stockpile, restrict civilian use of, and, finally, commandeer it led him to editorialize on the subject at least twelve times before Armistice Day. Secretary Charles Parsons provoked the first article when he sent Herty a copy of a resolution on platinum adopted at the April meeting of the ACS in Kansas City, together with similar resolutions produced by the National Academy of Sciences and the Daughters of the American Revolution. Addressed to the Council of National Defense, then in charge of coordinating America's war effort, the ACS resolution called attention to the scarcity of platinum, to its vital importance for wartime research and industry, and to the need to discourage citizens from using it for jewelry, photographic paper, or any other nonessential purpose. "Any appeal you can make about the use of platinum . . . and any publicity . . . will be appreciated," Parsons wrote. Personally, he thought Herty

should put less stress on the war angle and more on the continuing need for platinum in chemical and scientific development. "I want this to last after the war is over," Parsons explained.⁴⁰

"An Appeal Addressed to the Wives and Daughters of Chemists," Herty's May 1917 editorial, explained briefly why platinum was so important. In the laboratory it was indispensable for research; in the plant it was important in many processes, particularly in the manufacture of sulfuric acid by the contact process. Many chemical industries depended directly on an ever-growing supply of sulfuric acid, and for the "modern method" of making nitric acid by oxidation of ammonia, platinum was "all-important." Furthermore, sulfuric and nitric acids were essential to the production of gun cotton and high explosives made from coal tar. Unfortunately, Herty continued, certain properties of platinum, its scarcity, and its high price led to its use for jewelry, with the result that little was left for the use of chemists. To make matters worse, the chief sources of the rare element were Russia and Brazil, both of which had severely curtailed production because of the war. Consequently, the country had to conserve its limited supply and avoid using it for any nonessential purpose. Citing the pledge of the Daughters of the American Revolution to refuse to purchase or to accept gifts of platinum jewelry for the duration, Herty urged the wives and daughters of chemists to support the movement through their friends, their clubs, and their public meetings. "You will thus aid directly," he informed them, "those who are now charged with the . . . responsibility of supplying the products essential for the defense of our country and the triumph of the noble ideals which led us into the World War."⁴¹

The American Chemical Society's campaign to convince women to give up platinum jewelry in the name of patriotism attracted considerable attention. The Press and Publicity Committee distributed a press release to managing editors titled "Patriotism, Vanity and Platinum," and Herty composed a long article on the subject for the women's page of the *Atlanta Constitution*.

Stung by adverse public reaction, the Jewelers' Vigilance Committee countered with a campaign of its own. It accused the chemists of trying to drive down the price of platinum, labeled their efforts a "false appeal to patriotism," and insisted that no shortage of platinum existed. Secretary of Commerce William Redfield seemed to support the jewelers by declaring that the country would not be well served if the public stopped spending and women believed the "erroneous newspaper statements that they should stop buying platinum jewelry in order to show their patriotism." That puzzled Herty, in view of the testimony of several scien-

tific organizations and the fact that chemists were scrambling to develop suitable substitutes for platinum because the price had climbed some 500 percent in the last few years. Nevertheless, he continued to agitate the issue, in particular urging support for the recently organized Women's League for the Conservation of Platinum. Led by Edith Taylor Spear, the wife of a chemist at MIT, the Women's League received high praise from Charles Parsons of the ACS. He thought the organization had done a great deal to convince women "what really 'bad taste' it is to wear a metal that looks like lead . . . simply on account of its high price."⁴²

As the war dragged on, Herty continued to agitate the platinum issue, scoring a defensive War Industries Board for its slowness to commandeer enough platinum to meet the government's projected needs for 1918, for its apparent reluctance to alienate the jewelers, and for what seemed to him to be misleading testimony given by administration spokesmen to the House Ways and Means Committee. Not until October 1918 did Congress act effectively to restrict the use of platinum to wartime and scientific purposes. Herty and the American Chemical Society had won their battle with the jewelers and the bureaucrats, but the victory was short-lived. On November 14, 1918, a directive from the Bureau of Mines announced that because the "public safety" no longer required it, all regulations relating to "platinum, iridium and palladium and compounds thereof are revoked."⁴³

During his editorship of the *JIEC*, Herty exploited every opportunity that came his way to promote and protect the interests of his chosen profession. As the self-proclaimed "mouthpiece of chemistry," he used the columns of the journal and the apparatus of the ACS News Service with great skill to enhance the public image of the chemist and to educate the American public about the importance of chemistry in every phase of everyday life. He also employed his journalistic powers, his genial personality, and his vast network of contacts in business, academia, and government to minimize the hardship and dislocation that World War I inevitably imposed upon men more at home in the classroom or the industrial laboratory than the military barracks or the burgeoning bureaucracy.

Through the officers of the American Chemical Society, chemists offered their services to the country well before war was declared on April 6, 1917. Herty called on them in editorials in March and April to show their commitment by completing two questionnaires. The first, distributed in response to a request by the Council of National Defense in cooperation with the Bureau of Mines and the ACS, aimed at creating a roster of chemists, their qualifications, skills, and experience. If war came, it could be used to determine where and in what ca-

capacity each man might best serve. The second questionnaire originated in the chemistry committee of the National Research Council and sought to identify investigators who could aid the government in certain specified lines of research. Aware of the irreparable loss suffered by European countries early in the war, when patriotic technical men went into the trenches instead of the government laboratory or the weapons plant, the sponsors of both surveys hoped to avoid costly error by matching the scientist or engineer to the job in which he could do the most good.⁴⁴

Herty shared the concerns of those who wanted to avoid the mistakes of Britain and France. In a June 1917 editorial headed "In the Light of Experience," he called on American chemists to think twice before rushing off to war, even if it led some to question their patriotism. Noting that American military forces were being raised by two methods, voluntary enlistment and a draft system not yet in operation, Herty advised his readers that vital coke oven and antisubmarine research was already being disrupted because eager young chemists had joined the army. In addition, he knew of one commercial laboratory whose entire staff would be called up by the draft even though it was busy constructing high-explosives plants. Finally, Herty had carefully checked all official statements about probable draft exemptions and found chemists mentioned nowhere. He did not think men engaged in vital research should be allowed to enlist: chemists should constitute "an official reserve for the adequate and uninterrupted output of the greater chemical industry which must immediately arise if this nation is to throw all of its resources into war." The long-range impact of the war on undergraduate and graduate education also worried Herty. Concerned about projected declines in enrollment, the loss of faculty to industry and the military, and the likelihood of tighter budgets, many educational administrators were planning to curtail normal university programs. Herty thought such retrenchment would be a great mistake, particularly if chemistry and chemical engineering were affected. In fact, such courses should be increased rather than reduced, not only to prepare an "adequate reserve army" of chemists to fight the war but also to serve the country when peace was finally restored.⁴⁵

Both themes, the importance of assigning chemists to tasks that used their special skills and the need to train an adequate chemical force for the nation's future, appeared repeatedly in Herty's wartime editorials. But despite elaborate ACS proposals to work with the War Department, the government still had no clear-cut policy regarding the use of chemical personnel at the end of 1917.⁴⁶

The importance of chemistry to the war effort was formally recognized in Janu-

ary of the following year when the War Department established and attached to its General Staff a new division styled the Chemical Service Section of the National Army. The division had two purposes: to unify all research activities being conducted for the War Department and to create a chemical unit for service with the American Expeditionary Forces in France. General John J. Pershing had urged the latter, and some of the "ablest scientific minds" in the profession were going abroad to advise him on chemical matters pertaining to the war. That was a beginning but not enough to satisfy Herty, who continued to complain about army red tape which prevented the transfer of specific individuals with chemical specialties from line duty to a government laboratory. He also deplored the fact that certain branches of the service were appealing for manpower from chemical industries at the same time that some well-trained and highly experienced chemists were serving their country by scrubbing floors, chopping wood, and digging ditches at military installations. When the war began, Herty reminded his readers, sixteen thousand chemists filed cards with the Bureau of Mines listing their training and specialization. The aim was to help the government use its technical manpower efficiently. "Alas," Herty sighed, "these cards of voluntary information are now bound tightly together by the red tape of . . . the General Staff. Somebody, please cut the tape!"⁴⁷

Herty's editorial blast in the February 1918 issue of the *JIEC* went to press only a few days before the adjutant general issued tentative and still confidential orders to correct the problem. On January 26 he changed the transfer procedure, essentially giving discretion over it, as well as industrial deferments, to the newly established Chemical Service Section of the National Army. ACS leaders wanted to publicize the new order at once to stop "demoralization" among chemists and industrialists. But Colonel William H. Walker, assistant director of the Gas Service in the Chemical Service Section and one of the men who would be in charge of administering it, urged delay. He had survived one deluge of deferment applications and was convinced that premature publicity would set off another. Instead, he planned to send out instructions to local draft boards regarding the new deferment rules. Otherwise, he told Herty, "Every chap will now claim to be a chemist who can give you the formula for water."⁴⁸

Herty thought developments in the first part of 1918 constituted "a long step in the right direction," as he editorialized in the March issue of the *JIEC*. But he was still disturbed that university instructors could not qualify for deferment. The War Department had officially recognized the need to keep engineering and

medical students in school as long as possible, and both groups needed instruction in chemistry to be thoroughly trained. Yet local draft boards apparently declined to defer draft-age faculty unless college administrators registered strenuous objections with higher authorities. And many institutions were already crippled because some of their professors were doing war research in Washington bureaus or the Chemical Service Section of the National Army. Herty hoped that the same wisdom that moved the adjutant general to save the industrial work force would prevail in the case of colleges and universities.

Four months later, in July 1918, Herty was still calling on the authorities to guarantee the provision of reserves for the “army of American chemists . . . now in rapid process of complete mobilization.” No one could tell how many chemists would be needed by the military, the government bureaus, and industry to staff that army. But one thing was certain: replacements would have to come from the universities and colleges. Then, falling back on a favorite prescription for successful accomplishment, Herty urged the universities, the War Department, and the chemical industries to cooperate. Universities, already strapped for funds, could help the cause by merging departments, revamping curricula, enlarging classes, and requiring students to share laboratory equipment and dormitory facilities. The War Department could exempt chemistry instructors and detail qualified men already inducted to instructional work in university lecture rooms and laboratories. And business leaders could ensure the future by augmenting faculty salaries, endowing university laboratories, and funding student fellowships. “It is not a question of charity or philanthropy,” Herty pointed out, “[it] can well be regarded as an investment.”⁴⁹

Herty sent reprints of his editorial to university presidents, industrial leaders, and high-ranking officials of the military and the government, requesting each to respond so that he could publish their remarks in a “symposium” he planned for the September 1918 issue. Reaction was generally favorable, particularly from academic leaders, although the most satisfying response came from someone less prominent. Major Samuel Avery, a chemist serving with the University Relations Section of the Chemical Warfare Service in Washington, advised Herty on August 9, 1918, that relief was on the way. A Committee on Education and Special Training was devising a plan that would allow faculty to remain in the classroom and students to complete their studies at an accelerated pace by enrolling both in a new program, the Students’ Army Training Corps. “We have also two distinct plans by which enlisted men can be furloughed back to teach

chemistry," Avery added, "and as soon as either of these receives the O.K. of the General Staff I will let you know so that public announcement can be made."⁵⁰

The Students' Army Training Corps program was activated quickly on campuses all over the country, but within weeks it was scrapped just as quickly. For participating schools it meant wrenching reorganization efforts, reflecting in microcosm what the whole country experienced when the Armistice was signed in November 1918. Herty's "chemical army," not fully mobilized until the previous summer, was as unprepared as everyone else for the outbreak of peace. Almost immediately it was converted into a potential army of the unemployed because of rapid demobilization by the armed forces and the wholesale cancellation of government contracts with industry. Herty first addressed the problem editorially in the December 1918 issue of the *JIEC* when he reported that Major Allen Rogers, chief of the Industrial Relations Branch of the Chemical Warfare Service, had announced plans to help chemists in that service find appropriate jobs in civilian life. Herty applauded the program but wondered what, if anything, was being done for chemists in other branches of service. Privately, he was not optimistic. To a former student who wondered whether he could be a good chemist after serving at the front, Herty noted: "We are in the midst of readjustments . . . with the great mass of chemists . . . seeking positions either in educational or industrial institutions. It will probably be months before this readjustment is completed. Meanwhile, many of the younger fellows are on the anxious bench."⁵¹

By February 1919 Herty thought the growing scarcity of jobs for chemists warranted an editorial update. Already more than 80 percent of the chemists in uniform had been discharged and most were looking for jobs. In New York a stream of men still in uniform visited the Chemists' Club daily hoping to find jobs through its employment office. Herty compiled some statistics. Some 576 aspirants had registered; 29 had doctorates, 50 had master's degrees, and 70 had work beyond the bachelor's. Few wanted to do routine analytical work, preferring to engage in research, plant work, or management, and practically no one wanted to teach. Many claimed they could not complete their educations for financial reasons, and most who came from areas beyond New York, Pittsburgh, and Washington wanted to remain in or around the big cities. Finally, no one was interested in a job that paid less than \$1,500 a year. Herty thought his comments might disturb some of his readers. "But that is a part of our job, so here goes," he continued. First, it was clear to him that there were too many chemists in the East, obviously the result of individual choice because demobilized men who

opted to go to their hometowns were given travel expenses. In time the problem would right itself—men had to eat—but meanwhile many parts of the country were denied the chemist's skills. Next, Herty was disturbed that no one cared to teach. Teaching, after all, was the "foundation work of chemistry." Third, he doubted that insufficient funds kept anyone from finishing a degree. It was a question of desire and determination. Young men should not be satisfied with the bachelor's degree. "Look forward to the end of the next twenty year period. Figure out in dollars and cents the income of a thoroughly trained chemist as compared with the incompletely trained," he continued. A doctor's degree could not guarantee a successful future; personality and other factors also played a role. But one thing was certain, Herty argued: "If, during the next five years there issues from our universities a largely increased number of doctors, thoroughly trained in the methods of research, the future of chemistry is assured in America. Back to the colleges and universities!"⁵²

Herty's concerns for chemists in and out of military service, as well as for the future of chemistry in the nation's military establishment, did not end when the Armistice was signed. He played an active part in the fight to keep the fledgling Chemical Warfare Service alive after the war, despite determined efforts by some who wanted to diminish or dismantle it in the name of reorganization or retrenchment.

Research work on gas warfare began early in 1917, when the Bureau of Mines set up an experiment station at American University in Washington. Meanwhile, various army units were conducting other phases of chemical war work for the War Department. To facilitate coordination and increase efficiency, President Woodrow Wilson transferred control over the American University research station to the War Department on June 25, 1918, and three days later General Orders No. 62 announced creation of the Chemical Warfare Service. Its director, Major General William L. Siebert, was regular army and described by Herty as "one of the most distinguished engineers in the War Department." Initially, most prominent members of the ACS, including its advisory committee on war work in the Bureau of Mines, opposed the transfer, but they were mollified somewhat when civilian chemists engaged in research and production work became commissioned officers in the newly created Chemical Warfare Service. Commenting on the transfer in the August 1918 issue of the *Journal*, Herty acknowledged his concern that the "numbing effect" of War Department red tape might hamper the "spirit of originality, daring and speed . . . so essential to the successful prose-

cution of research." He hoped his fears would prove groundless; otherwise "a national disaster would result."⁵³

Like it or not, chemists adjusted to wartime necessity, and by November 1918 many prominent members of the ACS held commissions in the Chemical Warfare Service. They had no intention of remaining in the peacetime army, but when it became clear that the Chemical Warfare Service was going to be dismantled, many objected strenuously. Lieutenant Colonel William McPherson, a professor of chemistry at Ohio State University who spent the war at Edgewood Arsenal, wrote Herty on the eve of his demobilization: "I cannot help feeling that this is a great mistake and that the chemists of the country will be held responsible. . . . The matter is naturally a technical one and the public . . . is not qualified to . . . judge." He urged Herty to bring the issue before the council at an upcoming ACS meeting. If a committee representing twelve thousand chemists petitioned the secretary of war, McPherson argued, there would be action. And Herty, he thought, with no personal interest in the service, was the man to head the committee. In fact, Herty wrote McPherson, the future of the Chemical Warfare Service had already been considered at a recent meeting held in Washington to reorganize the National Research Council. But the majority concluded that nothing could be done as long as those in charge of the War Department remained in office.⁵⁴

Despite his somewhat passive reply to McPherson, Herty began working to save the Chemical Warfare Service during the summer of 1919. By that time, two bills affecting it were being considered by committees of Congress. The first, an army appropriations measure, provided funding for the next fiscal year (through June 30, 1920); the second proposed a permanent reorganization of the army along lines recommended by Secretary of War Newton D. Baker and Army Chief of Staff General Peyton D. March. Meanwhile, the Overman Act, a wartime measure not due to expire until six months after ratification of a peace treaty, allowed the War Department to reorganize and regroup army units at will, subject to executive orders of the president. Testifying before the Senate Committee on Military Affairs on the army appropriations bill in mid-June 1919, Secretary Baker explained his vision of a postwar army. Among other things, it involved an expanded Engineers Corps, equipped with every facility for the training of troops in the traditional duties of that branch and enlarged to include a research laboratory that would keep the United States ahead of any "adversary in its study of the applications of science to warfare." So reconstituted, the new Engineers Corps,

possibly renamed the Scientific Corps, would subsume separate existing units like the Chemical Warfare Service. Both Secretary Baker and General March, but especially March, thought that gas warfare would probably be outlawed in the near future; consequently, they argued that enough research to provide the army with adequate defense in the event of attack by a hostile force would satisfy the nation's security requirements.⁵⁵

General Siebert and his deputy, Lieutenant Colonel Amos A. Fries, also testified before the Senate committee on the army appropriations bill. Both advocated the continuation of the service as a separate unit and stood by their view that it should engage not only in research but in development, production, and supply as well. Their budget estimate, completely missing from the War Department proposal, provided funds for an administrative office in Washington and the concentration of all other operations at Edgewood Arsenal, where a \$34 million plant for the manufacture of gases had been built during the war. Other arguments advanced by Siebert and Fries for the continuation of the service as a separate entity included Siebert's view that the work of the Chemical Warfare Service was a "specialty" that could not be performed successfully by officers whose other duties required them to shift regularly from rivers and harbors work to building fortifications and training troops; that chemical warfare, which accounted for 30 percent of all United States casualties in the recent war, deserved to be "one of the most powerful arms of the service"; and that if the United States ever again had to subdue Mexico, the Philippines, Haiti, or any other people not equipped with gas masks, there was no substance that could do it as effectively as gas. "You can kill them if you want to with the poisonous gas or simply blind them temporarily with the tear gas," Fries advised the senators.⁵⁶

Apparently they were convinced. As finally approved by Congress, the army appropriations bill continued the Chemical Warfare Service as a separate unit for at least another fiscal year. But that did not deter Secretary Baker. On August 4, 1919, he submitted the army reorganization bill to the lawmakers, together with a letter reiterating his arguments for abolishing the Chemical Warfare Service. At that point, Herty entered the contest actively, taking steps to save the threatened service. After reviewing the proposed bill and the testimony given in its support to the Senate committee, he decided to devote the entire editorial section of the September *JIEC* to the subject. A close friend, H. E. Barnard of Indiana, introduced him to the chairman of the Republican National Committee, Will Hayes, who in turn arranged for Herty to meet with a member of the Sen-

ate Committee on Military Affairs. While in Washington on business connected with dyes legislation, he also met with General Siebert and Major Frederick E. Breithut, a chemist friend still on active duty with the Chemical Warfare Service. Working with Breithut and other chemists already demobilized, he began a campaign to organize the profession against the War Department's plans. Letters to such prominent chemists as W. R. Whitney of the General Electric Company explained why it would be a mistake to put civil, mechanical, or electrical engineers in charge of the chemical research and development necessary to produce the materials used in gas warfare. Those who needed more convincing were referred to former officers in the service such as Colonel W. H. Walker and W. E. Lewis of MIT. "If the present bill is passed in its entirety," the letter to Whitney concluded, "it is a direct slam at the technical organizations of the country."⁵⁷

On August 26, 1919, Herty testified before the Senate Military Affairs Committee at the request of its chairman, James W. Wadsworth, Jr., Republican of New York. He also had lunch with General Siebert and Colonel Fries, and the colonel later sent him a copy of his article addressed to "technical men" about the dangers to their professions posed by the pending army reorganization bill. Herty thanked Fries and expressed regret that he would have to be in Europe on dyes business for the next two months. Nevertheless, he hoped his testimony in Washington, his upcoming editorial, and the news bulletin recently mailed to six hundred newspapers would "help some in the good work."⁵⁸

Back in the United States by mid-November, Herty resumed the Chemical Warfare Service fight, this time concentrating on the House Committee on Military Affairs, where a move to merge (or submerge) the service with the Ordnance Department had surfaced. In the January and February 1920 issues of the *JIEC* he sounded editorial alarms, titled, respectively, "Chemical Warfare Service Endangered" and "Critical Days." The first claimed that failure to make the service a separate unit would "deaden the cooperative spirit" felt by civilian chemists for the CWS; the second declared that House committee action on the army reorganization bill would determine whether the Chemical Warfare Service would be a "vigorous independent unit of our War Department or . . . a weakling appendage of some division of that Department." Too late to make the February edition, Herty learned that the threat had been overcome. "House Military Comm. voted today to make Chemical Warfare Service separate," Colonel Fries telegraphed on January 29, 1920. The news must have cheered Herty, but new problems soon developed.⁵⁹

In late February the Army General Staff kicked General Siebert downstairs, transferring him to an obscure divisional command in Atlanta. Herty was outraged. Through the ACS News Service, his correspondence, and public speeches, he mounted a vigorous campaign against the War Department and the General Staff, charging them with disciplining Siebert for daring to fight the army reorganization bill before Congress. Colonel Fries replaced Siebert, but he suspected that the appointment had been made in line with a plan to restrict the service to nothing more than a "little research institution at Edgewood Arsenal with a colonel at the head of it." If chemists were to have any standing in the War Department, Fries declared, "they have got to get busy with those who make the laws." Herty did not need much prodding. If Fries could tell him which members of the House Committee on Military Affairs were responsible for trying to "belittle" the Chemical Warfare Service, he would see to it that chemists started "pressuring" those congressmen through various organizations in their home districts. Meanwhile, he contacted former officers of the service, urging them to lobby the chairman of the House committee. The battle seesawed for weeks, but by June 1, 1920, Colonel Fries advised Herty that House and Senate conferees had finally reached agreement on the army reorganization bill and the measure awaited the president's signature. "Everything considered," Fries remarked, "the conferees did very well indeed by us and deserve the thanks of all friends of the C. W. S."⁶⁰

Once the existence of the Chemical Warfare Service as a separate unit had been assured, Colonel Fries (elevated to the rank of brigadier general in July 1920) and Herty set about forging closer ties between the service and civilian chemists. Following a meeting with Fries and F. E. Breithut, a former officer in the CWS, Herty wrote to the president of the American Chemical Society, W. A. Noyes. General Fries was interested in developing cooperation with and securing advice from the society, Herty reported, and he had taken the "liberty" of assuring the general of the society's wholehearted support. In Herty's opinion, the best manifestation of that support would be the creation of a permanent ACS committee to advise the Chemical Warfare Service. He hoped the idea would appeal to Noyes and, if it did, that he would invite General Fries to meet with Noyes's advisory group when the ACS held its fall convention in Chicago. Noyes was receptive, and by September 23, 1920, a fifteen-man committee, chaired by Herty, held an organizational meeting with General Fries at the Chemists' Club in New York. As its first act the advisory committee tried to find an outstanding ACS member

willing to serve the Chemical Warfare Service as director of research. In addition, it identified a pool of fifty chemists, chosen to fit a profile drawn up by General Fries, to act as consultants to the service.⁶¹

Other efforts to promote cooperation between civilian chemists and the CWS came with the organization of an auxiliary CWS post of the American Legion in New York City, the participation of the CWS in the National Exposition of Chemical Industries, and an address delivered by Herty for the National Research Council which illustrated the importance of supporting fundamental research in chemistry, using the Chemical Warfare Service and the dyes industry as outstanding examples. The August 1920 issue of the *JIEC* reported the "revival" of the CWS American Legion post at a dinner held to elect officers and to honor General Fries. Fries gave a stirring address urging "the closest possible cooperation" between the CWS and civilian chemists, and Leslie T. Sutherland was elected president of the post. Shortly thereafter, the ACS advisory committee to the CWS was created and Herty pressed for Sutherland's appointment to it, despite the objections of ACS president Noyes. As Herty saw it, the American Legion could exercise considerable political clout with Congress if enemies of the CWS continued their efforts to undermine the organization.⁶²

Herty urged General Fries to enter an exhibit in the National Exposition of Chemical Industries, despite the limited time available to prepare one. The Chemical Warfare Service, Herty remarked, had to be "closely linked up" to the chemical industries, not only because it would have to depend upon them and the universities for personnel but also because it would require supplies from "a thoroughly developed chemical industry, more particularly, dyestuff plants." Herty thought a good share of the public and the Congress understood all this. But "public education work" had to be carried on unceasingly, and the exposition provided an excellent opportunity. Consequently, in behalf of the CWS, he had already arranged with the exposition managers for free space, special exemption from exhibit regulations, free supplies, apparatus, and personnel from the dyes industries, and press coverage. They had both talked a great deal about the close connection between the dyestuff industries and the Chemical Warfare Service, Herty reminded the general. "Now we ought to provide the public with a graphic illustration."⁶³

Finally, the National Research Council invitation to give a public lecture in Washington on the importance of supporting fundamental research in chemistry, using the Chemical Warfare Service, the dye industry, and all other coal-tar-

related industries as illustrations, gave Herty a perfect opportunity to “educate” Congress in behalf of his favorite causes. Specifically, he wanted them to vote adequate funds for the CWS and severely restrict the importation of foreign dyes and scientific equipment. Unfortunately, the lawmakers turned a deaf ear. A budget request for \$8 million by the CWS, chopped in half by hostile forces in the War Department before the measure even reached Capitol Hill, was reduced by the House to \$1.5 million. Fries thought the Senate would repair the damage, but it did not, despite resolutions voted by the American Chemical Society’s Committee on National Policy, bulletins sent out by the ACS News Service, and newspaper reaction to Herty’s National Research Council lecture, all of which urged generous support for the CWS. When it came to appreciating the importance of funds for research and development, General Fries complained to Herty, Congress was no better than the average businessman. The War Department was even worse; it had requested more than \$5 million for horses and mules but nothing for gas masks. Nevertheless, both Herty and Fries pledged to fight on. When President Warren G. Harding took office in March 1921 and promptly called Congress into special session, Herty’s ACS committee to advise the Chemical Warfare Service planned to endorse the CWS request for \$4,492,376, an amount it described as “conservative, in consideration of the important character of the work which must be done.” Despite all efforts, however, the CWS appropriation for 1922 amounted to only \$1,350,000.⁶⁴

Strong pressures to cut expenditures after a costly war, together with a faltering economy, go a long way toward explaining why Congress refused to provide adequate funds for the Chemical Warfare Service. But there was another, less easily measured factor at work as well. In Europe and the United States a strong drive for disarmament developed after the Armistice. Some of it came from pacifists, but many who dismissed them as hopelessly naive supported the movement because they believed that World War I had grown out of an arms race. In the United States, disarmament sentiment was strong among political leaders as well as the general public. Senator William E. Borah, Republican of Idaho, began pressing for a disarmament conference late in Wilson’s second term, and the Harding administration, not to be upstaged by the British, scheduled a nine-power conference in Washington only a few months after taking office.⁶⁵

Even chemists were affected by the disarmament movement, as Herty discovered when he asked members of his ACS Committee to Advise the Chemical Warfare Service to approve his annual report. Richard C. Tolman, a chemist

employed by the Fixed Nitrogen Research Laboratory of the War Department, demurred. "As an employee of the War Department," he wrote Herty in April 1921, "I should hardly feel like criticizing the unfriendly attitude of high officials of the War Department." Convinced that his superiors were simply trying to do their duty when they scaled down CWS appropriations requests, Tolman wondered if he should resign from Herty's committee. "I find myself in considerable sympathy with the general public demand for disarmament," he added. Herty answered that he saw no problem with criticizing the War Department; General Fries had written extensive memorandums charging his superiors with "obstruction," and his remarks were part of the public record. He would be sorry to see Tolman leave the committee, but Herty believed that the work of the Chemical Warfare Service should be "vigorously pushed," considering the state of international conditions. "I, too am very anxious to see disarmament begin, and especially chemical disarmament," Herty declared, "but I am not in favor of our country starting on any such program from the chemical viewpoint while other nations are busy as I know they are in this line and while Germany is left stronger than she ever was before." He sent the dissenting chemist a copy of a recent editorial.⁶⁶

If Tolman had been reading the *JIEC* regularly, he must have been aware of Herty's positions on the War Department, the Chemical Warfare Service, "chemical disarmament," and a good deal more. Only two months after the Armistice, Herty lamented the absence of a chemist among the "host of American specialists" who went to Paris as advisers to help write a treaty ending the war with Germany, "a country which makes of chemistry its strong right arm in times of peace and war." In February 1919 he reported the remarks of a German editor who threatened that any attempt by the victors to control the west bank of the Rhine or the port of Danzig would cause Germany to "rise as one man and make war again, even if we had no weapon left except poison gas." Noting that the terms of the Armistice required Germany to give up ships, submarines, airplanes, artillery, and other "instruments of war," Herty wondered why poison gas, the "most fearful of modern developments," had not been included. There was a remedy, however: simply prohibit the manufacture of chlorine in Germany, "for Chlorine enters into all substances used on a large scale in this method of fighting—mustard gas, phosgene, chloropicrin, etc." As an afterthought, Herty left his readers with something to ponder. Because the Allies had had to develop gas warfare to meet the German threat, world production of chlorine had been "over-

stimulated.” With peace restored and economic readjustment inevitable, Herty asked, who was going to go out of business—the Germans who started gas warfare or the patriotic American manufacturers who answered their government’s call to meet the German menace?⁶⁷

Herty was relieved to learn in mid-March that the Paris peacemakers had forbidden the construction of tanks and the manufacture of gas in Germany. But by June 1919, when the completed treaty was presented to the Germans for signature, he was worried again. It was not their bluster and initial refusal to sign that bothered him. In fact, he remarked, if they had shown the same stubbornness before signing the Armistice, “We would have been in Berlin by this time with many matters permanently settled.” What distressed Herty was his conviction that the next war would not be fought with battleships and submarines; it would be a chemical war, and the weapons for it would be developed in chemical laboratories. The treaty prohibited Germany from manufacturing poison gas, but as far as he could determine, it placed no restrictions on her chemical industries or laboratories. “The way is open,” he warned, “what are we to do?” Herty answered his own question. First, America’s Chemical Warfare Service should be kept intact, especially its research and development divisions. Second, it should be expanded to include divisions on the tactics and strategy of chemical warfare. And third, the nation should foster a highly developed and diversified organic chemical industry “by means of import licenses, tariff, antidumping legislation, and any other means which may be suggested.” In that way, young chemists would be attracted to the field, plant personnel at all levels would be trained in the highly skilled techniques essential to the organic chemical industry, and the nation would have a fully trained reserve upon which to call in the event the Germans did reject the treaty and resort to “‘fresh hatred and killing,’” as their government allegedly threatened.⁶⁶

It took a while, but by February 1921, when he delivered his public lecture for the National Research Council, Herty’s arguments for a strong Chemical Warfare Service, a totally protected organic chemicals industry, and “chemical disarmament” were neatly packaged. Much of what he said was repeated in the March 1921 lead editorial for the *JIEC*, but there the emphasis was on chemical disarmament. As Herty used the term, it meant German chemical disarmament, and it was this editorial, titled “Thinking It Through,” which Herty sent to the War Department chemist who declined to criticize his superiors. Briefly, Herty argued that Germany was producing more tons of dyes per month in 1921 than

she had in 1914; that her dye plants had supplied all the poison gas and most of the explosives used by her armies throughout the war; that she was suspected of supplying "Bolshevist Russia," which had no chemical industry, with poison gas used to defeat a White army; and that the Bolsheviks, with the largest standing army in the world, were threatening to employ "new forms" of weapons, supplied by Germany, against their European neighbors.⁶⁹

The whole world was talking about disarmament, Herty pointed out, primarily as a way to escape the cost of an arms race in battleships and big guns. But to achieve "real peace," aviation and gas warfare had to be taken into account. Everyone agreed that the first step toward disarmament was to strip a defiant Germany of her power to make war. "Sections 168 and 169 of the peace treaty," Herty argued, "give ample power for bringing about the chemical disarmament of Germany through destruction of her surplus dye plants." When he went to Paris in the fall of 1919 as a member of a conference on reparations dyes, Herty wondered why German dye plants were still intact. The Europeans wanted them dismantled, he was told, but American negotiators objected on the grounds that dye plants produced materials useful in peacetime. The same attitude explained the preservation of German plants for the fixation of atmospheric nitrogen.⁷⁰

By 1921, however, many countries had freed themselves from dependence on Germany by developing their own dye and nitrogen-fixing plants. The result was "over-productive world capacity" and nullification of the American "peace product" argument. More important, the presence of surplus German plants practically guaranteed a future commercial war. And thanks to her manufacturing experience, superior distribution networks, and government sanction of her chemical cartel, Germany was sure to win it, particularly against a country like the United States, whose ideals and laws prohibited such combinations. "Unneeded in peace," Herty warned, "these [German] plants represent, in terms of chemical warfare . . . infinite possibilities of war making."⁷¹

There were some hopeful signs. Although no Americans were participating, an interallied conference in London was currently discussing chemical disarmament, and in the United States a new administration would soon take office. When it did, Herty predicted, "peace will be made with Germany . . . [and] possibly a world conference on disarmament will be called. In any case, the new administration has a distinct share of the responsibility of effectuating the chemical disarmament of Germany, so that she may not again embroil the world in war."⁷²

Herty's editorial proposal for the chemical disarmament of Germany did not develop in a vacuum. For months he had been in correspondence with two executives of the British Dyestuffs Corporation, Victor Le Febure and S. A. Whetmore. Le Febure, a former British officer who served with both the French and American chemical warfare units during the war, visited the United States in the fall of 1920. Before returning to Europe, he arranged to show Herty a manuscript based on his own experience and records recently released by the British War Office. It was, he asserted, "the first complete account of chemical warfare from the inside . . . [revealing] the dominating part played by the I. G., the great German Combine." With Herty's help, he hoped to get as much publicity for the book as possible to influence legislation pending before "our respective governments and vital to our organic chemical industries." Meanwhile, Le Febure published an article, "Chemical Disarmament," which argued that true disarmament required the "redistribution of organic chemical capacity" throughout the world. Translated into action, that meant drastic cuts in the productive capacity of German dye plants, active support from the League of Nations for such a program, and passage of dyes protection bills in Great Britain, the United States, and elsewhere. "[Chemical disarmament] . . . is," Le Febure's article concluded, "one of the most important measures now before the world, and . . . one of the few . . . [on] which immediate action can be taken towards the stabilization of world peace."⁷³

Whetmore shared Le Febure's convictions. When the British Parliament acted to bar the importation of synthetic dyes and intermediates for a period of ten years, he commented to Herty: "I am convinced that the greatest danger to the peace of Europe . . . and . . . the world is not advanced socialism or bankruptcy or unemployment but a combination of the capacity and knowledge of the German dyestuffs trust and the old Prussian military spirit, which, as all observers agree, is still rampant in Germany. To obtain the prohibition of imports . . . is therefore to me but one step in a series which it is necessary to take in order that the danger which is overshadowing Europe may be removed."⁷⁴

More important, Whetmore argued, was the mobilization of a popular campaign that would force the governments of Britain, France, and the United States and the League of Nations to apply the military restrictions of the Treaty of Versailles to the fullest extent against a still defiant Germany. Neither Whetmore nor Le Febure expected much from the Wilson administration. But strong sentiment for disarmament in the United States and the election of Warren Harding made them hopeful that the Senate would act to "correct" the weaknesses of the

Treaty of Versailles. Specifically, they hoped the Senate would demand a reservation requiring German chemical disarmament as part of its price for ratifying the document.

In complete accord with his British friends, Herty moved swiftly to promote the cause through the columns of the *Journal*, the ACS News Service, interviews and editorials in major newspapers, and, above all, in Washington. President Harding, his cabinet, every member of the Senate Foreign Relations and Military Affairs committees, and all newly elected senators received copies of his March 1921 *JIEC* editorial. But Congress chose to end the war by joint resolution, subsequently signing a treaty with Germany that simply confirmed to the American government all rights stipulated in the Treaty of Versailles. That left chemical disarmament up to the Conference on the Limitation of Armaments scheduled to meet in Washington on November 11, 1921. As the conferees assembled, the best that Herty, the American Chemical Society, and the Chemical Warfare Service could do to influence events was to secure the appointment of ACS president Edgar Fahs Smith and General Amos Fries to technical committees that would advise the American delegates. Fries was pleased at his appointment because it served notice to all attending the conference that chemical warfare would receive "full consideration" and that the expertise of the service would be called upon in all discussions about "abolishing or limiting use of CW [chemical warfare]." But Herty was less sanguine. In a November 1921 editorial titled "Danger Ahead," he conceded that every good citizen prayed for the "removal of the causes of war" and hoped for reduced spending on obsolete weapons. One item on the agenda bothered him—"control of new agencies of warfare." To the extent that it applied to chemical warfare, Herty thought there was something missing in the "make-up" of the conference: "We are not anxious about what our friends with whom we fought side by side are going to do with this new agency. The question becomes acute only when we think of that nation which initiated gas warfare, in spite of its plighted word [the Hague Conferences of 1899 and 1907], and whose chemical equipment, already strengthened by the demands of war, looms all the larger as other means of warfare are restricted. It is an easy trap to walk into. Shall it be of our own setting?"⁷⁵

The twin issues of chemical disarmament and chemical warfare were not settled at the Washington Arms Conference in 1921. Indeed, throughout the interwar period they continued to attract world attention in a series of studies and conferences sponsored by the League of Nations. But Herty's mission lay elsewhere.

Late in 1921 he resigned his editorship of the *Journal of Industrial and Engineering Chemistry* to become president of the newly organized Synthetic Organic Chemicals Manufacturers' Association (SOCMA). A valedictory editorial assured fellow chemists that he was not abandoning the cause or the profession. "We are not going to say good-bye," Herty pledged, "for we are not going away, only going to work in another room of this house of our national welfare."⁷⁶

CHAPTER SIX

* * * * *

Fighting for an American Dyes Industry

Of all the battles Herty waged during his editorial career, none engaged him more completely than the drive to secure American chemical independence from Germany. To that end he championed efforts to develop a domestic source of potash for fertilizer and he urged Congress to protect American manufacturers of laboratory equipment by eliminating duty-free imports then available to educational institutions. But above all, Herty used his editorial soapbox to fight for the establishment of a full-scale American coal-tar dyes industry. Only then, he insisted, could the German stranglehold on our industrial and national security be broken.¹

Herty spent much of his two terms as president of the ACS (1915–16) working for tariff legislation that would encourage American investment in what he called a fully developed, “self-contained” dyestuffs industry. After months of debate, a Democratic-controlled Congress produced a General Revenue Act in September 1916, Title V of which fixed duties on dyes: coal-tar crudes were admitted free; intermediates were dutiable at 15 percent ad valorem plus 2.5 cents a pound, and finished products entered at 30 percent ad valorem plus 5 cents a pound. With specific duties about half as high as those originally proposed, the rates adopted were generally acceptable to chemists and manufacturers, but one feature of the bill certainly was not. Inserted at the last moment, it exempted “natural and synthetic alizarin, and dyes obtained from alizarin, anthracene and carbazol; and natural and synthetic indigo, and all indigoids, whether or not obtained from indigo,” from the specific duty of 5 cents per pound.²

156 Outraged at such legislative legerdemain, Herty spent the last part of his ACS

presidency and the first weeks of his editorial career protesting the exemption clause and trying to have it stricken from the final measure. He held Claude Kitchin, Democratic chairman of the House Ways and Means Committee, personally responsible for the offensive clause, and he supported wholeheartedly resolutions adopted during the September 1916 ACS meeting which condemned the exemption. In January 1917 Herty reprinted the resolutions in his first issue of the *JIEC* as part of "An Open Letter to the House of Representatives." The chemists' September prediction had proved accurate, he commented, citing as evidence "tremendous activity" in those lines of manufacture fully protected by the tariff and "sluggishness" where the special duty had been withheld. Chemists and manufacturers were not to blame, Herty insisted. Despite severe shortages of raw materials, "foolish talk" about the unsuitability of American coal for dye-making, and unfair criticism about the quality of their finished products, they had moved swiftly and courageously to meet the critical needs faced by industry since the outbreak of war; gradually they were gaining the experience that would lead to efficient production. But what about the future? "Must the greater part of this development be sacrificed at the cessation of the European war?" Herty asked. "Have we built a bridge across which our nation would pass to industrial independence and preparedness" on the solid pillars of ad valorem duties but with "one-fourth of the superstructure, the special duty, deliberately omitted?"³

Herty did not stop there. Copies of his "Open Letter" went to everyone in Washington, starting at the Oval Office. He followed up with long personal letters to important members of Congress, the cabinet, and the military, urging removal of the exemption clause and stressing that dye plants could be converted readily to the manufacture of munitions. But nothing worked. As Congressman Nicholas Longworth, Republican member of the House Ways and Means Committee, put it, trying to change Kitchin's mind was like "butting agst. a stone wall." Finally, convinced that nothing could be achieved through the usual channels, Herty played his press card. He composed a scathing editorial for the March 1917 issue of the *JIEC* which blasted Claude Kitchin and Caesar Cone, a North Carolina textile manufacturer, for having sacrificed the public interest in behalf of special privilege. Caesar Cone was the only textile manufacturer to pressure Congress for the exemption clause and Chairman Kitchin the only congressman to defend it publicly. "Have Messrs. Cone and Kitchin any right," Herty asked, "willfully to restrict the number of potential munitions plants in this country in such a crisis as is now upon us?"⁴

Written in mid-February 1917, just after the United States broke diplomatic

relations with Germany, Herty's editorial would not be published until March 1, too late for action by a Congress headed for adjournment. Consequently, he arranged to have the *New York Times* and the *Manufacturers' Record* carry it during the last week in February. "I have sought by publicity," he explained to R. H. Edmonds of the *Manufacturers' Record*, "to show up this situation in the hope that something still may be accomplished." But Congress, embroiled in a dispute with President Wilson about arming merchantmen, adjourned without acting. Still hopeful two months later, Herty advised Edmonds confidentially that he had been told the "objectionable exception" would be removed when Congress took up tax matters in December. "I understand that Mr. Kitchin has himself made this statement," Herty reported to his fellow editor. Kitchin was "very much riled at my constant hammering away," he added. But that was all right. "It was intended to rile him and I think that procedure was necessary in order to get action on this disgraceful piece of legislation."⁵

Disgraceful or not, the legislation adopted in 1916 remained in place for five years. Meanwhile, a growing American dyes industry did not go unprotected, thanks to a combination of factors—the war, legislation spawned by the war, and cooperation before, during, and immediately following the war by groups in and out of government normally at odds on tariff questions. As long as the fighting continued, American dyemakers were relatively immune from foreign competition, although the reorganized German chemical cartel (the *Interessengemeinschaft der deutschen Teerfarbenfabriken* or IG) made no secret of its intention to regain prewar markets. Wartime legislation also gave the new dyes industry a protective boost. Section VII of the 1916 General Revenue Act created a non-partisan Tariff Commission. A "scientific" reform endorsed by President Wilson and progressives of both parties, the commission studied the chemical industry intensively in 1917, reporting its conviction that a coal-tar branch was essential to the country and that its development required "extraordinary protection." More important for the immediate future were two laws enacted in August and October 1917. The first created the post of alien property custodian and authorized that official to issue licenses to American citizens and corporations for the use of enemy-owned patents and trademarks. The second, the Trading-with-the-Enemy Act, augmented the custodian's powers by authorizing the confiscation and sale of foreign-owned plants, real estate, securities, patents, and trademarks. It also created the War Trade Board, which, among other things, controlled all import and export traffic through a licensing system. Finally, as Herty was careful to point

out in his January and March 1917 editorials, the fight to secure tariff protection had brought together groups who put development of a full-scale, self-contained American dyestuff industry ahead of their special interests as producers or consumers. He thought such cooperation was probably a first in American history, and in the months and years ahead he dedicated himself to keeping it alive.⁶

As editor, Herty welcomed the advent of the United States Tariff Commission because he thought its thorough investigations would provide sound data about actual conditions in the chemical industry, encourage and reassure potential investors concerned about foreign competition, and silence “invidious questions” about the motives of those seeking “compensatory protective legislation.” But to do the job right, Herty and the ACS thought President Wilson ought to name a chemist to the commission. Wilson rejected the suggestion although his choice for the chairmanship, Harvard economist F. W. Taussig, did invite the society to recommend a slate from which a chemical adviser would be selected.⁷

Herty’s interest in the work of the Tariff Commission was genuine, but it was the newly minted office of the alien property custodian that provided him, the emerging dyes industry, and the entire field of chemistry with perhaps the best friend any of them could have. A. Mitchell Palmer, a progressive Democrat from Pennsylvania, became the first alien property custodian and under the amended Trading-with-the-Enemy Act began using his authority to sell or license German property, especially dye and chemical patents, to American industry. But first that property had to be identified and investigated, and for that task the custodian relied heavily on Francis P. Garvan, a prominent New York lawyer and former assistant district attorney who directed the custodian’s Bureau of Investigation from offices in Washington and New York. Thorough research soon convinced Garvan that a self-contained, completely developed chemical industry was essential to America’s well-being. Never again, he concluded, must the country’s economic and national security depend on an outside power guilty of the ruthless behavior revealed by his investigations. Described by an admirer as a “warm-hearted, nimble-witted, pugnacious Irishman . . . [and a] stalwart champion when the industry badly needed friends,” Garvan devoted himself totally to his newfound cause.⁸

Only a few months elapsed before Garvan and Herty crossed paths. The two met early in 1918 in the conference rooms of the New York Bar Association when Herty, then chairman of the New York section of the ACS, offered to put Garvan “in touch with the chemical industries that might need looking into.” He gave

Garvan several leads on the spot but on second thought decided to discuss the matter with his executive committee. The chemists were eager to help the alien property custodian, but in view of the "peculiarly delicate questions" that might arise, they thought a formal request for cooperation should come from someone in the government. Garvan agreed, and two weeks later his legal counsel, Joseph Choate, Jr., sent Herty an appropriate letter. Specifically, the alien property custodian's investigative unit wanted a list of any chemical firms suspected of enemy ownership or "disloyal or dangerous activities." Begun in the highly charged, crisis atmosphere of war, the close relationship between Herty and Garvan lasted until the latter's death in 1937. It is hard to imagine two men of more dissimilar background and temperament. It is even harder to think of two more dedicated to the principle of American chemical independence or more determined to bring it about.⁹

Before an effective campaign for its protection could be mounted, the dyes industry had to be organized. Described as a "heterogeneous lot" consisting of chemists, college professors, chemical manufacturers, former dye dealers, dye consumers, and "a few opportunists," dye men were suspicious, secretive, and intensely competitive. It was not easy for them to form a trade association, but their drive to survive and a common interest in effective tariff protection against German postwar competition eventually led them to cooperate. Preliminary efforts began in the summer of 1917 when a group of dyemakers and dealers tried to create a single organization for the entire industry. But that move came to nothing the following February after an organizing committee recommended that membership be restricted to manufacturers and specifically to those firms whose ownership and base of operations were strictly American. Firms formerly connected with German houses were suspect as fronts for foreign owners. As for the dealers, long identified with German dye houses, some were notorious for having engaged in the kind of business tactics that shocked Francis Garvan. Here was the chance to stamp out such abuses. Despite the dealers' protests, therefore, on March 6, 1918, a properly purged membership created the Dyestuff Manufacturers' Association of America, with Morris R. Poucher of du Pont, formerly associated with the American branch of the Badische Company, as president and chairman of its executive committee. Shortly thereafter, the leading element of the group, representing such major firms as du Pont, Calco, and Grasselli, organized the American Dyes Institute, which soon absorbed the Dyestuff Manufacturers' Association.¹⁰

Commenting in an April 1918 editorial, Herty left no doubt about where he stood on the membership issue. The dealers had tried to bludgeon their way into the organization with veiled threats that their rejection would force them into "Teutonic arms" after the war. They also hinted that self-interest might compel them to lobby Congress against higher tariffs, which led Herty to wonder if German agents were behind some dealers. If so, the joke was on them, he thought. Congress was even more convinced than the public that "the Dyestuff industry is not only . . . a key industry, but more important still . . . an invaluable reserve for high explosives manufacture."¹¹

With most of the major participants in the struggle for protection identified and future battle lines emerging, Herty paused in July 1918 to assess the progress made during the previous two years. When the British fleet blockaded German ports, American textile plants faced shutdowns and pharmaceutical stocks were seriously depleted. Prices soared as supplies dwindled. But in barely two years, "a miracle has been wrought." Mills and other plants dependent on supplies of synthetic colors now operated normally, and the sick had adequate medicine. Yet prices for coal-tar products had fallen to reasonable levels and manufacturers were even exporting some items. As evidence Herty cited recent announcements by two government agencies which he considered to be "fitting tribute . . . to the skill and energy of the American chemist." The War Industries Board reported few actual or prospective shortages of medicinal chemicals, and the United States Tariff Commission, having just completed its first census of synthetic dyestuffs and medicinals, found that domestic production of those items in 1917 had surpassed the amount imported during the last full year of peace (fiscal year 1914). Only those dyes denied the special five cents per pound duty had failed to make significant progress. Nevertheless, Herty thought a winning combination had been put together: "Congress, capital, and chemists cooperating have accomplished the modern miracle."¹²

Several months later, Herty returned to the "cooperation" and "miracle" themes. Still confident that chemists and capital were willing to persevere in the drive to secure "National Self-Containedness," he was less sure about the staying power of Congress and the public. In December 1918 he wondered whether the public was willing to pay the higher costs usually associated with the development and early phases of manufacturing new products. Consumers of dyestuffs had already agreed to support protective tariffs. "But what about potash [for fertilizer] and duty-free imports [of scientific equipment] for educational institutions?" De-

spite efforts to develop a domestic supply of the first and to plug the tariff loophole that permitted the second, support from organizations representing the principal consuming groups was noticeably lacking.¹³

By February 1919 Herty's attention had shifted to Congress. Again he praised chemists for their contribution to the "economic miracle" that transformed America between 1914 and 1917. "As if by magic," an industry of coal-tar chemicals (dyestuffs and medicinals) had developed with incredible speed. Then, when the United States entered the war, the skills and equipment used to make dyes had been applied to the manufacture of high explosives and poison gas. Other chemists turned out gas masks and optical glass "of the highest quality." But now the war was over and new economic changes faced the country. "The peace treaty will soon be signed, embargoes will be lifted, and normal international trading will be resumed. Are we prepared?" asked Herty. Congress had plenty of problems before it, but Herty hoped the legislators would accept the recent findings of the Tariff Commission, which detailed shortcomings in the 1916 General Revenue Act and adopt the remedies proposed. He also hoped they would end duty-free imports of laboratory equipment. If so, he predicted, "American skill and enterprise" would take another step toward economic independence.¹⁴

In fact, "American skill and enterprise" were already at work in the office of the alien property custodian. Ever since his appointment in August 1917 and the adoption of the Trading-with-the-Enemy Act, later supplemented by legislation that enhanced his authority, A. Mitchell Palmer had moved zealously to discover, confiscate, lease, and, finally, sell enemy-owned plants, patents, and trademarks to American firms. The aim was to guarantee American war production, especially in chemical products, and to prevent Germany from reestablishing her chemical monopoly after the fighting ended. When Palmer became attorney general in March 1919, Francis Garvan took his place. By that time the custodian's office had been severely criticized by certain chemical firms and congressmen who objected that its disposition of German patents gave a few American firms inordinate benefits. But Garvan had a solution that would silence most critics: the sale of all enemy patents still held by the custodian to a neutral, nonprofit corporation with power to license their use, nonexclusively, on equal terms and a royalty basis, to any bona fide American individual or corporation. The royalties would be reserved to resist anticipated lawsuits and to promote chemical science and industry in America.

The Garvan proposal attracted considerable support, and early in 1919, at a

meeting in New York, Palmer, Garvan, and several leading representatives of the American Dyes Institute and the Manufacturing Chemists Association drafted plans for an organization subsequently incorporated as the Chemical Foundation. Capitalized at \$500,000 with funds subscribed by leading American manufacturers, mostly in the chemical industries, the foundation “purchased” from the custodian over 4,900 seized German patents for \$250,000. President Wilson’s approval, secured informally in March, was granted officially by executive order in May 1919.¹⁵

Herty was ecstatic. In the April issue of the *JIEC* he listed the officers of the newly created Chemical Foundation. Alien property custodian Garvan had been elected president, and his chief legal investigator, Joseph Choate, Jr., was retained as counsel. A “dollar-a-year man” during the war, Choate also served as legal counsel to the American Dyes Institute and as a member of its tariff committee. Described by Herty as the “chief scout” in the alien property custodian’s investigative work, Choate wrote the chemical section of the custodian’s *Report* issued in the spring of 1919. In harrowing detail it narrated the nefarious tactics of the German dyes cartel, as well as the propaganda and espionage activities perpetrated in the United States by German businessmen and officials of the German government. Herty published the *Report*’s entire chemical section in April 1919, arranging also to have Choate address the American Chemical Society at its spring meeting in Buffalo.¹⁶

Garvan also circulated the *Report*, and on April 25, 1919, he delivered a spell-binding address in New York to the National Association of Cotton Manufacturers. The horrific details regarding German machinations must have kept the textile men on the edges of their seats. But just as interesting was Garvan’s agenda for the Chemical Foundation. He promised to fight “at the customs gate” any violation of the patents under foundation control, however “camouflaged” the attempted violation might be; to set up an “Intelligence Department” that would advise the American public about past German iniquities and to prepare it for the “coming struggle” the German cartel was expected to mount; to expose future efforts at propaganda or espionage; and to counteract all unfounded criticism of the American chemical industry from whatever source it might arise. More positively, the foundation intended to foster research in and out of government; promote cooperation between university and industry; and through its control over German copyrights, “free much scientific literature from the shackles of the German language.” Then Garvan got to the heart of the matter. The foundation

planned to petition Congress for a law establishing a licensing system covering all importations of chemicals for the next ten years. Such a system would guarantee "proper importations" to the textile and other dependent industries, enabling them to compete fairly in world markets; at the same time, it would protect America's existing industry and promote the growth of chemical independence. In setting that course, Garvan declared, "We ask no more than England, France, Italy and Japan have already decided to grant on behalf of their own independence."¹⁷

Garvan's intention to press Congress for a licensing system arose from his conviction that "no tariff alone can protect new industry." Furthermore, until a license plan could be enacted, he wanted the admission and distribution of chemical imports to be under the control of the Chemical Foundation. Joseph Choate asked Herty to secure the support of the American Chemical Society for such a program early in April 1919. Meanwhile, problems arose. The War Trade Board (WTB), then in control of all imports and exports, was scheduled to go out of existence on June 30, 1919. But well before then, in mid-March, its spokesman told Joseph Choate, Morris Poucher, and other leaders of the American Dyes Institute that he "did not think it would do anything to protect the American dye industry, since that was a function of Congress." Later the WTB modified its position somewhat, although it still thought its job was to provide the dye industry with only "minimum protection, such as would limit the freedom of trade no more than was absolutely necessary" to prevent its destruction.¹⁸

Such reluctance on the part of the WTB did not discourage the dyes interests, who were not without resources when it came to influencing policy. Certainly Garvan did not hesitate to use the powers of his twin offices as alien property custodian and head of the Chemical Foundation. And Choate, the foundation's counsel, who also gave legal advice to the American Dyes Institute and served on its tariff committee, was admirably positioned to serve as Garvan's instrument. On March 29, 1919, a cable signed by almost a hundred dyes consumers was dispatched to President Wilson, then in Paris working on the Treaty of Versailles. Coordinated if not composed by Choate, the cable asserted that an independent, self-sustaining American dye manufacturing industry could not be established unless German competition were cut off for several years; no tariff, by itself, would be sufficient to protect the industry against the tremendous resources and unscrupulous tactics of the German cartel. Only a licensing plan, "excluding all foreign dyes reasonably obtainable in the United States," could save the new industry. Consequently, the cable's signers urged Wilson to incorporate such a plan

in both the peace treaty and congressional legislation. Herty helped the cause by publishing the petition in the May issue of the *JIEC* and celebrating it for its broad vision, its recognition of the dye industry's significance to the national welfare, and its spirit of cooperation. Noting that the signers included "not a single [dyes] producer," Herty declared that the petition would inspire American chemists "to give consumers the best and cheapest products the world has ever known." Another effort to shape policy came on April 4, 1919, when Choate, joined by William T. Miller, a member of the executive board of the American Dyes Institute, sent a telegram to B. S. Cutler of the Bureau of Foreign and Domestic Commerce, U.S. Department of Commerce. The wire proposed the creation of a committee composed of dye producers and consumers to advise the bureau on chemical imports policy. Obviously formalizing what had already been agreed to, the telegram suggested a slate of eight names: four presidents of major dye-consuming textile trade associations and three dye producers nominated by the American Dyes Institute, one of whom was Morris R. Poucher of du Pont. The eighth man, named as a representative of the American Chemical Society, was Charles Herty.¹⁹

Herty's official participation in efforts to shape administration policy and tariff legislation took another step forward when J. Merritt Matthews, chairman of the American Dyes Institute Tariff Committee, asked him to join the committee. Herty accepted at once, attending his first meeting on May 13, 1919. Much of the discussion was no revelation to the new member; for weeks he, Joseph Choate, Morris Poucher, and Garvan, singly or in groups, had shuttled back and forth between New York and Washington for meetings with War Trade Board officials, friendly congressmen, and Attorney General Palmer. Nicholas Longworth, Republican of Ohio and member of the House Ways and Means Committee, was in contact with the Tariff Committee and had conveyed his intention to introduce a dyes protection bill when the special session of Congress convened. He wanted specific information from the committee in order to draw up a suitable measure and to prepare himself to defend it in debate. After discussion, the committee agreed that whatever Longworth's proposed bill might say about tariff rates, it had to incorporate a licensing feature. Choate and Garvan, scheduled to be in Washington within a few days, planned to "demonstrate" to the congressman why a license system was superior to a very high tariff and why it was important to vest the licensing power in some "proper board" or commission after the expiration of the War Trade Board on June 30.

Other matters presented during Herty's first meeting with the Tariff Committee

concerned Morris Poucher's recent negotiations with the War Trade Board. For the rest of its tenure, he reported, the WTB agreed to use its licensing powers to regulate and even exclude imports of German dyes. Agreement came after Garvan and Poucher secured Attorney General Palmer's endorsement of the arrangement. In addition, the WTB agreed to appoint an Advisory Committee on Dyes to help settle problems that might arise if German manufacturers tried to ship finished dyes into the United States. The issue arose because the Associated Governments (the United States and the Allied powers) had decided to permit German dye exports, subject to whatever restrictions each nation might impose. Consequently, the WTB had to formulate rules and regulations to control such importations, and it needed expert advice from producers and consumers of dye-stuffs to do it effectively. On May 8, 1919, therefore, the WTB appointed an eight-man Advisory Committee on Dyes, consisting of the same persons named earlier as advisers to the Bureau of Foreign and Domestic Commerce. Poucher also told the Tariff Committee that if the WTB Dyes Advisory Committee should recommend the admission of any German dyes, of types not manufactured in the United States but which might be needed by American consumers, the imports would be consigned to the Chemical Foundation, Incorporated, for distribution. These arrangements would last until June 30, 1919, after which it would be necessary for Congress to create a licensing board to continue the policy begun by the WTB. The rest of Poucher's remarks involved recommendations regarding the best strategy and tactics to pursue when hearings on tariff legislation opened before the House Ways and Means Committee. "The position of the Dye Industry . . . should be made so strong," Poucher concluded, "that Congress and the country would be impressed with the necessity of building up this industry at home."²⁰

Herty attended the first meeting of the War Trade Board's Dyes Advisory Committee in Washington on May 19, 1919. The committee appointed Joseph Choate as counsel, elected Herty secretary, and made plans to gather data regarding the type, amount, trade name, and manufacturer of the dyes consumers expected to use during the next several months. The WTB needed the data to determine whether, and in what amounts, it would permit the importation of German dyes. Only materials not manufactured in the United States or not available in sufficient quantity to meet consumer needs would be licensed, and only WTB-approved imports would be legal.

WTB policy, announced on May 20, 1919, was easier to frame than to imple-

ment. Herty drafted a letter explaining WTB regulations and urging consumers to cooperate by completing a questionnaire composed by the committee. But after talking to one textile executive, Joseph Choate doubted that they would provide the information. Other things also worried the WTB Dyes Advisory Committee, particularly the news that German dyes interests had begun soliciting their prewar customers. Expecting normal commercial relations to resume with the signing of the peace treaty, they wanted to know what colors and chemicals the American trade would be ordering. One disgruntled customer informed William Corwine, the secretary of the American Dyes Institute, that he wanted to protect American industry, but certain essential colors were extremely rare or not produced in the United States. "If you do not get busy and get some of these dyestuffs on the market," he declared, "we shall . . . be compelled to fall back on the German dyestuffs." Firms dependent upon a special class of dyes, the indanthrene or vat dyes, exerted particularly heavy pressure on the WTB, arguing that without them they could not compete in the world market. The need for vat dyes was so obvious to anyone "in the trade," one textile dyer wrote Herty, that the Dyes Advisory Committee should not wait for the tabulated results of the WTB survey. It should urge the agency to license their importation immediately.²¹

Uncertainty made things more difficult. Unless Congress moved quickly to enact some form of license system, the WTB was the only dam standing against a potential flood of German imports. Congressman Longworth introduced a bill to raise tariff rates on dyes sharply, adding a license feature to it, and by June 23 it was before the House Ways and Means Committee. But quick action was unlikely even though traditionally high-tariff Republicans controlled both houses and President Wilson firmly supported protection for the industry. Meanwhile, there was concern that the WTB might expire even earlier than expected, depending on how the phrase "end of the war" in the law that created the agency was interpreted. What, for example, would happen to it if President Wilson ended the war by proclamation?²²

Apparently Herty did not become seriously concerned until June 30, 1919, after seeing a note in the *Journal of Commerce* about raising the Allied blockade against Germany. If that led Wilson to end the war by proclamation, and with it the Trading-with-the-Enemy Act, he declared in an urgent letter to Garvan, "great damage" would be done to the American dyes industry, both psychologically and economically. The competition of German dyes brought in by the prewar importers would not only demoralize American producers; it would also make it hard for

the government to dispose of the German dyes upon which it had an option under the reparations clauses of the peace treaty. "This would mean," Herty advised the alien property custodian, "that our present shortage . . . of vat dyes, would be filled by importers acting directly for German manufacturers, and remitting directly to them rather than through the Reparations Commission." Ironically, as Herty penned his letter, the Department of State was preparing to issue a press release announcing that on May 12, 1919, by executive order, President Wilson had transferred the "personnel, duties, powers, functions and records of the War Trade Board to the State Department, as of July 1, 1919."²³

The WTB's new lease on life kept the floodgates closed against German chemicals for a while longer, and it gave the Chemical Foundation and the American Dyes Institute more time to build support for the license system incorporated in the Longworth bill. But it failed to placate consumers who were clamoring for vat dyes, and it certainly did nothing to appease importers eager to reestablish prewar connections with German dye manufacturers. Meanwhile, the Dyes Advisory Committee responded to an agency request to frame a "comprehensive policy" on dyes importation. On June 26, 1919, the committee made three recommendations: (1) that in all decision making three interests must be considered in the following order: (a) the dye and chemical industry as a national or "key" industry vital in peace and war, (b) consumers of dyes and chemicals, and (c) manufacturers of dyes and chemicals; (2) that no licenses must be issued for the importation of German dyes *except* for those brought into the United States through the channels of the Reparations Commission; and (3) that the Chemical Foundation should act as consignee for the Reparations Commission.²⁴

In a second communication the same day, June 26, the Dyes Advisory Committee explained that it based its policy recommendations to the WTB on its understanding of the reparations clauses of the peace treaty as published in the *Congressional Record* of June 9, 1919. Under Annex VI, part 1, the Reparations Commission could require Germany to turn over to the Allies up to 50 percent of the dyes and chemicals on hand when the treaty went into effect. Part 2 provided that from the time the treaty took effect until January 1920, and for each six-month period thereafter until January 1925, the commission could require Germany to turn over up to 25 percent of any specified dye or chemical produced. Unless some action were taken like that proposed by the Dyes Advisory Committee, there would be two "channels of importation" open to the Germans—one through the Reparations Commission for America's share of the 50 percent on hand when the

treaty became effective; the other through the remaining 50 percent controlled by Germany, over which the Allies had no control except through legislation by their own governments. The committee warned that Germany would try to supply the American market from her own share rather than from the share supplied through the Reparations Commission. And she would do it through the importers in the United States who represented German companies, as license applications already in hand made clear. As a result, the Reparations Commission would be competing with German manufacturers and their American agents. "Or in other words," the committee declared, "the German government and its agents would be in competition with the American government and its agents." The Dyes Advisory Committee also spoke to the issue of vat dyes. Trade conditions made quick action imperative because the stocks of vat colors in the United States were practically exhausted and manufacturers were not yet ready to supply the need. Consequently, the committee urged the Reparations Commission to take immediate action to establish an agency in the United States for the importation and distribution of vat dyes to consumers. Finally, it recommended that the War Trade Board "make some public statement of policy" so that consumers could have some information about when and how to secure what they needed.²⁵

But the WTB did not issue a press release explaining its dyes importation policy until a month later (July 26, 1919). By that time consumer pressure on the State Department was so strong that it had to respond. Incorporating the sense of its Dyes Advisory Committee's recommendations, the statement declared that for the present no licenses were being granted for the importation of German dyes because, upon ratification of the peace treaty, dyes would immediately become available under Annex VI, in adequate amounts and at reasonable prices, through the Reparations Commission. Furthermore, the need for German dyes was deemed to be "less urgent" because of the current availability of Swiss and English products. Noting that the committee's authority to control importation was only temporary, the statement reminded the public that "a permanent policy affecting the importation of dyestuffs is now being considered by Congress." But Congress did not act. As the summer wore, on the House Ways and Means Committee continued to wrestle with variations of the Longworth bill, and Henry Cabot Lodge held the Treaty of Versailles hostage in the Senate Foreign Relations Committee. Quick access to German dyes through the Reparations Commission, therefore, seemed unlikely.²⁶

For a brief moment Herty thought he had found a way around the bottleneck.

On August 19 a friend recently back from Europe informed him that pending creation of the Reparations Commission, some German dyes, probably vat dyes, had been released for sale to the French, Belgians, and Italians from stocks being held in occupied territories. The possibility of getting some of the released material for the United States led Herty to call Garvan immediately. But when he began his explanation, Garvan interrupted to say that another scheme was in the works. He promised to notify Herty as soon as things had come "to a definite head."²⁷

Meanwhile, pressure to relax the WTB dyes import policy grew so intense, particularly from consumers of vat dyes, that officials finally scheduled a hearing. On August 26, 1919, about thirty individuals, representatives of the National Association of Shirtmakers, the War Trade Board Section, its Dyes Advisory Committee, and Francis Garvan of the Chemical Foundation, gathered in the Washington offices of the WTB. Every interest represented supported the final decision to allow the importation of a six-month supply of German vat dyes because American manufacturers were not yet able to meet consumer needs. But there was a procedural problem. The United States had no official representation on the Reparations Commission because the Senate objected to American participation while the Treaty of Versailles was still pending. Consequently, Garvan proposed that President Wilson issue an executive order empowering him (Garvan) to send an agent to Paris with authority to buy dyes from the Reparations Commission. Herty was Garvan's choice to carry out the assignment.²⁸

When the August 26 meeting with the shirtmakers broke up, Wilson had still not agreed to Garvan's request. It worried Frank Cheyney, one of Herty's colleagues on the Dyes Advisory Committee, because the "good faith" of the committee and the WTB was at stake. Cheyney also thought the forces fighting the dye licensing bill in Congress would gain momentum if the pledge to relieve the shirtmakers fell through. The "great need now," he wrote Herty, was quick action in acquiring dyes and a "reasonable" amount of publicity about the actions being taken. Herty responded the next day. Word had just come from Washington announcing President Wilson's official approval of the Garvan proposal, and Herty planned to leave for Europe within the week.²⁹

Before sailing, Herty wrote notes to prominent British chemists he hoped to visit, and he prepared a statement about his trip for an influential trade paper. But two vital matters could not be resolved before he left. One involved a WTB survey of consumer needs for the next six months, the results of which would be cabled to him in Paris; the other required negotiation of an agreement with the

Textile Alliance, which, it was hoped, would act as the receiving and distribution agent for the dyes Herty expected to procure. To C. W. Hawes of the WTB and to Morris Poucher of the Dyes Advisory Committee (and du Pont and the American Dyes Institute) Herty sent the same message: do everything possible to complete both tasks so that the pledge made to supply consumers with dyes within sixty days could be redeemed.³⁰

Herty left New York on September 3, 1919, hoping to find out how and through what mechanisms he could secure the desperately needed German dyes and promising himself that he would complete his mission in two months, the maximum period he was willing to be away from his editorial post. Too late to participate in an important interallied conference held in London, Herty learned on arrival of plans to invite German manufacturers to Versailles to arrange for the partial release of German dyestocks impounded by the Allies. If all went well, France, Belgium, and Italy would secure up to twenty-two hundred tons of dyes and the United States and Britain could each withdraw up to fifteen hundred tons of the impounded stocks. The plans also called for measures to ensure equitable distribution of desirable and less desirable colors and to persuade the Germans to come to Versailles by promising them that they could sell “freely” (that is, to anyone) from their half of the dyestocks, a quantity corresponding to the type and amount of each dye taken by the Allies. As Herty explained it in a December 1919 editorial, the projected conference was not “a matter of treaty enforcement but of joint agreement.” Such an “agreement” was necessary because the United States Senate had not yet approved the Treaty of Versailles and therefore objected to the application of any of its provisions, in this case, Annex 6 of Part 8, which related to German dyes. But a “joint agreement” to effect the release of some of the impounded dyes was apparently acceptable.³¹

In Paris Herty had an office in the Hotel de Crillon, where the American Commission to Negotiate Peace was housed. Soon he was working closely with the Committee on Organization of the Reparations Commission, the group that would meet with the leaders of the German cartel early in October. He found everyone on the committee to be courteous and cooperative, and his work went very smoothly during the first weeks. But when the WTB cable listing the amounts of specific dyes required by American consumers reached him on September 29, Herty knew there was a problem. After checking the cable against the German inventory of available dyes, he calculated that America’s share under the “joint agreement” would provide only 30 percent of her needs. Nevertheless, he pre-

pared an itemized order from the list of vat dyes given in the WTB cable, and he tried unsuccessfully to make a deal with the Allies to increase the American allotment.³²

The Allied meetings at Versailles with representatives of the German cartel on October 2 and 4, 1919, progressed according to plan. But as America's share of the reparations dyes fell woefully short of consumer need, Herty decided to try direct negotiations with the Germans, hoping to acquire the other 70 percent from their share of the existing dyestocks or from their share of future production. Somewhat disrupted by strikes and coal shortages, German dye factories had not been destroyed by the war, and according to American officials stationed in the occupied territory, their owners and operators were willing to deal. Consequently, on October 4 Herty met alone with C. von Weinberg, head of the cartel and chairman of the eight-man group at the Versailles meeting. The upshot was a German bid, good for at least four weeks, to sell both "general" and vat colors at prices which, though higher than those to be paid for reparations dyes, were still reasonable.³³

For a brief moment Herty enjoyed his triumph. Then, on October 6, he learned that a snag had developed in New York and Washington because the WTB had failed to carry out plans made by its Dyes Advisory Committee. Briefly, the committee had called for the creation of a vat dye consumers' association that would exercise exclusive control over the purchase, importation, and distribution of the ordered dyes. The Textile Alliance, an organization with some wartime importing experience, agreed to undertake responsibility with the stipulation that the WTB approve the arrangement. A modified agreement had been worked out by September 29, but final arrangements were not completed until October 25 because, among other things, the WTB wanted to avoid the appearance of discriminating against the private importers and their customers.

What the bureaucrats finally produced certainly did not satisfy the importers, but it would take some time for their protest to be effective. Meanwhile, a cable to Herty on October 28 explained the procedures that would soon be made public. The Textile Alliance had been designated as the "sole official agency" for importing dyes from the "official [reparations] source"; importation from the official source through the alliance was optional for consumers; and the WTB would permit private importers to whom licenses had already been issued or might be issued to import from the official source through the Textile Alliance. The crucial point was that in filling orders from the official source (reparations dyes), the

alliance would give preference to consumers who had assigned their allocation cards (WTB licenses to import) directly to it. The WTB also planned to advise private importers that they could participate in the cartel offer (also called the Herty option) if they did so through the alliance, and no distinction would be made in favor of those whose allocation cards had been assigned directly to the alliance.³⁴

Between October 6 and 28, Herty had plenty of time to feel frustrated and depressed. His deal with the cartel was firm for only thirty days, and the uncertainty about importation seemed likely to nullify all of his efforts. On October 16 he sought information from Morris Poucher and Frank A. Fleisch, then in London. Fleisch, vice-president of the Textile Alliance, was authorized to carry out the dye purchase arrangements set up by Herty, but everything had to wait until the WTB completed its deliberations. "I am surely going to fall into habits of profanity if I stay on this job much longer," Herty fumed in a note to Lois Woodford. "Washington can beat the band mussing up a perfectly simple situation. The dickens of it is that this mussing up is about to seriously threaten the matter of my sailing Saturday week for New York, and that gets my goat! I want to be back in the office where you can do a real day's work—on your own responsibility—and feel that you have accomplished something."³⁵

Despite mounting frustration and still waiting for instructions from the WTB, Herty postponed his departure for New York until November 1. Meanwhile, Frank Fleisch of the Textile Alliance joined him in Paris and the two decided to go to occupied Germany to visit von Weinberg. The option to purchase dyes directly from the cartel negotiated at Versailles would expire on November 2, and Herty hoped to secure an extension. But von Weinberg did not feel free to act without consulting the other members of the cartel. Consequently, Herty left instructions with him to contact his Paris office as soon as a determination was made. Back in France just in time to make his sailing date, Herty left a memorandum for a member of the Peace Mission at the Hotel de Crillon, explaining that an important telegram from von Weinberg was expected and that its contents must be cabled immediately to the War Trade Board in Washington. Weeks later, using the editorial "we," Herty chose the perfect metaphor to describe his feelings as he left for America: "We gave up hope and started the journey home bluer than the purest indanthrene."³⁶

Herty's gloom did not lift until his slow-moving ship reached the United States on November 13, 1919, and a representative of the Textile Alliance informed

him that "harmony and uniformity again prevailed." Consumers had canceled their assignments of allocation certificates to German importing agencies, settling on the Textile Alliance as the sole channel of importation. Now the way was clear to move forward, and within a few days the Textile Alliance cabled its representative to complete Herty's purchasing arrangements. The "harmony and uniformity" reported to Herty on November 13 did not last long. Within a week Kuttroff, Pickhardt and Company, Importers, circulated a letter to their customers which questioned press reports crediting Herty with securing an option to buy vat dyes. Claiming to have "information from abroad that no option has been given for Indanthrene Dyes," the importers offered to procure them in a "substantial quantity" and urged the return of customer licenses which, in its efforts to speed up delivery of those dyes, Kuttroff had surrendered to the Textile Alliance. In closing, the importer expressed the hope that consumers would lobby Congress against the Longworth bill because any license plan would be "prejudicial to their interests" and "always make for delay."³⁷

Other challenges to "harmony and uniformity" came from disaffected consumers. On November 18, 1919, the Vat Dyes Committee of the National Association of Shirtmakers met with the WTB's Dyes Advisory Committee. The shirtmakers praised Herty for his efforts in their behalf but blasted the WTB for its failure to obtain, or to let "others" obtain, the dyes needed to manufacture enough cotton shirting for their purposes. The shortage drove prices up, made their shirts noncompetitive, and ultimately forced them to import cloth from England. The shirtmakers also charged the WTB with "poor coordination" and "needless delay." Herty's work was substantially completed by October 4, they pointed out, yet the WTB did not authorize action by the Textile Alliance until November 18.³⁸

Publication of the shirtmakers' complaints in various trade journals did little to enhance the image of the WTB. But their protests paled compared to the scorching attack launched on December 1, 1919, by a group of textile and dyeing firms located in Pennsylvania, New York, and New Jersey. A widely distributed pamphlet titled *Memorandum in Opposition to the Purchase by the Government Through the Textile Alliance, or Other Official Agency, of Dyes Directly from the Manufacturer* began by questioning the need for wartime import restrictions when there was no war. Only dyes and chemicals of German origin were still controlled, which conflicted with State Department policy that declared protective measures to be a congressional prerogative. More specifically the document

described the WTB Dyes Advisory Committee as the tool of the two most powerful dye manufacturers in the country, whose aim it was to stamp out competition and create a monopoly; charged the WTB with ignoring consumer interests and barring the press from WTB hearings; denounced WTB circulars on policy and procedure as confusing and contradictory; implied that Herty had somehow misrepresented his negotiations with the cartel; and accused the government, because of its designation of the Textile Alliance as the official importation agency, of paternalism, playing favorites, and discrimination against American citizens engaged in the business of importing. Worst of all, charged the pamphlet, the WTB scheme had deprived consumers of free choice and delayed the delivery of needed dyes by as much as three months.³⁹

Circulation of the consumer memorandum was carefully timed to coincide with hearings on the Longworth bill, which began before a Senate subcommittee on December 8, 1919. On December 11, Colonel John Wood of the American Woolen Association led the attack against the Dyes Advisory Committee, using most of the arguments in the memorandum as his text. The next day the Dyes Advisory Committee filed a spirited rebuttal, three pages longer than the consumer memorandum and subsequently circulated in some form by the ACS News Service, the Textile Alliance, and the Chemical Foundation.⁴⁰

While the battles over import controls and permanent legislation raged in and out of committee hearing rooms, the Textile Alliance and its Dyes Advisory Committee, identical in membership to that of the War Trade Board, worked hard to complete financing and shipping arrangements for the long-awaited German dyes. Unfortunately, red tape, a dock strike, and disputes with the cartel about shipment and payment schedules caused substantial delay. Herty suspected the fine hand of Kuttroff, Pickhardt when he discovered that one of the cartel companies, Badische, was claiming inability to fill its part of the order negotiated by von Weinberg. (Kuttroff was the Badische agent in the United States.) Like Choate and other members of the Dyes Advisory Committee, Herty thought the WTB should cancel whatever allocation certificates Kuttroff held in order "to let the Badische Company know that they must first carry out their agreement made through the cartel before other products from their plant would be allowed to come in." He also wanted Garvan to use his influence in the State Department, and the president of the Textile Alliance agreed. The cartel must keep its promises under the Herty option, he argued; otherwise the Textile Alliance, the State Department, and the American dye industry would all be discredited.

By mid-spring 1920, vat dyes began to arrive in the United States with some regularity. The Textile Alliance continued to distribute reparations dyes to the satisfaction of consumers if not importers. And Kuttroff, Pickhardt continued to protest that the sale of reparations dyes through a private agency, the Textile Alliance, was discriminatory. As the months passed, however, the Textile Alliance found its role as government agent burdensome, and early in 1922, despite the objections of its Dyes Advisory Committee, which feared the reestablishment of German control over the U.S. market, it decided to get out of the importing business altogether. By that time, Herty's primary interests lay elsewhere, although he continued to sit on the Dyes Advisory Committee of the Textile Alliance at the request of its president.⁴¹

Herty's mission to Europe to secure dyes in the fall of 1919 and his service on the Dyes Advisory Committees of the WTB and the Textile Alliance were, for him and everyone else interested in protecting the dye industry, only a sideshow. The real action was taking place in Washington, where Congress began to grapple with dyes protection during the late spring of 1919. It did so with the blessings of a chief executive whose traditionally low-tariff views had been modified by war-time experience. From Paris President Wilson urged Congress to give the dyestuff and related chemical industries "special consideration" in its tariff deliberations. "Our complete dependence upon German supplies before the war," the president wrote, and the close "relation between the manufacture of dyestuffs on the one hand and of explosives and poisonous gases on the other" gave the dye industry "an exceptional significance and value." Certainly America intended to join post-war disarmament efforts, but meanwhile prudence dictated the maintenance of a strong chemical industry. "[The] German chemical industry," Wilson reminded the lawmakers, "with which we will be brought into competition, was and may well be again a thoroughly knit monopoly, capable of exercising a competition of a peculiarly insidious and dangerous kind."⁴²

The Longworth bill, redrafted after consultation with leaders of the American Dyes Institute and the Chemical Foundation, went to the House Ways and Means Committee by the end of June 1919. Besides sharply higher rates and a licensing feature, it called for an eleven-member dye licensing commission to be named by the president. Import licenses would be granted for materials not obtainable domestically at a "reasonable" price and only if such importations did not interfere with the "building up of a complete and self-sustaining domestic manufacture of coal-tar products."⁴³

Herty testified before the Ways and Means Committee as part of an elaborately

planned campaign directed by Morris Poucher of the American Dyes Institute. He came away convinced that the committee would report a "suitable" bill. But during July, Chairman Joseph Fordney reopened the hearings, leading William Corwine of the American Dyes Institute to call the faithful back to Washington. "Be sure and be on deck," Corwine wrote Herty. "I understand the re-opening is on the initiative of the importers, working through Congressman J. Hampton Moore." A Republican from Philadelphia, Moore had attacked the Chemical Foundation in a speech on the House floor. That drew a sharp public response from Joseph Choate, whereupon the irritated congressman asked to have the hearings reopened so that the committee could interrogate the officers of the foundation. Garvan appeared as the principal witness and, as Herty described it in the August 1919 *JIEC*, soon turned the proceedings around. He reveled in the opportunity to make the genesis and activities of the Chemical Foundation a matter of public record and relished the chance to unmask the identities and motivations of his critics, most notably the importing house of Kuttroff, Pickhardt and Company. Once part of the American branch of Badische Anilin und Soda Fabrik, the firm had been taken over by the alien property custodian during the war. Herty had to leave before the hearings closed, but he was optimistic that a bill containing both "substantial" tariff rates and a license system would emerge from the committee.⁴⁴

It did, in the form of yet another substitute submitted by Congressman Longworth on July 31, 1919. Substantially the same as his previous effort, except that it limited the license feature to only two years and lodged licensing authority in the U.S. Tariff Commission, the new Longworth bill went to the Senate on September 29, 1919.⁴⁵

Not everyone who favored protection for dyes thought a license plan was the best way to secure it. Herty admitted that Congress was divided, "with the Democrats pulling at the license end and the Republicans sticking out for tariff." Neither seemed to grasp the fact that if the Treaty of Versailles were approved and peace proclaimed, the Trading-with-the-Enemy Act would "automatically be swept away and the flood of German dyestuffs pour in upon us." Herty confided his concerns to his friend Bernhard C. Hesse but generated little sympathy because, as Hesse saw it, the Longworth bill was "insincere and full of 'niggers' & 'jokers,' too damn much politics & not enough candor and frankness." If Herty and his friends really wanted to protect the dye industry, Hesse contended, they should "not go about it in the gumshoe fashion of that licensing part of the Longworth bill."⁴⁶

The Longworth bill was still working its way through the House of Representatives when Herty's mission to Paris removed him from the legislative scene. By the time he returned, it had been referred to the Senate Finance Committee, and action to extend the life of the War Trade Board was also before the upper house. On November 10, 1919, Pennsylvania Republican Boies Penrose, chairman of the Senate Finance Committee, introduced a resolution to continue War Trade Board control over the importation of dyes and coal-tar products until January 15, 1920, regardless of whether the Treaty of Versailles was ratified (thereby killing the WTB) before that date. Presented after a conference with Congressman Longworth, several senators, and a representative of the Manufacturing Chemists' Association, the Penrose resolution was a temporary expedient adopted on the assumption that the Longworth bill could not possibly become law before peace was proclaimed.⁴⁷

President Wilson signed the Penrose resolution and on December 2, 1919, reiterated his support for dyes protection in his annual message to Congress. Six days later, a subcommittee of the Senate Finance Committee chaired by James Watson of Indiana began hearings on the Longworth bill. Many of the witnesses, as well as their arguments, had appeared before the House Ways and Means Committee during the previous summer, but new testimony regarding more recent developments was also introduced. For example, the pro-license forces responded point by point to the hostile charges made by the textile men in their just published memorandum, and Herty, who testified on December 9 and 10, discussed his mission to Europe, emphasizing the relatively intact state of the German dyes industry, the expansion and recapitalization of German chemical and munitions plants; the Allied decision (which he considered unwise) not to restrict severely or even dismantle German chemical factories; the dyes protection laws, with license features, recently adopted by France and soon to be enacted in Britain; and the substance of his interview with the director of the Badische Anilin und Soda Fabrik at Ludwigshafen during which the German industrialist told him: "We are going to get back our business in your country, and we are going to get it through our agents." Asked who the agents were, the director responded, "Kuttroff, Pickhardt & Co."⁴⁸

Senator Watson's subcommittee hearings recessed for the holidays and did not reopen until January 12, 1920. That gave Herty a chance to expose Kuttroff, Pickhardt and Company in a January editorial titled "Kicking Up Dust." Specifically, he accused the importing firm of sending a cable to the Badische Anilin und Soda

Fabrik designed to torpedo his October 4, 1919, option to purchase dyes from the cartel. Suggesting that WTB controls over imports were about to be withdrawn, Kuttroff's November 14 cable stated, "This will enable you to maintain your position that all goods to this country outside reparation goods should come to us." In fact, the WTB planned no policy change, but the cable had the desired effect. On November 25 word came from Germany that it would be impossible to extend the agreement Herty had made with the cartel at Versailles. Herty turned the cancellation notice over to the State Department, which promptly refused to recognize it. The upshot was another cable to Herty on December 15: "Have pleasure informing you that I have succeeded prolongation option as given you fourth October. For all details are ready negotiate with your representative . . . Paris. Von Weinberg." If the December 15 cable gave von Weinberg pleasure, it was nothing compared to Herty's elation when Alien Property Custodian Garvan read the entire correspondence into the Senate subcommittee's record. As Herty summed up the account in his January editorial, "The burrowers had been at work, they had worked in vain, and the evidences of their burrowing are a part of official records. Doubtless these subterranean operations will be continued, but our prediction is that the consumers of dyestuffs, when all the facts are known to them, will turn their heads in disgust from all such earth-movers, whether they be dust-kickers, mud-flingers or burrowers."⁴⁹

Well before the subcommittee hearings resumed on January 12, 1920, a revised dye bill had been crafted to please as many elements of the Senate as possible without sacrificing the basic goal of maximum protection for the American coal-tar industry. Reported to the full Senate Finance Committee on January 30, 1920, the revised measure dropped the license feature of the Longworth bill in favor of "an embargo on the admission of dyes to this country to be administered by the Tariff Commission in accordance with such rules and regulations as the commission may adopt within the limitations imposed by this act."⁵⁰

The change came because testimony before the subcommittee indicated that the Senate would not approve a license system. Other revisions limited the embargo to three years and reduced the rates of the Longworth bill to what they had been in the existing tariff act (Underwood-Simmons) as amended in 1916. Reported almost unanimously to the full Senate on February 13, 1920, the bill "was cheerfully accepted" by the industry, whose spokesman, William Corwine, predicted that most dye consumers would be equally satisfied. Certainly Herty was pleased. Pronouncing the bill "splendid . . . stronger and better than any . . . pre-

viously proposed," he wrote Morris Poucher that it was a "tribute" to the leaders of the Dyes Institute, the members of the Senate subcommittee, and the American people. "I certainly want to come down to Washington when the measure comes up before the Senate," he added.⁵¹

Unfortunately, debate on the dye bill had to wait while the Senate grappled full-time with the peace treaty, finally rejecting it on March 19, 1920. Even that did not clear the legislative decks, and as time passed, opponents of the dye bill from opposite ends of the economic spectrum managed to marshal their forces. For example, the Free Trade League protested the "great secrecy" surrounding the origin of the dye bill, and the American Protective Tariff League charged that it had been "concocted by [special] interests." "A strange pair of bedfellows, that!" Herty sniffed.⁵²

More significant opposition came from Republican senator George Moses of New Hampshire and the press of other Senate business. Moses tried unsuccessfully to kill the embargo provision of the dye bill by amendment, and other legislation, notably the appropriations bill, took up so much time that it was May 1 before Senator Watson could schedule the dye measure for consideration. Senator Joseph Frelinghuysen of New Jersey opened the debate with a ringing speech in behalf of the dyes industry, and the opposition, led by Moses and Democrat Charles S. Thomas of Colorado, responded a few days later. Their attack turned into a filibuster which finally caused the Longworth bill to be laid aside so that other measures could be addressed before the Senate adjourned on June 5, 1920, for the presidential nominating conventions. The press announced that the Longworth bill was dead. But Herty denied it. "Delayed in passage—yes, but dead—no," he predicted in a June 1, 1920, editorial. "Time and again we have expressed the conviction that the Senate will pass the dye bill. . . . That conviction is to-day as strong as ever, for it is based upon our confidence in the common sense, the intelligence and the patriotism of the members of the United States Senate."⁵³

Herty's confidence was misplaced. The senators did indeed adjourn without acting on the dye bill, but all was not lost. Just before adjournment, they placed the bill on the Senate calendar to be called up when Congress reconvened in December. And equally important, they approved the Sundry Civil Appropriations bill, which included funds to continue the work of the War Trade Board for another year.⁵⁴

Looking ahead to the "short" session, Herty was still sure in July that the

Longworth-Watson bill, as some now called it, would secure Senate approval. The same senators would be voting on it, and he still thought their common sense, intelligence, and patriotism would lead them to vote "aye" before final adjournment in March 1921. By December 1920, however, Senator James Watson advised him that the "physical mechanics" of the situation might prevent passage of any bill affecting the chemical industries because Boies Penrose, chairman of the Senate Finance Committee, was on record against what he called "pop-gun legislation." Penrose preferred to take no action until an entirely new and comprehensive tariff measure could be prepared. Herty tried to bring pressure on Penrose through Will Hayes of the Republican National Committee and the columns of the *New York Times*. In a long letter to the editor, he reviewed the legislative history of the Longworth bill, condemned Senators Moses and Thomas for their continuing filibuster tactics, and called upon their colleagues to invoke the cloture rule. Support for the bill was bipartisan, Herty insisted, and every possible argument for and against it had already been heard. "Bring the measure to a vote," he urged. Herty also supplied the *Times* editor with copious "Notes" from which a glowing editorial endorsement of the dye bill was composed and published, along with Herty's letter, on December 21. "We all appreciate the space you gave on your editorial page to this subject," Herty wrote gratefully, "and believe that you have started a real re-awakening of public opinion on the dye question."⁵⁵

Early in 1921 Herty made another effort to influence Penrose by sending ACS president Edgar Fahs Smith to see him. Both men were Pennsylvanians, and Smith considered the senator an old friend. But Penrose had his own agenda, and the Republican-controlled Sixty-sixth Congress adjourned sine die with none of the bills designed to protect war-born chemical industries enacted into law. Nevertheless, based on Penrose's record on the "farmer's emergency tariff bill," Herty hoped to win the senator's support for chemical protection measures in the new Congress, soon to meet in special session.⁵⁶

American farmers had been particularly hard hit by the severe economic slump that struck the United States after World War I. Prices for wheat, corn, meats, and cotton dropped to half of their wartime levels, leading to large-scale protests and pressure on Congress for relief. The result was the enactment of the Emergency Tariff Act on May 27, 1921. Designed originally to last for six months, the measure was extended until finally replaced by the Fordney-McCumber Act of 1922, the general tariff revision upon which Senator Penrose had been insisting.

In the rush to aid the farmers, Congress did not overlook the coal-tar chemical industry. While the emergency tariff was before the Senate Finance Committee, Senator Henry Knox of Pennsylvania introduced an amendment to the agricultural bill which continued for six months the WTB regulations covering the importation of coal-tar chemicals and transferred the administrative machinery of the WTB section from the State Department to the Treasury Department. From the perspective of the dyes industry, the amendment was essential because Knox had also introduced a resolution to end the war; when it passed, protection for dyes would end too because the Trading-with-the-Enemy Act, under which the WTB operated, would be terminated. As Herty saw it, Knox was "simply acting in good faith" to preserve the only industry that would be affected by the peace resolution (commercial relations with Germany in everything else had already been reestablished).⁵⁷

Others saw it differently. When the Senate Finance Committee reported the Knox amendment favorably, Moses of New Hampshire became what Herty called the "high soprano" in a loud but limited "chorus of opposition." Criticizing the dye industry as a monopoly, Moses and his friends charged that the Knox amendment perpetuated war policies in peacetime and imposed on the citizens an "obnoxious and vicious system" under which a "voracious trust" could "conceal its acts of spoliation and robbery." Nevertheless, the Knox amendment, now dubbed the Dye and Chemical Control Act of 1921, passed the Senate by a substantial margin. Later, a conference committee cut the six-month protection against German dyes to three, and on May 27, 1921, President Harding signed the measure, leading Herty to comment, "A near tragedy has been averted, but the end is not yet."⁵⁸

This time, Herty's predictive powers proved all too accurate. Permanent tariff legislation designed to replace the prewar Underwood-Simmons Act would not be enacted until September 1922. Meanwhile, those favoring extraordinary protection for the new chemical industries in the form of a license system or embargo found their opponents more determined than ever. For example, Kuttroff, Pickhardt and Company circulated letters urging their customers to petition Congress against both forms of protection, and Senator William H. King of Utah called for an investigation into the lobbying tactics surrounding the recently adopted Emergency Tariff Act. As reported by the *New York World*, King and his friends wanted to know if the inclusion of the chemical and dye feature in the Emergency Tariff Act was the payoff to powerful domestic manufacturers for their part in

reducing the Republican campaign deficit; what ties existed among the Chemical Foundation, the American Dyes Institute, and domestic manufacturers of dyes and drugs; and to what extent the alleged “combination” of American manufacturers, headed by the du Ponts, controlled the licensing system of the Chemical Foundation in order to replace a German with an American monopoly. Both sides in the tariff dispute claimed to be eager for the investigation to go forward. The *World* interviewed Francis Garvan, who welcomed an inquiry even though the Chemical Foundation was not the specific target of any charge in Senator King’s resolution. But whether an investigation would actually occur, the *World* advised its readers, depended upon the leaders of the Republican party who negotiated the alleged deal between dye manufacturers and the Republican National Committee.⁵⁹

Senator King’s threat to the “Dye Lobby” had barely subsided when action developed on another front. On June 29, 1921, Ways and Means Committee chairman Joseph Fordney reported the new tariff bill, H.R. 7456, to the House. Schedule I dealt with chemicals and dyes. Drafted by a subcommittee chaired by Nicholas Longworth, Schedule I raised specific and ad valorem rates on dyes made in the United States and introduced something called “American valuation.” A departure from the usual practice, it required that ad valorem duties be set not on the basis of foreign market value but on the selling price in the United States of comparable items produced domestically. Finally, the new tariff bill provided for a three-year embargo, to be administered by the Tariff Commission, against any dyes which would compete with those made in the United States.

Even before the bill went to the House, Herty knew that Republican congressman James A. Frear of Wisconsin, a member of the Ways and Means Committee, was bitterly opposed to the chemical schedule. To find out why, he asked Victor Lehner, a chemist at the University of Wisconsin, what he knew about the congressman. Frear had launched what Herty described as “a violent attack” on the chemical and dye schedule in the new tariff bill and seemed to be “particularly enraged” against Francis Garvan. Anything Lehner could tell him about Frear, especially “his stand on various international matters during the war,” would be appreciated. But Lehner did not know much about Frear except that he had been a “close adherent” of Robert M. LaFollette for years. That in itself made him suspect in Herty’s view.⁶⁰

Congressman Frear, or at least his opinions on the pending tariff, were soon extremely well known. On July 6, 1921, the *Journal of Commerce* carried a front-

page story headed "Savage Attack on Dyes Tariff Made by Frear—Republican Member of Ways and Means Accuses Party Colleagues of Disregarding Pledges. Govt. is Creating Monopoly . . . 'Trust' Seeks Continuance of War Embargo So That High Prices May Be Maintained, 'While Consumer Pays the Bill.'" Specifically, Frear objected to the dyes schedule in the Fordney bill. He complained not because the bill was protective but because it provided for a "government created monopoly"; because the committee had heard no evidence indicating the differences between the cost of manufacture abroad and in the United States, nor had the proponents explained why synthetic indigo, made in such quantity that half was exported, should cost four times the prewar price and double the cost of production with a reasonable profit added; because during the war an American dye business of "enormous" size grew up like a "mushroom, extracting unconscionable war profits" from the public; because the dyes industry was controlled by the Chemical Foundation, a half-billion-dollar "trust," which demanded continuation of the embargo to keep prices several times higher than prewar levels without danger of competition; because attorneys for the "dye trust" drew up the law, which, besides imposing a three-year embargo against any material similar to one made here, also imposed intolerable restrictions and obstacles in the path of any who tried to import, thus compelling them to use "inferior" dyes; and finally, because the Fordney bill required the Tariff Commission, which helped frame the bill and was "beholden" to the dyes interest, to administer its regulations. Frear's attack concluded with the prediction that American textiles would be unable to compete on the world market, that millions would be "extracted" from American consumers, and that the government would lose import duties, all in the name of "National Defense," which was the justification used for the "unconscionable profits" some would continue to reap under a bill whose dye schedule was "without precedent in any tariff law ever passed by Congress."⁶¹

If Congressman Frear's arguments sound familiar, it is because many of them were supplied by C. Cyril Bennett, who briefed Senator Moses for his assault on the Longworth bill in the Sixty-sixth Congress. On July 1, 1921, Frear wrote Bennett as follows: "When I first decided to oppose the Dye Schedule I saw Senator Moses at his request, and he told me I could rely upon anything you said on that subject and that your knowledge of the Chemical Foundation would be valuable to me. In order to meet with no embarrassment I asked whom you represented and on your assurance of only yourself, I felt free to call upon you. Frankly, I say to you that Senator Moses' promise of your ability and understanding of the

general subject has been fully met, and I appreciate more than I can express your suggestions to me.”⁶²

Bennett’s suggestions may have pleased Frear, but their incorporation into his minority report on the Fordney bill, as printed in the *Journal of Commerce*, outraged Herty and Garvan. Both responded immediately at the editor’s request. Herty began by attacking Frear’s patriotism, if not his loyalty. Recalling Frear’s “stong pro-Germanism” in casting votes against tabling the McLemore resolutions, against the declaration of war, and against the draft, Herty commented, “It is not surprising . . . that with the war over his predilections again exhibit themselves.” Next, Herty argued that Frear had provided no evidence of monopoly in the dyes industry, and finally, he predicted that Frear’s “outburst” would be ignored by the House. It was clear from reading the chemical section of the Fordney bill, Herty declared, that Congress was impressed with the importance to the nation of the chemical industries. It would see to it that no nation with Germany’s commercial record would have a voice, “no matter how camouflaged, in the determination of our national policy.”⁶³

When the Fordney bill went before the House for final passage on July 21, 1921, Congressman Frear moved to strike out the embargo provision, and the motion carried, 209 to 193. Herty was devastated. To Edgar Fahs Smith, president of the ACS and the willing if somewhat unsophisticated “official voice” of the society, Herty confessed that the news from Washington was “almost paralyzing. I feel as if someone had hit me a hard lick right between the eyes . . . I am staggering from the effect of it and cannot get my bearings.”⁶⁴

For the next several days Herty and the pro-embargo forces tried to regroup as the Senate Finance Committee prepared to take up the Fordney bill. To General Amos Fries of the Chemical Warfare Service, whose shrill wire to Herty asked, “Is not present crisis in dye bill a threat to whole chemical profession?” Herty replied affirmatively but reassuringly. He intended to contact ACS president Edgar Fahs Smith and secretary Charles Parsons at once to plan society strategy for the coming battle before the Senate Finance Committee. As Herty saw it, the situation called for extension of the powers of the War Trade Board beyond August 28, 1921, when the Emergency Tariff lapsed, until the pending bill could be adopted, and restoration of the embargo feature to the House bill by the Senate Finance Committee. Meanwhile, he had some marching orders for General Fries, which involved “arousing the War Department and through it the Administration.” General Fries should approach Secretary of War John W.

Weeks. If Weeks could get the president's support, surely Secretary of the Navy Edwin Denby would go along and that, in Herty's opinion, might count for more than any number of letters from chemists. Someone else whose support would mean a great deal was Herbert Hoover, the secretary of commerce.⁶⁵

Fries acted at once. By August 2, 1921, the day before the Senate Finance Committee opened hearings on the dyes section of the Fordney bill, he sent Herty copies of letters written by the secretaries of war and navy to Boies Penrose. He had visited Hoover, who offered to sign a letter written by Fries urging the Senate to continue the "war embargo" until Congress adopted the permanent tariff law. And he had talked to the president's personal physician, who agreed to discuss the matter with Harding. Later, Fries secured permission from Penrose to make the Weeks and Denby letters public.⁶⁶

On the American Chemical Society front the plan called for Smith to appear before the Senate Finance Committee to argue for restoring the embargo to the Fordney bill. Herty supplied him with reference materials and arguments designed to explain to the senators why simple protection was not enough to attract the capital necessary to "round out the dyes industry." He counted on Smith to make a "good show" because he was not part of the industry, had no ax to grind, and was highly respected for his experience and leadership in the ACS. But Smith never got the chance to influence the committee. His mail to Senator Penrose was answered with a form letter, and a secretary tried to discourage him from seeking a place on the hearings schedule. Smith went to Washington anyway, was told to wait in an anteroom, and was finally informed that the committee had adjourned for the day. The only persons to be heard were General Amos Fries for the restoration of the embargo and H. E. Metz, a former importer who switched to dyes manufacturing during the war but who now favored the removal of all restrictions on dye imports.⁶⁷

Smith and ACS secretary Charles Parsons also went to see Secretary Hoover, who assured them that chemistry would be protected. "But I thought I detected in his remarks a feeling against the Embargo," Smith reported to Herty. The Senate "cloakroom talk" left him with the same impression. "I came away very discouraged," the ACS president added. "I understand they [the senators] were going to have Metz on again this morning." Herty tried to cajole Smith into returning to Washington, but Smith insisted that he could not add anything to their case. Meanwhile, he would continue to work "undercover" through the one friend he had on the committee who was "perfectly familiar" with all his thoughts.⁶⁸

Smith was more sensitive than Herty to the mood that seemed to be developing

in and out of Congress on the dyes protection question. No one opposed the need to raise tariff rates, but a growing number questioned the standard arguments of embargo proponents. And many seemed disposed to believe that a dyes monopoly was in the making, especially after a series of mergers produced two chemical giants, Union Carbide and Carbon and Allied Chemical and Dye Company. One Herty correspondent who favored the embargo thought some of its advocates had been too heavy-handed in lobbying for it. "Beyond question of a doubt," he wrote Herty just before hearings began in the Senate Finance Committee, "one man from Wilmington should be asked to stay home as outside opinion seems to be absolutely a unit on this point." Newspaper coverage also had some impact. Long excerpts from Congressman Frear's fulminations against the embargo and the Chemical Foundation, which he insisted should be investigated by the attorney general, circulated throughout the country, and some papers, notably the Hearst chain, supported Frear editorially. Yet, when he considered who opposed the embargo (all of the importers, the Hearst papers, the *Nation*, and Congressman Frear), Herty could not understand why it was so hard to build congressional support for it.⁶⁹

Meanwhile, the American Chemical Society launched a major effort to influence Congress. President Edgar Fahs Smith sent letters to every member of the House and Senate, soliciting support for the embargo. And after consultation with Herty, he sent a long summary of the embargo's legislative history and the arguments for its adoption to all members of the society, urging each one to write his or her congressman at once. At the same time, Herty and Charles Parsons targeted key senators on the Finance Committee for special letters and wires. Some of the reaction must have been disheartening. Reed Smoot of Utah strongly supported higher tariffs for dyes and everything else on principle. But he was unalterably opposed to an embargo. He voted for it in the Emergency Tariff Act only because existing schedules set in 1916 were too low to protect the industry until a new tariff could be worked out. Smoot, along with Senator Watson of Indiana and Congressmen Longworth and Frear, was appointed to a Republican joint subcommittee with instructions to work out a compromise that would protect the coal-tar industry and, at the same time, maintain party unity and achieve a passing vote in the Senate. Considering the subcommittee's makeup, Herty had few illusions. "If Mr. Longworth can succeed in saving the embargo for which he has so consistently fought," Herty commented in the September 1921 *JIEC*, "his efforts should entitle him to be considered the legislative genius of the age."⁷⁰

At least one of Herty's two legislative goals was achieved in 1921, when Con-

gress acted to extend the emergency tariff, and with it the embargo, until the permanent tariff measure could be enacted. That would not occur for almost a year. Meanwhile, the anti-embargo forces were gaining ground. Cyril Bennett, whom Senator George Moses of New Hampshire introduced to Congressman James Frear, continued to work with Moses to defeat the embargo. He also did research to find negative information about the Chemical Foundation for use by Moses, Frear, and other lawmakers, and he prepared rebuttals to the well-reported speeches delivered by Joseph Choate and Francis Garvan. On December 8, 1921, anti-embargo forces won a critical victory when the Senate passed a resolution calling for an investigation of an alleged monopoly in the dye industry. Introduced by Senator William H. King of Utah, the resolution also called for a thorough inquiry into what King labeled "deceptive propaganda" produced by the American Dyes Institute, the Chemical Foundation, and others. Hearings before a Senate judiciary subcommittee chaired by Senator Samuel Shortridge of California were scheduled for February 1922, which delighted Bennett. On December 12, 1921, he congratulated Moses "for [having secured] an investigation of this bunch of desperadoes. . . . [If] no mistakes are made, it should end in the complete routing of those who have been opposing you."⁷¹

The American Chemical Society also attracted Senator King's attention. Referring to the huge amount of pro-embargo mail generated by President Smith's plea that ACS members write their lawmakers, Senator King declared on November 8, 1921, "If the American Chemical Society can be prostituted to such an ignoble purpose, then it is time that the official personnel of the organization should be changed." He thought it was a "pitiable exhibition" to see President Smith "lending himself to a propaganda so untruthful, so utterly selfish."⁷²

Herty and H. E. Howe, an old friend and his successor as editor of the *JIEC*, were outraged. Both men thought a fitting response to Senator King would be to reelect President Smith, and that is what they urged fellow chemists to do, despite the view of some who thought the political situation in Washington should not influence the society's internal affairs. Clearly Smith sensed the tension when he asked Herty on December 11, 1921, "Is there harmony or discord in the American Chemical Society?" But Herty dismissed his concerns. "The only note that I have had is from Jimmie Norris at the M.I.T., complaining that the Society was getting too much into politics." Herty thought Norris was "shortsighted" if, given the "crisis" in Washington and the consistently strong resolutions passed by the society, he thought the membership should withdraw its support for mea-

tures that would ensure the future of chemistry in America. "The enemy is in the saddle," Herty exhorted. "We cannot afford to be wandering about meadows picking daisies."⁷³

While Norris was "wandering about meadows," Herty moved on to greener pastures. On October 31, 1921, he resigned his editorship to become the first president of the newly organized Synthetic Organic Chemicals Manufacturers' Association. The announcement caught many of his friends in the society by surprise. Arthur Little felt a "sense of bereavement," and discovering that Lois Woodford was leaving too simply added "calamity to bereavement." "You have every reason to be proud of the progress that the *Journal* has made under your direction," Little wrote Herty on November 10, 1921. "You have made it the best thing of its kind in the world." A. M. Comey, another good friend from Boston, seconded Little's remarks: "The fearless and uncompromising stand which you have taken on so many vital matters," he commented, "has been of untold value to the chemists of the country, and not only to the chemists but to the country itself." And J. W. Beckman of San Francisco wrote: "I feel you have done monumental work for the Chemical Industry in the United States. The best monument that can be raised to your honor, you have raised yourself in the editorials and in the handling of the *Journal of Industrial and Engineering Chemistry*."⁷⁴

Such sentiments were typical, and Herty was deeply touched by them. "I believe you can realize without my going into detail here," he wrote Edgar Fahs Smith in a personal note, "all of the feelings that have been tugging at my heart-strings." But he had decided that he could "serve America more fully" in the new position. A letter to the *Manufacturers' Record*, intended for publication, was more explicit. As the *Record* was well aware, Herty was a longtime advocate of a "self-sustaining" American chemical industry that would provide the country with both economic independence and national security. Until recently, most public interest had centered on dyes. But dyes were only part of the story; the new organization he would head would bring all of the synthetic organic chemical industries together in one organization. Herty had given up his editorial position "with great regret," but the members of the new organization had convinced him that they needed a president with no previous connection to any of the industries represented. They had also convinced him that his editorial work in arousing public opinion and stimulating interest in chemistry among university students had progressed to the point that someone else could carry it forward. What was needed now, the manufacturers argued, was the sound establishment of their

industry so that the students being trained would have a place to practice their profession.⁷⁵

During the five years of his editorial tenure (1917–21) Charles Herty played a major role in the ongoing campaign to promote and popularize chemistry among every element of American society. Part of a group within the ACS which believed firmly in cooperation between the academy and industry, Herty also wanted to expand the influence of technical men on government policy, a goal that he was convinced could be achieved only with the support of a “chemically conscious” public. The war gave Herty and those who shared his beliefs their opportunity. Its initial impact on the domestic economy, the introduction of new and terrible chemical weapons, and the government’s obvious dependence on the technical expertise of men drawn from academia and industry made the public receptive to the message that Herty and many others were sending: first, that the chemical industry was a key industry and that a fully developed and “self-contained” chemical industry was indispensable to America’s future economic welfare and national security; and second, that until America’s chemical industry was strong enough to meet and best foreign competition, Congress would have to provide it with extraordinary protection in the form of a license system or an embargo.

In the *Journal of Industrial and Engineering Chemistry* Herty had the perfect soapbox for the exposition of his ideas, and he mounted it immediately. For example, in his very first issue, January 1917, he announced that “COOPERATION” would be the watchword of his editorial office. In that spirit he offered the *Journal’s* services as a coordinating agency for the developing chemical industries, particularly the coal-tar chemical industries; he urged the appointment of a chemist to the newly created U.S. Tariff Commission; he addressed an “Open Letter” to Congress, pressing for the repair of a “defect” in the existing tariff law, and he welcomed the creation of the ACS Press and Publicity Committee, which he predicted would “continue the task of effectively bringing together the public and the chemist.”⁷⁶

All of these positions were in line with Herty’s commission as the first full-time editor of the *JIEC*. The charge from the ACS directors had been to broaden the *Journal’s* focus, to reach beyond the society, and to speak out not only on “purely chemical matters” but on anything that affected “the relations of the chemical profession to great public or national problems.” In the name of broadening the *Journal’s* focus and “reaching out,” Herty introduced new features such as the Washington correspondent’s monthly newsletter, the regular reports of foreign

chemical correspondents, and the “symposium” wherein an entire issue was devoted to a single topic. Other departments of the *Journal* were upgraded and expanded. But above all, Herty concentrated on developing the editorial and news functions of the publication. Describing himself as the “mouthpiece” of organized chemistry, he used the editorial columns during and after the war to promote such causes as the National Exposition of Chemical Industries, an annual event usually held in New York; the wartime stockpiling and conservation of such vital materials as nitrates and platinum; deferment for chemists whose training made them more useful in the government laboratory, war plant, or classroom; advanced chemical education for returning veterans; tariff protection for war-born industries; the establishment and continuation of the Chemical Warfare Service as a separate branch of the United States Army; and the chemical disarmament of Germany.⁷⁷

In his last editorial for the *JIEC* Herty surveyed his record. As of December 1921, a chemist nominated by the ACS served as an expert adviser to the Tariff Commission; vital materials had been stockpiled or commandeered during the war; American dyes and scientific equipment were not yet “adequately” protected, but pending legislation and the patriotic support of American chemists for home manufactures made Herty optimistic that they soon would be; a proposition for German chemical disarmament would be introduced at the Washington Arms Limitation Conference; and the Chemical Warfare Service was still alive, despite misguided efforts to dismantle, smother, or starve it to death. Above all, Herty was pleased that chemists had finally waked up to their responsibilities to instruct the public about the importance of chemistry in every phase of life. “That is the real miracle of the last five years,” he declared in his valedictory. Through the daily press, magazines, popular books on chemistry, the chemical expositions, public speeches, and conversations, chemists had taken their profession to the people. “The response . . . has been fine,” Herty concluded, “and America is better off to-day because of it all—and that is the main point.”⁷⁸

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Herty and the Synthetic Organic Chemicals Manufacturers' Association: Stabilizing an Industry

On September 15, 1921, Charles Herty addressed a New York meeting of some eighty manufacturers of synthetic organic chemicals, urging them to act cooperatively to overcome the many problems confronting their industry. In response, the participants named a committee to confer with the leadership of the American Dyes Institute about expanding its membership to take in “all branches of the organic chemical industry . . . be they [manufacturers of] dyes, perfumes, photographic chemicals, medicinals, or whatnot.”¹

Herty was not sure how much actual progress had been made until October 28, 1921, when he went to Washington for another meeting with the manufacturers. During the evening they formally created the Synthetic Organic Chemicals Manufacturers' Association, selecting him as their president by unanimous vote. At once he told the presiding officer that he could not accept, but the manufacturers would not be put off. Finally, convinced by their eloquence that he could do more for chemistry in America as president of SOCMA than as an editor, Herty agreed to leave the *Journal of Industrial and Engineering Chemistry*.²

ACS president Edgar Fahs Smith received Herty's resignation with genuine regret. “I don't know what we are going to do without you,” he wrote. “I feel very sad over the whole thing.” Herty appreciated the sentiment, but as he explained

to a fellow editor, the new job presented challenges for which the manufacturers thought he was especially well qualified. They wanted someone who could arouse public opinion, develop enthusiasm among university personnel, work closely with manufacturers, but at the same time had no previous connection "with any individual interest or any particular part of the field." Herty's record as president of the ACS and editor of the *JIEC*, added to the fact that he held no stock in any firm related to the chemical industry, made him a natural choice for the presidency of SOCMA.³

The ACS directors' selection of Harrison E. Howe as Herty's editorial successor was just as natural. Herty was delighted and promptly offered Howe his congratulations and his help during the period of transition. The only thing that disturbed him was the news from Charles Parsons that the *Journal* would be moved to Washington. Herty thought it should remain in New York, but Parsons and Howe prevailed; the *Journal* found new quarters in northwest Washington, and President Herty of the Synthetic Organic Chemicals Manufacturers' Association, together with his longtime secretary, Lois Woodford, remained at the old address in the Metropolitan Tower.⁴

Like some two thousand other trade associations operating in 1921, the Synthetic Organic Chemicals Manufacturers' Association embodied many of the ideas championed by the new secretary of commerce, Herbert Hoover. A mining engineer and successful businessman before entering public service, Hoover served as administrator of the Belgian Relief Fund in 1914 and as food administrator in the Wilson administration during World War I. Those experiences, together with a Quaker upbringing that stressed the work ethic and mutual help, seem to have shaped the idea of voluntary cooperation he brought to the Commerce Department and promoted in government-business relations. Hoover wanted to expand American business at home and abroad, and he wanted to make smaller businesses as efficient and profitable as their larger counterparts. To that end, he enlarged the operations of the Bureau of Foreign and Domestic Commerce, assigning commercial attachés to American embassies with the aim of increasing foreign orders on American firms; he supported higher tariffs to protect the domestic market; he urged business and industry to use the government's scientific services and its expertise in management, waste elimination, transportation, and the arbitration of labor disputes; and above all, he advocated the formation of voluntary trade associations. In the name of business "stabilization" and to overcome the inherent waste of competition, firms in a particular

field such as synthetic organic chemicals were encouraged to establish codes of ethics, to standardize product quality, and to gather and exchange information on such issues as sales, demand, costs of production, and prices. The advantages for member firms, if not necessarily for consumers, were obvious, but there were drawbacks as well. Members of "voluntary" associations did not always play by the rules, and the courts, until 1925, often cracked down on practices that smacked of price-fixing or monopoly.⁵

As outlined in the constitution adopted by the Synthetic Organic Chemicals Manufacturers' Association, President Herty's duties required him "to advance the science of organic chemistry by encouraging the manufacture in the United States of all kinds of organic chemicals; to cooperate with the various agencies of the government of the United States in its efforts to develop, improve and render serviceable a complete organic chemical industry; to promote cordial relations between American firms . . . to disseminate information; to promote the highest scientific and business standards; [and] to take whatever action as is proper for the establishment and perpetuation of the organic chemical independence of the United States." Specifically that meant that Herty chaired SOCMA's legislative committee and served as an ad hoc member of all other committees; gathered and analyzed statistical data from industry sources and government bureaus; issued bulletins to the membership "as matters of importance arose"; represented the organization in Washington and in hearings before the United States Customs Bureau and its Board of Appraisers; produced "educational" pamphlets, exhibits, and other public relations materials; arranged for legal aid; gave speeches; and presided over general and sectional meetings of the organization.⁶

In 1922 much of Herty's time was spent in Washington while the Fordney-McCumber tariff bill made its way through the Senate. Later he devoted months to the tedious details of overseeing the industry's interests before the Board of Appraisers, whose function it was to devise and administer regulations based on relevant sections of the Fordney law. But the attention of everyone interested in the coal-tar chemical industry during the first six months of 1922 was monopolized by twin threats mounted against the American Dyes Institute and the Chemical Foundation from the Senate and the Justice Department. The first attack began in December 1921, when the Senate passed a resolution proposed months earlier by Senator William King of Utah, which called for an investigation of an alleged monopoly in the dyes and chemical industry. Senator Joseph Frelinghuysen of New Jersey broadened the inquiry to include the activities of dye

importers, and hearings began on February 20, 1922, before a Senate judiciary subcommittee chaired by Samuel Shortridge of California. They lasted until the middle of May, producing almost fifteen hundred pages of printed testimony.

To prepare for the Shortridge hearings, Herty combed his files, going back to October 1914 and the Hill bill to help refute the charges against the dyes industry by Senator Moses and others. Used to good effect, particularly by Francis Garvan and A. M. Patterson, president of the Textile Alliance, the documentation Herty supplied helped to discredit the testimony of one of the principal witnesses for the importers, William Paul Pickhardt, of Kuttroff, Pickhardt and Company. Garvan also used his appearance to review the entire history of the Chemical Foundation, welcoming the opportunity, as he had in previous investigations, to make the foundation's records available to the committee and the public. He also insisted that "the people who make these charges" testify under oath and that the sources of their testimony be traced, confident that "each and every one . . . will lead direct to Germany and the 'I.G.' and its support and sustenance by the German Government."⁷

Well before the Shortridge hearings ended, Herty and other members of SOCMA appeared relatively confident about the outcome. Reporting from Washington to the first annual meeting of SOCMA, then going on in New York, Herty declared on March 31, 1922, that the investigation of "our industry" by the Shortridge committee had "cleared the atmosphere completely," allowing it to "stand forth today as it always should have—worthy, and deserving of the full respect of all good Americans." That conclusion was seconded by R. C. Jeffcott of Calco Chemical Company, a member of the SOCMA board of governors. He had just returned from Washington, where members of SOCMA, the American Dyes Institute, and representatives of "individual" companies had been testifying before the subcommittee almost daily. "Not one grain" of evidence had been produced to support the charge of monopoly, Jeffcott declared. Rather, the opposition had been discredited. But the investigation had been worthwhile because it allowed the industry to put the facts on record. The net results were deeper understanding of the industry and more sympathy for it from Congress, which now seemed to realize the need to protect and "stabilize" it. Congress, Jeffcott predicted, would give them more protection as a result of the investigation than they could have gotten without it.⁸

That remained to be seen. The Shortridge hearings ended without producing a formal report, which the dye interests interpreted as a victory. But trouble was

developing on another front. During the spring of 1922, the Chemical Foundation sued several chemical companies to recover royalties on dyes manufactured under licenses granted to the companies by the Federal Trade Commission, the agency that controlled seized German patents before they were purchased by the Chemical Foundation. The royalties were held in trust by the United States Treasury, and the only way the foundation could obtain them was through legal action against the licensees. Meanwhile, word circulated in Washington that the government intended to challenge the Chemical Foundation's ownership of the patents. On July 1, 1922, President Harding confirmed the rumors by ordering his alien property custodian, Thomas Miller, to demand the return of all patents, trademarks, and copyrights assigned to the foundation during the previous administration. Miller issued his demand to the Chemical Foundation on July 8, and a week later Francis Garvan responded, denying the government's claim of ownership and refusing to comply. The upshot was a civil suit against the Chemical Foundation filed in the United States District Court in Wilmington, Delaware, on September 8, 1922.

For SOCMA, the ACS, and everyone who believed in a chemically independent America, the government's attack on the Chemical Foundation was a terrible blow. Well before the suit was actually filed, President Herty of SOCMA was directed by his board of governors to seek an interview with President Harding to explain just how disastrous his action against the Chemical Foundation would be for the synthetic organic chemicals industry. The president saw Herty and a delegation from SOCMA on July 14, which was more than he was willing to do for the ACS. When a select committee of ten distinguished chemists asked for an appointment, it was turned down with the excuse that the president was too busy. That led Herty's successor at the *JIEC*, H. E. Howe, to publish a scathing editorial on August 1, 1922, which the ACS News Service made available to the popular press. Among other things, it suggested that the president did not realize what he was doing when he moved against the foundation, that he had failed to consult chemists, manufacturers, or professors of medicine before acting, and that he had been unduly influenced by the "misinformed" or, worse still, the Germans. The Chemical Foundation, Howe declared, was the "nucleus of our organic chemical industry." Through its licensing program, over \$100 million had been invested by manufacturers, despite the serious postwar depression. Yet the administration seemed prepared to sacrifice the industry. "What . . . is behind all this uproar?" Howe asked, proceeding to answer his own question. It was poli-

tics. Harding's letter to the alien property custodian, he noted, had been "nicely timed" to coincide with the fight for the embargo feature of the Fordney tariff bill then being waged in the Senate.⁹

The government's announced intention to move against the Chemical Foundation did indeed come at a crucial moment in the long struggle to secure what the chemical industry considered necessary protection for the coal-tar products industry and what their critics called special privilege. Late in December 1921 SOCMA had budgeted \$5,000 to \$10,000 for "legislative action" in the coming year. The money was to be used to cover expenses incurred by Herty, his secretary, and other SOCMA personnel who would have to spend much of their time in Washington while the Shortridge hearings were in progress and during Senate consideration of the pending Fordney tariff bill. In late January 1922 Herty did not think all the money would be needed. But a month later SOCMA's board of governors had to call on some of the larger firms to pay their assessments in advance so it could meet current expenses.

Herty was so busy during the spring of 1922 that he rarely visited New York. Besides keeping watch on the Shortridge hearings, he and other representatives of SOCMA had to make themselves constantly available to members of the Senate Finance Committee. On March 31, 1922, Herty wired SOCMA members, then assembled in New York for their first annual meeting, that he would stay in Washington until the Senate Finance Committee acted. Senator Frelinghuysen "is making a glorious fight for us," Herty reported. He was confident that the senator could bring the full committee around. Specifically, what Herty and SOCMA wanted written into the Fordney bill was a one-year extension of the emergency tariff (or Dye and Chemical Control Act), which barred the importation of synthetic organic chemicals produced in the United States. When the Finance Committee agreed to the extension, Herty was ecstatic but foes of the dyes interests were not. Even before the bill was reported, Senator King of Utah demanded another investigation, this time into what he called the Finance Committee's "Star Chamber" proceedings from which the public, the press, and even Democratic members had been excluded. In a newspaper interview on April 1, 1922, King charged that "paid spokesmen and lobbyists of the dyestuffs and other 'big interests'" had been "thronging the . . . corridors" and "buttonholing" senators for months. He thought their behavior constituted a scandal and promised that it would be "thoroughly ventilated" before the full Senate acted.¹⁰

King was as good as his word. He continued to hammer the chemical indus-

tries, and Senator Joseph Frelinghuysen, among others, continued to rebut King's allegations with materials supplied largely by Herty. Much of the argument dealt with the dollar value of the industry and the amount of growth it had undergone since 1914. King cited its current volume, noted that its phenomenal expansion had occurred under the moderate Underwood tariff, and denied any necessity for an embargo feature in the new tariff. The rebuttal challenged King's statistics, pointed to lapses in his use of chemical terminology, disputed his description of conditions in postwar Germany, and impugned his patriotism by demanding, "Is the Senator solicitous for the American chemical manufacturing industries or the German industries?"¹¹

The debate was not restricted to the Senate floor. Pamphlets, circular letters, questionnaires, magazine articles, and resolutions adopted by interested groups filled the mails and the media. Herty's principal contribution consisted of a public statement listing average annual prices of some sixty-seven American dyes from January 1, 1917, to April 27, 1922, showing the percentage of price decreases as they occurred. His "evident purpose," sneered the *American Economist*, official organ of the American Protective Tariff League, was to suggest to the public that dye prices had dropped because of the embargo. The conclusion was unwarranted. All the figures showed was that domestic competition had materially lowered prices, which no one disputed. "But the embargo does away with foreign competition," the magazine continued, and that "enables domestic producers to charge such prices as they may be able to agree upon." Nor did Herty's use of indigo to prove his point that domestic competition and "efficiency" could bring prices down satisfy the editor. Why compare its 1917 price of \$1.42 with the current price of thirty cents? Why not use the prewar price of sixteen or seventeen cents? Indigo was not a war industry, the *Economist* insisted. Its manufacture had been well established, without extraordinary protection, before the war. But now it was covered by the embargo, and its current price was 50 percent higher than it ought to be. That in itself proved the existence of a domestic monopoly. "We admit that Dr. Herty is very adroit," the editor concluded, "but he has, in this instance, failed to establish his point."¹²

It was in this atmosphere of increasing shrillness that President Harding ordered the alien property custodian to reclaim the patents held by the Chemical Foundation. The action seemed to galvanize forces on both sides of the embargo issue. Certainly Herty was never busier. On July 14, the day he went to see President Harding to protest the order to the foundation, Senator George Moses delivered

another broadside against the chemical industries, and the next day his colleagues voted thirty-eight to thirty-two to drop the embargo provision from the Fordney bill. How many votes were swayed by the senator's forensic powers and how many by some Republican members' unwillingness to defy the president is a question. Either way it was a setback and Herty, SOCMA, the ACS, the Chemical Foundation, and their friends prepared to fight back. On July 24, 1922, Herty convened a special meeting of the SOCMA board of governors to shape battle plans. Two committees were appointed. The first was directed to frame a reply to Senator Moses, and the second was sent to Washington to "straighten out" Republican senators who voted against the extension of the embargo. Meanwhile, *JIEC* editor H. E. Howe urged the fifteen thousand members of the ACS to get busy. They had to save their profession from the "snake in the grass," Germany, which was continuing the war despite the treaty. And she was carrying it on at the highest levels of the American government, which had proved to be "the weakest line of defense." Most of Howe's fire was directed at President Harding's action against the Chemical Foundation, but he saved a little ammunition for a warning shot at the Senate. The embargo issue was not dead, he declared. It would be brought up again when amendments to the Fordney bill were offered on final passage. "So speak up!" he urged his fellow chemists. The fight would require the help of every member. "Can we count on you?"¹³

The campaign to blitz the senators went on for the rest of the summer, and whether in Washington or New York Herty supplied encouragement and arguments for those willing to lobby their lawmakers. Increasingly, he stressed the importance of the synthetic organic chemical industry to medicine as well as the national security and economic independence arguments for retention of the embargo. Herty thought the "splendid editorial" in the July 22 issue of the *Journal of the American Medical Association* hit just the right note. Entitled "Is German Domination of Drugs Again Imminent?" it proved to be very effective with those senators to whom Herty had sent it. Always courteous, Herty thanked the *Journal's* editor for his support. "We still have a fighting chance," he reported on August 9, 1922, urging the medical profession to make its considerable influence felt in Washington.¹⁴

By mid-August it was clear that the Senate would not restore the embargo to the Fordney bill although it had no qualms about setting extremely high duties on synthetic organic chemicals in the name of equalizing the difference in the cost of production between the foreign and domestic product. Senator Joseph

Ransdell of Louisiana told one of Herty's operatives working the Senate corridors that he could get all the "protection" he wanted, even 1,000 percent. But Ransdell doubted that his colleagues would approve the embargo. His assessment was accurate. On August 17, 1922, the senators accepted the Bursum amendment providing duties of 75 percent ad valorem and 10.5 cents specific per pound on intermediates and 90 percent ad valorem and 10.5 cents specific per pound on finished products. Furthermore, the rates would be based on the American selling price for all products that competed with those made in the United States. The Fordney bill went to conference on August 22, and Herty went on a much needed vacation through the Berkshires and the Adirondacks with his wife and daughter. To his elder son, Holmes, he admitted that the "last stage" of the Senate battle had been a "severe drain on my vitality." Nevertheless, he was looking to the future. "If the Conference Committee agrees to the Senate program," he added, "I think we will be ready to go ahead with the expansion of the industry."¹⁵

The long struggle was not quite over. When the conference committee reported the Fordney-McCumber Tariff on September 13, duties on finished coal-tar products had been reduced from 90 to 60 percent ad valorem, foreign valuation replaced American valuation, and a one-year embargo on competing foreign products had been put back in the bill. Furthermore, the president was authorized to extend the embargo for another year. The Senate approved, but the House balked and the bill went back to conference. Two days later, the House accepted the second conference report, which set the duty on finished dyes that competed with domestic products at 60 percent ad valorem, American valuation, and seven cents a pound. For intermediates the rate was 55 percent and seven cents a pound. After two years the specific rates would remain, but ad valorem duties would be reduced to 45 percent on finished goods and 40 percent on intermediates. On September 19 the Senate agreed, and President Harding signed the bill three days later.¹⁶

The embargo feature had been lost, but the coal-tar products industry enjoyed a measure of protection accorded outright to no other class of imports by the Fordney bill: American valuation. That is, ad valorem rates were based on the American selling price of a comparable article made in the United States. If no comparable article existed, the rates were based on the "United States value" (the value of the imported article in the United States, less duty, transportation, and other charges). Furthermore, on the advice of the Tariff Commission, the president was authorized to raise or lower rates by 50 percent. This was done in the

name of equalizing the differences in costs of production between the United States and competing foreign countries.

Historians of chemistry and tariff policy Williams Haynes and F. W. Taussig have differed substantially in appraising the Fordney-McCumber Act. Haynes called its enactment "evidence of new national recognition of the economic and military importance of chemical products," whereas Taussig thought the measure sacrificed sound economics to partisan politics. More recently, L. F. Haber, a British historian of chemistry, found that the law accomplished what the most ardent proponents of the dyes industries wanted it to do: "Imports of synthetic indigo and of alizarin fell to negligible levels within a few years, and the quantity of dyestuffs of all sorts that were still imported was maintained at about 2000 tons a year." More important, the law "benefitted the entire organic chemicals section of the industry, and so contributed to its rapid development in the inter-war years." What it did to other sectors of the economy and to international trade, however, has made it the target of innumerable critics from that day to this.¹⁷

However clear the long-term effects of the Fordney-McCumber Tariff may appear to historians, its immediate impact caused Herty and the SOCMA membership considerable concern. Only three days after President Harding signed the new law, SOCMA'S board of governors voted to create a seven-man tariff committee, chaired by Herty, to review the new rates, point out defects in the law, and investigate the possibility of support in the executive and legislative branches of government for a substitute measure. On October 2, 1922, Herty sent out a circular letter asking all members to indicate how the new tariff had affected their business. Reaction was mixed. Some were satisfied; one thought it was a "disaster," and some thought it was too early to tell. Perplexed, Herty commented to a friend, "I am frank to say that these replies tend to complicate rather than simplify the situation. . . . It may be that the final decision will be to let matters ride." That was what happened. At SOCMA'S annual meeting on December 19, 1922, Herty reported "increasing cordiality" between the organization and various government bureaus. Administrative departments often gave importers the benefit of the doubt under the old system, but now they were inclined to favor American manufacturers. Congress was not likely to "tinker" with the tariff in the next session, and in any case it was providing the industry with adequate protection in its present form.¹⁸

SOCMA'S decision to live with the Fordney-McCumber Tariff did not mean that all went smoothly thereafter. Difficulties arose with importers over how to

interpret and apply those sections of the tariff act which had to do with American valuation, and an importer accused an American manufacturer of listing inflated selling prices with the United States Board of Appraisers with the aim of driving the cost of the comparable foreign product so high that American producers would have the home market all to themselves.

Ultimately the importers took their complaints to the United States Court of Customs Appeals in Washington, contending that the American valuation provision was "not practicable" and unconstitutional as well. But they appear to have been unsuccessful. SOCMA retained a firm of attorneys whose leading partner formerly sat on the Customs Appraisal Court, as well as a "technical adviser" formerly with the Bureau of Foreign and Domestic Commerce, and managed to turn back all challenges. Speaking at the annual meeting in December 1924, Herty reported: "We can boast the proud record of never yet having legally contested the decisions of the Appraiser; on the other hand we have constantly fought for the rights given us under the present Tariff Act, and again we have a record of success in every case."¹⁹

Herty hardly had time to settle down to the routine of overseeing a fledgling trade association when another threat appeared to be lurking on the horizon. This time the horizon lay somewhat farther away, in the Ruhr region of Germany, which French and Belgian forces occupied when Germany failed to meet its reparations obligations under the Treaty of Versailles. In the spring of 1924 a committee of experts headed by the American financier Charles G. Dawes produced a more realistic program for reparations payments which did not end the problems surrounding reparations but did mark the beginning of a new era in postwar international relations.²⁰

During the summer of 1923 Herty was concerned with how the French intended to dispose of German dyes seized during the occupation. In a letter of introduction for Frederick Breithut, a newly appointed chemical trade commissioner of the U.S. Department of Commerce, to a French friend, Jean Girard, secretary of the Société de Chimie et Industrie, Herty asked the Frenchman what quantity of dyes had been seized and whether a policy for distribution had been announced. By August 4 Breithut was in Paris and Herty was urging him to see various prominent Frenchmen and to "express our hope and confidence that surplus seized dyes which are competitive with American products will be sold at *not lower* than German export prices." Otherwise, Herty cautioned, their sale in the United States would be "disastrous" for the American industry, especially

the smaller producers. He followed that letter up by conferring with an economic adviser to the State Department and submitting an explanatory letter to the department urging it to make "appropriate remonstrances" to the French government. The State Department agreed to look into the matter, and Herty thanked an assistant secretary and the economic adviser for relieving his anxiety. In Paris, meanwhile, Breithut made contact with most of the French officials Herty had asked him to see, as well as with various Americans visiting Europe on chemical business. By August 22, 1923, he was satisfied that the American industry had nothing to fear and cabled Herty to that effect. Only fifty-four hundred tons of material had been seized, of which some three thousand tons would be sold on the world market. Furthermore, the price was expected to be so high that it could not have an adverse effect on American producers.²¹

Herty's exchanges with Breithut, the Commerce Department, and the State Department are interesting because they indicate that Herty usually found out what Breithut was reporting to his superiors before they did. Breithut taught chemistry at the City College of New York before the war, served as a major in the Chemical Warfare Service, and later chaired the chemical division of the War Trade Board. In February 1922, SOCMA employed him on a month-to-month basis to help Herty prepare materials for the Shortridge hearings, and three months later, with Herty's help, he was appointed a chemical trade commissioner by the Department of Commerce. The position grew out of Secretary Herbert Hoover's insistence that the Commerce Department play a part in every phase of the administration's economic policy, domestic and foreign. The State Department protested when Hoover named people from his department to take over some of the duties traditionally performed by consular officials. But the secretary pushed ahead, expanding the operations of his department at home and abroad and generally convincing American businessmen that he, rather than officials in the State Department, knew what was good for them. Attached to the consulate in Berlin, Breithut occupied one of the Commerce Department's new posts, and during his thirteen-month tour abroad he visited European capitals from London to Warsaw, interviewing government officials and industrialists, gathering chemical data, and reporting on the potential for the expansion of U.S. markets in Europe. On August 31, 1923, the State Department sent Herty a dispatch from the Paris embassy marked "for your *strictly confidential* information," unaware that Breithut had sent the same message by cable to Herty nine days earlier. Again, on September 14, Breithut reported to Herty from Basel on the

Swiss dyes industry, asking him not to use the information for publication until the Bureau of Foreign and Domestic Commerce sent it to him. "I shall send it to Concannon [his superior] in the . . . next few days but it takes a little time to whip these things into shape as official reports. In the meantime, I want you to know about them."²²

During the fall of 1923 Herty decided somewhat abruptly to visit France and England with his wife and daughter. He told only a handful of friends and family about the trip, ostensibly because he did not want it mentioned in the newspapers and because it was supposed to be a "real vacation." It was, in a way, if attending the Opera Comique and the Comedie Française, visiting Versailles and the Hotel des Invalides, and playing with eleven-year-old Dolly in the Jardin de Tuil made the five-week stay abroad a vacation. But most of Herty's time was spent with Breithut, American chemist friends on business in Paris, American embassy personnel, and French chemists, industrialists, and government bureaucrats. Herty hoped to learn as much as he could about the effect of the French occupation of the Ruhr on the European dyes industry, rumored deals between the British and French dye interests on the one hand and the German IG on the other, and how both might affect the American industry. One other task involved securing an English translation of a French book titled *L'évasion des capitaux Allemands*. The International Congress of Industrial Chemists' Societies met for several days during Herty's Paris stay, and he also made a side trip to London to visit various important officials of the British Dyestuffs Corporation (BDC). While in London, he was the guest of Sir William Alexander, head of the BDC, who thoughtfully arranged a dinner party for him. Besides S. A. Whetmore and Victor Le Febure, also members of the corporation and old friends of Herty's, the guests included Sir William Perkin, the son and namesake of the man who in 1856 had "stumbled on to mauve and ushered in the era of synthetic dyes."²³

From three or four long personal letters to Francis P. Garvan written between October 4 and 19, 1923, and more particularly from a revealing historical memorandum composed in 1932, it is clear that Herty's Paris trip was an unofficial fact-finding mission for the Chemical Foundation president as well as a vacation. Addressed affectionately to "Dear Old Man," the letters reported on the high prices of German dyes; the impact of the Fordney tariff on foreign dye manufacturers—"much more severe . . . than was the selective embargo"; the French government's sale of the seized German dyes to a pool of French dye manufacturers dominated by the "unreliable and tricky M. Frossard"; Herty's attempts to

meet Frossard and, if possible, find some way to make him walk "a straight, fair line, at least as far as we are concerned"; that there seemed to be "no hard evidence of a Franco-German combination in the dye industry," beyond a contract made two years earlier by the unscrupulous Frossard; an interview Herty gave to the Paris correspondent of the *New York Times* about the reported trip of the director of the Badische Company to the United States for the purpose of raising money or effecting a deal with American dyes manufacturers (he was against it); and the standoff between France and Germany in the Ruhr and how it was likely to end. Herty's comments in one of these letters illustrate his continuing distrust of the Germans:

Stresemann's jockeying to try to juggle France out of its victory in the Ruhr and his evident unwillingness or inability to make the industrialists do anything to help out the financial situation, have brought things to somewhat of an impasse. . . . He may be simply bluffing and may possibly soon buckle under, but one thing seems certain—Poincare is not going to budge one inch from the program he laid down last January, and I wouldn't be surprised, if Stresemann keeps up his monkey business much longer, to see the French put still more pressure on the Germans. They are the same old Germans . . . still confident that they are eventually going to rule the world. They seem to be absolutely unaware that they lost the war and incurred obligations thereby. But winter is coming and there is going to be much suffering in Germany. I wonder if that will bring them to their senses.²⁴

The 1932 Herty memorandum was considerably more explicit than the 1923 letters. In it Herty recalled that from various chemists attending the international congress in Paris he learned of a deal between France and Germany whereby the Germans would gain control of the French nitrate industry in exchange for "the promise of full technical information concerning the operation of the Haber process." He was shocked because of the close relationship between a nitrate supply and military operations and immediately conveyed his concerns to a number of leading French chemists and industrialists. Shortly thereafter Herty was shocked again. On his visit to London in late October 1923, Sir William Alexander, his host and head of the British Dyestuffs Corporation, showed him confidential minutes of meetings held between representatives of the British and German chemical industries, "all looking toward a merger." It was this information, together with rumors about a "possible coalition" between the Germans and the du Pont Com-

pany that caused Herty to cable Garvan from Paris on November 5, 1923: "From reliable source learn DuPont negotiating w/Cartel [the IG]. . . . Such action fatal to our fight. Get busy w/Irene DuPont or directors. Sailing Wednesday."²⁵

The Hertys sailed for New York on November 7, 1923. For Mrs. Herty, who suffered intensely from asthma, the cold, rainy weather in Paris and the voyage home were a severe strain. She was ill for months after they reached New York, unable to leave the family's apartment and confined to her bed most of the time. But Herty was as active as ever. Immediately on reaching the United States, he went to see Francis Garvan to make a personal report. That was November 17. On the nineteenth he went to Montreal to give a speech, on the twenty-third he was in Washington for an appointment with Secretary Hoover, and four days later he was in Wilmington. The Delaware visit involved a confrontation with Irénée du Pont regarding the rumors linking his company with the IG. If they were true, Herty intended to resign the SOCMA presidency and publicly denounce du Pont and his company as traitors. Du Pont, after all, had personally lobbied for special tariff protection on the grounds that the industry was essential to the nation's defense.²⁶

Far and away the most arduous and secretive travel Herty undertook in late 1923 was a return trip to Paris. One reason for the hasty journey was to secure publication rights and author approval for an American edition of *L'évasion des capitaux Allemands*, which Herty, Garvan, and the French government hoped to get before the public while the Dawes Commission was in session. The book was very anti-German, and the hope was that its anticipated effect on public opinion would influence the commission to take a hard line. The French authorities did their part, but the project had to be abandoned when Herty could not find a publisher on his return to New York. The main reason for Herty's second trip to Paris, however, was Garvan's insistence that he make another effort to impress upon the "highest officials of the French Republic" the immense importance of research, organic chemistry, and the nitrate industry to the future security of France. Maurice Léon, a lawyer connected with the same firm to which Joseph Choate, Jr., the foundation's counsel, belonged, went with Herty. Léon spoke French fluently (Herty did not) and had several friends in the French government. Aboard ship and during their first week in Paris the two men were ostensibly strangers, but privately Herty was giving Léon a crash course in chemistry so that he could make their case effectively with the French leaders.

Léon met with Premier Raymond Poincaré on December 29, 1923, and he

arranged interviews for the Americans with other officials, including Marshal Ferdinand Foch, the president of the republic, and the minister of the devastated areas. Sure that they had done their best, Herty and Léon left for home on January 2, 1924. Two months later, Herty noted in the 1932 memorandum, dispatches from Paris reported that the Franco-German nitrates agreement had been canceled "on the ground that through the passive resistance in the region of the Ruhr the Germans were not carrying out the deliveries they had promised and that the contract had thus been violated."²⁷

Herty's interest in European developments regarding the occupation of the Ruhr, the machinations of the IG, and the impact on the American dyes industry continued unabated. So did the regular "inside information" he received through Frederick Breithut, whose tour of chemical installations took him all over Europe. From Milan he reported that the "German influence" was very dominant in the Italian chemical industry, that reparations dyes were regularly resold to foreign countries, notably the United States, regardless of the protocol to the Versailles Treaty, which prohibited it, and that when asked about the practice, the men in charge simply shrugged and answered: "It is forbidden." He had asked United States officials to lodge protests but frankly did not expect much. "I wish I could get to see Mussolini," the frustrated American added, "to talk to him about the significance of the industry to his country and the meaning of his manufacturing interests playing with the Germans."²⁸

No doubt the news from Italy made Herty unhappy, but another note from Breithut must have made him angry. It contained a copy of a memorandum by Captain Reginald Norris, a member of the unofficial United States delegation to the Allied Reparations Commission, which declared that the German Bayer Company had made a deal with the American Grasselli Company to manufacture certain Bayer colors in the United States. Furthermore, Karl Bosche of Badische had visited the du Ponts and it was generally believed that a similar arrangement was being negotiated with that firm. "Please keep this memo absolutely confidential," Breithut urged. "You know that certain leaks have made Norris a little peeved." Then, somewhat inconsistently, he asked Herty to show the memo to Garvan and R. C. Jeffcott of Calco Company.²⁹

As his November 5 cable to Garvan from Paris indicated, Herty already knew about the rumor regarding du Pont and the IG. He went to Wilmington to confront Irénée du Pont about it in late November, and by the time Breithut's December 11 letter arrived, he had had a visit from a du Pont executive who

assured him that there was nothing to it. What he thought about the alleged Grasselli-Bayer connection is not clear. But it must have disturbed him because Grasselli was one of the major American dye firms and, like du Pont, an important member of SOCMA.³⁰

By the end of January 1924 the Germans appeared to be making inroads on the British front. Despite the stiff ten-year embargo act against German dyestuffs adopted in 1920, the British Dyestuffs Corporation, whose management included several of Herty's British friends, was reportedly preparing to enter an agreement with the IG. If carried out, it would allow the IG to dominate the manufacture of organic chemicals in the United Kingdom. Herty already knew about the British-IG negotiations, but after reading reports in the *Manchester Guardian*, he attacked the scheme as an "amazing situation" in an interview given to the New York correspondent of the *London Daily Mail*. The agreement would mean the beginning of the end of dye manufacture in Britain, Herty declared. Plants would gradually close down and technicians would disappear. The British would be mere sellers, not manufacturers, of the colors they used, all because of "short-sighted consumers seduced by artful offerings of low-priced German dyes made possible through a deliberate depreciation of the mark." To Herty it represented a complete reversal of the vaunted British tradition of fighting with one's back to the wall. Recalling the victims of gas made in German dye plants and the British and American leaders who warned about the dangers of a revitalized German industry, Herty labeled the reported agreement "an unholy alliance." Whatever Britain might do, he declared, the United States would continue "to fight against German recovery of its world domination in this field."³¹

Herty immediately began bombarding Breithut for more information about the BDC-IG arrangement, particularly about its impact on the French. Breithut needed no prodding. He had already seen everyone of consequence in France, and by mid-February 1924 he was in England interviewing Sir William Alexander, chairman of British Dyestuffs. The French were "hostile" and "not surprised," Breithut reported. They had long suspected the existence of a deal between the British and the Germans. But Breithut did not believe that the agreement had been finalized, arguing that the new British government under Ramsay MacDonald was trying to improve relations with the French. Once in Britain, Breithut interviewed Alexander and other officers of the BDC, members of the dye licensing board, consumer groups, and spokesmen for the lesser British dye firms. In sum he learned that BDC officials favored the deal with the IG because they

feared that neither a Labour nor a Liberal government would reenact an embargo act like the one in force and might even repeal the current law, without which the British industry could not meet German competition; that the stockholders would generally favor the deal if BDC profits increased; that while other British dye firms feared they would be forced out of business by a BDC "monopoly," some specialty houses thought they might prosper; and that reaction among dye consumers ranged all the way from those who favored free trade to those who insisted that the national welfare required a totally self-contained industry.³²

Breithut's prediction that the Ramsay MacDonald government would not approve the BDC-IG draft agreement turned out to be correct. But that did not end Herty's concerns about events in Europe. In his February 5, 1924, letter to Breithut he commented on the still-pending problem of the Ruhr. Accounts in the *New York Tribune* indicated that the members of the Dawes Commission were lining up in two blocs: the British, Italians, and Americans on one side and the Belgians and French on the other. The first group, reported the *Tribune*, appeared eager to break the grip of the second on the occupied territory. Herty thought that would be a great mistake and that it would result in a "direct blow" against America's synthetic organic chemical industry. He was afraid that General Dawes and A. N. Young, an adviser, did not understand the matter "in all its bearings," and he urged Breithut to take it up with the U.S. ambassador in Paris, Mr. Herrick: "Perhaps he could be persuaded to give his active aid to taking care of the interests of American industry."³³

On February 29, 1924, Herty repeated his concerns to Breithut, pointing out two things that no one could afford to overlook: first, that world capacity exceeded demand by 200 percent, and second, that the dyes industry had to be treated differently than any other because of its unique political and economic character. Herty doubted that the Americans on the Dawes Commission grasped either point and hoped that Breithut had met and managed to "educate" them. He also remarked that whatever the commission did would have a profound impact on the security of France. It would be very unfortunate for that country, he added, if through the failure of the Americans "the importance of settling this matter properly were overlooked."³⁴

Three days later Herty decided on direct action. He sent General Dawes a cable through the American Embassy urging that "before your committee recommends complete release of German industry from restrictions you consider the possibility of excepting the organic chemical or dye industry." The cable went on to explain

that if freed from all control, Germany could easily reassert its former supremacy and destroy the American industry. That in turn would leave the United States without the indispensable resources of "modern war, of economic independence and of scientific advance."³⁵

Whether Herty's cable reached Dawes is unclear, but it made its way to other high places. Breithut sent it, together with a letter quoting extensively from Herty's letter of February 29, to Senator P. A. Brangier. The senator was an intimate of the French premier, Poincaré, whose hard-line tactics with the Germans both Herty and Breithut admired. A few days later Brangier reported to Breithut that Poincaré was very interested in what the Americans had to say, that he was "watchful of events," and that the French representatives on the Commission of Experts (Dawes Commission) were "fully alive to the significance of the synthetic organic chemical industry" and were watching out for French interests.³⁶

As Herty had proposed, Breithut also visited the American ambassador in an effort to educate him about the importance of the Dawes Commission deliberations to the synthetic chemicals industry. He found the ambassador more knowledgeable about the industry than expected but unwilling "to take the initiative at this end of the line." Instead, he suggested that Herty contact officials in the State Department who could then instruct the ambassador as to what action should be taken. "He is anxious to help," Breithut continued, "but feels that he cannot do anything without instructions from Washington. He regards himself merely as the instrument to carry out their policies."³⁷

Trade Commissioner Breithut's activities for the Bureau of Foreign and Domestic Commerce in 1923-24 illustrate abundantly the blurring of traditional roles about which the State Department complained after Hoover became secretary of commerce. Ostensibly attached to the United States Consulate in Berlin, a dependency of the State Department, Breithut crisscrossed Europe freely and constantly in the name of expanding United States commerce abroad, reporting to his bureau chiefs in Washington. Any limits the State Department may have imposed on his activities are not apparent from his correspondence with Herty. And the absence of such limits may explain his willingness to convey Herty's views on the Dawes Commission deliberations, not to mention the results of his own investigations regarding the status of the BDC-IG agreement, through irregular channels to the premier of France. Certainly Ambassador Herrick felt somewhat more constrained about acting on his own authority.

The Dawes Commission made its report in April 1924. It provided for a reorga-

nization of the German Reichsbank under Allied supervision; annual reparations payments by Germany beginning at \$250 million, to be gradually increased over the next five years until the initial amount more than doubled; and a foreign loan almost as large as the first annual installment, designed to support the newly stabilized mark and to get the program under way. More than half of the loan came from American financiers, to the dismay of people like Herty who saw no logic in underwriting the recovery of an economy, an important part of which, he contended, represented a direct threat to the industry that he and others had been fighting to protect.

In 1924 Herty voted for Calvin Coolidge and Charles G. Dawes in spite of the position Dawes took on the Reparations Commission. But by March 24, 1925, he was having second thoughts. In a long letter to Nicholas Longworth he noted that the Dawes Commission report had inspired a rash of efforts by foreign concerns to negotiate loans with American bankers. A \$3 million loan had been made by a New York bank to a member of the cartel, and another, ten times that size, had been proposed. "Are these loans to the cartel justified, and what is their purpose?" Herty asked. He went on to point out that the cartel had just been awarded a huge sum by the German government to compensate it for losses allegedly suffered during the occupation of the Ruhr. His source, a German financial newspaper, speculated that the cartel's monetary backing might rank it among the largest and most independent operations in the world. Under the circumstances, Herty continued, one could only speculate about why the cartel was seeking loans. But, he warned, "We do know that determined efforts are being made by the Cartel, through extension of long term credits in foreign markets, to deprive us [the U.S. dye manufacturers] of a healthy export business which has been developed. It is a trying problem if we must fight for export markets against American money in the hands of foreigners."³⁸

In 1922 Herty was still chairman of the American Chemical Society's Advisory Committee to the Chemical Warfare Service. But as president of SOCMA he thought he should step aside, and shortly thereafter, H. E. Howe, his successor as editor of the *JIEC*, was appointed to the post. Nevertheless, Herty continued to do everything he could to promote the service. Working closely with General A. A. Fries, he used his persuasive talents to influence Congress and the public, and he orchestrated support in the American Chemical Society for matters the CWS considered critical to its well-being. For example, on June 17, 1925, a resolution prohibiting the use of chemical and bacteriological weapons was adopted

by the Conference on the Supervision of the International Trade in Arms then meeting in Geneva. Not part of the original agenda, the Geneva Protocol, as it came to be called, was put forward by Congressman Theodore E. Burton, who led the American delegation. Immediately Fries, Herty, and the ACS began the counterattack.

Fries believed that pacifists, radicals, and internationalists were behind the antiwar and disarmament movements in the United States during the 1920s. Sure that the Geneva Protocol reflected the sentiments of such elements, he wanted to fight the measure and its advocates head-on. American chemists and the chemical industry should make their support for the CWS, financial and otherwise, perfectly clear, he wrote Herty on August 3, 1925. Camouflage would not do: "Camouflage always gets the paint rubbed off showing the naked interior; especially . . . when it touches political questions. The only thing to do is stand [firm]. . . . The chemical industries must say straight out that they are behind the CWS."³⁹

Herty assured the general that the CWS had the full support of organized chemistry. But he disagreed on tactics. When the U.S. Senate prepared to consider the Geneva Protocol in the fall of 1925, he advised Fries against an "aggressive fight right now." The educational effort being made through letters, visits to congressmen and administration officials, public speeches, and the press ought to be allowed to run its course. It would take longer, Herty admitted, but in the long run it would pay off.⁴⁰

Eventually Fries saw it Herty's way. By the spring of 1926, he agreed that the educational campaign was taking effect, at least with Congress. Fries's aide, writing to Herty the same day, did not think the Geneva Protocol would even be brought up for debate. It was, but Senator James Wadsworth and other allies in the upper house spoke against it so effectively that it was returned to the Foreign Relations Committee. Herty was delighted. On December 16, 1926, he congratulated Wadsworth for "great service" to his country. "You literally routed Mr. Borah," he added. "This should stop for all time the silly talk engaged in by so many about the 'monstrosity' of gas warfare."⁴¹

As president of SOCMA Herty continued to play a significant role in the ACS, serving as councillor for the New York section, speaking to local sections, and presenting papers at general meetings. Groups ranging from political interest associations such as the National Republican Club to learned societies and professional organizations such as the Franklin Institute and the American Institute

of Chemical Engineers also heard him speak on some variation of his favorite topic, the coal-tar industries of the United States. But increasingly, Herty accepted invitations to address college audiences. MIT was his particular favorite, not only because his elder son held a doctorate from the Boston school but also because he thought it rendered great service to the nation, "sending out every year so many thoroughly trained men."⁴²

Herty also continued to work closely with Francis Garvan and the Chemical Foundation. Some of this work, begun while he was still editing the *JIEC*, lasted throughout his tenure with the trade association (1921–26). In December 1919 the ACS appointed Herty to represent the society at meetings of the foundation's shareholders. Later he provided liaison between Garvan and commercial publishers, government agencies, the ACS, and leading chemical manufacturers. For example, in August 1920 he arranged a deal between the Century Publishing Company and the foundation which led to the mass distribution of Edwin E. Slosson's popular volume, *Creative Chemistry*, to high schools, libraries, service clubs, and prominent individuals all over America. The Slosson book became the first in a set of volumes issued at nominal cost by the foundation in its drive to make the public "chemically conscious." Herty also negotiated a cooperative arrangement among chemical manufacturers, exposition managers, and the Chemical Warfare Service which resulted in an outstanding National Exposition of Chemical Industries in September 1920. Garvan was so pleased with the educational properties of several exhibits that year that he commissioned Herty to acquire them for the foundation.

Herty's role in "selling" the foundation to chemists and manufacturers who knew little about it or the motives of its president was also important. When a chemist from Ohio State University asked him for the "real facts" about the foundation, seeking assurance that it was no threat to the ACS, Herty replied, "I know of no better friend of chemistry in this country than Mr. Francis P. Garvan." He referred the questioner to editorials in the *JIEC* and hearings before the Ways and Means Committee.⁴³

Besides issuing licenses for German patents to American manufacturers, promoting protective legislation in Congress, and defending itself in court, the Chemical Foundation spent much of its time and income on popular education. In 1923 Herty became directly involved in one of its educational enterprises, funded by Francis Garvan and his wife in memory of a daughter who died in childhood but sponsored by the ACS. Designed to promote chemistry among the

nation's youth through a prize essay contest, the project was directed by a four-man committee consisting of Chairman H. E. Howe, Wilder D. Bancroft and Herty for the ACS, and Alexander Williams for the foundation. It was open to all boys and girls enrolled in public and private secondary schools, and the finalists were eligible for scholarships at Yale and Vassar plus cash awards of \$500.⁴⁴

The prize essay contest was not the only ACS enterprise supported by the Chemical Foundation. Beginning with a \$25,000 grant in 1922, the foundation gave more than \$800,000 to ACS publications and programs by 1938. Herty's friendship with Garvan and his role as ACS representative on the foundation's advisory committee certainly had some influence on how the money was spent. In November 1925, for example, Herty asked E. J. Crane, editor of *Chemical Abstracts*, one of the society's principal journals, to think about how he would change the publication if money were no object. It took him three weeks, but on November 28, Crane provided Herty with a hefty proposal. "This whole question is a sort of pipe dream," Herty cautioned the eager editor. But he let Crane know that he would not have raised the issue if no possibility of success existed. Months passed while Herty gathered more data about potential costs, and in May 1926 he was ready to submit a specific proposal to Garvan. It called for the creation of a \$2.5 million fund whose annual earnings at 5 percent would provide a handsome supplement to the \$100,000 budgeted for *Chemical Abstracts* by the ACS. That would enable Crane to produce for America "an ideal digest of the chemical literature of the world." Crane was ecstatic. In a burst of gratitude he thanked Herty for his efforts. If accepted, the funding plan would constitute one more of the "many fine things" Herty had done for chemistry in America.⁴⁵

Herty's \$2.5 million "endowment" scheme did not materialize, but support for *Chemical Abstracts* and other ACS projects was forthcoming in the form of more modest grants from the Chemical Foundation. These lasted until the early 1930s, when the foundation announced that reduced income required it to withdraw from many of its promotional activities.⁴⁶

Whether the Chemical Foundation would have money to spend on any cause was a question throughout Herty's presidency of SOCMA. Only months after the trade association was created, the Harding administration demanded that Garvan return the German patents held by the foundation. Many of the firms in SOCMA were licensees of the foundation; according to one source, more than \$100 million had been invested by such licensees to exploit the patents. Consequently, Herty and the industry he represented were vitally interested in the suit

launched when Garvan refused to comply with the government's demand. Filed in the United States District Court at Wilmington, Delaware, on September 8, 1922, the bill of complaint charged that certain elements of the dye and chemical industry had sought to acquire the German patents in order to create a monopoly in the United States; that the alien property custodian seized the patents and sold them at a private sale to the foundation, of which he was an officer, thereby violating several laws; and that the sale was "irregular . . . especially in regard to price . . . [and] therefore . . . void."⁴⁷

Trial began in Wilmington before the Honorable Hugh M. Morris on June 4, 1923, and testimony concluded late in July. Herty was not a witness, but he turned down at least one speaking engagement because he felt his presence was required during part of the trial. Later, while he was "vacationing" in Europe, the government filed a brief adding a conspiracy charge to its original complaint. Lois Woodford sent him clippings about the case from New York newspapers, but that was a poor substitute for being personally in touch with what the *Daily News Record* of October 29, 1923, labeled "The Most Important Litigation Now in Any U.S. Court." The *Record* thought the district court decision would be appealed no matter who won, and that is what ultimately occurred. Judge Morris dismissed the suit against the foundation in January 1924, and the government immediately announced its intention to appeal. In March 1925 the Circuit Court of Appeals unanimously affirmed the lower court's decree, and the Supreme Court followed suit in October 1926. Within forty-eight hours Herty sent a cordial note to Associate Justice George Sutherland. For ethical reasons he had refrained from writing while the case was before the Court. But for the past four years he had been confident of the final outcome "because of the opinion you gave me at the time we had the good fortune to have you as our consultant counsel." Herty was "naturally" pleased with the decision because, as he put it in a similar note to Judge Morris, "we can go to work now with renewed vigor and inspiration." Morris answered graciously, remarking that justice had been done and that the chemical industry had a great opportunity for patriotic service. "I have no doubt," he added, "that it will never be unmindful of the extent to which it has been constituted guardian and trustee of the nation's welfare."⁴⁸

When Herty wrote his notes to Morris and Sutherland, he was about to make another career change, this time to a full-time position as adviser to the Chemical Foundation. Lois Woodford, who went to the foundation with him, described the move as a logical step now that the "new industry" was firmly established in

manufacturing skills and in the public's understanding. "Dr. Herty feels that he can best serve the advancement of the chemical and allied sciences and industry," she told the *Manufacturers' Record*, "by accepting Francis Garvan's offer to join the Foundation."⁴⁹

In the five years Herty spent with SOCMA, his efforts to protect and promote the synthetic organic chemicals industry received high praise from members of the organization, leaders of the ACS, and high officials in government. Secretary of Commerce Herbert Hoover, present at the creation of the association in 1921, described Herty as a man of outstanding integrity. "It is a matter of no little personal satisfaction to me," he told one of Herty's friends, "that Dr. Herty was chosen [to head SOCMA]." The secretary demonstrated his regard by making Herty a member of his chemical advisory committee and, when Herty resigned in 1926, by accepting his recommendation that a representative of the synthetic organic chemicals industry continue to serve on the committee. James Norris, chairman of the Division of Chemistry and Chemical Technology of the National Research Council and president of the American Chemical Society in 1925–26, also praised Herty's direction of SOCMA. He especially commended his efforts to build cooperation between professors of organic chemistry and "the men in your industry." News of Herty's resignation caused considerable regret among SOCMA members. Edgar Queeny of Monsanto Chemical Company thought "the very bottom had dropped out of SOCMA," and E. M. Allen of Mathieson Chemical wondered what would become of the organization. A. Cressy Morrison of Union Carbide, who served with Herty on Hoover's advisory committee, had mixed feelings. "I feel deeply the loss to the Synthetic Organic Chemicals Manufacturers' Association and am wondering what will become of it with your personality withdrawn," he wrote Herty in late November 1926. But he realized how much Herty could give to the Chemical Foundation. "I do not know what the change means to you personally . . . but I do know this, that it will be a great relief to you to get into a more scientific and less commercial field."⁵⁰

A drastically reduced budget and a 33 percent cut in salary during his last two years at SOCMA may have played some part in Herty's decision to resign. But his conviction that the industry was at last firmly established and the opportunity to play a larger role in the foundation's work of popular education made the real difference. He looked forward to working closely with Francis Garvan in exploring the "innumerable avenues of useful public service" which the new position promised.⁵¹

When Herty left SOCMA in mid-November 1926, he and his family had been living in New York for exactly ten years. Of the three Herty children, only Dolly still lived at home; Holmes was married and Frank was working in Massachusetts. Dolly was clearly the family "pet" and must have provided particular comfort to Sophie when Herty was out of town on business, giving speeches, or attending the seemingly endless round of luncheons, dinners, and professional meetings that characterized his existence after he left North Carolina.⁵²

Besides their rented Upper West Side apartment, the Hertys acquired a summer home on the south shore of Long Island at Hampton Bays in 1920. Sophie and Dolly spent the summers there, and Herty usually joined them for weekends and short vacations. In town, the family took advantage of the city's social, cultural, and recreational facilities. They made trips to parks, programs, and lecture series at the Metropolitan Museum of Art, attended the theater, the opera, and concerts featuring renowned artists, and, best of all from Herty's point of view, received passes to baseball games and the World Series every time it took place in New York. Shopping at Lord and Taylor, B. Altman, and Best and Company filled some of Sophie's leisure time; so did a wide selection of periodical literature ranging from *House and Garden* to *Harper's* and the *Atlantic Monthly*. Herty preferred *Outlook*, *World's Work*, and the daily papers, principally the *New York Times*.⁵³

Professional organizations, learned societies, and clubs occupied another major portion of Herty's life in New York. In the last category, the Chemists' Club and the Century Association in New York and the Cosmos Club in Washington afforded intellectual and social stimulation, as well as important business and professional contacts. Membership in the prestigious Century Association was particularly rewarding. Charles Baskerville, Herty's predecessor as head of the chemistry department at the University of North Carolina, and Charles Miller, an editor of the *New York Times*, sponsored Herty for membership in May 1919, and for the rest of his life he found the Century to be a congenial home away from home. He entertained there, he discussed business there, and he played billiards there, winning the club championship in the spring of 1926 with a string of twenty-four victories. He expressed special gratitude to Baskerville for having proposed his name. The members were "delightful" and the "atmosphere one of simplicity and culture . . . it has made a new thing out of New York life for me."⁵⁴

Life in New York for the closely knit Herty family was prosperous, productive, and agreeable in every respect but one: Sophie's asthmatic condition grew worse

despite heroic efforts to control it through medication, change of scene, and even surgery. At various times Herty arranged to send her to the mountains or to visit friends in the South, to import batches of specially produced medications from chemist friends who worked for pharmaceutical houses, and to consult with research men about newly developed and still experimental treatments for asthma and bronchitis. By 1924 Sophie's recurring attacks were so severe that Herty appealed to General Amos Fries of the Chemical Warfare Service. "I am wondering," he wrote desperately, "whether several treatments with chlorine would be helpful. . . . It seems to me the doctors have tried everything in the world, and I see so little improvement."⁵⁵

Herty's own health was remarkably good during the first ten years spent in New York. He did suffer from overwork in 1917 and again after the long tariff battle in 1922; an attack of influenza put him on the sick list in the spring of 1920; and he experienced some trouble with his eyes and teeth during the next two years. But a week or ten days away from the office quickly restored his energy and allowed him to resume a pace that might easily exhaust a much younger man. Nevertheless, Herty had no plans to slow down. Almost sixty years old when he resigned as president of SOCMA, he looked forward eagerly to his new post as adviser to the Chemical Foundation and the challenges it promised.⁵⁶

CHAPTER EIGHT

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Herty and the Chemical Foundation

When Charles Herty left SOCMA for the Chemical Foundation in November 1926, he and Francis Garvan had been working together for years. But now Herty would be devoting full time to the cause the two men shared: educating Americans in every walk of life about the importance of chemistry to “the health, the wealth and security of the nation.” As it had in the past, Herty’s educational work for the Chemical Foundation took many forms, extending well beyond the campus. He continued to visit colleges and universities, addressing audiences ranging from undergraduates to specialists, but he also spoke to businessmen, womens’ clubs, and professional societies. He used the media to disseminate the message as well. During a single week in October 1927, for example, Herty addressed three hundred Massachusetts industrialists, the Virginia section of the American Chemical Society, the University of Richmond Medical School, the Richmond Women’s Club, and the general public in a fifteen-minute radio program. He also provided friends at the *New York Times*, the New York office of the *London Daily Mail*, and a chemical trade journal with interviews and material for editorial comment.¹

Another phase of Herty’s new job required him to represent the foundation or Garvan personally at important meetings such as the International Conference on Bituminous Coal, held in Pittsburgh during November 1926, and the First International Congress of Soil Science, which met in Washington the following June. Garvan was interested in the first because it featured a German chemist/inventor, Friedrich Bergius, who discussed his process to derive oil from low-

grade coal and because at least one Bergius patent was controlled by the Chemical Foundation. Herty probably attended the soil science conference, for which the foundation provided financial support, because of Garvan's ongoing efforts to promote agricultural research. In 1926 *Chemistry in Agriculture* joined the list of popular volumes commissioned and distributed by the foundation, but compared to *What Price Progress* and *Chemistry in Industry* its sales were disappointing.²

Other dimensions of Herty's work involved the identification and assessment of projects the foundation might support; the promotion of research by industry, academia, and government; and the oversight of government policy, congressional legislation, and business activity that might have an impact on American chemistry and the American chemical industry. Funding requests evaluated by Herty included projects to develop chemical literature for a course of study which the Federation of Womens' Clubs planned to sponsor; to support a Pennsylvania State University professor who wanted to write a "popular book on matter and energy"; to publish a multivolume chemical reference work; to finance kidney research at the University of North Carolina; to increase the amount already granted to the chemistry program at the University of Maryland; and to build a new chemistry laboratory at Wellesley College. After visiting the Wellesley campus, its hard-working, scholarly faculty, and the "firetrap" that housed its existing laboratory, Herty thought the last request deserved special consideration.³

Like his educational work, Herty's efforts to promote research by universities, industry, and government began long before he joined the foundation. But Garvan's dedication to the advancement of American chemistry, coupled with the generous salary and expense account provided by the foundation, enabled Herty to press the research issue as never before. Early in 1926, while still president of SOCMA, he launched an aggressive campaign to educate investors, businessmen, and "especially bankers" about the importance of research "as the true basis of industrial progress." In a speech delivered at MIT, he praised the packinghouse industry for its "progressive" research program but criticized the steel industry, particularly the United States Steel Corporation, as a "laggard" when it came to support for research. His remarks could not have been lost on Dwight Morrow, an associate of J. P. Morgan and Company, who shared the platform with him. The Morgan firm had financed the creation of United States Steel early in the century and still exercised control over it through Judge Elbert Gary, chairman of the board. Later, when New York papers reported Judge Gary's efforts to de-

fend his research policy in a stormy stockholders' meeting, Herty wrote Dwight Morrow that he welcomed the "first awakening stretchings" of the sleeping giant. But a careful perusal of the *Transactions* of the American Iron and Steel Institute for 1925 revealed not a single contribution from anyone at U.S. Steel. "More power to [the stockholders]!" Herty commented. "When the sleeper fully wakes he will find undreamed of new sources for dividends that will make all stockholders happy."⁴

If the steel industry was slow to recognize the value of research, others, including Herty's old love the naval stores industry, appeared to be more progressive. Early in 1926 Herty visited Atlanta to address the American Ceramic Society. Word of his presence in Georgia led to an informal meeting with the Naval Stores Section of the Savannah Board of Trade, and within a few months he had reestablished ties severed in 1916 when he left the South to edit the *JIEC*. Specifically, Herty made personal contact with the leadership of the Pine Institute of America, a recently organized trade association designed to "conduct upon scientific principles, an engineering and chemical institute which shall serve and advance the legitimate interests" of landowners, turpentine producers, factors, manufacturers of wood products, and anyone else interested in the industry. He also discovered that the Pine Institute was supporting research fellows at Mellon Institute; that the government was engaged in extensive field studies on naval stores production techniques at its experiment station at Starke, Florida; that Eloise Gerry of the Forest Products Laboratory in Madison, Wisconsin, was still conducting experiments concerning the causes of resin flow; and that the current government appropriation for research work on every aspect of southern pine amounted to only \$37,000. Of that, only \$10,000 was earmarked for naval stores research, a figure Herty dismissed as "utterly inadequate."⁵

Soon Herty began urging organizations and individuals inside and outside of government to do whatever they could to enhance the scope and funding of basic naval stores research. Following an "intensely interesting visit" with Gerry in April 1926, Herty wrote to C. P. Winslow, her superior at the Forest Products Laboratory. Gerry was a talented microscopist who had been studying the problems associated with naval stores production for years, in the field as well as in the laboratory, and like Herty, she was convinced that the "real solution" to the industry's difficulties depended upon discovering the cause of resin flow in turpentine trees. Herty thought she was particularly well equipped to solve the problem if

the FPL, the USDA, and the government would provide the necessary resources. "I am writing purely on my own initiative," Herty assured Winslow, "to urge that you give every moment of her time possible to this work."⁶

Herty also informed Winslow of his intention to interest southern lawmakers in Gerry's work and arranged a luncheon in Washington with Senators Joseph Ransdell of Louisiana, Walter George of Georgia, and Duncan Fletcher of Florida, whose states accounted for the bulk of American naval stores production. That news brought a quick response from the acting director of the FPL, who urged Herty to talk with someone at the laboratory or in the Forest Service before seeing the senators. A meeting was hastily arranged with Forest Service personnel in Washington, and the result was a bill that incorporated "all the points" agreed to in the preliminary conference. A marvel of elasticity, it authorized the secretary of agriculture to conduct such "silvicultural, physiological, economic and other forest and laboratory experiments and investigations," either independently or in cooperation with other branches of federal, state, or local government agencies, universities, business organizations, or individuals, as might be necessary to determine and demonstrate the best methods of producing crude gum from southern pines. It also authorized up to \$50,000 to carry out the purposes of the legislation. To Senator Fletcher, who agreed to introduce the legislation, Herty remarked that the problems of the naval stores industry were exactly the kind that the government ought to help solve—everyone in the turpentine belt would benefit, he argued, not simply one or two producers. Furthermore, a prosperous naval stores industry could add \$35 to \$50 million annually to the nation's wealth as well as considerable tax revenue, all for a mere \$50,000 investment.⁷

As expected, Congress adjourned without action on the Fletcher bill in the summer of 1926. But Herty continued to lay the groundwork for the next session, when it would be reintroduced. He urged newspaper and trade journal editors to support the measure, and he tried, with practically no success, to start a letter-writing campaign among the naval stores men. He also offered to testify before the Senate Committee on Agriculture and Forestry when hearings were scheduled. But an adverse report from the Bureau of the Budget killed any chance that Congress would enact the Fletcher bill, and Herty and others interested in naval stores research had to settle for an increase of only \$5,000 in the existing appropriation, less than half of which Gerry thought would be allocated to her work in 1927.

Disappointed, Herty redoubled his efforts to secure funding for Gerry's re-

search. On February 8, 1927, after having joined the Chemical Foundation, he visited Colonel William Greeley, head of the Forest Service, to “set him straight on the importance of research on the cause of resin flow.” Two weeks later, in Jacksonville, Florida, he urged a convention of naval stores men to support Gerry’s work, and by April he was planning to deliver the same message to the secretary of agriculture. Herty met Secretary William Jardine on March 28 when both men addressed a banquet of the American Institute of Chemists at Yale. Herty presided as toastmaster, and Jardine, the guest of honor, spoke on the importance of fundamental research in agriculture. A. F. Woods, director of scientific research for the USDA, also attended the New Haven dinner, and the positive attitude of both officials encouraged Herty to seek a follow-up meeting during which he could stress the need to increase department appropriations for “cooperative research” into the causes of resin flow. Meanwhile, he told Gerry on April 1, Colonel Greeley had supported her efforts with a letter to the naval stores men, urging them to provide funds for an organic chemist and a plant physiologist so that “the three of you can get down to the most efficient work in solving the problem of *the cause of resin flow*.”⁸

For years Herty had advocated “cooperative research,” that is, research conducted by an interdisciplinary team focusing its varied talents on particular aspects of a single problem. His most recent remarks on the subject, delivered to the AAAS in December 1926, had already been printed and distributed by the Chemical Foundation. But in the spring of 1927 he wanted reprints of the speech mailed to congressmen because the last page contained a paragraph that justified government support for basic research. Such research, Herty argued, benefited the whole people and should be funded with federal tax revenues. Some might protest that anything involving the government would inevitably result in red tape, inefficiency, and politics. But he was confident that an enlightened public and an educated Congress working together could rise above all three. In any case, he promised Gerry that he intended to continue his efforts in her behalf “in official circles.” And he did, urging the head of the Forest Service to expedite Gerry’s work and working hard for the passage of the McSweeney-McNary bill. Supported by various conservation societies, state legislatures, and trade associations representing newspaper publishers, pulp and paper manufacturers, and the lumber and wood products industries, the McSweeney bill provided for a ten-year research program on forestry and forest products to meet national needs and to ensure sustained development. When it passed in May 1928, Herty wrote Gerry,

“After longing for twenty three years for research on the cause of resin flow and after many years hoping for you to have the opportunity in cooperation with other scientific workers to bend your whole energy to the solution of that problem, the day seems now to be at hand.”⁹

Besides working hard to promote research in government and industry, Herty tried to encourage it at his alma mater, the University of Georgia. In 1928 the state provided no support for faculty research, leading Herty to look for funds elsewhere, specifically to the wealthy widow and daughter of an old friend in the naval stores business. He was not sure how the money they planned to give the university would be allocated, but to Professor Alfred Scott of the department of chemistry, whose cause he was supporting, Herty wrote, “I have done my best, old boy, and while I am not optimistic . . . you can never tell.” In the end, the daughter endowed a research fellowship in chemistry and the widow contributed money for special apparatus that Professor Scott would need in his efforts to determine the composition of resene, a derivative of turpentine. The widow also paid for Scott’s trip to Washington so that he could visit the research facilities of the Bureau of Standards and learn how to use the new equipment. Gratefully, Herty wrote the widow that he was sure Scott’s research would provide a “clear picture” of what resene was. “Once knowing that,” he explained, “we will be in an intelligent position to discover industrial utilization for the product or its constituents.”¹⁰

Herty’s role in stimulating research at the University of Georgia was typical of much that he did in behalf of chemistry and the chemical industry during his long and productive career: having identified a problem that needed investigation and whose solution might lead to material progress, he found enthusiastic individuals like Alfred Scott or Eloise Gerry, whose skills and training equipped them to carry on the necessary investigations, and he brought them together with those who could advance or finance the undertaking, even if the resources invested promised no immediate payoff. Sometimes, as in the case of his own work in naval stores, he was an active participant in the investigative process; at other times his role more nearly resembled the part played by a catalyst in a chemical reaction. Either way, bringing the necessary elements together was surely one of Herty’s greatest gifts.

Another aspect of Herty’s career at the Chemical Foundation involved the careful oversight of any development in the public or private sector that might adversely affect American chemistry or the American chemical industry. In July

1927 Herty asked a Canadian friend what he knew about a rumored scheme to merge the British and German chemical industries. Hatched by the German IG, the European "chemical trust" reportedly included France as well as Britain and eventually would incorporate Italy and Switzerland. By October, through speaking engagements and contacts with the media, Herty was urging all sectors of the American public to unite against the "European combine." He charged that it was a "German plot" against America's chemical independence, peace, and prosperity. Nevertheless, he opposed those who called for repeal or modification of the Sherman Anti-Trust Act in order to combat the economic threat. They argued that only a highly integrated domestic industry, unhampered by government restraints, would be strong enough to keep the European giant from penetrating the American market. But Herty disagreed, convinced that in the absence of an antitrust law domestic producers might abuse the protective tariff and threaten the "consuming public." He thought sound economic development depended upon both the protective tariff and the Sherman Act and that the prospective "inter-continental chemical fight" would be "a real test of a competitive system against a monopolistic system," which the competitive system would finally win.¹¹

Although Herty found the formation of the international cartel "offensive" on economic grounds and "sinister" in its implications for national defense, what really alarmed him and Garvan in late 1927 was the degree to which American loans were financing the "European Chemical Cartel." Herty first questioned the wisdom of American investment in German economic recovery publicly in the spring of 1925, warning of an impending commercial clash between the United States and Germany. But in November 1927, he told the Salesmen's Association of the American Chemical Industry that "the clever and subtle hands of the Germans" had put together a combination composed of Germany, Britain, and France and capitalized at over a billion dollars. "What are the purposes of this international chemical cartel?" he asked rhetorically. According to its proponents, the aim was to achieve "rationalization," to protect Europe against American exports, to position Europe advantageously for an anticipated reduction of American tariff barriers, and, eventually, to bring the German and American industries closer together. To Herty, "rationalization" was a glib term used by Europeans to connote mass production, unification of sales agencies, and reduction of overhead. But he argued that it also meant allocation of markets and price fixing. As for "protecting" Europe from American exports, he cited U.S. Department of Commerce figures for 1926 which showed that total U.S. chemi-

cal exports amounted to approximately one-third of Europe's (\$171,000,000 to \$495,500,000), and dye exports consisted of only one-tenth the European total (\$5,950,159 to \$56,020,602). Given the numbers, Herty contended, the European argument for a cartel was "silly." "Plainly, it is not a matter of protection against the American export business, but a desire to crush it, through fear of what it may become." Herty thought lowering tariff barriers would be disastrous for American consumers as well as for American chemical manufacturers. Where would American consumers be now, he asked, if they were still dependent on foreign sources of supply controlled by a cartel whose members were so deeply in debt to the United States? Finally, the suggestion allegedly put forward by the leader of the British chemical industry that a European cartel would bring the German and American industries closer together struck Herty as ludicrous. "What . . . may we expect next?" he asked.¹²

Whatever the purposes of the European cartel, Herty told his audience, American military, congressional, and industrial leaders were taking it seriously because in any future war the chemical industry would be the "backbone of national defense." All nations agreed on that point, and that was sufficient justification for regarding the international cartel as "an actual offensive military alliance against the United States." Finally, Herty got to the heart of the matter. Noting that the cartel had recently effected a merger with the Norwegian Hydro-Electric Company and that the latter planned a major expansion in its nitrogen fixation operations by floating a \$20 million loan in the United States through a New York financial institution, Herty questioned the morality of the transaction. Was it "right" for the savings of Americans to be used for the support of a foreign monopoly whose aim was to stifle its American competition? Were bankers simply interested in commissions or were they thoughtful men whose positions of power required them to act responsibly?¹³

Even before his address to the Salesmen's Association Herty was attacking the National City Corporation of New York for its reported interest in handling the foreign loan scheme. On November 1, 1927, he wrote Secretary of Commerce Herbert Hoover that he found it "remarkable," given the progress being made by American manufacturers in nitrogen fixation, for American money to be "lined up" against American industry. "It is to be hoped," he added, "that every instrumentality, industrial and governmental, will be brought to bear against the consummation of any such pernicious alignment." Herty did not stop there. He continued to hammer away at the subject in speeches to businessmen and

professional organizations, and he bombarded cabinet officers and friendly newspaper executives with personal visits and written material for their edification or their editorial pages. His speech to the Salesmen's Association was printed and widely circulated by the Chemical Foundation as was his November 21, 1927, letter to the editor of the *New York Times*. The response was overwhelmingly favorable, but at least one critic delivered a scathing rebuttal. George Buckley, vice-president of the National City Corporation, the institution marketing the foreign bonds being offered to American investors, talked with a *New York Times* reporter following one of Herty's speeches. Cheap imported nitrate fertilizer was used heavily by American cotton growers, Buckley remarked. And that irritated Herty, whom he charged was "connected" with the Allied Chemical Company, the domestic firm "trying to manufacture a synthetic nitrate, hiding, meanwhile behind high tariff walls."¹⁴

Disturbed by the "personal character" of Buckley's remarks, Herty asked the *Times* editor to print his letter of reply. As a personal acquaintance, the editor knew that Herty owned no chemical stock, but readers of the *Times* did not. Consequently, Herty wanted to set the record straight. For years the Chemical Foundation had been trying to overcome widespread ignorance about the fundamental role of chemistry in everyday life and to preach the important lesson that research must precede any significant industrial advance. Buckley's statement, however, indicated that "there is more work to be done." If Buckley had followed the methods of research, he would have discovered that Herty had never been connected with Allied Chemical Company as an employee, stockholder, or consultant; that all nitrate fertilizer materials were admitted duty-free under the Tariff Act of 1922; and that although large amounts of ammonium nitrate, dutiable at one cent a pound, were imported from Norway in 1927, none of it went into fertilizer. Its price, therefore, was of no interest to American cotton growers. Published promptly by the *Times*, Herty's letter seems to have ended the controversy with Buckley. But the Chemical Foundation's fight with Buckley's firm, the National City Company, and others that raised funds for the cartel by selling bonds to American investors, continued until the onset of the Depression. By that time Herty had long since left his full-time position with the foundation to become an independent chemical consultant.¹⁵

Soon after Herty joined the Chemical Foundation in late 1926, Garvan gave him two long-term assignments. The first called for the development of a plan for the "wisest utilization by the American Chemical Society of a \$20 million endow-

ment,” and the second directed him to organize “concerted and thoroughly comprehensive backing” for a bill sponsored by Senator Joseph Ransdell of Louisiana which provided for the establishment of a federally funded “National Institute of Health.” Herty had been interested in both projects well before 1926, but as in the case of his educational work and his efforts to promote research, the active, material support of Garvan and the foundation made it possible to convert good ideas into reality. By 1926 the American Chemical Society was already receiving significant financial support from the Chemical Foundation and the personal fortune of Mr. and Mrs. Garvan. The society began sponsoring an annual prize essay contest for secondary school students in 1923–24. The Garvans provided medals and college scholarships for the winners, and the foundation supplied administrative assistance and reference materials for the aspiring contestants. Garvan and the foundation were also underwriting editorial and publication costs of the *Journal of Chemical Education*, a magazine aimed primarily at teachers of chemistry and issued by the ACS Division of Chemical Education. Herty served on the ACS committee that oversaw the prize essay contests from their inception, and he negotiated the arrangement by which the foundation paid the salary of the journal editor through his principal employer, the University of Maryland.¹⁶

Early in 1927 Herty began concentrating on the ACS endowment scheme. Almost at once, however, his attention was diverted because two groups in the society, without prior consultation, announced plans to sponsor summer institutes. Both wanted to provide educational experiences for chemistry teachers and businessmen, and both applied for grants from the Chemical Foundation to cover part of their anticipated expenses. H. E. Howe, editor of the *JIEC*, asked the foundation for \$7,500 to support the first of what he hoped would become a yearly “National Institute of Chemistry,” held under the joint sponsorship of the ACS and a university on the campus of the host school. His request was approved by the foundation in mid-February 1927. Designed to last for two weeks in July, Howe’s institutes expected to feature prominent chemical experts who would present substantive lectures to participating teachers and industrialists during morning sessions and “popular” speeches to the general public at night. Afternoons would be devoted to small group discussions and recreational activities. The aim, Howe explained, was to give participants, especially the teachers, a chance to acquaint themselves with the latest developments in their field.

The other proposal emanating from the American Chemical Society came from Neil Gordon, editor of the *Journal of Chemical Education*. Gordon had

been working for a year and a half with the Senate of Chemical Education, an auxiliary of the ACS Division of Chemical Education, on a plan for a "Research Institute of Chemical Education." In January 1927 he described it in the *Journal of Chemical Education*, inviting readers to comment before it was submitted to the senate and the council of the ACS for final approval at the April meeting in Richmond. Among other things, the "Research Institute" planned to offer summer work for teachers. When Gordon read Howe's March issue of the *Journal of Industrial and Engineering Chemistry*, which announced approval of the Howe institute by the ACS executive committee, he immediately went to see Herty in New York.

It did not seem logical to Gordon that the foundation would fund two summer school operations and, after looking through Gordon's extensive file of correspondence, Herty could understand his concern. He immediately arranged to meet with Howe, and the two men agreed that the committee named to manage Howe's institute should be expanded to include Neil Gordon and the chairman of the Division of Chemical Education, B. S. Hopkins. Howe also agreed, Herty informed ACS president George Rosengarten right after the March 10, 1927, meeting, that if the ACS council approved the senate (Gordon) plan when it met in Richmond the next month, the work for teachers would "naturally" go to Gordon's Research Institute. All this was discussed by phone with ACS secretary Charles Parsons, "who can't see any problem." But Herty disagreed, advising Parsons that Howe would explain things to him when he got back to Washington. Meanwhile, Herty expressed regret to Rosengarten for not being aware of what the Senate of Chemical Education had been doing and, because he had joined the organization so recently, for not realizing that representatives of the Chemical Foundation had helped formulate plans for the Research Institute of Chemical Education "at the time when the question of support of the Inst. of Chemistry was under consideration."¹⁷

After seeing Herty's long explanatory letter to Rosengarten, Charles Parsons sent Herty an explanatory letter of his own on March 12, 1927. Until Herty's phone call it had never entered his mind that there could be any conflict between Howe's and Gordon's proposals. He still saw no conflict, even if both were approved and established. But Parsons had known nothing of Gordon's plans until he read about them in the newspaper. Neither had Howe, "who is supposed to be in charge of our [ACS] publicity." Consequently, Parsons had invited Gordon to Washington for a talk, and the discussion convinced him that the two insti-

tutes were not in conflict except that both used the word *institute* in their titles. Howe's plan was designed simply to provide teachers and industrialists with a refreshing experience and to bring them "up to date in chemical knowledge." Gordon's scheme envisioned the establishment of a "research institute on chemical pedagogy, located at one place, with an endowment of a million and a half dollars." Parsons admitted that Howe's committee should have included B. S. Hopkins, chairman of the Division of Chemical Education, from the beginning. But Rosengarten had remedied that "oversight" by inviting Hopkins, and Neil Gordon as well, to a planning meeting of Howe's committee scheduled for March 15, 1927. Unless Gordon tried to make drastic revisions in Howe's concept, Parsons predicted confidently, "there will be full harmony at the meeting." Finally, Parsons's March 12 letter provided Herty with a personal assessment of Neil Gordon. "In my opinion," Parsons remarked, "he has a very strong tendency, if not desire, to stir up trouble unless he can have what he wants when he wants it."¹⁸

Nothing more seems to have developed until the ACS convened for its spring meeting in Richmond. There Gordon's efforts to promote his institute plan created what Herty called "turbulent conditions" in the council meeting. They also caused strained relations between Herty, who championed Gordon's cause, and the leadership of the society. Memorandums and correspondence produced during and immediately after the April 11–14, 1927, meeting show clearly that ACS president George Rosengarten, secretary Charles Parsons, and *JIEC* editor Harrison Howe considered Gordon something of a loose cannon whose efforts to promote his institute and his journal, and to secure funding for them, had been carried on without authorization from the society or even the Division of Chemical Education. On April 25, 1927, Parsons addressed an official letter to the chairman of the division, B. S. Hopkins, requesting specific information about Gordon's activities and closing with the remark, "If the affairs of the Society are to be properly correlated, individuals cannot work independently and secretly in its name, or in the name of any one of its divisions."¹⁹

Unfortunately, the difficulties that put Gordon, Herty, and the foundation at odds with the leadership of the American Chemical Society would take months to resolve. Basically, the issue had to do with money and control. The *Journal of Chemical Education* was established and issued by the Division of Chemical Education, and, like its editor, Neil Gordon, it was supported by the foundation. Neither the American Chemical Society nor the Division of Chemical Education

had ever supplied funds for the *Journal* because none were available. But that did not mean that the society or its secretary and business manager, Charles Parsons, had no interest in the projects of the division and the activities of its *Journal* editor. In official correspondence during the spring and summer of 1927, Parsons made it clear to officers of the Division of Chemical Education that despite the policy of "almost complete autonomy" that usually characterized relations between the society and its divisions, activities within divisions sometimes tended "to interfere with matters of important policy affecting the whole Society." Neil Gordon's "apparently independent and largely secret course" of soliciting funds from the foundation had done exactly that, Parsons feared, costing the Society between \$35,000 and \$40,000 a year, which Garvan had promised Parsons for the society's other journals. On behalf of the society's directors, the secretary wanted to know if the division officers were aware of Gordon's fund-raising and whether they condoned it. In other words, the ethics of accepting outside money was not at issue; what mattered was who within the society got the money and how he got it. Acting for the division, Chairman B. S. Hopkins asked the Chemical Foundation whether Gordon had appealed for funds in the name of the society or the division, as Parsons charged, and whether his requests had resulted in less funding for other ACS projects. W. W. Buffum, chief auditor for the foundation, went to Illinois to consult with Hopkins, and Herty composed a multipaged "official" response to Hopkins, signed by George Corbett, vice-president of the foundation, which was intended to demolish the "innuendoes" contained in Parsons's letters to the officers of the division. Hopkins forwarded the Herty/Corbett letter to Parsons, but the secretary was not satisfied. On June 24, 1927, he accused Hopkins of irresponsibility to the ACS for having failed to report all details regarding the foundation's support for Neil Gordon and the *Journal of Chemical Education*. The Division of Chemical Education was part of the ACS, Parsons admonished, and the parent body was responsible for any projects the division sponsored. Finally, the secretary noted pointedly, the Chemical Foundation was distinct from the American Chemical Society. Hopkins, resentful of Parsons's implication that he was not doing a good job as division chairman, declined to forward Parsons's letter to the foundation. It would "offend Mr. Garvan" and hurt the ACS, he advised the secretary on July 5, 1927.²⁰

Matters continued to deteriorate, and by August 1927 everyone concerned was sure that a major confrontation would occur when the society met in Detroit the following month. As Herty saw it, the trouble had grown out of a personal grudge

that ACS secretary Parsons bore against Neil Gordon. On August 5, 1927, Parsons decided to send Francis Garvan and the Chemical Foundation a copy of his "offensive" June 24, 1927, letter to B. S. Hopkins. Under no circumstances, Parsons explained to Garvan, did he want any misunderstanding to develop between the ACS and the foundation. His sole purpose was to ensure a "businesslike conduct of affairs" between the society and its Division of Chemical Education and to safeguard both the ACS and the foundation from criticism. Herty forwarded the Parsons letters to Garvan on August 15, 1927, noting that he thought the June 24 item provided a "reasonable basis" for stating that foundation support of the *Journal of Chemical Education* "through the former channels" could not be continued after September. "Under the circumstances" Herty felt confident that neither the ACS nor the Division of Chemical Education would want to continue the *Journal* and that it could be "amicably arranged" following the September issue for the foundation to take it over. That would assure continued publication of a better product at less expense and avoid the appearance of a rupture with the ACS. It would also require "a little careful handling" when the society met in Detroit.²¹

Late in August B. S. Hopkins asked Herty to attend a special conference of the Division of Chemical Education on September 4, 1927, just before the formal opening of the Detroit convention. Herty and his secretary arrived more than an hour late. Nevertheless, Hopkins immediately called on him to present the foundation's position regarding the *Journal of Chemical Education*. Emphasizing that it was "their property," Herty stated that if the ACS or the Division of Chemical Education could not "see [their] way clear" to continuing the *Journal*, the Chemical Foundation was prepared to take it over, including its editorial staff, as its own organ, "pushing it to the utmost." He went on to explain that in view of the criticism expressed by the society's officers, the foundation could not continue its support "under the present system." It would, however, see to it that the transition was made "without embarrassment to anyone."²²

Confident before the meeting that the foundation could count on the cooperation of the officers and members of the Division of Chemical Education, Herty may have been unprepared for the reaction produced by his statement. One member described it as a "bombshell," and another asked, "Why should the Division get this when it is the national officers who have done the criticizing?" Others expressed concern about the *Journal's* unpaid bills and existing contracts, and still others raised questions about editorial policy in the event that the foundation took

over publication of the *Journal*. Herty tried to satisfy the several concerns, but in the end, despite agreement that “all had been harmonious” between the division and the foundation until ACS leaders intervened, no one expressed dissatisfaction with the attitude of the national officers. Neither were the division’s officers willing to accept Herty’s argument that editorial policy would be unchanged because the same staff would be in charge. “The phrase ‘organ of the Foundation,’” he recorded in a long memorandum, “seemed to be interpreted as ‘mouthpiece’ for Foundation propaganda, with no regard for the Division’s interest.” The meeting broke up with Herty’s comment that there would be plenty of opportunity during the coming week to discuss and “thrash out” any questions that might come up.²³

For the next several days Herty kept a careful account of everything bearing on the *Journal of Chemical Education* issue. He spent Sunday evening with old friends who wanted to know “what all the fuss is about.” People were choosing sides by the next day, and Herty’s diary described the atmosphere as “very tense and distinctly frigid.” Garbled accounts of the Chemical Foundation’s position were everywhere and Secretary Parsons had “discretely” distributed and then withdrawn copies of his correspondence on the subject. Meanwhile, Herty maintained a “low profile.” On Tuesday, September 6, Herty learned that the Division of Chemical Education had decided to “wave the flag of independence,” that is, to look for publication money elsewhere, and if that did not materialize, the ACS executive committee promised that some other “way would be found.” Later, Herty met with Larkin Meade of the Chemical Foundation, who agreed that a continuation of foundation support for the rest of the year would probably ease matters, although both men felt that the request should come from the division. Hopkins finally went to Herty’s room on Thursday and received assurances that the foundation would meet the division’s obligations until January 1. Word of the “adjustment” spread quickly, and Herty noted a relaxation of tensions and evidence of “marked cordiality” on every side. He left Detroit that night and by the following day, September 9, 1927, he was reporting by telephone to Garvan from his home in Hampton Bays.²⁴

Back in the foundation offices on Monday, Herty was planning to write to Hopkins confirming the agreement reached in Detroit when the mail’s arrival interrupted him. A personal letter from Hopkins dated Friday, September 9, explained that soon after talking with Herty the day before, a letter to the Chemical Foundation prepared by the executive committee of the division was ready for his signature. Because the committee thought it ought to have a written statement

regarding the planned changes in the division's relationship with the foundation, it was decided to mail the letter. "I am sure you will understand," Hopkins continued, "that it comes with the utmost good will on our part. We feel that nothing but the most friendly relations will continue in the future as in the past." The letter ended with Hopkins expressing a "deep sense of obligation" to Herty personally for his "kindly spirit of good will and assurance of continued interest."²⁵

Unfortunately, the "good will" in Hopkins's personal letter was more than offset by the hostile tone of the division's official letter to the foundation. Signed by Hopkins as chairman and R. A. Baker as secretary of the executive committee, it began by quoting a June 10, 1927, foundation letter which assured the division that it would "continue . . . to aid you in your good work" with whatever funds might be necessary to make the *Journal of Chemical Education*, "without any expense to the Society," the leading publication of its kind. Thus the committee was "taken by surprise" when Herty informed it on September 4 that no more funds would be provided following the close of the Detroit ACS convention. Herty had gone on to state that there were two alternatives: "Either we can surrender to the Chemical Foundation the goodwill, business management and editorial control of the *Journal* or we can continue its publication without financial aid from you." The division, however, had committed itself to long-term contracts with advertisers and subscribers on the basis of the foundation's June 10 letter. "We cannot, in honor to either the *Journal* or the Chemical Foundation, cancel these obligations," the division letter protested. Nor would current income allow them to be carried out. Hence the "attitude" expressed by Herty placed the division "in an extremely embarrassing position . . . [and] apparently repudiates the Foundation's previous arrangement." Next, the division's letter declared that after discussion with the Senate of Chemical Education, the executive committee of the division, and the directors of the ACS, it had been the "unanimous opinion" of all concerned that "the best interests of Chemical Education in the future will be served by continuing the *Journal* . . . under the complete control of the Division." In a paragraph remarkable for its abundance of candor and lack of tact, the letter concluded: "We cannot feel, however, that your organization will leave us to meet our contractual [*sic*] obligations undertaken only because of your agreement with us that you would guarantee their fulfillment. We request a statement from you of the position which the Chemical Foundation expects to take. In particular, may we direct your attention to the serious effects of discontinuing the present arrangement covering contracts made in good faith prior to January 1, 1928."²⁶

Herty was outraged, but he let a day pass before sending copies of the correspondence to Garvan. Describing the letter to the foundation as “entirely uncalled for” in light of the assurances he had given Hopkins and Baker verbally before he left Detroit, Herty declared, “I feel that this letter completely changes the whole atmosphere.” He suggested that they meet as soon as possible to review the situation. Two days later, September 15, 1927, Herty wrote to Hopkins making the same complaint but in more detail. The “spirit” of the division’s letter to the foundation was “completely at variance” with the understanding that had been reached by Hopkins and Herty on September 8. Furthermore, Herty’s part in the September 4 meeting with the division officers had been “entirely misrepresented,” and finally, the letter totally ignored Herty’s pledge that the foundation would continue support for the *Journal* until January 1, 1928. Consequently, he now thought the whole matter should be looked at in light of the division’s official letter of September 8, which the foundation would answer “in due course.”²⁷

Neil Gordon, editor of the *Journal of Chemical Education*, was in Europe on September 16, 1927, when Herty advised him that affairs concerning the *Journal* were “badly muddled.” He cut short his trip and by October 4 was back in the United States gathering data for a meeting called by B. S. Hopkins. The executive committee of the Division of Chemical Education planned to meet in Washington on October 16 with ACS president George Rosengarten and secretary Charles Parsons to make “definite arrangements” for the *Journal*, Gordon informed Herty. He wanted to see Herty before then because when the meeting convened he would have “to give them my ultimatum . . . I do not wish to do this without having all the facts before me and [without first] having conferred with you.”²⁸

Meanwhile, William Buffum of the foundation had been instructed by Garvan to have Herty prepare a letter for distribution to all members of the ACS. It began by asserting that Charles Parsons, by “certain correspondence and actions,” had made it impossible for the Chemical Foundation to continue its support for the *Journal of Chemical Education* and ended by pledging that Garvan would personally fund the publication until the end of the year. It also included copies of all correspondence bearing on the issue and expressed Garvan’s deep regret that Parsons, the “smallest man” on the ACS roster, had disrupted the long-standing “harmonious relationship” between the society and the foundation.²⁹

Herty’s letter was never mailed, but it became the basis of a proposal drafted by William Buffum which recommended that the executive committee of the Division of Chemical Education express regret to Garvan and the foundation for its

“misinterpretations” of Herty’s September 4 presentation and for repeating them in the September 8 letter to the foundation; that it ask the foundation to take over all financial responsibility for the *Journal of Chemical Education*; and that it continue to exercise exclusive control over the selection of editors and editorial policy of the *Journal of Chemical Education*. Finally, on October 27, 1927, the distressing saga came to an end when Hopkins and Baker of the Division of Chemical Education sent the foundation a letter essentially incorporating the recommendations. William Buffum assumed the post of business manager of the *Journal of Chemical Education*; Neil Gordon continued to edit the *Journal*; and Garvan continued to subsidize him and the publication until 1932, when the foundation withdrew from its various promotional activities.³⁰

Herty’s relations with some of the leading members of the American Chemical Society were never again as close as they had been. He saw Parsons as having caused the difficulty over the *Journal of Chemical Education* and his friendship with Howe was also strained, at least for a while, if the salutations used in their correspondence is any indication. Formerly addressed to “Dear Howe,” Herty’s letters now opened with the more impersonal “My Dear Mr. Howe.” That Herty felt somewhat isolated by the experience may also be inferred from his efforts to get his side of the story before a few old friends. In late September 1927, he sent D. B. Keyes, a colleague of B. S. Hopkins at the University of Illinois, copies of Hopkins’s letters to him and to the foundation, with an update on what had occurred after the Detroit meeting. It was Hopkins’s letter to the foundation, Herty commented, “which threw the . . . fat into the fire.” Even more telling was a letter to E. C. Franklin, like Herty a student of Ira Remsen at Johns Hopkins and a former president of the society. Franklin asked about the “row” over the *Journal of Chemical Education*, and Herty sent him copies of the correspondence because “it reveals the whole situation and furnishes the best medium for getting the full story.” Then he added, “It was a great happiness to see you again. The years are passing by and it is good to keep in touch with those to whom one feels especially close.”³¹

One of Herty’s two long-range assignments at the Chemical Foundation, the development of a multimillion-dollar endowment scheme for the ACS, never materialized, but he had more success with the second, the marshaling of support for the creation of a national institute of health. Like so much of his work for the foundation, Herty’s interest in an institute devoted to fundamental research on drugs and medicinals began long before he joined the organization in

November 1926. The idea grew out of America's wartime experience and a conversation with J. R. Bailey, an organic chemist at the University of Texas, who attended a New York Giants baseball game with Herty in the summer of 1918. On their way downtown, Herty asked Bailey where he would go if he wanted to test a newly developed compound which he thought might prove more effective against particular diseases than those already in use. Bailey answered that he did not know, and that inspired Herty to write an editorial for the September 1918 *JIEC* titled "War Chemistry in the Alleviation of Suffering." It was a "peculiar situation," Herty told his readers, that of the three primary commercial applications for coal-tar chemicals, explosives, dyestuffs, and medicinals, the last faced the most problems in testing new compounds. "Rarely does the chemist possess the technique," Herty commented. "He must rely upon the pharmacologist and the physiologist to determine the therapeutic value of the product."³²

He went on to note that the university community frequently lacked the spirit of cooperation needed to facilitate interdisciplinary research, not to mention the equipment or funds necessary to test findings that emerged from the "organic chemical laboratory." A few industrial firms conducted animal experiments, but their facilities were limited and not available to all organic chemists. And government laboratories usually suffered from inadequate appropriations. Fortunately, Herty continued, wealthy individuals had endowed institutions such as the Rockefeller Institute for Medical Research, "where the chemist and the biologist can work in the closest cooperation." A new drug to treat syphilis had just been synthesized at Rockefeller, Herty reported, and it was being tested clinically in the hospital associated with the institute. But institutions of that type were few in number, and Herty thought the time had come to remedy the situation. Laboratory technique from the chemist's vantage point was similar whether explosives, dyes, or medicinals were being prepared, and the war had developed many "brilliant organic chemists" whose talents could be harnessed to relieve suffering. Therefore, he proposed the creation of a privately endowed institution patterned somewhat after the Mellon Institute to which "well trained young men" supported by fellowships could be sent by pharmaceutical manufacturers. There they could work cooperatively with the organic laboratories of universities and hospitals to solve specific problems.³³

Response to Herty's September 1918 editorial was so favorable that he arranged for the New York section of the ACS to hold a symposium at its November meeting on the subject of "an institute for cooperative research as an aid to the

American drug industry." Herty's conversations and correspondence with prominent figures in the fields of biochemistry, pharmacology, and drug manufacturing indicated strong support for the concept. The only questions raised had to do with where the work should take place and who should fund it. John J. Abel of Johns Hopkins, a renowned pharmacologist, thought that pharmaceutical houses might do the necessary investigation if they extended their research facilities and hired "first class" pharmacologists and "synthetic chemists." But H. A. Brown Dunning, member of a firm of pharmaceutical chemists, argued that only a few drug manufacturers could attract able pharmacologists. The "best men" worked for endowed institutions like Rockefeller Institute, and those connected with universities usually had too many students and not enough laboratory equipment to engage in serious research. Furthermore, the constitution of the American Society of Pharmacology barred membership to anyone in the permanent employ of drug firms. Consequently, Dunning thought Herty's proposal for a privately endowed institute was the only "practical" plan. Yet another suggestion came from an editorial writer for the *Philadelphia Ledger* who liked Herty's idea but wondered why it could not be carried out by a government agency such as the Bureau of Standards. That suggestion was quickly squelched. After talking with several "eminent" pharmacologists, Herty informed the newsman, "We all seemed to agree that it would be better if we could find some individual or individuals who, like the Mellon brothers of Pittsburgh, would amply endow such an institution."³⁴

At the November meeting of the New York section, ACS chemists listened to presentations about an institute for cooperative research from John J. Abel of Johns Hopkins; P. A. Levene of Rockefeller Institute; Carl S. Alsberg of the USDA Bureau of Chemistry; A. S. Loevenhart of the research division of the Chemical Warfare Service; D. W. Jayne of the Barrett Company, manufacturer of synthetic chemicals; and F. R. Eldred of Eli Lilly Company, a pharmaceutical house. Carefully chosen by Herty, the men represented a broad cross section from government, industry, the academy, and privately funded research institutions. Herty opened the session with a few remarks and a statement from John Abel, who could not be present. Later, he called on E. R. Weidlein, acting director of the Mellon Institute, who described the foundation and growth of that organization. Enthusiastic about the institute idea, Weidlein promised to do whatever he could to help the chemists formulate their plans.

The meeting ended with a unanimous resolution in support of the proposed

institute. Specifically, the section endorsed the creation of a facility with enough endowment to attract and maintain able scientists engaged in fundamental research and enough equipment to encourage the establishment of fellowships by manufacturers interested in solving specific industrial problems. Convinced that the project should be under the general guidance of the American Chemical Society, the New York section forwarded its resolution, with a transcript of the evening's proceedings, to the society's Advisory Committee. Herty was a member of the Advisory Committee, and on January 11, 1919, President William Nichols named him chairman of a special committee to prepare a policy statement for the proposed institute and an estimate of the endowment necessary for salaries, buildings, equipment, and operating expenses.³⁵

In the weeks following the November meeting, Herty received so much support for the proposed institute that he planned to devote much of the January 1919 issue of the *JIEC* to the subject. He was particularly pleased with the response of Charles J. Lynn, president of the American Drug Manufacturers' Association, who asked him to address the association's convention when it met in New York sometime in March. The only negative reaction came from members of the American Pharmaceutical Association who could not understand why pharmaceutical manufacturers should support something sponsored by the American Chemical Society when "pharmaceutical institutions" needed all the help they could get. "Is the American Pharmaceutical Association going to take a back seat . . . and allow the A. C. S. to do its work?" demanded one professor of pharmacy.³⁶

As chairman of the ACS special committee for the proposed drug research institute, Herty quickly nominated several prominent chemists, biologists, pharmacologists, and industrial representatives to serve with him. Besides John Abel of Johns Hopkins, P. A. Levene of Rockefeller Institute, and F. R. Eldred of Eli Lilly Company, they included Reid Hunt of Harvard's department of pharmacology; Treat Johnson of the Yale chemistry department; Raymond Bacon, director of the Mellon Institute for Industrial Research; and F. O. Taylor of Parke, Davis and Company, a major manufacturer of pharmaceuticals. The members were carefully chosen for their scientific expertise, their connection with the pharmaceutical industry or existing institutes, or their identification with other professional societies that might feel threatened by the Herty proposal. For example, Reid Hunt, an authority on the effects of poisons and alcohol on the human body, was also president of the American Society of Pharmacology and a member of

the Council on Pharmacy and Chemistry of the American Medical Association (AMA). By January 1921 Julius Stieglitz of the University of Chicago was added to the committee, P. A. Levene resigned, and Carl Alsberg of the USDA Bureau of Chemistry was named to replace him.³⁷

Herty's committee met for the first time on February 22, 1919, after which he drafted a "preliminary report" for ACS president William Nichols. Modified to accommodate a few members, it recommended the creation of an institute for drug research devoted to both "pure" research and the solution of "specific industrial problems" through fellowships financed by industry; that the institute be composed of seven divisions headed by three types of chemists (physical, organic, and biological), two pharmacologists ("chemical" and "physical"), and two experimental biologists (a bacteriologist and a pathologist), each supported with appropriate staff; that an endowment of \$10.4 million be sought from private benefactors; and that control of the institute be vested in two boards of directors, one "financial" and one "scientific." Acknowledging the concerns of one colleague, Herty explained that it was important to get their "general ideas" recorded in some form so that they could start looking for someone to fund the institute.³⁸

Herty was already looking for support, financial and otherwise, through the ACS News Service and the Edward Marshall Syndicate, Incorporated. The News Service released a story about the appointment of Herty's committee for a drug research institute on the day of its first meeting, February 22, 1919, and the Marshall Syndicate distributed a lengthy interview with Herty the next day. Published in nationally circulated newspapers, the Marshall interview attracted the interest of important people, including Francis Garvan, then in the process of organizing the Chemical Foundation, Incorporated. It may also have stiffened the opposition of some, such as H. V. Arny, editor of the *Journal of the American Pharmaceutical Association*, and Paul Nicholas Leech, who directed the American Medical Association's Research Laboratory. Arny had already expressed his misgivings about the Herty institute plan in the journal he edited, and Leech blasted it through the columns of the *Chicago Chemical Bulletin*, a newsletter issued by the Chicago section of the ACS. The American Medical Association was headquartered in Chicago, and some of the principal offices of the American Pharmaceutical Association were also located there. Consequently, ACS secretary Charles Parsons interpreted the publication of the Leech attack in the *Chemical Bulletin* as one more example of the "sectional spirit" that had long strained relations between "eastern" and "western members" of the American Chemical Society. But

John M. Francis, a chemist employed by Parke, Davis and Company, thought Leech was really speaking for the hierarchy of the AMA, "a limited number of men in Chicago . . . [and] one of the most subtle and . . . most powerful institutions that this country has known for the last hundred years." Francis applauded Herty's institute concept, thought it was "desperately needed," but made it clear that pharmaceutical manufacturers and others would distrust any organization in which "official representatives" of the AMA played "too prominent" a role. Instead, pharmacologists, bacteriologists, pharmacists, and representatives of the medical profession chosen "at large" should all participate, but "the representatives of the American Chemical Society should dominate." The ACS included branches of all the sciences, Francis argued, and therefore could not be suspected of undue favoritism for any particular field.³⁹

Herty refrained from answering Leech in his own journal, but he did register a strong complaint through the ACS Advisory Committee of which he and University of Chicago professor Julius Stieglitz, as former presidents of the ACS, were both members. Stieglitz agreed that the Leech article should never have been published and promised to take it up with the *Bulletin's* editors. He also wrote Leech a strong letter advising him that he would be more effective and win more converts to his point of view if he employed a less "acrimonious style." Unfazed, Leech was still attacking the Herty proposal months later, and Herty was still ignoring him by refusing to publish his remarks in the *JIEC*. Meanwhile, the American Pharmaceutical Association continued its assault on Herty's institute plan in sectional and national meetings of professional societies. On May 15, 1919, Herty successfully defended the proposed institute against several spokesmen for the Pharmaceutical Association who shared the platform with him at a meeting of Philadelphia chemists. Told that he might be asked to address the national convention of the Pharmaceutical Association the following August, he quickly demurred. No invitation had yet been received, he wrote his informant, but if one came, the Philadelphia experience would cause him to turn it down. "I certainly would not accept such an invitation. Their animus is all too plain."⁴⁰

Garvan's response to Herty's February 23, 1919, interview with the Marshall Syndicate was much more encouraging. Early in March Herty told one of his institute committee members that the Marshall interview had "caught the eye of some New York people" who seemed interested in helping to finance the project. "I cannot go more into detail at the present time," he added, "but it certainly looks hopeful." The same message went to other members of the committee, but

nothing concrete developed for several months. It was not because Herty had lost interest. The "dyestuff situation" was taking most of his time during the first half of 1919, and the postwar economic slump, added to what Herty called the "heavy drain on financial men" caused by wartime taxes, greatly complicated matters. But he was not discouraged and promised a friend to "keep hammering away" because the proposed institute constituted the "loftiest possible ambition for American chemistry." In August Herty assured one of his committee members that he had purposely muted his efforts in behalf of the institute so that the "Am. Med. Assoc. and American Pharmaceutical Assoc. could blow off all the steam they wanted to blow." Another, more important reason had to do with getting the Chemical Foundation organized and making its purposes clear to the public. Herty thought that had been done admirably in congressional hearings on the Longworth dye bill held during June and July 1919, and he had Garvan's promise of support for the drug institute as soon as foundation funds became available.⁴¹

Early in 1920 Garvan was ready to make good on his promise. On January 16 he suggested that Herty's plans for the "research laboratory" be put in "rough enough shape" for discussion in the near future. Herty responded enthusiastically but not fast enough to suit P. A. Levene of the Rockefeller Institute, who regretted that the committee had been allowed to remain "dormant all this time." The reason, Herty explained to Levene and others, was the slow progress of the dye bill then before the Senate. By September 30, however, Herty notified the committee that Garvan would provide the group with \$50,000 to formulate definite plans for the institute, and he scheduled a meeting for October 11 in the New York offices of the Chemical Foundation. When it convened, Garvan suggested that as a first step Herty's committee should conduct an exhaustive survey of the nation's existing resources and facilities for combating human suffering. Then it should produce a full-scale report, detailing "in popular language . . . the best means of promoting chemical science for the prevention and cure of disease." Such a report, one committee member remarked later, would provide Garvan with "something to sell" to an intelligent public that spent hundreds of millions every year "patching up the sick" when it might better devote a fraction of that amount to research for the eradication of disease. It would also help the foundation find a benefactor willing to endow the proposed research facility. Meanwhile, the committee authorized Herty to name a subcommittee composed of three scientists, one representative of the pharmaceutical industry, and himself as chairman for the purpose of actually drafting the proposed report. Julius

Stieglitz of the University of Chicago, Reid Hunt of Harvard Medical School, Treat Johnson of Yale, and F. R. Eldred of Eli Lilly were duly appointed, and the Chemical Foundation agreed to pay each man \$2,500 and expenses for their services.⁴²

The plan Herty and Garvan worked out called for the subcommittee to produce a finished report within six months, that is, by May or June of 1921. At its first meeting on November 27, 1920, each subcommittee member agreed to prepare a "rough draft" of an assigned section of the proposed document by January 1, 1921. These would be circulated for comment, and the subcommittee would then meet with Herty in New York to put its work in "more definite shape." Meanwhile, Herty described the mood of his subcommittee to Garvan as one of "absolute harmony and unanimity" regarding the importance of cooperative work. But opinions varied about the direction that work ought to take, and at least one personnel problem had to be resolved during the early stages of the committee's existence. P. A. Levene of the Rockefeller Institute resigned from the larger committee for somewhat obscure reasons, and early in 1921 his resignation was accepted.⁴³

Herty's subcommittee met in New York on January 15 and March 12, and the entire body assembled in Rochester at the ACS convention on April 28, 1921. By that time the committee had changed its name to the ACS Committee on an Institute for Chemo-Medical Research and the subcommittee had produced a preliminary report for consideration by the full membership. Herty composed the introduction and Julius Stieglitz of the University of Chicago coordinated the contributions of Treat Johnson, Reid Hunt, and F. R. Eldred with his own work to produce the body of the report.

Throughout its formulation, subcommittee members proposed revisions and shifts in emphasis which Stieglitz carefully incorporated. For example, Treat Johnson cautioned Herty that "in laying stress on the laymen's point of view," the report must not overlook the "scientific side of our work." It would be read and commented on by "men of science," he pointed out, and Garvan would also expect something that would appeal to both laymen and "technical men." In addition, Johnson wanted it made clear that the proposed institute would be more than a facility to discover and encourage the manufacture of better remedies. The point was to learn how to prevent diseases rather than simply to provide new products to cure them. Knowledge of the fundamental laws controlling human health and normal development had to be acquired and disseminated, and to do

that, Johnson asserted, "We should begin at the very foundation of our being, namely, the cell."⁴⁴

By mid-May everyone except John Abel of the Johns Hopkins department of pharmacology had conditionally approved the report and Herty was redrafting its conclusions. Abel's objections went beyond stylistic quibbles. He complained that the body of the report contained so many "positive statements" regarding therapeutics that it would open the committee to attacks from pathologists, bacteriologists, and "medical men." The "phraseology on the medical side," Abel continued, showed only a "superficial . . . acquaintance with the subject." He had shared the report with a colleague, "a fine pathologist," and although the reaction was very "outspoken," Abel hoped they could forward his remarks to Stieglitz without hurting his feelings. As it stood, Abel could not sign the report because it appeared to have been "filtered through the mind of an enthusiastic organic chemist without receiving due modification and correction from the pathologist and the bacteriologist." He realized the document was meant for a popular audience, but he thought they would regret issuing it without revision if a "keen critic with a caustic pen" decided to rebut it.⁴⁵

Surprised by Abel's "most unexpected" letter, Herty wrote Reid Hunt that he thought he could get Abel "into line all right." He did, but it took considerable tact on his part and extraordinary cooperation from Julius Stieglitz to bring the work to a successful conclusion. On June 1, 1921, Herty went to Baltimore to confer with Abel, and the next day he wired Stieglitz: "Consider it important you see Abel after you and I have discussed the situation." Stieglitz complied, and on June 8 he sent Herty an account of his interview in Baltimore. Abel and several of his medical colleagues proposed a number of changes, Stieglitz reported, but "fundamentally, in the matter of the vital importance of chemistry for medical research and the importance of a new institute along the lines planned, we are of one opinion." The men in Baltimore wanted the report to place more emphasis on the role that medicine played in the identification of research problems and on preventive medicine, points Stieglitz thought would make the report more "impressive for medical critics" without altering it radically. He assumed that Herty had named Abel to the committee for good reason and was glad to take advantage of his "professional ability and directness." But revisions would take a little time, Stieglitz pointed out; consequently, he wanted to take the material with him to Stanford, where he was teaching that summer.⁴⁶

Stieglitz was as good as his word. By July 4, 1921, he had completed his work

and the finished report was in Herty's office. The revision might have lost some of its "sweep of ardent purpose," Stieglitz wrote in a covering letter, but he thought it had gained in "solidity and authority." Herty agreed and so did Abel, and by August 5, 1921, the completed document was forwarded to Garvan. By that time also Herty had praised John Abel for his valuable suggestions and Julius Stieglitz for his "painstaking work" of revision. "It has been an inspiration to me," he told the Chicago chemist. "As I read the report more and more I feel it is a document which is going to have a marked influence and that we have done something that is well worthwhile."⁴⁷

As presented to the Chemical Foundation, the committee's report began by noting the value of scientific cooperation during the war, especially in the case of chemical warfare, and urging that in peacetime it be enlisted in the war against disease. Next, it declared that although Congress had funded scientific cooperation during wartime, it was against traditional practice to support fundamental research in government laboratories. Such facilities existed to enforce laws or for "other utilitarian purposes." Moreover, the aim was to minimize government control in peacetime. Manufacturers, in business for profit, could not supply the capital required for such research facilities, and neither could universities. Only the private sector could produce the necessary endowment, which the committee fixed at over \$10 million. The report then provided a detailed breakdown of how the money would be spent and how the institute would be governed. The next forty pages of the document dealt with the relation of the "fundamental sciences" (chemistry, biology, physics) to medicine, followed by a discussion of existing facilities for chemo-medical research. None of these, it was argued, approached problems primarily through chemistry. As for existing government bureaus and laboratories, only the Hygienic Laboratory in the United States Public Health Service could conceivably be adapted to perform the work the committee planned for its proposed institute of chemo-medical research. Based on past experience, however, such adaptation seemed unlikely. Congress never appropriated enough for salaries or equipment, with the result that it was impossible to keep good men in government service. In sixteen years four men had served as chief of the chemical division of the Hygienic Laboratory and the position had been vacant for one-fourth of that time. In conclusion, the report declared that the complexity of the human organism and the diseases it fell prey to required the cooperation of scientists in several fields; that the country had no institution wherein intense physical and chemical research was taking place "hand in hand" with medical and

biological study; and that in the proposed Institute of Chemo-Medical Research, the attack would be cooperative from the selection of the problem to its ultimate solution. Ending on the same note with which it began, the report reiterated: "May the day come when the lesson of the power of cooperative scientific endeavor, so effectively utilized in the Chemical Warfare Service organization, be applied with equal success to the solution of problems of disease and health."⁴⁸

Soon after Herty's committee completed its work, the Chemical Foundation published the report in pamphlet form and arranged to distribute six hundred thousand copies to "every medical man, university professor and . . . women's organization in the country." Garvan complimented Herty and the committee for "a splendid piece of work" and predicted that the country would hail it as "one of the really great ideas of the age." As issued by the foundation, the report was somewhat revised and renamed "The Future Independence and Progress of Medicine in the Age of Chemistry." "Thorough discussion" with Francis Garvan, Herty explained to his committee on January 27, 1922, convinced both men that the report would "carry more weight if it were directed to the general subject of cooperation between chemists, pharmacologists, and biologists" rather than to the establishment of any "definite institute." Material on "the latter point" would be printed in a special appendix that could be distributed later to those with an "active interest."⁴⁹

During the next several weeks Herty supplemented the Chemical Foundation's distribution of the report by sending it to prominent members of the Century Club, some of whom were editors and publishers of influential and widely circulated magazines and newspapers including the *Outlook* and the *New York Times*. Both devoted articles to the report early in 1922, and through Julius Stieglitz Herty hoped to secure support for the project from the editor of the *Journal of the American Medical Association*, George Simmons. Simmons prepared an editorial which Stieglitz read before publication and described to Herty as "on the whole, entirely satisfactory." But, he added, "It does make the suggestion that the Government could afford through the Public Health Service, to take up on a large scale the work we propose."⁵⁰

Simmons was not the only one in 1922 who thought the government ought to get involved. After seeing a copy of the foundation pamphlet, Senator Morris Sheppard of Texas offered to introduce a bill for the establishment of a chemical research laboratory, and a judge in Michigan was circulating a petition aimed at securing similar legislation. Harvey L. Curtis, a physicist in the Bureau of

Standards, also thought the proposed research institute should be funded by the government, arguing that many good men chose to serve in government laboratories because of the valuable contacts they made with outstanding scientists, the well-equipped facilities, and the chance to render public service. He thought Congress would be more generous with salaries if the scientific societies organized an educational campaign and focused public pressure on the lawmakers. Finally, although he disputed Herty's generalization that congressional restrictions limited research in government laboratories to "utilitarian" purposes, he did not think the Public Health Service was the place to locate the proposed institute because that agency was concerned largely with "regulatory, routine matters."⁵¹

For most of 1922 Herty was so busy in Washington trying to secure protection for the dyes industry that he had little time to build support for the chemo-medical research project. As president of the newly launched Synthetic Organic Chemicals Manufacturers' Association, however, he represented firms that manufactured medicinal chemicals as well as dyes. And what Larkin Mead of the Chemical Foundation called the "medical argument" proved very effective in the effort to persuade Congress that American coal-tar chemicals needed extraordinary protection against German competition. Herty took the time, therefore, to stroke prominent medical men by sending them copies of the foundation pamphlet and enlisting their support for a totally self-sufficient American coal-tar chemical industry.

After issuing its report in 1921, Herty's Committee on an Institute for Chemo-Medical Research held no formal meetings although, as Herty informed ACS president James F. Norris in March 1925, the influence of its report continued to grow. Many references to its usefulness as a model were made when the William Boyce Thompson Institute for Plant Research opened in October 1924, and authorities at Harvard and Johns Hopkins used it effectively to raise money for the expansion of their chemistry departments. In addition, Georgetown University planned to build a chemo-medical facility patterned after the institute proposed in the Herty committee's report. "The Committee has by no means given up hope," Herty advised Norris. He recommended that it be continued for another year.⁵²

What seems to have kept hope alive in Herty and his committee were some encouraging signs that the message preached in the ACS report was getting through to the general public. Graduate schools reported increased activity in biochemical research and major newspapers devoted whole columns to the coverage of cooperative chemo-medical research under way at Yale and the Rockefeller Insti-

tute. Heartened by such developments, Herty commented to a *New York Times* editorial writer, "Perhaps we are coming nearer the day when public interest will be so aroused that the ideals for advancement in research set forth in that report may be about to be realized."⁵³

Early in 1926, as part of his ongoing efforts to promote cooperative research, Herty sent Senator Joseph Ransdell of Louisiana a copy of the ACS *Report on the Future Independence and Progress of American Medicine in the Age of Chemistry* and a bulletin issued by the recently established Boyce Thompson Institute of Plant Research. Noting the strong arguments presented in the latter for cooperative research on plant life, Herty thought Ransdell would quickly see the need for a similar facility, "which would bring together, under one roof, the best workers in the country: chiefly in chemistry, but also in physics, biology, microbiology and pharmacology to develop a concerted attack upon the fundamental problems of medicine." When he contacted Ransdell, Herty was simply trying to interest a fellow southerner in the promotion of a good cause. The two men had cooperated during the long dyes fight and had recently renewed their acquaintance as a result of Herty's efforts to promote naval stores research. Intrigued by the material Herty sent, Ransdell encouraged him to write him "in as much detail as you care to."⁵⁴

The relationship between Herty and Ransdell reestablished early in 1926 developed over the next four and a half years into a close working partnership. Ransdell, whose long career in Washington began in 1898, spent fourteen years in the House before going to the Senate, where he remained until Huey Long defeated him in 1930. Described by one biographer as one of "the most consistent protectionists in the Senate," he worked hard to safeguard the sugar and cotton interests in his state and to establish federal responsibility for flood control of the Mississippi. With their common interest in protectionism and the promotion of human health, not to mention their southern heritage, it is not surprising that Senator Ransdell and Charles Herty soon found themselves working for a common goal: the establishment of a national institute of health.⁵⁵

From the beginning Ransdell wondered why the "big thought" Herty and his committee proposed could not be realized by some government facility. He offered to introduce legislation to that effect immediately, but as Herty reported to the president of the ACS, "The Committee still feels . . . that the ideal solution would be one of private endowment rather than of government support." Nevertheless, Herty did suggest that Ransdell make a speech on the Senate floor

to publicize the institute idea. Randsell was willing but felt that more would be gained if he introduced a specific bill, scheduled hearings on it, and then delivered a speech to his colleagues. Given the budget process, the senator doubted that the bill would pass but still thought it was the best way to attract wide public attention.

Late in March 1926 Herty polled his committee on the Randsell plan, expressing his own misgivings in a cover letter. Response was mixed. Some thought a bill should be introduced, others were opposed, and a third group thought the "important work" then being done by the government through the United States Public Health Service should be given more money and better facilities. "I am confident," Herty reported to the senator, "that the Committee still feels that the Institute which they had in mind when they wrote the report should be privately endowed." He wished he could write a "more definite" letter because the senator's "sincere and enthusiastic interest" moved him very much. In any case, it was probably too close to adjournment to accomplish anything in the current session. Undeterred, Randsell wrote back that he too thought private funding for the proposed institute was best. But he still believed the publicity to be gained by introducing a bill was worthwhile. If Herty and his friends would draw one up, now or later, he would be glad to sponsor it to get the "cause" going. What he hoped to do, Randsell explained, was call the attention of wealthy men to the need for such a facility so that some might do for humans what the Boyce Thompson Institute was doing for plants.⁵⁶

Herty's Committee on an Institute for Chemo-Medical Research was "so scattered" in April 1926 that he saw no way it could furnish Randsell with a bill. Nevertheless, he hoped the lawmaker would find a way to deliver a speech on the Senate floor, and on April 10 he thought he had found one for him. A bill "for the development of the Public Health Service and other public health activities of the Government" had recently been introduced in the House by Representative John Parker of New York. Herty wondered if Randsell approved the measure, and if so, whether he would be willing to introduce it in the Senate. Under section 3b of the bill, he pointed out, an opportunity existed to expand the work of the Hygienic Laboratory "along the lines suggested in our report. . . . [A] discussion of that on the floor of the Senate would give valuable publicity." In time Randsell approached officials of the Public Health Service about expanding the Hygienic Laboratory but found that though they wanted more money, they were too intimi-

dated by the stringent budget procedure to ask for it. "That being true," Ransdell advised Herty on June 1, 1926, "I doubt if I will introduce a bill. . . . [My] present idea is to make a speech along very general lines, looking to the great end . . . which you and your associates had in getting up your splendid report."⁵⁷

Exactly a month later, Ransdell changed his mind. He now planned to introduce a bill in the Senate on July 1 and to deliver a major speech on it the next day. Herty, who had supplied considerable source material for the speech, was taken by surprise. "Had I known [when] you were going to make it I certainly would have been there," he wrote the senator on July 2, 1926. He hoped reprints could be made; meanwhile, he had forwarded his copy of Ransdell's speech to "my friend Dr. John H. Finley, the Assistant Editor of the *New York Times*," urging him to give it as much attention as possible.⁵⁸

As first introduced, Ransdell's bill provided for the creation of a National Institute of Health within the United States Public Health Service and an appropriation of \$5 million for land and buildings; the expenditure of \$2 million per year for five years to expand the existing Hygienic Laboratory and to support postgraduate fellowships for established professionals; and authorization for the government to accept private donations for use in "ascertaining the cause, prevention, and cure of disease affecting human beings." Almost four years later, Congress finally passed a somewhat revised and scaled-down version of the original bill which converted the Hygienic Laboratory into the National Institute of Health; authorized Congress to spend up to \$750,000 to expand the facility; provided for the creation of a system of fellowships; and gave the secretary of the treasury authority to accept gifts to carry out the purposes of the act.⁵⁹

From the beginning, the legislative path of the Ransdell bill was influenced by the fortunes of the Parker bill, a measure designed to make the federal government's several health agencies more efficient through administrative reform and bureaucratic consolidation with the Public Health Service. Support for the Parker bill came from within the government, specifically from the Public Health Service, and from various groups in the private sector that made up the national health movement (spokesmen for the leading insurance companies and organizations like the American Heart Association, the American Public Health Association, the National Organization for Public Health Nursing, and the American Society for the Control of Cancer). As one author has remarked, "This alliance was more expedient than committed. The members of the national health

movement could not afford the open opposition of the Public Health Service, and the Service had repeatedly failed to accomplish by itself desired internal reorganization." Consequently, the two joined forces, and the Parker bill, introduced on March 8, 1926, and subsequently referred to Chairman John Parker's House Committee on Interstate and Foreign Commerce, was the result. Meanwhile, profoundly influenced by the Herty committee report calling for more basic chemo-medical research, Senator Ransdell began thinking about drafting a health bill of his own. He introduced legislation to create the National Institute of Health on July 1, 1926.⁶⁰

In her monograph, *Inventing the NIH: Federal Biomedical Research Policy, 1887-1937*, Victoria Harden traces the tortuous paths of the Ransdell and Parker bills through the United States Congress, providing a wealth of political, professional, and bureaucratic detail as a contextual framework. Among other things, she discusses the fiscal conservatism of the Harding and Coolidge administrations, particularly that of the director of the budget, Herbert M. Lord; the bureaucratic infighting inevitably associated with drives for government reorganization; the conviction among most scientists that the private sector should support "fundamental" (as opposed to "applied") research; the impact of World War I on science and its public image; and, with due attention to social and economic factors, the changing patterns of research funding that developed during the 1920s. The story is fascinating, but of particular interest here are the parts played by Garvan, Ransdell, and Herty, especially Herty, in the enactment of both bills.⁶¹

Francis Garvan's interest in chemical projects that involved efforts to prevent or combat disease grew out of personal tragedy: the loss of a daughter from a streptococcus infection for which no effective treatment existed. Soon afterward, in February 1919, Herty's interview with Edward Marshall about the need for an institute for chemo-medical research appeared in several of the nation's newspapers. Garvan contacted Herty, and the two men were soon working closely together on everything that pertained to chemistry, including its role in fighting disease. Among other things, that meant educating the public through widely circulated foundation publications like *The Future Independence and Progress of American Medicine in the Age of Chemistry* (1921) and *Chemistry in Medicine* (edited by Julius Stieglitz in 1928). In addition, it meant substantial support by the Chemical Foundation for medical research programs at Yale and Johns Hopkins. Finally, when Herty joined the foundation full-time in late 1926, Garvan

directed him to develop a "concerted and thoroughly comprehensive" program of support for Senator Ransdell's bill. For Herty, a seasoned veteran of the legislative wars to secure protection for coal-tar dyes, it must have seemed like old times.⁶²

Joseph Ransdell, a longtime Democratic congressman and senator from north Louisiana, had a personal interest in health matters that went back to the beginning of the century when he visited Panama during the construction of the canal. In 1917, he sponsored the measure that created the National Leprosarium at Carville, Louisiana. One of Ransdell's biographers described him as a sincere, conscientious individual with a "deep sense of duty," a concern for the underprivileged around him, and "no rigidly defined political or social philosophy."⁶³

Herty would have agreed with that assessment. Soon after he and Ransdell began working together, he assured Garvan that the Louisianian was "very deeply in earnest" about the National Institute of Health bill. And because he was "naturally in close touch with all the Democrats" and independent enough to get along with Republicans, he thought the measure could be handled in a thoroughly nonpartisan manner.⁶⁴

Ransdell's ability to deal with members of both parties was important at a time when Republicans controlled the Congress and the White House. Even more important was his ability to work with the leadership of the Public Health Service and other supporters of the Parker bill who made it clear that passage of that measure was their first priority. Willing to combine the Parker bill with his own measure as presented to the Senate in 1927, Ransdell agreed the following year to separate the two when the Parker bill, having encountered stiff opposition and significant alteration in the House, was on its way to passage in that body. The House bill had the support of the secretary of commerce, Herbert Hoover, and a good chance to pass the upper house if introduced as a separate measure. "Not wishing to alienate the Public Health Service," Senator Ransdell gracefully acquiesced, reintroduced his bill for a National Institute of Health in its original form, agreed to delay hearings on it, and promised to do all that he could to expedite passage of the Parker bill (now styled the Jones bill after its Senate sponsor.)⁶⁵

After a conference committee adjusted differences between the House and Senate versions of the Parker bill, it was sent to President Coolidge on May 10, 1928, only to be vetoed eight days later. Demoralized, officials of the Public Health Service expected little as long as Coolidge held office, but Ransdell continued to press the administration in behalf of his bill. He also reminded the Public Health

Service that it would benefit if his bill became law and passage of the Parker law was bound to follow. An influenza epidemic during the winter may have made the difference. President Coolidge and Treasury Secretary Andrew Mellon both endorsed the Ransdell bill early in 1929, and the Public Health Service quickly followed suit.

Hoping to secure Senate approval before adjournment, Ransdell lobbied hostile senators of both parties, delivered a lengthy address on the Senate floor, solicited support from friendly newspapers, and paid another visit to the lame-duck president. The Senate approved the bill on March 1, 1929, but the House refused to suspend its rules to allow consideration of the measure before Congress adjourned on March 4.

Ransdell did not give up, and following discussions with Public Health Service officials, it was decided to prepare another measure which combined the salient features of the Parker and Ransdell bills. Congressman Parker raised technical objections to a combined bill but agreed to support both measures separately. Introduced simultaneously in the House and Senate on May 20, 1929, the Parker bill did not become law until the following April. The Ransdell bill was finally signed by President Hoover on May 26, 1930, but not without some revision. Most notably, the Treasury Department insisted that the bill state precisely how much would be spent for expansion of the Hygienic Laboratory. A figure of \$750,000 was suggested by Secretary Mellon, considerably less than the \$5 million originally proposed in 1926.⁶⁶

Senator Ransdell's willingness to persevere despite repeated disappointments and his ability to compromise with good grace made him the ideal "Mr. Inside" during the four-year-long battle to establish a National Institute of Health. Just as essential to ultimate success were the personal and professional resources that "Mr. Outside," Charles Holmes Herty, brought to the struggle. Like Ransdell, Herty was genial, hardworking, and dedicated; and like the senator, he knew his way around the committee rooms and administrative bureaus of Washington. But he had other assets that made his efforts to secure passage of the Ransdell bill particularly helpful. First, Herty's Committee on an Institute for Chemo-Medical Research spoke for one of the largest bodies of organized scientists in the country, the American Chemical Society. In 1926 it boasted more than fourteen thousand members. Second, as president of the ACS, as editor of the *JIEC*, and as president of SOCMA, Herty had worked closely with other scientific and tech-

nical organizations and leading members of industry to promote the cooperative spirit and practice of science. He thought that spirit had won the war, and he was determined to mobilize it in support of the proposed National Institute of Health. Third, Herty's outstanding talents as a writer and public speaker, used so effectively on behalf of chemistry during and after the war, constituted powerful weapons in the educational and public relations battles that had to be fought in behalf of the National Institute of Health, inside and outside of Congress. Finally, the most important asset that Herty brought to the fight was the support of Francis Garvan and the Chemical Foundation. Herty conceived the institute idea, and his ACS committee produced the thoughtful report that expressed it in mature form. But it was Garvan's interest and the foundation's financial resources that made it possible to put a good idea before a national audience.⁶⁷

When the Ransdell bill finally became law in 1930, Herty had not been a full-time employee of the Chemical Foundation for almost two years. The change came following a conference in June 1928 during which Garvan announced that the foundation would have to cut expenses because of the gradual expiration of patents from which its income was derived. He asked Herty to edit a popular chemistry magazine which he planned to support with his own funds. Herty answered that he felt embarrassment over what "in the light of the developments of my work, has turned out to be the incongruous title of "Advisor." Garvan suggested no modification of foundation policies or change in his title, and Herty was not interested in the editorship. Clearly the time had come to look for another job. But Garvan urged him not to hurry and to make sure that whatever he did would not be interpreted as "a breach between you and me."⁶⁸

In fact there was no real breach between the two men, and Herty willingly agreed to Garvan's request. Herty had already been offered another job and rejected it because he felt "morally bound" to continue his work for the foundation on the Ransdell bill. But he had been thinking seriously about putting his talents and experience to work in what he believed would be the next great area of industrial chemical development, the South. Noting the recent growth of chemical activity in Virginia, West Virginia, and to a lesser degree in Deep South states such as Georgia, Herty predicted significant development in the paper industry "in connection with the naval stores industry." Officials in the Forest Service agreed with him, but a number of research problems had to be worked out first. As a southerner, "with enough Irish in my temperament to make me somewhat

sentimental," Herty told Garvan, he wanted to do what he could to accelerate the industrial development of his native region. He thought his close ties with the chemical industry, his many friends among "the leaders of . . . finance and public thought," and the confidence southern people had always placed in him provided grounds for thinking that he could "fit into this picture somewhere in a helpful way."⁶⁹

Through a Georgia friend interested in the paper–naval stores scheme, plans were under way to hire Herty as a consultant. If all went well, he would split his time between New York and the southern states, traveling through Washington every two weeks, with all transportation costs paid. He planned a "scouting trip" through the South during the latter part of September, but before making any commitments he wanted Garvan's reaction to an arrangement whereby he would continue the foundation's work on the Ransdell bill and the prize essay contest. "With the trend of the chemical industry so strongly to the South," he explained, it was imperative that southerners, especially children, learn more about chemistry, something they could do best through the medium of the contests. Consequently, he proposed a liaison with the foundation that would allow him to visit Washington every two weeks to work with Senator Ransdell on the health bill and, during his travels through the South, to promote the prize essay contests in visits to schools, colleges, and state offices of education.⁷⁰

Garvan responded a few days later with a penciled note. He was delighted with Herty's "opportunities" and interested in his "proposition." Anxious to retain Herty's services, he suggested a two-year arrangement, beginning on October 1, 1928, at \$5,000 per annum. "What do you think of this?" Garvan asked. "Let me know frankly. I can't write at length."⁷¹

Herty accepted at once, very happy that the close relationship they had shared for so many years was not to end and pleased that he would be able to carry on "that part of the Foundation work in which I am so deeply interested." At the same time he would be free to develop his work in the South. The arrangement worked well, particularly as it concerned the Ransdell bill. During the next two years Herty's extensive correspondence with the senator indicates frequent meetings and close cooperation as the two men patiently lobbied congressmen and administration officials, accommodated their cautious allies in the Public Health Service, and educated the general public. Successful at last, both were present in the Oval Office when President Herbert Hoover signed the Ransdell bill on

May 26, 1930. For Ransdell the ceremony marked the high point of a long career in public service; he was defeated by Huey Long in the Louisiana Democratic primary later that year. For Herty, it represented both an end and a beginning. It ended twelve years of tireless effort to establish a facility devoted to fundamental medical research. And it freed him to begin a new career, this time designed to heal the economic ills that plagued his native South.⁷²

CHAPTER NINE

* * * * *

Promoting Southern Industry Through Chemistry

Herty's decision to become a chemical consultant in the fall of 1928 grew out of a series of events that began three years earlier. In May 1925, James M. Mallory informed Herty that his company, the Central of Georgia Railroad, had convinced the American Ceramic Society to hold its next annual meeting in Atlanta. Mallory was Central's industrial agent and a longtime friend of Herty's going back to their youth in Athens. The convention would take place in February 1926, Mallory explained, and it was his job to find a speaker who could "galvanize" an audience about the ceramic resources of Georgia, the amount of research already conducted on kaolin, or Georgia clay, and what future industrial results could be expected with more research and the cooperation of the society. Herty accepted provided Mallory could find no one more qualified before February, that he supply data on the current state of Georgia's clay industry, and "that you find some good quail hunter in Savannah that has got a dog and is willing to take me out for a day's hunting." Soon Mallory was sending Herty bulletins, pamphlets, and newspaper articles about Georgia's kaolin deposits, together with materials on other minerals that might contribute to cement and glassmaking industries in the state. He also arranged for Herty to spend two days with his friend Savannah attorney Gordon Saussy, who owned a "comfortable lodge" on a fifteen-hundred-acre wooded tract which he kept "well stocked with birds."¹

Herty began gathering comparative economic data for his address from a variety of sources. The most valuable came from two University of Georgia professors,

R. Preston Brooks of the business school and J. H. T. MacPherson of the department of history and political science. Both men had worked for years with politicians and industrial leaders to secure progressive tax reform that would allow the state to increase its support for all levels of education. But for various reasons their efforts had been blocked by special interests. Armed with the statistical data they provided, Herty pledged to use his speech to the American Ceramic Society to send the legislature a message. "I am not going to let that opportunity pass," he told the acting chancellor, "without hitting one good straight lick about the penurious policy of the state towards the University."²

In the speech, supplied in advance to several Georgia newspapers, Herty also used census data to illustrate how far the South had come since 1900 in the diversification of both agriculture and industry. But, he told his largely northern audience, it could not "rest content with shipping raw material." Factories had to be developed near those raw materials, and that required vision on the part of manufacturers as well as capital from bankers. Referring to the clay deposits of central Georgia to make his point, he noted that the material lay near the surface; that plenty of good water to wash it was available; that labor "of a type not given to . . . strikes" was plentiful; and that the nearby ports of Savannah and Brunswick afforded ample facilities for storage of fuel oil. In short, there was no good reason for Georgia not to develop factories and potteries that could turn out "whiteware of all sorts, sanitary ware . . . floor and wall tiles, electric porcelain and many other products." Finally, Herty hammered away at two themes he had been preaching for ten years: cooperative research and economic independence. The ceramics industry should follow the lead of the canning industry, which maintained a national research laboratory in Washington, he argued. As for the million and a half tons of "foreign" clay imported between 1922 and 1925, "Is it not worth the serious thought of producers in Georgia to strive to bring this annual \$4,000,000 worth of clay business to this State?"³

Herty's Atlanta speech was published in full in the *Industrial Index* of Columbus, Georgia, from which he later ordered two hundred reprints. The *Atlanta Georgian* printed an account of it with a favorable editorial, but the brief coverage provided by the *Journal* and the *Constitution* barely mentioned his remarks about the state's miserly treatment of the university. "The delivery of that message," Herty complained to James Nevin of the *Georgian*, "was the main reason which took me to Georgia."⁴

Because the Atlanta Convention Bureau blanketed the state with publicity be-

fore the Ceramic Society's convention, Herty's brief visit to Georgia mushroomed into a triumphal tour. Besides addressing conventioners in Atlanta's elegant Biltmore Hotel, he visited family and friends in Athens; met with students and faculty at Georgia Tech; enjoyed the privileges of the Capital City Club; gave a brief radio talk over the facilities of *Atlanta Journal* Station WSB; and was the guest of honor at an "Old Home Town Reception" in Milledgeville, his birthplace. Then he was off to tour the clay deposits and brick plants of Wilkinson County, to visit his aunt in Columbus, and on to Jacksonville for some personal business. Finally, he turned northward to Savannah for two days of hunting with Gordon Saussy and to address the Naval Stores Section of the Savannah Board of Trade.⁵

For Herty the Georgia visit turned out to be considerably more than a trip down Memory Lane. Impressed by the progressive spirit of the men he met when he appeared before the Naval Stores Section of Savannah's Board of Trade, he soon began asking the United States Forest Service for naval stores bulletins, corresponding with Thomas Gamble, editor of the *Naval Stores Review*, and lobbying Washington and the Forest Products Laboratory to provide additional funding for the research activity of Eloise Gerry (see Chapter 8). He also renewed contact with Carlton (Carl) Speh, longtime secretary-manager of the Turpentine and Rosin Products Association and an officer of the Pine Institute of America (PIA), which Herty learned was sponsoring research at the Mellon Institute. The aim was to develop new products from naval stores. The "new spirit" that seemed to pervade what Herty remembered as a profoundly conservative industry delighted him. "I would certainly like to get back in touch with the industry again," he wrote Gerry on February 2, 1927. And he did. When O. H. L. Wernicke, president of the Pine Institute, and several others asked him to participate in the upcoming Naval Stores Get-Together at Jacksonville, he accepted with enthusiasm.⁶

Attended by turpentine producers, factors, timber growers, technical men from bureaus of the federal government, and representatives of various forest products trade associations, the Get-Togethers featured symposia, speeches, and discussions about pricing and marketing problems, research to develop new products, and the most advanced techniques in reforestation and fire control. At the 1927 meeting Herty made a strong speech urging support for Gerry's research on the causes of resin flow, and later he breakfasted with the trustees of the Pine Institute of America, who subsequently named him to their technical advisory committee. Carl Speh and O. H. L. Wernicke did not agree on many issues connected with the fledgling organization, but they both wanted his advice about the Pine

Institute's research program at the Mellon Institute. "We all have unbounded confidence in Dr. Herty," Wernicke advised Mellon's assistant director. What pleased Herty most about the "new" naval stores industry, he wrote Wernicke after the meeting, was its interest in reforestation and research and its awareness that it was part of America's chemical industry. He wanted to build that awareness by borrowing the Pine Institute's mailing list so that he could send each member a brochure about the publications of the Chemical Foundation.⁷

One important result of Herty's attendance at the 1927 Naval Stores Get-Together was his introduction to Alex Sessoms, nephew and namesake of an old Florida friend. The elder Sessoms was one of the first turpentine operators to adopt the Herty cup-and-gutter system in 1902, and his nephew was also a pioneer. Following the Get-Together session on February 23, 1927, he invited Herty to visit his eighty-six-thousand-acre tract of cutover and naturally reseeded slash pine timber at Cogdell, Georgia, some twenty-three miles from Waycross. Organized as the Timber Products Company, Sessoms's enterprise was pursuing policies Herty was sure would produce a perpetual output of lumber, spirits of turpentine, resin, and cross ties. A professional forester oversaw operations, turpentine operators were required to use the cup system and the most conservative scarification techniques, and gum was processed in a modern steam distillation plant. In addition, the company kept two motorized fire-fighting units patrolling the woods at all times, and it maintained fire lanes and plowed fire strips at appropriate intervals throughout the tract. Finally, the Hercules Powder Company of Brunswick, Georgia, leased the right to remove from the property dead trees and resinous stumps from which it then extracted turpentine and resin, and other lessees grazed cattle on company land enclosed by eighty miles of fencing. Herty was so impressed by what he saw that he decided to produce an article about it for the *Manufacturers' Record*. Reporting to Francis Garvan on March 4, 1927, he wrote, "This I believe is going to furnish the model according to which a new naval stores industry of the South will be developed."⁸

Herty's increasingly frequent trips below the Mason-Dixon line after 1926 convinced him that the New South Henry Grady proclaimed in 1886 was finally beginning to take shape. Besides the successful attraction to the region of new business and industry by railroad industrial agents such as J. M. Mallory and the enlightened operations of such indigenous entrepreneurs as Alex Sessoms, the commitment to research expressed at Naval Stores Get-Togethers seemed to indicate the arrival of a new day. "It was amazing," Herty wrote Garvan after one trip,

“to notice how the men in this industry (once such confirmed old-fogies) were catching the spirit of research and taking a far more progressive point of view.”⁹

During the spring of 1928 Herty’s efforts to stimulate southern economic development intensified. Besides building support among naval stores men for the McSweeney-McNary bill, a comprehensive measure designed to increase USDA research on forest products (including southern pine), he testified in favor of it before a Senate committee and lobbied a number of congressmen, including Speaker of the House Nicholas Longworth. Longworth arranged an appointment for him with the chairman of the House Rules Committee, and shortly thereafter the bill cleared the lower chamber. Reporting developments to naval stores interests in Savannah and Jacksonville, Herty remarked, “Now, if the industry will get busy and spend some money on fundamental scientific research . . . I will feel happy in seeing the beginning of that new era in the naval stores industry which I tried to depict in my address to the Get-Together meeting in Savannah last February.”¹⁰

Speaking for an important part of the industry, the Pine Institute of America, Carl Speh responded at once with thanks for Herty’s efforts. As for the challenge to “spend some money,” Speh claimed to be “more pro-research” than Herty because 100 percent of his time was devoted to naval stores. The industry had to spend on research, he added, to compensate for “100 years of indifference.” For the rest of the spring and much of the summer, Herty and Speh worked closely together to plan the research program supported by the PIA at the Mellon Institute. They also collaborated on a strategy to prod the USDA, specifically the new head of the Forest Service, R. Y. Stuart, into allocating McSweeney-McNary Act funds for field research on the slash pine and, more important from Herty’s point of view, for the fundamental investigations of Eloise Gerry. Herty’s contribution was particularly important in these negotiations because, as a member of an advisory committee to one of the bureaus in the USDA, he was personally acquainted with Secretary William Jardine and A. F. Woods, director of scientific research.¹¹

Finally, Herty agreed to deliver the 1928 commencement address at the University of Georgia if the school’s first choice, then recovering from an illness, had to withdraw. “I know this is taking a liberty with you,” Chancellor Charles Snelling wrote Herty on April 4, “but you are my friend; and what use is a friend if he won’t help you when you are in trouble? Do this for the University and for me.”¹²

Far from being offended, Herty accepted eagerly because there were plenty of

things he wanted to say to "our people" if it could be done without the usual "oratorical trimmings." As he had in his address to the American Ceramic Society, he intended to present comparative economic data to illustrate what strides some southern states, if not Georgia, had already taken in chemical development. "I am confident," he wrote E. O. Fippen, secretary of Virginia's State Conservation and Development Commission and one of his sources, "that the South has just as much right to look forward to a great development of the chemical industries as it had several years ago in the case of the textile industry."¹³

Herty's commencement address was as frank as Snelling's invitation to deliver it. After describing the shortages and suffering endured by the South during the Civil War because of its failure to industrialize and the similar situation facing the United States in 1914 because of its uneven chemical development, Herty moved into the postwar period, noting that in the case of coal-tar chemicals the country had acted swiftly to achieve independence. But for potash, an important ingredient of artificial fertilizers, Americans still depended on foreign sources because agricultural interests insisted on free importation. Nitrogen, however, vital to the manufacture of munitions and another constituent of artificial fertilizers, was being manufactured in Virginia and West Virginia, despite the political and industrial bickering that had stymied its development at Muscle Shoals. But there was a problem that might strangle the nascent industry. Using funds from bonds floated by greedy U.S. bankers, the Europeans were trying to organize a "world nitrogen trust." Herty urged his listeners to foil their efforts by saying no when the bond salesmen showed up at their doors.¹⁴

Next, Herty turned to Georgia's future and some problems of industrial chemistry which, if solved, could avert economic distress and create great wealth. Citing the rapid increase in the nation's production of rayon, the fact that it was essentially a "southern" industry, and that in the normal course of events, lower prices and better quality were bound to result as chemists continued to improve the product, Herty asked, "What of the future of cotton?" So far, the rayon industry had increased the value of cotton linters, which it used as a raw material. But the industry's use of alpha cellulose derived from wood pulp already exceeded its use of cotton linters. "Can the Georgia farmer sell cotton in competition with wood pulp at ten cents a pound?" Herty asked. Urging cotton farmers to think of their crop as cellulose, "for that is what lint cotton really is," Herty held out some hope. Once the structure of the cellulose molecule was fully understood, he predicted, a host of new industries could be expected to develop. And in that

development, "The South should take front rank as a producer of both raw material and finished product. It will then be capitalizing its greatest of all natural resources, a bountiful supply of solar energy."¹⁵

As for the paper industry, which, like the textile industry in earlier decades, was moving southward from New England, Herty cited statistics to illustrate how much faster southern pine, particularly slash pine, grew than did the white pine, hemlock, and spruce used to produce paper in the North. A tax policy designed to encourage reforestation and a determination to keep fire out of the woods had done much to restore Georgia's timber. Consequently, he predicted a great future for the paper industry in the South if one all-important technical problem could be solved: the removal of resin from the tree without damage to its cellulose fibers.

Herty also discussed the development of useful products from much that was currently used for fertilizer, animal feed, or simply thrown away. Here again there were knotty technical problems which chemistry could solve. For example, David Wesson, the chemist who developed cottonseed oil, had recently created an edible high-protein "spread" from what was left of the cottonseed after the oil had been expressed. As for naval stores, chemistry had created a problem for which more chemistry might be the answer. New synthetic organic chemical solvents were limiting the market for spirits of turpentine. Consequently, naval stores men had to find new uses for their rosin. Again, chemical research was essential if the industry were to survive.¹⁶

Finally, Herty got to the heart of the message he wanted to deliver to the faculty, the trustees, and the people of Georgia. What, he asked, was the state doing to provide its sons and daughters with the training in research that would qualify them to "grapple intelligently . . . with the economic and industrial problems bearing so directly upon the future of the State?" A look through the University of Georgia catalog provided no evidence of graduate research training leading to the doctorate of philosophy. How could the institution call itself a "university"? Since the founding of Johns Hopkins and the subsequent reform of graduate training in America, the term "university" had come to mean a place where graduate students, under the direction of inspired specialists in various "departments of learning," and with access to comprehensive libraries, might thoroughly steep themselves in a given subject, search the literature for what had already been achieved, formulate new problems for study, and then, through "patient, persistent effort . . . expand the boundaries of knowledge, whether by laboratory experiment, by delving into extensive records or by carefully garnering and as-

sembling facts in order to draw accurate conclusions therefrom." The production of students so trained, Herty asserted, explained the nation's matchless progress during the last half century. But demand exceeded supply; certainly universities could not begin to satisfy industry's "clamor" for researchers with advanced degrees in chemistry. Nor could graduates in the audience before him expect to compete with those with "higher training." Lacking it, there seemed to be definite limits to what they could achieve, "no matter how earnest . . . [their labor] might be."¹⁷

The last few paragraphs of Herty's commencement address excoriated the state for shirking its responsibility to its children, denying them educational opportunities, or forcing them to go elsewhere "to feed upon the bounty of more progressive states." Reminding his listeners that Georgia benefited in countless ways from the work of researchers trained elsewhere, he asked, "Is it the spirit of our people to profit from this store of riches, and add nothing?" The inadequacies of the university's medical school and the lack of equipment in its departments of biology, physics, and chemistry came in for special mention as Herty concluded: "I care not who says the treasury of the State cannot afford it; I say in turn, the State cannot afford longer to neglect it. . . . True, the funds may not be immediately available . . . but this is a matter of investment for the future. . . . In justice to those who are coming after us, away with the fetish of aversion to bond issues . . . utilize the credit of this great State to equip the University to send a quickened bloodstream of highly trained men and women out into every part of this beloved Commonwealth."¹⁸

Slated to be honored by the board of trustees with the degree of Doctor of Laws, Herty was not sure how his somewhat unconventional commencement address would be received. But immediately after the ceremony Chancellor Snelling reassured him that some of what he said would be remembered by those in a position to help the university. "It was just the sort of seed sowing that is needed here," he wrote Herty on June 29, 1928. "I know it will bear good fruit."¹⁹

Shortly after his return to New York, Herty received a letter from Gordon Saussy announcing that the city of Savannah and several business groups had raised money to hire an industrialist who could find and attract industry to the city. A five-man board representing the municipal government and the participating organizations would manage the fund and hire the industrialist. Saussy, who had helped to raise the fund, thought the board needed an organic chemist

with industrial experience more than a traditional executive secretary or railroad industrial agent—someone “in touch” with capital and personnel willing to invest in developing new industries, especially those based on Georgia’s agricultural output. They all wanted “more smokestacks and payrolls,” but Saussy doubted that conventional industries would relocate. Savannah was more likely to attract industrial “specialties.” In any case, he had been asked to find someone who might “fill the bill,” and he wanted Herty to make a recommendation.²⁰

Herty agreed to look for “the right man.” But meanwhile, having just conferred with Carl Speh, secretary of the Pine Institute of America, he wanted Saussy and J. M. Mallory to meet with Speh in Savannah, where Speh would repeat the substance of their conversation. On July 27, 1928, the three men had lunch together, and from the letters that Mallory and Saussy wrote Herty immediately afterward, it is possible to surmise what Herty had proposed. Apparently, he and Speh envisioned the creation of a cooperative, Southwide industrial development agency funded by railroad companies operating in the region. Like the Savannah plan, the goal would be to attract capital for investment in new industries along their rights-of-way. Herty’s contribution, not specified, would probably involve his chemical expertise and his widespread contacts with northern industrialists and bankers. It may be that he planned to direct the proposed agency or to serve it as a technical consultant, but that is unclear. Mallory’s reply, however, was not encouraging, at least as far as securing support from the railroads was concerned. “We are sincerely and intensely interested in some plan that might induce you to come South when conditions are such that you can leave your present connection,” he told Herty. But the railroads had been losing money since January 1927 and had been cutting expenses. Furthermore, a bill pending in Congress designed to permit additional consolidation would probably reduce the number of southeastern lines to three or four, with the object of concentrating on operations and traffic; developmental work would be subordinated. And some railroads, the Southern for example, would not join any “mutual or cooperative plan.” If Herty wanted some group to take the lead, he ought to approach the power companies. The Alabama Power Company was the most “progressive and effective development organization and influence in the South today,” Mallory declared. Its president was also president of the Southeastern Power and Light Company, and Mallory thought that one day Southeastern would absorb the Alabama, Georgia, Gulf, and Mississippi Power and Light companies and various others. He

encouraged Herty to investigate because Alabama Power's president Martin had shown an interest in chemistry and "as their lines extend all over the Southeast the future is most alluring."²¹

After a night's sleep, Mallory wrote Herty another letter, noting that Georgia "sorely needed" a development research organization that could serve the whole state and work cooperatively with the Georgia State College of Agriculture, the Georgia School of Technology, chambers of commerce, and luncheon clubs where no commercial organizations existed. A group called the Greater Georgia Association or Georgians Incorporated was operating, but it duplicated the work of A. M. Soule at the State College of Agriculture and had never accomplished what Mallory thought it should. If the organization were properly run, however, with a department to handle industrial developments and research, it could be very useful. "Such things as sweet potato research, the research with pine wood for pulp and paper and a no. of other things which you know about better than I do could be solved with immense value to the whole state." Mallory was not sure how such a project should be approached, but to succeed he knew that it would need the support of bankers and power companies as well as railroads.²²

Gordon Saussy's letter of July 27 to Herty was much shorter and somewhat cryptic. It promised an immediate investigation "to determine if anything is to be done there" and a fuller letter in a few days. Meanwhile, Herty replied to Mallory, thanking him for his suggestions and indicating his interest in an arrangement whereby half of his time could be spent in the South. "I think it would give me a new zest in life," he confided, "and I know how deeply my heart would be interested in such work."²³

On August 10, 1928, Herty received an "official" letter from Gordon Saussy describing the organization, operational scheme, and makeup of Savannah's Industrial Committee. It also advised him that the committee's chairman, Howard Foss, would soon visit New York to discuss the selection of a "suitable Industrial Commissioner" whom the committee was prepared to pay \$8,000 to \$10,000 a year. The rest of the letter contained Saussy's personal comments. If Herty was interested in the position, he should write to C. J. Hunter, a member of the committee, stating what salary he would expect and whether he would accept a three-year contract. Herty was touched by Saussy's interest but told him frankly that the Savannah job was not precisely the kind of work for which he was looking or for which he felt best qualified: "My interest lies primarily in seeking to accelerate the movement of the chemical and allied industries to the South, and aiding

in the development of new industries which must rely on chemical work for their establishment and maintenance." He agreed with Saussy that it made no sense to try to imitate development elsewhere. Knowledge of local conditions, availability of raw materials, and other indicators of possible success ought to determine what industries should be developed.²⁴

Unwilling to tie himself down to a single client or community, Herty hoped to operate all over the South, to establish enough contacts in various localities to make a living, and then "to get out and hustle to the best of my ability." He believed he could be of assistance to "liberal" chambers of commerce, and he wondered if Saussy thought it would be possible to make a part-time arrangement with Savannah's Industrial Committee for \$2,000 or \$3,000 a year. If so, he could cooperate with the industrial commissioner, perhaps establish an office near him, and help to work out some of Savannah's problems. In any case, he hoped the Industrial Committee would not make any firm decisions before he could visit the city during the third week in September.²⁵

Besides the Savannah visit, Herty arranged with Carl Speh to attend the Waycross Forestry Fair, the Turpentine Operators Association meeting at Colquit, Georgia, a meeting of the board of trustees of the Pine Institute of America at Mobile, and another with Alabama and West Florida turpentine operators at Pensacola. Back in New York early in October 1928, Herty came to a decision. He wrote to Carl Speh and A. F. Bullard, officers of the Pine Institute of America, accepting their offer to serve as a consultant on research problems and all matters connected with educational institutions and government departments in Washington at a fee of \$2,500 per year, beginning on November 1. Another letter went out the same day to H. C. Foss, chairman of the Savannah Industrial Committee, confirming the tentative agreement discussed with the committee in Gordon Saussy's office on Herty's recent trip. Under its terms, Herty would become an adviser to the Industrial Committee and its industrial commissioner at an annual retainer of \$3,000, also beginning on November 1. Having already negotiated a half-time arrangement at \$5,000 a year with Francis Garvan to continue his work on the Ransdell bill and the foundation's prize essay contests, Herty would begin his career as a chemical consultant with an annual income of more than \$10,000.²⁶

For the next three years (1929-31) Herty spent approximately two weeks of every month traveling among his several southern clients and the other two weeks developing contacts for them with northern bankers, manufacturers, and techni-

cal experts from his New York office at 101 Park Avenue. En route to and from the South he invariably traveled through Washington to help Senator Ransdell shepherd the National Institute of Health bill through Congress or to promote the interests of his various clients. For example, in December 1928 he arranged for scientists in the Bureau of Standards to cooperate with a chemist at the University of Georgia to determine the composition of resene, a naval stores derivative which the Pine Institute hoped might have commercial value.

Herty's first service as consultant to Savannah's Industrial Committee involved finding a suitable commissioner to spearhead the city's drive for new industry. The man he recommended was George M. Rommel, who had recently produced valuable reports for the USDA and the Bureau of Standards on the potential uses of farm wastes and the future possibilities of cellulose from farm and forest. Much of his work for the government had taken him through the coastal South, and as recently as 1927 he had visited Savannah to interview prominent naval stores executives. Herty conferred regularly with Rommel about what kind of industry would be most suited to Savannah and how best to attract it. He also investigated interested firms to determine whether they were financially sound, and he campaigned vigorously for Savannah whenever a major company was rumored to be opening a branch "somewhere in the South." Above all, he used his vast network of friends and acquaintances in technical, financial, and industrial circles to open doors for Rommel, who then usually prepared a comprehensive brief especially tailored to the needs of the most desirable prospects.²⁷

Besides the city of Savannah, Herty's clients included Auburn University and the University of Georgia, an Atlanta geologist seeking funds to manufacture a new kind of face brick, the kaolin or china clay interests in several southern states, and the Central of Georgia Railroad. His work for the Atlanta geologist and the kaolin interests was designed to promote a full-scale ceramics industry in Georgia. To that end Herty appeared before congressional committees and the United States Tariff Commission in an attempt to secure higher rates on imported English clays in the pending Hawley-Smoot tariff.²⁸

In 1930 Herty's interest in solving technical and marketing problems led him to become a consultant for the Tom Huston Corporation. A holding company, the Huston Corporation controlled several firms, including Tom's Toasted Peanuts, which turned out packaged confections at its plant in Columbus, Georgia, as well as frozen food operations located in the peach belt of middle Georgia and the orange country around Orlando, Florida. Working with the company's research

department, Herty tried to overcome a host of difficulties such as a peanut blight affecting 50 percent of the crop in southwest Georgia; packaging problems that severely limited the shelf life of some peanut products, and storage and shipping difficulties in the frozen food line. He also hoped to find commercial uses for one of Huston's waste products, the peanut shell.²⁹

Without doubt, the most significant association Herty formed in his first year as a consultant was with Alex Sessoms, president of the Timber Products Company of Cogdell, Georgia. Following his first visit to Sessoms's vast plantation, Herty was convinced that the naval stores industry would be perpetuated. As long as fire was kept out of the woods, self-seeding slash pine would replace the virgin longleaf forests cut down twenty-five years earlier. Meanwhile, conservative turpentine and lumbering of mature trees, production of cross ties from dead and fallen timber, removal of old stumps for extraction of turpentine, and cattle grazing on the unburned grasslands would provide an income while the new timber crop grew. The only thing necessary to provide the enlightened operator with a perpetual income was to find a profit-making use for the thinnings, young trees that had to be removed from the rapidly growing forest so that it could produce high-quality turpentine trees and sawtimber.³⁰

The thinnings were the right size for use as pulpwood in the existing kraft paper mills along the Gulf Coast from west Florida to Louisiana and Arkansas, but that market was becoming saturated. Sessoms and others like him needed a new outlet that could use slash pine thinnings in great quantity while they waited for their timber to mature. Herty was sure that the answer lay in the development of a white paper and newsprint industry in the South, something that, at the time, most experts considered highly improbable for economic and technical reasons. Herty agreed that there were problems, but unlike the experts, he thought they could be solved with money, research, and determination. In 1928 he agreed to become a consultant for Sessoms's Timber Products Company for one year, renewing the arrangement for two more years in exchange for twenty shares of stock per annum. His initial task was to find northern bankers willing to refinance the company so that it might expand operations, but they proved unresponsive. Later he made contact with several paper companies to have tests conducted on thinnings from Sessoms's trees and to interest them in establishing plants somewhere close to Cogdell or Waycross.³¹

Herty's first visit to Sessoms's Cogdell operation in early 1927 seems to have focused his attention on the field of cellulose chemistry. The term *cellulose* arose

about 1839 following the publication of research conducted by a Frenchman, Anselme Payan, on "ligneous matter," or the woody cell walls of trees and other plants. Payan showed that "ligneous matter," then thought to be a single substance, was actually composed of two chemically distinct materials, lignin and what came to be called cellulose. Ninety years later, Herty described the relationship of the two materials, lignin and cellulose, in the cell walls of all vegetable matter as "in rough analogy like mortar between the bricks of a wall." Little was known about lignin, but chemists had learned a good deal about cellulose, and considerable progress had been made in cellulose technology. The American Chemical Society recognized that progress when it held two cellulose symposia in 1920 and, more formally, when it established the Division of Cellulose Chemistry in 1923. Convinced that American synthetic organic chemistry was moving "from the coal-tar to the cellulose period," Herty discussed the topic briefly in a paper read before the ACS Division of Industrial and Engineering Chemistry in September 1926. But after his trip to Cogdell the next year, he began methodically gathering information on recent developments in cellulose chemistry and industries based on cellulose.³²

Among other things, Herty learned that several plants in the Midwest, one of which was already in operation, planned to use cornstalks as the raw material for a chemical pulp in the manufacture of high-grade paper or wallboard. Billed as a way to relieve a serious agricultural problem and to conserve depleted northern forests at the same time, the new process was attracting considerable attention. Herty thought that Sessoms's slash pine thinnings could serve the same purpose. To arouse interest in the general topic, he delivered a series of speeches in 1928 pointing out the need for more cellulose research and projecting what it might mean in the way of new industry, especially in the South. Regardless of the makeup of his audience, he usually made the same points. Americans were living in an "Age of Cellulose." Rayon, made from alpha-cellulose derived from cotton linters and wood pulp, was transforming America's textile industry. Film for the movie industry, lacquers for furniture and automobile bodies, guncotton for artillery and smokeless powder, celluloid, cellophane, artificial leather, insulating material, and paper also came from chemically treated cellulose. Furthermore, as cellulose chemists and research-minded capitalists continued to pour resources into the field, rayon production was bound to increase and a host of new industries based on cellulose could be expected to develop. Already cotton farmers could not supply the demands of rayon manufacturers, who were relying increas-

ingly on wood pulp. Wood pulp was cheaper, Herty pointed out, and if ongoing research on cornstalks, straw, and similar waste materials proved successful, the competition facing cotton farmers would be even stiffer.

Next, Herty usually talked about the forests from which expanding cellulose-based industries would probably have to secure their raw materials in the future. He did not think any section of the country would have a monopoly because each enjoyed certain advantages. "In the North generally," he pointed out in the fall of 1928, "the spruce does not contain much resin, which is an immediate asset in the manufacture of cellulose. . . . [But] look at the tremendous advantages the South has in sunlight, for it is the sunlight that makes wood." Invariably he cited figures which showed that northeastern red spruce and white pine at thirty years of age increased annually at 0.4 and 1.3 tons per acre respectively, whereas the slash pine and loblolly pine of the Southeast produced an annual yield per acre at thirty years of age of 2.9 and 2.5 tons. Shortleaf pine was next at 2.0 tons and longleaf pine at 1.7 tons per year came in last among the southern woods, still well ahead of those from the North. The slash pine, Herty added, was also the greatest producer of turpentine.

One version of the Herty speech, originally delivered to the National Industrial Conference Board in New York in May 1928, appeared later in *Nation's Business*, a magazine published monthly by the United States Chamber of Commerce. Another formed an important part of his commencement address at the University of Georgia in June 1928, and still another was part of a program at a summer institute sponsored jointly by the ACS and Northwestern University the following month. To Francis Garvan, who helped finance the institute, Herty wrote on July 26, "This meeting has brought together the leading authorities on both the pure and applied phases of cellulose chemistry, and I am confident that the general interest and activity in this field justifies the statement I made a year or so ago that with the coal-tar chemical industry now fairly well established, the next great advance in this country would be connected with cellulose problems, all of which are of tremendous importance."³³

Besides educating industry and the general public on cellulose, Herty was learning everything he could about cellulose research in progress. Following the Institute of Chemistry meeting at Northwestern, he went to Madison, Wisconsin, to confer with officials at the Forest Products Laboratory and to visit A. W. Schorger of the C. F. Burgess Laboratories located in the same town. Schorger was a recognized expert on cellulose chemistry, and the Forest Products

Laboratory had been conducting pulping experiments on various southern woods for more than a year. Herty was also in contact with university and industrial chemists working on various phases of cellulose technology. Specifically, he was collecting data regarding the relative advantages of slash pine over cornstalks or Canadian spruce as a raw material for the manufacture of white paper and newsprint. The USDA reported that slash pine produced, on average, seven times more growth per year than spruce, and the dean of forestry at the University of Toronto stated that 270,000 acres of Canadian spruce were cut down each year and only 2,000 were replanted. Given the South's advantage in growth rate and the fact that spruce pulpwood was selling at \$18 a cord, Herty did not think it took much imagination to conclude that the industry was bound to develop in the southern states. As for cornstalks, one Bureau of Standards expert who visited Alex Sessoms's timber farm in June 1928 estimated that slash pine thinnings could be delivered to a paper mill for a dollar or a dollar and a half per ton compared to cornstalks at \$5. Herty was greatly encouraged. "Now, if we can just get somebody to work out the deresinification problem," he replied. "Whoever puts some originality into that problem and succeeds from an economic standpoint will certainly reap a rich harvest and open a new day for the paper industry."³⁴

In the end, Herty worked out his own "deresinification problem," which, technically at least, turned out to be no problem at all. To Eloise Gerry of the Forest Products Laboratory he explained in October 1928, "What I want to know primarily is what is the average resin content of second growth slash pines of from ten to fifteen years of age, just such pines as Mr. Sessoms and . . . [others] will have to discard in thinning out their stands, for that is the basis of the pine pulp question of the future as I see it now."³⁵

Three months later, Herty arranged to have the laboratory of Hercules Powder Company at Brunswick, Georgia, determine precisely how much resin was contained in young slash pine, that is, pine containing no heartwood. Naval stores experts at Hercules's main plant in Wilmington predicted a minimum of 5 percent while others estimated as much as 15 percent would be found in the test samples provided by Alex Sessoms. These consisted of sawdust from thirty young, peeled slash pines ranging from four to ten inches in diameter and sealed in five ten-gallon tin cans to keep out air. Early in February, S. J. Kloss, manager at Brunswick, reported the amount of resin to be only 1.38 percent, confirming Herty's hunch and giving him a bombshell to detonate when he addressed the

American Paper and Pulp Association (APPA) at New York's Waldorf Astoria on February 21, 1929.³⁶

Herty began his speech by noting that the paper and pulp industry constituted one of the major industries in the United States. Its one thousand firms, representing a capital of \$1.3 billion, produced more than a billion dollars worth of product in 1927. "Therefore," he reasoned, "for weal or for woe, [it] is of national importance." Noting that the "suitability" of white spruce had led the industry to locate in northern states close to spruce forests in the United States and Canada, Herty went on to cite expert opinion which indicated the certain depletion of those forests. A report from the USDA commissioned by the Paper and Pulp Association was one of the sources. "But there is another angle to this matter," Herty advised his audience, "that is, the question of independence of any country outside our borders for sources of supply of either raw material or finished product." He recalled the chemical famine experienced in the United States during World War I and the subsequent drive to make the nation chemically independent. Then, noting that Canadian officials had recently considered a ban on the shipment of Canadian wood to mills in the United States, he remarked: "I only wish to use this as an illustration of how situations over which you have no control . . . are likely to arise so long as your industry is not independent of outside sources of supply."³⁷

Next, Herty provided his audience with a brief lecture on cellulose: what it was; what industries depended on it for raw materials (theirs, among a host of others), and where it came from. Lantern slides of leaf sections illustrated how cellulose was formed, and the point was made that light and heat were essential to the process. Noting that chemical reactions generally take place better at higher temperatures, Herty produced a chart based on government data which showed the relative growth of trees per acre, North and South. Longleaf pine, commonly called Georgia pine or yellow pine, from which many in his audience produced 286,000 tons of kraft paper in 1928, grew four times as fast as spruce at thirty years of age. All of this was prologue for a detailed discussion of the slash pine, which grew even faster, and which Herty wished to discuss at length because "my main purpose today is to try to bring two industries into closer relationship, the paper and pulp industry, on the one hand, and the naval stores industry, on the other." Using slides supplied by Eloise Gerry and Alex Sessoms, Herty explained how enlightened naval stores men conducted turpentine operations, where slash

pine grew, how much cutover land existed in the pine belt, and how rapidly self-seeding slash pine reproduced if ground fires were kept under control. Then he described in detail what fire prevention techniques were being employed at Cogdell and elsewhere in south Georgia through recently organized timber protective associations which the state encouraged with small subsidies.³⁸

"How far does all this concern you?" Herty asked his listeners. He explained. For best results Sessoms's turpentine forests had to be thinned of young trees five to ten inches in diameter and a use found for the thinnings. Herty proposed that they be used for wood pulp. He knew the paper men would immediately object that they contained "too much resin for anything but kraft paper." And he knew that a recently published bulletin of the Department of Agriculture proclaimed southern pine "probably too resinous for consideration" by the sulfite process and "probably too resinous for consideration by mechanical processes." But having searched the published literature he could find no hard evidence as to the actual amount of resin in young slash pine. The estimates of experts were also unsatisfactory. In a recent poll he found their replies ranged from 5 to 15 percent.³⁹

Then Herty detailed the circumstances of the test made for him by Hercules Powder Company from samples of slash pine prepared by Alex Sessoms. The wood showed about 1.38 percent resin, Herty reported, carefully acknowledging the Hercules manager's statement that the results "are only approximate and should not be used for calculations where any great importance is attached thereto." In perfect agreement with the manager's caution, Herty aimed simply to clear away erroneous notions about the resin content in unwounded young slash pine and to stimulate interest in "this most remarkable possibility," namely, a combination of the pulp and paper industry with the naval stores industry in the slash pine region, where invested capital might realize cash returns in ten years rather than sixty. To that end he proposed that representatives of both groups "sit around a table . . . [to discuss] these matters freely in order to determine if here may not lie the future for both of these great industries."⁴⁰

Finally, Herty brought the paper and pulp manufacturers up to date on the status of basic cellulose research. The problem was being approached from "three entirely different angles," he reported, and it pained him to report that most of the chemical advances were being made elsewhere than in the United States. In Germany, Scotland, and Scandinavia private industry was generously supporting fundamental research conducted by universities and private institutes. And in

Canada Professor Harold Hibbert, formerly of Yale and a close friend of Herty's, had recently become director of a pulp and paper research institute supported jointly by the Canadian Paper and Pulp Association, the Canadian government, and McGill University. "How pitiful, by comparison, is the activity along these lines in this country of ours," Herty lamented. "Surely the day cannot be far distant when thoughtful men in your [industry] and allied industries will see to it that America does not lag behind in this rational road to progress."⁴¹

Reaction to Herty's presentation at the Waldorf, widely covered by trade journals and the popular press, came from all over the country. Reprints of another address on the same subject, given to the Engineering Foundation several weeks earlier, were also being widely distributed early in 1929. "We certainly seem to have started a discussion through that informal address," Herty commented to the director of the Engineering Foundation. "I am getting clippings from every section of the country and foreign countries." Noting that the press had played a major role in "the making of the American chemical industry," Herty hoped the "continuous publicity" on cellulose would have similar results. Among those who responded positively to Herty's speeches were Carlisle Winslow, director of the Forest Products Laboratory, and Professor Harold Hibbert of McGill University, whose Canadian Paper and Pulp Research Institute was just getting under way. Both were especially taken with the idea of an industry-sponsored "cellulose institute," and Hibbert thought Herty's "many friends and genial personality" would soon make it a reality. Herty valued their comments, but what probably pleased him most of all was the interest his speech to the APPA stirred up in Glens Falls, New York, site of an International Paper Company plant. Impressed by the rapid growth of slash pine reported by Herty, an International representative wanted to repeat Herty's tests in the company's laboratory if Herty could send a "small sample . . . a cross section of a freshly cut [slash pine] tree, taken near the base, weighing about twenty pounds, and containing both sapwood and heartwood." Herty was glad to comply, but he asked Sessoms to send International two samples, one as described and the other without heartwood, "for my whole proposition is based upon the use of young trees without heartwood." Herty also told the International man to look up a German journal, *Cellulose Chemie*, which Herty had learned about after the APPA speech. The January 13, 1929, issue carried articles by two researchers who reported that "young pine trees and the sapwood of older trees are readily pulped by the sulphite process. This process cannot be used on the heartwood of pine." After some prodding, Herty learned

late in 1929 that International had not only confirmed his findings; it also planned to conduct semicommercial scale tests as soon as it could obtain the equipment.⁴²

Herty did not wait for International to act. In the spring and summer of 1929 he tried to set up experimental tests to make sulfite pulp from slash pine at a Boston research firm. That did not work out, nor did efforts early in 1930 to enlist the facilities of the Georgia Institute of Technology in Atlanta. Meanwhile, Herty continued gathering data, learning all he could about growth rates, yield per acre, and natural habitat of the various species of southern pine. In the late spring of 1929 he and Alex Sessoms made an extensive survey of kraft paper mills, reforestation projects, and government experiment stations in the Gulf states. He also arranged for tests to be conducted at Starke, Florida, to establish the age at which heartwood formed in young trees and the length of time slash pine and longleaf pine logs had to season before they could be pulped successfully. Finally, Herty kept abreast directly and indirectly with the work being done on southern woods by the Forest Products Laboratory in Madison, Wisconsin.⁴³

Herty was well acquainted with the personnel of the Madison facility and had tried, personally and through third parties, to convince them to concentrate on pulping slash pine by the sulfite method. But the laboratory had its own agenda. Besides loblolly and longleaf pine, it was working with southern hardwoods. C. E. Curran, in charge of the Pulp and Paper Division, described the laboratory's activities in an article titled "Present and Future Trends in the Pulping of Southern Woods" published by *Paper Industry* in January 1930. Commenting on the rapid growth of the southern pulping industry between 1921 and 1929 (from 382,500 tons produced in twenty-six mills to 1 million tons from thirty-six mills), Curran attributed the expansion to an abundance of cheap wood in the region and its proximity to the pulp market. Based on figures from the APPA and the United States Forest Service, he reported that a cord of pulpwood sold for \$16.80 in New England; \$18.04 in New York, \$12.43 in the Great Lakes region, \$8.96 on the West Coast, and \$7.56 in the South. He estimated the South's existing timber at over two billion cords or 30 percent of the nation's total. Moreover, the region could produce new stands quickly; twenty years was enough to grow pulpwood-sized timber if hogs and fire were kept away from seedlings. Consequently, the South could look forward to a perpetual supply of pulpwood at a cost that should remain "static."⁴⁴

Moving on to a discussion of "present pulping trends," Curran thought the South's continued plant expansion and its concentration on the production of

a single product, kraft, was unhealthy. Diversification was essential to stabilize the southern industry, and he summarized what the FPL had been doing to encourage it: "Confirming previous work, the southern yellow pines were found to be reduced to pulp best by the sulphate process; this is an alkaline process but is less alkaline than the so-called soda process that is normally employed in pulping hardwoods [gum, tupelo, birch, maple *et. c.*] for book paper. The unsuitability of the *sulphite* or acid pulping process for the pines was ascertained, as well as the unsatisfactory grinding qualities when the mechanical process was applied."⁴⁵

Next, by increasing the amount of "cooking chemical" per unit of wood and using it in "somewhat greater dilution," the FPL obtained more pulp per unit of wood, pulp of better color before bleaching, pulp equal or superior in strength to that produced using the standard sulfate process, and pulp that could be bleached with the ordinary bleaching agents with no significant loss in strength and, if subjected to "modified" bleaching techniques developed by the FPL, with an increase in strength and a saving in bleaching agent. The "modified bleaching technique" consisted of a "two-stage operation" involving chlorine water or "gaseous chlorine" in the first stage and "ordinary bleaching powder (calcium hypochlorite)" in the second. The combination of cooking and bleaching techniques, Curran summarized, "accomplishes the desired objective—a strong white pulp from southern yellow pine."⁴⁶

Until January 1930, the FPL had confined its investigations to loblolly and longleaf pine, although future plans called for work with other varieties of "the southern pine family." The laboratory also intended to investigate the possibility of producing sulfite pulp from pines, which Curran thought might interest the South if its pulping and lumbering industries could be so "integrated as to select wood going to the plant." Referring to Herty's address to the American Pulp and Paper Association ten months earlier (February 1929), which reported the "very small quantity" of resin in young slash pine, Curran noted that resin was "usually considered the bar" to the use of the sulfite or groundwood processes for the pulping of pine. But the wood Herty had subjected to analysis consisted "almost entirely" of sapwood, and research in the United States and Europe had already established that sapwood was readily pulped by the sulfite process. Heartwood, by contrast, resisted the acid reagents. "Dr. Herty's inference is," Curran continued, "that by elimination of the resins [through the use of sapwood only], this disadvantage [of the sulfite process] will be removed."⁴⁷

What Curran found most interesting about Herty's presentation, however, was

his point that successful growers of slash pine for timber purposes achieved the best results through consistent thinning of young trees. He thought it entirely possible that such thinning operations would result in enough wood to maintain a pulp mill. Then, assuming that the thinnings could be successfully pulped by the sulfite or groundwood methods, their lower cost should give slash pine a decided advantage over northern-grown spruce, hemlock, or fir. "Such a forestry development," Curran concluded, "would be an entering wedge for the newsprint industry, perhaps the largest tonnage in the paper field, into the South."⁴⁸

Curran's reference to Herty's APPA speech and his tentative comments about the "possibility of producing sulphite pulp from pines," "assuming that the special quality of this young pine will permit its being pulped by either the sulphite or . . . groundwood methods," suggest that part of Herty's message had gotten through to the Forest Products Laboratory. But another part had not. Well before 1930 Herty had concluded that the research necessary to develop a southern newsprint industry ought to be done somewhere near the trees. At first, he thought the FPL might be induced to open a southern branch, and on December 10, 1928, he sent Senator William Harris of Georgia a memorandum headed "On the Creation of a branch of the Forest Products Laboratory in the southeastern part of the United States for the Study of the Utilization of Southern Pine and Hardwoods for Pulp and Paper Manufacture." Harris was the second-ranking Democrat on the Senate Agricultural Appropriations Subcommittee and in an earlier meeting with Herty indicated support for the idea.

The Herty memorandum began by citing precedent for regional federal facilities and moved on to offer reasons for the establishment of a southeastern branch of the FPL. Although the kraft paper industry in the South was already well developed, it explained, there were certain research problems that had to be worked out before the full raw material resources of the region could hope to enter all lines of the paper and pulp industry. To carry out that research at Madison, Wisconsin, far from the source of the experimental material, would slow the development process. Therefore, Herty urged the immediate creation of an FPL branch somewhere in the Southeast "so that the work on these problems can be vigorously pushed."⁴⁹

Herty had worked hard in 1928 for passage of the McSweeney-McNary Forest Research Act, and he responded at once when Carlisle Winslow and Eloise Gerry asked him to lobby Congress against threatened cuts in the FPL's 1929-30 budget. Part of that budget, they explained, was slated for work on a modification

of the sulfite process to make it applicable to resinous woods. When Congress left the budget intact, Herty inquired through a friend whether the FPL could make pulping tests on young slash pine. But late in March 1929, C. C. Heritage of the Division of Pulp and Paper replied that the laboratory's schedule would not permit any work on slash pine until after September 1 and the funds to carry it out would have to come from the petitioner. In fact, the article by C. E. Curran published in *Paper Industry* and quoted at length above indicates that work on slash pine was still in the talking stage in January 1930. No doubt that reinforced Herty's conviction that a southeastern branch of the FPL should have been established, and it certainly helps to explain why, when Carlisle Winslow again asked him to lobby for an appropriations measure to expand its facilities in Madison, he respectfully declined. "For once I find my thoughts going a little apart from yours . . . in regard to this particular proposition," Herty explained. He certainly wanted Winslow's staff to have adequate housing, but he also wanted the FPL to be of maximum service to the people. That is why he had worked so hard for the establishment of a branch in the Southeast, preferably in Savannah, which he was confident would be the center of paper manufacture in the next fifteen or twenty years. "Someday I would like to talk this whole matter over with you," Herty added tactfully, "for I feel that we know each other well enough to discuss the question with mutual understanding."⁵⁰

Convinced that the South would have to make its own way, Herty began looking for other laboratory facilities early in 1930. With J. M. Mallory, industrial development agent for the Central of Georgia Railroad, he worked out a scheme that involved establishing an experimental paper laboratory at the Georgia Institute of Technology and securing financial support for it from industry and railroads in Georgia and Alabama. Unfortunately, nothing came of their efforts. President M. L. Brittain of Georgia Tech seemed more interested in securing a \$300,000 grant for the college from the Daniel Guggenheim Fund for the Promotion of Aeronautics than he was in supporting research on pine trees. And President A. E. Clift of the Central of Georgia concluded from newspaper accounts that work being conducted at the Forest Products Laboratory and elsewhere "would scarcely justify" any expenditure by his company. Herty was disappointed but not surprised. He thought Clift had confused what the *Atlanta Journal* reported about the sulfate process and kraft paper research with his own plans to produce white paper using the sulfite process. If so, there is no evidence that Herty's letter of clarification did anything to make Clift change his mind.⁵¹

With no testing facilities of his own, Herty had to make other arrangements. Early in 1930 he asked Alex Sessoms to send three or four boles (lengths) of seasoned, heart-free slash pine, from five to ten inches in diameter, to George K. Spence of the Castanea Paper Company at Johnsonburg, Pennsylvania. Spence was Castanea's chief chemist and thanks to Herty's friend R. W. Howell, he had agreed to make numerous tests on Sessoms's pine at no charge. Howell was vice-president of the paper mill division of R. T. Vanderbilt, an investment firm, and if the tests went well, he and Herty hoped to convince Castanea's management to establish a branch in Waycross or Cogdell using Sessoms's timber for raw material. In Castanea's laboratory, Spence subjected the young slash pine to precisely the same conditions as spruce, testing the pulp of each for length and strength of fiber and amount of bleach necessary to achieve an acceptable product. On March 19, 1930, Howell wired Herty the good news: "Fibre and strength tests [of slash] approximate spruce." Later, similar tests using longleaf pine were attempted, with less satisfactory results. Unfortunately, the problems were still unresolved when Spence had to turn his attention to Castanea's regular work.⁵²

Friendship also enabled Herty to investigate another aspect of the slash pine's potential in 1930. On September 11, he wrote to J. L. Coker, president of Carolina Fiber Company at Hartsville, South Carolina, asking if it would be possible in the next few weeks to have some seasoned slash pine logs, five to ten inches in diameter and consisting solely of sapwood, converted into mechanical pulp or groundwood. Coker's brother had been a good friend of Herty's at the University of North Carolina and Coker's son had fond memories of the Herty family in Chapel Hill. Consequently, he was glad to make the groundwood test provided it was a small one because only one of his grinders was then in operation. Herty arranged to have Alex Sessoms send four seasoned, peeled slash pine logs to Coker's plant and planned to be present when the test took place. "This test means a whole lot to us," Herty explained to Sessoms, "for there has never been a test made of slash pine for the manufacture of ground wood . . . which . . . constitutes about $\frac{3}{4}$ of the content of *newsprint* paper." They already knew they could make acceptable chemical pulp, the other 25 percent of newsprint, from the Castanea tests. Therefore, if all went well in South Carolina, Herty could say to the newsprint manufacturer, "Here is your opportunity."⁵³

The results were positive and available in time for Herty to use them effectively in an unusually frank and well-publicized address to the Atlanta Chamber of Commerce on October 29, 1930. It was not Herty's first speech in Atlanta

that year; he had addressed a convention of agricultural workers and an editorial institute of the Georgia Press Association at Emory University in February and the American Chemical Society and the City Club of Atlanta in April. But none of the speeches had the impact of the October talk, judging by the volume of press comment and correspondence that later inundated Herty's New York office. The response was hardly surprising considering that Herty had carefully arranged ahead of time with Howard Blakeslee, science editor of the Associated Press, for the widest possible coverage. Besides blasting Georgians for being too complacent or passive about developing the abundant resources of their state (If you want something that is worth going after, why not go after it?), Herty spelled out in detail his familiar tale of cellulose, specifically as it related to paper. He marveled that a state so rich in raw materials printed its newspapers on paper from "without the state . . . from Canada, or Sweden, or Russia," and that "not a pound of packing material is made here. Not even . . . wrapping paper is made in this State, and yet we can grow cellulose faster and better than anywhere in the world." He reiterated the point that young, all-sapwood slash pine had been proved to be "practically as free from resin as the Canadian spruce," despite a statement published by the U.S. Forest Service in 1927 which labeled it "probably too resinous for consideration" by the sulfite process.⁵⁴

Next, Herty mentioned the "trials and tribulations" endured in trying to find a laboratory that would determine whether slash pine would digest like Canadian spruce. He knew the FPL was working on the problem "in their way," but it took a long time to get things done by the government. Demonstrating a sample from the Castanea test, he noted that it came from a ten-year-old south Georgia pine tree, seven and a half inches in diameter. Canadian spruce took sixty years to reach that size. "They are cutting and using their spruce faster than they can produce it," he declared. "We can make six crops down here while they are growing one."⁵⁵

Herty went on to tell his audience how the Castanea test had been conducted. Small chips of slash pine were placed in a metal basket hung "right in the same digester where they were cooking tons of this Canadian spruce." It was cooked in the same "liquor" at the same temperature and under exactly the same conditions as the spruce. He showed them a vial containing a sample of the resulting slash pine pulp as it came from the digester and two pieces of white paper, one of which he thought to be the "first piece of white paper ever made out of slash pine by the sulfite process," and the other a piece made from spruce at the same time.

It took thirteen and a half pounds of bleach to whiten the spruce pulp and only thirteen for the same quantity of slash pine pulp. Holding them aloft, he added, "The chemist said that this pine sheet is a prettier white than this [spruce] one; he called it a perfect bleaching." The groundwood experiment at the Coker plant in Hartsville, South Carolina, was also described, and Herty held up another sample which he believed to be the first mechanical pulp ever made from slash pine. Coker thought it was a "very fine material for paper-making." And, Herty added, "He has been making paper for twenty-five years."⁵⁶

The rest of Herty's speech was a combination of reproof and exhortation. Georgians had enough wood to supply the whole country with newsprint if they kept fire out of the woods and worked to bring in mills that would use their resources. For those who wanted to know if longleaf and loblolly pine would also make paper, Herty answered that he did not know but had a "hunch" that any pine without heartwood could be pulped by the sulfite process. But it was only a hunch, not a "demonstrated fact." Recounting his mortification at having to beg others to do his experimental work, he made an impassioned plea to the "thinking men of Atlanta" to establish a properly equipped and staffed research laboratory in Georgia: "Then we could answer these questions intelligently and bring that great industry to this State."⁵⁷

If there was any doubt about which "thinking men in Atlanta" Herty was addressing, he made it clear in the next few sentences. The Georgia Power Company and the railroads should "get right square behind" the problem of developing new business because it was a "justifiable" expenditure of their stockholders' money. And Atlanta bankers ought to develop a statewide financial service that would investigate thoroughly new industrial proposals from financial, technical, and engineering standpoints. That would mean hiring "first-class scientifically trained men" to work with the city's "ablest financiers." Then, if an enterprise passed muster, the service should "get behind it and furnish Georgia capital." Such an organization would attract funds that were "idle," invested in bonds or in foreign securities. "I wish our bankers could loosen some of that money," Herty concluded, "and put it to work for Georgia."⁵⁸

Within days Herty was besieged with requests for reprints of the Atlanta speech, for samples of slash pine pulp, and for information about the suitability of the sulfite process for other species of pine. *Papermill and Wood Pulp News* wanted Herty to contribute a "technical" article for publication; a du Pont experiment station wanted him to send twenty-five pounds of slash pine chips so that they could

pulp it, and chambers of commerce and consulting engineers from North Carolina to New England wanted to know if white pine and hemlock could substitute for slash pine. Invitations to address the South Carolina Commercial Forestry Conference in January 1931 and the Southern Newspaper Publishers' Association (SNPA) the following July also resulted directly from the Atlanta speech. But what must have pleased Herty most of all was a note from the Forest Products Laboratory. "It may interest you to know," wrote C. E. Curran of the Pulp and Paper Division, "that we have corroborated your results in our semi-commercial equipment."⁵⁹

Curran's note supplemented what Herty already knew—that the Forest Products Laboratory had at last gotten seriously involved with southern pine. On September 12, 1930, the Forest Service was quoted in the *New York Times* as having announced that young pines without heartwood grew rapidly and were easily reproduced if protected from fire and that thinnings for paper manufacture would furnish a new industry for the South. A friend sent Herty the clipping, noting, "I see . . . the government is coming around to the conclusion at which you arrived some time ago." Herty sent the story to a manufacturer planning to visit Sessoms's holdings in south Georgia with a wry comment: "It is good to have the band-wagon full of people though some of the important passengers seem to forget who got up the excursion." He also sent it to Alex Sessoms, noting that "they give us no credit for first calling attention to this subject." Undisturbed, Sessoms answered that Herty seemed to get plenty of publicity; he saw two or three references a week to his statements in journals or newspapers. But that was not the point. "The main value I attach to publicity of this sort," Herty explained, "is the fact that it tends to make converts to our ideas on the subject, and thereby to further the location of a plant in the neighborhood of your timber."⁶⁰

In one respect the press coverage Herty received, particularly for the Atlanta speech, may have been too effective because it led some eager entrepreneurs and local boosters to think the manufacture of newsprint from southern pine could be undertaken profitably and at once. For example, M. R. Davis, who owned pine land in southeast Texas, wanted Herty to send his "formula for the wonderful discovery"; Armand May and his brother wanted to start a paper mill in an old Savannah shipbuilding facility; and Bruce Strowd, a former student of Herty's at Chapel Hill, thought the recently closed hosiery mill in nearby Durham would be a good place for a paper mill. Herty had to cool them off, explaining that many technical questions still needed to be resolved. His reply to Strowd was

more personal than those sent to others, but the message was the same: the paper manufacturing business should not be tried on a small scale by amateurs. It required vast amounts of capital and a great deal of skill. "I have no doubt a paper industry is going to develop in the South some day," Herty wrote his former student. "I don't mean to discourage you . . . I only want to emphasize the care with which you should proceed."⁶¹

Some who read accounts of Herty's speeches thought *he* should proceed with caution as well. There were several reasons, some based on technology, some on economics, and some on prejudice. In an article titled "Wood Pulp and Paper Possibilities in Georgia" published in June 1928, Austin Cary offered arguments from all three categories against the likelihood of the industry's early development in Georgia. An expert with the U.S. Forest Service and a consultant at the time to Alex Sessoms's Timber Products Company, Cary acknowledged that Georgia's vast quantities of pines and hardwoods, existing and potential, should make the state a "natural" for paper manufacture at some future date. But if her raw materials were satisfactory "in general," they were not the best sources available for some "important kinds" of paper. Northern spruce and poplar, he argued, were "superior" for newsprint, book and magazine papers, and the fiber from which rayon products were made. Given the very large-scale manufacturing capacity of New England, Canada, and the Pacific Northwest and existing forest resources there, he saw "decided limits" to the development of a white paper industry in the South.⁶²

Cary's article cited several other factors that had to be considered if a "southern enterprise" were to compete profitably with mills elsewhere: availability of clean water and cheap fuel, a skilled work force, a large capital outlay, and "high class" management. Paper manufacturing was a "hard game," he warned; "only those financially and technically equipped should go into it." Finally, when the industry did come to Georgia, he thought outside forces would take the lead in its development. But Georgians ought to welcome those forces because the paper industry was more permanent and stable than most, "its nature and the high class character of the men who usually conduct it accounting for that."⁶³

By the time Herty delivered his Atlanta speech in October 1930, Austin Cary's list of obstacles to the rapid development of the paper industry in Georgia seemed relatively minor. For one thing, the Depression was entering its second year and although its awesome dimensions had not yet become apparent, the pulp and paper business was already in trouble. The editor of a leading trade journal, *Paper*

Industry, had been warning his readers about “overproduction” since April 1927. Noting that plant capacity for the manufacture of newsprint had increased by 17 percent in 1926, he predicted that continued expansion would drive prices down. A few months later he reported that some Canadian producers were considering plans to limit production. Disturbed at the amount of new construction at a time when existing mills were operating at 15 to 20 percent below capacity, the manufacturers doubted that the current price of Canadian newsprint, \$65 a ton, could be maintained. United States mills were also operating well below capacity and consumption had reportedly “eased off.” By January 1928 the editor was likening himself to Paul Revere and pleading with newsprint producers to “wake up” before it was too late. Overproduction had “smothered” the industry in 1927 and would “garrot” it in the coming year unless the manufacturers stopped plant expansion and set up some kind of institute or organized body to ascertain facts regarding production and markets. Six months later (June 1928) the price of newsprint had dropped by \$3 a ton and *Paper Industry* was quoting a Wall Street analyst’s remark that “this is not a good time to buy paper stocks.” The premiers of two Canadian provinces were meeting with paper manufacturers to do something about overproduction and the editor thought the United States should do the same. “Without government interference the paper industry would scuttle itself,” he declared. “The kind of competition born out of overproduction always commits suicide.”⁶⁴

But Canadian provincial efforts to impose limits failed when New Brunswick would not go along. The International Paper Company was building a new plant in that province and, like the other major producers of newsprint in Canada, resisted all efforts at government control. Ultimately International “took the bull by the horns,” negotiating a huge three-year contract with the Hearst Publishing Company at \$55 a ton. That threatened to drive smaller mills out of business, and again the prime ministers of Quebec and Ontario indicated that they might have to act by curtailing the supply of pulpwood taken from Crown lands by companies like International. In January 1930 an effort by some Canadian manufacturers to raise the price of newsprint by \$5 a ton touched off a storm of protest by the American Newspaper Publishers’ Association (ANPA), giving Herty another argument in favor of developing a southern newsprint industry. But the price increase came to nothing when International would not go along. *Paper Industry*’s editor was gloomy by February 1930. “If price cutting is to be the order of the day,” he predicted, “then bread lines are not far away.”⁶⁵

Casting about for root causes of the depressed situation in April 1930, *Paper Industry* cited the Payne-Aldrich Tariff of 1909, which put imported newsprint on the free list, and the too rapid development of the kraft industry in the South. The Payne-Aldrich Tariff made U.S. manufacturers "victims of a political trade" which led them to produce other kinds of paper; it also led Canadians, "seeing a chance to get rich quick," to rush madly into the newsprint field and, ultimately, to overproduce. Current overproduction in the kraft industry was more evidence that the economic advantage of new location was quickly dissipated through too much expansion. Finally, the fact that the new Hawley-Smoot Tariff continued standard newsprint on the free list offered United States manufacturers little hope for early relief.⁶⁶

From their standpoint the situation was already bad but promised to get worse. In February 1930 a Senate resolution asked the secretary of the interior to find out how much woodpulp could be obtained from Alaska. Its sponsor argued that American newspaper publishers had to have a secure supply of newsprint and rumors indicated that Canadian manufacturers had entered a "combination" to fix prices. A Federal Trade Commission (FTC) report submitted to the Senate in July 1930 found no evidence that U.S. antitrust laws had been violated; however, the actions of one United States firm with large interests in Canada (International Paper Company), led the commission to advise Congress to "keep watch" on any attempt by the "Canadian combination" to operate through an "agency" in the United States. The FTC report also provided statistics that indicated clearly the degree of the country's dependence on foreign sources: forty-two United States paper mills produced 1,392,276 tons of newsprint in 1929 while thirty-eight Canadian firms turned out 2,728,827 tons during the same period. Furthermore, United States publishers consumed 3,794,000 tons of newsprint in 1929 of which only 36.2 percent was produced by U.S. manufacturers; 57.8 percent came from Canada, 3.5 percent from Newfoundland, and 2.5 percent from Finland and Sweden. Government experiments on the manufacture of paper from "farm waste" should be continued, the FTC report concluded, and government-owned forest land in Alaska should be made available to U.S. companies on "liberal terms."⁶⁷

By September 1930 the Forest Service announced that Alaska's Tongass National Forest could satisfy one-fourth of the country's annual demand for "more than four million tons" of newsprint, that it could be done without "depletion," and that two firms were prepared to invest \$20 million if granted licenses to cut

timber by the Forest Service and the right to develop waterpower sites by the Federal Power Commission (FPC). The FPC was planning to act on the companies' applications before the end of the year, but the worsening Depression seems to have intervened. On August 4, 1931, the Forest Service announced that the sale of government timber in Alaska would depend on "market conditions." Meanwhile, officers of the American Paper and Pulp Association appealed to President Hoover to halt negotiations altogether, arguing that to develop Alaskan timber at that time would "thrust unwarranted production on an *over-expanded* industry struggling with lowered demand and vanishing profits." It would cause greater unemployment and further depreciate a capital investment of \$800 million in the United States, Canada, and Newfoundland, of which \$600 million had been invested by American citizens. "We appeal to you," the APPA petition concluded, "to remove the disturbing threat of government timber in Alaska and establish it as a great reserve for the future."⁶⁸

For Herty, the initial proposal to develop Alaska as a source of pulpwood for American newsprint must have stirred conflicting emotions. On the one hand, it would allegedly free the United States from dependence on foreign suppliers indefinitely, if not perpetually. On the other, if the cost estimates for a ton of Alaskan newsprint delivered to Cincinnati were accurate, it could delay or even derail the establishment of a southern newsprint industry for about the same time. As a committed advocate of "self-containedness," Herty could hardly protest the Alaskan scheme. But as a southerner he was equally committed to the economic development of his section. Whether APPA protests or second thoughts by the prospective lessees made the difference, the government did not open Alaska's forests in 1931, leaving Herty free to deal with critics who continued to challenge his advocacy of slash pine for newsprint on technical, economic, and even rhetorical grounds.⁶⁹

Besides Austin Cary, who was neither a chemist nor a paper manufacturer, one of Herty's most articulate critics in 1930-31 was R. H. Stevens, chief chemist at the Bogalusa Paper Company, Bogalusa, Louisiana. Early in December 1930, Herty and Stevens both addressed the American Institute of Chemists in New Orleans. Herty had to leave before hearing Stevens's paper but wrote for copies, which Stevens promptly sent. He also sent his regrets for not having had a chance to "point out one or two things" in which he thought Herty erred. Finally, he expressed concern that Herty's efforts to promote the manufacture of newsprint in the South might be exploited by unscrupulous persons who would "fleece the

public" through the sale of fraudulent stock. He knew Herty would not knowingly be a party to such schemes; he simply raised the issue to put him on guard so that he could protect his reputation.⁷⁰

Herty answered that he always "tried to keep an open mind" and that he would appreciate it if Stevens would specify the errors. As for the danger of some promoter misusing his public remarks, Herty doubted that progress would ever be made "if we always held back because unscrupulous people might . . . fleece the public." He wanted to be informed if anyone was using his name without authorization. But meanwhile, as he had stated in several recent speeches, he was thoroughly convinced that slash pine could make cheap newsprint. Furthermore, a recent letter from C. E. Curran of the Forest Products Laboratory reported that they had succeeded in "making newsprint from such wood."⁷¹

Stevens was glad to itemize Herty's "errors." In basing his statement regarding the low resin content of young slash pine on the "acid number of the gasoline extract," Herty had overlooked a matter that was "more troublesome," that is, unsaponifiable matter and "some of the oleoresinous materials insoluble in gasoline." In concluding from the basket test done at Castanea that slash pine could be suitably pulped by the sulfite process, Herty had overlooked the fact that the chips in the basket, hung at the top of the digester, "got the benefit of the highest SO₂ content liquor." Those conditions would not prevail throughout the digester. Next, Herty should not have pronounced the groundwood test of slash pine a success without providing specific data about quality and consumption of power. Finally, Herty's comparative figures for the price of slash pine and spruce were inaccurate, and he had seriously underestimated the cost of power in the South. All in all, Stevens doubted that newsprint produced from slash pine could meet the cost of spruce paper, which he thought could be produced for \$30 a ton in the North and sold at a profit in New Orleans for \$49. A week after the New Orleans meeting, Stevens added, he had attended a meeting of the APPA Research Committee at the Forest Products Laboratory at which Curran had discussed the laboratory's experimental production of newsprint from slash pine. Curran had not seemed very optimistic about the feasibility of manufacturing "*cheap*" southern newsprint. Later the committee members discussed the issue informally, and all agreed with Stevens that any effort to build a viable southern newsprint industry under existing economic conditions was "premature." They also agreed that Herty's efforts to promote the development might encourage dishonest persons to fleece "innocent investors."⁷²

Herty made no effort to answer Stevens's "illuminative but not convincing" criticisms, remarking simply, "Some day you will see." But the matter did not end there. In March 1931, *Paper Industry* published Stevens's New Orleans speech, most of which was devoted to a detailed description of the chemical and mechanical processes involved in making kraft paper from pine. Several paragraphs summarized recent work done at the Forest Products Laboratory and elsewhere to bleach kraft pulp so as to produce a white paper of "high durability and permanence." Then Stevens predicted that "any white papers made from the southern pines will be made by the sulphate process for many years to come." Not until the last paragraph, which did not appear in the New Orleans presentation, did Stevens challenge Herty's arguments directly. He noted that in the name of making the South independent of foreign suppliers, some urged the substitution of young slash pine for Canadian spruce, claiming that it could easily be manufactured chemically and mechanically into cheap newsprint. Stevens thought the suggestion was "premature," considering the tremendous oversupply of Canadian newsprint, the cheaper power costs there, and the still abundant supply of spruce, "the pulpwood *par excellence*." It might "shock the sensibilities of some hyper-patriotic Southerners" that Americans had invested a quarter of a billion dollars in Canadian mills, he continued. But it was true, and "that fact remains a stumbling block to the development of cheap newsprint in the South." Furthermore, the closing of uneconomic Canadian mills and the merger of others into "huge combines," not to mention the projected Alaskan projects, all argued strongly against investment in southern mills. Finally, a footnote identified Stevens as a native of Florida.⁷³

R. H. Stevens was not Herty's only critic in 1931. Austin Cary was still unmoved by Herty's claims for slash pine, or what he thought Herty was claiming for it. Informed that Cary was checking up on his public remarks, Herty reacted good-naturedly. But the relationship was clearly strained and remained so throughout the first half of 1931. When the two men ran into each other at the Cosmos Club in Washington, Herty went out of his way to give Cary an opportunity to discuss whatever was on his mind. But he declined. "Just what it all means is anybody's guess," Herty wrote James Mallory on June 2, "and I am not particularly interested . . . unless some public criticism appears. That I should duly take care of."⁷⁴

That the criticisms of Stevens and Cary, published and otherwise, were having an impact in technical and industrial circles is clear from Herty's correspondence

during the first half of 1931. Eloise Gerry, who was unofficially keeping Herty informed about the “very encouraging” work on slash pine being conducted by the Forest Products Laboratory, commented on February 28 that Herty had “rather taken . . . [Cary’s] breath away” regarding the pulp prospects of the South. Later, when Herty and Gerry met for some field experiments at Cogdell, she referred to “some erroneous impressions concerning . . . [Herty’s] statements about the resin content of all sap-wood slash pine.” She suggested that he put on record somewhere a “definite statement” of what he actually had said, and on April 2, 1931, he sent her an itemized account of every major speech he had made on the subject, beginning with the February 1929 address to the American Paper and Pulp Association, together with reprints of his actual remarks. The speech to the Atlanta Chamber of Commerce in October 1930, reported by Associated Press science editor Howard Blakeslee, “stretched matters a bit” in applying Herty’s remarks about the resin content in slash pine to “any of the Southern pines.” But Herty, who often spoke extemporaneously, had taken the precaution of having a “rapid stenographer” present and could therefore send Gerry an account of what he said. He also quoted his remarks on the same subject in a letter to the editor of a Chapel Hill newspaper, addresses to the American Institute of Chemists in New Orleans (December 1930) and the Association of Agricultural Workers in Atlanta (February 1931), and in the abstract of a speech he would give in late May when he planned to address the Georgia Commercial Forestry Conference in Savannah. In view of all the evidence, he was confident that no “fair-minded person” could accuse him of forgetting the letter or spirit of his scientific training.⁷⁵

Gerry promised to make good use of the material Herty sent. “It is the over-ambitious quoters who make the trouble,” she commented. But the newspapers were not responsible for all Herty’s troubles. Only a few days after he sent Gerry the extensive documentation of his public remarks, Harold Hibbert, professor of cellulose chemistry at McGill and director of the Canadian Institute of Pulp and Paper Research, advised him that he was being accused of misstatements. “For your confidential information,” Hibbert wrote on April 9, 1931, “an official of a prominent N. J. paper company . . . claimed that the resin content was more than you had stated.” In the interest of what Herty was trying to do, Hibbert thought it would be a good idea to have the FPL publish an analysis of a number of samples of slash pine in the *Journal of Industrial and Engineering Chemistry*. But Herty replied that his resin results had already been confirmed by the Bureau of Research of International Paper Company and the chief chemist at the Brown Paper

Company, one of the largest manufacturers of newsprint in the United States. Furthermore, he had recently received some samples of white paper made by the FPL from all-sapwood slash pine. "They state that no difficulty whatever was experienced with resin, so I am not worrying about that question any more."⁷⁶

What Herty was really worrying about in the spring of 1931 was whether his and Sessoms's efforts to secure funding for an experimental pulp and paper laboratory in Georgia would prove successful. Since the beginning of the year they had been working hard to persuade power companies, railroads, and a few large landholders to put up \$20,000 a year for five years to cover operating expenses of such a laboratory. If they succeeded, Francis P. Garvan would provide \$50,000 to outfit the facility with the necessary machinery. Nothing was settled in early March when Herty answered a letter from T. G. Woolford, president of the Georgia Forestry Association, about the annual meeting of that group to be held in May 1931 at Albany, Georgia, at which Herty would be a featured speaker. For some time Herty and Sessoms had been cooperating with Woolford's organization and the state department of forestry to educate the public about the folly and waste of burning the woods each fall. Kept free from fire, Georgia's cutover acreage, too infertile for traditional agriculture, would, in a very few years, produce crops of pulpwood, turpentine trees, and sawtimber. What Woolford wanted to know in March, however, was Herty's opinion about inviting someone from the Forest Products Laboratory (in addition to Eloise Gerry) to address the Albany convention.⁷⁷

"I hope it will not be done," Herty answered. His relations with everyone in Madison and the U.S. Forest Service were good, but he thought both agencies had been too slow to attack the basic obstacles in the way of a white paper industry for the South. Specifically, he faulted the FPL for its failure to follow up research conducted in its own and other laboratories which established the low resin content of sapwood in the longleaf pine (1921), the different resin contents of sapwood and heartwood (1926), and the results of a sulfite pulping test of longleaf pine which proved that it was equal to spruce in quality and color (1926). "With this information before them," Herty continued, the FPL made "no vigorous attack" on the problem. Nor did FPL director C. P. Winslow show much interest when Herty spoke to the APPA in February 1929 about the low resin content of slash pine. Herty urged him to go to work on slash pine, but Winslow answered that his appropriation was for longleaf. More than a year and a half passed before an appropriation for slash pine was secured, and Herty thought his

own efforts to pressure Senator William Harris did more to get it than anything emanating from the FPL.⁷⁸

Other reasons Herty offered for keeping the FPL off the Georgia Forestry Association program included Winslow's lack of interest in setting up an FPL branch in the South, the use of slash pine containing 16 percent heartwood in an FPL sulfite experiment which made the whole thing "an absurd undertaking," and above all, rumors that the FPL was "dragging its feet" in research on southern pines because of pressure from lumber interests in Washington and Oregon. "It is up to us to make our own fight on our own grounds," Herty argued. Free from outside influences that would retard development, the South would have to mount its own research program, and it would have to do so on a large enough scale to answer intelligently any technical or economic questions a paper manufacturer might raise. Finally, noting the difficulty of raising money for the kind of laboratory they would need, Herty thought any "magnification" of the FPL's activities would make their task even harder. "I don't care a rap about my own personal status in this matter," he told Woolford, "but I do chafe at the bit when I know how seriously the economic development of the South has been held back."⁷⁹

Ironically, C. E. Curran of the pulp and paper section of the FPL elaborated the laboratory's position regarding development of a southern white paper industry only a few days after Herty wrote his letter to Woolford. To S. R. Spencer, president of the First Carolinas Joint Stock Land Bank, who had inquired about the pulping possibilities of southern woods, Curran explained on March 18, 1931, that the laboratory had been working on southern pines for several years with special funds provided from Congress, that its "principal aim" was to develop a strong white pulp, and that "very interesting results" had been achieved. He enclosed several technical reports and articles. Curran went on to say that the FPL agreed with Herty that the production of newsprint from young slash pine was "an attractive possibility." They had produced it in the laboratory on a semicommercial basis, and he enclosed samples for Spencer, noting that they were equal in strength to commercial newsprint, "although somewhat sub-quality in color, cleanliness and finish." They thought such problems could be "ironed out" in the manufacturing process, but so far they had been unable to arrange a commercial-scale test. "It is one thing to produce these papers on a laboratory or semi-commercial scale," Curran pointed out, "and another to do this commercially at a profit." Curran went on to discuss "other economic angles of the

newsprint field” which were more discouraging: the excess production and plant capacity in North America, the resulting price cuts (from \$65 to \$55 a ton in the last year), and the fact that production costs averaged about \$50 a ton, although some very large units could produce a ton for \$40. The South had the advantage of cheap wood, he continued, but there were other costs (power, water supply, labor) that had to be competitive for any enterprise to succeed, and no authoritative data for those costs existed. “In other words,” Curran concluded, “our frank opinion is that the matter is to be approached with caution. . . . From a long range view we fully expect the South to become a center of newsprint manufacture. We are not so sanguine, however, on the immediate building up of this industry in the South.”⁸⁰

From the two long letters summarized above, it seems clear that no unbridgeable gulf separated Herty’s position from that of the Forest Products Laboratory. What is not clear is whether Curran, Spencer, or someone else sent Herty a copy of the Curran letter or when it came into his possession. But it is likely that he had it by May 12, 1931, when he wrote Alex Sessoms that he had received “some interesting news from Madison which has changed and softened a good deal my feelings about the situation there.” By that time he had also met P. A. Baird, senior chemist at the FPL, at a meeting in Marianna, Florida. Baird discussed some difficulties encountered in a sulfite digestion of slash pine at the laboratory and Herty wanted to continue the discussion by letter. Then in June, Herty met Curran and E. C. Sherrard of the Forest Products Laboratory when all three attended a conference at the newly established Institute of Paper Chemistry at Appleton, Wisconsin. Eloise Gerry was not there, but on June 15, 1931, he wrote her about the “nice talk” he had had with the two men. “I think we all understand each other now,” he added. Five days later, another, more expansive letter to Gerry indicated agreement all around about the necessity for goodwill and cooperation in solving “southern problems.” Herty promised to do all he could to help the FPL before committees of Congress, but he also made clear his intention to continue his drive for an experimental laboratory in Georgia. The problems to be solved in using southern pine for white paper were simply “too great for any one laboratory to do it all.”⁸¹

During three years (1929–31) as a chemical consultant, Herty traveled endlessly between New York and various points in the South in the interest of his clients. And until May 1930, he paid countless visits to congressional offices and com-

mittee rooms in behalf of the Ransdell bill. Finally, he gave dozens of speeches in New York and all over the South, but especially in Georgia, to promote southern industrial development and protection of the piney woods against fire.

While he traveled, Herty's competent assistant, Lois Woodford, ran his New York office at 101 Park Avenue. She edited his speeches for publication, kept his accounts, billed the clients, and forwarded his mail. She also served as liaison with the Chemical Foundation, a task that had become increasingly distasteful to her by the late spring of 1930. Herty was in Alabama when passage of the Ransdell bill was imminent. Garvan's office wanted a press release immediately, and William Keohan, Garvan's representative in Washington, insisted that she wire Herty for it. Otherwise, he was going to write it. That irked Woodford, who explained later to Herty, "I was sorry even to bother you . . . but the 'boss' [Garvan] characteristically told someone else to do our job, and I wouldn't let it go by." On June 23, 1930, Woodford penciled a note for the absent Herty on a telegram: "Comment when I told F. P. G. you had left for South 'We don't get much service out of him, do we?' I volunteered my services most meekly. That's *the answer*—no flunky—no job!" Herty's retainer from the foundation was very late in arriving during much of 1930, but what seems to have upset her most of all was a letter from Francis Garvan to Joseph Ransdell which the latter had printed in the *Congressional Record*. Whatever it said left Woodford so "annoyed and disgusted" that she felt like writing a letter herself to send along for Herty's signature. "Just as soon as you get back here," she urged, "let's put yourself on record for the break [with the foundation] as of October 1st when the two years end."⁸²

Herty's official half-time connection with the Chemical Foundation ended on October 1, 1930, but in the spring of 1929 he had also been engaged for one year as Francis Garvan's "special chemical consultant" at \$5,000 per annum, to be paid in advance in quarterly installments. By September 17, 1930, the year had long since elapsed, but the last salary check was still outstanding. Herty sent Garvan a polite reminder, and three weeks later the latter responded. "What are you cross with me about? I ain't done nuthin, except go broke." He sent the check, facetiously threatening to stop payment unless Herty apologized. Then he asked Herty to lunch to discuss some "strange remarks" Herty made at an earlier luncheon. "What's on your mind? Come to lunch and let's talk it over. I am too sick a man to quarrel with, and you are too old to quarrel, and we ain't got nuthin' to quarrel about anyhow."⁸³

Herty answered in the same light tone, and whatever stiffness may have been

present in their recent relations seems to have been eased. From all accounts, Garvan was a very forceful person whose aggressive manner did not please everyone, as Herty discovered when he proposed him for membership in the Century Club. After two years he finally withdrew his name. Nevertheless, the two men, so different in personality yet so alike in economic philosophy, remained close friends until Garvan's death in late 1937.⁸⁴

While Herty was traveling extensively during the consulting years, changes occurred in his family. Holmes Herty had two small children by 1928 and an unhappy marriage that ended in divorce the following year. Soon remarried, he was doing well in his career as a physical chemist with the Bureau of Mines in Pittsburgh. Frank Herty, unhappy in his first job with Stone and Webster in Massachusetts, took a new position with the Brooklyn Union Gas Company in 1928 and married the next year. Finally, sixteen-year-old Dolly Herty entered Dana Hall, a preparatory school in Wellesley, Massachusetts, in 1928, from which she graduated two years later. Still the pet of the family, she went on to Vassar and Cornell from which she received a master's degree in botany in 1936.

Unfortunately, Sophie Herty's health continued to deteriorate during the late 1920s, despite Herty's heroic efforts to find new doctors or treatments to relieve her from recurring attacks of "acute bronchial asthma." Severely ill in the spring of 1927, she recovered somewhat that winter when she and Dolly spent the academic year in Athens. But she was sick throughout the summer and fall of 1928 and most of the next year until an extreme attack killed her in August 1929. With all of his children married or at school, Herty decided to give up the New York apartment and move into the Murray Hill Hotel. Located across the street from his office, it had the added advantage of being close to the Century and Chemists' clubs, where most of his leisure time was spent when he was visiting the city.⁸⁵

Herty's health also deteriorated somewhat during the latter part of the 1920s. Years of constant train travel and a heavy schedule of speaking engagements, some of them separated by hundreds of miles in a forty-eight-hour period, were bound to take a toll. In 1927 and again in the fall of 1929 Herty was forced by severe bronchitis or influenza to take time off from his work. The 1929 illness was particularly severe; after several days of bed rest and a month-long trip south to escape the harsh northern weather, he returned to New York only to suffer a relapse early in 1930. His friend and fellow Centurion Dr. Warren Coleman had been treating him with "quinine and strychnine tablets before meals as a tonic," Herty reported to his son on October 31, 1929. But the medication may have

been for a more serious malady. A year earlier Herty had suffered an acute attack of some sort while at the Century Club. Later, the physician who treated him, also a member of the club, wrote him a note: "I regret exceedingly that I have not had the opportunity of seeing you at the Club to ask you about your pain. I trust, however, that you are feeling better and [are] relieved of anxiety."⁸⁶

Despite the warnings, Herty did not slow down. Indeed, he was preparing to enter the most arduous part of his long career. For the rest of his life he would maintain and even increase the number and frequency of his speeches and the distances he traveled to promote the development of a white paper and newsprint industry in the South. But first he needed an experimental laboratory to convince the doubters that southern pine could be an acceptable and economic substitute for northern spruce. As 1931 began, the chances of securing it appeared more promising than ever before.

CHAPTER TEN

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The Savannah Pulp and Paper Laboratory

Herty's efforts to secure funding for an experimental laboratory, unavailing throughout 1930, began to show some signs of success early in 1931. By that time he was working closely with several prominent individuals—members of the state legislature, officers of the Georgia Forestry Association and the State Board of Forestry, and influential businessmen—who shared his goals regarding reforestation, fire control, and the full-scale development of Georgia's forest products industry, especially as they related to the manufacture of white paper and newsprint. Among his most effective collaborators were T. G. Woolford, Bonnell Stone, B. M. Lufburrow, and his old friend Alex Sessoms. Sessoms was a member of the State Board of Forestry and probably introduced Herty to the other men. Woolford, president of the Retail Credit Corporation headquartered in Atlanta, had been president of the Georgia Forestry Association since 1929. And Bonnell Stone, also a member of the State Board of Forestry, served as the Forestry Association's president from its reorganization in 1922 until he became its secretary three years later. Early in 1931 he also represented Blairsville, Georgia, in the state legislature. Finally, B. M. Lufburrow was a professional forester who became the administrative head of the State Board of Forestry in 1925. In 1931, however, a sweeping proposal to reorganize state government threatened to politicize his department by merging it with the State Game and Fish Commission, something everyone seriously committed to forestry and the forest products industry was trying hard to prevent.

Through business connections and personal networks, Woolford, Stone, and

Lufburrow opened doors for Herty in Georgia, and he used contacts in New York and Washington to promote their common interests in conservation, fire prevention, and industrial development. For example, early in 1930 Woolford, Lufburrow, and various businessmen arranged through the Savannah and Atlanta Chambers of Commerce, the Natural Resources Products Division of the National Chamber, and the Georgia Forestry Association to hold a Commercial Forestry Conference in Savannah. As a member of the preliminary arrangements committee, Herty helped the program committee secure prominent speakers for the conference through his ties with the national press. He also agreed to deliver a thirty-minute speech which Woolford was sure would be "of more interest and value than the rest of the oratory."¹

During the summer of 1930 Woolford also put Herty in touch with executives of the Georgia Power Company who might support his proposal for an experimental paper laboratory. Six months later, Herty thought the scheme had been "knocked in the head" by someone in the New York offices of Commonwealth and Southern Corporation, a holding company with vast interests in southern power companies, but early in 1931 at least one local official still held out hope. W. H. Barnwell of Georgia Power Company's Industrial Division in Atlanta asked Herty to outline a program of the experimental work he expected to perform in the proposed laboratory and to "explain how you will put [it] to practical use." He also wanted to know whether the investigative work necessary to develop newsprint manufacturing in the South could be done in existing paper mills or at the Forest Products Laboratory at Madison, Wisconsin.

Congress was then considering a USDA request for appropriations to establish a naval stores research station somewhere in the southeastern region, which tended to undercut Herty's efforts to raise private capital in Georgia. So did reports early in 1931 that International Paper Company was planning to open a southern plant to manufacture white paper and newsprint. Even T. G. Woolford accepted that rumor, which Herty quickly squelched. Macon publisher W. T. Anderson had "made the same mistake" a year earlier, he told Woolford, but in fact the new plant would be turning out kraft paper. During a recent visit, International's chief engineer had assured him that no white paper would be produced at Panama City. "Don't forget," Herty wrote another correspondent who was under the same impression, "they [International] have many millions invested in newsprint paper mills in Canada and I have my grave doubts if they would take any active steps in jeopardizing their investments there by leading off in [the] development of newsprint in the South."²

Besides introducing Herty to prominent Georgia business executives who might underwrite his laboratory, T. G. Woolford arranged for Herty to address a joint session of the Georgia legislature on February 6, 1931. Speaking from brief notes, Herty described the four species of pine native to Georgia, explained how rapidly each would reproduce naturally if protected from fire, and summarized what the timber protective organizations in several counties were doing to keep fire out of the woods. Moving on to a discussion of papermaking, he outlined the differences between kraft and white paper, recounted the experiments conducted for him on slash pine, and showed samples of the results. Then he explained why paper manufacturers were reluctant to invest capital in the South, why the United States had to import most of its newsprint, and why that would be unnecessary if slash pine replaced Canadian spruce in the manufacture of white paper. Reciting evidence from several sources to show that the substitution was technically feasible, he urged the creation of a "semi-commercial-scale" laboratory in which it could be proved that pine newsprint comparable in quality to that from spruce could be produced at a competitive price. Tentative offers of free housing and free equipment for such a laboratory had already been made, he told the lawmakers, but money was needed to hire a staff and to cover operating expenses.³

Herty appreciated everything that Woolford, Stone, and Lufburrow were doing to help him build support for the laboratory. He thought his talk to the joint session of the legislature had "sunk pretty deep in the minds of the members," and Lufburrow agreed. On February 13, 1931, he advised Herty that "your talk to the joint session . . . is paying remarkable dividends already . . . the profound impression made upon the group will linger [for] some time to come."⁴

Meanwhile, Woolford, Bonnell Stone, and others were making plans for the upcoming meeting of the Georgia Forestry Association to be held at Albany, Georgia, on May 20–21, 1931. Herty would be a featured speaker, as would Eloise Gerry of the Forest Products Laboratory and Senator William Harris of Georgia. A self-described friend of the forest products industries, Harris had done little to promote Herty's efforts in 1928 to secure a branch of the FPL for the South. And without such a facility, Herty had been forced to rely on friends and business associates for the initial investigations regarding the suitability of pine pulp in the manufacture of white paper. By March 1931, however, Harris had become a convert.⁵

On the political front, Bonnell Stone was working actively to protect the interests of forestry in the legislature although he would not be a member of the new body scheduled to convene in late June 1931. That Georgia's state government

would be thoroughly reorganized in the coming session was a certainty. The real issue for Stone and other leaders of the Georgia Forestry Association early in 1931 was how reorganization would affect the forestry department. By mid-March Stone sent Herty a copy of reorganization proposals developed by the association's legislative subcommittee. Designed to "keep *forestry* lined up with other scientific work and free from politics," and listed in order of preference, the proposals urged that the forestry department be left to operate alone, "as at present," or that the governor be advised of the association's "willingness" to merge the state's forestry and geology departments in the name of reorganization, or that the governor be advised that the association was unwilling to include the Fish and Game Commission in any proposed consolidation. Begun on borrowed money in 1925, the forestry department enjoyed a budget of \$185,000 five years later, most of it from federal and private sources. If the state's contribution could be increased for the next biennium, Stone informed Herty, he hoped some money would be earmarked "for research work along the line you have suggested."⁶

When the Georgia Forestry Association convened in Albany, Georgia, on May 20, 1931, it adopted a resolution aimed at fulfilling Stone's hope. "Whereas" laboratory tests at federal and private institutions indicated that a number of species of Georgia woods were suitable for manufacturing white paper, and "whereas" there was no paper mill in the state, the resolution urged the next General Assembly to appropriate \$15,000 per year for the next two years, to be administered by the State Board of Forestry "in connection with research and utilization of our state forests." Herty was delighted and promptly wired the good news to his secretary.⁷

During the next several weeks, Herty was busy giving speeches and representing the Chemical Foundation at various functions. On June 6, 1931, he went to Appleton, Wisconsin, where the Institute of Paper Chemistry was laying the cornerstone for a new building, and on June 30 he addressed the Southern Newspaper Publishers' Association at its convention in Asheville, North Carolina. The speech to the newspaper publishers, arranged by SNPA secretary Cranston Williams, began a relationship with a group that would play a central role in achieving Herty's goal, the beginning of newsprint manufacture in the South. But that lay several years in the future. Meanwhile, Herty was building bridges and busily gathering technical and financial data from every conceivable source to prepare a memorandum on the cost of outfitting an experimental semicommercial paper and pulp plant.⁸

Composed for Francis Garvan, Herty's memorandum also went to T. G. Woolford, Bonnell Stone, and B. M. Lufburrow on July 2, 1931, with a note attached that it was not confidential and could be used in any way they saw fit. A letter to Woolford the same day explained that during the past two weeks Herty had talked with a "very influential" friend in New York who indicated the probability of securing a gift to the Georgia Forestry Association which would pay for all of the equipment of the proposed laboratory and Herty's services as director. Furthermore, a "gentleman in Georgia" had promised that a suitable building and free power would be made available. "These three items," Herty added, "are of course based upon the assumption that the recommendations of the *Georgia Forestry Association* for an appropriation by the State of funds sufficient for personnel and incidental expenses, amounting to some \$15,000 to \$20,000 a year, will be favorably acted upon by the legislature *now in session*."⁹

Unfortunately, politics interfered. On July 7, 1931, Woolford informed Herty that the special committee appointed to make recommendations regarding reorganization legislation had "done their [*sic*] worst." Article 4 of Senate bill No. 46, entitled "An Act to Simplify the Operations of the Executive Branch of Government," proposed that the existing departments of forestry and geology be subsumed by the Game and Fish Commission; that the offices of state forester and state geologist, both held by professionals, be abolished, along with their appointed advisory boards; and that the incumbent game and fish commissioner, a political appointee, be named director of a reconstituted agency, to be styled the Department of Natural Resources. Unwilling to see the good work done by the state forestry and geology departments subverted, Woolford, Stone, Herty, and other friends of forestry in the state mapped a campaign to save the threatened agencies from the machinations of the politicians. It began with an impassioned plea in the House of Representatives by Bonnell Stone, who urged his erstwhile colleagues not to make "two purely scientific departments" part of a "notoriously political machine." Next, Woolford addressed an open letter to the architect of the reorganization bill, Senator Hugh Peterson, who had remarked that he intended to "force us [forestry] into politics whether we want to or not." Letters to officers of the Georgia Federation of Women's Clubs and the president of the Garden Clubs of Georgia urged those organizations to lobby legislators against Article 4. And a visit of lawmakers and members of the Forestry Association to Alex Sessoms's model forestry operation at Cogdell, Georgia, was also in the works. But that trip had to be postponed when the House moved to consider the reorganization bill

immediately. Meanwhile, at Herty's request, editor Clark Howell of the *Atlanta Constitution* published a statement and an editorial against the pending measure, but to no avail. After easily crushing a last-ditch move to amend Article 4 by merging forestry and geology, the House passed the reorganization bill by 187 to 6. Discouraged but not defeated, Herty wired Lois Woodford in New York: "House has just passed measure very destructive of Georgia Forestry Department's usefulness. Steamroller methods. We are laying plans for systematic campaign in Senate."¹⁰

Part of that campaign involved a visit by the legislature's Joint Committee on Conservation to Alex Sessoms's establishment in south Georgia during the weekend of July 24–26, 1931. Arranged by the Georgia Forestry Association, its primary goal was to show the lawmakers what enlightened forest management practices could mean to the state. Another opportunity to make the point came during the following week, when Woolford, Stone, Sessoms, Herty, and several other "friends of forestry" appeared before the Senate Committee on the State of the Republic to urge defeat of the reorganization bill as passed by the House. By August 6 the Senate Committee on Conservation approved a substitute bill that would merge the forestry and geology departments only, and a week later the full Senate acquiesced. Reporting the action, the *Atlanta Constitution* accurately predicted House approval in conference, and by August 22, 1931, the reorganization bill was ready for the governor's signature. Now the two houses could devote themselves to the real fight, the deadlocked appropriations bill.¹¹

While Herty and his friends were trying to save the state forestry department from the politicians, they were also working to extract an increased appropriation for the department from the same source. The aim was to secure an additional \$15,000 to \$20,000 a year for the next biennium to match funds that Herty hoped to bring in from New York and Wilmington for his laboratory project (no small task given the Depression and the governor's plan to cut the previous budget by 20 percent). Sometime in June 1931 Francis Garvan sent Herty's estimate of the cost to equip a semicommercial pulp and paper plant to Jasper E. Crane, a vice-president of E. I. du Pont de Nemours. Crane responded positively, and Herty visited the huge chemical firm to present his plan in more detail. Unfortunately, his efforts failed to elicit any money. As Crane explained it to Garvan on July 31, the proposition was "very meritorious" and, if ably carried out, might well "result in an important development in the utilization of southern pines." But because du Pont did not manufacture paper or pulp, Crane thought it would be "quite

out of line with our own activities to make a financial contribution." Those "activities," incidentally, included selling chemicals to existing paper manufacturers whose operations would certainly be affected if a southern industry should develop. In the end, the Chemical Foundation pledged the \$50,000 necessary to equip "a semi-commercial experiment station" in Georgia, conditional only on the legislature's guarantee of \$20,000 a year for two years for personnel and operating expenses, the whole to be administered by the forestry department. On August 7, 1931, while the fate of the forestry department was still unsettled, Herty wired the good news to T. G. Woolford. "Very anxious to have conference with you, Stone and Lufburrow Atlanta next Tuesday. Happiness cannot express it," he added. A similar message went to Howard C. Foss, a member of the Savannah Industrial Committee, which Herty served as a consultant. "You will remember our discussion of this matter," he wrote the influential Foss, "so keep your fertile brain working, for if we succeed with the legislative appropriation, the next step will be location."¹²

By August 11, 1931, Herty, Woolford, Stone, and Lufburrow were hard at work trying to convince the Georgia legislature to match Francis Garvan's offer. A letter-writing campaign and personal contact produced what Herty called "partial success" when the Senate approved a one-year appropriation for \$20,000. But that was insufficient, Herty told the *Atlanta Constitution* on August 16. It would take more than a single year to install machinery and do the work necessary to answer certain technical questions. And no "prudent" northern manufacturer would consider investing \$4 or \$5 million in a southern paper plant without those answers. He hoped, therefore, that when the appropriations bill was reconsidered by the House, "ways and means" would be found to fund the proposed laboratory for a second year. Two days later, while the appropriations bill was in conference committee for the first time, Herty told his secretary that he might be able to raise operating funds for the second year through private contributions. Nevertheless, he and his cohorts continued to work the legislative halls while a power struggle between forces in the Senate and House played itself out. During the 1931 session the House had refused to impeach Agriculture Commissioner Eugene Talmadge following an inquiry begun in the Senate. That touched off a bitter battle between pro- and anti-Talmadge forces over the amount budgeted for his department, and it was still raging as the session's deadline approached (midnight of August 22, 1931). Unable to hold the presses for its Sunday edition, the *Constitution* reported the outcome on Monday, August 24: "The climax of a wild

night under Capitol Dome came at 6 o'clock Sunday morning when, after a brief effort by irreconcilables to throw the appropriations bill into a *fourth* conference committee, the Senate adopted the money bill and the last major [measure] of the session was disposed of." On an inside page a single line stated that "a paper pulp fund" had been created at \$20,000 a year for two years.¹³

Exhausted by the time the legislature adjourned sine die, Herty wired the good news to Lois Woodford. He spent the rest of the week in Savannah, and on September 1 he was back in New York. By that time congratulatory messages from all over the country were piling up in his office. The most eloquent note came from J. M. Mallory of the Central of Georgia, who rejoiced with him for securing the laboratory appropriation and for saving the forestry and geology departments from "the political scrap heap." "You have done old Georgia a great and constructive service," he declared, "and I extend you my heartiest congratulations."¹⁴

With the funding problem settled, the next issue to be resolved was the laboratory's location. Before leaving for New York, Herty carefully announced that several cities would be considered and that the decision would rest with the State Board of Forestry. Bonnell Stone, aware of the potential for bitter rivalry, praised Herty for his tact, but J. M. Mallory commented that he was "fully aware of who will really select the site," adding that Savannah would do its part "without any embarrassment to that party." Besides Savannah, Brunswick, St. Mary's, Waycross, Dublin, and Valdosta, Georgia, hoped to attract the laboratory by offering free housing, power, and similar inducements.¹⁵

Back in Georgia by mid-September 1931, Herty began meeting informally with the president of the Georgia Forestry Association (T. G. Woolford) and the executive committee of the State Board of Forestry. At a session on September 18 the conferees took action made necessary by the Reorganization Act, which merged the forestry and geology departments into the new Georgia Department of Forestry and Geological Development, effective January 1, 1932. The new law also abolished the existing State Board of Forestry, replacing it on the same date with a commission of six members to be appointed by the governor. But Herty's prospective role and that of the laboratory were not spelled out. Consequently, Bonnell Stone and T. G. Woolford prepared a series of resolutions concerning the organization of a "Division of Research on Wood Pulp and Cellulose" under Herty's direction; how the money appropriated for the new laboratory would be spent; what Herty would be paid; how and when the money from the Chemical Foundation would be "paid over"; and how to establish clerical liaison between the

laboratory and department headquarters in Atlanta. Woolford wanted to make sure that the new Georgia Department of Forestry and Geological Development would formally create Herty's "Division or Bureau of Research" and that it would be a distinct entity, "just as Forestry and Geology are separate," within the new department. The clerk to whom the laboratory would report ought to be in the geological section, Woolford told Herty, "merely for the purpose of keeping the forestry people out of your bailiwick. In other words, my thought would be that the research work would in no wise be under the supervision [of] or responsible to the Forestry Department." "You read my mind," Herty replied. "Will see you on Friday." He did, and the recommendations proposed on September 18 were formally approved by the State Board of Forestry on September 30, 1931. At the same meeting Savannah was announced as the winner of the laboratory sweepstakes.¹⁶

Choosing a site for the new laboratory was not the only thing on Herty's mind during September 1931. "I hope to see the plant in operation by January 1," he wrote Eloise Gerry early in September, admitting that "it will take a lot of hustling to accomplish this." Certainly Herty did plenty of "hustling," but the need to make several trips to Wilmington, Delaware, and Montreal for discussions with equipment suppliers and an expert on papermaking made the target date unrealistic.¹⁷

Money and how to disburse it was another problem Herty had to deal with in the fall of 1931. Following the September 18 conference with Woolford, Stone, and others, Herty asked Garvan to make a formal offer of the Chemical Foundation's \$50,000 grant in a letter addressed to Governor Richard Russell and to do so in time for the September 30 meeting of the State Board of Forestry. The statement should note, Herty added, that the money would be "paid over" for equipment approved by Herty by January 1 so that state money could become available as of that date. Meanwhile, Lois Woodford advised Herty that catalogs and letters from would-be suppliers were "pouring in" so fast that she had drafted a form letter to acknowledge them.¹⁸

At the last moment, a snag developed that seemed to threaten the whole enterprise. Woodford informed Herty on September 26 that Garvan was refusing to make the foundation's \$50,000 available until Herty and she completed an earlier assignment regarding material in Herty's files that might be of value for a proposed history of the Chemical Foundation. "I tried to explain how matters were being rushed on the laboratory plans," Woodford wrote her absent employer,

“and he asked me to give you this message: that there will be nothing doing on the laboratory proposition until the file job is finished, that any other way of doing things is not ‘fair play.’”¹⁹

Herty left for New York as soon as possible. It is not clear what he did there, but within twenty-four hours he was able to wire T. G. Woolford: “Tell Bonnell Stone I am bringing Chemical Foundation letter with me. Every thing alright [sic].” Back in Georgia in time for the September 30 meeting, he advised his secretary that everyone was “satisfied and happy” and he was tired.²⁰

Nevertheless, Herty’s pace quickened. Besides continuing his negotiations with Pusey and Jones, the principal supplier of the papermaking machinery to be installed in the new plant, he had to correspond with and visit other firms from which he hoped to secure equipment either free or at greatly discounted prices. In addition, he arranged to visit the Forest Products Laboratory at Madison and the Institute of Paper Chemistry at Appleton, Wisconsin, to learn as much as possible about efficient plant and laboratory design.

Finding a competent staff for the new facility also kept Herty busy late in 1931. Alex Sessoms’s son-in-law asked him for a job, but despite their friendship, Herty had to turn him down. Funds were very limited, he explained, and would have to be used to hire trained research chemists and “expert paper mill mechanics.” Ultimately, Herty managed to secure an experienced four-man team that promised to report to Savannah right after the New Year holiday.²¹

Besides negotiating with suppliers, visiting paper laboratories, and hiring a staff, Herty had to continue his consulting duties for Tom Huston in Columbus, Georgia, and the Alabama Polytechnical Institute at Auburn, Alabama; negotiate a lease between the State Board of Forestry and the Industrial Committee of Savannah for the building that would house the laboratory; prepare a detailed budget for 1932; select the wood donated to the laboratory by former Savannah mayor Gordon Saussy; and stroke the politicians who supported the laboratory appropriation in 1931 and whose help would be needed again in the next biennium. He also found time to write an article about the laboratory for a Georgia Chamber of Commerce publication and to thank the Atlanta office of the Associated Press for its constant support of “all my efforts.” “He is worn to a frazzle,” Lois Woodford told Herty’s contact at Pusey and Jones in December 1931, “but . . . [hopes] that the days in the woods cruising for timber and a little hunting will pull him back all right.”²²

Herty’s initial hope that the experimental pulp and paper plant would be ready

to operate by January 1, 1932, proved to be too ambitious. It was certainly not his fault. Nor was it the fault of the Savannah business and political community, which, through its Industrial Committee, made a suitable building available and donated wood, water, electricity, and fuel oil to produce steam power, all at no cost. The Chemical Foundation had also honored its pledge, and by the end of 1931 Herty had spent about \$44,000 of the \$50,000 grant. The rest would be needed later to equip laboratories for physical and chemical testing of the pulp and paper manufactured in the experimental plant. The holdup came from equipment manufacturers whose rosy promises of delivery even Herty was beginning to doubt by mid-December. "How far they will keep their promises I cannot tell," he wrote Bonnell Stone. "All tell me that I will certainly have a period of delay, exasperations and worries of all sorts before the equipment is fully installed and ready . . . so I am prepared mentally for that situation."²³

Immediately after the New Year, equipment and material began to trickle in slowly and Herty's staff arrived, "ready and willing for any old job that comes along." G. C. McNaughton, research chemist and Herty's second in command, came from the Mead Paper Company of Kingsport, Tennessee, and Chillicothe, Ohio, after spending seven years with the Forest Products Laboratory in Madison, Wisconsin. His assistant, plant engineer Bruce Suttle, had years of experience in paper mills from West Virginia to Louisiana; W. F. Allen, the chemist in charge of laboratory pulp and paper testing, had done research work for the Bureau of Standards and the National Research Council; and J. B. Osborn, Jr., also scheduled to work in the testing laboratory, had formerly been engaged in sugar and oil chemistry, most recently with the Pan-American Petroleum Corporation. "I think it's going to make a fine team," Herty wrote Lois Woodford on January 3. "McNaughton is a peach . . . I am certainly going to unload all the technical problems on him."²⁴

In March 1932 the staff was significantly augmented when Spencer Noble, a recent graduate of Auburn University in chemical engineering, volunteered to serve the pulp and paper plant for a year without pay and a citizen of Savannah provided \$4,000 to hire two additional employees. "The staff is developing a fine spirit, though each one is different," Herty informed his secretary. "I would have been lost, however, without McNaughton." Unfortunately, McNaughton's qualities were equally evident to the Everett Pulp and Paper Company of Washington State and he left the Savannah laboratory early in 1933.²⁵

Located at 512 West River Street, adjacent to docks and railroad siding, Geor-

gia's "semicommercial" pulp and paper plant was housed in a warehouse building belonging to the Savannah Electric and Power Company. The Pusey and Jones Corporation considered the plant "the most modern and complete . . . of its kind," designed to "parallel as closely as possible the technical and mechanical processes of commercial plants." Its daily capacity was about 2 tons of paper, however, compared to the average of 150 tons per day turned out by high-speed commercial machines. The intention, Herty advised one correspondent, was to carry out systematic research on native pines, "both as to chemical and mechanical pulp." Employing standard techniques, the Georgia plant would convert lengths of pulpwood into finished white paper, "whether newsprint, book or bond paper." "No new process is involved," Herty explained, "but we hope to demonstrate that by proper seasoning of the wood all grades of white paper can be manufactured by standard processes in use throughout the paper industry today." "Of course," he added, "the economics of such production will be very carefully studied" and the results published as bulletins by the Department of Forestry and Geological Development.²⁶

By mid-April 1932, most of the pulp and papermaking equipment was in place and Herty was overseeing the selection and debarking of loblolly and slash pine in the woods close to Savannah. "Ground and chipped the first wood today. Hurrah!" he reported to Woodford on April 12. But that was one of the few progress reports she received from Herty because he was simply too busy to write. Besides overseeing work in the laboratory, he was traveling, consulting, lobbying, and giving speeches. In addition to making monthly visits to New York, he went to Washington on legislative business twice; he fulfilled consulting duties in Columbus, Georgia, and Auburn, Alabama; he met with Governor Richard Russell in Atlanta; and he gave a speech in Montreal to the Technical Section of the Canadian Pulp and Paper Association.²⁷

At least one trip to New York provided Herty with something more rewarding than hard work and a quick game of billiards at his club. On January 25, 1932, the *New York Times* announced that the American Institute of Chemists would honor Herty with a medal for "noteworthy and outstanding service to science and the profession of chemistry in America." The award would be made following a dinner at the Chemists' Club early in May. Congratulatory messages poured in from all over the country. The president of Atlanta's Retail Credit Corporation thought the American Institute of Chemists "has found out what we in Georgia have known for many years," and the president of the ACS hoped Herty would

live to “receive fifty more medals” if through chemistry “you can . . . bring back your beloved Southland to the realization of your dreams.”²⁸

Herty reported the successful outcome of the first experiments conducted in the Savannah laboratory to Woodford on May 31, 1932. A sulfite cook of loblolly pine had “worked beautifully,” he told her, and they expected the same results from longleaf. Meanwhile, the entire staff was pledged to secrecy because Herty wanted to “spring” the news at the annual meeting of the Georgia Forestry Association in late June.²⁹

Just two days later, a second “confidential” note informed Woodford that the longleaf test had also been successful. “The result is beautiful . . . no difference between slash, loblolly or longleaf. *It is purely a question of all sapwood,*” Herty explained. He asked Woodford to arrange a luncheon date at the Century Club with Howard Blakeslee of the Associated Press. “I will give him a real story,” he promised. But Herty’s efforts to coordinate his speech to the Forestry Association with the Associated Press story misfired when the Atlanta office released the account too soon. Undismayed, Herty wrote Woodford on June 25, “I think we got an increased amount of publicity, the Atlanta office of the A/P got a good calling down for a sloppy piece of work, and we wound up with . . . a desire on their part to help me in every way possible. All’s well that ends well.”³⁰

Herty was right. Within days, inquiries regarding the work in Savannah began to come in from technical journals, trade papers, paper chemists, chemical suppliers, and old friends. Some wanted a story, some were looking for business, and some wanted to visit the laboratory. Herty was glad to welcome visitors, especially if they represented manufacturers considering a southern location. During the summer of 1932, for example, he thought the Scott Paper Company of Chester, Pennsylvania, might build a plant in Savannah. Consequently, he spent several days in the laboratory with Scott’s technical director so that he could study prepared samples “from the standpoint of absorptive capacity.”³¹

Other than a tight budget, the toughest problem faced by Herty’s laboratory in 1932 was sapstain, a blue stain that often showed up in timber cut during warm weather. Caused by fungi that developed in wood where beetles had burrowed, sapstain lowered the value of timber and, in papermaking, produced an undesirable gray-colored pulp. To combat it, Herty’s staff tried several things, such as dipping the wood in various solutions, but what worked best was the use of green or unseasoned wood for both chemical and mechanical pulp. By October paper samples from Savannah made entirely of “green pine” were circulating among

northern manufacturers, one of whom advised Herty that "this is an excellent sheet of paper."³²

Following the laboratory's production of the "first real paper" in September 1932, Herty went to New York for several days during which he visited paper manufacturers and others interested in buying and selling newsprint. Among other things, he wanted to arrange parallel tests of the pine newsprint made in Savannah with the standard spruce product used by the *New York Times* and other metropolitan dailies. The results, published in Herty's report for 1931 and 1932, attracted considerable attention. Besides listing comparative data (for weight, thickness, burst ratio, and so on), the report explained that specimens of the newsprint manufactured in the Savannah laboratory had been sent by Cranston Williams, secretary of the Southern Newspaper Publishers' Association, and Royal S. Kellogg, director of the Newsprint Service Bureau, to all of their members. (The latter organization included every newsprint manufacturer in the United States, Canada, and Mexico.) The result was a flood of interest in the possibilities of southern newsprint manufacture and a stream of visitors to the laboratory who went away with what Herty described as "a much improved idea of the direct bearing of the work on reforestation and on the future prosperity of the state."³³

In the midst of his efforts to interest northern investors and paper manufacturers in the potentialities of the South, Herty did not overlook the need to educate and inspire his fellow Georgians about the importance of fire prevention and reforestation to the future economic development of their state. Despite a hectic schedule in the summer and fall of 1932, he managed to give speeches to farmers in Hinesville, to a forestry camp in Young Harris, and to a Labor Day celebration in Waycross. He also visited Milledgeville, where the chemistry students of Georgia State College for Women were measuring pulp fiber for him, to accept a donation from the townspeople of wood from which the laboratory produced paper. And he stimulated interest and support among the people of Augusta with a similar "stunt." He arranged to have some young pines cut down on a Sunday afternoon, trucked 150 miles to Savannah, converted to finished paper on Monday and Tuesday, and returned to Augusta by Wednesday morning in time for a luncheon of civic clubs, timber producers, and landowners that he then addressed on the possibility of papermaking in Georgia. Yet another educational effort involved an arrangement with a Savannah landowner who agreed to set aside an eighteen-acre tract of young, second-growth loblolly, longleaf, and

slash pine for demonstration purposes. Until 1920 the field had been under cultivation. Now the district forester would use the tract as a model to show other landowners and timber growers how thinning should be done to leave the best trees for naval stores and sawtimber. The thinnings would be shipped to Herty's laboratory for pulpwood. Finally, Herty attempted to enlighten President-elect Franklin D. Roosevelt about the part pine trees could play in rescuing Georgia from the depths of the Depression. With figures supplied by his contacts in the pulp and paper industry and "a first-class specimen of newsprint" made in the laboratory, Herty hoped to show the state's most illustrious adopted son how money spent for the imported product could be kept at home if a white paper industry were developed in the South. The occasion was a "great forestry meeting" held on November 29, 1932, at Warm Springs, Georgia. Herty and Roosevelt, a part-time resident of Meriwether County, were the principal speakers.³⁴

From the beginning of his efforts to prove the feasibility of pine as a substitute for spruce in the manufacture of white paper, Herty encountered skeptics and critics among manufacturers and technical men connected with the paper industry. Some, like Allen Abrams of Marathon Paper Mills in Rothschild, Minnesota, were old friends. Abrams was "not particularly interested in seeing the sulphite industry go to the Southern States," but he was realistic enough to understand that "progress will not be impeded." In that spirit he informed Herty about recent pulping tests done on jack pine (a northern variety) using ammonium sulfite instead of the "customary calcium bisulphite." Herty thanked him but thought "there would appear [to be] no difficulty in cooking the all sapwood slash pine with calcium bisulphite." "Some day," he predicted, "you will be packing your trunk to come down and join us in making the American pulp and paper industry absolutely independent of any outside source of pulpwood."³⁵

Other critics, less friendly than Abrams, thought that day would be a long way off. R. H. Stevens, chief chemist of the Bogalusa Paper Company of Bogalusa, Louisiana, agreed with Herty that the South enjoyed many natural advantages for the manufacture of paper and that the South's existing paper industry should diversify. But the two men differed materially on what form that diversification should take. Stevens thought the South should expand its production of what he called "mechanical papers," that is, wrapping paper, wallpaper, and paper for boxes and containers, because, he explained, "The fibers of the southern pines differ from those of northern conifers in being longer, thicker-walled and consequently stiffer and tougher. Therefore, in the manufacture of papers which

require fibers of these characteristics, the South should become pre-eminent." Stevens also noted that for some "mechanical papers" the pulp, produced by the sulfate process, would have to be bleached, "either wholly or partially." That presented no technical problem because the Forest Products Laboratory had already "worked out the fundamentals of pulp bleaching and developed successful methods for each of the Southern pines." But it would raise costs because more chemicals were needed for bleaching sulfate pulp than for pulps made from spruce by the sulfite process, which Herty favored.³⁶

What Herty and Stevens really disagreed about was newsprint, or more precisely, the possibility of it being produced competitively in the South in the foreseeable future. Newsprint was a form of what Stevens labeled "cultural papers," that is, "papers used for printing (newspapers, magazines, books, etc.) or writing (bond, ledger, etc.)." In 1930 newsprint made up two-thirds of all the "cultural papers" consumed in the United States and approximately 28 percent of all paper used. Furthermore, imports of newsprint, mostly from Canada, exceeded domestic production by more than a million tons a year, an imbalance Stevens attributed to the Canadian Reciprocity Act of 1910, which put newsprint on the free list. He saw no chance that duties would be imposed because of the newspaper lobby's "selfish" interest in obtaining supplies at the lowest rates possible. "Obviously, therefore," Stevens declared, "any success in the manufacture of newsprint in the South must be based on the ability to compete with foreign costs of production."³⁷

He doubted that the South could compete for several reasons. The Tariff Act of 1922 required that newsprint be composed of 70 percent groundwood and 30 percent "unbleached sulphite." In the standard procedure, groundwood was produced by pressing wood against a revolving grindstone on which water was being sprayed. The resulting small particles of wood formed the pulp, which, acting as "filler stock," made the finished sheet opaque enough to take print acceptably. No chemicals were used, the labor cost was small, and the yield was high. Essentially, then, the cost of groundwood depended on the cost of wood and power. But not all wood was suitable for groundwood. "Resins fill up the gritty surface of the stone," Stevens pointed out, reducing its power to cut. Unless some effective way could be found to remove the resin from the wood before grinding it, or from the stone during the grinding process, the rate of production would be seriously reduced, or conversely, the power consumed per ton of groundwood produced would be significantly increased. Steaming the wood or treating it with chemicals before grinding was effective but added to the cost and darkened the product. As

for the relative cost of power, Stevens asserted, despite its "magnificent expansion in hydroelectric development," the South was still "far behind Canada and Scandinavia. The cost per horsepower year will run from three to six times that of the lowest cost foreign newsprint mills." And though southern wood cost less than Canadian or European spruce, the difference was "not so much less as is commonly supposed." Some northern mills, he claimed, could still buy spruce wood for \$6 a cord, delivered to the mill.³⁸

Stevens saw additional problems for the South in the manufacture of sulfite pulp, the other component of newsprint. First, using the standard lime base acid, all pines were harder to penetrate than spruce, and the southern species were especially difficult. "The heartwood of these species is virtually impenetrable," he added. Second, the southern climate posed another problem in preparing the sulfite acid. Experience indicated that a high free SO₂ content was essential to pulp southern pine. But the water available from southern artesian wells was too warm to prepare high free SO₂ acid, and to "resort to plant scale refrigeration would be too costly for newsprint grade of sulphite." All in all, Stevens argued, it would be "far preferable to obtain light colored chemical pulps from the southern pines by bleaching, partially or completely, pulps produced by the *sulphate* process."³⁹

Convinced that the South could not manufacture newsprint competitively with Scandinavian or Canadian mills, Stevens thought it should concentrate instead on competing in the domestic market by expanding the range of its products. That would be challenging enough, considering that a recent statistical analysis by the American Paper and Pulp Association indicated a stabilization in per capita consumption of "cultural" papers, that current policy restricted immigration, that the rate of population increase was likely to diminish in the future, and that the capacity of existing American mills surpassed demand and would do so for the next several years. "It is only by competing with these existing mills in the home market," Stevens concluded, "that there is any hope for expanding the paper industry of the South in the near future." But no one should expect a "boom"; only gradually would the region free itself from dependence on other sections and, because of its natural economic advantages (low wood cost, easy replenishment), "assume a dominant position in national production."⁴⁰

Stevens's remarks appeared in a two-part article published by the *Paper Industry* in June and July 1932. Much of what he said was not news to Herty, who had corresponded with him and even appeared on the same program with him at a

meeting of the American Institute of Chemists in December 1930. But some of his comments were directed specifically at Herty, although he did not mention him by name. For example, Stevens referred to "a test with young slash pine chips cooked in a basket placed just beneath the cover of a commercial sulphite digester" which had "recently received much publicity." The reference was to Herty's test at the Castanea Paper Company, which Stevens clearly thought left something to be desired. "Apparently," he commented in the July 1932 article, "no one has pointed out that in that way the chips were exposed to the highest free-SO₂-content acid, a condition which favors the pulping reaction." He thought the test should be repeated with baskets placed at different heights in the digester.⁴¹

Herty felt compelled to respond to these criticisms, and in early 1933 he had the perfect opportunity. On February 14, he addressed the annual meeting of the Technical Association of the Pulp and Paper Industry (TAPPI) in New York. He began by acknowledging the presence in the audience of George Spence, Carlisle Winslow, C. E. Curran, Harold Hibbert, and Otto Kress. Spence was the chemist at Castanea Paper Company who conducted the test cited above; Winslow and Curran represented the Forest Products Laboratory at Madison with whom Herty had had some misunderstandings in the past but with whom he was now on cordial terms; Hibbert was an old friend who directed a cellulose institute at McGill University in Montreal; and Kress was the head of the recently created Institute of Pulp and Paper Chemistry at Appleton, Wisconsin. All of them had cooperated with Herty when he was setting up the Savannah laboratory and he was grateful. As for the rest of the audience, he showed appropriate humility. "I am really such an utter freshman," he apologized, "that it is a piece of nerve for me to talk to technical men about paper production."⁴²

Nevertheless, he did. He did not mention Stevens's article, but he did respond to his remarks about artesian well water and the difficulty of preparing high free SO₂ acid in a warm climate. "We found," Herty reported, "that by simply putting lead pipes on the inside of our acid tanks, and letting this [uncooled artesian] water circulate through them to take off the heat of the reaction, we have no trouble in building up our free acid to any strength we want." As for grinding southern pine wood, which Stevens maintained would cost considerably more than it cost to grind spruce, Herty's laboratory arranged through the Scott Paper Company to acquire a cord of spruce wood from Nova Scotia which was sawed into blocks about three and one-quarter inches square and eighteen inches long.

Pine blocks of the same size were also prepared. Run through the grinder separately under identical conditions, the pine required more power to grind, but the rate of production was faster so that the horsepower consumed per ton of product was less than that for spruce. "I feel," Herty declared, "that it is just as much in error to say that it requires more power to grind pine than spruce, as to say that the wood is too rich in resin for consideration for sulphite pulp. I don't say yet that it is going to be cheaper to grind, but I will say with perfect confidence that it is not going to be more expensive."⁴³

The rest of Herty's speech dealt with a variety of topics. He summarized the history of the Savannah plant and described the nature and layout of its equipment; he displayed samples of slash pine and spruce wood, equal in size but differing by more than forty years in age; he presented data regarding cooking times and temperatures for sulfite pulp, average yields, and fiber measurements; and he discussed the "pitch problem," which Savannah did not experience when using freshly cut pine, but which was commonly encountered with spruce. "Has spruce a different resin in it from our pine resin?" asked Herty. The Forest Products Laboratory had done no work on the subject, and he could find no answers in the literature, which led him to suggest more research on the composition of resins. Finally, Herty invited everyone to Savannah to observe the plant and to check its records. A formal invitation from the Georgia Forestry Association to the American and Canadian Paper and Pulp associations, their technical divisions, and the American Paper Mill Superintendents Association proposing a joint meeting in Savannah on May 1-2, 1933, would be issued shortly. And Herty had already secured special rates from the Ocean Steamship Company, which had a boat leaving from New York on April 28. "All we are trying to do," Herty concluded, "is to demonstrate that you can substitute this young pine for spruce, because we want to see white paper mills down in Georgia. If some of you can work it out quicker in your own laboratories, go to it and get the glory. But come down and look over our records, and criticize. We thrive on criticism."⁴⁴

Well before Herty spoke to the Technical Association of the Pulp and Paper Industry, he had to deal with several problems relating to the laboratory, his financial situation, and his family. He had to arrange for the funeral of his eccentric sister-in-law, Ida Peacock, a recluse for whom Herty had provided a home years before but which, by the time she died, had become a squalid ruin overrun by the pack of stray dogs she insisted upon maintaining. He also had to curtail his living and office expenses. In the fall of 1932 Herty moved from the DeSoto Hotel to a

room in a private home where he also took his meals. Later, he had to give up Lois Woodford, his secretary in New York, who had been with him since 1917. He continued to maintain an office there, but by the spring of 1933 part of the suite was sublet to an architect and the room Herty retained was paid for by the Savannah Industrial Committee.⁴⁵

As for the laboratory, Herty learned late in December 1932 that George McNaughton had been offered another position and would be leaving by the first of February. Fortunately, Herty thought he knew where to find a worthy replacement, and within a few weeks the new man was in Savannah and "catching on fine." A press release described William MacNaughton as someone "well known in the paper industry," whose career included six years as secretary of the Technical Association of the Pulp and Paper Industry, two years as an engineer with the Newsprint Service Bureau, and, most recently, three years in the newsprint division of the International Paper Company.⁴⁶

Finding a way to solve the laboratory's financial problems proved more difficult. From the beginning Herty had managed to obtain donations of wood and chemicals as well as greatly discounted prices from manufacturers whose equipment he had purchased. He also received free passes for travel on the Central of Georgia and several other railroads during the laboratory's first year. Nevertheless, he soon exceeded his budget, and only the generosity of Savannah's citizens and an extra grant from the Chemical Foundation had made it possible for the laboratory to do as much as it had in 1932. By the end of that year Lois Woodford was searching for funds in New York but with no success. The only thing Herty could look forward to, it seemed, was the continued support of the legislature, which he worked hard to secure during the first three months of 1933.⁴⁷

In January Herty went to Atlanta to see the governor and leaders of the House and Senate in behalf of the laboratory. A large delegation of lawmakers planned to visit the facility by the end of the month, and Herty intended to put on a show. "We're getting everything ready for a complete demonstration tomorrow," he wrote Woodford on January 26, 1933. "Our plans are all made and everything is in apple pie order. I hope good will result from it. P.S. 75 members are coming!" A few days later Herty advised his brother-in-law, Professor Will D. Hooper of the University of Georgia, that he had been asked to address a joint session of the legislature. No date had been set, but T. G. Woolford, president of the Georgia Forestry Association, would meet with House and Senate leaders

to fix the time. Meanwhile, there was “lots of work to do” in the laboratory to prepare specimens for the appearance.⁴⁸

Herty did more than make up a few samples to show the men who would soon be considering appropriations for the next biennium (1934–35). He also acquired some young slash pine grown from year-old seedlings planted in 1926 by James Fowler of Soperton, Georgia. Culled from a stand that Fowler would later turpentine and harvest for timber, the thinnings were converted into newsprint on which the *Soperton News* printed a special edition to commemorate a meeting of the Georgia Press Association. That feat attracted plenty of attention in Georgia but much more when Herty reported it and other laboratory achievements to the western New York section of the ACS at Niagara Falls.

Herty told his fellow chemists that laboratory tests conducted by William MacNaughton, “a recognized expert,” showed the paper produced for the *Soperton News* to be stronger and lighter in weight than standard newsprint. Practically, that meant a publisher could realize 6.6 percent more sheets per ton and reduce mailing costs of his product at the same time. Herty’s speech also emphasized the rapidity of growth of the Soperton trees, some of which reached eight inches in diameter when only seven years old. Furthermore, although only loblolly seemed to grow as fast as slash, the laboratory had found that 90 percent of the South’s pine varieties made good newsprint. Noting that the United States imported two-thirds of the newsprint it consumed, Herty pointed out that it took northern spruce fifty years to reach pulpwood size, that it cost approximately \$9 to \$10 a ton, and that it was often stockpiled for a year, tying up capital. By comparison, southern pine sold for \$3.50 a ton and was so plentiful that there was no need to keep more than two or three weeks’ supply on hand. Finally, Herty told his audience, the laboratory had proved it cost no more in power to grind pine for mechanical pulp than it did to grind spruce.⁴⁹

Timed neatly to coincide with the deliberations of the Georgia legislature, Herty’s Niagara speech was covered extensively by the New York papers and the Associated Press. “That was certainly a series of bombs you fired . . . last night,” Herty’s brother-in-law commented admiringly after reading an account of the Niagara meeting in the *Atlanta Constitution*. The response was just as enthusiastic in New York and Savannah. “Things have been humming since you left,” Lois Woodford reported on March 17, and Herty found himself “deluged with mail from all directions” on his return to the laboratory. “I think all this publicity is

going to result in financial eyes being turned down this way before long," he confided to his nephew. Meanwhile, everyone on the staff was hard at work, "making real progress," but aware that "we haven't yet covered the ground completely."⁵⁰

Less than a week after the Niagara Falls speech the Georgia legislators voted unanimously to continue supporting the laboratory at \$20,000 a year for the next biennium (1934–35). Herty was delighted, but his joy soon faded. On March 24, 1933, Governor Eugene Talmadge vetoed the laboratory appropriation bill, along with thirty-nine other pieces of legislation passed by a defiant legislature which had turned down several measures he favored. Nonplussed, Herty tried desperately to put together a telephone and telegram campaign to change the governor's mind, but there was no time; Talmadge was on his way to Miami and Havana. Besides, a Talmadge confidant advised Herty through his brother-in-law, any argument or opposition simply made the governor more obstinate. Will Hooper was outraged that "one drunken fool" could destroy such important work. But in the name of reform, he discovered, the line item veto had been approved by Talmadge's predecessor, Richard Russell.⁵¹

To some who commiserated with him Herty expressed the hope "that everything will work out alright [*sic*]." Actually, he feared the governor's action could wipe out "a truly remarkable piece of work" of great economic significance to more than one-third of the country.⁵²

The pressure Herty's partisans brought on Governor Talmadge to rescind the veto did not change his mind, but it did provoke from him a justification of sorts. On April 20, 1933, Talmadge sent an editorial from the *Statesman*, "a little paper published here in Atlanta, which gives my attitude about the [laboratory]," to a Savannah woman who had urged him to reconsider. A floundering political journal begun in 1930, the *Statesman* was originally owned and edited by Frank Lawson. But Lawson needed money, and after he borrowed \$1,000 from a Talmadge crony, Talmadge became associate editor, the *Statesman* became a propaganda sheet, and Lawson became a self-described press agent. The editorial on the laboratory appropriation veto is illustrative. Noting that the veto had aroused "a furor of antagonistic comment" in Georgia newspapers and that Governor Talmadge had been assailed as "unscientific" and ignorant of the importance of developing a "pine paper industry," the *Statesman* asserted that none of "this inspired publicity" had addressed certain facts: first, that in asking for its first appropriation, directors of the laboratory had stated that they would ask for no more state money; and second, that "even now" the directors of the plant had

announced through the *Savannah Evening Press* the impending visit of national paper manufacturers to Savannah to discuss the capitalization and foundation of branch mills in Georgia. Citing the special edition of the *Soperton News* as proof, the *Statesman* argued that there was no need to continue state support because the "Savannah venture" had passed the "experimental stage" and was "ready for commercialization." Besides, the editor continued, "One of the governor's most pronounced ideals is that the government should be taken out of business." He was right to veto the appropriation, therefore, because "it is up to private capital to continue the process [of industrialization], not the state of Georgia."⁵³

Coming as it did on the heels of the highly successful and well-publicized *Soperton News* demonstration, the laboratory appropriation veto demoralized Herty. "I'm beginning to feel the need of either a vacation or the opportunity to cuss somebody out," he wrote Lois Woodford on April 30, 1933. But the arguments Talmadge used to justify his action must have made him feel even worse. First, there is no indication in the Herty Papers that he or anyone connected with the laboratory had ever pledged to limit their requests for state support to a single biennium. In fact, Herty's *Report* for 1931 and 1932 contains a section headed "Future Work" which indicates the existence of still unsolved problems in the manufacture of newsprint, not to mention the need for new equipment required to pursue the ambitious, long-range research agenda he spelled out. Obviously, the aim was to operate an ongoing research and development facility funded by the state. Second, the American Paper and Pulp Association, scheduled to meet in Savannah on May 1 and 2, 1933, was not planning, as Talmadge would have it, to consider the "capitalization . . . and foundation of branch mills throughout the pine belt of Georgia." In their own words, the manufacturers were simply going "to intimately examine the prospects for a great development of the paper industry in the South." The program called for an inspection of the research work and operation of Herty's laboratory, the presentation of papers featuring economic, engineering, and other phases of southern pulp and paper development, and visits to naval stores plants and reforestation projects. In other words, as described in the APPA's *Monthly Review*, the visit was an "excursion," not an investment opportunity.⁵⁴

Seventy-five members of the APPA came to Savannah. They were impressed with what they saw in Herty's laboratory and in the woods around the city, and they were royally entertained by the Georgia Forestry Association, the Chamber of Commerce, and leading citizens of southeast Georgia. Nevertheless, the

principal spokesmen for the visitors, C. W. Boyce, secretary of the APPA, and Allen Abrams, president of TAPPI, were clearly not ready to endorse wholesale migration of their industry to the region. Most of their arguments were economic and hard to refute. Abrams agreed that the possibility of establishing a sulfite or white paper industry in the South was "intriguing," and he acknowledged the contributions of Herty, who had "ferreted out the facts"—that southern pines less than twenty years old were free of heartwood, that their resin content was low until heartwood developed, and that "a papermaking stand" could be grown in ten to fifteen years. He also commended Herty for urging the "papermen of the country" to visit the laboratory and to check his findings. That was the "right attitude" for any man to take, whether scientist, banker, or "what not." But, Abrams continued, "as in all research of such character it is impossible to give a sound answer in a short time." He seconded the remarks of another speaker who thought "sound development in five to ten years would be satisfactory."⁵⁵

The comments of Boyce, speaking for the APPA, were considerably more comprehensive. He was firmly convinced that the North American white paper industry was "tremendously overexpanded, particularly in newsprint," he thought Herty had embarked on an "almost impossible task, to break into this already crowded field with a new type of product, especially . . . when the normally intense competition is unbelievably intensified by the liquidation of companies in receivership," and he admired Herty's courage for pushing forward in the face of such obstacles. He also wondered at Herty's judgment in asking him to address the gathering, knowing that he was likely to paint a discouraging picture. Boyce then outlined the industry's recent history, noting that the rapidly expanding American market during the 1920s had masked manufacturing capacity in Canada, Europe, and the United States West and South. But the tide had turned; consumption was declining and producer nations were fighting to retain their stake in the American market by using a "varied assortment of weapons: dumping, depreciated currencies, subsidy and what not. And these, naturally, inspire our own nationals to combat." The result was instability. Nevertheless, the industry's spirit "to adjust itself to a new era" was strong, and the fact that the APPA had come to Savannah to see Herty's accomplishments was evidence that it was seeking new sources of strength. "Some of us may be skeptical," Boyce noted frankly, "but none of us may safely pass over these accomplishments."⁵⁶

Looking at the current situation in the industry, Boyce argued that overwhelmingly favorable production costs were not, of themselves, enough to guarantee

success to a southern industry. Southern states along the Atlantic seaboard and the Gulf accounted for only 6 percent of annual U.S. newsprint consumption, or 225,000 tons, an amount that would sustain only two modern mills. "If newsprint is to be manufactured in the South and if its manufacture is to be significant in the South's economy," Boyce continued, "it must compete in the nation's large markets, in that band of consumption some 250 miles wide from New York and Baltimore on the east to Chicago and St. Louis on the west, a band that is about equi-distant between the Canadian band of production on the north and the southern pine belt on the south."⁵⁷

Boyce's views about newsprint applied to the manufacture of other paper as well: "Southern consumption is not now sufficient to warrant mill construction, except possibly for demonstrating purposes. The south must compete with other regions, and in many cases with mills more favorably located." Citing the southern kraft industry to prove his point, he asserted that its development had amounted to "nothing" until the product became established "in large consuming markets." Whether the southern kraft story could be repeated in newsprint, book papers, and "other sulphite specialties and bonds" depended on several factors, Boyce continued. Wood was one of the most important because its cost accounted for a third to more than a half of the cost of manufacturing pulp. Here the South had several advantages. Its forests of young pines could easily supply the entire nation's pulpwood requirements; woods operations could be carried on throughout the year; forests were easily accessible; and storage at the mill could be reduced to "a minimum." "Woods labor" was plentiful and wage rates were "traditionally low." "These and other factors give the southern producer a substantial advantage," Boyce conceded, but it would be obliterated if shipping costs of the finished product from the mill to the consumer exceeded rates elsewhere.⁵⁸

Next, Boyce cited figures which indicated that the average shipping charge to New York City from the southern states, \$7.50 per ton, was about \$2.50 more than the charge from Maine and "perhaps" \$4.00 more than from New York State. The cost to ship from the South to the Chicago market was even higher. In other words, "the freight differential permits a greater pulpwood cost in New England and New York of about \$2.00 a cord." And if that was not sufficiently discouraging, Boyce predicted that a southern industry would also have to face competition from the Pacific coast. The cost of wood there was only slightly higher than in the South, transportation charges to the eastern market were about the same, and the region had already begun to manufacture white paper. "If this

analysis is correct," Boyce commented, "we have achieved what amounts to regional balance in pulpwood; f.o.b. mill prices plus freight charges on finished products to large consuming points add [up] to a figure that at the moment shows no great advantage to any one region."⁵⁹

Boyce then weighed the possibilities of a southern industry's ability to compete with Canada's. The Canadian "newsprint manufacturing belt" and the southern pine belt were approximately equidistant from the high-consumption arc he had identified (New York–Baltimore to Chicago–St. Louis). He estimated that transportation charges would also be roughly the same. Assuming that manufacturing costs (power, labor, chemicals) would balance as well, the South's one advantage would be its cheaper wood. Under normal circumstances, Boyce continued, that might be enough to allow a gradual shift of the industry to the South. But the times were not normal, and it was important to realize that the Canadian industry was "slowly but irresistibly going through the wringer . . . the water is being squeezed out, [and] . . . the whole capital structure is undergoing a squeezing process that will have a marked influence upon costs." Boyce doubted that the South would be able to duplicate the Canadian mills at a figure even close to what Canadian capitalization would be fixed at when the "squeezing process" was over. "This is a factor that must be reckoned with," he warned. Finally, after reminding his audience that "industrial expansion is a serious matter," Boyce closed his remarks on a cautionary note. When technical development and economic conditions were favorable, he predicted, the paper industry would welcome a "new competitor." But meanwhile he urged southern producers to exercise "temperance in expansion," which meant as much to the South as to the rest of the country. "The Canadian experience of overexpansion is a glaring example of the dissipation of chances," he concluded. "May that experience be avoided here—and in the Pacific Northwest."⁶⁰

Boyce's concerns about southern expansion in the face of falling demand were understandable. In February 1933 the APPA *Monthly Review* published figures provided by R. S. Kellogg of the Newsprint Service Bureau which indicated that newsprint production for the entire North American continent was continuing its downward trend. Production for January 1933, down slightly from December, was 17 percent below the amount produced in January 1932. In fact, the figures were lower than any January since 1923. Production in Newfoundland had fallen by 7 percent, in the rest of Canada by 16 percent, and in the United States by 21 percent. The drop in newspaper and periodical advertising for January and Feb-

ruary of 1933, some 24 percent, explained the cutbacks. In January 1933, Kellogg reported, leading daily newspapers in the United States were averaging twenty-two pages compared to the twenty-four-page average of January 1932. Similarly, Sunday newspapers had dropped from seventy-nine pages to sixty-seven.⁶¹

W. T. Anderson echoed Boyce's words about temperance in expansion after APPA members withdrew from the Savannah meeting to visit Herty's pulp and paper plant. Editor of the *Macon Telegraph* and a staunch supporter of Herty's efforts to get the vetoed state appropriation restored, Anderson noted that a number of Georgians seemed to think Herty's work had been completed to the point that newsprint production could go forward successfully at once. That was contrary to any claim ever made by Herty, he declared, proceeding to read a statement from him which showed that while much had been learned and paper had been produced, there was still much to do. For example, the laboratory still had to discover how to make newsprint with tensile strength suitable to the high-speed equipment of commercial plants, how to perfect the paper's surface for the absorption of ink and the reproduction of cuts, and how to make book and writing papers whose production required the use of Georgia clays and rosins. Instead of trying to interest the visiting paper manufacturers in establishing plants in their towns, Anderson declared, the chief concern of the Chamber of Commerce representatives in his audience "should be to find ways of keeping Dr. Herty on the job."⁶²

On May 7, 1933, Herty wrote Lois Woodford at her new place of employment, Sulco Laboratories, Incorporated, on East 38th Street. "Well, the show is over and the monkey is (almost) dead," he reported, but the APPA members had gone away "deeply impressed" by what they saw in the laboratory. He was busy "mopping up" after the performance, and in a few days he would leave for New York to visit his "abbreviated" office. Meanwhile, the laboratory's funding problems continued to plague him. By the end of June efforts were under way to secure support from the federal government through Robert Fechner, director of the Civilian Conservation Corps. "Confidentially," Herty told his son Holmes, "it is hoped that an appointment can be made with the President between July 6th and 10th at which about six of us, including the two Ga. Senators, will try to put across a convincing argument." The group intended to ask for \$105,000 to cover equipment and operating expenses in 1934 and 1935. "What's worrying me today," Herty wrote Woodford on July 1, 1933, "is the question of what the Governor will do even if we succeed in Washington. Sometimes I feel like chucking

the whole business in the river but I know such thoughts are simply a sign of weakness, for no real fight was ever won by any such method.”⁶³

Fortunately for his mental state, Herty was so busy in the laboratory during the summer and fall of 1933 that he had no time to dwell exclusively on money troubles. No federal support came from Washington, and the state was slow to turn over the installments still owed for 1933. But the break finally came early in November, when Governor Talmadge agreed to lease the laboratory to the Savannah Industrial Committee for two years at a dollar a year and the Chemical Foundation awarded the facility \$105,000 to cover the cost of new equipment and operating expenses for 1934–35. Herty’s brother-in-law was delighted. “It must be a happy feeling to tell these politicians where they can go,” he commented.⁶⁴

Despite their uncertain financial status, Herty and his staff accomplished a great deal in 1933. Besides producing newsprint for the *Soperton News* from young pine thinnings only eight years old, the Savannah laboratory manufactured and shipped sulfite pulp to sixteen laboratories that agreed to test it against the industry standard. Results began to come in a month later. “I enclose two sheets of the *Savannah Press* printed on our paper,” Herty wrote his son on June 28, 1933. “Everybody, including the northern people, admit that our paper is better than the imported Swedish paper used in the regular editions. We are coming along.” In addition, the laboratory began making experiments in late May 1933 to test power requirements in the manufacture of groundwood. Clearly there were problems. On August 17 Herty advised Lois Woodford, “We’re . . . having our troubles, but hope to pull through all right.” Another advance came in early September, when the laboratory discovered that acceptable newsprint could be made from small, previously turpented trees. Abandoned by naval stores operators after only a few years, the trees constituted what Herty labeled “a dead loss to society.” If used for pulpwood, he estimated, they could add “a potential value of about \$20,000,000 to the standing wood values of the South.” Thomas Gamble, publisher of the *Weekly Naval Stores Review*, printed a supplement on the paper in which he described the experiment. The donated logs came from sixteen-year-old slash and longleaf pines abandoned by a naval stores operator in Pembroke, Georgia. The trees were sawed into regulation pulpwood length and subjected to the standard method of making paper, and the resulting newsprint met standard quality tests. Literally millions of such trees existed in the turpentine belt, Gamble advised his readers. At \$3 a cord they might satisfy 25 percent of United States paper demands “on a continuous basis.” Three days after Gamble’s supple-

ment appeared, confirmation regarding the quality of the paper came from an unexpected source, the United States Bureau of Standards. "Where they got the paper I don't know," Herty wrote his former secretary, "for I didn't send it. I did give a lot of it to different people in New York and imagine someone up there sent it down to Scribner."⁶⁵

Without doubt the most important experiment performed by Herty's crew during 1933 took place not in the laboratory but hundreds of miles away in a Canadian paper mill. For weeks Herty had been negotiating with several major newsprint manufacturers to use their facilities and pulp produced in the Savannah laboratory for a full-scale commercial run. By September the Certainteed Products Corporation of New York had agreed to let one of its subsidiaries, the Beaver Wood Fibre Company of Thorold, Canada, make the paper run at no cost. The pulpwood, loblolly pine, was donated by a Chatham County (Savannah) native, and several Georgia newspaper publishers paid to ship the pulp to Canada. They also agreed to print their regular editions on the finished product if the experiment was a success.

The weather was unseasonably warm in Savannah while the laboratory was preparing the pulp, and Herty worried that "blue stain" might affect it. But thanks to a local ice company, which provided cold storage facilities, that problem did not arise. By October 21 the pulp had been loaded aboard three refrigerator cars attached to a fast freight and was on its way to Canada. "We have had a hectic five weeks getting our material ready," Herty wrote his daughter, "so next week we're going to close the laboratory . . . while MacNaughton, Allen and I go up to Thorold . . . for the commercial run. Keep your fingers crossed."⁶⁶

Herty's stated reason for shipping southern pulp "coal" to a Canadian "Newcastle" was to establish that southern pulp could produce as good a grade of standard newsprint on a fast commercial paper machine as that turned out on the laboratory's "small and slow" equipment. "If so," he explained, "the case is made up, for all the economics favor the South as the seat of a future great newsprint industry."⁶⁷

At five o'clock on November 1, 1933, after spending hours preparing the proper mix of sulfite pulp and groundwood and carefully scrubbing every trace of spruce pulp from the equipment, the Thorold crew prepared to make the crucial test on a paper machine housed in a huge building two hundred feet wide and five hundred feet long. John Ball, manager of the Thorold plant, oversaw operations from a balcony while Henry Zieman, plant superintendent, issued instructions to

the operators. Herty and his crew were mere spectators as the Thorold workmen sprayed water on the fast-traveling wire and the drying rolls revolved. "Suddenly," Herty recalled in a published interview, "the wire began to look milky—the pulp was on its way to paper. Back it went to the stock chest, thicker and thicker grew the wet sheet."⁶⁸

After a few adjustments, a sheet 155 inches wide began traveling through press rolls on its way to a succession of steam-heated drying rolls. "Now was the crucial moment," Herty continued. "Would the sheet have sufficient wet strength to withstand the tension as it passed to the drying rolls? My heart almost stood still." Unable to keep his seat, he accompanied the workmen, following the sheet's progress over the rolls. At the end, as a wide sheet of white paper emerged, a workman "with a dexterous slit with a knife and a blast of compressed air lifted the sheet to the top of the calendar stack." A "crackling sound" indicated that the paper was moving from one roll to another, finally winding onto a reel. "There was the first sheet of commercial newsprint from Georgia pine, pure white and smooth surfaced," and Herty wanted the moment recorded. John Ball examined a piece of the paper and remarked, "We are going to lick it, Doctor." Herty answered, "Give me that first piece," and he wrote Ball's words on it. As the finished product was removed to the rewinder and the run continued, Herty, MacNaughton, and Allen, along with the Thorold crew, waited for a break in the paper, a common occurrence in newsprint mills. But hours passed and the paper did not break. Near midnight Henry Ziemann advised Herty that the supply of Georgia sulfite pulp was almost gone. He offered to prepare some spruce sulfite to be mixed in with the pine so that Herty would have enough to fill all of his orders, but Herty declined. He wanted the publishers "to be able to say truthfully that every fiber in the sheets of their special issues was grown on Georgia soil." At 1:45 A.M. the last bit of paper came over the reel and Herty grabbed it for another souvenir. This time Henry Ziemann uttered the appropriate comment, which was duly recorded on the paper: "Not a break in a carload." Then Ziemann carefully inspected the entire papermaking machine and reported, "No sign of pitch anywhere." "Write that down on the same paper," Herty answered. He was not surprised because analyses had been made on the pulp before it left Savannah. But he wanted his friends in the industry "to have the word of the man who made the run." "It is difficult for them to believe, but it is true," Herty explained later to the *Savannah Morning News*. "And this fact assures a paper industry eventually for the South."⁶⁹

For Herty the results obtained at Thorold were gratifying in the extreme. It was to be expected that the patriotic Georgia publishers who planned to print their regular editions on the product would pronounce it superior in every respect. Less biased sources, however, were also impressed. John Ball wrote Herty fully the day after the Thorold run. "It ran 100 percent perfect as far as the paper machine was concerned," he noted. The surface quality was "fairly good," but with a little more experience in preparing pulp, he was sure Herty would be able to get "a still better surface, a much cleaner and better sheet of paper." "By this test," Ball concluded, "you have proven that your southern pine is in a high sense suitable for the manufacture of newsprint. . . . The carload of paper now on its way to Georgia cities may mark the beginning of a great industrial development for the South."⁷⁰

Another Canadian, A. A. MacDiarmid, chief engineer of Price Brothers and Company, Limited, was less flattering about the quality of Herty's newsprint. But he too thought a little more work in the laboratory would make it competitive with the northern product. Even more interesting was his exhaustive breakdown of comparative costs to deliver newsprint to the publishers. "Summing up . . . the various factors [pulpwood, chemicals, power, labor, freight, and capital charges]," he told the Canadian Pulp and Paper Association, "it appears there would be a total difference in cost of paper delivered in large consuming centers along the Atlantic Coast of about \$8.00 to \$9.00 a ton in favor of a Southern mill over a typical up-to-date Canadian mill located in Quebec or Ontario."⁷¹

MacDiarmid thought the day was not far off when the South would be able to manufacture a commercially competitive product, given its "powerful advantage" of lower costs, its desire to attract new industry, and the effort it was making to solve technical problems. He went on to note that fifteen or twenty years earlier practically all the kraft paper made in North America had come from the northern states and Canada. But in the last nine years United States production had more than doubled, and the increase had come primarily from the South. Meanwhile, Canadian kraft exports to the United States had decreased by more than 60 percent. The only way the Canadian newsprint industry could meet the threat of southern competition, MacDiarmid warned, was to become more efficient and to secure the "closest cooperation of Governments, Power Companies and Transportation organizations," much of whose annual income came directly or indirectly from the paper companies. "Action had best be taken before Southern newsprint mills are built," he concluded. "Afterwards, it will be too late."⁷²

On November 20, 1933, nine Georgia newspapers printed their regular editions on the paper produced in Thorold, Canada. Each carried extended accounts of the laboratory's history, the Canadian experiment, and interviews with Herty. Some, like the *Macon Telegraph*, featured a comprehensive report prepared for nationwide distribution by Herty's friend Howard Blakeslee, science writer for the Associated Press. The effect was everything Herty hoped it would be from the standpoint of public relations. "I am completely swamped with mail," he wrote Lois Woodford on November 29. Of the few congratulatory letters preserved in the Herty collection, all came from old Georgia friends who knew little about papermaking but had unbounded pride in his achievement. "How proud Sophie would have been!" exclaimed one woman who had lost her home because of the Depression. She hoped Herty would reap the rewards he so richly deserved, the chief one of which, she was sure, would be the satisfaction of having helped the small farmers of the South, "black as well as white," to make a living. "I trust the [paper] industry doesn't get into the hands of corporations of rich men," she added.⁷³

Herty had little time to answer his mail or read his press clippings before another challenge arose. On November 23, 1933, he accepted a position with the chemical division of the National Recovery Administration (NRA). Created during the first Hundred Days of the New Deal, the NRA aimed at achieving industrial recovery through cooperation and planning by government, business, and labor. As a deputy administrator of the chemical code, Herty was required to spend every other week in Washington, which, added to his work as director of the Savannah laboratory, kept him "mighty near . . . out of breath." "But what does that matter," he asked one well-wisher, "as long as you are happily at work?"⁷⁴

In a speech to the National Manufacturers' Association, General Hugh Johnson, head of the NRA, explained that cooperation was the entire goal of his agency. "The idea here is industrial self-government, through trade associations, with such governmental sanction and supervision as is necessary to protect the public interest . . . against every abuse of monopoly and exploitation . . . aimed at by the anti-trust acts." The agency would be exactly what industry through its trade associations chose to make of it, he continued. Whereas trade associations before NRA were "barely tolerated," now they could become a "fully implemented arm of government" which could "police" the economy under government supervision. For those who associated inefficiency and red tape with government agencies, Johnson proposed two safeguards: insistence on "industrial

self-government” through trade associations and the “Codes of Fair Competition,” which they constructed, and constant rotation in personnel so that deputy NRA administrators would always be men on loan to the government for about six months from the ranks of industry, science, and technology. That way there would always be “fresh blood” and “new ideas” in the agency and the evils of “political subserviency,” “academic irresponsibility,” and “routine lethargy” would be avoided. Herty fit Johnson’s description of the ideal NRA administrator perfectly. As a former president of the Synthetic Organic Chemicals Manufacturers’ Association he was intimately acquainted with the mechanisms of trade associations. And as a frequent collaborator with government during the 1920s, particularly those branches led or influenced by Herbert Hoover, he was, like General Johnson, a firm believer in the former president’s philosophy of voluntary “cooperation.” In fact, Herty had espoused the concept publicly as early as 1915 during his first term as president of the ACS. Finally, six months was about the length of time that Herty was prepared to give to government service. “The trouble with the Washington job,” he complained to Will Hooper in February 1934, “is that it makes it practically impossible for me to go anywhere except Washington and Savannah.” By March 22, therefore, he had resigned “in order to devote more of my time to the development of the white paper industry in the southern states.”⁷⁵

The Thorold experiment and the attention it received in the national press made Herty something of a celebrity in his home state. It also made the Savannah laboratory a magnet for technical men and potential investors who began to take the possibilities of developing a newsprint industry in the South somewhat more seriously by 1934. On January 25, the citizens of Milledgeville, Georgia, celebrated “Herty Day” by marking their favorite son’s birthplace on the campus of the Georgia State College for Women with a granite slab. The slab bore a bronze plate inscribed: “Dr. Charles Holmes Herty, Statesman-Chemist. Born on this spot December 4, 1867. By his leadership he has made America chemically self-sufficient. He has unselfishly given his time and talent to develop Georgia’s natural resources.” A week later, the Savannah Chamber of Commerce announced that it would award Herty its Arthur Lucas medal for outstanding service to the community when it celebrated its fiftieth anniversary at a banquet on March 29, 1934. Former Mayor Gordon Saussy, the man most instrumental in bringing Herty to Savannah, could not be there, but he thought the honor was richly deserved. “I find that our people not only appreciate what you have done,” he

wrote Herty, "but have in their minds and hearts a sincere, sympathetic and high regard for your good self." Yet another indication of the home folks' esteem came in May 1934 when he was awarded the Herty Medal, an honor established the previous year by the Georgia section of the ACS to recognize southern chemists. Finally, the South Georgia Teachers' College, now Georgia Southern University at Statesboro, recognized Herty's contribution to the naval stores industry in April 1935 by designating a small grove of trees on the campus as the "Herty Pines" and unveiling a bronze tablet commemorating the placement of the first Herty cup on a local pine tree some thirty-four years earlier.⁷⁶

In 1934 Herty decided to make Savannah his official residence, shifting his voter registration from one "Empire" state to another. He still visited New York, but the trips were less frequent as work in the laboratory intensified and travels around the South occupied more and more of his time. Lois Woodford packed up his journals for shipment to Savannah in October 1934, and the following spring Herty gave up his office at 101 Park Avenue. By that time he had acquired a Savannah office away from the laboratory which was large enough to house everything still in New York. "It is going to be very helpful," he wrote his son in May 1935, "to have all my stuff together . . . and to have a quiet place where when work demands it I can get away from the noise of flat screens, chippers, saws, etc."⁷⁷

Herty's money troubles were also less pressing by 1934. The Chemical Foundation's decision to fill the funding void left by the Talmadge veto guaranteed enough money to run the laboratory through 1936. Nevertheless, a \$5,000 personal debt accumulated during the laboratory's first two years forced Herty to practice what he called "the most rigid economy." He was greatly relieved, therefore, when Francis Garvan asked him to become the foundation's southern representative in March 1935. He would spend half his time at the laboratory and the other half promoting the "general interests of the South in chemical developments" by giving speeches and appearing before Congress or state legislatures to win support for the development of such products as tung oil, starch from sweet potatoes, or alcohol from wood and other vegetable products. To give the South the full benefit of his "ripened judgement . . . experience and learning," Herty would have to be "free of care and worry." Therefore, Garvan explained, besides the \$5,000 Herty received as director of the laboratory and the additional \$5,000 for his work as the foundation's representative, he would have an unlimited expense account for travel "to carry out our objects."⁷⁸

A fuller, more formal statement of what Garvan and the Chemical Foundation

meant by “our objects” emerged at the first Conference of Agriculture, Industry and Science held at Dearborn, Michigan, in May 1935. Hosted and funded by Garvan and the Chemical Foundation and featuring speakers including Henry Ford, the director of the Mellon Institute, the master of the National Grange, the president of the General Motors Research Institute, Irénée du Pont, Colonel Robert McCormick of the *Chicago Tribune*, and Herty, the conference arranged for the creation of a national council to serve as “a coordinating Forum for American Agriculture, American Industry and American Science in developing new industrial markets for farm products.” The hope was that the council’s work would result in the “gradual absorption” of the nation’s farm surplus by industry; the profitable employment of idle land; increased purchasing power for the farmer; increased demand for manufactured products; new jobs for the unemployed; the revival of industry; and, ultimately, recovery for the nation. Convinced that the road to recovery lay through “chemurgy” (industrial use of organic raw materials, especially farm products) rather than government-sponsored crop reduction schemes, the Dearborn conferees were clearly at odds with the architects of the New Deal’s agricultural and tariff policies, a difference that became more obvious as the chemurgic movement gathered steam in 1936 and 1937. But for Herty, a member of the national council (later styled the Farm Chemurgic Council) and chairman of its subcommittee on cellulose, the stated goals of the chemurgic movement defined precisely what he was trying to achieve by promoting a white paper industry for the South.⁷⁹

With the financial picture clarified and the Thorold, Canada, commercial newsprint demonstration behind them, Herty and his laboratory staff were ready to expand the scope of their investigations by 1934. Early in the year they were installing new equipment and making tests to determine the optimal mix of chemical to groundwood pulp in newsprint manufacture. Other tests, conducted for Herty by chemistry students at the Georgia State College for Women in Mill-edgeville, involved the measurement of fiber in pulp samples, and by late May the laboratory was turning out what a state publication described as “a high grade [of bond] paper in which Georgia clay and rosin are used along with pine.”⁸⁰

Another laboratory development that attracted considerable interest involved efforts to produce a bleached, purified sulfite pulp high enough in alpha cellulose content for use in the manufacture of rayon. Normally the rayon industry used cotton linters, almost pure alpha cellulose, or pulp from northern or Scandinavian wood for raw material. But in 1934 the price of cotton linters was going up as the price of cotton rose, and alpha cellulose consumers, Herty discovered, were

“more receptive to the possibilities of . . . using cheap wood pulp.” The fact that the bulk of United States rayon was produced in the South, “where the pine is the predominant tree,” provided another reason to place alpha cellulose studies and rayon production high on the laboratory’s 1934 research agenda. To conduct the necessary experiments, Herty hired R. H. Rasch, an expert in the field of cellulose research and a longtime employee of the Brown Company of Berlin, New Hampshire. Rasch obtained samples of standard alpha cellulose pulp from rayon manufacturers all over the country, subjected them to careful analyses, and used the information to produce a high-content alpha cellulose pulp from pine which compared favorably with the best commercial product. By late November the Savannah pulp had been tested by the North American Rayon Corporation of Elizabethton, Tennessee, and the Tubize Chatillon Corporation, at Rome, Georgia. Both issued encouraging reports which led to additional experimentation and full publication of the results through newspapers, Herty’s speeches, and important trade journals.⁸¹

Other accomplishments of the laboratory after 1934 included the production of coated paper, book paper, rotogravure paper, writing paper, and cellophane, the last item made from tupelo, one of the gumwoods commonly found in southern swamps. Finally, the laboratory began a series of investigations using kraft or sulfate pulp in the summer of 1935. The plan called for extensive bleaching studies on the sulfate pulp to determine its suitability for newsprint and for alpha cellulose in the manufacture of rayon. More than two years later, Herty announced the production of newsprint made from a furnish consisting of 75 percent black gum groundwood and 25 percent semibleached sulfate. A departure from most of his previous work, which employed the sulfite process, the paper was used to print the *Savannah Evening Press*, samples of which Herty passed out to members of the Technical Association of the Pulp and Paper Industry, then meeting in Savannah. The Forest Products Laboratory at Madison, Wisconsin, had been experimenting with the bleached sulfate process for several years, and R. H. Stevens, chemist at the Bogalusa Paper Company, predicted in 1931 that when the South did establish white paper mills, bleached sulfate pulp would be used. The obvious advantage was that trees possessing heartwood could be used for newsprint, which was not the case with the sulfite process. By 1936 Herty frankly did not care what process a paper manufacturer might employ provided pine was the raw material and the prospective mill was located in the South.⁸²

There were problems as well as triumphs in the laboratory after 1934. One,

the solution of which required considerable trial and error, had to do with the type and coarseness of the stone used to produce groundwood. At one point Herty was satisfied that the proper stone had been found, despite rumors to the contrary being circulated by northern paper manufacturers. "I'll put this groundwood up against any manufactured anywhere," he boasted to Francis Garvan in July 1935. Nevertheless, the laboratory was still experimenting with stones of increasingly coarse grit in October 1937, hoping to overcome entirely the differences resulting from the use of slow-growing and fast-growing wood in the grinding process. A knottier problem had to do with pitch in bleached sulfite pulp. "Not pitch in the sense as used by the papermakers," Herty explained in the same letter to Garvan, "but in an excessive amount of fats which seem to be characteristic of our southern pines." There was no trouble with the unbleached sulfite used to make newsprint but "real trouble in bleaching sulphite for rayon, book and bond paper pulps, etc." Herty assigned plant chemist Homer Eaton to research the difficulty, and by early 1936 he had submitted an exhaustive report whose results were made public later that year. As Herty explained in a short history of the laboratory composed in October 1937, the fats and waxes were found to be located in the "ray cells and the parenchymous cells" surrounding the resin ducts and could be eliminated "by dilution of the pulp and flowing it over an inclined wire screen," a simple process that proved to be "eminently successful."⁸³

Initially, Herty speculated that soap or paint might be made from the extracted material, and the laboratory began a systematic investigation, hoping to find a useful purpose for the huge amounts of recovered fats and waxes that would become available if sulfite mills were established in the South. Unfortunately, limited funds forced the work to be put aside by the end of 1937.⁸⁴

While Herty's hardworking staff labored to overcome technical difficulties, he spent increasing amounts of his time promoting the chemurgic movement and looking for men with enough faith to share his vision of a southern white paper industry and enough capital to make it a reality. The search took him from New York to Texas, and it lasted until his death in 1938.

* * * * *

Realization of a Dream: The South's First Newsprint Mill

By the spring of 1934, Herty was sure that the establishment of a white paper industry in the South was only a matter of time. Redoubling his efforts to interest capital in taking the first step in what he hoped would become a wholesale migration, he worked closely with Savannah bankers and real estate interests, federal officials, and a swarm of northern capitalists and paper manufacturers whose representatives beat a path to the Savannah laboratory following the successful Canadian demonstration. There were encouraging signs. Mills B. Lane, chairman of the board of Savannah's Citizens and Southern National Bank, was trying to secure a loan from the Reconstruction Finance Corporation to finance a newsprint mill in the city. And a prominent Savannah realtor, R. L. Cooper, was urging the Great Northern Paper Company of Millinocket, Maine, to locate a branch plant in a vacant Savannah facility. Finally, the entire enterprise seemed to have the endorsement of the Oval Office. Speaking to a group of reporters on the day after the Canadian test, President Franklin Roosevelt remarked: "Dr. Herty and I first discussed the use of Georgia pine [for white paper] at least four or five years ago. I have been following the experiments ever since. I am delighted that his dream has come true and that we are to use Southern pine for newsprint purposes."¹

Unfortunately, what President Roosevelt seemed to be encouraging was not supported by some members of his "brains trust." On June 2, 1934, an Atlanta editor informed Herty that an economist in the Department of Agriculture had issued a ruling which opposed development of any industry that might "adversely

affect foreign trade." Outraged, the editor wired Herty: "This means continued importation 70% newsprint paper worth one seventy millions yearly, large part of which . . . [you have] proved could be diverted to South for pine grown on retired cotton or waste land STOP This also means natural development of South sacrificed for other sections already better developed and more prosperous STOP Suggest vigorous action at once to prevent this unjust discrimination against the South STOP Please wire expression your views."²

Herty was not fazed. "If Professor Mordecai Ezekiel [the USDA economist] has in mind the prevention of the development of a newsprint industry in the Southern states," Herty replied, "he had better get off the track because a locomotive is approaching him under full steam and it cannot be halted." Citing the "intense activities" of southern industrial leaders, the interest of northern capitalists, and the "enthusiasm" of technical men from northern mills who had visited the Savannah laboratory, Herty doubted that one bureaucrat could block southern industrial development. If Ezekiel's ruling had a basis in law, he continued, the law could be changed. He was sure that southern congressmen and senators would back him; many had already pledged to let nothing interfere with "a development that means so much to the prosperity of our people . . . and through them to the people of the whole nation."³

What Herty knew that the Atlanta editor probably did not was that Francis Garvan and the Chemical Foundation were already taking steps to counteract what Garvan considered Ezekiel's wrongheaded policies. Early in 1934 Garvan wrote President Roosevelt urging him to include a southern newsprint project in the national recovery program. During the previous four years, Garvan's letter pointed out, the United States had imported an average of \$170 million worth of "wood paper and paper base stocks" annually, or 70 percent of its yearly consumption. If spent in the United States, that \$170 million would "revolve and be spent ten times," producing, rather than losing, \$1.7 billion worth of business for the nation's economy each year. The president forwarded Garvan's letter to the USDA, and Professor Ezekiel answered it, informing Garvan that "the products which we import . . . produce dollars to pay for products we export." The country was already facing an acute problem because of reduced foreign demand for hogs and wheat, he explained. "If we take still further steps to reduce our imports, the ability of foreign countries to buy our cotton and fruits for export will be correspondingly reduced, and in the end we will merely intensify our farm readjustment problem."⁴

When made public, Ezekiel's response stimulated an outcry that led him to modify his position, and on June 7, 1934, he wrote Garvan again, this time pledging that the USDA would do everything it could to encourage new industries "wherever those industries were well adapted to the nation's resources and could stand on their own feet." But Garvan was not mollified and framed a reply that ultimately appeared in a special publication issued by the Chemical Foundation. Accusing Ezekiel of attempting to practice a form of industrial birth control, he charged that the bureaucrat's effort to trade hogs and wheat for a prospective white paper industry in the South would fail because it offended both economic and "moral" law. One dollar's worth of domestic trade was more valuable to the national economy than five dollars of international trade, Garvan insisted. "Do you not understand the theory of the revolving dollar?" He proceeded to illustrate by citing the American machine lace industry, which he claimed represented a \$20 million investment, an annual product worth \$4 million, and employment and support for eight thousand workers and their families, a total of some forty thousand people. "It is an industry developed out of American genius," Garvan declared. But what if, in the name of reciprocal trade, the government had decided to sacrifice the domestic lace industry in order to market surplus agricultural products abroad? To import \$4 million worth of lace products each year in exchange for \$4 million worth of hogs would be to trade "at least five to one, perhaps ten to one—who knows?" Lace manufacturers bought raw materials in the United States from those who bought what they needed in America, they paid taxes in America, and they supported schools, churches, and other American institutions. "Destroy . . . [the lace industry]," Garvan instructed the economist, "and that destruction becomes a spiral, spreading its destruction like ripples from a pebble dropped in a pond. You cannot trade hogs and wheat for industrial development, for the advance of culture or of science, for no arithmetic will provide you with a basis." Then, switching to the moral argument but keeping the lace industry as his example, Garvan invoked the Mosaic Code. "It is a violation of the Eighth Commandment . . . 'Thou shalt not steal'—for you would rob the lace maker of Rhode Island and his laboring men, ostensibly to enrich the farmer. . . . You would substitute Mordecai Ezekiel, et al., for God in attempting to shape our endeavors in contradiction of His Laws."⁵

While Garvan was sparring rhetorically with Ezekiel, Herty was participating in another effort to secure capital for a newsprint mill that seemed more promising than all the others. On May 22, 1934, his old boss at the National Recovery

Administration, Major George L. Berry, delivered an important address at the Asheville, North Carolina, convention of the Southern Newspaper Publishers' Association. A former senator from Tennessee and president of the International Printing Pressmen and Assistants Union of North America, Berry at that time represented the printing trades in the NRA. In his speech he painted a glowing picture of what a newsprint industry could do for the South. Cheap raw materials, cheap power, rail and water transportation, ideal climate, and "sound" labor conditions made the industry a "natural" for the region, Berry told his audience, urging them to do whatever was necessary to establish it. The next day Herty's replacement at the NRA sent him a news clipping reporting Berry's remarks. "You can see that the Major is only too glad to put in a good word for *your* industry," he commented.⁶

The newspapermen responded to Berry's challenge by naming a committee to investigate the possibilities of manufacturing newsprint in the South. Chaired by James G. Stahlman of the *Nashville Banner*, the committee was formally organized at Herty's laboratory on June 25, 1934, and on his advice retained an eminent newsprint mill engineer as a consultant.⁷

Initial reports of the committee's findings stimulated considerable interest among groups of capitalists and engineering firms. But there was negative reaction as well, primarily from northern and Canadian manufacturers such as William A. Whitcomb, president of the Great Northern Paper Company. Whitcomb argued that regardless of what wood was employed, existing mills could barely survive given the depressed price of newsprint. Having experimented, he was convinced that newsprint made from southern pine was no cheaper than that made from spruce. Furthermore, whether the mill was built in the South, the West, or the North made no difference because the NRA Code imposed uniform labor rates. Whitcomb doubted that southern publishers would invest their own money in what he was sure would be a losing proposition. "You might get the 'New Dealers' to build it," he suggested. But until demand increased, it made no sense to overcrowd an already glutted market. "Better to let the wood remain as it is. . . . We ought to leave something to future generations."⁸

R. L. Cooper, the Savannah real estate man who received Whitcomb's letter, dashed off an immediate reply that was certainly influenced if not actually dictated by Herty. Among other things, it noted that whereas the price of newsprint might be below the cost of manufacture, it should make some difference whether the wood used cost \$5 a cord rather than \$10; that the South's mild climate would

certainly lower building costs; that the rapid growth of southern timber would require a smaller investment in timber land, making the overhead for taxes, fire protection, and hauling correspondingly less; that if southern pine grew five times as fast as northern spruce, it should be possible to produce the same amount of timber on one-fifth as much acreage for a “perpetual supply”; and that unlike northern mills, which sometimes had to keep a million dollars worth of wood on hand, a southern mill could bring in fresh supplies every day of the year, thereby saving a sizable amount in interest. Next, Cooper’s letter advised Whitcomb that the South had been producing raw materials and buying manufactured products long enough; the time had come to improve its economic standard by increasing the number of goods it manufactured as it had already done in textiles and was beginning to do in furniture. As for Whitcomb’s professed concern about the depletion of southern forests, Cooper noted that in the southeastern coastal plain “vegetation springs so freely and grows so fast we have to fight its encroachment on our fields and clearings.” He knew of cases where three to four crops of mature timber had been cut from the same land since 1865. “The Georgia coastal plain *cannot* and will *never* become a desert,” Cooper asserted confidently.⁹

Herty thought Whitcomb’s letter was “an amazing document.” To Francis Garvan, to whom he sent a copy, he remarked, “I cannot see any other interpretation . . . but one of antagonism to our development here—otherwise his letter would stamp him as being childish and silly.” Herty was probably annoyed because he had gone to considerable trouble and some personal expense to send Great Northern a carload of southern pine so that the firm could make a test run with it at its Millinocket, Maine, plant. He also offered the services of William MacNaughton, the Savannah laboratory’s technical man, to supervise the test. But Great Northern chose to go ahead without MacNaughton and without installing certain recommended equipment. Then, when the results proved less than satisfactory, Whitcomb concluded that “you cannot make Southern pine newsprint any cheaper than you can Northern spruce newsprint.” Even worse, Herty found out several months later that Great Northern was using its test results to block southern efforts to raise capital in New York.¹⁰

Despite the Whitcomb letter, Herty remained optimistic throughout 1934 about the likelihood of locating a newsprint mill in the South. He attended a meeting of the SNPA Newsprint Committee in Nashville late in July and stayed closely in touch with its subsequent efforts to interest various groups of capitalists. There were encouraging signs, particularly after Canadian newsprint producers

threatened a price rise in the second half of 1934. That led the committee to work harder, and by October Chairman Stahlman could report that four “responsible groups of large capital” were interested in building newsprint mills in the South.¹¹

Herty was also hopeful because of an apparent general upturn in the economy. Speaking to the Association of Southern Agricultural Workers in Atlanta on January 31, 1935, he expressed his conviction that abundant prosperity for the nation, “more equally shared by all classes of our people,” was not far off. Furthermore, based on close study of the region’s raw materials, agriculture, existing industry, and forest resources, he was sure that “the next great field of investment” would be the South. Emergency legislation had already stabilized the banks, raised farm prices, stimulated industry, and given labor a larger share of its output. But such measures were “strictly . . . [temporary] reliefs.” Sounder and more permanent rewards would come to the region through the application of chemistry to its resources. In fact, a “new period” was already under way, Herty told his audience, pointing to enterprises begun in “the very midst of the depression [by] far-sighted men in the chemical industry”—soda plants in Louisiana, kraft mills from Arkansas to Florida, nitrogen fixation plants in Virginia and West Virginia, and rayon mills along the Atlantic seaboard. Herty thought the time was right to add one more. “I have in mind particularly the attracting of capital to the South for the development of a great white paper industry.” It would not be easy, given the opposition of northern and Canadian manufacturers and the banks that financed their operations. But he was satisfied that pine newsprint made in the South and delivered in New York for \$27.54 would be able to compete with the spruce product at \$47.24, the average cost fixed by northern manufacturers for their product in statements to the National Recovery Administration. “The day of the birth of this industry in the South should therefore be at hand,” Herty declared. “I believe that through the active support of the . . . [SNPA], led by Fighting Jimmy Stahlman, the time is not far distant when definite announcement of our first Southern newsprint mill will be made.”¹²

Herty’s optimism seemed more than justified during the spring of 1935. Important visitors and representatives of major firms continued to stream through the laboratory, often bringing with them teams of technical men to assess the quality of the various pulp products being studied in Savannah. On March 6, for example, the general manager and research director of the *Chicago Tribune*’s paper mill in Thorold, Ontario, visited the laboratory. Shown every aspect of its operations, including its records, and given a tour of the woods to evaluate

the timber, the men were considering Savannah as a potential manufacturing site. Ten days later their boss, Colonel Robert McCormick, appeared with three more technical men. The colonel could spare only three hours, Herty reported to Francis Garvan, "but the boys put on a first-class show for him." Other visitors included representatives of Sears-Roebuck, Texas Gulf Sulphur Company, and the American Can Company. Some were interested in the laboratory's work on alpha cellulose for rayon while others were investigating the potential of pine sulfite for container board.¹³

Herty was delighted with all the interest being shown in Savannah by potential investors, but he was even more intrigued by developments on another front. On March 7, 1935, John Coffin of the Hearst organization, a new member of the SNPA Newsprint Committee, visited Herty's office to tell him about a recent meeting held by the SNPA in Birmingham. Although it was not apparent from the "carefully guarded" press release, Coffin informed Herty, the committee had succeeded in securing five-year contracts from publishers for "the full 60,000 ton [per year] capacity" of the prospective newsprint mill. Herty immediately sent Garvan the good news. "I think it will only be a matter of two or three weeks now when some definite announcement will be made as to the location of a plant," he confided, adding that the bulk of the contracts had come from Oklahoma and Texas. Georgia had made only "a slight showing," and Florida had done "practically nothing."¹⁴

Weeks passed but no announcement of a newsprint mill for the South was forthcoming. Meanwhile, Herty had become the Chemical Foundation's southern representative and an active participant in the chemurgic movement, which was officially launched on May 7-8, 1935, at the first Conference of Agriculture, Industry and Science at Dearborn, Michigan. Besides authorizing the creation of a national council, the conferees listened to prominent speakers and adopted a statement of chemurgic principles which made somewhat disparaging references to New Deal agricultural, industrial, and tariff policies. Noting that modern science had developed new tools that enabled surplus agricultural products to be transformed into industrial raw materials through chemistry, the statement argued that no limits should be imposed by government on "the genius of science, the courage of private industry and the productive capacity of agriculture," which, left to their own devices, would create new taxable wealth, restore purchasing power, and put people back to work.¹⁵

Not everyone subscribed to chemurgy as the way to overcome the Depression. Reporting deliberations at Dearborn, a skeptical *Time* magazine commented,

"The purpose of the meeting was to wave the U.S. flag, kick the New Deal, boost the Liberty League, damn bankers, irritate the petroleum industry, and most sincerely, to help the U.S. farmer earn a living by showing him and the rest of the nation how chemistry can turn farm products to industrial account."¹⁶

Time did report some of the promising research on soybeans, tung oil, slash pine, and Jerusalem artichokes discussed at the conference. It also noted the reaction of the American Petroleum Institute, which opposed efforts to pass state laws that would require the blending of "corn alcohol" with gasoline. The institute offered to put up \$15,000 if the Chemical Foundation would match it for a "second impartial investigation of the value of alcohol-gasoline blends," but Garvan declined. As for newsprint from pine trees, the subject Herty discussed at Dearborn, *Time* thought "the main trouble with Dr. Herty's project is that paper-making mills cost millions, which are now hard to raise."¹⁷

Herty did not have to be reminded that capital for his pet project was hard to find. But he doubted that the difficulty was solely economic, and at Dearborn he had shared his perceptions with the audience. For those who might wonder why people were not "rushing South to build mills," Herty had two explanations. First, unless prospective investors actually visited the Savannah laboratory, they would find newspaper reports of what it had achieved "hard to believe." And second, certain elements of the existing paper industry were deliberately blocking his efforts to raise money. "They are against us hard," he charged. "I know too well what I am talking about. I know where they can put the sticks and stop the movement. It has been done. It has been done in the last six months. It will be done some more."¹⁸

Herty went on to say that the country could not afford to continue importing two and a half million tons of paper and a million and a half tons of pulp annually when there were southern people on relief who wanted to work and when, without a tariff and in competition with the whole world, white paper could be produced in the region at prices that would relieve the American people of "the present tax on paper—because that is what it is." Despite his own setbacks, Herty believed the efforts of the SNPA Newsprint Committee to find investors would prove successful. "I hope that in the next few weeks, certainly within the next month, there is going to be a definite announcement of the first mill," he told the Dearborn conferees. "Then I hope that will be the only mill for a year because I want . . . [it] to work spring, summer, winter and fall, putting its product on the market, and after that the sky is the limit."¹⁹

Herty spent only a few days in Savannah following the Dearborn conference

before leaving again on a ten-day swing to Hot Springs, Arkansas, and Dallas, Texas. At Hot Springs he addressed the SNPA convention, and in Dallas he was the featured speaker at a joint meeting of the Chamber of Commerce and the Salesmanship Club. He was disappointed to discover in Hot Springs that the expected announcement of the South's first newsprint mill had to be canceled because the capital could not be secured. Nevertheless, the publishers were as determined as ever, voting to extend their contracts indefinitely and to give the Newsprint Committee authority to negotiate with "any responsible parties" who would agree to build a mill.

In Dallas Herty addressed about 250 local and East Texas leaders along chemurgic lines, "hooking up chemistry and agriculture, and the possibilities of paper-making in the loblolly pine region of east Texas." "They are all pepped up with the latter subject," Herty informed Carvan on May 27, "and we are expecting two groups of visitors from Texas here [at the laboratory] within the next week or two." The Dallas speech had been carefully arranged by Victor Schofflemayer, agricultural editor of the *Dallas Morning News*, whose articles describing vast stands of cheap pulpwood in East Texas had caught Herty's attention years earlier. He had corresponded frequently with the paper, and Schofflemayer had visited the Savannah laboratory. Consequently, the Texan was able to perform what Herty called "a splendid piece of advance newspaper work in preparing the public mind" for the May 23, 1935, address.²⁰

The Hot Springs–Dallas excursion produced no immediate results, but there was a development on the paper front in Savannah. After weeks of rumors and garbled newspaper stories, the *Savannah Morning News* announced that the Union Bag and Paper Corporation of New York would open a mill near the city. The world's largest manufacturer of bags and standard and special wrapping paper, Union Bag intended to build a \$4 million pulp and paper facility employing 875 people in the plant and an additional 500 in the woods with a total payroll exceeding \$1 million a year. "There is great enthusiasm here," Herty informed his son. "It's going to mean a lot for this section. Of course, though, they make only kraft pulp, but I hope it won't be very long before we will be lining up a newsprint mill also."²¹

Herty had no official connection with the new enterprise, but at least one trade paper thought he had influenced Union Bag to locate in Savannah. Besides the area's huge supply of pulpwood, the journal noted, "There has been a generous recognition of the influences exerted by the Savannah . . . Laboratory, directed

by Dr. Charles H. Herty . . . in promoting forest protection and . . . an atmosphere . . . favorable to the perpetuation of forestry operations on a tremendous scale." No doubt tax exemption, a thirty-five-year land lease on 425 acres of river-front property for \$1 a year, and free road and dock facilities also played a role. As one historian of southern industrialization has noted, municipal leaders did not give much thought to the long-term environmental implications of industry before the 1960s. But Savannah was an exception. Anticipating problems, local boosters gave Union Bag an added incentive: "It is agreed," they promised, "that in case litigation arises or suits are brought against you on account of odors and/or flowage from the proposed plant that the Industrial Committee of Savannah will pay all expenses of defending such suits up to a total of \$5000."²²

Besides the pressure of work and the rigors of travel, Herty had other things on his mind in 1935. In June he felt compelled to answer an attack on his claims about the cost of producing southern newsprint made by Royal S. Kellogg, secretary of the Association of Newsprint Manufacturers of the United States. Published originally in *Sphere*, a Washington monthly, and quickly reproduced in several trade journals, the article, "Hypothetical Cheap Newsprint," criticized Herty's estimates on three counts: wood costs, failure to include delivery costs to New York, and alleged "deficiency in [other] items of expense." Herty quickly drafted a response which he asked the trade journals to publish as soon as possible. Specifically, he noted that southern kraft mills had been buying pulpwood in "their own neighborhoods" for twenty years, with no evidence of any "depletion of supply with consequent enhancement of price." Nature had replaced the wood as fast as it had been cut, something those used to forest depletion in colder climates found hard to grasp. Next, Herty cited figures from the published results of an ongoing field survey being made by the United States Forest Service. Comparing existing pulpwood supply (104,734,000 cords) with annual consumption (12,000,000 cords) and "increment of growth under average conditions" (one cord per acre per year in the slash pine district), he concluded that "here is an abundant supply in perpetuity at the present rate of consumption." Furthermore, most of the slash pine area had not yet been surveyed and neither had any of the loblolly, old field, and Virginia pine regions, species equally usable for pulp and paper.²³

Then Herty taunted Kellogg, "the lover of facts," for having used an "estimated" \$5 as the cost of shipping newsprint to New York. A "simple inquiry" would have established that coastal steamers would transport it for \$3 a ton from Savannah

and all the other South Atlantic ports. "In other words," Herty declared, "the South is much nearer the great consuming centers of the East and Northeast than the average present-day United States or Canadian mills, for distance in such matters is purely a matter of transportation costs." Finally, to Kellogg's charge that his estimated figures were too low if measured against "demonstrated experience in the most efficient existing plants," Herty answered that he might have made "minor errors." But "these errors were just as much against us as in our favor." A paper read by a northern technical man before the Canadian Pulp and Paper Association in 1934 had examined Herty's cost estimates minutely, sustained them, and, in the discussion that followed, "there were no dissenting voices." The laboratory's records were available to everyone, and all were welcome to visit the facility and to examine samples of its work. "The trek of the newsprint industry will eventually be southward," Herty concluded, "and the next great field for investment in the United States will be the Southern States."²⁴

The Herty-Kellogg dispute did not end with a journalistic exchange. The two men attended many of the same professional and industry meetings and could be counted on to provide a good show. In January 1936, for example, the Society of American Foresters met in Atlanta, and both men took part in the discussions that followed presentations by speakers from the Forest Products Laboratory, the Southern and Northeastern Forest Experiment Stations, and the Forest Survey project being conducted by the United States Forest Service. Most of the formal remarks had to do with technical details of paper manufacture, potential expansion in the several pulp-producing regions, and whether the South should try to break into newsprint manufacture given the apparent problems of overcapacity and depressed prices then bedeviling the industry. Kellogg began the debate by insisting that "economics determine events," that the United States newsprint industry was part of a continental industry, which in turn was part of a world industry. Unlike other types of paper, newsprint was not protected and had to be made and sold in world markets subject to world competition. Next, he presented an array of figures designed to show that under the most optimistic circumstances, existing North American production and imports of newsprint would in 1936 exceed ability to consume by some six hundred thousand tons. "And that excess of possible production," he argued, "more than anything else, is going to determine what is done in the way of building additional plants, whether it is in the South, in Canada or Newfoundland, or in Alaska. . . . I have never said you can not make newsprint down here," Kellogg concluded. "But making it is one thing and

making money out of it is another thing. These plants that are in existence are not going to fold up and quit because of something going on somewhere else.”²⁵

“If you can make an article for \$47 and another man can make it for \$27, there is going to be enough sporting blood in some man’s veins to put up a mill and try to take advantage of that difference,” Herty retorted. He had information that a southern mill would be started in the next few months. Let it operate a year, produce and make money, “and the rest is not going to be a trend, but . . . a flood.” He challenged Kellogg’s figures on shipping costs, and he disdained proposals from newsprint manufacturers in Maine and on the Pacific coast that the South join an effort to secure tariff protection. “I say we do not need a tariff. We need simply capital to make newsprint cheap enough to compete with the world.” Throughout his remarks Kellogg had talked of sustaining “a reasonable price” for newsprint. Herty replied that if a price had to be sustained by failing to develop the South, it amounted to putting a direct tax, through the publishers, on all of the American people. In any case, he thought southerners had been excluded from a “rich inheritance” long enough, condemned to poverty while other sections grew wealthy. The development of a great paper industry in the region could change all that, eliminating one-room shacks, malnutrition, and tattered clothing.²⁶

In public exchanges with Kellogg and others, Herty exuded confidence about the imminent establishment of a southern mill; privately he was not always so sure. “I have been pretty deeply in the dumps recently about a commercial development,” he wrote Garvan in July 1935. “There is such great indifference on the part of southern industrialists and so much misrepresentation going on in the North that we don’t seem to be making any progress.” The Southern Newspaper Publishers did not seem to be getting anywhere either. But what really disturbed Herty was something he learned on his last trip to New York: “Young Jock Whitney,” chairman of the board of the Great Northern Paper Company, was allegedly telling New York associates that “our work down here is no good and that he has a report from the Great Northern bearing this out.” The reference was to the test made on Georgia pine which Herty had made available to Great Northern and from which its president, William A. Whitcomb, had concluded, “You cannot make Southern pine newsprint any cheaper than you can make Northern spruce newsprint.” Such reports, needless to say, would destroy whatever credibility Herty, the Savannah Industrial Committee, or the SNPA Newsprint Committee had managed to generate in the New York banking and investment community. Just as disturbing was the evidence Herty acquired which indicated that another

northern firm had purposely sabotaged a test it made on southern pine. He declined to put the details in his regular report to Garvan but promised they would shock him. "The favorite indoor sport today," Herty complained, "seems to be for a northern newsprint manufacturer to get hold of some southern pine, get us tied up in it . . . and then make it go wrong. They will not follow our advice and therefore naturally get poor results. I'm never going to touch a proposition like that again. It's too much like a gold brick game."²⁷

Herty was not inventing enemies out of whole cloth. One correspondent advised him that a United States Forest Service report on the amount and cost of southern pulpwood and the most desirable sites to locate pulp plants was "so favorable . . . that, for political reasons, it would probably not be distributed." Those with capital invested elsewhere would block it, according to his sources in the New Orleans branch of the Forest Service. A note found in Herty's wallet after his death seemed to support his suspicions about sabotage. Undated and typewritten it stated: "I learned the detail of what happened with A. D. and S. before the paper run. The mixing gears were changed without even the control men knowing about it so they could muss the thing up and all by S. calling these fellows into the secret conference.—Fine relations when a head deliberately makes liars and cheats out of his own personnel."²⁸

Failure to attract support for a southern newspaper mill from the federal government also discouraged Herty. In July 1935 H. E. Barnard, director of research for the Farm Chemurgic Council, asked Herty if he had seen a *New York Times* story which seemed to indicate "a rather softer attitude" by the United States Department of Agriculture toward development of a southern newsprint industry. Herty had seen it but did not think much would change. "Secretary Wallace is evidently between the horns of a dilemma," he wrote Barnard. "Papermills in the South mean cheaper newsprint, employment . . . and increased prosperity in a cotton forsaken section of the country. On the other hand, I think his natural sympathies are with the Secretary of State who wants to trade with paper in the reciprocal treaties for concessions along the lines of other manufactured articles."²⁹

But Herty hoped that "given time," Henry Wallace could eventually be won over. Meanwhile, he was working through other channels, namely the junior senator from Georgia, Richard B. Russell. Russell was a strong supporter of the New Deal and as governor had approved the state's appropriation for Herty's laboratory, which Governor Eugene Talmadge subsequently vetoed. In August 1935,

Herty reminded Senator Russell of their previous association, updated him about the laboratory's recent accomplishments, and acquainted him with efforts being made to secure capital for the establishment of a newsprint mill in the South. Citing the opposition of northern manufacturers and their ability to prejudice bankers against a southern enterprise, Herty noted that attempts to secure a loan through the Reconstruction Finance Corporation (RFC) were also being challenged on the grounds that such a loan "would be in the nature of a subsidy, and that it would be wrong government policy to subsidize in another part of the country a new source of competition to the present industry." But Herty had just learned that USDA officials no longer opposed development in the South, and his reading of the *Congressional Record* convinced him that Congress intended the RFC to make loans when officials concluded they would be repaid, and when "financial help from regular banking circles was not available." Sure that an RFC loan would "prove the turning point" in bringing the white paper industry to the South, Herty quoted data to show that existing plants in the United States could not satisfy domestic needs. In 1934, he maintained, Americans imported 4,419,396,000 pounds of standard newsprint worth \$76,271,527, 958,601 tons of bleached and unbleached sulfite pulp at \$41,206,888, and 478,128 tons of unbleached and bleached kraft pulp valued at \$17,108,489.³⁰

Herty also tried to secure federal funding for a southern newsprint mill through Georgia's senior senator, Walter George, through Clark Howell, editor of the *Atlanta Constitution* and chairman of the Federal Aviation Committee, and through George Foster Peabody, a Georgia-born financial magnate who was the president's close friend and the man who convinced him to make Warm Springs his home away from home. Still another approach to the president was made through Herty's former boss at the NRA, Major George Berry. But nothing worked. By January 1936 he learned that the Department of Commerce was "in favor of going slowly on any southern 'news' project." Herty thought that was very unfair and wondered if "the paper gang that hangs around Washington" had been blocking southern efforts. To Senator Pat Harrison of Mississippi he complained that during the first eleven months of 1935 newsprint production in Canada, Newfoundland, and Mexico had increased by more than 165,000 tons. Meanwhile, United States output declined almost 40,000 tons. Nothing in those figures convinced Herty that the South should "go slowly" in developing the newsprint industry. When he thought of all the people living "hard lives" whose lot would be improved if they could sell their wood to a paper mill, he was

particularly disturbed. "I cannot get over the thought," he wrote Harris, "that we in this part of the country are still a part of the United States. I know you share these feelings."³¹

The whole question of securing assistance from one or another federal agency to build the South's first newsprint mill is murky. The Southern Newspaper Publishers' Association resolution of May 1934, which created the Newsprint Committee, stipulated that it raise funds from private sources, which Chairman James Stahlman claimed in February 1937 kept him from accepting government offers to build a mill more than two years earlier. Also in May 1934 Francis Garvan of the Chemical Foundation cautioned Savannah banker Mills B. Lane against seeking a loan from the RFC for a mill in that city because it would invite political interference in a technological venture and raise charges of subsidizing the press. Yet by late 1935 Garvan and Herty were working hard, if unsuccessfully, to secure RFC assistance and to counteract bureaucratic objections to a southern newsprint industry. It may be that Garvan and the SNPA had revised their attitudes about government involvement. Or it may be that the reluctance of private capital made the difference. In any case, everyone involved was busily looking for money from any quarter, and during 1936 several possibilities developed.³²

Herty spent much of his time that year traveling and speaking in behalf of chemurgic activities and the Chemical Foundation. Besides addressing the Beaumont, Texas, Chamber of Commerce in March, he gave major speeches to the second annual Conference of Agriculture, Industry and Science held in Detroit in May and to a regional meeting in Lafayette, Louisiana, in October. Other talks designed to promote the chemurgic movement were given in Georgia, Mississippi, and Florida and on radio. Finally, Herty preached the chemurgic message at a University of Georgia alumni luncheon. "The crowd fell for it one hundred per cent," he informed the research director of the Farm Chemurgic Council. "I never saw such an enthusiastic audience. When I got through they were all on their feet in almost wild applause."³³

In 1936 Herty also visited New York several times to help the Chemical Foundation develop its new "cellulose department." Plans called for him to direct a three-part program that would include continuation of his work on southern pine pulp at the Savannah laboratory, fund-raising to build a graduate program in cellulose studies at the Massachusetts Institute of Technology, and creation of a full-time cellulose research team at the Boyce Thompson Institute in Yonkers, New York. Herty recruited Wanda Farr, formerly employed by the USDA Bureau

of Agricultural Economics, to head the Boyce Thompson team, which he hoped would consist of an organic chemist, a cytologist, an x-ray specialist, a colloid chemist, a physicist, and "enough laboratory assistants to relieve the experts of drudgery." "That is going to be one of the greatest things that ever happened for research in this country," Herty wrote the managing director of the Chemurgic Council, "and from my own personal standpoint [it] will be the realization of a dream which I discussed before the Engineering Foundation in New York City in November, 1928."³⁴

Wherever he traveled and whenever he spoke, Herty never missed an opportunity to promote the establishment of a southern newsprint industry, and in the spring of 1936 there were signs that the message was finally getting through. Stahlman's Newsprint Committee was actively negotiating with "a group of New York capital," and southern publishers agreed to renew their contracts for the prospective mill's output when the SNPA convention met in Asheville in May 1936. Hope dimmed somewhat later, but Herty was still optimistic in September. The publisher of the *Charlotte* (North Carolina) *Observer* had a group of "southern capitalists" interested in a newsprint mill, and Herty developed similar enthusiasm in Atlanta following a radio broadcast in that city. But nothing had been nailed down by the time he spoke to a Louisiana audience in mid-October. Exasperated, he criticized bankers on both sides of the Mason-Dixon line. Northern bankers turned "thumbs down" when asked to finance a southern mill because they wanted "first of all to get their money out of Canadian and Northern mills," many of which were in receivership. And southern bankers were just as bad because they were apathetic. "If all of the banks of the South would . . . put forth as much effort to establish a mill . . . as the North is putting forth to oppose [one]," Herty declared, "we would have a southern newsprint mill immediately."³⁵

The frantic pace that Herty maintained throughout much of 1936 caught up with him in October, causing worried friends to alert his daughter, Dolly, then teaching at Vassar College in Poughkeepsie, New York. "All report that you have a *bad cough* and *are not taking care of yourself*," she scolded. "Please see a good doctor . . . if for no other reason than for my sake." In fact, Herty had already been ordered to bed by a physician, who subsequently prescribed a brief cruise to Miami for his recuperating patient. But by the end of November Herty had pronounced himself cured, and within a few weeks he was back in the laboratory, giving speeches, and traveling frequently from New York to Texas.³⁶

In New York, Herty told a semiannual meeting of the Farm Chemurgic Coun-

cil on January 22, 1937, that the southern paper industry was growing rapidly. So far, only kraft mills were being built, he reported, "due principally to the opposition of certain financial institutions in the North which are tied up with the International Newsprint Trust." But that was bound to change. Citing an article in the *Manufacturers' Record* which claimed that southern banks had more than \$8.75 billion in resources as of June 1936, he predicted that if "Eastern opposition" continued, southerners would soon say, "Forget New York bankers, we will start our newsprint paper industry ourselves and keep the profits at home instead of paying tribute to them."³⁷

Herty probably knew something on January 22 that he was not sharing with his audience. Less than a week later, he was in Dallas meeting with a group of New York businessmen, Texas bankers and lumbermen, and spokesmen for southern publishers to plan what would eventually become the South's first newsprint mill. Accounts describing events leading to the January 28 conference vary in detail, but all agree that Herty's investigative work and the Chemical Foundation's financial support for it were crucial. According to James Stahlman, a "group of New York capital" and the SNPA Newsprint Committee had been working together for months when he was notified shortly after New Year's Day 1937 that the "group was prepared to erect and operate a mill in East Texas" if the publishers of Texas, Oklahoma, Louisiana, and Arkansas would contract for a "minimum amount" of newsprint tonnage. Stahlman immediately contacted E. M. (Ted) Dealey of the *Dallas Morning News*, who had been building interest in Texas for the project for several months. Dealey called a meeting of publishers for January 11, the tonnage was contracted for, and "announcement of the first southern newsprint mill is the result."³⁸

Other, more detailed accounts stress the role of Francis Garvan in moving the Texas newsprint project forward. Garvan's long history of fighting cartels, his recent "investigations" indicating that the price of newsprint was "fixed in London," and his conviction that many New York banks were dominated by the same "London interests" that controlled the supply of American newsprint led him to search for a new source within the United States and to fight for its development regardless of "organized opposition." He found that source in the South and in the work of Charles Herty, whose activities he funded. Then, with Stahlman organizing the publishers, Garvan began looking for a reputable firm to construct and operate a mill somewhere in East Texas and the southern capital to finance it. He assigned William Buffum, treasurer and general manager of the Chemical Foun-

dation, to develop interest among bankers, timberland owners, and transportation officials and asked Louis Calder, president of Perkins-Goodwin Company in New York, to build the plant. (Perkins-Goodwin had already built the Union Bag and Paper Company kraft mill in Savannah and Calder's brother ran it.) Next, Garvan asked Wirt Davis, an old friend and Yale classmate and chairman of the board of the Republic National Bank in Dallas, to devise a financial plan that would produce \$5 million. Davis conferred with local and state capitalists and industrialists, and on Thursday, January 28, 1937, six bankers, four lumber magnates, two oil and gas company executives, and one municipal official met with Ted Dealey of the *Dallas News* (representing the publishers), William Buffum of the Chemical Foundation, Albert Newcombe and R. W. Wortham, Jr., of the Perkins-Goodwin Company of New York, and Charles Herty to make definite plans regarding the organization, financial structure, and location of the proposed mill. Using an appropriate metaphor to describe his sentiments as he left the Dallas meeting, Herty remarked, "I have been in a log jam for several years but it has now been broken by the action of you Texans. I am a very happy man over the result of our deliberations."³⁹

Southland Paper Mills, Incorporated, was formally chartered on May 5, 1937, and five days later the stockholders met in Dallas to elect a board of directors and company officers. Most of the discussion dealt with plans for financing the company, and it was clear that agreement would not come easily. As an early company history described deliberations over the next several months, "It became increasingly apparent that there could be no harmonious meeting of minds of all interested parties." But the project was "kept alive by a closely knit group," namely, E. L. Kurth, president of the Angelina County Lumber Company and vice-president of Southland; Louis Calder and Albert Newcombe of the Perkins-Goodwin Company; and a few publishers led by Ted Dealey, James Stahlman, and E. K. Gaylord. Garvan's former classmate, Dallas banker Wirt Davis, was Southland's first president, but when the company was rechartered in 1938 he was replaced by E. L. Kurth. The company history provides only a hint about what happened in the interim: "This [closely knit] group proceeded with engineering and financial plans despite procrastination of others and growing lack of interest of individuals formerly prominent in the project, and despite many interior [internal?] obstacles that were seemingly insurmountable. It was not until the opposing interests entirely withdrew that it was possible to concentrate group effect [effort?] on the many details and problems."⁴⁰

Herty seems to have played little part in the internal affairs of the Southland Paper Mills, Incorporated, after the January 28, 1937, meeting in Dallas which authorized its organization. Instead, he returned to Savannah to resume a busy schedule involving work in the laboratory, planning for a spring chemurgic conference in Georgia, speeches in Florida and Atlanta, and trips to New York for a visit with Wanda Farr's research group and a meeting of the Technical Association of the Pulp and Paper Industry. He was also working hard in Savannah and Atlanta to bring bankers and publishers together for the establishment of a newsprint mill in Georgia. "With the start made in Texas," he reported to Francis Garvan, "it has been easy to get things going here." But everything had to be canceled or put aside when Herty developed severe bronchitis following what he described as "a mild case of flu." His condition grew worse, and finally his physician and his daughter, summoned from New York, persuaded him to enter a hospital for several days. The rest seemed to do him good, and by the beginning of March he was back at work and assuring his children that he would not push himself too hard. Dolly was skeptical when she learned that her father had agreed to lecture at Armstrong College in Savannah and to serve on Governor E. D. Rivers's State Planning Board. But he insisted that he had an understanding with the governor, that he would not be called upon to "take the initiative" on the board, and that he was "perfectly free" to resign whenever he felt that the work was too demanding.⁴¹

Despite such promises, Herty found it hard to slow down, and within days of his release from the hospital he was deeply involved in making plans for the Georgia Chemurgic Conference scheduled to meet in Macon on April 9, 1937. Besides helping to arrange the program, he agreed to give a radio talk over a Macon station, to deliver a welcoming speech and a progress report on his work at the opening session, and to prepare a major address for delivery by Francis Garvan. "Please have this speech here in finished form by at least the 1st or 2nd of April," Garvan ordered. "This is to be the speech of my life, so I want it done right and I want it here in time to perfect my delivery so that its authorship will be *unsuspected*."⁴²

The road trips and speeches continued throughout the spring and summer of 1937. From Macon, Herty went to Jackson, Mississippi, and to Chapel Hill, North Carolina. Back in Savannah by the latter part of April, he left again around May 7 for a three-week-long swing to Dallas, Hot Springs, Philadelphia, New York, and Dearborn, Michigan. In Dallas Herty attended the first meeting of

Southland's board of directors. Next, he went to Hot Springs for the annual meeting of the Southern Newspaper Publishers' Association. He and James Stahlman received plaques of appreciation for their work in bringing a newsprint plant to the South, and Herty was made an honorary member of the association. Then it was on to New York for a conference with Albert Newcombe of the Perkins-Goodwin Company about the cost of converting pine into newsprint and finally to Dearborn for the third Farm Chemurgic Conference, which met between May 27 and 29, 1937. Herty arrived early so that he could participate in a radio show entitled "Industry Turns to the Soil," which the NBC Farm and Home Hour broadcast from Station WWJ in Detroit.⁴³

For the rest of the summer most of Herty's activities centered on work in the laboratory and speeches on fire prevention delivered to farmers and timber owners all over south Georgia. He managed to attend several minor league baseball games in Savannah for recreation, and he was looking forward to sharing the "charming home" which he and his daughter rented in August 1937 because she did not like what Herty called "hotel life." Soon after they occupied their new quarters, Herty wrote his son Holmes, "Dolly and I are very comfortable. . . . Everything is beautifully arranged . . . and the servant who came with the proposition is a peach—one of the old time negroes. Wish you could look in on us."⁴⁴

Herty also made two or three trips to New York during the summer to attend a directors' meeting of the Farm Chemurgic Council, visit the cellulose research team at the Boyce Thompson Institute, and report personally to Garvan at his retreat in the Adirondack Mountains. At least one trip dealt with problems involved in financing Southland. There was disagreement among the several interested parties about where and how some of the necessary funds should be raised. Wirt Davis and the Dallas investment firm of Donald O'Neil and Company wanted most of the money to come from Texas. But Albert Newcombe of Perkins-Goodwin thought they had little prospect of raising enough locally, and by July 12, 1937, he had interested a New York firm, E. H. Rollins and Sons, Incorporated, in handling the sale of debentures and preferred stock. Newcombe was also negotiating with George V. Rotan and Company of Houston and Chanute, Bosworth Company of Denver, whose executives were willing to underwrite part of the Rollins proposition but refused to be associated with "any deal headed by O'Neil."⁴⁵

No final agreement emerged in the summer of 1937. But contact was established with the Reconstruction Finance Corporation, and in 1938 its decision

to lend the company some \$4 million made it unnecessary to involve "regular financial channels" or to provide the commissions and bonuses their participation would have entailed. On September 4, 1937, following a two-and-a-half-hour wait outside his Washington office, Herty managed to see the chairman of the board of directors of the RFC, Jesse Jones. Initially unresponsive, Jones was more positive after Herty acquainted him with the Southland project, the persons involved in it, and the amount of capital they were willing to invest. He made several suggestions which Herty incorporated in a memorandum and submitted for his approval the following day:

First, that in the matter of the \$4,000,000.00, which had been arranged with the private bankers, Rollinson [*sic*] and Son, the R. F. C. would substitute a long [loan] of \$4,000,000.00. . . . Second, that by doing this the necessary capital to be raised would be reduced by \$400,000.00, the bonus to be paid, under the previous arrangement, to Rollinson [*sic*] and Son. Third, this arrangement would also save to the Southland Paper Mills, Inc. the block of common stock, which would have gone as an additional bonus to Rollinson [*sic*] and Son. Fourth, that the loan by the R. F. C. would be at five per cent interest. Fifth, that the loan must be amortized within a period of ten years.⁴⁶

It did not hurt Herty's cause that Jesse Jones was well acquainted with Wirt Davis, then the president of Southland Mills, and that Jones himself was, according to one recent account, a "freewheeling Texan" willing to "lend large amounts of money to investors in new enterprises . . . in effect . . . a modern venture capitalist . . . whose policies could not fail to stimulate business." Whether Jones and Garvan were also acquainted is not clear, but Jones certainly knew that the Chemical Foundation president was pushing the Southland project. "I told him to keep the papers [regarding Southland]," Herty wrote Garvan immediately after his conference with Jones, "as my mission was complete except for informing you as to the outcome."⁴⁷

Southland Paper Mills made its first formal request for a loan to the Reconstruction Finance Corporation on September 25, 1937, just three weeks after Herty's ice-breaking visit. Based on financial and engineering studies, the company's spokesmen estimated that they would need \$7 million to build the plant. Reasonably sure that it could raise \$1.5 million from publishers and "interested individuals" and that an additional \$2.1 million could be realized by selling pre-

ferred stock to the public, the company asked the RFC for a loan of \$3.4 million. The agency agreed conditionally, but when Southland could not raise its share (\$3.6 million), it asked the RFC to increase the loan to \$4 million. In June 1938 Southland was rechartered, E. L. Kurth replaced Wirt Davis as president, and three months later the company arranged with Champion Paper and Fibre Company of Pasadena, Texas, to supply its chemical pulp requirements. That reduced its capital needs by \$1 million. About the same time, September 1938, commitments for enough stock had been secured by the company to satisfy the RFC, and on October 12 the agency agreed to lend the company \$3,425,000. Meanwhile, Southland officials were moving to meet the requirements of another federal agency, the Securities and Exchange Commission. After protracted negotiations, the company's registration statement was finally approved on January 14, 1939. Ground for the South's first newsprint mill was officially broken the same day.⁴⁸

When Herty ended his meeting with Jesse Jones in September 1937, he remarked that his "mission was complete" as far as Southland was concerned. But his larger mission, the end of United States dependence on foreign sources of newsprint, the firm establishment of a white paper industry in the South, and the achievement of a higher standard of living for the region's impoverished farmers, was still unrealized. Unfortunately, his ability to go on working for those goals received a serious setback when the Chemical Foundation announced that it would have to cut off support for the laboratory by the end of the year. During the six years of its existence, the laboratory had received more than \$400,000 from the state, the Savannah Industrial Committee, the city of Savannah and, above all, the Chemical Foundation. Herty thought the Industrial Committee and the city would continue to provide use of the laboratory building, water, fuel oil, and free wood, but any state money would depend on the action of future legislatures. Consequently, he began casting about for alternative support. Early in October he approached certain executives in the steel industry, hoping to interest them in funding the laboratory for the next five years. Paper mills were large-scale users of steel for structural purposes and equipment, Herty pointed out. Furthermore, much of the steel in existing mills would have to be replaced because of corrosion problems; therefore, the potential market for more expensive stainless steel was bound to increase. A 150-ton paper mill required about 10,000 tons of steel, Herty estimated, and kraft mills then under construction in the South would probably use 290,000 tons. But that figure could triple if enough sulfite and newsprint mills to replace current United States imports were constructed.

The argument was sound, but the “stainless group” was unmoved. Herty would have to look elsewhere if the work in Savannah were to continue.⁴⁹

Worried and discouraged, Herty received another blow early in November, when Francis Garvan died unexpectedly. Garvan’s health problems began years earlier, following what was described as a “nervous breakdown” in 1926. As a result, he had to conduct much of his Chemical Foundation work through associates such as William Buffum, Herty, and others, who often visited his New York town house or his summer retreat in the Adirondacks. He did appear personally on certain important occasions such as the first Chemurgic Conference in 1935 and the first meeting of Southland’s board of directors in 1937.⁵⁰

Deeply affected, Herty went to New York for the funeral and later expressed his feelings in a lengthy note to Mrs. Garvan. After recalling his first meeting with Garvan, he referred to the “many meaningful incidents” in the twenty years of their association. Above all, he told her, he would always remember the unflinching support Garvan had given him, and he promised to spend his remaining years working to achieve their shared goal—“economic independence . . . in the matter of newsprint.”⁵¹

During the last weeks of 1937, Herty’s quest for enough money to keep the Savannah laboratory alive after January 1, 1938, extended from Wilmington and Washington to all of the statehouses in the Southeast. One scheme involved an interview with L. W. “Chip” Robert, an Atlantan with important business and political connections regionally and nationally. Robert was assistant secretary of the United States Treasury from 1933 to 1936, secretary of the Democratic National Committee in 1936, and executive officer of the Conference of South-eastern Governors when James Stahlman suggested that Herty approach him in November 1937. Herty visited Robert in Washington to discuss a funding scheme for the laboratory, and Robert agreed to present it at an upcoming conference involving nine southern governors and President Roosevelt. Basically, it proposed that each southern state (which might or already had benefited from the expansion of the paper industry) contribute \$8,000 to a fund for the support of the laboratory. Unfortunately, the president changed his travel plans, and the governors canceled the meeting. Nevertheless, Robert sent each governor a copy of the Herty proposal together with a strong letter urging action. “We are waiting now to hear from them,” Herty informed a close friend on November 30.⁵²

Meanwhile, offers of assistance came from several quarters, especially after the newspapers carried stories regarding the laboratory’s plight. Alex Sessoms,

Herty's old friend in Cogdell, Georgia, offered to contribute \$2,000 a year for the next two years if the laboratory continued to function. Prominent Savannah citizens launched a fund-raising effort, and C. Stewart Lee of Pusey and Jones, Inc., a Wilmington manufacturer of papermaking machinery, proposed a campaign to raise \$30,000 a year for three to five years from similar firms to continue the laboratory as a memorial to Garvan. Herty thought Lee's idea was splendid and encouraged him to pursue it immediately, informing him at the same time about his efforts with the southern governors. Finally, the director of the school of forestry at the University of Florida suggested that Herty move the facility to Gainesville. "Would it be possible for us to consider moving your laboratory here under the jurisdiction of the State of Florida?" he asked. "It may develop that we can work something out in this regard."⁵³

In the midst of all of his troubles, Herty could at least take comfort in the certain knowledge that his long crusade to promote the development of the southern newsprint industry was finally being taken seriously. Citing data Herty had been calling attention to for years, an editorial titled "Some Newsprint Facts to Ponder" published in the February 1937 issue of *Paper Industry* noted that the United States used more newsprint than any other country, that its annual consumption had exceeded domestic production for years, and that production began moving to Canada around 1912 because of the diminishing supply of suitable "native woods" (spruce, balsam, and hemlock) available in the United States and still used "almost exclusively" to produce the finished product. In 1913, the editor continued, the United States produced 1,305,000 tons of newsprint to Canada's 350,000 tons; by 1926 U.S. production had peaked at 1,678,000 tons and Canada surpassed her for the first time at 1,882,000 tons. Finally, in 1935, Canada led the world with 2,753,000 tons, followed by Great Britain with 970,000 tons and the United States in third place with 912,000 tons. Yet the United States alone consumed 44 percent of the entire world's tonnage. For that reason, "economists, businessmen, technologists, research workers and others" had been "pondering" for some time how to meet the growing demand without depending on foreign sources. Herty, the editor acknowledged, had been "pondering" longer than most. He had "startled" the industry years ago by suggesting that young southern pine, pulped by standard processes, could make satisfactory newsprint. There were doubters, but only sixty years earlier, the editor noted, the very idea of making paper out of wood pulp had been labeled "impractical." Now research indicated that Herty's idea had merit, and "financial interests" planned

to construct a newspaper mill in East Texas. Was this the beginning of another pulp and paper development in the South, wondered the editor, and would it start a movement that would lead to the South "dominating the news field as it now dominates kraft?"⁵⁴

Subsequent issues of the *Paper Industry* indicate that pondering was on the increase. In the March 1937 number the president of the American Paper and Pulp Association worried that too rapid expansion in the South could lead to the same problems recently experienced in Canada: excess capacity and low prices. But the very next month the editor announced that the existing newsprint industry could not satisfy increasing demand, even through imports. Consumers were clamoring for delivery, and manufacturers were at last "sitting in the saddle." After years of having buyers set the price while production costs went up, the journal reported, "The all-important most recent move . . . is [the] announcement that the contract basis on standard newsprint will be \$50 per ton for the first six months of 1938." International Paper Company had made the first move, and nearly all the other manufacturers in the United States and Canada quickly followed suit, raising the cost of a ton of newsprint delivered in New York, Chicago, and Atlantic and Gulf ports by \$7.50 from the prevailing \$42.50. Considering that the price had been \$65 before the Depression, as low as \$40 in 1933, and only \$41 in 1936, the editor thought the industry was at last on the way to recovery.⁵⁵

The announced price boost may have pleased manufacturers, but it infuriated publishers, North and South, making the prospect of cheaper, domestic newsprint from southern pine more attractive than ever. On April 27, 1937, the American Newspaper Publishers' Association resolved to create a committee "to cooperate with . . . the splendid newsprint committee of the SNPA . . . in interesting financial backing in Southern newsprint projects," and two weeks later the board of directors of Southland Mills held its first meeting in Dallas. Whether the announced price increase and the ANPA's response to it had any direct effect on events in Dallas would be hard to prove. But there is no doubt about Herty's feelings regarding these fast-moving developments. "These are happy days for me," he told a radio audience in late May 1937. After he and his supporters had been laughed at, then the subject of "scoffing," "misleading propaganda," and "powerful financial opposition," the "truth" had finally prevailed and the first mill for making southern newsprint had just been organized. But he was looking ahead. "This mill," Herty predicted, "is but the forerunner of many more newsprint mills to be located throughout the pine belt of the South; their output will insure the

independence of [the nation's] publishers . . . and through [mill] payrolls . . . and [farmers'] woodlots . . . [they] will bring prosperity to a vast section of our country."⁵⁶

The laboratory's future was still unsettled in early December 1937, when Herty celebrated his seventieth birthday at a dinner given in his honor by some of Savannah's most prominent citizens. Cards, letters, and telegrams came from friends and family all over the country to supplement the extravagant praise heaped on him by fellow diners. Former mayor Thomas Gamble's remarks were typical. He praised Herty's contribution to the "benefit of mankind" during the last forty years and extolled the personality that had endeared him to all who knew him intimately. It must make Herty happy to know, Gamble continued, that he was esteemed not only as a scientist but as a man and a cherished friend "who has found sweetness in life through adding sweetness to the lives of others" and "whose sincerity and simplicity were not lost when high praise and great success came."⁵⁷

The birthday dinner was only the first in a series of honors that Herty would receive during the next few weeks and months. Late in December 1937, he was named "Man of the Year for Georgia and the South" by the editors of *Progressive Farmer*, an award he valued highly because it came from "so representative a publication of the farming interests in the South." Another, more widely reported, tribute came in January when he was the guest of honor at Florida Industries Day when the Container Corporation of America dedicated its new plant at Fernandina Beach. And finally, Savannah honored its most illustrious citizen at a testimonial dinner in February 1938.⁵⁸

Herty was certainly no stranger to honors and awards, particularly those bestowed by his peers in the chemical and academic communities. By 1938 he had received honorary degrees from Pittsburgh, Colgate, the Universities of Georgia, North Carolina, and Florida, Oglethorpe, and Duke. But the recognition that went with Florida Industries Day surpassed anything he had ever experienced. It also stimulated some controversy which Herty later tried to resolve by issuing public disclaimers. In October 1937, Herty's aid was enlisted by Albin Dearing, a public relations man in charge of publicizing the opening of Container Corporation's new plant in Florida. Herty provided Dearing with quantities of printed information and agreed to help him make a list of prominent individuals who should be invited to the ceremonies. Meanwhile, the governor of Florida and the president of Container Corporation decided to convert the plant opening into a special celebration, dubbed Florida Industries Day, and Herty was asked to be the

guest of honor. "It is their unanimous wish to signalize your efforts in behalf of the South's industrial progress by unveiling a plaque at Fernandina inscribed to you and your most estimable achievements," Dearing informed Herty. The public relations man thought it was a small enough tribute to a scientist whose work would mean so much to the southern people in the coming generation. Herty was touched. "This is truly a surprise to me, for throughout this work I have been concerned with only one thing, *viz.*, getting the work pushed as fast as possible in order to hasten the day of the building of mills in the South to give employment to people needing it." Modestly, Herty added that he worried about too much credit being given to him and not enough to the "loyal, enthusiastic and self-sacrificing" members of his staff and those who made the laboratory possible.⁵⁹

Dearing did his job well. Before the formal ceremonies, scheduled for January 14, 1938, he sent a *Life* magazine photographer to visit Herty, and he arranged for a Paramount Newsreel crew to shoot "sequences of the whole Southern pulp story" with Fernandina scenes supplementing pictures of Herty's laboratory, "characteristic" pine forests, rural family settings, and anything else of interest that Herty might suggest. He also sent Herty a series of mat "features," prepared by the Chicago agency for which he worked, which would be distributed to newspapers all over the country on the day after the ceremonies.⁶⁰

Covered by press, radio, and newsreel, the Florida Industries Day ceremonies attracted considerable attention and a flood of congratulatory messages for Herty from all over the country. They also led *Time* magazine to send a "March of Time" film crew to Savannah for more extensive coverage of the laboratory, and by March 1938 its version of the impact Herty's work was having on the South was being shown in theaters all over the country. The film, *Old Dixie's New Boom*, was accompanied by advertising that urged theatergoers to "see the new one hundred million dollar paper and pulp industry—Slash pine made into kraft, white paper, newsprint," featuring "Dr. Charles Herty, the chemist who made the epoch-making discovery!"—all for fifteen cents before 2 P.M. at one newsreel theater in midtown Manhattan.

Unfortunately, some press reports, like the theater billboard, credited Herty with achievements in paper chemistry which belonged to others, and some were simply garbled, not unusual whenever technical subjects were covered by those with limited technical training. For example, a story in the *Wall Street Journal* suggested that the \$100 million southern kraft industry "resulted largely from the pioneer research . . . begun seven years ago by Dr. Herty"; a Canadian journal

declared that Herty's laboratory had developed the pulping process to be used at Fernandina; and even the august *New York Times* identified Herty as "the discoverer of the process for making kraft pulp and paper." As a former editor, director of a news bureau, and a speaker renowned for his ability to convey technical information effectively to audiences of every type, Herty appreciated the power of the popular press and the special impact of film, but he was also aware that inaccuracy could distort the message and destroy credibility. When the film editor for the Paramount "Eyes and Ears of the World" newsreel substituted shots of the living conditions of poor cotton farmers for those of poor folk in the pine forests, Herty objected because the interior views of laborers' shacks in the cotton belt indicated a sense of community; what he wanted to emphasize was the "isolated cabin in the woods where no community life is possible." More distressing were the erroneous news reports. As Herty complained in detail to one correspondent, the newspapers "persist in one error," namely, that he "discovered" the paper-making process used at the Fernandina Container Corporation plant. In fact, it was an "old" process used for decades in both North and South. The honors paid him at Fernandina, he pointed out, were for the work done in promoting the Southeast as a venue for future development of the pulp and paper industry, for "boosting" the forest survey of southern pulpwood resources, and for conducting officers of the Container Corporation on a tour of the Savannah laboratory during which they learned about the South's advantages "for producing pine as a crop" and about the character of pine fiber, "which lends itself so readily to all lines of pulp and paper manufacture."⁶¹

Private disclaimers were not enough. Sometime in February 1938, Herty was contacted by a friend, B. F. Williamson, a Florida businessman, who sent him some correspondence that had recently "passed across" his desk. It included a November 10, 1936, letter from R. G. MacDonald, secretary of the Technical Association of the Pulp and Paper Industry, to Charles Parsons, secretary of the American Chemical Society; a letter from Charles Parsons to Professor Townes Leigh of the University of Florida, dated January 31, 1938, which included the MacDonald-Parsons letter; and Williamson's letter to Townes Leigh and another professor, dated February 5, 1938, following his perusal of the MacDonald-Parsons and Parsons-Leigh letters. In November 1936 Parsons asked MacDonald if any important scientific contributions to the literature had ever been reported from Herty's laboratory. MacDonald replied that only one paper, read by W. G. MacNaughton in Richmond in 1935, qualified; that Herty's laboratory had made

some pulp which a Canadian mill had converted successfully to newsprint, which he understood was “only fair from the printing point of view”; and that he thought A. D. Little had performed the same feat years earlier. What Herty did contribute was proof that young trees did not contain heartwood and were less subject to discoloration from blue stain. Slash pine was being used commercially for kraft paper in 1936, but no newsprint was then being made from any species of pine in the South. “To sum up,” MacDonald concluded, “I may say that no development of Dr. Herty’s laboratory is at present being applied commercially, and I do not believe that any of the present growth in the kraft industry in the South is directly due to his efforts, other than the psychological influence that may have inspired the Savannah business interests to induce Union Bag and Paper Corporation to locate at Savannah. However, the processes used in this mill were well known in the industry of this country and Europe.”⁶²

On January 31, 1938, Parsons contacted Professor Townes Leigh for “information . . . [no] publicity.” He knew that Florida had been “putting Dr. Herty on a pedestal as the Magician of the South.” The enclosed clipping from *Science* made that clear. But what Parsons really wanted to know was whether Herty had had anything to do, other than as a “revivalist,” with the kraft industry in the South. Besides enclosing a copy of MacDonald’s November 1936 letter, he commented that he understood all of Herty’s work to have involved the sulfite process, that kraft paper was made by the sulfate process, “an entirely different procedure,” that Herty had done nothing to improve the kraft process, and that the kraft industry in the South “would be there today irrespective of the work done in Savannah.” “On the other hand,” Parsons continued, Herty was a “spellbinder”; he had preached paper throughout the South for years and as far as Parsons knew had never claimed to have any influence on the kraft industry. Why, then, was he being honored with a plaque for the kraft procedure? Parsons assured Leigh that if Herty had done the work claimed, he wanted to know it and give him “due credit.” Recent contacts with Atlanta chemists, however, indicated that they had similar questions. “What do you know about it?” Parsons asked.⁶³

Professor Leigh then handed everything over to Williamson, who responded on February 5, 1938, that he had been at Fernandina and Jacksonville when Herty was honored, that Herty had made no claims for himself, and that on that occasion he had exhibited newsprint made from bleached sulfate (kraft) and groundwood. “I have heard Herty at national meetings,” Williamson continued, “and he has . . . always been very modest in taking any credit . . . and has de-

fended any criticism that was offered." As Williamson saw it, the correspondence might touch off "[an unfortunate] discussion" that would do "great harm to the South . . . and little to enlighten the man on the street." MacDonald represented an organization (TAPPI) that had consistently opposed the development of southern newsprint. If Parsons really wanted information, Williamson ended, he should visit the Savannah laboratory and judge for himself the validity of Herty's claims.⁶⁴

Herty thanked Williamson for the correspondence, noting that it contained two things he had not known about: the "extract" from *Science*, which he subscribed to but had been too busy to read, and the "activity" of Parsons, which did not surprise him because, according to rumor, he had been engaging in it for years. The trouble went back to 1921, when Herty learned of an "incident" involving Parsons and a female employee of the ACS. Parsons knew that Herty was aware of it, although Herty said nothing because it would have jeopardized "a perfectly innocent woman" whose livelihood and that of her parents depended upon her job with the society. Parsons's attitude toward Herty immediately became hostile and did not improve when soon afterward Herty left the editorship to become president of the Synthetic Organic Chemicals Manufacturers' Association at \$25,000 a year, considerably more than he and Parsons were earning with the ACS. The two men had not spoken or shaken hands since 1921. As for Herty's remarks at Fernandina, Williamson was there and knew that he had made no claims regarding kraft pulp and paper made from pine. "I cannot hold myself responsible for what reporters of daily papers have to say," Herty declared. "And I am not going to let myself worry about these matters, for there is too much serious constructive work to be done."⁶⁵

But Herty did worry about what the newspapers were saying and had already made one public disclaimer by the time he wrote Williamson. On February 21, 1938, he addressed the audience from the stage of Savannah's Lucas Theater following the first screening of *Old Dixie's New Boom*, the "March of Time" film soon to be shown all over the country. "Too much credit has been given me in an overabundance of good will on the part of many of the daily newspapers," he informed the "first nighters." Citing a widely copied account of the Fernandina ceremonies, which described him as the inventor of the kraft process, he declared, "This was so patently an error it was not worth correcting to paper men, but in order that the record may be clear to all, let me say the kraft pulp and paper industry has been in existence in the South for the last twenty-seven years." Ed

Mayo, a fellow resident of Savannah, was the "pioneer" in the kraft field and, like Herty and his associates, had "struggled with the same difficulties, prejudices and skepticism which we have been going through in trying to start the newsprint industry."⁶⁶

A week later, on March 1, 1938, Herty decided to set the record straight with the scientific community as well. Apparently too preoccupied with other problems to read his mail regularly (the correspondence from Williamson), Herty wrote J. McKeen Cattell, editor of *Science*, that "only yesterday" had he seen the note published in the January 28, 1938, issue which repeated the error about Herty and the kraft process. To remove any misunderstanding "among my many scientific friends," Herty asked Cattell to print his letter, which included an extract from the speech delivered at the Lucas Theater. Cattell complied, and Herty put the incident behind him.⁶⁷

Of far more concern to Herty than protecting his reputation early in 1938 was his fight to keep the laboratory going. Skimping along with donations and remnants of earlier appropriations, the facility was struggling to stay alive while Herty devoted himself frantically to the search for financial support. C. Stewart Lee, the Pusey and Jones Company executive, managed to secure checks from various equipment manufacturers which he passed along to Herty. And Albin Dearing, the public relations man for Container Corporation, asked Herty's permission to solicit pledges of financial support from the southern governors attending Florida Industries Day at a brief meeting following the ceremonies. By that time, they should have a "casual understanding of the importance of the paper business," he explained, and should be in the "right frame of mind." Herty agreed, but no money seems to have been raised immediately from any southeastern state. Instead, salvation came from the Georgia legislature and Governor E. D. Rivers's office through what Herty described as a combination of "hard work" and "lots of political action." On February 15, 1938, Rivers signed a bill creating the Herty Foundation, whose board of trustees was authorized to take over the Savannah laboratory and to raise funds for its permanent support through contributions from other states, individuals, or corporations. Meanwhile, the legislature appropriated \$10,000 in its regular session and an additional \$20,000 in a special session to support the facility in the current year. With great relief, Herty informed his son on March 1, "The Herty Foundation was organized here on Monday. It is a beautiful set-up and I hope [it] will lift a lot of worries from my shoulders and will be instrumental in giving permanency to the work here."⁶⁸

Exhausted from the struggle to ensure the laboratory's future, Herty decided to spend a week in St. Petersburg, Florida, watching the New York Yankees and St. Louis Cardinals in spring training. The trip revived him, and by early April 1938, he was back in harness, meeting with the Herty Foundation board of trustees, welcoming visitors to the laboratory, making speeches, and traveling. The trips were usually confined to Georgia or, if essential, to Washington or New York; longer excursions had to be turned down for lack of money. To the new president of the Farm Chemurgic Council, who wanted him to address a meeting in Omaha, Herty replied, "At one time, when Garvan was living, I had an expense account for just such matters." But things had changed, and at that point Herty expected no improvement in his lifetime.⁶⁹

Tight as the financial situation was, there was one trip Herty was unwilling to forgo in the spring of 1938. On May 30 to June 1, he attended the annual convention of the Southern Newspaper Publishers' Association held at Biloxi, Mississippi, during which SNPA president Ted Dealey and Newsprint Committee chairman James Stahlman told the publishers "in no uncertain terms" that if they wanted southern newsprint they would have to put up more money. A total of \$720,000 worth of Southland stock was still unsold, a situation that would have to be remedied if Southland Mills, Incorporated, to be rechartered on June 4, 1938, were to qualify for the loan requested from the Reconstruction Finance Corporation. As Stahlman remembered it years later, "[For] two nights and the intervening day, through cajolery, browbeating, persuasion, hard selling and plain horse-sense, the necessary stock was purchased by the smarter publishers and Southland was on its way!" With the pledges in hand, Stahlman predicted a rosy future. The newsprint industry would migrate southward like the textile industry before it, he told the publishers, and after newsprint mills would come "rayon and chemical plants and other allied industries. . . . I honestly believe," Stahlman continued, "that the minute this first unit . . . commercially produces newsprint . . . you will see an influx of newsprint mills into the South and you will see within the next ten or fifteen years such an industrial, economic and social rehabilitation as you never have dreamed."⁷⁰

If anything, Herty was more optimistic than Stahlman. When his turn came to address the publishers, he declared, "What you are doing is something the South is always going to be grateful for, because the only argument left in the whole newsprint situation by the most bitter antagonists . . . is the fact that there has never been a commercial mill to produce it." Now that argument would be

silenced, and Herty predicted “a new period of industrial activity” that would rival the recent boom in kraft manufacture. “I look forward to seeing within a very few years,” he concluded, “newsprint mills distributed . . . throughout the South from Virginia to Texas.”⁷¹

Herty returned to Savannah a happy man, planning to resume direction of the laboratory’s ongoing experiments with pine, black gum, and tupelo sulfite pulps to obtain the best raw material for white paper and rayon manufacture. He also intended to continue his speaking engagements and to that end managed to secure a copy of the “March of Time” film for use in schools and for other “educational groups.” Finally, he had to deal with a funding problem regarding Wanda Farr’s cellulose group at the Boyce Thompson Institute. Like the laboratory in Savannah, her operations had been affected by Garvan’s death and the reduced support available from the Chemical Foundation.⁷²

The effort to help Wanda Farr was still in progress when Herty suffered the first in a series of heart attacks in June 1938. “I am convinced,” he wrote his old friend Alex Sessoms on June 27, “that I overtaxed myself somewhat during the past two or three weeks and under the doctor’s orders I am staying quietly at home, carrying on my work in this room.” He was eating and sleeping well and joked that he was “just getting a good loaf.” Ten days later, he was still “lying up here in bed doing nothing” and still eating and sleeping well. But he was more specific about his condition in a note to an old friend in New York who had once been his physician: “Of course, this is under the orders of the doctor who insisted I have been driving myself too hard and thereby brought on a little heart trouble which he feels complete rest will cure. . . . Maybe in about a week more I will be up and about again, but I have learned my lesson and in the future I am going to try to be a good deal more reasonable in my treatment of myself.”⁷³

During the second week of July, Herty’s doctor sent him to a hospital, ordering complete rest and barring all visitors from his room except for members of the family. Meanwhile, his devoted secretary, Lucy Chambers, and the assistant director of the laboratory, Charles Carpenter, handled his business correspondence and responded to the many inquiries from concerned friends who read about his illness in the newspapers. The stricter regimen seemed to be working. Eloise and Charles Herty Hooper, Herty’s nephew and namesake, saw him on July 24 and found him “feeling so good [that] we were greatly encouraged.” Two days later, Lucy Chambers visited a still optimistic if somewhat more resigned patient. Among other things, she recalled several years later, they talked about death.

“‘Are you afraid?’” she asked him. “‘No, not as you mean it,’ Herty answered, ‘but there are so many, many wonderful things coming up on the horizon.’” The next morning, July 27, 1938, he was dead, just as his legacy to the South he loved so well was beginning to take material form.⁷⁴

After services at St. John’s Episcopal Church in Savannah, where he had served on the vestry, Herty’s body was cremated in Macon and his remains interred at Milledgeville, Georgia. The funeral was private, but the response to his death extended from New York to Texas, ranging from an obituary and an editorial in the *New York Times* to resolutions replete with “whereases” adopted by groups such as the Savannah Rotary Club, the Mississippi state legislature, and the Houston, Texas, Chamber of Commerce. His contributions to the preservation of one southern industry (naval stores) and the promotion of another (white paper and newsprint) were duly celebrated, but the warmest tribute was reserved for the man. To those who knew him personally, Herty was simple, modest, and unassuming, “seemingly frail in body,” but a “giant” mentally and “rich in gifts of the soul.” “The man was as great as the scientist, perhaps greater,” declared the editor of the *Richmond News Leader*; “to know him was not only to love him: it was to reverence [sic] him.” The editor of the *Atlanta Georgian* agreed. Herty was more than a great scientist, he told his readers. “He was a seer. He was an emancipator, a force for social, economic and spiritual advancement of his people. He was,” in sum, “a man of great humanity.”⁷⁵

The tributes paid to Herty continued for years. Among them were a new men’s dormitory named for him at Georgia Southern College (now the University of South Georgia), the site of his first turpentine investigations in Statesboro, Georgia; a memorial service, portrait, and scholarship fund at the University of Georgia provided by the Alumni Association; a park established on the outskirts of Milledgeville, Georgia, his hometown; a forest exhibit and museum, the Herty Forest Institute, located in Waycross, Georgia; a Liberty ship, the SS *Charles Herty* launched in 1943; and a bronze plaque with his portrait done in bas-relief hung on the walls of the Georgia State Capitol three years later. But the greatest monument to Herty’s memory was not in Georgia.⁷⁶

Southland Paper Mills, Incorporated, initially created in May 1937, received a new charter from the state of Texas on June 4, 1938. Ground was broken for the new facility on January 14 of the following year at Herty, Texas, about a mile from Lufkin, and the partially completed building was formally dedicated on May 27, 1939. More than two hundred publishers, dignitaries, and invited

guests looked on as E. L. Kurth, Southland's president, unveiled a bronze plaque bearing the likenesses of Francis Garvan and Charles Herty with the inscription, "THE FIRST PLANT FOR MAKING COMMERCIAL NEWSPRINT PAPER FROM SOUTHERN PINE. THIS INSTITUTION IS THE FRUIT OF THE GENIUS AND DEVOTION OF TWO GREAT AMERICANS, FRANCIS PATRICK GARVAN AND CHARLES HOLMES HERTY." G. B. Dealey, president of the *Dallas Morning News*, delivered the principal address, which honored both men, "not with us in the flesh, but . . . [whose] spirits hover today in acclamation of a victory won, a task well done." Garvan's contributions to the development of a "self-contained" American chemical industry, to stimulating research, and to underwriting the activities of Herty's laboratory were duly recognized. "Had it not been for his vision, his tenacity and his untiring energy," Dealey told his audience, "we would not today be celebrating this epochal result of his genius." But it was for Charles Holmes Herty, "most modest of men, whom we all knew and loved," that Dealey reserved his warmest praise. "No man had greater faith in the ultimate destiny of the South," the publisher declared. "He believed that eventually the common yellow pine of the South would become the farmer's salvation. He almost lived to see the fruition of his dream. He was at the [SNPA] Biloxi convention . . . when the complete financing of the mill was finally assured; and, although he passed away shortly afterward and did not live to see what we see today, he did know that it was definitely in the making and so died a happy man."⁷⁷

The professional career of Charles Holmes Herty spanned almost fifty years of service to American chemistry in posts that took him from the poorly equipped laboratory and classrooms of the University of Georgia to a well-appointed suite in a Manhattan office tower, from the isolated pine forests of Florida and south Georgia to the paneled committee rooms of the United States Congress, and from tasks ranging from overseeing convicts in the turpentine belt to serving on presidential advisory committees and negotiating with the German chemical cartel. A friendly, modest, and outgoing man who adapted to new places and new people with ease and grace, Herty was articulate and persuasive. He could speak with equal facility to chemists or laymen, women's clubs or chambers of commerce, academics or industrialists, adjusting the message effortlessly to the nature of his audience. But the message itself remained remarkably unchanged over the years. Certain themes such as the importance of education and fundamental research,

the need to foster cooperation between government and industry or industry and academe, the achievement of American chemical independence, and the development and diversification of the southern economy occur again and again in his speeches and writings.

As a professor, president of the American Chemical Society, editor of the *Journal of Industrial and Engineering Chemistry*, director of the ACS News Service, and adviser to the Chemical Foundation, Herty spent years trying to make the nation "chemically conscious." His carefully orchestrated campaigns to secure dyes protection, a National Institute of Health, and the establishment of a newsprint industry in the South constituted what he regarded as his most important "educational work." Some friends and most opponents dismissed it as lobbying or "propaganda," and some charged him with being a tool of major chemical interests. He was not, in the material sense; his salary never exceeded \$25,000 a year, and he scrupulously avoided holding stock in any industry whose cause he championed. He seems simply to have believed that what was good for the American chemical industry was good for America.

Herty's personal contributions to his profession and to the nation cannot be measured in dollars and cents. Nor should they be judged exclusively in the context of our own times. For him, support for an entirely American chemical industry was a form of patriotism, and he equated service to it with service to the country. Convinced by World War I that Germany must never be allowed to reimpose chemical dominance over the United States, he made "national self-containedness" synonymous with national security. One may certainly question his chauvinism and his economic judgment, but his dedication to his country and his profession is beyond dispute.

As for Herty's contributions to the achievement of a New South, his cup-and-gutter system of turpentine served to revitalize an industry on the point of extinction, and his demonstration that southern pine could replace imported spruce in the manufacture of newsprint was a giant step forward in the attraction to the South of another. In the 1990s many view development, growth, and burgeoning industry, particularly the chemical industry, as a mixed blessing. But in the 1930s, when Herty was striving to secure new opportunity for a region described as the nation's number one economic problem, most southerners welcomed his efforts. Herty did not invent the slogan "Better Living Through Chemistry," but he certainly believed in it and did all he could to achieve it for his beloved South.



Notes

CHAPTER 1. THE FORMATIVE YEARS

1. James C. Bonner, *Milledgeville, Georgia's Antebellum Capital* (Athens: University of Georgia Press, 1978), 215–20, 229 (quotation); Kenneth Coleman, gen. ed., *A History of Georgia* (Athens: University of Georgia Press, 1977), 203, 210–12; Alan Conway, *The Reconstruction of Georgia* (Minneapolis: University of Minnesota Press, 1966), 149, 161n. Milledgeville had a population of 2,313 in 1870 and only 3,332 ten years later. Atlanta claimed 21,289 people in 1870, and by 1880, with 37,409, had surpassed Savannah as Georgia's largest city (Bonner, *Milledgeville*, 232; Coleman, *History of Georgia*, 236).

2. For a full discussion of New South rhetoric and its practitioners, see Paul Gaston, *The New South Creed: A Study in Southern Mythmaking* (New York: Knopf, 1970), 87–89, 189–96.

3. *U.S. Census*, 1850, p. 99; *U.S. Census*, 1870, p. 2h; Olive Herty Lucas to Charles Herty, [1918?]; Typescript of obituary of Bernard Richey Herty, n.d., Box 137, Folder 1; Letters of guardianship to F. A. Herty, Baldwin County, December 2, 1878, Box 137, Folder 2, Charles Holmes Herty Papers, Special Collections, Robert W. Woodruff Library, Emory University, Atlanta, Georgia. Hereafter, unless otherwise indicated, all citations of manuscript materials refer to the Herty Papers at Emory University. Some citations to the Herty Papers before 1926 carry no box or folder numbers because the Herty Papers were not cataloged when I began my research. Other material on the Herty family comes from Anna Maria Green Cook, *History of Baldwin County, Georgia* (Anderson, S.C.: Key-Hearn Printing Company, 1925), 366–67, 382–84; James C. Bonner, ed., *The Journal of a Milledgeville Girl* (Athens: University of Georgia Press, 1964), 23 (n. 2), 80 (n. 16), 89 (n. 32), and an interview with Eloise and Charles Herty Hooper, August 8, 1978.

4. Olive Herty Lucas to Herty, [1918?]; Cook, *History of Baldwin County*, 369; Bonner, *Journal of a Milledgeville Girl*, 25 (n. 7); Olive Herty Lucas Recollections, “Herty Day”

Folder, 1934, Special Collections, Georgia College, Milledgeville, Georgia; Eloise and Charles Herty Hooper interview, August 8, 1978.

5. John L. Hardeman to Herty, June 6, 1884 (quotation); Bonner, *Milledgeville*, 238–39, 240–41; Cook, *History of Baldwin County*, 382–84, 447; Bonner, *Journal of a Milledgeville Girl*, 25 (n. 7); Middle Georgia Military and Agricultural College, *Annual Announcement and Register*, 1881–82, pp. 2–20, Box 136, Folder 5; Eloise and Charles Herty Hooper interview, August 8, 1978; Thomas G. Dyer, *The University of Georgia: A Bicentennial History, 1785–1985* (Athens: University of Georgia Press, 1985), 135.

6. Edward L. Gordy interview with Charles Herty, [1932], Box 137; Frank Herty interview, May 11, 1977.

7. Cook, *History of Baldwin County*, 119; Typescript of Bernard Herty obituary, n.d., Box 137, Folder 1; Photocopy of biographical sketch of Charles Holmes Herty, January 12, 1960, Vertical File, Georgia Room, University of Georgia Library, hereafter cited as Georgia Room, UGA Library; Frank Herty interview, May 16, 1977.

8. Charles M. Strahan, quoted in *Red and the Black*, December 8, 1933, news clipping, Vertical File, Georgia Room, UGA Library; *Manual of the University of Georgia*, 1890 (Atlanta: Jas. P. Harrison & Company, 1890), 27; Minutes of the Board of Trustees, July 1884, University Records, pp. 526, 530, UGA Library, hereafter cited as Minutes of the Board of Trustees, UGA; Dyer, *University of Georgia*, 129; clippings, undated, Box 145, Folder 6, Herty Papers.

9. Minutes of the Board of Trustees, UGA, July 1884, pp. 526, 530; *Centennial Catalogue of the Trustees, Officers and Alumni of the University of Georgia from 1785 to 1885* (Athens: Weekly Chronicle Job Office Printing Co., 1885), 6–17, Georgia Room, UGA Library; *Pandora* 1 (1886): 3–4.

10. Charles Herty, Johns Hopkins University Questionnaire, October 4, 1886 (quotation); Charles Herty to Sec'y Johns Hopkins Institute, September 9, 1886; J. M. Stoney to President, Johns Hopkins University, September 17, 1886, all in the Ferdinand Hamburger, Jr., Archives, Johns Hopkins University, Baltimore, Maryland.

11. D. S. Tarbell, Ann T. Tarbell, and R. M. Joyce, "The Students of Ira Remsen and Roger Adams," *Isis* 71 (December 1980): 620–26.

12. Courses attended by Charles Holmes Herty compiled from the Johns Hopkins University *Circular*; "Herty, Charles Holmes," in W. Norman Brown, comp., *Johns Hopkins Half-Century Directory* (Baltimore: Johns Hopkins University, 1926), 161, Ferdinand Hamburger, Jr., Archives, Johns Hopkins University; Herty correspondence with Ira Remsen, 1892–99, Herty Papers; Tarbell, Tarbell, and Joyce, "The Students of Ira Remsen," 620.

13. Johns Hopkins Glee Club program, February 19, 1889; Official university baseball

scorecard [1889]; Johns Hopkins University Athletic Association, Athletic Exhibition, February 21, 1889; Johns Hopkins University Benefit Minstrel Show Program, February 28, 1890; clipping, *Baltimore Sun*, n.d., Box 136, Folder 6, Box 145, Folder 6; Charles Herty interview with Edward L. Gordy, [1932], Box 137; Dyer, *University of Georgia*, 147–48; Minutes of the Board of Trustees, UGA, June 1889, pp. 258–59.

14. *Athens (Ga.) Banner*, January 14, March 9, 1890, May 5, 1891.

15. *Ibid.*, December 10, 1897. See also Frances Taliaferro Thomas, *A Portrait of Historic Athens and Clarke County* (Athens: University of Georgia Press, 1992).

16. Minutes of the Board of Trustees, UGA, June 11, 12, 1890; UGA Prudential Committee Minutes and Miscellaneous Papers, May 17, 1890; *Athens Daily and Weekly Banner*, December 10, 1897; Dyer, *University of Georgia*, 121–33, 148.

17. *Catalogue of the Trustees, Officers and Alumni of the University of Georgia from 1785 to 1899* (Atlanta: Foote and Davis, 1894), unpaginated; *Athens Daily and Weekly Banner*, December 10, 1897.

18. *Atlanta Journal*, October 26, 1891; *Athens Banner*, May 7, November 1, 1891, June 17, 23, 24, July 5, 1893; *Pandora* 8 (1895): 15–16; *Report of State Board of Visitors to Board of Trustees* (Athens, Ga., June 17, 1896), unpaginated; James Walter Mason et al., *Class of 1897* (50th Reunion publication, 1947), 25–26, 27, 31–32. For a thorough discussion of the forces hostile to the university, see Dyer, *University of Georgia*, esp. chap. 6. Walter Hill's administration is discussed at length by Dyer in chapter 7.

19. H. B. Battle to Ira Remsen, September 29, 1888; *Pandora* 5 (1892): 54, 99–100.

20. Minutes of the Board of Trustees, UGA, June 1890, p. 339; *Atlanta Constitution*, December 21, 1894, December 25, 1895; W. D. Hooper folder, Vertical File, Georgia Room, UGA Library; Eloise and Charles Herty Hooper interview, August 8, 1978.

21. *Athens Banner*, January 12, 1890, May 30, 1891, June 4, 1893, July 19, 1899; unidentified clipping, perhaps an obituary, of Franz Emil Schaller, n.d., Box 152, Folder 16.

22. Minutes of the Board of Trustees, UGA, July 28, 1891, pp. 387, 390, June 16, 1894, p. 450, June 19, 1895, p. 458, June 13, 1896, pp. 476, 477, June 11, 1897, p. 498, and June 15, 1897, p. 508.

23. T. W. Reed, quoted in John Stegeman, *The Ghosts of Herty Field: Early Days on a Southern Gridiron* (Athens: University of Georgia Press, 1966), 2; Charles Herty, MSS. on athletics for the *Georgian*, [1901], Box 141, Folder 5; *Red and the Black*, October 30, 1897, clipping, Vertical File, Georgia Room, UGA Library; *Pandora* 5 (1892): 99–101, 8 (1895): 123, 9 (1896): 135; "Athletic Fever," clipping, n.d., Box 145, Folder 6; *Atlanta Constitution*, November 29, 1891; *Athens Banner*, November 15, 1891.

24. *Athens Banner*, November 15, 1891; *Atlanta Constitution*, January 21, 25, 31, February 14, 17, 18, 19, 20, 21, 1892.

25. *Red and the Black*, January 20, June 16, 1894, January 5, March 2, 1895, December 2, 20, 1899, March 17, 1900, Vertical File, Georgia Room, UGA Library; *Atlanta Constitution*, December 23, 1894; *Pandora* 8 (1895): 123, 9 (1896): 134–35, 10 (1897): 108, 168; Charles Herty to Howell Cobb, February 3, 1898; *Athens Daily Banner*, February 5, 6, 1898. Material on Herty's activity with athletics was originally published in my article "Charles Holmes Herty and the Establishment of Organized Athletics at the University of Georgia," *Georgia Historical Quarterly* 67 (Fall 1993): 525–40.

26. *Red and the Black*, January 27, 1894, Vertical File, Georgia Room, UGA Library; *Pandora* 7 (1894): 171.

27. Ira Remsen to Herty, May 27, 1892, August 29, 1894 (quotations); H. L. Wells to Herty, April 15, July 21, 1896; Dyer, *University of Georgia*, 185.

28. Ira Remsen to Herty, October 18 (quotation), December 22, 1892, February 7, March 28, July 27, December 26, 1893; H. L. Wells to Herty, January 15, April 23, 1894.

29. H. N. Stokes to Herty, July 30, August 2, 5 (quotation), 6, 1895; W. A. Noyes to Herty, July 12, 1897; Franciscus A. H. Schreinemakers to Herty, June 27, 1892; R. S. Norris to Herty, February 12, 1894.

30. H. L. Wells to Herty, April 15, July 21, 1896; H. N. Morse to Herty, May 4, 1896; Edgar Fahs Smith to Herty, November 11, 1897; Amos B. Brown to Herty, November 11, 1897, March 23, 1898, January 10, 1899.

31. R. L. Foreman to Herty, May 3, 1899; Herty to Howell Cobb, April 5, 1899; William McMurtrie to Herty, April 12, 1899; Edgar Fahs Smith to Herty, May 7, 1899; Ira Remsen to Herty, May 23, 1899; F. P. Venable to Herty, June 1, 1899.

CHAPTER 2. SAVING THE NAVAL STORES INDUSTRY

1. L. F. Haber, *The Chemical Industry, 1900–1930: International Growth and Technological Change* (Oxford: Clarendon Press, 1971), 38–40, 42–44; John Joseph Beer, *The Emergence of the German Dye Industry* (Urbana: University of Illinois Press, 1959), 57–62. For a fuller explanation of the differences and similarities between the universities and the *Hochschulen*, see Beer, chap. 7. See Haber, chap. 3, for a comparison of late nineteenth- and early twentieth-century chemical education in Britain, the United States, and Germany.

2. Robert F. Bud, P. Thomas Carroll, Jeffrey L. Sturchio, and Arnold Thackray, *An Historical Application of Science Indicators* (Philadelphia: Department of History and Sociology of Science, University of Pennsylvania, 1978), 170; Tarbell, Tarbell, and Joyce, "The Students of Ira Remsen," 620–26.

3. Herty to Howell Cobb, April 5, 1899; Frank Herty interview, May 11, 1977.

4. Charles Parsons to Herty, May 26, 1899; Edgar Fahs Smith to Herty, March 31, 1899; Francis C. Phillips to Herty, May 26, 1899; H. C. White to Herty, January 1, 1900; Bud et al., *Historical Application of Science Indicators*, 200 (n. 22).

5. Notebooks—"Personal Impressions of Professors and Laboratories 1899–1900," Box 140, Folder 1; A. Werner to Herty, April 26, 1901, April 30, 1913; Haber, *Chemical Industry*, 37, 74.

6. Notebooks—"Personal Impressions of Professors," 98, 99, 100, 104, 108, 111, 112, Box 140, Folder 1.

7. Frank Cameron, "Charles Holmes Herty," *Journal of the American Chemical Society* 61 (July 6, 1939): 1619–24; Homer Black to Herty, May 3, 15, 22, June [?], 1901; "Dixie," abstract of Herty speech given at Georgia Tech, June 1, 1901, Box 144, Folder 1; Germaine M. Reed, "Charles Holmes Herty and the Popularization of Chemistry," paper presented at the History of Science Association meeting, December 27, 1984, Chicago, Illinois.

8. Herty told the story of his conversation with Witt publicly for the first time in the speech delivered at Georgia Tech on June 1, 1901. He repeated it many times thereafter throughout his career.

9. Otto Witt to Herty, July 12, 1900.

10. William McMurtrie to Herty, December 4, 1900, February 5, 1901; Charles Baskerville to Herty, December 10, 20, 1900; James Lewis Howe to Herty, February 13, 1901; W. L. Dudley to Herty, December 9, 1900; H. L. Wells to Herty, December 13, 1900; Ira Remsen to Herty, December 14, 1900; Edgar Fahs Smith to Herty, December 15, 1900.

11. W. L. Dudley to Herty, February 4, 1901; Ira Remsen to Herty, December 14, 1900; C. L. Jackson to Herty, February 21, March 20, May 18, August 31, 1901; William McMurtrie to Herty, April 21, 1901; Abstract of Herty speech to Georgia Tech, May 31, 1901, "Dixie," magazine supplement to unidentified newspaper, June, July 1901, Box 144, Folder 1; Excerpt of Chancellor's Report to Board of Trustees, *Bulletin of the University of Georgia*, [June 1901], Box 145, Folder 6.

12. Herty, German Notebooks, 1899–1900, p. 168, Box 140, Folder 1; Herty to John Egan, January 18, 1901.

13. An earlier version of material in this chapter appeared in my article "Serving the Naval Stores Industry: Charles Holmes Herty's Cup-and-Gutter Experiments, 1900–1905," *Journal of Forest History* 26 (October 1982): 168–75. J. F. Lewis to Herty, October 15, 1900; J. P. Williams to Herty, November 20, 1900; H. A. Dunn to J. M. Mallory, October 23, 1900; Herty to John M. Egan, January 18, 1901; Charles Holmes Herty, *A New Method of Turpentine Orchardng*, *Bulletin* 40 (Washington, D.C.: Bureau of Forestry, 1903), 9.

14. Herty, *New Method of Turpentine Orchardling*, 10–13.
15. *Ibid.*, 15–16; Herty to E. Moulie, September 22, 1902.
16. W. W. Ashe, *The Forests, Forest Lands, and Forest Products of Eastern North Carolina*, Bulletin 5 (Raleigh: North Carolina Geological Survey, 1894), 96–105; W. W. Ashe to Herty, November 1, December 14, 1900.
17. Herty to John M. Egan, January 18, 1901; John Egan to Herty, January 21, March 3, 27, 1901; J. P. Williams to Herty, June 14, 21, 1901; Herty, *New Method of Turpentine Orchardling*, 16.
18. Herty's correspondence with the Bureau of Forestry, begun in late 1900, mushroomed after January 1901. See correspondence with O. Luebker, Gifford Pinchot, and George B. Sudworth, January through August 1901, in National Archives, R1–C15, Miscellaneous Correspondence (cited hereafter as NA), and in Herty Papers. See also Herty, *New Method of Turpentine Orchardling*, 16.
19. Because local potteries refused to supply the small number of clay cups needed at Statesboro, containers of galvanized iron were used instead. See Herty, *New Method of Turpentine Orchardling*, 15–17; Herty to John Egan, July 26, 1902; "A New Method of Turpentine Orchardling," Bureau of Forestry, Circular 24 (Washington, D.C., February 2, 1903), Box 47, Folder 5.
20. J. B. Chestnutt to Herty, September 5, 1901; Thomas Watson to Herty, December 1900; Herty, *New Method of Turpentine Orchardling*, 16–17.
21. Homer Black to Herty, May 3, 15, 22, June 17, 1901; John Pitt to Herty, June 7, 1901; Archibald Smith to Herty, June 7, 1901; Herty to Overton Price, August 20, September 12, 1901, NA, R1–C15; *Savannah Morning News*, September 10, 12, 1901.
22. Herty to E. Moulie, September 22, 1902; Herty to editor, *Atlanta Journal*, September 24, 1902; Herty to editor, *American Soap Journal and Manufacturing Chemist*, January 1, 1904.
23. Gifford Pinchot to Herty, October 8, 10, 15, 28, November 4, December 13, 1901; Frank Cameron to Herty, November 7, 23, 1901; Herty to W. B. Hill, November 21, 1901.
24. Trustees' letters to Herty, December 4, 6, 10, 12, 1901; Walter Hill to Howell Cobb, November 21, 1901; *Red and the Black*, December 7, 1901, Vertical File, Georgia Room, UGA Library; *Georgian* 6 (December 1901): 72.
25. Herty, *New Method of Turpentine Orchardling*, 18–19; Herty to John M. Egan, July 26, 1902; Documents by J. N. Paulk, W. E. Coleman, J. A. J. Henderson, June 4, 1902, granting Charles Herty the right to conduct experiments on their property in Ocilla, Irwin County, Georgia.
26. Charles Herty, "The Turpentine Industry in the Southern States," *Journal of the Franklin Institute* 181 (March 1916): 339–67, specifically 353–54.
27. George B. Sudworth to Herty, May 17, 19, June 3, 9, 21, 25, 26, 1902; W. C. Powell

- to Herty, June 23, July 1, August 9, 1902; Frank Klarpp to Herty, September 23, 1902.
28. Thomas Gamble to Herty, August 2, 1902; George Sudworth to Herty, August 23, 1902; B. F. Holder to Herty, September 3, 1902; Herty to *Atlanta Journal*, September 24, 1901; Herty to *American Soap Journal and Manufacturing Chemist* 13 (October 1902): i, 37–38; Herty, *New Method of Turpentine Orchardring*, 31–32.
29. Charles Herty to editor, *Dixie*, August 1, 1904; George B. Sudworth to Herty, August 23, 1902; Overton Price to Herty, September 6, 9, 10, 17, 1902.
30. Herty, “New Method of Turpentine Orchardring,” Box 47, Folder 5; Herty, *New Method of Turpentine Orchardring*, 31–32; Herty to John Egan, July 26, 1902; Herty to J. P. Williams, August 3, September 1, 2, 1902; W. A. Winburn to Herty, September 1, 1902; Herty to President of Southern Railroad, September 23, 1902.
31. Herty, *New Method of Turpentine Orchardring*, 32.
32. Herty to editor, *Dixie*, August 1, 1904; Herty, *New Method of Turpentine Orchardring*, 18–19.
33. Thomas F. Armstrong, “The Transformation of Work: Turpentine Workers in Coastal Georgia, 1865–1901,” *Labor History* 25 (Fall 1984): 518–32; Frank Klarpp to Herty, August 30, 1902, January 5, 6, 1904; Herty to A. G. Paul, February 14, 1903; S. P. Woolfolk to Herty, December 15, 1903.
34. Herty to A. G. Paul, February 14, 1903; Herty to W. C. Jackson and Company, December [?], 1903.
35. J. A. McDougald to Herty, November 11, 1901; Herty, Notes on jobs and work rates, [1901].
36. Revised constitution of the Turpentine Operators Association, October 1902; Jno. C. Powell to TOA members, September 15, 1902; Herty to editor, *Dixie*, August 1, 1904.
37. Herty, *New Method of Turpentine Orchardring*, 16–17; Herty to J. W. McMillan, January 11, 1902; Herty to H. Stevens & Co., January 11, 1902; J. W. Brigham to Montague and Company, January 22, 1902; George Sudworth to Herty, March 20, 24, April 23, 1902.
38. Herty to Montague and Company, September 1, 16, 1902; D. P. Montague to Herty, September 5, 10, 1902; Stevens Brothers Pottery Company to Herty, July 8, 25, 1902; Herty to United Industrial Fibre Company, September 1, 1902; Herty to W. J. Marshall, September 1, 1902; Herty to Syracuse Pottery Company, September 1, 16, 1902; Syracuse Pottery Company to Herty, September 23, 1902; Herty to editor, *Dixie*, August 1, 1904; Herty to Jno. Powell, October 18, 21, 1902; Jno. C. Powell to Herty, October 20, 1902; J. A. Maltby to Herty, October 24, 1902; Herty to J. A. Maltby, October 27, 1902; Herty to L. F. Patterson, November 14, 1902; L. F. Patterson to Herty, December 2, 13, 1902; Herty to George B. Sudworth, November 28, 1902.
39. Herty-Krager correspondence, September 4, 16, 18, 1902.

40. Herty to C. L. Krager, September 23, 26, October 2, 10, 11, 15, 21, November 28, 1902; C. L. Krager to Herty, September 18, [?], October 11, 14, December 15, 24, 1902; Frank Klarpp to Herty, October 9, 1902; Herty to D. H. McMullen, October [10?], 18, 21, 1902; Herty to Jno. C. Powell, September 23, October 18, 21, 1902; Herty to selected turpentine operators, October 1, 1902; Herty to Geo. B. Sudworth, November 28, 1902; Geo. B. Sudworth to Herty, December 3, 1902.
41. Herty to C. L. Krager, October 10, November 28, 1902; Jno. C. Powell to Herty, October 3, 20, 1902; John H. Powell to Herty, December 8, 10, 11, 14, 23, 1902.
42. John H. Powell to Herty, December 8, 11, 1902; Herty to John H. Powell, December 13, 1902; Bureau of Forestry to Herty, September 17, 1902; S. Powers to Herty, September 13, 1902; Otto Luebker to Herty, September 19, 1902; Herty to editor, *Atlanta Journal*, September 24, 1902; Herty to Geo. B. Sudworth, November 14, 1902, January 20, 1903.
43. Geo. B. Sudworth to Herty, February 4, 1903; Herty to John H. Powell, February 5, 9, 1903; Herty to Geo. B. Sudworth, February 6, 1903.
44. Herty to Geo. B. Sudworth, February 14, 17, 18, March 21, 24, 1903.
45. Geo. B. Sudworth to Herty, March 28, 1903; Herty to George B. Sudworth, November 10, 1903; Herty to C. L. Krager, November 17, 1903; Herty to W. J. Harlow, December 19, 22, 1903.
46. C. L. Krager to Herty, September 23, December 10, 1903; Herty to Krager, September 24, October 12, 14, December 19, 1903 (quotation); John H. Powell to Herty, September 19, December 29, 1903; Herty to Jas. B. Adams, October 26, 1903; C. L. Krager to Bureau of Forestry, September 17, 1903.
47. W. J. L'Engle to Herty, February 14, 1905 (quotation); Frank Klarpp to Herty, August 3, 1903; Herty to C. L. Krager, October 28, November 5, 11, 1903; Jno. Henderson to Herty, January 27, 1905; J. E. North to Herty, January 30, 1905; J. P. Williams to Herty, January 30, 1905; Curry Co. to Chattanooga Pottery Company, February 5, 1905; Herty to D. R. Stewart, February 10, 1905; Herty to J. C. North Lumber Company, February 10, 1905.
48. George B. Sudworth to Herty, June 6, July 7, 1902, April 2, 10, 1903; Herty to Geo. B. Sudworth, March 23, April 6, 1903.
49. Geo. B. Sudworth to Herty, April 2, 1903; Herty to Geo. B. Sudworth, April 6, 1903.
50. Herty to A. Sessoms, May 12, 1903; Herty to International Mercantile Marine Company, May 12, 1903; Charles Herty, "Report on Trip to European Countries for Studying Methods of Turpentinizing and Allied Subjects, 1903," typescript.
51. Charles Herty, "Report of Trip to European Countries for Studying Methods of Turpentinizing and Allied Products, 1903," with covering letter to Geo. B. Sudworth, November 13, 1903.

52. Herty, "Report of a Trip to European Countries"; Herty to Frank Klarpp, August 28, 1903; Herty to J. T. Hunt and Co., August 27, 1903.

53. Herty to Frank Klarpp, October 23, 1903; Jas. Adams to Herty, September 14, 1903; Herty to Chas. B. Betts and Co., October 8, 1903; Herty to E. P. Alexander, October 9, 1903; Herty to Walter Robinson, October 14, 1903.

54. Herty to Geo. B. Sudworth, November 10, December 19, 1903, January 16, 30 (quotation), 1904; Herty to Sam Lamont, n.d.; Geo. B. Sudworth to Herty, December 7, 28, 1903.

55. Herty to Geo. B. Sudworth, November 10, 1903; Herty to Bureau of Forestry, September 24, 1903.

56. Herty to Geo. B. Sudworth, January 4, 1904; Geo. B. Sudworth to Herty, February 26, March 6, 1904; Herty to Gifford Pinchot, January 23, March 9, 1904.

57. Herty to J. W. Callahan, February 12, 1904.

58. Geo. B. Sudworth to Herty, January 5, 1904 (quotation); Herty to Geo. B. Sudworth, March 2, 1904; Herty to W. A. Mitchell, January 10, 1902; C. H. Martin to Herty, January 5, 9, 1902; Herty to W. A. McNeeley, January 7, 1903.

59. Bureau of Forestry to Herty, December 26, 1901; Herty to Otto Lubekert, January 20, 1902; Herty to Jno. Powell, February 27, 1903; Mgr., Mutual Life Insurance Company, Atlanta branch, to Herty, May 12, June 15, 1903; Herty to Geo. B. Sudworth, April 20, 1904; Herty to Gifford Pinchot, March 9, 1904.

60. Geo. B. Sudworth to Herty, June 6, 17, 21, 25, July 7, 1902; James G. Newton to Herty, July 8, September 23, 1902, January 1, 1903; Patent Examiner to Herty, September 15, 1902, January 9, 1903; Herty to Commissioner of Patents, January 13, 1903; F. I. Allen to Herty, January 15, 1903; U.S. Patent Office Specification forming a part of Letters Patent granted to Charles H. Herty, February 3, 1903.

61. Gifford Pinchot to Herty, telegram and letter, January 20, 1903; Herty to D. H. McMillan, October [10?], 1902; Herty to Charles K. Weller, November 19, 1902.

62. Herty to Gifford Pinchot, January 23, 1903.

63. *Ibid.*; Gifford Pinchot to Herty, February 4, 1903.

64. Gifford Pinchot to Herty, February 4, 1903.

65. See Herty-Sudworth correspondence, January 4 through April 2, 1904; Gifford Pinchot to Herty, February 20, 22, 1904; Herty to Gifford Pinchot, March 2, 9, 1904.

66. Pat Woolfolk to Herty, March 3, 1904; Frank Klarpp to Herty, April 1, 1904, September 26, 1903; Herty to Frank Klarpp, March 30, 1904.

67. Herty to Frank Klarpp, March 30, 1904; Herty to George B. Sudworth, March 9, 31, April 9, 1904; Geo. B. Sudworth to Herty, April 2, May 7, 1904.

68. Herty to George B. Sudworth, January 16, 1904; Charles Krager to Herty, January 15, 1904; Herty to C. L. Krager, January 19, 1904.

69. Herty to C. L. Krager, January 21, 1904.

70. Herty to C. L. Krager, January 31, 1904; C. L. Krager to Herty, January 22, 1904.
71. C. L. Krager to Herty, January 30, February 3, 1904; Herty to C. L. Krager, February 6, 1904.
72. Herty to J. W. Callahan, February 12, 1904; J. W. Callahan to Herty, February 13, 1904.
73. Herty to C. L. Krager, February 12, 1904; C. L. Krager to Herty, February 15, 1904; Herty to W. C. Powell, February 15, 1904.
74. Minutes of the Board of Directors, Chattanooga Pottery Company, February 23, 1904; C. L. Krager to Herty, February 25, 1904.
75. C. L. Krager to Herty, March 2, 1904.
76. Herty to Gifford Pinchot, March 9, 1904; Herty to Consolidated Naval Stores Company, March 9, 1904; Herty to James Newton, March 9, 1904.
77. Contract with Chattanooga Pottery Company, copy, April 1, 1904; Herty to C. L. Krager, April 18, 1904.
78. Herty to Southern Railroad Company, Seaboard Airline Railroad, Central of Georgia Railroad, and Atlantic Coastline Railroad Co., June 3, 1904; Herty to operators, June 14, 1904; Herty to W. E. Cummer, June 13, 1904; Herty to George Sudworth, June 14, 1904; Herty to A. D. Covington, June 1, 1904; V. H. Power to Herty, June 23, 1904.
79. Herty to Percy Ketchem, October 19, 1904; Wilkinson and Fisher to Herty, January 15, 1904.
80. Ashleigh Moses to Herty, September 27, 1904; Herty to Ashleigh Moses, October 7, 1904; Jas. T. Newton to Herty, October 7, 1904; H. A. McEachern to Herty, October 13, 1904; Herty to H. A. McEachern, October 18, 1904; Herty to Wilkinson and Fisher, October 18, November 16, December 10, 1904, January 10, 1905; Wilkinson and Fisher to Herty, October 20, November 19, December 19, 27, 1904; H. D. Smith to Herty, November 8, 21, December 19, 1904; Herty to H. D. Smith, December 17, 1904; Herty to John Robinson, January 6, March 21, 1905; John Robinson to Herty, January 11, 1905; John Henderson to Herty, November 15, 30, 1904; Herty to operators, November 14, 1904; George Wentworth Carr to Fleming and Fleming, November 23, 1904; Fleming and Fleming to Herty, November 25, 1904; E. L. Vickers to Herty, December 15, 1904; Geo. B. Sudworth to Herty, January 17, February 15, 1905; Herty to Geo. B. Sudworth, January 21, March 21, 1905; C. M. Farber to Herty, March 20, 1905; Herty to C. M. Farber, March 27, 1905.
81. Herty to Messrs. McCaskill and Company, February 20, 1905; E. R. Phillips to Consolidated Land Company, February 22, 1905; Herty to East Coast Lumber Company, March 2, 1905.
82. John Henderson to Herty, February 25, 1905; Jas. Newton to Herty February 28, 1905.

83. Herty to Frank Fleming, March 2, 1905; Herty to East Coast Lumber Company, March 2, 1905; John Henderson to Herty, March 3, 23, 1905; Herty to John Henderson, March 25, 1905; Herty to Jas. T. Newton, March 4, 1905; Herty to E. R. Philips, March 4, April 15, June 5, July 12, 1905; E. R. Philips to Herty, March 7, April 12, May 2, 1905.

84. John Henderson to Herty, June 8, 11, 1904; Rena Bouchelle to Herty, June 11, 1904.

85. Rena Bouchelle to Herty, June 11, 1904; Herty to Geo. B. Sudworth, January 4, 1904; Herty to P. L. Sutherland, June 20, 1904; Herty to James Newton, March 4, 1905; Geo. B. Sudworth to Herty, May 7, 1904; J. B. North to Herty, November 19, 1904; Herty to John Henderson, December 3, 1904, January 27, 1905; Curry Co. to Chattanooga Pottery Company, February 5, 1905; John Henderson to Herty, January 19, 28, 1905.

86. Herty to John Henderson, August 6, 1905; John Henderson to Herty, August 7, 1905.

87. Herty to P. L. Sutherland, August 11, 1905; John Henderson to Herty, August 23, 1905.

88. For the details of these events see C. L. Krager to Herty, June 22, 29, July 9, 25, August 17, 1904; Herty to C. L. Krager, August 2, 1904; Herty, undated note appended to Krager to Herty, August 17, 1904; D. P. Montague to W. F. Coachman, June 25, 1904; W. C. Powell to Herty, July 2, 1904; Herty to W. F. Coachman, July 11, 1904; Herty to John Henderson, July 11, 19, August 11, 1904; John Henderson to Herty, June 8, August 10, 1904.

89. Herty to Geo. B. Sudworth, April 9, 1904, January 2, 1905; Herty to Rena Bouchelle, May 2, 1904; [?] to Herty, April 8, 1904; A. G. Paul to Herty, October 8, 1904; C. Seton Fleming to Herty, November 17, 1904; Herty to H. A. Hodges, May 13, 1905.

90. Herty to Wilkinson and Fisher, August 31, 1904; Will Hooper to Herty, September 9, 1904; James Stoney to Herty, September 11, December 21, 1904; W. F. Coachman to Herty, November 1, 1904; Herty to Joe Poole, December 17, 1904; Herty to Atlantic National Bank, January 3, 1905; Herty to John Henderson, February 2, 1905.

91. Herty to Geo. B. Sudworth, October 10, 1904. See also Herty's correspondence with Sudworth between June and December 1904.

92. Francis P. Venable to Herty, May 25, 28, June 2, 3, July 22, August 19, December 13, 1904, January 7, 12, 28, 1905; Herty to Francis P. Venable, June 1, 15, July 19, August 29, October 19, 1904; Herty to Will Hooper, August 11, 1904; Herty to John Henderson, January 9, 1905; Herty to P. L. Sutherland, December 25, 26 (quotation), 1904.

93. Thomas Gamble, *Gamble's Naval Stores Yearbook for 1929-1930*, 4-9, Box 47, Folder 7; *Gamble's International Naval Stores Yearbook for 1930-1931*, 57-58, Box 47, Folder 8; E. L. Demmon, "Relation of Forest Research to the Naval Stores Industry," June 21, 1929, MS, Box 51, Folder 10; Herty to Thomas L. Waters, March 2, 1928.

CHAPTER 3. THE CHAPEL HILL YEARS, 1905–1916

1. Francis P. Venable to Herty, May 25, 28, 1904.
2. Herty to Francis P. Venable, June 1, 1904.
3. Francis P. Venable to Herty, June 2, 13, 1904.
4. Herty to Francis P. Venable, June 15, July 19, 1904; Herty to John Henderson, July 24, 1904; F. P. Venable to Herty, July 19, 22, August 19, 1904; A. H. Patterson to Herty, July 13, 1904; Will Hooper to Herty, August 5, 1904.
5. Herty to Will Hooper, August 11, 1904; Herty to F. P. Venable, August 29, October 19, 1904.
6. Herty to P. L. Sutherland, December 25, 1904.
7. Herty to Jonathan Henderson, January 9, 1905; Jonathan Henderson to Herty, December 27, 1904, January 10, 1905; Francis Venable to Herty, January 28, 1905.
8. George B. Sudworth to Herty, January 18, March 8, May 10, June 19, 1905; Herty to Geo. B. Sudworth, May 13, 1905; Herty to W. F. Coachman, May 2, 1905.
9. Herty to F. P. Venable, February 21, March 4, June 17, 1905; F. P. Venable to Herty, February 23, March 10, 1905; Herty to F. K. Ball, March 25, April 12, May 5, 13, 25, 1905; F. K. Ball to Herty, March 28, April 14, May 8, 16, 1905; Herty to Frank Fleming, June 30, 1905; Frank Fleming to Herty, July 3, 15, 1905; Herty to Geo. B. Sudworth, June 22, July 23, 1905.
10. Archibald Henderson, *The Campus of the First State University* (Chapel Hill: University of North Carolina Press, 1949), 200; William Meade Prince, *The Southern Part of Heaven* (New York: Rinehart, 1950), 20–23, 29–34; Louis R. Wilson, *The University of North Carolina, 1900–1930* (Chapel Hill: University of North Carolina Press, 1957), 124. More recent histories of the university include Robert Burton Hines, *The Light That Shines* (Chapel Hill, University of North Carolina Press, 1965), and William D. Snider, *Light on the Hill: A History of the University of North Carolina at Chapel Hill* (Chapel Hill: University of North Carolina Press, 1992).
11. For this discussion of Venable's presidency I have drawn heavily on Wilson, *University of North Carolina*, particularly chapters 3, 4, 5, and 8. See esp. pp. 47, 71–75, 115–18, 166–75.
12. *Ibid.*, 59–60, 74–75; R. P. Brooks to Herty, January 21, 1907; Herty to Ulrich B. Phillips, May 1, 13, 1907; Herty to P. L. Sutherland, September 16, 1905; Herty to Chase Palmer, November 12, 1912.
13. Herty to P. L. Sutherland, September 16, 1905; Herty to American Book Company, Henry Holt & Company, John Wiley and Sons, July 14, 1905; Herty to Arthur A. Thomas Co., August 17, 1906.
14. Robert A. Hall to Herty, February 26, 1910 (quotation); Herty to C. W. Martin,

May 24, 1906; Chas. E. Brewer to Herty, May 11, 1909; W. H. Emerson to Herty, May 11, 1909; Gilbert Boggs to Herty, May 12, 1909; B. B. Ross to Herty, May 19, 1909.

15. Herty to Alexander Smith, Frank Cameron, W. D. Bancroft, M. T. Bogert, S. L. Bigelow, T. W. Richards, and A. D. Noyes, May 25, 1910; T. W. Richards to Herty, May 28, 1910; Grinnell Jones to Herty, June 6, 25, 30, 1910; Herty to Grinnell Jones, June 8, 21, 27, 30, 1910; J. M. Bell to W. H. Waggoner, [?], 1910; Herty to J. M. Bell, August 11, 21, 1910; Herty to L. M. Dennis, August 25, 1910.

16. Herty to H. M. McEachern, H. L. Covington, W. C. Jackson, and D. H. McMillan, September 11, 1905; Herty to E. K. Graham, May 17, 1915, May 13, 1916.

17. H. A. McEachern to Herty, September 15, 1905; D. H. McMillan to Herty, September 18, 1905; Herty to J. A. Holloman, October 11, 1905; Herty to A. D. Covington, September 21, October 25, 1906; A. D. Covington to Herty, October 23, 1906; P. L. Sutherland to Herty, April 28, 1907; Herty to P. L. Sutherland, May 1, 1907; Maximillian Toch to Herty, March 26, 1912, March 5, 1913; Herty to General Chemical Company, November 15, 1912; L. H. Baekeland to Herty, December 9, 1913; Herty to Chas. L. Reese, April 28, 1914.

18. Herty to J. E. Mills, July 29, 1905; Charles Baskerville to Herty, November 4, 1905; Emil Borgmann to Herty, April 19, 1907; Herty to H. L. Wells, April 2, 1910; Herty to Victor C. Edwards, March 1, 1913.

19. Herty to Geo. B. Sudworth, May 26, 1908; Herty, Proposal to Reorganize the Curricula for the Degree of Bachelor of Science in the School of Applied Sciences, May 29, 1908; Francis P. Venable to Herty, October 28, November 17, 1909; Herty, Report to the President of the University of North Carolina, 1910; Kemp P. Battle, *History of the University of North Carolina*, Vol. 2 (Raleigh: Edwards and Broughton, 1912), 681; Wilson, *University of North Carolina*, 71–75; F. P. Venable to A. H. Patterson, April 13, 21, 1908; A. H. Patterson to F. P. Venable, April 20, June 2, 1908, University of North Carolina Papers, Southern Historical Collection, University of North Carolina Library, Chapel Hill, North Carolina.

20. Wilson, *University of North Carolina*, 59–60, 155–56; R. H. Battle to Herty, June 7, 1910; Herty to R. H. Battle, June 11, 1910.

21. Wilson, *University of North Carolina*, 169; E. K. Graham to Herty, July 5, 1901; A. S. Wheeler to Herty, June 15, September 18, 1910, April 16, 1911; Herty to A. S. Wheeler, June 27, December 19, 1910, May 6, 1911; Hampden Hill to Herty, August 11, 1910; F. P. Venable to Herty, August 24, 1909, August 8, October 22, 1913, January 17, 1914; Herty to Manning Venable, November 26, 1913; Herty to Chas. S. Venable, December 16, 1913; Herty to F. P. Venable, August 2, 1916; J. M. Bell to Herty, June 27, July [?], 1914.

22. F. P. Venable to Herty, October 22, 1913, January 17, May 18, 1914; R. H. Lewis

to Herty, April 9, 18, May 8, 29, 1914; Herty to R. H. Lewis, April 14, 1914; Victor Bryant to Herty, May 2, 1914. For a full account of the hazing incident, see Wilson, *University of North Carolina*, 156–57.

23. Herty to F. P. Venable, June 3, 1914.

24. Wilson, *University of North Carolina*, 74–75, 168, 251; S. R. Benedict to Herty, September 15, 1905; Maggie Foote to Herty, September 15, 1905; Daisy Allen to Herty, September 3, 1907; Willie T. Byrd to Herty, August 11, 1910; E. K. Graham to Herty, September 25, 1913; M. H. Stacy to Herty, November 4, 1913; J. S. Jarman to Herty, January 17, 1914.

25. Herty to H. P. Battle, February 12, 1906; Herty to Luther Lockhart, March 6, 1906; A. Rufus Morgan to Herty, July 27, 1907; Herty to V. C. Edwards, August 7, 1907; W. T. Bird to Herty, August 11, 1910; Herty to Sam Dickson, January 21, 1911; Herty to Fred Downing, March 23, April 26, May 30, 1912; C. W. Armstrong to Herty, April 14, 1913.

26. Herty to C. L. Miller, August 14, 1906 (quotation); J. R. Harris to Herty, October 12, 1905; Herty to F. B. Carpenter, February 7, 1906; Herty to Mathieson Alkali Works, November 20, 1906.

27. Haywood Knight to Herty, March 13, 1914; Herty to H. L. Wells, March 26, April 14, 1909; Herty to H. P. Talbot, March 26, 1909; Herty to E. J. Newell, October 6, 1911; Herty to Duncan MacRae, February 3, November 26, 1912, May 17, 1913; Duncan MacRae to Herty, March 19, November 20, 1912, May 14, 1913; E. I. du Pont de Nemours Powder Co. to Herty, October 6, 1911; Preston Irvin to Herty, January 17, 1912; Charles S. Williard to Herty, April 12, 1914; Herty to Charles L. Reese, June 3, 1915.

28. Herty to Dr. Richard Lewis, April 1, 1907.

29. Herty to J. R. Harris, January 9, 1910.

30. Fred Stem to Herty, April 27, 1908; Duncan MacRae to Herty, March 19, November 20, 1912; Atherton Seidell to Herty, February 10, 1906; Daisy Allen to Herty, April 22, September 14, 1907.

31. Hampden Hill to Herty, October 16, 1916 (quotation); Herty to Tho. A. Jones, Jr., October 20, 1916.

32. Herty to P. L. Sutherland, September 16, 1905; Herty to Governor M. B. Broward, February 2, 1906; E. M. Coulter to Herty, October 9, 1912; Will Hooper to Herty, March 3, 1906; Herty to P. F. Brock, April 4, 1911; Herty to F. B. Rankin, May 28, 1907; Herty to Hugh Jennings, July 25, 1907; Herty to Frank Sparks, September 28, 1907; Herty to Otis Stockdale, November 18, 1907; Herty to Otis Lamson, December 17, 1908; Herty to Paul Deshiell, November 18, 1909; Herty to Howell Peacock, June 11, 1914; W. A. Withers to Herty, March 30, 1906; Rennie Peale to Herty, March 14, 1907; L. R. Wilson to Herty, n.d., 1913, October 1, 1915; Frank Cameron to Herty, April 17, 1907; Rev. H. P. Dewey to Herty, May 28, June 6, 1906; Dean Andrew A. West to Herty, June 7,

1907; Herty to H. W. Moesta, May 18, 1908; Herty to Geo. Howe, April 16, 1910; Herty to Messrs. C. F. Ross and Co., April 29, 1910, May 9, 1911.

33. George B. Sudworth to Herty, November 16, December 2, 19, 1905, January 10, 19, June 11, October 23, 30, 1906; Herty to Geo. B. Sudworth, November 21, 28, 1905, January 13, February 14, 26, March 23, May 28, June 19, September 3, 15, 1906; Herty to Frank Klarpp, February 13, March 2, April 10, September 3, 1906.

34. Herty to Geo. B. Sudworth, December 15, 1909. For full coverage of the Green Cove Springs experiments see the Herty-Sudworth correspondence for 1907–9. Herty's bulletin appeared in 1911 as *The Relation of Light Chipping to the Commercial Yield of Naval Stores*, Bulletin 90 (Washington, D.C.: U.S. Forest Service, 1911).

35. Herty to Charles Parsons, April 27, 1907; W. A. Noyes to Herty, May 22, 1908; Maurice Bursey, *Carolina Chemists: Sketches from Chapel Hill* (Chapel Hill: Department of Chemistry, University of North Carolina, 1982), 92. Herty continued to work with graduate students on platinum and arsenic compounds at least as late as 1911. See Herty to A. Werner, December 19, 1910, May 13, 1911; Herty to Burton Ray, March 30, 1911; Herty to Charles Parsons, November 15, 1911.

36. Herty to W. D. Hooper, February 7, 1912 (quotation); Herty to *National Provisioner* (trade journal), March 9, 1908; Herty to Messrs. Roessler & Hasslacher, April 23, 1908; Herty to M. S. Harper, May 11, 1908; Herty to L. A. Ransom, May 4, 9, 1908; Herty to Jas. B. Pratt, June 27, July 8, 1908; Herty to Librarian of Congress, July 22, 1908; James B. Pratt to Herty, June 5, 1908; Cotton Seed Crushers Assoc. of Georgia to Herty, June 11, 1908; Geo. A. Gardner to Herty, June 15, 1908; Vladimir P. Polevay to Herty, February 27, 1909; Nippon Menkwa Kabushiki Kaisha [Japan Trading Co., Hankow, China] to Herty, September 3, 1908; Charles Herty, *Per Cent Tables for Oil in Cottonseed Products, with Method of Analysis* (Chapel Hill: University of North Carolina Press, 1908).

37. Herty to Geo. B. Sudworth, March 7, April 3, 1907; Richard K. Meade to Herty, January 10, May 2, 1907; Herty to J. A. Holloman, April 22, 1907; C. P. Dusenberg to Herty, April 23, 1907; Herty to R. H. Edmonds, April 22, 1907; Herty to Richard Meade, May 3, 1907; Maximillian Toch to Herty, May 6, 14, 1907; Herty to W. A. Noyes, June 9, 1907; Herty, Annual report to UNC President F. P. Venable, December 11, 1909; Herty to C. L. Parsons, January 8, 1910, July 23, 1915; M. C. Whitaker to Herty, September 8, 1913; Herty to Benjamin Brooks, April 5, 1915. For a fairly complete bibliography of Herty's published scholarly work, see Cameron, "Charles Holmes Herty," 1619–24.

38. Herty to Professor A. Tschirch, December 11, 1906, January 17, 1907; Herty to C. A. Howell, E. B. Wilcoxon, and G. C. Long, January 17, 1907; Herty to Frank Klarpp, October 25, 1907; Herty to Geo. B. Sudworth, December 13, 16, 1907; Herty, "The Turpentine Industry in the Southern States," 360–62.

39. Gerry found plenty of secondary or pathological ducts on older specimens but

“never in a position to indicate their formation as a result of a preliminary streak.” Herty to George Sudworth, May 15, 1916.

40. Herty to Howard Weiss, May 27, 1916. See also Herty’s correspondence with Eloise Gerry between 1926 and 1928.

41. Herty to Otto N. Witt, January 26, 1912; Otto Witt to Herty, June 17, 1912; Herty to W. F. Coachman, July 9, 1912.

42. For the Herty–A. D. Little, Inc., correspondence on papermaking, see V. E. Nunez to Herty, October 1, 1913; Herty to V. E. Nunez, October 9, 1913; A. D. Little to Herty, October 30, 1913. For Coachman’s scheme see Herty to W. F. Coachman, June 29, July 30, October 15, November 23, 1915; Herty to Professor M. Vezes, July 30, 1915; Herty to A. D. Little, July 30, 1915; A. D. Little to Herty, October 16, 1915. See also Herty correspondence with Jackson Townsend, July 30–November 15, 1915.

43. Battle, *History of the University of North Carolina*, 2:742; Wilson, *University of North Carolina*, 112–14; R. M. Bird to Herty, January 16, 1915; Herty to Maximillian Toch, March 8, 1913; Herty to R. M. Bird, February 16, 1915. See also George Brown Tindall, *The Emergence of the New South, 1913–1945* (Baton Rouge: Louisiana State University Press, 1967), 266.

44. Herty to W. H. Pegram, March 13, 1906; C. L. Parsons to Herty, August 19, October 22, 1907; Herty to L. O. Howard, January 14, July 22, 1908; Herty to J. F. Hotz, February 6, 1906; S. E. Carr to Herty, May 22, July 6, 1906; Herty to S. E. Carr, July 16, 1906, December 9, 1937, Box 124, Folder 7; M. Vezes to Herty, May 27, 1910; Herty to Treasurer, Société Chimique de France, October 23, 1935, Box 125, Folder 7; Herty to W. D. Bancroft, February 25, 1909; Herty to J. L. Howe, March 18, 1909; W. R. Whitney to Herty, April 26, 1909; Herty to A. D. Little, March 6, 1912; Herty to J. McK. Cattell, April 4, 1912; J. McK. Cattell to Herty, April 6, 1912; Herty to Isaac F. Harris, December 18, 1912.

45. R. B. Owen to Herty, May 27, October 7, 1913, April 23, August 23, 1915; Herty to R. B. Owen, May 31, 1913, May 8, June 7, 1915, Folder 20, Box 124; Washington Academy of Sciences to Herty, January 15, 1914; Marston Bogert to Herty, December 30, 1916; John Dewey and A. O. Lovejoy to Herty, November 17, 1914; Herty to Marston Bogert, January 16, [1917]; Herty to O. A. Lovejoy, December 14, 1914; Herty to Moravian Brotherhood, January 10, 1912; Herty to Maximillian Toch, February 10, 1907; Maximillian Toch to Herty, April 27, 1907; Leo H. Baekeland to Herty, May 3, 1907; Herty to Leo H. Baekeland, May 8, 1907; Herty to Richard Meade, April 24, 1907; McGraw-Hill Book Company to Herty, August 21, 1911; Herty to McGraw-Hill Book Company, August 21, September 15, 1911; John Wiley & Sons, Incorporated, to Herty, October 5, 1916; Herty to John Wiley & Sons, October 9, 1916; Herty to Walter B. Hill, December 15, 1905; Frank Cameron to Herty, May 8, 1911; Herty to Frank Cameron, May 13,

1911; Howard Weiss to Herty, April 7, 1914; Herty to Howard Weiss, April 23, 1914; W. A. Ragan to Herty, January 21, 1916; Herty to W. A. Ragan, January 26, 1916; William H. Walker to Herty, September 8, 1916; Edwin A. Alderman to Herty, October 14, 23, 1916.

46. John Powell to Herty, May 20, June 27, 1907; Herty to John Powell, May 28, 1907; Herty to Cary B. Townsend, August 28, September 6, 27, 1907; Cary B. Townsend to Herty, July 2, September 2, 16, 1907; C. P. Dusenbury to United States Forest Service, May 12, 1908.

47. For the vast amount of correspondence affecting Herty's relations with the Chattanooga Pottery Company and its successors, as well as the several patent challenges, see Boxes 42-45, especially the correspondence with P. L. Sutherland, J. G. Boyd, Frank Fleming, Arthur Perry, James T. Newton, and Wilkinson, Fisher, Witherspoon and Mackay, Attorneys.

48. Herty to Chattanooga Pottery Company, April 23, 1906; Herty to Edw. G. Trenholm, November 17, 1906; Edw. G. Trenholm to Herty, December 17, 1906; J. A. Cranford to Herty, April 12, 1907; John H. Powell to Herty, February 9, 1906; Herty to Arthur Perry, February 25, December 14, 1907, December 15, 1908, March 4, 1909; Arthur Perry to Herty, January 25, April 8, May 14, 1907, February 15, March 8, 1909. After 1910 Consolidated held 1,538 shares, Herty owned 548, P. L. Sutherland held 296, and everyone else held 100 or less. Penciled note on back of Herty Turpentine Cup Company Statement, 1910; Herty to Julian Boyd, September 22, 1911; Julian Boyd to Herty, September 25, 1911; Herty Turpentine Cup Company Statements 1910, 1911, 1912, 1913; Julian Boyd to Herty, December 5, 1912; Frank Cameron to Herty, December 10, 1914 (first quotation); Herty to Arthur Perry, February 19, 1915 (second quotation).

49. Herty to P. L. Sutherland, January 19, 1906; Herty to John Henderson, January 26, 1906; Herty correspondence with W. F. Coachman and the Naval Stores Export Company between October 24, 1905, and July 27, 1907; Herty correspondence with McIntosh Mills of Newnan, Georgia, and T. W. Goodrum of Newnan, Georgia, June 5, 1906, through October 15, 1913; Herty correspondence with S. W. Sparger, May 10, 1906, through December 1, 1908; Herty to C. C. McDonald, March 20, 1912; Arthur Perry to Herty, October 4, 1906, May 18, 1911; W. A. Redding to Herty, January 10, April 8, June 29, 1907; Herty to Arthur Perry, April 10, October 9, 1907, April 21, May 13, 1911; Herty correspondence with Paul Schenck, January 18, 1910, through December 8, 1911; Herty to Southern Life and Trust Company (brokers), June 1, 1908, October 12, 1909, May 23, 1912; Hunter Mfg. and Commission Company to Herty, June 30, December 31, 1908; Herty to Charles Baskerville, February 1, 1906; J. C. MacRae to Herty, May 20, 1910; Herty to Registrar of Deeds, Orange County, North Carolina, June 8, 1910; R. L. Strowd to Herty, February 12, 1913; Duke Land Co. to J. B. Mason, April 10, 1910; Geo. B. Stephens to Herty, October 17, 1914.

50. Herty to P. L. Sutherland, September 30, 1905, January 13, 1906; W. J. Hillman to Herty, October 19, 1905; Herty to Odell Hardware Co., October 16, 1905, March 7, 1906; Herty to J. C. Edwards, May 24, 1906; E. T. Burrowes to Herty, December 17, 1908; Herty to Carlton Buessee, August 3, 1906; Herty to Geo. W. Baekeland, October 22, 1910.

51. Herty to R. W. Hogue, September 18, 23, October 15, 1908; Herty to Bishop J. G. Cheshire, May 12, 1912; Herty, Subscription Letter for Building Fund, March 15, 1913; Reginald Mallet to Herty, September 9, 1913; Executive Committee of Laymen's Committee to Charles Herty, May [?], 1910.

52. Sidney Bost to Herty, October 5, 1911; J. J. Wilkins to Herty, June 6, 1911; Herty to General Clergy Relief Pension Fund, October 10, 1911; Herty, Reporting Form for Laymen's Committee on the Promotion of the General Clergy Relief Pension Fund in North Carolina, January 21, 1913; Alfred J. P. McClure to Herty, January 24, May 29, 1913, January 22, 1914; Herty to Alfred J. P. McClure, March 14, May 20, November 26, 1913; [A. J. P. McClure?], Official Report and Statement of Pension and Relief of Clergy, Widows and Orphans for North Carolina, [May] 1913; Joseph B. Cheshire to Herty, May 26, 1913; Herty to Finley L. Williamson, October 25, 1913; Herty, Form Letter to Clergy, October 31, November 13, 1913; Herty to Ed. S. Seeman, November 22, 1913; Herty to S. Alston Wragg, April 23, 1914; Monell Sayre to Herty, March 17, May 21, 1915, January 29, March 15, April 13, May 5, 1916; Herty to Monell Sayre, May 27, 1915, May 8, 1916.

53. Herty to Standard Underground Cable Co., July 20, 1908; Herty to Sumter Telephone Co., July 29, 1908; Herty to Southern Bell Telephone Co., February 25, 1909; Herty to Western Electric Co., March 12, 1909; Herty to M. B. Spier, October 18, 1909, January 25, 28, 1910; Agreement to sell Chapel Hill Telephone Company, August 26, 1912.

54. R. H. Sykes to Herty, December 18, 1906; Bank of Chapel Hill to Herty, July 6, 1907; Herty to Paul Schenck, April 26, 1909.

55. Herty to B. C. Black, April 25, 1910; Herty to Town Clerk, Greensboro, North Carolina, May 6, 1910; Herty to M. H. Stacy, October 7, 1910; Herty to Editor, *Chapel Hill News*, January 30, 1911; Herty to Stephens Lithographing & Engraving Co., May 9, 1911; Herty to Dr. Isaac Harris, March 15, 1912; Joseph Hyde Pratt to Herty, January 13, 1913; A. S. Wheeler to Herty, March 13, 1916; [?] to Herty, July 27, 1916.

56. N. W. Walker to Herty, November 16, December 15, 1908, November 30, 1910; Herty to N. W. Walker, November 22, 1908, October 24, 1916; W. E. Lindsay to Herty, November 21, 1915; Frank Herty interview, May 11, 1977.

57. J. G. de Roulhac Hamilton to Herty, August 1, 1906, August 21, 1908; Herty to J. G. de Roulhac Hamilton, September 3, 1906, August 26, 1908; Will Hooper to

Herty, January 11, 1909; Herty to Will Hooper, January 14, 1909; Herty to R. W. Hogue, June 28, 1912.

58. Marwood Roberts to Herty, May 13, 1907, March 14, October 2, 1910; Herty to Mrs. R. W. Roberts, February 9, March 17, October 10, 1910; Florence I. Holmes to Herty, August 4, 1905, January 22, 1906, May 31, 1910, June 16, July 27, 1914; Mary M. Hill to Herty, July 1, 1906; Herty to F. P. Drane, July 30, 1906; Herty to W. D. Hooper, December 18, 1906, February 15, 1912; W. D. Hooper to Herty, December 12, 1906, May 1, 1912, November 23, 1916.

59. Frank Herty interview, May 11, 1977; Chas. Baskerville to Herty, May 10, 1905; Herty to D. H. Hamilton, April 13, 1907; Herty to [?] Seed Company, February 4, 1908; J. N. Lay to Herty, November 23, 1913; Herty to W. H. Bockock, March 20, 1907; Herty to D. E. Williams, July 24, 1905; Herty to Southern Railway agent, Chapel Hill, North Carolina, July 25, 1905; Herty to T. J. Fraley, August 26, 1905; Herty to J. J. Hooper, September 30, 1905; Royal Borden Furniture Co. to Mrs. C. H. Herty, July 26, 1905; W. H. Hughes to Mrs. C. H. Herty, October 10, 1905; Oriental Rug Co. to Mrs. C. H. Herty, October 13, 1905, January 28, 1909; Herty to Mead Cycle Co., October 24, 1908, September 20, 1912; John Wanamaker to Mrs. C. H. Herty, November 27, 1908; H. A. Gaskins to Herty, February 1, 1910; Herty to H. A. Gaskins, February 5, 1910; Herty to Messrs. Dulin and Martin, February 8, 1910; Herty to Minch and Eisenbrey, October 18, 1911; T. J. Lambert Clothiers to Herty, April 2, 1913; W. M. Dye to Herty, June 28, 1912; Herty to W. M. Dye, July 8, 1912; John H. Magruder Fine Groceries and Wines to Herty, February 7, 1914; Herty to Gosman Ginger Ale Co., March 19, 24, May 9, June 14, 1910; Herty to Jno. Reese, August 28, 1907; Herty to Hubert Royster, December 26, 1910; Herty to W. C. Woodward, Jr., December 26, 1907; La Reforma Cigar Factory to Herty, August 31, 1908; E. A. Kline Co. to Herty, October 25, 1911; Herty to Macmillan Co., October 27, 1906; Herty to D. C. Heath, September 5, 1908; Harper Bros. to Herty, January 25, 1907; Herty to Harper Bros., March 29, 1910; Herty to *Washington Post*, September 10, 1910; Herty to *New York Times*, October 17, 1912, November 15, 1915; Herty to *Raleigh News and Observer*, February 17, 1913; Herty to *Manufacturers' Record*, January 24, 1916; Herty to S. S. McClure Co., November 16, 1908; *The Outlook* to Herty, February 27, 1909; Herty to G. E. Steichert & Co., March 9, 1910, April 9, 1912.

60. Herty to Gilbert Boggs, May 18, 1910; Herty to State of North Carolina, May 19, 1910; Herty to Rambler Automobile Co., May 20, 1911; Prince, *Southern Part of Heaven*, 244–45; Sophie Herty to Herty, July 6, 7, 1910; Caroline Sosnowski to Herty, July 8, 1910.

61. Herty to Rambler Automobile Co., September 18, 1911; Herty to Thomas Jeffrey Co., August 31, October 5, 12, 28, December 18, 1912; Herty to Fritz Schlock, February 14, March 17, 1913; Fritz Schlock to Herty, February 21, March 2, May 18, 1913.

62. Herty to Frank P. Morton, June 20, 1906; Herty to Tine Piner, June 20, 1906; Herty to Frank Drane, July 16, 1906; Herty to Geo. B. Sudworth, August 28, 1907; Charles Venable to Mrs. F. P. Venable, [July 3, 1907], F. P. Venable to Mrs. F. P. Venable, July 3, 7, 1907, Francis P. Venable Papers, Southern Historical Collection, University of North Carolina; Herty to Old Dominion Steamship Lines, August 3, 1908; Herty to Fred Stem, August 25, 1908; Herty to D. H. Winter, June 14, September 3, 1909; Herty to H. S. Leard, December 12, 1910; Herty to Daniel L. Dovall, December 16, 1910; Herty to M. S. Rodriguez, December 16, 1910; Herty to J. E. Teeple, September 20, 1911; Herty to Maximillian Toch, September 20, 1911; Herty to Cunard Steamship Co. Baggage Department, September 30, 1911; Herty to J. M. Bell, August 2, 1913; Callie Sosnowski to Herty, July 8, 1913; Herty to C. L. Parsons, August 2, 1913; Herty to Emma Long, May 28, 1913; Herty to J. A. Brewster, March 24, 1915; Herty to Frank Clark, March 23, 1916; Frank Herty interview, May 11, 1977.

CHAPTER 4. HERTY AND THE AMERICAN CHEMICAL SOCIETY

1. For the history of the American Chemical Society, see Charles A. Browne, ed., *A Half Century of Chemistry in America, 1876–1926* (Easton, Pa.: American Chemical Society, 1926), and Charles Albert Browne and Mary Elvira Weeks, *A History of the American Chemical Society* (Washington, D.C.: American Chemical Society, 1952).

2. Browne and Weeks, *History of the American Chemical Society*, 48, 50–51.

3. *Ibid.*, 510.

4. Wyndham D. Miles, ed., *American Chemists and Chemical Engineers* (Washington, D.C.: American Chemical Society, 1976), 382–83; “Proceedings of the American Chemical Society for the Year 1907,” *Journal of the American Chemical Society* 29, pt. 2 (1907): 70; C. L. Parsons to Herty, July 17, August 19, 1907; Herty to C. L. Parsons, July 20, August 1, 1907; William McMurtrie to Herty, July 27, 1907. Hereafter the “Proceedings” of the American Chemical Society, contained in the annual volumes of the *Journal of the American Chemical Society*, will be cited as “Proceedings,” *JACS*, followed by the appropriate volume, date, and page number.

5. Charles Parsons to Herty, October 22, November 25, 1907.

6. Charles Parsons to Herty, October 6, November 25, 1909, December 7, 1910; Herty to Charles Parsons, December 9, 1910; Herty to H. E. Howe, January 1, 191[4]; Miles, *American Chemists and Chemical Engineers*, 300–301, 444–45.

7. Herty to Alexander Smith, August 27, 1910; Herty to L. H. Baekeland, August 27, 1910; Herty to E. C. Franklin, August 27, 1910; Herty to S. W. Young, August 27, 1910.

8. H. E. Howe to Herty, October 6, 1913; Frank Cameron to Herty, November 8, 1913;

Charles L. Parsons to Herty, November 29, December 20, 1913; Herty to T. W. Richards, January 10, 1914; T. W. Richards to Herty, January 12, 1914; Wilder Bancroft to Herty, February 12, 1914.

9. Charles Venable was the son of Francis P. Venable, president of the ACS in 1905. Duncan MacRae to Herty, January 10, 1915; Charles Parsons to Herty, December 22, 1914, November 23, December 21, 1915; A. D. Little to Herty, January 7, 1915; W. D. Bancroft to Herty, January 7, 1915; Edgar Fahs Smith to Herty, January 22, 1914; Will Hooper to Herty, December 31, 1914; "Proceedings," *JACS* 37 (January–June 1915): 1; "Proceedings," *JACS* 38, pt. 2 (1916): 1, 11.

10. Herty to Charles Parsons, December 22, 1914; T. W. Richards to Herty, January 1, 1915.

11. B. P. Caldwell to Herty, March 1, 1915; Herty to H. E. Howe, July 10, October 19, 1915; H. H. Tozier to Herty, September 2, 1915; Edward Johnson to Herty, September 5, 1915; Herty to Lewis Saunders, November 1, 1915; Herty to E. K. Graham, November 16, 1915.

12. Herty to Allan Rogers, January 6, 1916; Albert Bolenbaugh to Herty, February 17, 1916; President, University of Michigan Chemical Honorary Society to Herty, February 17, 1916; Leon W. Parsons to Herty, March 6, 1916; Herty to H. W. Rhodehamel, March 20, 1916; Herty to Charles Parsons, April 11, 1916; J. Merritt Matthews to Herty, April 4, 1916.

13. William Jennings Bryan to Herty, February 12, 1915; B. C. Hesse to Herty, May 25, 1916; Herty to G. Oakley, October 21, 1916; L. H. Baekeland to Herty, May 22, 1916; A. D. Little to Herty, June 5, 1915; Herty to Charles Parsons, January 29, February 14, 1915; Charles Parsons to Herty, February 16, April 8, 1915; "Proceedings," *JACS* 37 (July–December 1915): 67, 73–74, 77, 81; Miles, *American Chemists and Chemical Engineers*, 508–9; Browne and Weeks, *History of the American Chemical Society*, 109.

14. Geo. Lang to Herty, June 28, 1915; Geo. Lang to Parsons, June 28, 1915; Lewis B. Allyn, "Your Child and the Soda Fountain," *Ladies World*, clipping, June 15, 1915.

15. J. A. Bridgman to Council of ACS, July 28, 1915; Charles Parsons to Herty, June 30, 1915; Herty to Geo. Lang, Jr., July 10, 1915; Arthur D. Little to Herty, July 16, 1915; W. D. Bigelow to Herty, September 22, 1915; Herty to Marston T. Bogert, September 27, 1915; M. T. Bogert to Herty, October 2, 1915; Herty to Julius Stieglitz, January 5, 1916; Julius Stieglitz to Herty, January 8, February 22, 1916.

16. Frank R. Eldred to Herty, February 28, 1916.

17. Julius Stieglitz to Herty, March 19, 28, April 8, 1916; Herty to Julius Stieglitz, March 23, 1916.

18. Julius Stieglitz to Herty, April 8, 1916; "Proceedings," *JACS* 38, pt. 2 (1916): 72–74.

19. Edwin T. Layton, Jr., *The Revolt of the Engineers: Social Responsibility and the American Engineering Profession* (Cleveland, Ohio: Case Western Reserve University, 1971), 1–19.

20. H. W. Wiley, quoted in Browne and Weeks, *History of the American Chemical Society*, 68–69. See also *ibid.*, Table 1, p. 50.

21. Joseph W. Richards, quoted in Browne and Weeks, *History of the American Chemical Society*, 70–71. For a full account of the problems faced by the American Chemical Society in dealing with specialization in the profession, see *ibid.*, esp. chap. 6. See also Herman Skolnik and Kenneth M. Reese, eds., *A Century of Chemistry: The Role of Chemists and the American Chemical Society* (Washington, D.C.: American Chemical Society, 1976), 12–14. For similar arguments between pure and applied or technical scientists in other disciplines, see Daniel Kevles, *The Physicists* (New York: Knopf, 1978), 46–47.

22. Browne and Weeks, *History of the American Chemical Society*, 72, 74–78; “Proceedings,” *JACS* 28 (1906): 52–58. See also Layton, *Revolt of the Engineers*, 40–41.

23. Browne and Weeks, *History of the American Chemical Society*, 78–80, 83–85; Skolnick and Reese, eds., *Century of Chemistry*, 102, 104; “Proceedings,” *JACS* 29, pt. 2 (1907): 70; “Proceedings,” *JACS* 30, pt. 2 (1908): 9, 23, 79; “Proceedings,” *JACS* 31 (1909): 13.

24. Browne and Weeks, *History of the American Chemical Society*, 84–85; Charles Parsons to Herty, November 25, 1907; Marston Bogert to Herty, October 25, 1908; Herty to Marston Bogert, October 29, 1908.

25. “Proceedings,” *JACS* 31 (1909): 13.

26. American Chemical Society, *Report of Committee on Business Management*, June 1914, Box 121, Folder 21.

27. *Ibid.*; W. A. Noyes to T. W. Richards, November 4, 1914.

28. Extract of minutes, Board of Directors meeting, April 1915 (copy); Charles Parsons–William Brady correspondence (copies), May–June 2, 1915; D. K. French to Herty, July 14, 1915; Herty to D. K. French, July 10, 19, 1915; L. I. Shaw to Herty, December 10, 1915; Herty to L. I. Shaw, December 18, 1915.

29. Charles Parsons to Herty, September 15, 1916; Gilbert N. Lewis to Herty, September 19, 1916; Herty to Gilbert N. Lewis, October 9, 1916.

30. M. C. Whitaker to Charles Parsons, December 3, 1915; A. D. Little to Councillors, November 23, 1910; “Proceedings,” *JACS* 33 (January–June 1911): 1, 37–38; “Proceedings,” *JACS* 35 (January–June 1913): 7; Skolnick and Reese, *Century of Chemistry*, 102; Browne and Weeks, *History of the American Chemical Society*, 89–93, 370, 372.

31. M. C. Whitaker to Herty, December 3, 1915; Herty to M. C. Whitaker, December 6, 1915; Minutes (copy), Board of Directors meeting, December 11, 1915; Charles Parsons to Herty, December 14, 1915.

32. Charles Parsons to Herty, February 23, June [?], 1916; W. A. Noyes to Herty, May 24, 1916; Herty to W. A. Noyes, May 26, 1916; Herty to Charles Parsons, June 21, 1916.

33. Herty to A. D. Little, July 23, 1916; H. E. Howe to Herty, July 27, 1916; Charles Parsons to Herty, August 11, 1916; W. A. Noyes to Herty, August 16, 26, 1916; Herty to W. A. Noyes, August 30 (quotation), 22, 1916.

34. M. C. Whitaker to Charles Herty, December 3, 1915, July 17, 25, 1916; Ellwood Hendrick to Herty, July 17, 1916; Herty to M. C. Whitaker, July 19, 1916.

35. W. A. Noyes to Herty, September 7, 1916; M. C. Whitaker to E. G. Love, September 8, 1916; Herty to W. A. Noyes, September 13, 1916.

36. Herty to Edwin A. Alderman, October 17, 1916; John W. Servos, "The Industrial Relations of Science: Chemistry at MIT, 1900–1939," *Isis* 71 (December 1980): 535–36; Wm. H. Walker to Herty, September 15, 1916; H. P. Talbot to Herty, September 15, 1916.

37. Charles Parsons to Herty, September 19, 1916; Herty to H. P. Talbot, September 22, 1916; Herty to W. H. Walker, September 22, 1916.

38. "Proceedings," *JACS* 38, pt. 2 (July–December 1916): 113–16; M. C. Whitaker, "The Future of the Industrial Journal," copy, September 27, 1916; Browne and Weeks, *History of the American Chemical Society*, 112–13.

39. "Proceedings," *JACS* 38, pt. 2 (July–December 1916): 108; George MacNider to Herty, October 1, 1916; R. H. Thornton, interview with Charles Holmes Herty, unidentified newspaper clipping, October 7, [1916].

40. Charles F. Roth to Herty, April 23, 30, 1915; Herty to Charles F. Roth, May 5, 1915; Marston L. Hamlin, "Why Not a Chemical Show?" *JIEC* 7 (March 1915): 179 (quotation).

41. Quoted in National Exposition of Chemical Industries brochure, September 20, 1915; *JIEC* 7 (June 1915): 549; Browne and Weeks, *History of the American Chemical Society*, 111.

42. *JIEC* 7 (December 1915): 1083; Herty to Charles Roth, October 7, 1915; Adriaan Nagelvoort to Herty, November 14, 17, 1915.

43. Herty to Charles Parsons, January 29, 1915; Charles Holmes Herty, "President's Address," *JIEC* (May 1915): 371–73; Browne and Weeks, *History of the American Chemical Society*, 505.

44. R. H. Edmonds to Herty, July 8, 29, August 1, 4 (wire), September 16, October 13, 1916; Herty to R. H. Edmonds, July 8, 20, August 1, 14, October 9, 1916; Herty to A. D. Little, August 4, 1916; A. D. Little to Herty, August 6, 1916; Adriaan Nagelvoort to Herty, August 4, 1916; R. H. Edmonds to E. K. Graham, September 16, 1916.

45. George Brown Tindall, *America: A Narrative History* (New York: Norton, 1984), 950–55. For a good account of the subject, see John Patrick Finnegan, *Against the Specter*

of the Dragon: *The Campaign for American Military Preparedness, 1914–1917* (Westport, Conn.: Greenwood Press, 1974).

46. Josephus Daniels, press release, July 13, 1915; Josephus Daniels to Herty, July 19, 1915; Herty to Josephus Daniels, August 18, 1915; Van H. Manning to Herty (wire), July 21, 1915; Chas. Parsons to Herty, July 26, August 6, 1915; L. H. Baekeland to Herty, August 2, 1915. See also Kevles, *The Physicists*, 105–7.

47. Thomas Robbins to Herty, January 4, 5, 14, 1916; Herty to Thos. Robbins, January 5, 18, 1916; Woodrow Wilson to Herty, January 13, 1916; Herty to Woodrow Wilson, January 18, 1916. A former president of the Society of Automotive Engineers, Howard Coffin was vice-president of the the Hudson Motor Car Company. See Finnegan, *Specter of the Dragon*, 116. See also Kevles, *The Physicists*, 108–9; David F. Noble, *America by Design: Science, Technology and the Rise of Corporate Capitalism* (New York: Knopf, 1977), 149.

48. B. C. Hesse to Herty, January 26, 1916.

49. Charles Parsons to Herty, February 14, March 29, April 10, 26, 1916; *New York Evening Sun*, April 6, 1916.

50. Haber, *Chemical Industry*, 190.

51. Wm. H. Nichols, “The War and the Chemical Industry,” *JIEC* 7 (February 1915): 132; Skolnick and Reese, *Century of Chemistry*, 147; Haber, *Chemical Industry*, 205.

52. Charles Herty, “Cooperation in Matters Chemical,” *JACS* 37 (October 1915): 2242; “Proceedings,” *JACS* 37 (July–December 1915): 83.

53. Josephus Daniels to W. R. Whitney, October 18, 1915; Tindall, *America*, 953–56; Finnegan, *Specter of the Dragon*, esp. chaps. 8 and 9.

54. A. A. Noyes to Herty, May 17, 1916; “Nitrate Supply Committee Recommendations on Synthetic Nitric Acid for the Government with Reports on Various Methods,” reprint, *JIEC* 9 (September 1917): 829. The Hale referred to was George Hale of the Mount Wilson Observatory, Pasadena, California.

55. Skolnick and Reese, *Century of Chemistry*, 146; L. H. Baekeland to Herty, May 19, 1916. See also Kevles, *The Physicists*, 5, 111–12, and Noble, *America by Design*, 150–52.

56. Arthur A. Noyes to Herty, May 23, 1916; Herty to Arthur A. Noyes, May 26, 1916; Wm. H. Welch to Herty, May 24, 1916; Herty to Wm. H. Welch, May 25, 1916.

57. Herty to Charles Parsons, May 30, 1916, C. L. Parsons to Board of Directors, May 25, 1916; Charles Parsons to Herty, May 27, 29, 1916.

58. Herty to A. A. Noyes, June 13, 23, 1916; A. A. Noyes to Herty, June 18, 1916.

59. Charles Parsons to Herty, L. H. Baekeland, and W. R. Whitney, June 20, 1916; Leo H. Baekeland to Charles Parsons, July 17, 1916; Herty to Charles Parsons, July 14, 1916; “Proceedings,” *JACS* 38, pt. 2 (July–December 1916): 70.

60. Charles Parsons to Herty, L. H. Baekeland, and W. R. Whitney, July 14, 1916;

A. A. Noyes to Charles Parsons, July 15, 1916; A. A. Noyes to Herty, September 25, 1916; Skolnick and Reese, *Century of Chemistry*, 146; A. Hunter Dupree, *Science in the Federal Government* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1957), 308–15. See also Kevles, *The Physicists*, 111–16, and Noble, *America by Design*, 151–53.

61. Charles Parsons to Herty, July 21, 1916; Charles Parsons to A. A. Noyes, July 22, 1916.

62. Arthur A. Noyes to Herty, September 16, December 21, 1916; Report to the Secretary of War by the Committee on Nitrate Supply of the National Academy of Sciences [1916]; Herty to A. A. Noyes, November 11, 1916; “Nitrate Supply Committee Recommendations on Synthetic Nitric Acid for the Government with Reports on Various Methods,” reprint, *JIEC* 9 (September 1917): 829, 830, 832; R. H. Edmonds to Herty, May 18, 1916; L. H. Baekeland to Herty, June 12, 1916; L. H. Baekeland to [?] Berolzheimer, June 12, 1916; H. H. Dow to W. R. Whitney, December 22, 1916; A. W. Smith to Herty, December 16, 1916; copies of Frank S. Washburn to L. H. Baekeland, December 29, 1916, January 4, 1917, included in L. H. Baekeland to Herty, January 5, 1917; Herty to Charles Parsons, January 11, 1917.

63. “Nitrate Supply Committee Recommendations on Synthetic Nitric Acid for the Government with Reports on Various Methods,” reprint, *JIEC* 9 (September 1917): 829–841. See also Report presented to the Secretary of War by the Committee on Nitrate Supply of the National Academy of Sciences, copy, 1916, and Williams Haynes, *American Chemical Industry, A History*, 6 vols. (New York: D. Van Nostrand, 1945–54), 2:95–96.

64. “Nitrate Supply Committee Recommendations on Synthetic Nitric Acid for the Government with Reports on Various Methods,” reprint, *JIEC* 9 (September 1917): 829–41; Haber, *Chemical Industry*, 205.

65. Proceedings of the Nitrate Supply Committee, copy, May 11, 1917; Report Presented to the Secretary of War by the Committee on Nitrate Supply of the National Academy of Sciences, copy, [?], 1916; Herty to Charles Parsons, July 12, August 21, 23, 1917; Charles Parsons to Herty, July 13, August 21, 22, 1917; Col. J. W. Joyes to Herty, August 22, 1917; Herty to Col. J. W. Joyes, August 23, 1917.

66. Charles Parsons to Herty, August 22, 1917; Haynes, *American Chemical Industry*, 2:89–90, 94–96. Parsons’s recollection appears as a note on page 94.

67. Haynes, *American Chemical Industry*, 2:96–109, 112; Haber, *Chemical Industry*, 205–6. For what became of the government nitrate plants and Wilson Dam, its unfinished hydroelectric project on the Tennessee River, see Preston J. Hubbard, *Origins of the TVA: The Muscle Shoals Controversy, 1920–1932* (Nashville: Vanderbilt University Press, 1961).

68. Tindall, *America*, 949–50; Frank Freidel, *America in the Twentieth Century* (New York: Knopf, 1960), 168–70; William E. Leuchtenburg, *The Perils of Prosperity, 1914–32* (Chicago: University of Chicago Press, 1958), 16–17; Herty to Frank Cameron, Decem-

ber 5, 1914. U.S. exports to Britain and France equaled \$754 million in 1914 and by 1916 had skyrocketed to \$2.75 billion (Thomas G. Paterson, J. Garry Clifford, and Kenneth J. Hagan, *American Foreign Policy: A History* [Lexington, Mass.: D. C. Heath, 1977], 266).

69. Herty to W. Lash Miller, July 19, 1915 (quotation); W. Lash Miller to Herty, July 10, 1915; Charles Parsons to Herty, May 8, 1915; Herty to Directors of the American Chemical Society, April 6, May 17, 1915; Wm. J. Wohlleben to Herty, June 7, 1915; W. H. Bowker, "The Agricultural Industries," *JIEC* 7 (January 1915): 59–61; Arthur D. Little, "The Dyestuffs Situation and Its Lesson," *JIEC* 7 (March 1915), 239; Haber, *Chemical Industry*, 174–75, 177, 179; Haynes, *American Chemical Industry*, 3:281.

70. "Recommendations of the New York Section of the American Chemical Society on the Enlargement of the Coal Tar Chemical Industry in the United States," *JIEC* 6 (December 1914): 972–73.

71. Haber, *Chemical Industry*, 185; Haynes, *American Chemical Industry*, 3:211, 229.

72. Charles Holmes Herty, "Cooperation in Matters Chemical," *JACS* 37 (October 1915): 2231–46.

73. *Ibid.* See also Bernard Baruch, *American Industry in the War: A Report of the War Industries Board* (Washington, D.C.: U.S. Government Printing Office, 1921), 192.

74. "Proceedings," *JACS* 37, pt. 2 (July–December 1915): 83–84; Herty to President Woodrow Wilson, September 24, 1915.

75. Herty to Thomas Norton, August 7, 16, 1915; Thomas Norton to Herty, August 11, 18, 1915; Haynes, *American Chemical Industry*, 3:229–30.

76. E. C. Pratt to Herty, October 26, 1915.

77. Herty to Bernhard C. Hesse, October 26, 1915; E. E. Pratt to Herty, October 2, 1915; Herty to E. E. Pratt, October 7, 12, 1915.

78. Herty to Bernhard C. Hesse, October 26, 1915; Herty to E. E. Pratt, October 30, 1915; E. E. Pratt to Herty, November 8, 1915; Joseph F. Tayloe to Thos. W. Prichard, November 10, 1915; Herty to Furnifold Simmons, November 26, December 1, 1915; *Cornell Chemist* 5 (December 1915): 118–20.

79. Herty to E. J. Hill, January 17, 1916; Herty to G. Gunby Jones, October 13, 21, 1915; G. Gunby Jones to Herty, October 16, 1915; Herty to O. J. Coffin, October 21, 1915; Haynes, *American Chemical Industry*, 3:247.

80. Herty to President Woodrow Wilson, February 17, 1916; Herty to Lawrence Holt, Jr., January 31, 1916; Herty to Thomas Battle, D. Y. Cooper, and Norfleet Webb, February 2, 1916; Herty to Joseph P. Tumulty, February 11, 1916; Haynes, *American Chemical Industry*, 2:9–10, 12; William Redfield to Herty, February 26, March 7, 15 (quotation), 1916; Herty to William Redfield, March 15, 1916.

81. C. B. Bryant to Herty, March 1, 1916; Herty to C. B. Bryant, March 2, 1916; W. Beckers to Herty, March 18, 1916; Herty to W. Beckers, March 22, 1916.

82. Charles Herty, "The Dyestuff Situation," MS. of speech to Annual Convention of the American Cotton Manufacturers' Association, Atlanta, Georgia, April 4, 1916.

83. Ibid.

84. Ibid.

85. Herty to C. B. Bryant, April 10, 1916; *Manufacturers' Record* to Herty, April 7, 1916; *Oil, Paint and Drug Reporter* to Herty, April 7, 1916; Albert Greene Duncan to Herty, April 22, 1916; Herty to Albert Greene Duncan, May 3, 1916; Haynes, *American Chemical Industry*, 3:227–28, 227n.; L. H. Baekeland to Herty, May 8, 1916.

86. Herty to E. J. Hill, February 21, 1916; Herty to Thos. O. Marvin, February 25, 1916; Thos. O. Marvin to Herty, February 28, 1916; Herty to Editor, *New Bedford Mercury*, March 1, 1916; Z. W. Pease to Herty, n.d.; Herty to J. Merritt Matthews, March 6, 1916; Herty to L. Ames Brown, March 6, 1916; Herty to V. Gilmore Iden, March 13, 22, 1916; V. Gilmore Iden to Herty, March 20, 27, 1916.

87. Herty to Thos. Robbins, February 12, 18, March 2, 3, 13, 15, 1916; Thos. Robbins to Herty, March 9, 1916; Herty to Naval Consulting Board, March 2, 1916; W. L. Saunders to Herty, March 13, 1916; Beer, *Emergence of the German Dye Industry*, 135.

88. Excerpts from a letter to W. L. Saunders in W. L. Saunders to Herty, March 24, 1916; W. L. Saunders to Herty, March 13, 1916; Herty to W. L. Saunders, March 15, 1916. The dollar value of imported dyes hardly reflected their economic impact on American industry. See, for example, Herty to W. L. Saunders, March 15, 1916, and Thomas Norton, "Dyestuff Situation in the United States at the Close of 1915," *JIEC* 8 (February 1916): 166–72.

89. Herty to W. L. Saunders, March 28, 1916.

90. Ibid.

91. Herty to Charles Miller, April 10, 1916; Herty to Ellwood Hendrick, April 10, 1916; Ellwood Hendrick to Herty, April 9, 1916; Miles, ed., *American Chemists and Chemical Engineers*, 212–13.

92. Ellwood Hendrick to Herty, April 13, 1916; Herty to Ellwood Hendrick, April 13, 1916; L. H. Baekeland to W. L. Saunders, May 1, 1916; W. L. Saunders to L. H. Baekeland, May 1, 1916; L. H. Baekeland to Herty, May 1, 1916; Herty to L. H. Baekeland, May 3, 1916; Herty to W. L. Saunders, May 3, 1916; W. L. Saunders to Herty, May 8, 1916.

93. Charles Herty, "The Expanding Relations of Chemistry in America," *JIEC* 8 (October 1916): 877; Haynes, *American Chemical Industry*, 3:230–31, 247, 249.

94. A. S. Wheeler to Herty, July [?], 1916; Herty to A. S. Wheeler, July 15, 1916; Herty, "Expanding Relations of Chemistry in America," 878.

95. Charles Parsons to Herty, July 13, 1916; Herty to William J. Stone, Brief IN REH. R. 16763, SECTIONS 400 AND 401, (DYESTUFFS), July 22, 1916.

96. Herty to R. H. Edmonds, August 19, 1916; Herty to Furnifold Simmons, August 21, 1916.
97. B. C. Hesse to Herty, August 21, 1916; Herty to Allen Rogers, September 7, 1917.
98. Herty, "Expanding Relations of Chemistry in America," 878.
99. Herty to Clark Howell, March 23, 29, 1916; Herty to O. J. Coffin, October 21, 1915; Herty to Charles Miller, February 6, 1916; Herty to H. B. Broughton, February 7, 1916.
100. Herty to Ellwood Hendrick, May 10, July 15, 1916; Herty to G. A. Oakley, December 22, 1916; Ellwood Hendrick to Herty, May 8, 12, 20, June 29, 1916; Herty to Ralph Graves, May 10, 1916; R. H. Evans to Herty, May 16, 1916; Browne and Weeks, *History of the American Chemical Society*, 123, 219–21.
101. Julius Stieglitz to Herty, December 22, 1917; Herty to Julius Stieglitz, December 26, 1917; Herty to Robert Neff, January 16, 1918; Charles Parsons to Herty, April 16, 1918; Minutes of the ACS Directors, April 13, 1918; Browne and Weeks, *History of the American Chemical Society*, 220–21.
102. Herty to Allen Rogers, August 14, 1915.
103. Herty to S. A. Kerr, October 12, 16, 24, 1916; Herty to W. S. Cross, M. C. S. Noble, Southern Underwriters, C. T. Woolen, W. W. Walker, P. H. Winston, October 24, 1916; Frank Herty interview, May 11, 1977; Fannie D. Archer to Sophie Herty, November 4, 1916; Herty to W. A. Withers, October 17, 1916; R. H. Lewis to Herty, October 10, 1916; Herty to R. H. Lewis, October 17, 1916.

CHAPTER 5. THE MOUTHPIECE OF CHEMISTRY

1. Herty to J. B. McDonnell, August 26, 1919.
2. Herty to H. E. Barnard, December 20, 1916; A. V. H. Mory to Herty, December 23, 1916; Frank Cameron to Herty, December 24, 1916; Herty to Telephone Company, New York City, December 18, 1916; Herty to M. A. Williamson, December 9, 1916; E. G. Love to Herty, November 9, 1916.
3. Herty to E. G. Love, November 11, 1916; Herty to C. L. Parsons, A. V. H. Mory, A. D. Little, Bernhard Hesse, and W. A. Hamor, November 15, 1917.
4. H. P. Talbot to Herty, November 13, 22, 1917; Herty to H. P. Talbot, November 24, 1917; Lois Woodford to Herty, November 22, 1917, December 10, 1919; Herty to A. D. Little, November 26, 1917; Nellie A. Parkinson to Herty, November 26, 1917; Herty memorandum, n.d. [1917]; Herty to E. G. Love, December 6, 1917, August 29, 1919; Herty to ACS directors, December 1, 1917; Lois Woodford to Emma P. Carr, May 18, 1918; Emma P. Carr to Lois Woodford, May 24, 1918; Herty to Grace McLeod, August 28, 1919; Herty to Lois Woodford, August 29, 1919; Grace McLeod to Lois Woodford, October 12, 1919; George Rosengarten to Herty, December 9, 1919; Lois Woodford to Edith Borstow, December 11, 1919.

5. [?] to Harvey Mack, December 18, 1916; Bertha Reynolds to Herty, July 27, 1917; Herty to Harvey Mack, August 14, 1920; [Herty], Memorandum on Bertha Reynolds's trip to Easton, September 2, 1920; Harvey Mack to Herty, May 3, 16, June 1, July 5, 1921; Herty to C. L. Parsons, August 12, 1921; Herty to C. I. Hopkins, July 18, 1921; Williams Printing Company to Herty, August 8, 11, 1921; Secretary to Herty, Memorandum, n.d.

6. M. C. Whitaker to Herty, November 20, 1916; M. C. Whitaker to C. L. Parsons, November 30, 1916; M. C. Whitaker, Tentative Budget for *Journal of Industrial and Engineering Chemistry* [1917].

7. Herty to E. G. Love, March 29, 1917; Julius Stieglitz to Herty, August 2, 1917; Julius Stieglitz to E. G. Love, copy to Herty, August 2, 1917; Bertha Reynolds to Mr. [Harvey] Mack, August 17, 1917; C. L. Parsons to Herty, September 19, 1917; Herty to E. G. Love, November 10, 1917; Herty *JIEC* Budget for 1918, November 10, 1917.

8. Charles Parsons to Herty, March 30, 1920; Herty to Charles Parsons, April 7, 1920; Herty to James Delehanty, April 10, 1920; Herty to O. A. Woodruff, April 14, 1920; Edward Robb Ellis, *The Epic of New York City* (New York: Coward-McCann, 1966), 494–96.

9. Herty to L. H. Dinkins, December 19, 1919; Announcement, American Chemical Society, New York Section, May 29, 1919; Skolnick and Reese, *Century of Chemistry*, 6, 10. The Chemists' Club was founded in New York in 1898.

10. Herty, Memo, January [?], 1920; Herty to C. E. K. Mees, June 28, 1918; C. E. K. Mees to Herty, July 1, 1918; Arthur Hirschfelder to Herty, July 10, 1918; Herty to Arthur Hirschfelder, July 24, 1918.

11. Herty to Hugh Scott Taylor, March 8, 1917; Herty to W. D. Bancroft, March 15, 1918; Grinnell Jones to Herty, April 15, 1918; Herty to Colonel Wm. H. Walker, October 26, 1918.

12. Herty to L. I. Shaw, July 3, 1919; Major Frederick Pope, MSS., May 7, 1919; Major T. W. Sill, MSS., n.d.

13. Walter Hayward to Herty, October 2, 1919; Herty to Douglas Woolf, December 5, 1919; Herty to Edwin Slosson, June 25, 1920; Herty to C. D. Snow, November 20, 1920; William G. Abbot to Herty, October 8, 1921.

14. Herty to H. W. Gillette, February 7, 1918; H. W. Gillette to Herty, February 9, 1918; H. C. Parmalee to Charles Parsons, April 19, 26, 1918; Charles Parsons to H. C. Parmalee, April 22, 30, 1918; Department of Interior Memorandum to Charles Parsons, April 30, 1918; Charles Parsons to Department of Interior, May 1, 1918; Charles Parsons to Herty, May 2, 3, 1918; Herty to Charles Parsons, May 4, 1918; Herty to Van H. Manning, May 11, 1918.

15. C. L. Parsons to Herty, October 5, November 21, 1918, May 3, 1919, February 11, 1920; Herty to C. L. Parsons, November 23, 1918; Wilder D. Bancroft to Herty, Novem-

ber 23, 1918; Herty to W. D. Bancroft, November 25, 1918; Arthur B. Lamb to Herty, February 12, 1920; Herty to V. Le Febure, February 25, 1921.

16. Herty to O. P. Hopkins, June 3, 1918, June 27, 1921 (quotation); Irene De Matty to Herty, December 9, 1916; Herty to Irene De Matty, December 15, 1916, January 11, 1917; R. S. McBride to Herty, January 15, 1917; O. P. Hopkins to Herty, May 28, 1918, June 15, 1921; Browne and Weeks, *History of the American Chemical Society*, 374–75.

17. Herty to Board of Editors of *JIEC*, January 25, 1917; Herty to Charles Parsons, January 25, March 19, 1917; B. C. Hesse to Herty, January 27, 1917; M. C. Whitaker to Herty, January 29, 1917; Charles Parsons to Herty, March 17, 1917; Paul Wooton to Herty, March 26, 28, 1917; Herty to Paul Wooton, March 27, 1917.

18. Herty to Paul Wooton, May 16, June 27, October 16, 1917, July 15, 1918, May 10, June 14, July 30, 1919; Paul Wooton to Herty, October 17, 1917, August 20, 1919; J. B. McDonnell to Herty, August 26, November 26, 1919, January 26, February 14, June 17, July 28, 1920; Herty to J. B. McDonnell, August 28, 1919, January 28, February 3, July 23, December 22, 1920; Herty to Watson Davis, March 9, 14, 1921; Watson Davis to Herty, March 15, August 12, 1921; Herty to Jean Giraud, February 10, May 8, 1920; Jean Giraud to Herty, April 22, 1920; Herty to Stephen Miall, April 23, 1920; Herty to Charles Lormand, January 17, 1921; Charles Parsons to Herty, September 1, 1920; Herty to Charles Parsons, September 2, 1920.

19. Ellwood Hendrick to Herty, May 8, 20, June 29, 1916; Herty to Ellwood Hendrick, May 10, 1916; Herty to G. P. Oakley, December 22, 1916; Allen Rogers to ACS Press and Publicity Committee, January 10, 1917; Allen Rogers to Julius Stieglitz, September 6, December 18, 1917; Julius Stieglitz to Allen Rogers, December 12, 1917; Browne and Weeks, *History of the American Chemical Society*, 219–21.

20. Allen Rogers to Julius Stieglitz, November 28, 1917; Minutes of ACS Press and Publicity Committee, July 15, 1918; Herty to E. G. Love, November 15, December 12, 1918; John W. Harrington to Herty, December 9, 1918; Herty to William Nichols, March 19, 1919.

21. Herty to William Nichols, March 15, 1919; Herty, Proposed Budget for 1920, n.d.; Herty to Geo. D. Rosengarten, May 2, 1919.

22. John Harrington, Travel Log, July 7–12, 1919; Charles Herty, Newsletter, July 12, 1919; Harry Barnard to Herty, July 25, 1919.

23. Herty to Harry Barnard, July 29, 1919; Chester H. Jones to Herty, June 30, 1920; Herty to Chester H. Jones, July 10, 1920; John Harrington to Herty, Report for 1920, November 8, 1920; W. D. Bancroft to Herty, December 3, 1920.

24. Herty to W. D. Bancroft, December 7, 1920.

25. *Ibid.*

26. J. W. Harrington to Herty, January 20, February 9, 10, 1921, n.d., September 10,

13, 1921; Herty to John J. Wallace, April 20, 1921; Herty to Holmes Herty, June 23, 1920; Herty to Sir William Pope, July 20, 1920; Herty to Lash Miller, August 18, 1920; Executive Committee, New York Section, ACS, to Herty, March 23, 1921; Allen Rogers to Herty, March 30, 1921; Herty to Harold J. Roast, May 14, 1921; Browne and Weeks, *History of the American Chemical Society*, 221–22.

27. Haynes, *American Chemical Industry*, 3:396–97. ACS wartime presidents included T. W. Richards (1914), Herty (1915–16), Julius Stieglitz (1917), and William Nichols (1918–19).

28. Herty to H. P. Talbot, November 12, 1914; W. Lash Miller to Herty, May 3, 1917; Herty to W. Lash Miller, May 5[?], 1917; Browne and Weeks, *History of the American Chemical Society*, 121.

29. Herty to S. A. H. Whetmore, February 20, 1918; Herty, Editorial Scrapbook, August 1, November 1, December 1, 1918; Herty to R. H. Edmonds, November 1, 1918.

30. League to Enforce Peace to Herty, March 21, September 20, 1918; Herty to League to Enforce Peace, April 24, September 23, 1918; Herty to R. H. Edmonds, March 27, April 3, 1919; Henry A. Forster to Herty, April 12, 1919.

31. Herty, Editorial Scrapbook, January, March 1917. See Chapter 4 for a discussion of the tariff battle of 1916 and Herty's part in it.

32. *Ibid.*, April 1917.

33. Geo. D. Chamberlain to Herty, April 3, 1917 (quotation); Walter O. Snelling to B. C. Hesse, April 2, 1917. See also Herty's correspondence with R. T. Haslam, Wm. H. Walker, Charles Parsons, Frederick Bonnett, Jr., A. W. Smith, and A. D. Little between April 2 and 10, 1917.

34. Herty to Members of Executive Committee, New York Section, ACS, October 10, 1917; Herty to Holmes Herty, October 24, 1917; R. M. Hurd to Herty, October 4, 1917; Herty to R. M. Hurd, October 5, 1917; Herty to American Defense Society, October 25, 1917; W. H. Gardner to Herty, November 16, 1917; Herty to W. H. Gardner, November 24, 1917.

35. Herty, Editorial Scrapbook, April 1918.

36. G. D. Van Arsdale to Herty, April 1, 1918; D. D. Berolzheimer to Herty, April 1, 1918; T. B. Johnson to Herty, April 1, 1918; W. F. Hand to Herty, April 9, 1918; R. H. Edmonds to Herty, April 10, 1918; Herty to R. H. Edmonds, April 16, 1918.

37. Ellwood Hendrick to Herty, March 30, 1918; Herty, Editorial Scrapbook, April 1, 1918.

38. M. C. Whitaker to Herty, May 18, 1918; M. C. Whitaker to Board of Trustees, Chemists' Club, April 3, 1918; Herty to M. C. Whitaker, April 4, May 28, 1918.

39. Herty, Editorial Scrapbook, November 1917; William Crozier to Herty, January 8, October 6, 17, 24, 1917; Herty to William Crozier, October 6, 10, 18, 23, November 13,

1917; Herty to R. H. Edmonds, October 23, 1917; Herty to Theo. R. Kendall, October 25, 1917; Herty to H. L. Thompson, November 3, 1917; Herty to Edward J. Wheeler, November 3, 1917; Herty to Fred Upson, November 13, 1917.

40. Herty, Editorial Scrapbook, May 1917 through October 1918; Charles Parsons to Herty, April 19, 1917.

41. Herty, Editorial Scrapbook, May 1917.

42. Allen Rogers to Herty, April 21, 1917; Herty to Mrs. M. A. Lipscomb, May 4, 1917; Charles Parsons to Herty, April 30, 1917; R. H. Edmonds to Herty, May 30, 1917; Herty to R. H. Edmonds, June 5, 1917; clipping, *New York Tribune*, May 29, 1917; Herty, Editorial Scrapbook, June, August, November 1917, February, May 1918; Charles Parsons, quoted in *JIEC* 10 (May 1918): 2 (reprint in Herty, Editorial Scrapbook); Edith Taylor Spear to Herty, January 31, February 2, 4, May 2, 1918; Herty to Edith Taylor Spear, February 6, 1918; Herty to Edward Bok, February 6, 1918; Herty to Charles Parsons, February 26, May 4, 1918; Charles Parsons to Herty, April 9, May 2, 1918; George F. Kunz to Herty, February 27, May 2, 1918.

43. Herty, Editorial Scrapbook, June, July, August 1918; Charles Parsons to Herty, October 18, 1918; Clarence Hall to Herty, November 14, 1918.

44. Herty, Editorial Scrapbooks, March, April 1917; Julius Stieglitz, Presidential address, ACS, Kansas City, Missouri, April 10, 1917, *JIEC* 9 (May 1917): 443–44. See also Browne and Weeks, *History of the American Chemical Society*, 113–16.

45. Herty, Editorial Scrapbook, June 1917.

46. Herty, Editorial Scrapbooks, August, September, November, December 1917.

47. Herty, Editorial Scrapbook, January, February (quotation) 1918.

48. William H. Walker to Herty, January 29, February 2, 1918 (quotation); Herty to W. H. Walker, January 30, 1918; B. C. Hesse to Herty, February 1, 1918; Charles Parsons to Herty, January 31, February 5, 1918; Herty, Editorial Scrapbook, February 1918.

49. Herty, Editorial Scrapbook, March, July 1918.

50. Herty to Fred Upson, Leo Baekeland, and Julius Stieglitz, July 24, 1918; Herty to Maximilian Toch, Frank Goodnow, A. Lawrence Lowell, Geo. Stone, William Siebert, Josephus Daniels, Newton Baker, H. H. Dow, C. E. K. Mees, and the presidents or deans of Harvard, Grinnell College, Columbia, and MIT, July 31, 1918; William Siebert to Herty, August 8, 1918; Samuel Avery to Herty, August 9, 1918. See also Noble, *America by Design*, 214–23.

51. Herty to Victor Coulter, December 20, 1918; Victor Coulter to Herty, November 21, 1918; Herty, Editorial Scrapbook, December 1918; Browne and Weeks, *History of the American Chemical Society*, 124–25; Skolnik and Reese, *Century of Chemistry*, 17.

52. Herty, Editorial Scrapbook, February 1919.

53. Herty, Editorial Scrapbook, August 1918; Browne and Weeks, *History of the American Chemical Society*, 116–18; Kevles, *The Physicists*, 132.

54. Browne and Weeks, *History of the American Chemical Society*, 118–19; William McPherson to Herty, March 24, April 1, 1919; Herty to William McPherson, March 27, 1919.

55. Herty, "Beware the Ide[a]s of March," *JIEC* 11 (September 1919): 814–16.

56. *Ibid.*

57. F. M. Dorsey to Herty, August 19, 1919; Herty to F. M. Dorsey, August 20, 1919; F. E. Breithut to Herty, August 19, 1919; Herty to F. E. Breithut, August 20, 1919; F. M. Dorsey to W. R. Whitney, copy, August 19, 1919.

58. J. W. Wadsworth, Jr., to Herty, August 21, 1919; Herty to J. W. Wadsworth, Jr., August 22, 1919; Herty to Amos A. Fries, August 28, 1919.

59. Herty to D. R. Anthony, December 16, 1919; Herty to Samuel Avery, December 22, 1919; Herty to A. A. Fries, January 8, 22, 1920; A. A. Fries to Herty, January 19, 29, 1920; Herty, Editorial Scrapbook, January, February 1920.

60. ACS News Service release of Herty speech to Western New York section, ACS, Buffalo, March 2, 1920; Herty to S. Hubert Dent, March 4, 1920; Amos A. Fries to Herty, March 3 (first quotation), 8, May 13, [June 1], 1920; Herty to Amos A. Fries, March 4, 9, 1920; Herty to W. S. Bacon, F. M. Dorsey, G. A. Burrell, and Wm. Walker, March 6, 1920; Herty to Geo. F. Chamberlain, March 8, 1920.

61. Herty to Amos A. Fries, July 17, August 26, September 30, 1920; Herty to W. A. Noyes, August 7, September 15, 1920; Herty to Members of ACS Committee Advisory to CWS, September 19, November 15, 1920; W. A. Noyes to Herty, August 10, September 16, 1920.

62. Herty, Editorial Scrapbook, August 1920; Herty to Amos A. Fries, August 26, 1920; Amos Fries to Herty, August 27, 1920; Amos Fries to Leslie D. Sutherland, n.d.; H. E. Howe to Herty, December 28, 1920; Herty to H. E. Howe, January 5, 1921.

63. Herty to Amos A. Fries, August 26, 1920.

64. Herty to H. E. Howe, January 5, February 18, 1921; H. E. Howe to Herty, February 25, 1921; Herty to Raymond F. Bacon, January 29, 1921; Amos A. Fries to Herty, January 12, 25, 28, February 10, May 18, 1921; Herty to Amos A. Fries, March 29, 1921; Herty to Victor Lehner, March 29, 1921; Herty, Report of ACS Committee to Advise the CWS, April 23, 1921.

65. Robert H. Ferrell, *American Diplomacy: The Twentieth Century* (New York: Norton, 1988), 169–70. For a full treatment of the Washington Conference on the Limitation of Armaments see Thomas H. Buckley, *The United States and the Washington Conference, 1921–1922* (Knoxville: University of Tennessee Press, 1970). On the peace movement

see Robert H. Ferrell, *Peace in Their Time: The Origins of the Kellogg-Briand Pact* (New Haven: Yale University Press, 1952).

66. Richard C. Tolman to Herty, April 14, 1921; Herty to Richard C. Tolman, April 18, 1921.

67. Herty, Editorial Scrapbook, January, February 1919.

68. *Ibid.*, March, June 1919.

69. *Ibid.*, March 1921.

70. *Ibid.*

71. *Ibid.*

72. *Ibid.*

73. V. Le Febure to Herty, November 1, 1920; Victor Le Febure, "Chemical Disarmament," reprint, n.d.; Herty to E. V. Patterson, December 22, 1920.

74. S. Whetmore to Herty, December 24, 1920.

75. Herty, Editorial Scrapbook, November 1921; S. Whetmore to Herty, December 24, 1920, February 3, March 7, 1921; V. Le Febure to Herty, February 3, 1921; Herty to S. Whetmore, January 24, February 18, 23, March 24, 1921; Herty to V. Le Febure, September 2, 1921; Herty to President Warren G. Harding, Harding Cabinet, various senators, Nicholas Longworth, and William Mitchell, March 2, 1921; Herty to Edward P. Mitchell, March 4, 1921; Ferrell, *American Diplomacy*, 155.

76. Herty, Editorial Scrapbook, December 1921; A. A. Fries to Herty, November 4, 1921; L. F. Haber, *The Poisonous Cloud: Chemical Warfare in the First World War* (Oxford: Clarendon Press, 1986), 290.

CHAPTER 6. FIGHTING FOR AN AMERICAN DYES INDUSTRY

1. For Herty's efforts in behalf of American potash see correspondence with S. R. Scholes, September 18, 19, 1917; with W. C. Demas, February 21, March 12, 1918; with Victor Boyden from February 21 through May 4, 1918; with John Treanor, October 21, November 6, 1918; with J. W. Turrentine, March 15, 26, 1919; and Herty, Editorial Scrapbook, December 1918, September 1920. For his work to protect American manufacturers of laboratory equipment see Editorial Scrapbook, December 1918, January, February, May, June 1919, February, July, November, December 1920, February 1921, and correspondence relating to the Bachrach Bill, May 10, 1918, through September 2, 1921, Box 71.

2. Herty, Editorial Scrapbook, January 1917; Haynes, *American Chemical Industry*, 3:250.

3. Herty, Editorial Scrapbook, January 1917.

4. *Ibid.*, March 1917; Herty to Joseph P. Tumulty, December 30, 1916; Herty to C. C.

Todd, November 1, 1916; Herty to E. J. Hill, January 29, 1917; Herty to Furnifold Simmons, January 9, February 12, 1917; Herty to Nicholas Longworth, January 16, 1917; Nicholas Longworth to Herty, January 16, 1917; Herty to Josephus Daniels, February 9, 1917; Herty to William Crozier, February 12, 1917.

5. Herty to Richard H. Edmonds, February 23, March 2, May 2, 1917.

6. Haber, *Chemical Industry*, 280–81, 283; Haynes, *American Chemical Industry*, 3:249, 251–53, 258–59; Freidel, *America in the Twentieth Century*, 183; Herty, Editorial Scrapbook, January, March 1917.

7. Herty to M. C. Whitaker, November 6, 10, 1916; Herty to ACS directors, November 6, 1916; Herty to B. C. Hesse, November 7, 1917; B. C. Hesse to Herty, November 4, 9, 1917; Julius Stieglitz to Herty, May 18, 20, 1917; F. W. Taussig to Julius Stieglitz, May 14, 1917; Herty to F. W. Taussig, June 1, 1917; Herty, Editorial Scrapbook, January, July 1917.

8. Haynes, *American Chemical Industry*, 3:260, and note at bottom of page; Florence Wall, “Charles H. Herty—Apostle to the South,” *Chemist* 9 (February 1932): 123–31.

9. Herty to Francis P. Garvan, March 27, 1918; Joseph H. Choate, Jr., to Herty, April 15, 1918.

10. Haynes, *American Chemical Industry*, 3:253–55.

11. Herty, Editorial Scrapbook, April 1918.

12. *Ibid.*, July 1918.

13. *Ibid.*, December 1918.

14. *Ibid.*, February 1919.

15. Draft of Certificate of Incorporation of the Chemical Foundation, Incorporated, February 5, 1919; Prospectus of Chemical Foundation, Inc., April 4, 1919; Reprint of Francis P. Garvan, Address to the National Cotton Manufacturers’ Association, April 25, 1919; Haynes, *American Chemical Industry*, 3:259–61; Herty, Editorial Scrapbook, March, April 1919. See also Noble, *America by Design*, 16, 127–28.

16. Herty, Editorial Scrapbook, April 1919; Herty to Grady P. Oakley, March 13, 1919; J. H. Choate, Jr., to Herty, March 31, 1919; Herty to C. L. Parsons, April 1, 1919.

17. Reprint of Address by Francis P. Garvan to National Cotton Manufacturers’ Association, April 25, 1919.

18. Joseph Choate, Jr., to Herty, April 10, 1919; Memorandum of meeting between Joseph Choate and committee of American Dyes Institute with Dean E. F. Gay, War Trade Board, May 2, 1919; W. F. Keohan to Herty, April 15, 1929.

19. Herty, Editorial Scrapbook, May, June 1919; Haynes, *American Chemical Industry*, 3:261–62; W. T. Miller and Joseph H. Choate, Jr., to B. S. Cutler, April 4, 1919; William T. Miller to Herty, April 10, 1919; Herty to William T. Miller, April 18, 1919; H. E. Danner to Herty, April 16, 1919; Herty to H. E. Danner, April 18, 1919.

20. J. Merritt Matthews to Herty, May 9, 1919; Herty to J. Merritt Matthews, May 10, 1919. Memorandum, unsigned, May 2, 1919, of meeting of representatives of WTB, American Dyes Institute and Chemical Foundation; minutes of Tariff Committee, American Dyes Institute, May 13, 1919; M. R. Poucher to Herty, May 5, 1919; Herty to M. R. Poucher, May 17, 1919; Herty to Ramsey Hoguet, May 6, 1919; Herty to Francis P. Garvan, May 7, 1919.
21. Lawrence Bennett to Herty, May 9, 1919; Herty to Lawrence Bennett, May 10, 1919; War Trade Board Resolution 745, May 14, 20, 1919; Confidential memorandum to members of American Dyes Institute, May 15, 1919; Herty, minutes of WTB Dyes Advisory Committee, May 19, 1919; Herty, Draft letter to Textile Manufacturers, May 28, 1919; Joseph Choate, Jr., to Herty, June 2, 1919; William Corwine to Herty, June 9, 1919, with enclosures from John Campbell Company to American Dyes Institute, May 29, 1919, and Ontario Dyeing Company to Frank Hemenway, May 19, 1919; Andrew Imbrie to Herty, June 20, 1919; Herty to Andrew Imbrie, June 27, 1919. See also Haber, *Chemical Industry*, 125, n. 1.
22. W. B. D. Penniman to Herty, June 13, 1919; Lawrence Bennett to Herty, June 13, 1919, with enclosure; Lawrence Bennett to William Keohan, n.d.; Herty, Editorial Scrapbook, June 1919.
23. Herty to Francis P. Garvan, June 30, 1919; United States Department of State, Press Release, July 1, 1919.
24. Dyes Advisory Committee to War Trade Board, June 26, 1919.
25. Dyes Advisory Committee to War Trade Board, June 26, 1919 (second letter).
26. Henry B. Thompson to Herty, July 18, 1919, with enclosures; Dyes Advisory Committee to Secretary of State, July 24, 1919; Lawrence Bennett to Herty, July 25, 1919; Haynes, *American Chemical Industry*, 3:262–63.
27. Herty to Lawrence Bennett, August 18, 20, 1919; Lawrence Bennett to Herty, August 19, 1919; Herty to Morris Poucher, August 21, 1919.
28. National Association of Shirtmakers to Lawrence Bennett, August 27, 1919; *Oil, Paint and Drug Reporter*, September 1, 1919; Herty, Editorial Scrapbook, December 1919.
29. Frank Cheyney to Herty, August 27, 1919; Herty to Frank Cheyney, August 28, 1919.
30. Herty to E. H. Tripp, August 29, 1919; Herty to S. Whetmore, August 29, 1919; Herty to H. J. Schnell, August 29, 1919; Charles Roth to Herty, August 31, 1919; Herty to C. W. Hawes, September 2, 1919; Herty to Morris R. Poucher, September 2, 1919. The Textile Alliance was an industry-wide organization that cooperated closely with the government during the war (Haynes, *American Chemical Industry*, 3:264, n. 1).
31. Morris Poucher to Herty, August 28, 29, 1919; Herty to Morris Poucher, Septem-

ber 2, 1919; Herty to F. A. Morlock, September 1, 1919; Herty, Editorial Scrapbook, December 1919; Herty to Francis Garvan, October 26, 1919; Colonel [?] Theunis to Major [?] Tyler, September 4, 1919; Ellis Loring Dresel to Colonel Theunis, September 8, 1919.

32. *Textile World Journal*, November 22, 1919; Herty, Editorial Scrapbook, November, December 1919; Herty to Lois Woodford, September 21, 1919; Herty to Francis Garvan, October 26, 1919.

33. Herty, Editorial Scrapbook, December 1919; *Textile World Journal*, November 22, 1919; “Cutler” to C. D. Snow, September 27–28, October 2, 1919; Herty to Francis Garvan, October 26, 1919; Herty to M. O. Forster, October 5, 1919; Haber, *Chemical Industry*, 246.

34. Herty to Lois Woodford, October 9, 1919; Herty, Editorial Scrapbook, December 1919; Henry Thompson to Textile Alliance, Inc., September 9, 1919; A. M. Patterson to Henry Thompson, September 15, 1919; State Department to A. M. Patterson, September 29, 1919; St. John Perrett to A. M. Patterson, October 25, 1919; War Trade Board to Herty, October 28, 1919; Haynes, *American Chemical Industry*, 3:263–64.

35. Morris Poucher to Herty, October 14, 16, 1919; Eric Kunz to Herty, October 14, 1919; Herty to Morris Poucher, October 16, 1919; Herty to Lois Woodford, October 16, 1919.

36. Herty, Editorial Scrapbook, December 1919; Herty to Lois Woodford, October 23, November 1, 1919; Herty to Francis Garvan, October 26, 1919; Herty, Memorandum for Colonel Logan, October 30, 1919.

37. Kuttroff, Pickhardt and Company, Inc., circular letter, November 22, 1919; G. F. Lamb to Herty, November 13, 1919; Herty, Editorial Scrapbook, December 1919.

38. St. John Perrett to Herty, November 24, 1919; Herty to St. John Perrett, November 24, 1919.

39. *Memorandum in Opposition to the Purchase by the Government Through the Textile Alliance, or Other Official Agency, of Dyes Directly from the Foreign Manufacturer.*

40. Frank Cheyney to Henry Thompson, December 16, 17, 18, 1919; B. R. Price to Herty, December 17, 1919; Herty to Frank Cheyney, December 17, 1919; Brief of Dyes Advisory Committee filed in response to testimony of Col. John Wood, December 12, 1919; Franklin Hobbs to Herty, December 18, 1919; ACS News Bureau Release, December 15, 1919.

41. Minutes of Dyes Advisory Committee of Textile Alliance, January 13, 1920, June 22, 1921; B. R. Price to Herty, February 3, 1920; W. B. Denton to Herty, February 14, 26, March 10, 15, July 12, 1920; Herty to Albert Rathbone, February 19, 1920; Herty to Francis Garvan, February 16, 1920; Herty to St. John Perrett, February 28, 1920; Textile

Alliance circulars, April 19, 22, 1920; E. A. Macon to Herty, June 16, July 26, 1921; Herty to E. A. Macon, August 6, 1921; Herty to A. M. Patterson, November 18, 1921; Haynes, *American Chemical Industry*, 3:264–65.

42. Quoted in Herty, Editorial Scrapbooks, June 1919.

43. Herty to Clerk, House Ways and Means Committee, May 24, 1919; *New York Times*, May 24, 1919; Herty, Editorial Scrapbook, July 1919; William Keohan to Herty, April 15, 1929.

44. Herty to Franklin Hobbs, June 13, 1919; Herty to Bradley Dewey, June 14, 1919; Herty to War Trade Board, June 11, 1919; Lawrence Bennett to Herty, June 12, 1919; Herty to Nicholas Longworth, June 23, 1919; Herty to Clerk, House Ways and Means Committee, June 24, 1919; William Corwine to Herty, July 11, 1919; Frank D. Wickham to Herty, July 12, 1919; Unidentified notes of Hearings before House Ways and Means Committee, July 14, 1919; Herty, Editorial Scrapbook, August 1919.

45. William Keohan to Herty, April 15, 1929.

46. Herty to B. C. Hesse, July 28, August 1, 1919; B. C. Hesse to Herty, July 29, 1919.

47. John Tierney, *Chemical Alliance Bulletin No. 13*, November 12, 1919.

48. William Keohan to Herty, April 15, 1929; Boies Penrose's secretary to Herty, November 26, 1919; William Corwine to Herty, November 21, 24, December 5, 1919; Charles Herty to Thos. Webb, December 5, 1919; Herty to Lois Woodford, December 11, 1919; Herty, Reprint of testimony to subcommittee of Senate Finance Committee, December 9, 10, 1919; Herty, Editorial Scrapbook, December 1919.

49. Herty, Editorial Scrapbook, January 1920; B. R. Price to Herty, November 28, 1919, cover letter with attachments, all in Textile Alliance Notebook, Herty Papers.

50. J. N. C., Jr. [Joseph Choate], to Herty, December 12, 1919; Douglas G. Wolfe to Herty, January 9, 10, 1920; William Keohan to Herty, April 15, 1929.

51. Herty to F. L. Dunlop, January 28, 1920; William Keohan to Herty, April 15, 1929; William Corwine to Herty, July 22, 1920; Herty, Editorial Scrapbook, June 1920; Herty to Morris Poucher, February 16, 1920.

52. Herty to M. R. Poucher, February 21, 1920; Herty to Service Machine Corporation, February 27, 1920; Herty to Nicholas Longworth, February 28, 1920; Herty, Editorial Scrapbook, April 1920.

53. Herty, Editorial Scrapbook, June 1920; William Keohan to Herty, April 15, 1929; Herty to Joseph Freylinghuysen, May 5, 1920.

54. William Corwine to Herty, July 22, 1920; Herty, Editorial Scrapbook, June 1920.

55. Herty, Editorial Scrapbook, July, September 1920; James E. Watson to Herty, December 7, 1920; Herty to H. E. Barnard, December 9, 1920; Herty to Charles Miller, December 17, 22, 1920; Herty, Editorial Scrapbook, January 1921.

56. Edgar Fahs Smith to Herty, January 24, 1921; F. W. Taussig, *The Tariff History*

of the United States, 8th rev. ed. (New York: Capricorn Books, 1964), 451–52; Herty, Editorial Scrapbook, April 1921.

57. Taussig, *Tariff History of the United States*, 451–54, 475–76; Herty, Editorial Scrapbook, June 1921.

58. Herty, Editorial Scrapbook, June 1921.

59. William Keohan to Herty, April 15, 1929; Herty to Nicholas Longworth, June 2, 1921; *New York World*, June 6, 1921.

60. Herty, Editorial Scrapbook, July 1921; William Keohan to Herty, April 15, 1929; Unidentified summary of efforts to enact protective legislation for coal-tar chemicals, undated, but apparently used in hearings on the Fordney-McCumber tariff, Box 91, Folder 5; Herty to Victor Lehner, June 27, 1921; Victor Lehner to Herty, July 1, 1921.

61. *Journal of Commerce*, July 6, 1921. For a fuller account of the majority and minority reports of the Ways and Means Committee, see reprint of House of Representatives, Report No. 248, *General Tariff Revision*, 67th Cong., 1st sess., in Herty Papers. For Frear's speeches on the same theme see reprints of *Congressional Record*, 67th Cong., 1st sess., July 11, 18, 1921, Herty Papers.

62. James Frear to Cyril Bennett, July 1, 1921.

63. Herty, draft of a letter to the editor, July 6, 1921; Herty to E. L. Howland, July 7, 1921.

64. Herty to Edgar Fahs Smith, July 22, 1921.

65. Amos Fries to Herty, July 23, 1921; Herty to Amos Fries, July 27, 1921.

66. Amos Fries to Herty, August 2, 1921; Herty to Francis Garvan, August 6, 1921; William Keohan to Herty, April 15, 1929.

67. William Keohan to Herty, April 15, 1929; Herty to Edgar Fahs Smith, August 1, 2, 1921; Edgar Fahs Smith to Herty, August 5, 1921.

68. Edgar Fahs Smith to Herty, August 5, 6, 1921; Herty to Edgar Fahs Smith, August 6, 1921.

69. W. H. Van Winckel to Herty, July 29, 1921; clipping, *Providence Journal*, August 8, 1921; clipping, *Boston Post*, August 8, 1921; Herty to Victor H. Power, August 5, 1921.

70. Edgar Fahs Smith to Herty, August 11, 15, 1921; C. L. Parsons to Herty, August 18, 1921; Herty to E. F. Ladd, August 18, 1921; E. F. Ladd to Herty, August 19, 1921; Herty to C. L. Parsons, August 25, 1921; Reed Smoot to E. H. Hamilton, August 30, 1921; Herty to Frank Eldred, September 2, 1921; Herty, Editorial Scrapbook, September 1921. See also Louis Galambos, *The Public Image of Big Business in America, 1880–1940: A Quantitative Study in Social Change* (Baltimore: Johns Hopkins University Press, 1975), 159.

71. Herty, Editorial Scrapbook, September 1921; Herty to William Keohan, November 9, 1921; William Keohan to Herty, April 15, 1929; James Frear to Cyril Bennett,

July 7, 1921; George Moses to Cyril Bennett, July 12, 23, 1921; C. Cyril Bennett to George Moses, December 12, 1921, July 16, 22, 1922; Herty and H. E. Howe to Council of American Chemical Society, November 30, 1921; Haynes, *American Chemical Industry*, 3:272.

72. Herty and H. E. Howe to Councillors of ACS, November 30, 1921, quoting Senator King in speech delivered November 8, 1921, and printed in the *Congressional Record* for November 30, 1921.

73. Herty and H. E. Howe to Councillors of ACS, November 30, 1921; Herty to Lois Woodford, December 2, 1921; Herbert McCoy to Herty, December 6, 1921; James F. Norris to Herty, December 7, 1921; Herty to Edgar Fahs Smith, December 12, 1921. See also Emil J. Baumann to Edgar Fahs Smith, August 18, 1921; L. Kahlenberg to Edgar Fahs Smith, October 20, 1921; Walter O. Scott to Herty, July 20, August 8, 1921.

74. Herty to Edgar Fahs Smith, October 31, 1921; A. D. Little to Herty, November 10, 1921; A. M. Comey to Herty, November 21, 1921; J. W. Beckman to Herty, November 16, 1921.

75. Herty to Edgar Fahs Smith, October 31, 1921; Herty to *Manufacturers' Record*, November 2, 1921.

76. Herty, Editorial Scrapbook, December 1921.

77. Germaine Reed, "Preaching the Chemical Word: Charles Holmes Herty and the Popularization of Chemistry," paper presented at History of Science Association meeting, December 27, 1984, Chicago; David Rhees, "The Chemists' Crusade: The Rise of an Industrial Science in Modern America, 1907–1922" (Ph.D. dissertation, University of Pennsylvania, 1987).

78. Herty, Editorial Scrapbook, December 1921. Chemistry was not the only profession to see the war as an opportunity to promote its influence with the public and the government. See Kevles, *The Physicists*, esp. chaps. 8 and 11, and Noble, *America by Design*, esp. chap. 7.

CHAPTER 7. HERTY AND THE SYNTHETIC ORGANIC CHEMICALS MANUFACTURERS' ASSOCIATION: STABILIZING AN INDUSTRY

1. News release, unidentified, September 16, 1921; William Corwine to Herty, September 9, 1921; Herty to Leon Parsons, September 21, 1921.

2. Herty to F. R. Eldred, October 5, 1921; Herty to Edgar Fahs Smith, October 31, 1921; Haynes, *American Chemical Industry*, 3:244n, 272–73.

3. Edgar Fahs Smith to Herty, November 2, 1921; Herty to editor, *Manufacturers' Record*, November 2, 1921.

4. Herty to H. E. Howe, November 8, 1921; M. C. Whitaker to Charles Parsons, November 9, 1921; *Textile World Journal*, November 12, 1921; Browne and Weeks, *History of the American Chemical Society*, 376.

5. Frank Freidel, *America in the Twentieth Century*, 251–52; Tindall, *America*, 1040–41; Louis Galambos and Joseph Pratt, *The Rise of the Corporate Commonwealth: U.S. Business and Public Policy in the Twentieth Century* (New York: Basic Books, 1988), 85–86.

6. SOCMA, Financial Survey, November 1, 1921, through June 30, 1926, Box 74, Folder 9; SOCMA, Minutes of the Board of Governors, November 3, 18, December 8, 1921, March 30, April 20, July 11, 14, September 25, November 3, 23, December 14, 1922, August 16, 1923, June 20, July 10, September 11, 1925; Trade Association Executives of New York, *Yearbook*, July 27, 1925; Lois Woodford to Thomas Delahanty, October 25, 1923; SOCMA *Bulletins*, January 27, July 19, and others, Box 75, Folders 12–14; *Drug and Chemical Markets*, January 3, 1923, Box 145, Folder 8; Herty, Address to New Jersey Chamber of Commerce, November 29, 1921; Herty to R. H. McKee, November 22, 1923.

7. SOCMA, Minutes of the Board of Governors, December 8, 1921, January 25, February 28, March 30, April 20, 1922; Herty, Notes for Shortridge Hearings, n.d., Box 91, Folder 4; Herty to Larkin Meade, January 7, 1922; Joseph Choate, Jr., to Herty, January 30, 1922; J. B. McDonnell, News Releases for American Dyes Institute, May 15, 16, 20, June 3, 1922; Edward J. Muhs, “The Chemical Foundation, Inc.,” unpublished manuscript, chap. 11, pp. 5–8, Box 1-A, Francis P. Garvan Papers, American Heritage Collection, Archives, University of Wyoming, Laramie, Wyoming; Rhees, “Chemists’ Crusade,” chap. 6.

8. SOCMA, Minutes of Annual Meeting, March 31, 1922, Box 74, Folder 6.

9. Muhs, “The Chemical Foundation, Inc.,” chap. 12, pp. 2–9, Garvan Papers, Box 1-A; Haynes, *American Chemical Industry*, 3:273; SOCMA, Minutes of the Board of Governors, July 11, 14, 1922; ACS News Bulletin, July 25, 1922; ACS News Service, “Chemical Roundtable,” August 1, 1922.

10. Clipping, *Washington Times*, April 2, 1922; typescript of remarks by Senator William King to reporters, April 2, 1922; SOCMA, Minutes of Board of Governors, January 25, 30, February 28, March 30, April 20, 1922; SOCMA, Minutes of Annual Meeting, March 31, 1922; William Keohan to Herty, April 15, 1929; Herty, Memorandum on Coal-Tar Chemicals, April 3, 1922; Taussig, *Tariff History of the United States*, 472.

11. Memorandum for [Joseph Frelinghuysen?] for speeches in the Senate, May 2, 8, 1922; Herbert Hoover to Joseph Frelinghuysen, May 5, 1922.

12. Geo. Demming to Joseph Frelinghuysen, May 16, 1922; E. T. Macon to Herty, May 18, 1922; Verona Chemical Company to J. H. Frelinghuysen, May 23, 1922; American Cotton Manufacturers’ Association, Resolution adopted in convention, Washington, D.C., May 26–27, 1922; *American Economist*, June 16, 1922, Box 145, Folder 8.

13. SOCMA, Minutes of the Board of Governors, July 14, 24, 1922; ACS News Bulletin, July 25, 1922; *Outlook* 131 (July 26, 1922); ACS News Service, *Chemical Roundtable*, August 1, 1922.

14. Charles Parsons to Herty, August 2, 1922; Herty, press clippings, August 3, 1922; C. E. Coates to Senators Edwin Broussard and Joseph Ransdell, August 9, 1922; Herty to C. M. Penfield, August 9, 1922; H. J. Achaud to Herty, August 12, 1922; Herty to G. H. Simmons, August 9, 1922.

15. H. J. Achaud to Herty, August 12, 1922; Herty to list of industrial representatives, August 17, 1922; Herty, notes for Senate Finance Committee hearings, [summer 1922], Box 91, Folder 5; William Keohan to Herty, April 15, 1929; Herty to Charles Holmes Herty, Jr., August 24, 1922.

16. William Keohan to Herty, April 15, 1929; Haynes, *American Chemical Industry*, 3:268; Jan Levine, "Red, White and Blue: The Political Campaign to Protect the American Dye Industry" (Senior honors thesis, University of Pennsylvania, 1980): 48, in possession of the author.

17. Taussig, *Tariff History of the United States*, 472–88; Haynes, *American Chemical Industry*, 3:268–69; Haber, *Chemical Industry*, 240. See also Joan Hoff Wilson, *American Business and Foreign Policy, 1920–1933* (Lexington: University Press of Kentucky, 1971), esp. chap. 3; Galambos and Pratt, *Rise of the Corporate Commonwealth*, 63–64; and Tindall, *America*, 1029, 1052–53.

18. SOCMA, Minutes of Board of Governors, September 25, 1922; Herty, Circular letter to SOCMA members, October 2, 6, 1922; SOCMA, Minutes of Tariff Committee, October 2, 9, 1922; E. C. Klipstein to Herty, October 4, 1922; Dye Products and Chemical Company, Inc., to Herty, October 9, 1922; Dow Chemical Company to Herty, October 11, 1922; Butterworth-Judson Company to Herty, October 13, 1922; L. H. Davis to Herty, November 14, 1922; Herty to L. H. Davis, November 16, 1922; Herty to N. W. Hyde, November 17, 1922; Herty, SOCMA Annual Meeting, December 19, 1922.

19. SOCMA, Minutes of the Board of Governors, November 3, 23, December 14, 1922; *Drug and Chemical Markets*, January 3, 1923; *Chemical and Metallurgical Engineering*, January 31, 1923, Box 145, Folder 8; Thos. Dougherty to Herty, January 10, 1923; Herty to Samuel Iserman, April 17, 1923; Samuel Iserman to Herty, April 18, 1923; *American Economist*, March 23, 1923; Herty, Memoranda, April 16, 17, 1923; H. F. W[ilnot] to F. B. Gorin, October 19, 1923; Herty to T. W. Vinson, April 22, 1925; Herty, *President's Report*, [December 1924], excerpted from SOCMA Annual Report.

20. H. Stuart Hughes, *Contemporary Europe: A History*, 4th ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1976), 127–28, 151–52.

21. Herty to Jean Girard, July 5, 1923; Jean Girard to Herty, August 1, 1923; Herty to F. E. Breithut, August 4, 1923; Herty to Department of State, August 6, 1923; Leland Harrison to Herty, August 8, 1923; Herty to Leland Harrison, August 9, 1923; Herty to A. N. Young, August 9, 1923; F. E. Breithut to Herty, August 13, 17, 22, 24, 1923; *Chemical and Metallurgical Engineering*, August 23, 1923, Box 145, Folder 8.

22. F. E. Breithut to Herty, September 14 (quotation), August 22, 1923; Leland Harrison to Herty, August 31, 1923; SOCMA, Minutes of the Board of Governors, February 28, November 23, 1922, May 10, August 13, 16, 1923; Herty to F. E. Breithut, February 29, 1924; Miles, ed., *American Chemists and Chemical Engineers*, 46–47; Wilson, *American Business and Foreign Policy*, 115–16.

23. Herty to Walter L. Johnson, September 21, 1923; Herty to W. D. Hooper, September 22, 1923; Herty, Passport, September 22, 1923, Box 136, Folder 13; Herty, Diary, 1923, Paris, October 2–November 7, 1923; F. E. Breithut, Statement of costs for translation, original and six copies, November 5, 1923; Beer, *Emergence of the German Dyes Industry*, 5, 24.

24. Herty to Francis P. Garvan, October 19 (quotation), 4, 8, 9, 1923, Misc., Box 73, Z 65, Garvan Papers.

25. Herty, Memorandum to Francis P. Garvan, February 2, 1932, Box 108, Folder 2; Herty to Francis P. Garvan, October 8, 9, November 5, 1923, Misc., Box 73, Z 65, Garvan Papers.

26. R. Jeffcott to Herty, November 3, 1923; Herty to Harold Howland, December 7, 1923; Herty to Frank Herty, January 31, 1924; Herty to H. C. Wells, February 16, 1924; Herty to L. D. Hopper, March 10, 1924; Herty to A. A. Fries, May 21, 1924; Herty to Holmes Herty, June 25, 1924; Herty to Edgar Fahs Smith, June 30, 1924; Herty to Lois Woodford, November 16, 1923; Herty, travel plans, November 27, 1923; F. E. Breithut to Herbert Hoover, November 14, 1923; F. E. Breithut to Herty, November 14, 1923.

27. C. M. Penfield to Herty, December 20, 1923; Herty to M. Girarclos, January 1, 29, 1924; F. E. Breithut to Herty, January 6, 1924; Herty to P. A. Brangier, January 29, 1924; Herty Memorandum to Francis P. Garvan, February 2, 1932, Box 108, Folder 2.

28. F. E. Breithut to Herty, December 9, 1923.

29. F. E. Breithut to Herty, December 11, 1923.

30. F. E. Breithut to R. C. Jeffcott, December 11, 1923. A note by Herty scrawled on the Breithut letter to Jeffcott mentions the visit from the du Pont executive.

31. Herty, interview with *London Daily Mail* correspondent, January 30, 1924; Haber, *Chemical Industry*, 274; Haber, *Poisonous Cloud*, 1–2.

32. Herty to F. E. Breithut, February 5, 18, 1924; F. E. Breithut to Director of Bureau of Foreign and Domestic Commerce, copy to Herty, February 21, 1924.

33. Herty to F. E. Breithut, February 5, 1924.

34. Herty to F. E. Breithut, February 29, 1924.

35. Herty to Charles G. Dawes, March 3, 1924.

36. F. E. Breithut to Herty, March 19, 1924; F. E. Breithut to P. A. Brangier, March 17, 1924.

37. F. E. Breithut to Herty, March 19, 1924.

38. Herty to Nicholas Longworth, March 24, 1925; Hughes, *Contemporary Europe*, 151–52. See also Wilson, *American Business and Foreign Policy*, chaps. 4 and 5.

39. Herty to Edgar Fahs Smith, January 24, 1922; Herty to E. J. Atkinson, June 9, 1922; H. E. Howe to Herty, June 27, 1922; A. A. Fries to Herty, March 26, May 15, June 5, 1924, February 21, August 3 (quotation), 6, 1925; Herty to A. A. Fries, May 16, June 30, 1924, February 13, 1925; ACS, Draft resolution against Geneva Protocol, July 23, 1925; Herty to J. N. Wainwright, January 10, 1925.

40. Herty to A. A. Fries, August 6, October 16, 1925.

41. A. A. Fries to Herty, April 5, May 28, 1926; C. E. Brigham to Herty, April 16, 1926; James Wadsworth to Herty, May 29, 1926; Herty to James Wadsworth, December 16, 1926; Herty to Joseph Ransdell, December 14, 1926; Joseph Ransdell to Herty, December 14, 1926. See Haber, *Poisonous Cloud*, 295–96, for a brief summary of the Geneva Protocol and its aftermath.

42. Herty to C. E. Brigham, March 14, 1923; Herty to Warren Watson, March 4, 1925; ACS, New York section, notice of meeting, March 25, 1925; Erle Billings to Herty, April 13, 1926, Box 22, Folder 4; Herty, “The National Defense and Industrial Preparedness,” speech delivered to the National Republican Club, January 12, 1924, Box 144, Folder 3; Herty, “The Coal Tar Industries of the United States,” address to the Franklin Institute, January 16, 1924; Herty to Hugh E. Moore, May 27, 1926, Box 123, Folder 2; Herty, address to Chi Chapter, Alpha Chi Sigma, Yale University, April 6, 1923; Herty to Wert Robinson, January 11, 1924; Herty to Ralph Earle, November 5, 1925; Charles Hayden to Herty, December 5, 1925; Elmer Knight to Herty, May 5, 1926; Herty to Elmer Knight, May 7, 1926; Herty to Vannevar Bush, November 13, 1926.

43. Charles Parsons to Herty, November 29, 1919; Herty to Francis P. Garvan, August 25, 26, 30, 1920; Herty to M. R. Poucher, September 2, 1920; Wm. Keohan to Herty, September 23, 1920; William Lloyd Evans to Herty, March 12, 1921; Herty to William Lloyd Evans, March 15, 1921.

44. H. E. Howe to Herty, April 19, 1923; Herty to H. E. Howe, April 20, 1923; News release announcing essay contest, [October 1923].

45. E. J. Crane to Herty, June 9, 1926, November 28, 1925; Rhees, “Chemists’ Crusade,” 295; Herty to Arthur Little, Julius Stieglitz, W. D. Bancroft, and W. R. Whitney, July 10, 1925; Herty to E. J. Crane, November 6, 30, 1925, January 6, June 4, 1926; Lois Woodford to E. J. Crane, May 15, 1926; Herty to F. P. Garvan, May 28, 1926. Rhees notes that H. E. Howe claimed the foundation’s contribution to the ACS totaled only about \$140,000. “Chemists’ Crusade,” 339, n. 81.

46. Browne and Weekes, *History of the American Chemical Society*, 132, 134, 301, 342.

47. “Chemical Lessons of Peace and War,” *Outlook* 131 (January 26, 1922): 510–11;

ACS News Service, *Chemical Roundtable*, August 1, 1922; E. Muhs, “The Chemical Foundation,” unpublished MS., chap. 12, Docs. Box 1A, Garvan Papers.

48. Herty to J. M. Bell, June 1, 1923; Herty to Hotel du Pont hat check attendant, Wilmington, Delaware, July 28, 1923; Lois Woodruff to Herty, September 28, October 29, 1923; clipping, *New York Tribune*, September 25, 1923, Box 107, Folder 5; clipping, *Daily News Record*, October 29, 1923; clipping, *Oil, Paint and Drug Reporter*, January 7, 1924, Box 145, Folder 8; Herty to Francis P. Garvan, October 8, 9, 19, 1923; E. Muhs, “The Chemical Foundation,” unpublished MS, chap. 12, Docs. Box 1A, Garvan Papers; Herty to George Sutherland, October 13, 1926; Herty to Hugh Morris, October 13, 1926; Hugh Morris to Herty, October 18, 1926, Box 107, Folder 6.

49. Lois Woodford to *Manufacturers' Record*, November 13, 1926, Box 121, Folder 6.

50. Paul Wooton to Herty, November 8, 1921; Herbert Hoover to Herty, December 20, 1926, Box 94, Folder 5; James F. Norris to Herty, December 9, 1924; Edgar Queeny to Herty, November 19, 1926; E. M. Allen to Herty, November 16, 1926; A. Cressy Morrison to Herty, November 24, 1926; Haynes, *American Chemical Industry*, 4:10–11.

51. SOCMA Financial Survey, Analyses of annual receipts, expenditures, and budgets, November 1, 1921, through June 30, 1926, Box 74, Folder 9; SOCMA, Minutes of Third Annual Meeting, December 12, 1924, Box 74, Folder 6; Herty to G. W. Gray, June 26, 1925; Herty, formal statement of resignation, November 13, 1926.

52. Herty to Apartment manager, October 17, 1917; Herty to Postmaster, October 17, 1918; Herty to F. P. Venable, June 13, 1922, September 22, 1923; Herty to Frank B. Herty, December 9, 1918; Herty to Holmes Herty, March 17, 1924.

53. Herty to J. G. Smith, June 18, 28, 1920; Herty to James Delehanty, June 22, 1920; Herty to Edward J. C. Smith, July 16, 1920; Herty to Lord and Taylor, February 1, 1918; Best and Company to Herty, [July 25, 1918]; Herty to B. Altman and Company, November 21, 1924; Herty to *New York Times*, August 16, 1919, June 8, 1923; Herty to various magazines, June 8, 1923; Bulletin for Lecture Series, Metropolitan Museum of Art, 1923–24; Herty, Checks for opera, theater tickets, October 31, 1922; Symphony Society of New York to Herty, November 7, 1922; Herty to F. W. Payne, October 4, 1924, April 11, 1925.

54. Herty to J. C. Olson, March 21, 1922, Box 123, Folder 2; Herty to Boswel McRea, April 27, 1918, Box 127, Folder 1; Herty to Wm. Buckner, October 27, 1920, Box 128, Folder 21; Herty to C. L. Parsons, May 24, 1917, February 14, 1918; Charles Baskerville to Herty, May 13, 1919, Box 127, Folder 15; Herty to Charles Miller, June 9, 1920; Herty to E. M. Allen, June 25, 1926; Herty to Rhinclander Stewart, April 5, 1927, Box 127, Folder 15; Herty to Charles Baskerville, August 27, 1920; Constance McLaughlin Green, *Washington: Capital City, 1879–1950*, 2 vols. (Princeton: Princeton University Press, 1962), 2:97, 203.

55. Herty to John M. Francis, July 8, 1918; Herty to W. B. MacNyder, August 15, 1919, August 6, 1920; Herty to J. R. Bailey, August 19, 1919; Herty to C. E. Burke, June 8, 1920; Herty to Allen Rogers, January 25, 1921; W. M. Corse to Herty, May 3, 1922; Herty to John D. McBarron, June 13, 1922; Pocono Manor to Herty, August 17, 1923; Herty to Harold Howland, December 7, 1923; Herty to H. C. Wells, February 16, 1924; Herty to L. D. Hoppe, March 6, 1924; Herty to Marston Bogert, March 11, 1924; Herty to F. O. Taylor, March 3, 12, 1924; Herty to T. B. Wagner, April 2, 1924; Herty to Edgar Fahs Smith, June 30, 1924; Herty to C. M. Strahan, October 14, 1924; Herty to Amos Fries, May 21, 1924; Medical bills, January 1, July 28, 1926, Box 138, Folder 1.

56. Herty to W. H. Watkins, March 9, 1920; Herty to Lawrence Clark, April 17, 1920; Herty to Wm. H. Stone, July 20, 1921; Herty to [Optician] Meyrowitz, June 14, 1922; [Ophthalmologist] Theobald to Herty, June 21, 1922; Dentist bills for Herty, 1925–26, January 1, 1926, Box 138, Folder 1.

CHAPTER 8. HERTY AND THE CHEMICAL FOUNDATION

1. Herty to Dear Old Man (Francis P. Garvan), November 16, 1926, Box 107, Folder 6; Herty to Francis P. Garvan, October 17, 20, 1927, Box 107, Folder 9; Rhees, “Chemists’ Crusade,” 297.

2. W. F. Keohan to Herty, November 13, 1926, Herty to [Francis P. Garvan], November 16, 1926, Box 107, Folder 6; Herty to Francis P. Garvan, June 16, 1927, Box 107, Folder 5; Herty to Francis P. Garvan, March 29, 1927, Box 107, Folder 7; Herty to Stanley H. Barrows, November 27, 1926, Box 107, Folder 6; Herty to several newspaper editors, June 9, 1927, Box 107, Folder 8; Francis P. Garvan, Chemical Foundation form letter, November 29, 1926, Box 107, Folder 6.

3. William Keohan to Herty, January 11, 1927, Herty to Francis P. Garvan, February 9, 1927, Box 107, Folder 7; Herty to E. W. Washburn, January 17, February 7, 10, 1928, Herty to William Buffum, February 10, 1928, Herty to Francis P. Garvan, February 29, May 14, 1928, Box 107, Folder 10; William DeB. MacNider to Herty, May 7, 9, 1928, Box 10, Folder 12; Herty to Frederick Lee, March 22, 1927, Box 118, Folder 29; Herty to Mr. and Mrs. Francis P. Garvan, April 5, 1928, Box 118, Folder 41.

4. Herty to Dwight Morrow, April 21, 1926 (quotation); Herty to Arthur Lowenstein, January 19, 1926; Herty to E. Royce Armstrong, April 21, 1926; “Elbert Henry Gary,” *Concise Dictionary of American Biography* (New York: Charles Scribner’s Sons, 1964), 331.

5. Thomas Gamble to Herty, February 12, 1926, Box 40, Folder 11; Pine Institute of America, news release, March 10, 1925, Herty to Thomas Gamble, May 24, 1926, Herty to C. F. Speh, May 24, July 20, 1926, C. F. Speh to Herty, May 27, 1926, Herty to O. L. Wernicke, August 4, 1926, O. L. Wernicke to Herty, August 17, 1926, Box 56, Folder 1.

6. Herty to C. P. Winslow, April 22 (quotation), 24, 26, 1926, Box 51, Folder 7.

7. Herty to Joseph Ransdell, April 22, 24, 1926; Ward Shepard to Herty, May 3, 1926; E. N. Munns to Herty, May 6, 1926; Herty to Duncan Fletcher, May 8, 1926, Duncan Fletcher to Herty, May 11, 1926, all in Box 51, Folder 7.

8. Ovid Butler to Herty, July 8, 1926, Herty to Paul Wooton, May 15, 1926, Herty to Thomas Gamble, May 24, 1926, Herty to J. C. Nash, May 14, July 16, 1926, Herty to Ellison D. Smith and George Morris, July 3, 1926, Thomas Gamble to Herty, July 26, 1926, J. C. Nash to Herty, July 23, 1926, Herty to Harry G. Schnell, September 28, 1926, all in Box 51, Folder 7; Duncan Fletcher to Herty, January 3, 1927, Box 51, Folder 8; Shirley Allen to Herty, January 13, 1927, Box 57, Folder 1; Eloise Gerry to Herty, January 28, 1927, Box 51, Folder 8; Herty to Francis Garvan, February 9, 28, March 29, 1927, Herty to A. F. Woods, March 30, 1927, Box 107, Folder 7; Herty to Eloise Gerry, February 9, April 1, 1927, Box 51, Folder 8.

9. Herty to W. B. Greeley, April 20, 1927, Herty to Eloise Gerry, November 2, 1927, Box 51, Folder 8; Herty to Eloise Gerry, January 12, 13, 1928, Eloise Gerry to Herty, January 20, 1928, Box 51, Folder 9; Herty to Francis P. Garvan, March 7, 1927, Box 107, Folder 7; Herty to Francis P. Garvan, February 29, 1928, Box 107, Folder 10; R. S. Kellogg to Herty, February 8, 11, 28, 1928, Box 51, Folder 9; Herty to R. S. Kellogg, February 9, 1928; Herty to Eloise Gerry, May 14, 1928, Box 51, Folder 9. On cooperative research see Kevles, *The Physicists*, 110, 193–94.

10. J. M. Reade to Herty, November 11, 1927, Herty to Mrs. B. F. Bullard, December 4, 1928, Box 7, Folder 3; Alfred Scott to Herty, January 28, October 22, November 26, 1928, Box 7, Folder 3; Herty to Alfred Scott, March 26, 1928; *Savannah Morning News*, clipping, October 17, 1928, Box 7, Folder 3; Herty to Mrs. B. F. Bullard, January 19, 1928, Box 3, Folder 10 (quotation).

11. Herty to Lash Miller, July 27, 1927, Box 94, Folder 6; Herty to Francis P. Garvan, October 17, 18, 1927, Box 107, Folder 9; Herty to R. H. Edmonds, October 31, 1927, Box 121, Folder 6. For a discussion of competition and the impact of U.S. tariff and antitrust policy on it, see Galambos and Pratt, *Rise of the Corporate Commonwealth*, 57–64.

12. Herty to Arthur Thomas, October 28, 1927, Box 94, Folder 6; Herty, “The European Chemical Cartel—How Will It Affect America,” speech to the Salesmen’s Association of the American Chemical Industry, November 4, 1927, reprinted from *Manufacturers’ Record*, November 10, 1927, Box 144, Folder 5.

13. Herty, “European Chemical Cartel.”

14. Herty to Herbert Hoover, November 1, 1927, Herty to Francis P. Garvan, December 13, 1927, Box 107, Folder 9; Herty to Editor, *New York Times*, November 16, 1927, Box 78, Folder 12; Herty to Rollo Ogden, November 18, 1927, Box 94, Folder 6; Herty to Rollo Ogden, February 1, 1928, Herty to R. H. Edmonds, November 23, 1927, Box 121, Folder 7; S. C. Lind, W. R. Cathcart, and Everett Smith to Herty, December 13, 1927,

Herty to Dwight Davis, December 14, 1927, Herty to Secretaries of State, Agriculture and Commerce, December 30, 1927, Herty to Chemical Foundation, December 23, 1927, Box 94, Folder 6; Herty, Speech to Second National Organic Chemistry Symposium, December 29–31, 1927, Box 22, Folder 12; Herty to R. H. Edmonds, February 1, 1928, quoting remarks of George Buckley reported in the *New York Times*, January, 29, 1928, Box 121, Folder 7.

15. Herty to Rollo Ogden, February 1, 1928, Box 121, Folder 7; Herty to Francis P. Garvan, February 29, 1928, Box 107, Folder 10; Herty to Francis P. Garvan, August 29, 1928, Box 107, Folder 11; F. P. Garvan to Watson Washburn, January 28, 1930, Box 108, Folder 2. For background on the IG and its activities, see Joseph Borkin, *The Crime and Punishment of I. G. Farben* (New York: Free Press, 1978), esp. chaps. 2, 4, and 10. See also Haynes, *American Chemical Industry*, 4:234–36.

16. Herty to Francis Garvan, January 26, February 9, 1927, Box 107, Folder 7; Herty to Frederick Lee, January 31, 1927, Box 120, Folder 8; Browne and Weeks, *History of the American Chemical Society*, 131–32, 409–12.

17. Herty to Francis Garvan, January 26, 29, February 9, 1927, Box 107, Folder 7; H. E. Howe to Herty, December 20, 1926, January 3, 1927, Box 19, Folder 6; H. E. Howe to Herty, March 9, 1927, Chemical Foundation to H. E. Howe, Herty to H. E. Howe, March 9, 1927, Herty to George Rosengarten, March 10, 1927, Box 19, Folder 7.

18. Charles Parsons to Herty, March 12, 1927, Box 19, Folder 7.

19. L[ois] W[oodford], Memorandum of the Richmond meeting, April 11–14, 1927; Herty, Memorandum of the Richmond meeting, April 11–14, [1927]; H. E. Howe to Herty, with memorandum, April 27, May 7, 1927; Herty to H. E. Howe, May 3, 1927, all in Box 19, Folder 7; Charles Parsons to B. S. Hopkins, April 25, 1927, Herty Miscellaneous File, Box 73, Z-65, Garvan Papers.

20. Browne and Weeks, *History of American Chemical Society*, 409–10; Charles Parsons to B. S. Hopkins, April 25, 1927, Herty Miscellaneous File, Box 73, Z-65, Garvan Papers; Charles Parsons to Lyman Newell, April 18, 1927; B. S. Hopkins to Chemical Foundation, May 4, 1927; W. W. Buffum to B. S. Hopkins, May 6, 1927; Herty to Francis P. Garvan, May 2, 1927; Geo. Corbett to B. S. Hopkins, June 10, 1927; Charles Parsons to B. S. Hopkins, June 24, 1927; B. S. Hopkins to Charles Parsons, June 17, July 5, 1927, all in Box 120, Folder 8.

21. Herty to Wilhelm Segerblom, August 3, 1927, Box 120, Folder 9; Neil Gordon to B. S. Hopkins, July 25, 1927, Box 120, Folder 8; W. Segerblom to Herty, August 1, 1927, Herty to Francis Garvan, August 15, 1927, Box 120, Folder 9; Herty to Henry Howard, August 11, 1927, Box 107, Folder 8; Charles Parsons to Francis Garvan, August 5, 1927, Charles Parsons to Geo. Corbett, August 5, 1927, Box 120, Folder 9.

22. Herty to Francis Garvan, August 17, 1927, Box 120, Folder 9; Herty to Francis

Garvan, n.d., Box 107, Folder 9; B. S. Hopkins to Herty, August 24, 1927, Herty, Memorandum of ACS Detroit Meeting, September 4–8, 1927, Box 120, Folder 9.

23. Herty to Francis Garvan, September 9, 1927, Box 107, Folder 9.

24. Herty, Memorandum of ACS Detroit Meeting, September 4–8, 1927, Box 120, Folder 9; Herty to Francis Garvan, September 9, 1927, Box 107, Folder 9; Herty to George Corbett, September 9, 1927, Box 120, Folder 9.

25. B. S. Hopkins to Herty, September 9, 1927, Box 120, Folder 9.

26. B. S. Hopkins and R. A. Baker to Chemical Foundation, Inc., September 8, 1927, Box 120, Folder 9.

27. Herty to Francis Garvan, September 13, 1927; Herty to B. S. Hopkins, September 15, 1927, both in Box 107, Folder 9.

28. Herty to Neil Gordon, September 16, 1927, Box 120, Folder 9; Herty to Francis Garvan, October 5, 1927, Box 107, Folder 9; Neil Gordon to Herty, October 6, 1927, Box 120, Folder 9.

29. William Buffum to Herty, October 11, 1927, Charles Herty to Members of the ACS, October 14, 1927, Box 120, Folder 9.

30. Herty to members of the ACS, October 14, 1927, Neil Gordon to ACS Committee on Chemical Education, October 11, 1927, ACS Committee on Chemical Education to Executive Committee of Division of Chemical Education, October 15, 1927, Neil Gordon to Francis Garvan, October 15, 1927, B. S. Hopkins and R. A. Baker to Chemical Foundation, October 27, 1927, Box 120, Folder 9; Browne and Weeks, *History of the American Chemical Society*, 410, 412.

31. Herty to Members of the ACS, October 14, 1927, Box 120, Folder 9; Herty to H. E. Howe, November 3, 1928, Box 30, Folder 13; Herty to D. B. Keyes, September 22, 1927, Box 120, Folder 9; Herty to E. C. Franklin, January 12, 1928, Box 107, Folder 10.

32. Herty, Editorial Scrapbook, September 1918.

33. Ibid.

34. Herty to John Abel, August 9, 21, October 23, 1918; John Abel to Herty, August 17, 1918; H. A. B. Dunning to Herty, September 21, 1918; Herty to H. A. B. Dunning, October 3, 1918; Harvey Watts to Herty, October 8, 1918; Herty to Harvey Watts, October 10, 1918.

35. Minutes of ACS New York Section, November 8, 1918; Minutes of ACS Advisory Committee, January 11, 1919; "An Institute for Cooperative Research as an Aid to the American Drug Industry," *JIEC* 10 (December 1918): 969–76. See also Herty's correspondence with all the speakers at the November 1918 meeting of the ACS New York Section between October 23 and November 8, 1918.

36. A. S. Loevenhart to Herty, November 12, 1918; Donald McKesson to Herty, November 14, 1918; Charles Baskerville to Herty, November 15, 1918; John Abel to Herty,

November 21, 1918; Arthur Herschfelder to Herty, December 13, 1918; F. R. Eldred to Herty, December 17, 31, 1918; Herty to Chas. J. Lynn, December 13, 1918; Herty to F. R. Eldred, December 21, 1918, January 10, 1919; Edward Kremers to F. R. Eldred, December 11, 1918.

37. Herty to F. R. Eldred, January 14, 1919; F. R. Eldred to Herty, January 20, 1919; Herty to William H. Nichols, February 5, 1919; Herty to P. A. Levene, February 17, 1919; Herty to R. Bacon, February 17, 1919; "Committee Appointed to Plan Drug Research Institute," ACS News Service release, February 22, 1922; C. S. Parsons to Members of ACS Committee on Institute for Drug Research, April 20, 1920, Box 102, Folder 4; Herty's correspondence with W. A. Noyes, Julius Stieglitz, Treat B. Johnson, and E. F. Smith between November 29, 1920, and January 27, 1921; C. Alsberg to Herty, January 29, 1921.

38. John J. Abel to Herty, February 24, March 17, 1919; Herty to Wm. H. Nichols, March 15, 1919; Treat B. Johnson to Herty, March 14, 1919; F. O. Taylor to Herty, March 19, 1919; Herty to John J. Abel, March 20, 1919; Herty to Members of Committee to Report to the ACS on an Estimate of the Cost and Outline of Policies of an Institute for Drug Research, March 28, 1919.

39. ACS News Service, "Committee Appointed to Plan Drug Research Institute," February 22, 1919; Edward Marshall Syndicate, Inc., "To Save Untold Thousands of Human Lives," interview with Charles Herty, February 23, 1919, Box 102, Folder 2; Herty, Memorandum for Mr. Garvan, "The Ransdell Bill," May 14, 1930, Box 104, Folder 4; Charles Parsons to Herty, April 17, 1919; J. M. Francis to Herty, April 23, 1919.

40. Herty to C. L. Parsons, April 19, 1919; Julius Stieglitz to Herty, May 1, 1919; Julius Stieglitz to Paul Nicholas Leech, May 1, 1919; Herty to John M. Francis, May 2, 1919; Sydney Davis to Herty, May 16, 1919; Herty to Sydney Davis, May 23, 1919; Frank Eldred to Herty, May 17, 1919; Herty to Frank Eldred, May 23, December 24, 1919.

41. Herty to F. R. Eldred, August 5, March 12, 1919; Herty to F. O. Taylor, March 3, 10, 1919; Herty to John Abel, March 17, 1919; Herty to J. M. Francis, May 2, 1919.

42. F. P. Garvan to Herty, January 16, November 1, 1920; Herty to Francis P. Garvan, January 19, October 26, 1920; P. A. Levene to Herty, March 6, 1920; Herty to F. A. Taylor, P. A. Levene, and F. H. Eldred, March 9, 1920; Herty to John J. Abel, May 26, 1920; Herty to Members of ACS Committee on Proposed Institute for Drug Research, September 30, October 6, 1920; Minutes of ASC Committee on Institute for Chemo-Medical Research, October 11, 1920; Reid Hunt to Herty, October 18, 1920.

43. Herty to Francis P. Garvan, November 29, 1920; P. A. Levene to Herty, November 19, 1920; Reid Hunt to P. A. Levene, November 20, 1920; Julius Stieglitz to Herty, November 29, 1920; Treat Johnson to Herty, November 29, October 12, 1920; Herty to Treat Johnson, November 30, October 14, 1920; P. A. Levene to Julius Stieglitz, Decem-

ber 14, 1920; correspondence between W. A. Noyes and Herty, November 29, 1920, through January 3, 1921; Herty to E. F. Smith, January 26, 1921.

44. Herty to Edgar Fahs Smith, January 26, 1921; Herty to Julius Stieglitz, Reid Hunt, Treat Johnson, and F. R. Eldred, January 5, March 1, 1921; Reid Hunt to Herty, February 17, 1921; J. Stieglitz to Herty, March 4, 1921; Treat Johnson to Herty, March 28, 1921; Julius Stieglitz, Draft Report, [March 10, 1921]; Treat B. Johnson to Julius Stieglitz, March 7, 1921; Herty to ACS Committee on Institute for Chemo-Medical Research, April 9, 1928.

45. Herty to John Abel, May 17, 1921; Herty to F. R. Eldred, May 24, 1921; John Abel to Herty, May 23, 1921; John Abel to Reid Hunt, May 23, 1921.

46. Herty to Reid Hunt, May 25, 1921; Herty to Julius Stieglitz, June 2, 1921; Julius Stieglitz to Herty, June 8, 1921.

47. Julius Stieglitz to Herty, July 3, 1921; Herty to John Abel, July 21, 1921; Herty to Chemical Foundation, Inc., August 5, 1921; Herty to Julius Stieglitz, July 20, 1921.

48. Typescript of "Report of Committee on an Institute for Chemo-Medical Research," July 4, 1921.

49. Francis P. Garvan to Herty, December 23, 1921; Marston Bogert to Herty, January 12, 1922; Herty to Members of ACS Committee on an Institute for Chemo-Medical Research, January 27, 1922, Box 102, Folder 7.

50. Herty to W. A. Day, February 9, 1922; Herty to Lawrence Abbott, January 30, March 4, 1922; clipping, *New York Times*, February 5, 1922; Julius Stieglitz to Herty, February 3, March 11, 1922; Herty to Julius Stieglitz, February 11, 1922.

51. Morris Sheppard to Herty, February 18, April 6, 1922; Frank O. Taylor to Herty, April 19, 1922; Herty to Frank O. Taylor, April 24, 1922; Harvey L. Curtis to Herty, October 25, 1922.

52. P. E. Somers to Herty, May 17, 1922; Herty to P. E. Somers, May 27, 1922; Wendell Phillips to Herty, February 27, 1922; Herty to Wendell Phillips, June 27, 1922; Larkin H. Mead to Herty, June 27, 1922, Box 107, Folder 4; Herty to Larkin Mead, June 28, 1922; Dr. J. J. A. O'Reilly to Congressmen Thos. H. Cullen and William Calder and Senator James Wadsworth, n.d.; Herty to J. J. A. O'Reilly, September 26, 1922; Herty to Augustus B. Wadsworth, January 31, 1923; Augustus Wadsworth to Herty, March 12, 1923; Herty to James Norris, March 18, 1925; Haynes, *American Chemical Industry*, 3:272-73.

53. Herty to Cornell Club, December 11, 1924; Herty to Treat B. Johnson, February 28, April 2, 1925; Treat B. Johnson to Herty, March 19, April 1, 1925; Herty to Alexis Carrel, March 23, 1925; Herty to John Finley, March 26, 1926.

54. Herty to Joseph Ransdell, January 19, 1926; Joseph Ransdell to Herty, February 5 (quotation), 12, 27, 1926, all in Box 103, Folder 3.

55. George Quitman Flynn, “Senator Joseph E. Ransdell of Louisiana and the Underwood Tariff of 1913” (M.A. thesis, Louisiana State University, 1962), 4–7, 37, 122; Joseph Ransdell to Herty, February 5, 1926, Box 103, Folder 3. See also Adras P. Laborde, *A National Southerner: Ransdell of Louisiana* (New York: Benziger, 1951).

56. Joseph Ransdell to Herty, February 5, 27, April 5, 1926, Box 103, Folder 3; Herty to President of ACS, March 26, 1926, Herty to Members of ACS Committee on Institute for Chemo-Medical Research, March 22, 1926, Box 102, Folder 9; Herty to Joseph Ransdell, April 2, 1926, Box 103, Folder 3.

57. Herty to Joseph Ransdell, April 8, 10, 1926, Joseph Ransdell to Herty, June 1, 1926, Box 103, Folder 3.

58. Joseph E. Ransdell to Herty, July 1, 1926, Herty to Joseph Ransdell, July 2, 1926, Box 103, Folder 3.

59. Joseph E. Ransdell, “A Comprehensive Federal Campaign Against the Unconquered Enemies of Human Health,” reprint of speech in the Senate of the United States, July 2, 1926, Box 104, Folder 8; Herty, Memorandum for Francis P. Garvan, May 14, 1930, Box 104, Folder 4; *The National Institute of Health*, reprint from the *Congressional Record*, May 26, 1930, attached to L. A. Thompson to Herty, April 27, 1934, Box 104, Folder 7.

60. Victoria A. Harden, *Inventing the NIH: Federal Biomedical Research Policy, 1887–1937* (Baltimore: Johns Hopkins University Press, 1986), 56–68.

61. Harden, *Inventing the NIH*, 51, 52–67, 71–75, 92–98.

62. *Ibid.*, 86–87; Herty to Julius Stieglitz, May 22, 1925, Box 102; Herty to Francis P. Garvan, January 10, February 29, 1928, Box 107, Folder 10; Herty to Francis P. Garvan, September 15, October 16, 1928, Francis P. Garvan to James Rowland Angell, October 17, 1928, Box 106, Folder 10; Hugh Young to Herty, April 9, 1929, Box 6, Folder 1; Herty to Francis P. Garvan, January 26, 1927, Box 107, Folder 7; *New York Evening Star*, clipping, October 29, 1929, Box 108, Folder 8.

63. Flynn, “Ransdell and the Underwood Tariff of 1913,” 3–7, 24–25, 45, 120–22, 125–26; Harden, *Inventing the NIH*, 100–101. See also Laborde, *National Southerner*.

64. Herty to Francis Garvan, Memorandum, February 9, 1927, Box 103, Folder 4.

65. Harden, *Inventing the NIH*, 112–14, 117, 122–23.

66. For this brief summary of the legislative history of the Ransdell and Parker bills, I have relied entirely on Harden, *Inventing the NIH*, especially chapters 6–7. See also Series 7 of the Charles Holmes Herty Papers and John Parascandola, “Charles Holmes Herty and the Effort to Establish an Institute for Drug Research,” in *Chemistry and Modern Society: Historical Essays in Honor of Aaron J. Ihde*, ed. John Parascandola and James C. Whorton (Washington, D.C.: American Chemical Society, 1983).

67. Browne and Weeks, *History of the American Chemical Society*, 139.

68. Herty to Francis Garvan, August 29, 1928, Box 107, Folder 11.

69. Ibid.

70. Ibid.

71. Francis Garvan to Herty, n.d., Box 107, Folder 11.

72. Herty to Francis Garvan, September 7, 1928, Box 107, Folder 11; Herty-Ransdell Correspondence, Boxes 103, 104; Herty to Henry Claus, June 3, 1930, Box 104, Folder 4; Harden, *Inventing the NIH*, 158, 160.

CHAPTER 9. PROMOTING SOUTHERN INDUSTRY THROUGH CHEMISTRY

1. J. M. Mallory to Herty, May 5, 1925, Box 62, Folder 1; Herty to J. M. Mallory, May 7, 1925; J. M. Mallory to Herty, November 4, 7, 1925.

2. R. Preston Brooks to Herty, January 22, 1926; Jno. MacPherson to Herty, January 25, 1926; Herty to Charles W. Snelling, January 19, 1926.

3. Charles Herty, typescript of Address at the Twenty-eighth Annual Meeting of the American Ceramic Society, Atlanta, Georgia, February 8, 1926, Box 144, Folder 4.

4. Herty to J. M. Mallory, January 29, 1926; J. M. Mallory to Herty, February 1, 1926; Herty to James Nevin, February 16, 1926.

5. J. M. Mallory to Herty, February 1, 1926; Herty to J. H. T. MacPherson, January 27, 1926; Herty to John L. Daniel, January 26, 1926; Capital City Club to Herty, February 6, 1926; Wm. C. Royer to Herty, January 29, 1926; F. H. Harding to Herty, January 30, 1926; Thomas C. Gamble to Herty, February 9, 1926.

6. Herty to William B. Greeley, March 10, 1926, Box 51, Folder 7; Herty to Thomas Gamble, May 24, 1926, C. F. Speh to Herty, May 27, 1926, Box 56, Folder 1; G. M. Reed, "Chemistry and the Southern Pine Industry: The Contributions of Charles Holmes Herty," November 1984, MS., Southern Historical Association, Charleston, South Carolina; Herty to Eloise Gerry, February 2, 1927, Box 51, Folder 8; O. H. L. Wernicke to Herty, February 8, 1927, Herty to O. H. L. Wernicke, February 11, 15, 1927, Box 56, Folder 2; Herty to W. J. Kelly, February 15, 1927, Box 40, Folder 11; Herty to Carl Speh, February 15, 1927, Box 56, Folder 2.

7. Herty to Francis Garvan, February 28, 1927, Box 107, Folder 7; Herty to Carl Speh, March 4, 19, 1927, Herty to O. H. L. Wernicke, March 5, 1927, O. H. L. Wernicke to Herty, March 12, 1927, Box 56, Folder 2; M. O. Boney to Herty, April 6, 1927, O. H. L. Wernicke to Geo. D. Beal, March 12, 1927, Carl Speh to Herty, March 19, May 17, 1927, Box 56, Folder 2; Germaine M. Reed, "Charles Holmes Herty and the Promotion of Southern Economic Development," *South Atlantic Quarterly* 82 (1983): 424–36. This article deals more fully with Herty's life as a consultant to promote industry in the South.

8. Herty to R. T. Haslem, March 3, 1927, Box 112, Folder 1; Herty to Alex Sessoms,

March 11, 1927, Herty to R. W. Edmonds, April 30, 1927, Box 112, Folder 1; Herty, reprint of “The Realization of a Vision: Possibilities in the Naval Stores Industries When Conducted by Improved Methods,” *Manufacturers’ Record*, Box 145, Folder 3; Herty to Francis Garvan, March 4, 1927, Box 107, Folder 7.

9. J. M. Mallory to Herty, March 5, 30, 1927, Box 115, Folder 3; Herty to Francis Garvan, March 4, 1927, Box 107, Folder 7. Gaston, *New South Creed*, does an excellent job of separating “New South” rhetoric from reality, especially in chapter 6, “The Emperor’s New Clothes,” 189–96.

10. Herty to J. C. Nash, Thomas Gamble, C. F. Speh, and Eloise Gerry, May 14, 1928, Box 56, Folder 3; Society of American Foresters to Herty, n.d., Box 51, Folder 9; O. M. Butler to Herty, March 9, April 21, 1928, Herty to Eloise Gerry, May 1, 9, 1928, Herty to Mildred Reeves, May 14, 1928, Box 51, Folder 9.

11. Carl Speh to Herty, May 17, 28, July 7, 23, 1928; Minutes of Conference on Mellon Research, June 1, 1928; Herty to Carl Speh, June 4, July 5, 9, 11, 25, 1928; Herty to A. F. Woods, July 16, 1928, all in Box 56, Folder 3.

12. Charles Snelling to Herty, April 4, 1928, Box 7, Folder 3.

13. Herty to Charles Snelling, April 9, 1928, Herty to E. O. Fippen, May 26, 1928, Box 7, Folder 3.

14. Herty, “Georgia’s Potential Wealth,” Baccalaureate Address at the Commencement Exercises of the University of Georgia, June 20, 1928, Box 144, Folder 6.

15. *Ibid.*

16. *Ibid.*

17. *Ibid.*

18. *Ibid.*

19. T. W. Reed to Herty, June 15, 1928, Herty to Charles Snelling, June 29, July 5, 1928, Charles Snelling to Herty, June 29, 1928, Box 7, Folder 3.

20. Gordon Saussy to Herty, July 11, 1928, Box 111, Folder 1.

21. Herty to Gordon Saussy, July 17, Box 111, Folder 1; Herty to J. M. Mallory, July 17, 1928, J. M. Mallory to Herty, July 27, 1928, Box 115, Folder 3.

22. J. M. Mallory to Herty, July 28, 1928, Box 115, Folder 3. Mallory’s ideas epitomize what James C. Cobb has called the “business progressivism” of the 1920s in his *Industrialization and Southern Society, 1877–1984* (Lexington: University Press of Kentucky, 1984), 30–31.

23. Gordon Saussy to Herty, July 27, 1928, Box 111, Folder 1; Herty to J. M. Mallory, August 16, 1928, Box 115, Folder 3.

24. Gordon Saussy to Herty, August 10, 1928, Herty to Gordon Saussy, August 16, 1928, Box 111, Folder 1.

25. Herty to Gordon Saussy, August 16, 1925, Box 111, Folder 1.

26. Herty to Carl Speh, August 16, 20, October 8, 1928, Carl Speh to Herty, August 18, September 14, 1928, Herty to A. F. Bullard, October 11, 1928, Box 56, Folder 3; Herty to Howard Foss, October 8, 1928, Box 111, Folder 1; Herty to Francis Garvan, August 29, September 7, 1928, Box 107, Folder 11. In fact, he never received any funds from the PIA, which claimed to have a cash flow problem. See Carl Speh to Herty, August 9, 1929, Box 56, Folder 4; Carl Speh to Herty, July 31, 1930, Box 56, Folder 5.

27. Herty to H. C. Foss, October 8, 1928, Box 111, Folder 1; Herty to H. C. Foss, August 1, 1929, Box 111, Folder 3; H. C. Foss to Herty, October 15, 1928, Geo. Rommel to Herty, November 26, 27, 1928, Box 111, Folder 1; January 4, 29, 1929, Box 111, Folder 2; L. L. McDonald to Herty, October 29, 1928, Box 111, Folder 1; L. L. McDonald to Herty, January 4, 1929, Box 111, Folder 2; Herty to L. L. McDonald, November 2, 1928, Herty to F. J. Sizemore, December 18, 1928, Box 111, Folder 1; Herty to Geo. Rommel, January 5, June 13, 1929, Herty to Norman Shepard and E. J. Morrison, April 10, 1929, Box 111, Folder 2.

28. J. M. Mallory to Herty, November 3, 1928, Box 56, Folder 3; Bradford Knapp to Herty, August 4, 1930, September 3, 1931, Herty to C. L. Hare, September 4, 1930, Box 113, Folder 4; Herty to Charles Snelling, September 6, November 12, 17, December 17, 1930, September 23, 1931, Charles Snelling to Herty, April 9, September 28, 1931, Box 7, Folder 4; T. Poole Maynard to Herty, November 6, 1928–June 11, 1931, Box 115, Folders 8–9; Herty correspondence with J. M. Mallory and others in Box 62, Folders 2–9.

29. Reed, “Herty and the Promotion of Southern Economic Development,” 431–32.

30. *Ibid.*

31. *Ibid.*; Austin Cary, “Wood Pulp and Paper Possibilities in Georgia,” *Georgia*, A. S. Carr to A. K. Sessoms, September 28, 1928, A. K. Sessoms to Herty, October 1, 2, 1928, August 5, 1930, H. W. Purvis to A. K. Sessoms, October 10, 1928, Box 112, Folder 1; Herty to Alex Sessoms, October 12, 1928, August 14, 1929, April 22, May 5, June 18, September 5, 18, 1930, Box 112, Folders 1–3; A. K. Sessoms to H. W. Purvis, October 18, 1928, Ingalls Kimball to Herty, November 13, 1928, Box 112, Folder 1; H. S. Studdiford to Lois Woodford, July 10, 1929, Box 112, Folder 2; Herty, Brief on the Timber Products Company of Cogdell, Georgia, n.d., Box 112, Folder 1.

32. Skolnick and Reese, eds., *Century of Chemistry*, 255; Herty, “A New Era Opens in Industry: Cellulose Chemistry Will Bring About Dramatic Changes,” *Nation's Business* (November 1928): 23–25, 116, Box 145, Folder 3; Browne and Weeks, *History of the American Chemical Society*, 280–81; Herty, “Future Trends of Synthetic Organic Chemistry,” paper read to ACS Division of Industrial and Engineering Chemistry, September 7, 1926, Box 144, Folder 4.

33. Herty to O. R. Sweeney, November 23, 1927, Box 53, Folder 2; O. R. Sweeney

to Herty, November 30, 1927, Box 53, Folder 2; John Nelson, "Cornstalks vs. Wood—The Base for Cellulose Products with Particular Reference to the Dorner Process," *Paper Trade* 53, no. 6, Box 53, Folder 2; Herty, Address to the National Industrial Conference Board, May 17, 1928, Box 144, Folder 6; Herty to Merle Thorpe, July 17, 1928, Warren Bishop to Herty, July 20, 1928, Herty to Warren Bishop, July 23, 1928, Box 53, Folder 2; Herty, "Georgia's Potential Wealth," Commencement Address to the University of Georgia, June 20, 1928, Box 144, Folder 6; Herty, "A New Era Opens in Industry," *Nation's Business*, November 1928, pp. 23–25, 116, Box 145, Folder 3; Herty to Francis Garvan, July 26, 1928, Box 107, Folder 10.

34. Herty to John D. Rue, July 12, 1928, Box 51, Folder 9; Herty to Hummel-Rose Fibre Corporation, July 12, 1928, Box 53, Folder 2; Herty to Francis Garvan, July 26, August 16, 1928, Box 107, Folder 10; Herty to Francis Garvan, n.d., Box 107, Folder 11; A. W. Schorger to Herty, August 9, 1928, G. J. Esselen to Herty, September 20, 1928, Box 53, Folder 2; Herty to George Rommel, July 6, 1928, Box 112, Folder 1.

35. Herty to Eloise Gerry, October 24, 1928, Box 51, Folder 9.

36. Herty to Alex Sessoms, February 15, 1929, Box 112, Folder 2; Herty, Address to American Paper and Pulp Association at the Waldorf Astoria, New York, February 21, 1929, Box 144, Folder 7.

37. Herty, Address to the American Paper and Pulp Association, February 21, 1929, Box 144, Folder 7.

38. *Ibid.*

39. *Ibid.*

40. *Ibid.*

41. *Ibid.*

42. Alfred D. Flinn to Herty, September 12, 18, October 31, 1928, March 4, 1929, Herty to Alfred D. Flinn, October 12, 1928, April 1, 1929, Box 119, Folder 14; Carlisle P. Winslow to Herty, January 11, 1929, Box 51, Folder 10; Harold Hibbert to Herty, [January], February 15, 1929, Box 53, Folder 3; *Paper Industry* 10 (January 1929): 1712–14; *Paper Industry* 10 (March 1929): 2163, 2175; Lois Woodford to Herty, July 19, 1929, Box 111, Folder 2; H. S. Bristol to Herty, August 3, 1929, Herty to H. S. Bristol, August 5, December 10, 1929, Box 53, Folder 4; Herty to George M. Rommel, March 15, 1929, Box 111, Folder 2; C. F. Rhodes to Herty, December 27, 1929, Box 53, Folder 4.

43. Herty to G. G. Esselen, June 26, July 1, 1929, Box 53, Folder 4; Herty, Memorandum on information obtained at International Paper Company, Mobile, Alabama, May 26, 1929, Herty to E. H. Mayo, June 14, 1929, Box 53, Folder 3; Herty to Henry Hardtner, June 14, 1929, Herty to J. M. Mallory, January 7, 1930, J. M. Mallory to Herty, January 9, 20, 1930, Box 115, Folder 4; Herty to B. M. Lufburrow, February 12, 1930, Box 52, Folder 7; E. L. Demmon to Herty, July 2, 1929, Box 51, Folder 10; E. L.

Demmon, "Relation of Forest Research to the Naval Stores Industry," June 21, 1929, Box 47, Folder 4; Herty correspondence with W. R. Matoon, October 12, 15, 1928, through April 1, 1931, Box 51, Folders 9, 10, Box 52, Folders 1, 3; Herty correspondence with Austin Cary and Eloise Gerry, March 4, 1930, through June 4, 1930, Box 52, Folders 1, 2; Herty to A. K. Sessoms, March 17, 1930, Box 112, Folder 3; C. C. Heritage to J. L. Cobb, March 26, 1929, Box 115, Folder 11; John L. Cobb to Herty, April 3, 1929, Box 115, Folder 11.

44. C. E. Curran, "Present and Future Trends in the Pulping of Southern Woods," *Paper Industry* 11 (January 1930): 1739–44.

45. Ibid.

46. Ibid.

47. Ibid.

48. Ibid. For Herty's relations with the Forest Products Laboratory, see correspondence between Herty and Carlisle P. Winslow between March 1927 and September 1931, especially January–December 1929, Eloise Gerry to Herty, February 5, May 6, 1929, Box 51, Folder 10; C. C. Heritage to J. L. Cobb, Jr., March 26, 1929, John L. Cobb, Jr., to Herty, April 3, 1929, Box 115, Folder 11; Memorandum Relative to Outstanding Results on Southern Pulp Investigations and Their Significance, November 1929, Box 51, Folder 10. See also Skolnick and Reese, eds., *Century of Chemistry*, 255–57; Sidney D. Kirkpatrick, ed., *Twenty-five Years of Chemical Engineering Progress* (New York: D. Van Nostrand, 1933), 103–16; and John Guthrie, *An Economic Analysis of the Pulp and Paper Industry* (Pullman: Washington State University Press, 1972), chap. 1.

49. Herty to William Harris, December 10, 1928, Box 51, Folder 9.

50. Carlisle P. Winslow to Herty, November 27, December 20, 1928, January 4, 1929, Box 51, Folders 9, 10; Herty to Carlisle P. Winslow, December 13, 1928, Box 51, Folder 9; Eloise Gerry to Herty, February 5, 1929, Box 51, Folder 10; C. C. Heritage to J. L. Cobb, Jr., March 26, 1929, John L. Cobb, Jr., to Herty, April 3, 1929, Box 115, Folder 11; Carlisle P. Winslow to Herty, February 13, 1930, Box 52, Folder 1. See also Eloise Gerry to Herty, March 12, 1931, Herty to Eloise Gerry, March 16, 1931, Box 52, Folder 3; Herty to Carlisle P. Winslow, February 19, 1930, Box 52, Folder 1.

51. Herty to J. M. Mallory, January 7, 14, April 16, 23, 26, 1930, J. M. Mallory to Herty, January 9, 20, March 8, 28, April 21, 28, 1930, Box 115, Folder 4; William T. Marble to Herty, February 21, 1930, Allen Abrams to Herty, February 25, 1930, Box 53, Folder 5; A. E. Clift to J. M. Mallory, April 24, 1930, Herty to A. E. Clift, August 6, 1930, Box 115, Folder 4; Robert C. McMath et al., *Engineering the New South: Georgia Tech, 1885–1985* (Athens: University of Georgia Press, 1985), 168–69.

52. September 9, 11, 1930, Box 53, Folder 6; A. Sessoms to Herty, January 23, 1930, Box 53, Folder 5; Geo. K. Spence to R. W. Howell, February 15, 1930, Box 53, Folder 5,

October 10, 1930, Box 53, Folder 6; Geo. K. Spence to Herty, May 2, June 26, July 24, 1930, Box 53, Folder 6; R. W. Howell to Herty, March 19, 1930, Box 53, Folder 5, May [21?], 1930, Box 53, Folder 6; Herty to Vincent Stouck, June 21, September 16, 1930, Box 53, Folder 6; Herty to Lois Woodford, June 29, 1930, Box 5, Folder 2.

53. Herty to J. L. Coker, September 11, 18, 1930, Box 53, Folder 6; J. L. Coker to Herty, September 16, 1930, Box 53, Folder 6; Herty to A. K. Sessoms, September 18, 1930, Box 112, Folder 3.

54. Herty, “Help Yourself,” address to Atlanta Chamber of Commerce, October 29, 1930, Box 144, Folder 9; Herty to J. L. Coker, October 15, 1930, Box 53, Folder 6; Lois Woodford to R. B. Nixon, January 30, 1930, Box 117, Folder 19; Flyer announcing Herty address to Agricultural Workers of the Southern States, February 5, 1930, Box 53, Folder 5; Herty to Howard Blakeslee, November 17, 1930, Box 53, Folder 7. Letters from *Southern Lumberman*, November 5, 1930, Armand May, October 29, 1930, and A. D. Little, November 17, 1930, to Herty, all in Box 53, Folder 7, are typical of the response his Atlanta speech inspired.

55. Herty, “Help Yourself,” address to the Atlanta Chamber of Commerce, October 29, 1930, Box 144, Folder 9.

56. *Ibid.*

57. *Ibid.*

58. *Ibid.*

59. Jos. Hodgens to Herty, October 30, 1930, F. C. Hahn to Herty, October 31, 1930, Box 53, Folder 6; Asheville Chamber of Commerce to Herty, November 6, 1930, F. B. Cutler to Herty, November 8, 1930, Box 53, Folder 7; William Butterworth to Herty, November 22, 1930, Box 57, Folder 21; Cranston Williams to Herty, November 5, 1930, Box 57, Folder 3; C. E. Curran to Herty, November 29, 1930, Box 52, Folder 2.

60. V. E. Carroll to Herty, September 12, 1930, Herty to Gibson Payne, September 12, 1930, Box 53, Folder 6; Alex Sessoms to Herty, September 15, 1930, Herty to Alex Sessoms, September 12, 18, 1930, Box 112, Folder 3.

61. M. R. Davis to Herty, October 30, 1930, Box 53, Folder 6; Armand May to Herty, October 29, 1930, Box 53, Folder 7; Bruce Strowd to Herty, January 10, 1930, Box 53, Folder 8; Herty to A. R. Anderson, January 23, 1931, Box 110, Folder 6; Herty to Bruce Strowd, January 28, 1931, Box 53, Folder 8.

62. Austin Cary, “Wood Pulp and Paper Possibilities in Georgia,” *Georgia*, June 1928, Box 112, Folder 1.

63. *Ibid.*

64. *Ibid.* For this discussion see editorials and “Canadian News” in *Paper Industry* between April 1927 and February 1930, vol. 9, nos. 1 through vol. 11, no. 11.

65. *Ibid.* See also Herty, speech to the Savannah Chamber of Commerce, “What Chemistry Means to the Southeast,” January 27, 1930, Box 144, Folder 8.
66. *Paper Industry* 12 (April 1930): 93, 103.
67. *New York Times*, February 16, 1930, clipping, *Paper Trade Journal*, February 6, 1930, clipping, Box 52, Folder 2; *Paper Industry* 12 (July 1930): 636.
68. *United States Daily*, September 22, October 16, 1930, August 4, 1931, *New York Times*, August 5, 1931, clippings, Box 52, Folder 2.
69. *Paper Industry* 12 (July 1930): 636; *United States Daily*, September 22, 1930, clipping, *Paper Trade Journal*, February 6, 1930, clipping, Box 52, Folder 2.
70. Herty to R. H. Stevens, December 17, 1930, R. H. Stevens to Herty, December 20, 1930, copies, in possession of the author. See also Herty-Stevens Correspondence, Box 53, Folder 7.
71. Herty to R. H. Stevens, December 29, 1930.
72. R. H. Stevens to Herty, January 5, 1931, copies, in possession of the author. See also Herty-Stevens correspondence, Box 53, Folder 7.
73. R. H. Stevens, “The Development of Paper Manufacture from Southern Pines,” *Paper Industry* 12 (March 1931): 2019–26.
74. Austin Cary to [Carolina Fiber Company], January 20, 1931, J. L. Coker to Austin Cary, February 10, 1931, Box 52, Folder 3; Herty to J. L. Coker, February 23, 1931, Box 53, Folder 8; Austin Cary to Herty, March 2, 1931, Herty to Austin Cary, March 6, 1931, Box 52, Folder 3; Herty to J. M. Mallory, June 2, 1931, Box 115, Folder 5.
75. Herty to Eloise Gerry, April 2, March 5, 16, 1931; Eloise Gerry to Herty, January 16, February 28, March 12, 1931, all in Box 52, Folder 3.
76. Eloise Gerry to Herty, April 4, 1931, Box 52, Folder 3; Harold Hibbert to Herty, April 19, 1931, Herty to Harold Hibbert, April 11, 1931, Box 53, Folder 9.
77. Roland Turner to Alex Sessoms, January 24, 1931, Box 112, Folder 4; Alex Sessoms to Herty, January 31, February 3, 1931, Alex Sessoms to Roland Turner, January 31, 1931, Box 115, Folder 13; W. H. Barnwell to Herty, March 3, 25, May 14, 1931, Herty to W. H. Barnwell, March 10, 16, May 19, 1931, Box 110, Folder 6; Herty to T. G. Woolford, March 6, 1931, Box 57, Folder 4.
78. Herty to T. G. Woolford, March 6, 1931, Box 57, Folder 11.
79. *Ibid.* On the South as a colonial economy see Sheldon Hackney, quoted in Gavin Wright, and Wright’s elaboration in *Old South, New South: Revolutions in the Southern Economy Since the Civil War* (New York: Basic Books, 1986), 156–58.
80. C. E. Curran to S. R. Spencer, March 19, 1931, Box 53, Folder 10.
81. Herty to Alex Sessoms, May 12, 1931, Box 112, Folder 4; Herty to P. K. Baird, May 5, 1931, Herty to Eloise Gerry, June 2, 5, 20, 1931, Box 52, Folder 3.

82. Lois Woodford to Herty, April 2, 8, May 14, 20, 23, June 23, 25, July 9, 1930, Box 5, Folder 2.

83. Herty to W. W. Buffum, September 17, 1930; Herty to F. P. Garvan, September 17, 1930, all in Box 108, Folder 2; Francis Garvan to Herty, October 9, 1930.

84. Herty to Francis Garvan, October 10, 1930, Box 108, Folder 2. See also Herty correspondence with Century Club members between January 1933 and February 1935, Box 127, Folder 18.

85. Herty to Henry R. Slack, March 13, 1928, Box 3, Folder 10; Holmes Herty to Herty, April 30, July 8, September 16, 1929, Box 138, Folder 2; Herty to Holmes Herty, April 8, 1927, September 13, 16, 20, 1929, Box 138, Folders 1 and 2; Herty to Fred W. Payne, March 16, 1927, Box 3, Folder 9; Herty to John D. McBarron, May 6, 1927, Herty to W. F. Hollingsworth, September 24, 1927, Bills for Sophie Herty's doctors, medicine, July 2, October 1, 1928, January 2, 1929, Box 138, Folder 1; Additional bills from doctors for Sophie Herty, June 1, July 1, 1929, Box 138, Folder 2; Herty to M. J. Seidman, August 31, 1929, Box 130, Folder 4; Herty to Sophie Sosnowski (cousin), September 24, 1929, Box 138, Folder 2.

86. Herty to Holmes Herty, October 31, 1929, February 12, 1930, Herty to Florence Hooper, November 4, 1929, Box 138, Folder 2; Herty, Daybook, 1929, entries from October 11, 1929, through January 24, 1930, Box 142, Folder 5; Walter L. Carr to Herty, September 5, 18 (quotation), 1928, Box 138, Folder 1.

CHAPTER 10. THE SAVANNAH PULP AND PAPER LABORATORY

1. I. James Pikel, Jr., *A History of Georgia Forestry*, Research Monograph No. 2, Graduate School of Business Administration (Athens: University of Georgia, [1966]), 71, 74–75, 81–82; Newsletter, United States Chamber of Commerce, March 1, 1930, W. Du B. Brookings to Herty, March 12, 1930, T. G. Woolford to Herty, April 10, 21, 1930, Box 57, Folder 8. For legislative efforts to submerge the Department of Forestry in 1931, see the *Atlanta Constitution*, July 5, 1931, p. 2A, July 12, 1931, p. 8, July 14, 1931, p. 4, July 19, 1931, p. 5.

2. Herty to T. G. Woolford, June 18, 1930, January 27, 1931, Box 57, Folder 11; Herty to Lois Woodford, December 3, 1930, Box 111, Folder 5; W. H. Barnwell to Herty, March 3, 1931, Herty to W. H. Barnwell, March 16, 1931, Box 110, Folder 6; J. M. Mallory to Herty, September 8, 1930, Herty to J. M. Mallory, September 12, 1930, Box 115, Folder 4; Alfred W. Scott to Herty, December 20, 1930, Herty to Alfred W. Scott, December 29, 1930, Box 7, Folder 4; Bonnell Stone to Herty, March 14, 1931, T. G. Woolford to Herty, June 9, 1931, Box 57, Folder 11; S. R. Spencer to Herty, January 29, 1931, Box 53, Folder 8; T. G. Woolford to Herty, January 30, 1931, Herty to T. G. Wool-

ford, February 2, 1931, Box 57, Folder 11; Herty to S. R. Spencer, February 2, 1931, Box 53, Folder 8. The naval stores field station ultimately went to Olustee, Florida. See T. G. Woolford to Herty, June 9, 1931, Box 57, Folder 11; Wade H. Wright, *History of the Georgia Power Company, 1855–1956* (Atlanta: Georgia Power Company, 1957), 213–16, 246–47.

3. Herty to T. G. Woolford, December 30, 1930; T. G. Woolford to Herty, January 8, 29, 1931, February 4, 1931; Herty, Notes for speech to Georgia Legislature, February 6, 1931, all in Box 57, Folder 11.

4. Herty to T. G. Woolford, February 23, 1931, Box 57, Folder 11; B. M. Lufburrow to Herty, February 13, 1931, Box 52, Folder 7.

5. T. G. Woolford to Herty, March 3, 9, 14, April 7, 1931; Herty to T. G. Woolford, March 6, April 9, 1931, all in Box 57, Folder 11.

6. Bonnell Stone to Herty, March 10, 14, 1931, Box 57, Folder 11. According to Stone, the state of Georgia provided only \$23,954 to the forestry department in 1931. The State Board of Forestry, composed of four state officers and five citizens named by the governor, served without pay (*Atlanta Constitution*, July 12, 1931, p. 8). Governor Richard B. Russell recommended \$30,000 for forestry and \$15,000 for geology per annum in the 1932–33 budget (Budget, Sect. 18–19, p. 7, General File, Richard B. Russell Papers, University of Georgia, Athens). For details about the reorganization plan and its progress through the legislature, see *Atlanta Constitution*, July 2–August 24, 1931.

7. C. A. Whittle to Herty, May 27, 1931, Box 52, Folder 7; Herty to Lois Woodford, May 22, 1931, Box 5, Folder 3.

8. Francis P. Garvan to Herty, May 20, 1931, Box 108, Folder 2; Cranston Williams to Herty, May 20, 1931, Herty to Cranston Williams, June 5, 1931, Box 57, Folder 23; Herty to George Rommel, June 6, 1931, Box 111, Folder 6; Harold Smith to Herty, June 4, 29, 1931, R. S. Kellogg to Herty, June 13, 1931, Box 53, Folder 10; Lois Woodford to Francis P. Garvan, June 26, 1931, Box 108, Folder 2; *Atlanta Constitution*, July 1, 1931, p. 1.

9. Herty to T. G. Woolford, July 2, 1931, Box 57, Folder 11.

10. T. G. Woolford to Herty, July 7, 1931, Box 57, Folder 11; Bonnell Stone to House of Representatives, Georgia General Assembly, quoted in *Atlanta Constitution*, July 12, 1931, p. 8; T. G. Woolford to Hugh G. Peterson, quoted in *Atlanta Constitution*, July 14, 1931, p. 4; T. G. Woolford to Mrs. Clarence Anderson, July 11, 1931, Box 57, Folder 11; Mrs. S. P. Sanford to legislators, July [?], 1931, Box 53, Folder 10; Herty to Lois Woodford, July 17, 1931, Box 5, Folder 3; Herty to Clark Howell, July 17, 1931, Box 53, Folder 10; T. G. Woolford and Charles Herty, statement published in *Atlanta Constitution*, July 19, 1931, pp. 5, 6; *Atlanta Constitution*, July 21, 1931, pp. 1, 12, July 23, 1931, p. 1; Herty to Lois Woodford, July 20, 1931, Box 53, Folder 10.

11. T. G. Woolford to Herty, July 22, 27, 1931, Box 57, Folder 11; *Atlanta Constitution*, July 24, 30, August 6, 14, 21, 22, 23, 1931.
12. *Atlanta Constitution*, July 2, 1931; Jasper Crane to Francis P. Garvan, July 11, 1931, Box 108, Folder 2, July 31, 1931, Box 53, Folder 10; Memorandum, Herty to Francis P. Garvan, July 31, 1931, Box 108, Folder 2; Herty to T. Guy Woolford, August 7, 1931, Box 54, Folder 1; Herty to Howard C. Foss, August 8, 1931, Box 54, Folder 1.
13. Herty to Alex Sessoms, August 8, 1931, Box 112, Folder 4; Herty to Emmett Williams, August 11, 1931, I. S. Ferguson to Herty, August 17, 1931, H. C. Foss to Herty, August 17, 1931, Box 54, Folder 1; Herty to Lois Woodford, August 18, 1931, Box 5, Folder 3; *Atlanta Constitution*, August 16, 1931, p. 5, August 23, 1931, p. 1, August 24, 1931, pp. 1, 5.
14. Herty to Lois Woodford, August 23, 26, 29, 1931, Box 5, Folder 3; William Wilson to Herty, August 25, 1931, Frank Klarpp to Herty, August 29, 1931, Box 54, Folder 1; Emily Woodward to Herty, August 31, 1931, Box 53, Folder 11; Eloise Gerry to Herty, September 1, 1931, Box 52, Folder 3; J. M. Mallory to Herty, August 25, 1931, Box 115, Folder 5.
15. Bonnell Stone to Herty, September 3, 1931, Box 54, Folder 1; J. M. Mallory to Herty, September 3, 1931, Box 115, Folder 5; Herty to Howard C. Foss, September 2, 1931, H. C. Foss to Herty, September 5, 1931, Box 53, Folder 1; J. M. Mallory to Herty, September 6, 1931, Box 54, Folder 1.
16. Bonnell Stone to Herty, September 11, 1931, T. G. Woolford to Herty, September 14, 1931, Herty to T. G. Woolford, September 14, 1931, Box 54, Folder 1; Minutes of called meeting of Executive Committee, State Board of Forestry, September 30, 1931, Herty to Francis P. Garvan, September 19, 1931, Box 54, Folder 1; Herty to Lois Woodford, September 19, 1931, Box 5, Folder 3.
17. Herty to Eloise Gerry, September 1, 1931, Box 52, Folder 3; Herty to Lois Woodford, August 29, 1931, Box 5, Folder 3; Herty to H. C. Foss, September 2, 1931, Box 54, Folder 1; Herty to Harold Hibbert, September 1, 8, 10, 1931, Harold Hibbert to Herty, September 8, 1931, Box 53, Folder 11.
18. Herty to Francis P. Garvan, September 19, 1931, Box 54, Folder 1; Lois Woodford to Herty, September 19, 1931, Box 5, Folder 3.
19. Lois Woodford to Herty, September 25, 1931, Box 108, Folder 2; Lois Woodford to Herty, September 26, 1931, Box 5, Folder 3; Herty to Francis P. Garvan, August 4, 1931, Box 108, Folder 2.
20. Herty to Lois Woodford, September 26, [28], 1931, Box 5, Folder 3; Chemical Foundation to Governor Richard B. Russell, September 28, 1931, Herty to Guy Woolford, September 28, 1931, Box 54, Folder 1.
21. R. S. Johnston to Herty, September 15, 1931, Box 54, Folder 1; Herty to Eloise

Gerry, October 14, 1931, Box 52, Folder 3; Herty to H. D. Pollard, October 10, 1931, Box 115, Folder 5; A. Leslie Sanders to Herty, August 31, 1931, Herty to A. Leslie Sanders, September 4, 1931, Box 112, Folder 4; Herty to Lois Woodford, October 30, 1931, Box 5, Folder 3; *Forest-Geological Review* (Department of Forestry and Geological Development, Atlanta, Georgia) 2 (March 1932): 6, Box 58, Folder 4.

22. Herty to Alex Sessoms, November 28, 1931, Box 112, Folder 4; Herty to Lois Woodford, October 25, 30, December 26, 1931, Box 5, Folder 3; Bonnell Stone to Herty, November 18, 22, 1931, Herty to Bonnell Stone, November 19, 28, 1931, Herty, Budget for Experimental Pulp and Paper Plant, November 28, 1931, Herty to A. L. Hinely, December 18, 1931, Bonnell Stone to Herty, October 28, December 9, 1931, Herty to Bonnell Stone, November 28, 1931, Herty to W. H. Duckworth, October 12, 1931, Herty to Walter Harrison, October 26, 1931, Fred Bridges to Herty, November 18, December 1, 1931, Box 54, Folder 1; Eloise Gerry to Herty, October 16, 1931, Box 52, Folder 3; F. H. Abbott to Herty, November 12, 1931, Box 115, Folder 9; Herty to W. F. Caldwell, October 12, 1931, Box 54, Folder 1; Herty to Carlisle P. Winslow, December 8, 1931, Box 52, Folder 3; Lois Woodford to R. S. Johnston, December 18, 1931, Box 54, Folder 1.

23. Herty to Alex Sessoms, September 1, 1931, Box 112, Folder 4; *Industrial Index* 26 (October 7, 1931), reprint, Box 145, Folder 12; Herty to A. L. Hinely, December 18, 1931, Box 54, Folder 1; Bonnell Stone to Herty, November 18, 1931, Box 54, Folder 1; Herty to William Buffum, December 23, 1931, Box 108, Folder 2; Herty to Bonnell Stone, December 11, 1931, Box 52, Folder 7.

24. Pusey and Jones Corporation, *Super-Calendar* 22 (January–March 1932), Box 115, Folder 13; Herty to Lois Woodford, January 3, 1932, Box 5, Folder 1.

25. Herty to Lois Woodford, February 23, 1932, Box 5, Folder 4, January 2, 1933, Box 5, Folder 7; Herty to Holmes Herty, March 4, 1932, Box 138, Folder 3.

26. Pusey and Jones Corporation, *Super-Calendar* 22 (January–March 1932), Box 115, Folder 13; Herty to Rowena Wilson Sullivan, January 8, 1932, Box 54, Folder 2. See also R. S. Johnston to Herty, September 15, 1931, Box 54, Folder 1, and Chas. H. Herty, "Report, Division of Pulp and Paper Research," *Report of the Commission, Department of Forestry and Geological Development, to the Governor and General Assembly of the State of Georgia* (Atlanta, 1931–32), 51–54.

27. Herty to Lois Woodford, January 13, 23, February 17, April 11, 12, May 13, 1932, Box 5, Folder 4; Herty to Holmes Herty, March 4, 1932, Box 138, Folder 3; Herty, Address to Technical Section, Canadian Pulp and Paper Association, Montreal, Canada, January 28, 1932, Box 144, Folder 10.

28. Marston Bogert to Herty, January 25, 1932, Cator Woolford to Herty, January 27, 1932, L. V. Redman to Herty, February 12, 1932, Box 123, Folder 10; Newsletter, American Institute of Chemists, April 8, 1932, Box 123, Folder 9. See also Florence Wall,

“Charles H. Herty—Apostle to the South,” *Chemist* 9 (February 1932): 123–31, and Lois Woodford to Herty, May 13, 1932, Box 5, Folder 5.

29. Herty to Lois Woodford, May 31, 1932, Box 5, Folder 5.

30. Herty to Lois Woodford, May 31, June 2, 22, 25, 1932, Box 5, Folder 5.

31. Andrew M. Fairlie to Herty, July 2, 1932, H. E. Barnard to Herty, July 6, 1932, Box 54, Folder 2; Herty to Lois Woodford, July 3, 25, 1932, Box 5, Folder 5; C. W. Kellogg to Herty, July 12, 1932, Lois Woodford to H. E. Barnard, July 19, 1932, Lois Woodford to Herty, July 21, 1932, Box 54, Folder 2; *Forestry-Geological Review* 2 (August 1932): 3.

32. Charles Herty, “White Paper from Young Southern Pine,” Address at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, New York City, February 14, 1933, Box 144, Folder 10; Herty to Lois Woodford, August 3, 10, 22, 31, 1932, Box 5, Folder 5; Lois Woodford to G. E. Steichert and Company, June 20, 1932, Box 54, Folder 2; *Forestry-Geological Review* 2 (March 1932): 7, 2 (October 1932): 6; F. C. Bagley to Herty, September 20, 1932, Box 54, Folder 2.

33. Lois Woodford to Herty, September 2, 1932; Herty, List of conferences while in New York, September 2–16, 1932; Herty to Lois Woodford, September 24, 1932, all in Box 5, Folder 6; Charles Herty, “Report, Division of Pulp and Paper Research,” *Report of the Commission, Department of Forestry and Geological Development to the Governor and General Assembly of the State of Georgia* (Atlanta, 1931–32), 51–57.

34. Herty to Lois Woodford, August 3, 10, Box 5, Folder 5, September 24, November 19, 21, 28, Box 5, Folder 6; Herty to Holmes Herty, October 19, 1932, Box 138, Folder 3; *Forestry-Geological Review* 2 (October 1932): 6, 3 (January 1933): 1, Box 58, Folder 4.

35. Allen Abrams to Herty, February 11, 1931, Herty to Alan Abrams, February 16, 1931, Box 53, Folder 8. Jack pine was being experimented with in the North as spruce became more scarce.

36. R. H. Stevens, “Paper Manufacturing Role in Economic Development of the South,” *Paper Industry* 14 (June 1932): 211–13, 14 (July 1932): 299–301.

37. Stevens, “Paper Manufacturing Role in Economic Development of the South, Part II,” *Paper Industry* 14 (July 1932): 299–301.

38. Ibid.

39. Ibid., 301. Italics added.

40. Ibid.

41. Ibid.

42. Herty, “White Paper from Young Southern Pine”; Stevens, “Paper Manufacturing Role in the Economic Development of the South,” *Paper Industry* 14 (July 1932): 301. For Herty’s previous exchanges with Stevens and his relations with Winslow and Curran, see Chapter 9.

43. Herty, “White Paper from Young Southern Pine.”

44. *Ibid.*; Herty to E. R. Richardson, September 16, 1932, Box 54, Folder 2.
45. Herty to Lois Woodford, October 3, December 17, 20, 1932, Box 5, Folder 6, January 2, March 21, 28, 1933, Box 5, Folder 7; Lois Woodford to Herty, November 18, 1932, Box 5, Folder 6, January 3, March 17, April 20, 22, 1933, Box 5, Folder 7; Lois Woodford to H. E. Howe, April 20, 1933, Box 30, Folder 13.
46. Herty to Lois Woodford, December 23, 1932, January 2, 24, 1933, Box 5, Folder 7; Press release, undated, Box 54, Folder 7.
47. Lois Woodford to H. E. Barnard, July 19, 1932, Box 54, Folder 2; Herty to Lois Woodford, August 3, 1932, Box 5, Folder 5, January 2, 26, 1933, Box 5, Folder 7; Herty to E. R. Richardson, September 16, 1932, Box 54, Folder 2; Lois Woodford to Herty, November 18, 1932, Box 5, Folder 6, March 17, 1933, Box 5, Folder 7; Lois Woodford, Memorandum of Conference with A. D. Flinn, November 29, 1932, Box 5, Folder 6.
48. Lois Woodford to Herty, January 23, 1933, Herty to Lois Woodford, January 24, 26, February 4, 1933, Box 5, Folder 7; Herty to Will D. Hooper, February 4, 1933, Box 7, Folder 6; *Atlanta Journal*, February 12, 1933, Box 151, Folder 5.
49. *Forestry-Geological Review* 3 (April 1933): 1; *New York Times*, March 15, 1933, Box 151, Folder 5.
50. W. D. Hooper to Herty, March 15, Box 7, Folder 6; *New York Times*, March 15, 1933, Box 151, Folder 5; Lois Woodford to Howard Blakeslee, March 16, 1933, Box 54, Folder 3; Lois Woodford to Herty, March 17, 1933, Box 5, Folder 7; Herty to Charles Herty Hooper, March 21, 1933, Box 138, Folder 4.
51. Herty to Lois Woodford, March 21, 1933, Box 5, Folder 7; W. D. Hooper to Herty, March 25, 1933, Box 7, Folder 7; Herty to W. D. Hooper, March 28, 1933, Box 7, Folder 6; William Anderson, *The Wild Man from Sugar Creek: The Political Career of Eugene Talmadge* (Baton Rouge: Louisiana State University Press, 1975), 82–85.
52. Herty to Lois Woodford, March 28, 1933, Box 5, Folder 7; Herty to F. G. Zinsser, April 1, 1933, Box 19, Folder 4.
53. Eugene Talmadge to Marie Louise Myrick, April 20, 1933, Box 54, Folder 3.
54. Herty to Lois Woodford, April 20, 1933, Box 5, Folder 7; Herty, “Report, Division of Pulp and Paper Research,” *Report of the Commission, Department of Forestry and Geological Development to the Governor and General Assembly of the State of Georgia* (Atlanta, 1931–32), 56–57; American Paper and Pulp Association, *Monthly Review* 2 (February 1933): 11, Box 58, Folder 9.
55. *Forestry-Geological Review* 3 (June 1933): 1–5, Box 58, Folder 4.
56. C. W. Boyce, “Regional Competition in Pulpwood, with Special Reference to the South,” speech to joint meeting of the Technical Association of the Pulp and Paper Industry and the Georgia Forestry Association, Savannah, Georgia, May 1, 1933, Box 58, Folder 9.
57. *Ibid.*

58. Ibid.
59. Ibid.
60. Ibid.
61. *Monthly Review* 2 (February 1933): 10, Box 58, Folder 9.
62. *Forestry-Geological Review* 3 (June 1933): 5, Box 58, Folder 4.
63. Herty to Lois Woodford, March 17, May 7, July 1, 1933, Box 5, Folder 7; Herty to Holmes Herty, June 28, 1933, Box 152, Folder 21.
64. Herty to E. George Butler, July 12, 1933, Box 54, Folder 3; Herty to Lois Woodford, July 14, August 17, 1933, Box 5, Folder 7; *Savannah Morning News*, November 8, 1933, Box 152, Folder 9; W. D. Hooper to Herty, November 8, 1933, Box 7, Folder 6.
65. Herty to Lois Woodford, May 30, August 17, September 2, 29, 1933, Box 5, Folder 7; Herty to Holmes Herty, June 28, 1933, Box 152, Folder 21, September 5, 1933, Box 138, Folder 4; Supplement, *Weekly Naval Stores Review*, September 23, 1933, Box 151, Folder 5; *Savannah Morning News*, September 26, 1933, Box 151, Folder 5. Burton W. Scribner was chief of the Paper Division of the U.S. Bureau of Standards. Herty to Lois Woodford, September 29, 1933, Box 5, Folder 7.
66. Herty to Lois Woodford, August 17, September 2, October 18, 1933, Box 5, Folder 7; Herty to Holmes Herty, September 5, October 20, 1933, Box 138, Folder 4; Herty to Dolly Herty, October 21, 1933, Box 138, Folder 4; *Atlanta Journal*, November 20, 1933, Box 151, Folder 5.
67. *Savannah Morning News*, November 20, 1933, reprinted in *Deserted Village*, no. 2 [1934]: 25, pamphlet published by the Chemical Foundation, Box 108, Folder 5.
68. Ibid., 27.
69. Ibid., 28–29, 31.
70. Ibid., 21–23, 33–35.
71. The main differences he attributed to wood (\$4), capital charges (\$1), and freight (\$4). A. A. MacDiarmid, “Southern Pine Newsprint Competition,” *Deserted Village*, 8–20, Box 108, Folder 5.
72. Ibid., 19–20.
73. Ibid., 45–53; Herty to Lois Woodford, November 29, 1933, Box 5, Folder 7; “Babbitt” [?] to Herty, December 20, 1933, Box 4, Folder 2.
74. Herty to C. C. Williams, November 23, 1933, Box 94, Folder 8; Herty to Laura M. Hoppe, January 16, 1934, Box 4, Folder 3.
75. Hugh Johnson, speech to National Association of Manufacturers, reprint, December 7, 1933, Box 94, Folder 8; Herty to W. D. Hooper, February 14, 1934, Box 7, Folder 6; Herty to Secretary of War, March 22, 1934, Box 94, Folder 9; Paul Conkin, *The New Deal*, 2d ed. (New York: Thomas Y. Crowell, 1975), 33.
76. Jere N. Moore to Herty, November 24, 1933, January 11, 1934, Box 119, Folder

22; Herty to Lois Woodford, January 15, 1934, Box 5, Folder 9; Herty Day Program, January 25, 1934, Box 119, Folder 22; *Union-Recorder* (Milledgeville), supplement, January 25, 1934, Box 145, Folder 14; *Savannah Morning News*, January 25, February 2, 1934, Box 151, Folder 10; Gordon Saussy to Herty, March 29, 1934, Box 4, Folder 3; J. Sam Guy to Herty, April 6, 1934, Box 117, Folder 22; Correspondence between Herty and officials of South Georgia Teachers' College, February–May 1935, Box 118, Folder 12; Marvin Pittman to Dolly Herty, August 5, 1938, Box 152, Folder 2.

77. Herty to Homer C. Parker, April 7, 1934, Box 4, Folder 3; Herty to Lois Woodford, April 12, August 28, September 12, October 4, 1934, Box 5, Folder 8; Herty to Lois Woodford, March 14, 1935, Lois Woodford to Herty, October 19, 1934, Box 5, Folder 9; Herty to Dolly Herty, March 16, 1935, Herty to Holmes Herty, May 14, 1935, Box 138, Folder 6.

78. Herty to Mrs. Dawson Allen, December 13, 1933, Box 54, Folder 4; Herty to Mrs. M. E. Judd, January 5, 1934, Box 57, Folder 11; F. P. Garvan to Herty, March 1, 1935, Box 151.

79. Conference of Agriculture, Industry and Science, "Declaration of Dependence upon the Soil and of the Right of Self-Maintenance," May 7–8, 1935, pp. 1–7, Box 65, Folder 1; Proceedings of Dearborn Conference on Agriculture, Industry and Science, May 7, 8, 1935, Box 65, Folder 9; Carl B. Fritsche to Herty, June 8, July 1, 1935; Report of June 17, 1935, Meeting of Committee on Permanent Organization, June 20, 1935, Box 65, Folder 1; Minutes, Farm Chemurgic Council, June 17, 1935, Box 66, Folder 2; H. E. Barnard to Herty, July 23, September 10, 1935, Herty to H. E. Barnard, July 25, 1935, Box 65, Folder 1; William Hale to Herty, December 17, 1935, Box 65, Folder 1; Herty to William Hale, December 19, 1935, Box 65, Folder 1.

80. Herty to Lois Woodford, January 15, 1934, Box 5, Folder 9; Herty to Holmes Herty, January 16, April 5, 1934, Box 138, Folder 5; Herty to L. C. Lindley, April 12, May 8, 1934, Box 117, Folder 22; *Forestry-Geological Review* 4 (May 1934): 4.

81. Herty to Francis P. Garvan, May 22, 1934, February 2, July 17, 1935, Box 73, Folder Z-65, Paper File, 1934–35, Garvan Papers; Herty to Holmes Herty, October 4, 1934, Box 138, Folder 5; J. C. Funke to Herty, November 24, 1934, H. L. Barthelmy to Herty, November 29, 1934, Box 73, Folder Z-65, Paper File, 1934–35, Garvan Papers; *Savannah Morning News*, December 6, 1934, *New York Times*, December 16, 1934, Box 152, Folder 10; Charles Herty, reprint of "An Urgent Message to the South," speech to the Association of Southern Agricultural Workers, Atlanta, Georgia, January 31, 1935, Box 144, Folder 10; *Proceedings*, Joint Conference of Representatives of Agriculture, Industry and Science, Dearborn, Michigan, May 7, 8, 1935, pp. 47–48, Box 65, Folder 9; Herty to Richard B. Russell, August 15, 1935, Box 73, Folder Z-65, Paper File, 1934–35, Garvan Papers; Charles Herty, "Rayon Pulp from Southern Pine," reprint, *Textile World*,

September 1935, Vertical File, Georgia Room, UGA Library. Rasch reported on his work in “Rayon Pulp from Southern Pine,” *Paper Industry* 17 (March 1936): 948–53.

82. Herty to Marie [?], July 23, 1934, Box 138, Folder 5; Lois Woodford to Herty, January 16, 1935, Box 5, Folder 9; Herty to Lois Woodford, January 18, 1934, Box 5, Folder 9; Herty to Holmes Herty, March 14, May 14, 193?, Box 138, Folder 6; Herty to F. J. Tone, June 18, 1935, Box 54, Folder 4; Herty to Francis Garvan, July 17, 1935, Herty to Richard Russell, August 12, 1935, Box 73, Folder Z-65, Paper File, 1934–35, Garvan Papers; Herty, *Atlanta Journal* radio interview, September 13, 1936, Box 151, Folder 5; *Savannah Morning News*, August 3, 1937, Box 51, Folder 5; Max Ferrand to Herty, October 26, 1937, Box 54, Folder 5; “TAPPI Meets in Savannah,” *Paper Industry* 19 (November 1937): 949. For the bleached sulfate question see *Paper Industry* 11 (August 1929): 833, and 12 (March 1931): 2019, and *Journal of Forestry* 34 (March 1936): 200–201, 212.

83. Herty, “The Pulp and Paper Laboratory at Savannah: Its History, Operation and Future,” October 8, 1937, Box 152, Folder [?]; Herty to Francis P. Garvan, July 17, 1935, September 17, 1937, Box 73, Folder Z-65, Paper File, 1934–35, Garvan Papers; Homer Eaton to Herty, January 1, 1936, Box 54, Folder 4; *Proceedings*, condensed, Southern Chemurgic Council, Lafayette, Louisiana, October 15–17, 1936, Box 67, Folder 12.

84. Unidentified news clipping, October 12, 1936, Box 127, Folder 19; Herty, “The Pulp and Paper Laboratory,” October 8, 1937, Box 152, Folder [?].

CHAPTER 11. REALIZATION OF A DREAM: THE SOUTH’S FIRST NEWSPRINT MILL

1. Herty to Lois Woodford, January 15, 1934, Box 5, Folder 9; Herty to Holmes Herty, January 16, 1934, April 5, 1938, Box 138, Folder 5; Herty to W. S. Kirkpatrick, June 2, 1934, Francis P. Garvan to Mills B. Lane, May 7, 1934, Box 73, Folder Z-65, Paper File, 1934–35, Garvan Papers; The remark attributed to FDR appears in Herty to Kirkpatrick.

2. W. S. Kirkpatrick to Herty, June 2, 1934, Box 73, Folder Z-65, Garvan Papers.

3. Herty to W. S. Kirkpatrick, June 2, 1934, Box 73, Folder Z-65, Garvan Papers.

4. *Newsdom* 8 (February 6, 1937), Box 152, Folder 11. *Newsdom* was a “National Newspaper of the Newspaper World.”

5. *Newsdom* 8 (February 6, 1937): 2, 3, Box 152, Folder 11. See also Herty to W. D. Hooper, June 29, 1934, Box 7, Folder 6, and *Atlanta Georgian*, July 27, 1938, Box 151, Folder 14. Garvan’s correspondence with Ezekiel and his commentary on it also appears in “The Birth Control of New American Industries: Cui Bono?” *Deserted Village*, no. 4, published in 1934 by the Chemical Foundation.

6. James C. Stahlman, “Publishers Created New Industry,” *Editor and Publisher*, Octo-

ber 31, 1953, reprint, courtesy of Reed Sarratt, Executive Director, SNPA, to the author, May 27, 1982; *Newsdom* 8 (February 6, 1937): 1, 4, Box 152, Folder 11; Joseph Battley to Herty, May 23, 1934, Box 94, Folder 9.

7. Stahlman, "Publishers Created New Industry," p. 223.

8. William A. Whitcomb to R. L. Cooper, June 29, 1934, attached to Herty to Francis P. Garvan, July 7, 1934, Box 73, Folder Z-65, Garvan Papers.

9. R. L. Cooper to William A. Whitcomb, July 4, 1934, attached to Herty to Francis P. Garvan, July 7, 1934, Box 73, Folder Z-65, Garvan Papers.

10. Herty to Francis P. Garvan, May 22, 1934, July 7, 1934, July 17, 1935, Box 73, Folder Z-65, Garvan Papers.

11. Herty to Holmes Herty, July 23, September 10, 1934, Box 138, Folder 5; Herty to Lois Woodford, September 12, 1934, Box 5, Folder 8; Herty to Bunxie (Mrs. Will Hooper), January 10, 1935, Box 138, Folder 6; Stahlman, "Publishers Created New Industry," 223–24.

12. Charles Herty, "An Urgent Message to the South," address to the Southern Agricultural Workers in Atlanta, Georgia, January 31, 1935, Box 144, Folder 10. Support for Herty's observations about the expansion of chemical industry in the South during the 1930s appears in George Brown Tindall, *The Emergence of the New South, 1913–1945* (Baton Rouge: Louisiana State University Press, 1967), 463–67.

13. Herty to Francis P. Garvan, February 2, March 7, 16, 1935, Box 73, Z-65, Garvan Papers.

14. Herty to Francis P. Garvan, March 7, 1935, *ibid.*

15. "Declaration of Dependence upon the Soil and of the Right of Self-Maintenance," adopted by the Conference of Agriculture, Industry and Science, May 9, 1935, Dearborn, Michigan, Box 65, Folder 1; Herty to Dolly Herty, March 16, 1935, Box 138, Folder 6. For a full, if uncritical, description of the chemurgic movement see Christy Borth, *Pioneers of Plenty* (New York: Bobbs-Merrill, 1939).

16. *Time*, May 20, 1935, Box 67, Folder 5. By 1936 the rhetoric of the chemurgic movement had attracted enough attention in the administration to touch off investigations of the Chemical Foundation by the Justice Department. See M. H. McIntyre to Secretary of Agriculture, August 25, 1936; [?] to Secretary of Treasury, April 5, 1937, both in Official Files, Chemical Industry, 1933–42, Franklin Delano Roosevelt Library, Hyde Park, New York.

17. *Time*, May 20, 1935, Box 67, Folder 5.

18. *Proceedings* of the Dearborn Conference on Agriculture, Industry and Science, May 7–8, 1935, p. 51, Box 65, Folder 9.

19. *Ibid.*, 54–55.

20. Herty to Holmes Herty, May 14, 1935, Box 138, Folder 6; Herty to Lois Woodford, May 15, 1935, Box 5, Folder 9; Herty to Francis P. Garvan, May 27, 1935, Box 73, Folder Z-65, Garvan Papers.
21. Lois Woodford to Herty, April 15, 1935, Herty to Lois Woodford, April 18, 1935, Box 5, Folder 9; Herty to Mrs. G. L. Candler, April 20, 1935, Box 4, Folder 4; Herty to Holmes Herty, June 3, 1935, Box 138, Folder 6; *Paper Trade Journal*, June 6, 1935, Box 145, Folder 14.
22. Quoted in Cobb, *Industrialization and Southern Society*, 129; Herty to Mrs. G. L. Candler, April 20, 1935, Box 4, Folder 4; *Paper Trade Journal*, June 6, 1935, Box 145, Folder 14.
23. Charles Herty, "South Can Make Cheap Newsprint," *Sphere Monthly from Washington*, July 1935, reprint, Box 152, Folder 7; Charles Herty, "Dr. Charles H. Herty Replies to 'Hypothetical Cheap Newsprint,'" reprint, *Paper Trade Journal* [July 1935].
24. Herty, "Dr. Charles Herty Replies"; Jack P. Oden, "Development of the Southern Pulp and Paper Industry, 1900–1970" (Ph.D. dissertation, Mississippi State University, 1973), 125–27. Oden notes that Kellogg was not Herty's only critic about costs, citing Elwood R. Maunder and Elwood L. Demmon, "An Interview with Reuben B. Robertson: Trailblazing in the Southern Paper Industry," *Forest History* 5 (Spring 1961): 8.
25. "Proceedings of the 35th Annual Meeting of the Society of American Foresters," *Journal of Forest History* 34 (March 1936): 189–220. Kellogg's remarks appear on pp. 214–16.
26. *Ibid.*, 217.
27. Herty to Francis P. Garvan, July 17, 1935, Box 73, Folder Z-68, Garvan Papers; Willam A. Whitcomb to R. L. Cooper, June 29, 1934, filed with Herty to Francis P. Garvan, July 7, 1934, *Ibid.*
28. Ralph L. Miller to J. T. Claiborne, copy to Lois Woodford, October 30, 1935, Box 54, Folder 4; Dorothy Minis to David Estes, February 24, 1980, Box 151, Folder 8.
29. H. E. Barnard to Herty, July 23, 1935, Box 65, Folder 1; Herty to H. E. Barnard, July 25, 1935, Box 65, Folder 1.
30. Herty to Richard B. Russell, August 13, 1935, Box 73, Folder Z-65, Garvan Papers. Herty probably meant 4 million rather than 4 billion pounds of standard newsprint. See also James Stuart Olson, *Herbert Hoover and the Reconstruction Finance Corporation* (Ames: Iowa State University Press, 1977), 33ff., 117.
31. Herty to Pat Harrison, January 2, 1936, Herty to George Foster Peabody, November 24, December 13, 1935, George Foster Peabody to Herty, December 10, 1935, Herty to Francis P. Garvan, December 13, 1935, Box 73, Folder Z-65, Garvan Papers. See also Oden, "Development of the Southern Pulp and Paper Industry," 127–29.

32. James G. Stahlman, "Texas Industrialists, Bankers to Build Pine Newsprint Mill," *Newsdom* 8 (February 6, 1937): 4, Box 152, Folder 11; Francis P. Garvan to Mills B. Lane, May 7, 1934, Herty to Francis P. Garvan, December 13, 1935, Box 73, Folder Z-65, Garvan Papers. See also F. P. Garvan, recommendation for federal financing, November 14, 1935, Box 66, Folder 5.

33. Herty to Holmes Herty, January 3, 1936, Box 138, Folder 6; Herty to Carl Fritsche, January 13, March 9, 1936, Box 65, Folder 2; Herty, interview with John Paschall, September 13, 1936, Box 151, Folder 5; *Proceedings*, Second Dearborn Conference of Agriculture, Industry and Science, May 12–14, 1936, Box 66, Folder 5; *Proceedings* (condensed), Southern Chemurgic Conference, Lafayette, Louisiana, October 15–17, 1936, Box 67, Folder 12; Herty to Francis Garvan, September 17, 1936, Box 73, Folder Z-65, Garvan Papers; Herty to H. E. Barnard, June 10, 1936, Box 65, Folder 2. For details of Herty's service to the chemurgic movement see his correspondence with Carl Fritsche, H. E. Barnard, Leo Christensen, and others, Boxes 65–67.

34. Herty to Lois Woodford, March 21, 1934, Box 5, Folder 9; Herty to Holmes Herty, June 25, 1936, Box 138, Folder 6; Herty to Francis P. Garvan, July 24, 1936, Box 73, Folder Z-65, Garvan Papers; Herty to Carl Fritsche, February 10, March 11, 1936, Box 65, Folder 2.

35. Herty, "Southern Slash Pine," *Proceedings*, Second Dearborn Conference, Detroit, May 12–14, 1936, pp. 212–18, Box 66, Folder 1; Stahlman, "Publishers Created New Industry," 224; *Newsdom* 8 (February 6, 1937): 4, Box 152; Herty to Francis P. Garvan, September 17, 1936, Box 73, Folder Z-65, Garvan Papers; Herty, *Proceedings* (condensed), Southern Chemurgic Council, Lafayette, Louisiana, October 15–17, 1936, Box 67, Folder 12.

36. Lucy Chambers to Wanda Farr, October 22, 1936, Herty to Wanda Farr, November 2, 20, 1936, Box 68, Folder 4; Dolly Herty to Herty, November 2, 1936, Herty to Holmes Herty, November 18, 1936, Box 138, Folder 6; Herty, Report to Farm Chemurgic Council, January 22, 1937, Box 66, Folder 2.

37. Herty, Report to Farm Chemurgic Council, January 22, 1937, Box 66, Folder 2; Oden, "Development of the Southern Pulp and Paper Industry," 128, n. 37.

38. Stahlman, "Texas Industrialists, Bankers to Build Pine Newsprint Mill," *Newsdom* 8 (February 6, 1937): 1, 4, Box 152, Folder 11. See also Stahlman's account of the founding of the first southern newsprint mill, "Publishers Created New Industry," 223–24, 226.

39. *Newsdom* 8 (February 6, 1937): 1, 4, 2, 5, Box 152, Folder [?]. See also Lloyd G. Schenck, "The Development of Southland Paper Mills, Inc. Up to September 12, 1939," 4–5, typescript, given to the author by Charles Carpenter, Montgomery, Alabama. When Herty died, Carpenter replaced him as director of the Savannah laboratory. Later, he

served as chief chemist of the mill subsequently organized as a result of the January 28, 1937, meeting in Dallas. Oden, "Development of the Southern Pulp and Paper Industry," also deals with the organization and financing of Southland Paper Mills, 131–35.

40. Schenck, "Development of Southland Paper Mills," 10–11. Wirt Davis, Francis Garvan, and Herty, all members of Southland's first board of directors, were not part of the second (*ibid.*, 12). For additional detail covering the period between May 1937 and June 1938, see the papers of E. L. Kurth, Special Collections, R. W. Steen Library, Stephen F. Austin State University, Nacogdoches, Texas.

41. Herty to Francis P. Garvan, February 23, 1937, Box 73, Folder Z-65, Garvan Papers; Herty to Holmes Herty, February 1, March 3, 1937, Box 138, Folder 7; Holmes Herty to Herty, February 28, 1937, Box 138, Folder 7; Herty to Frederick Palmer, February 3, 12, 1937, Box 4, Folder 6; Herty to W. D. Anderson, February 2, 1937, Box 67, Folder 4; unidentified clipping, February 3, 1937, Box 145, Folder 15; Herty to Dolly Herty, March 9, 1937, Box 138, Folder 7.

42. Herty to W. D. Anderson, March 4, 1937, Box 67, Folder 4; Herty to Lee Trimble, March 15, 1937, Box 67, Folder 4; Radio Station WMAZ to Herty, March 16, 1937, Box 67, Folder 4; Francis P. Garvan to Herty, March 19, 1937, Box 108, Folder 3. Garvan canceled at the last minute. What happened to the speech is not clear. See *Macon Telegraph*, April 9, 1937, Box 145, Folder 15.

43. *Savannah Morning News*, April 17, 1937, Box 115, Folder 15; Conference in New York between Dr. Chas. H. Herty and Albert Newcombe, May 22, 1937, Kurth Papers; Stahlman, "Publishers Created New Industry"; Radio script, May 25, 1937, Box 66, Folder 10; Herty to Frank Herty, May 6, 1937, Herty to Holmes Herty, May 7, 1937, Box 138, Folder 7; Report to the Board of Directors of Third Farm Chemurgic Council, June 2, 1937, Box 65, Folder 2.

44. Herty to Crockett Odum, August 14, 1937, Box 65, Folder 6; Herty to Holmes Herty, July 29, August 10, 1937, Box 138, Folder 7.

45. Herty to Carl Fritsche, June 11, 1937, Box 65, Folder 5; Wanda Farr to Herty, August 29, 1937, Box 68, Folder 6; Herty to H. E. Barnard, September 10, 1937, Box 65, Folder 6; Albert Newcombe to Louis Calder, July 12, 1937; Memorandum, Informal meeting of various interests in Southland Paper Mills, Inc., held in offices of Perkins-Goodwin Co., New York, August 27, 1937, Kurth Papers; Schenck, "Development of Southland Paper Mills," 6–9.

46. Herty, Memorandum addressed to the Honorable Jesse Jones, Chairman, Reconstruction Finance Corporation, September 5, 1937, attached to Herty to Francis P. Garvan, September 4, 1937, Box 73, Folder Z-68, Garvan Papers. The commitments outlined by Herty in his meeting with Jones had been agreed to at an informal meeting of the vari-

ous interests in Southland Paper Mills, Inc., held in the Rockefeller Plaza offices of the Perkins-Goodwin Company on August 27, 1937 (Memorandum, August 27, 1937, Kurth Papers).

47. Herty to Francis P. Garvan, September 4, 1937, Box 73, Folder Z-68, Garvan Papers; Irwin Unger and Debi Unger, *Twentieth Century America* (New York: St. Martin's Press, 1990), 231.

48. Schenck, "Development of Southland Paper Mills," 13–19, 29, 32; *Dallas Morning News*, May 28, 1939, copy presented to the author by Charles Carpenter, Montgomery, Alabama.

49. Herty to Holmes Herty, October 14, November 29, 1937, Box 138, Folder 7; Holmes Herty to Herty, October 30, 1937, Box 138, Folder 7; Herty, "The Pulp and Paper Laboratory at Savannah; Its History, Operation and Future," memorandum prepared for use in quest for funding, October 8, 1937, Box 152, Folder [?]. The history was reprinted in part by a Savannah newspaper shortly after Herty's death (*Savannah Morning News*, July 28, 1938, Box 151, Folder 15).

50. Herty to Wortley Rudd, November 7, 1937, Box 117, Folder 33; Schenck, "Development of Southland Paper Mills," 10.

51. Herty to Mrs. Francis P. Garvan, [November ?, 1937], Box 108, Folder 3.

52. Herty to Holmes Herty, November 29, December 6, 1937, Box 138, Folder 7; McMath et al., *Engineering the New South*, 192.

53. Alex Sessoms to Howard C. Foss, December 5, 1937, Box 54, Folder 5; Herty to Holmes Herty, December 6, 1937, Box 138, Folder 7; *Savannah Morning News*, December 5, 1937, Box 152, Folder 11; Herty to Emily Woodward, November 30, 1937, Box 57, Folder 28; H. S. Newins to Herty, November 30, 1937, Box 118, Folder 26.

54. "Some Newsprint Facts to Ponder," editorial, *Paper Industry* 18 (February 1937): 904.

55. *Paper Industry* 18 (March 1937): 1065–66, 19 (April 1937): 93. The prices differ slightly from figures published in Royal S. Kellogg, *Newsprint Paper in North America* (New York: Newsprint Service Bureau, 1948), 50.

56. Oden, "Development of the Southern Pulp and Paper Industry," 131–32; Herty, radio broadcast, May [?], 1937, Box 144, Folder 11.

57. Emily Woodward to Herty, November 29, 1937, Box 57, Folder 28; W. W. Carroll to Herty, December 2, 1937, Box 54, Folder 5; Lois Woodford to Herty, December 2, 1937, Box 5, Folder 9; *Savannah Morning News*, December 5, 1937, Box 152, Folder 11; E. M. Dealey, E. L. Kurth, and R. W. Wortham, Jr., to Herty, December 4, 1937, Box 4, Folder 6; Thomas Gamble to Herty, December 4, 1937, Box 4, Folder 5.

58. J. Jackson to Herty, December 28, 1937, Herty to Jesse Jackson, December 29,

1937, Box 115, Folder 7; *Chicago Daily News*, January 15, 1938, Box 145, Folder 15; Program, Testimonial Dinner sponsored by Savannah Chamber of Commerce and Lucas Theatre Management, February 21, 1938, Box 136, Folder 9.

59. Commencement Program, University of Pittsburgh, June 13, 1917, Box 136, Folder 9; E. B. Bryan to Herty, April 17, 1918, Box 117, Folder 8; *Charlotte News and Observer*, June 7, 1933, Box 145, Folder 14; Commencement Program, Oglethorpe University, May 27, 1934, Box 136, Folder 9; *Florida Times-Union*, June 8, 1937, Box 145, Folder 15; Herty to W. P. Few, April 7, 1938, Box 117, Folder 20; Albin Dearing to Herty, October 13, 1937, Box 54, Folder 5, October 29, 1937, Box 57, Folder 6; Herty to Albin Dearing, November 2, 1937, Box 57, Folder 6.

60. Albin Dearing to Herty, December 9, 10, 1937, January 11, 1938, Box 57, Folder 6; Florida Industries Day Program Honoring Dr. Charles Herty, January 14, 1938, Box 57, Folder 7.

61. Mrs. J. Phil Campbell to Herty, January 14, 1938, Arthur T. Williams to Herty, January 15, 1938, L. L. McDonald to Herty, January 14, 1938, Box 57, Folder 6; *Hamilton (Canada) Spectator*, January 15, 1938, *Chicago Daily News*, January 15, 1938, *Chicago Journal of Commerce*, January 17, 1938, Box 145, Folder 15; *Paper World* [March 1938], Box 145, Folder 16; Daniel C. Roper to Herty, January 25, 1938, Box 57, Folder 6; Geo. Rommel to Herty, January 26, 1938, Box 4, Folder 7; Herty to W. T. Anderson, Clarke Howell, Herbert Porter, Jack Williams, and several Georgia editors, February 1, 1938, Box 54, Folder 5; Jack Glenn to Herty, February 16, 1938, Box 54, Folder 5; Theater advertisement for “March of Time,” March 10, 1938, Box 145, Folder 16; Herty to Jack Glenn, March 14, 1938, Box 54, Folder 5; Wm. C. Park to Herty, January 19, 1938, Herty to Wm. C. Park, January 22, 1938, Box 54, Folder 5.

62. R. G. MacDonald to C. L. Parsons, November 10, 1936, C. L. Parsons to Townes Leigh, January 31, 1938, B. F. Williamson to Townes Leigh and W. H. Beisler, February 5, 1938, all in Box 54, Folder 5.

63. C. L. Parsons to Townes Leigh, January 31, 1938, Box 54, Folder 5.

64. B. F. Williamson to Townes Leigh, February 5, 1938, Box 54, Folder 5.

65. Herty to B. F. Williamson, March 3, 1938, Box 54, Folder 5.

66. *Paper World* [March 1938], Box 145, Folder 16. Herty’s remarks in this trade journal were apparently copied from a Savannah newspaper that covered the theater speech. Herty described it as “an accurate account.” See Herty to J. McKeen Cattell, March 23, 1938, Box 4, Folder 7.

67. Herty to J. McKeen Cattell, March 1, 23, 1938, Box 4, Folder 7.

68. Albin Dearing to Herty, December 15, 1937, Herty to Albin Dearing, December 18, 1937, C. Stewart Lee to Herty, January 14, 1938, Herty to Governor Fred Cone, January 29, 1938, all in Box 57, Folder 6; clipping, unidentified, February 11, 1938, Box

145, Folder 15; Herty to L. H. Baekeland, February 16, 1938, Box 4, Folder 7; E. W. Capen to Herty, March 2, 1938, Box 65, Folder 7; Editorial, *Chemical and Metallurgical Engineering* 45 (March 1938); Herty to Holmes Herty, February 5, March 1, 1938, Box 138, Folder 7. For the subsequent history of the Herty Foundation, still operating, see *Savannah Morning News*, July 16, 18, 1939, Box 152, Folder 12; Lucy Chambers to Cranston Williams, April 30, 1940, Cranston Williams to Lucy Chambers, April 30, 1940, Charles Holmes Herty, Jr., to W. F. Allen, May 1, 1940, Lucy Chambers to Charles Holmes Herty, Jr., n.d., Holmes Herty to Geo. M. Bazemore, June 3, 1940, Holmes Herty to Dolly Herty Minis, January 27, 1941, all in Box 152, Folder 23; Herty Foundation, “The Herty Story,” reprint from *Pulp and Paper*, May 13, 1968.

69. Herty to B. H. Knight, March 14, 1938, Herty to Jack Glenn, March 14, 1938, Box 54, Folder 5; Herty to Holmes Herty, April 12, May 6, 1938, Box 138, Folder 7; Herty to H. E. Barnard, March 12, 1938, Herty to Wheeler McMillen, March 12, 1938, Box 65, Folder 7; Herty to Wanda Farr, February 9, 1938, Wanda Farr to Herty, March 14, 1938, Box 68, Folder 7.

70. Schenck, “Development of Southland Paper Mills,” 12, 14; *Dallas Morning News*, May 28, 1939; Arthur Temple to E. L. Kurth, May 31, 1938, E. L. Kurth to Ted Dealey, June 28, 1938, Kurth Papers; Stahlman, “Publishers Created New Industry,” 224; *Paper Industry and Paper World* 20 (June 1938): 257.

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72. Herty, “The Pulp and Paper Laboratory at Savannah: Its History, Operation and Future,” October 8, 1937, attached to Herty to Holmes Herty, October 14, 1937, Box 152, Folder 7, 11; Victor Schoffemayer, *Dallas Morning News*, May 28, 1939, p. 10; Herty to Louis de Rochemont, April 28, May 24, June 21, 1938, Louis de Rochemont to Herty, May 3, 1938, Box 54, Folder 5; Wanda Farr to Herty, June 1, 4, July 22, 1938, Box 68, Folder 6; Wanda Farr to Herty, June 17, 1938, Box 87, Folder 8; Herty to Franklin Hobbs, June 4, 1938, Franklin Hobbs to Herty, June 9, 13, 1938, Box 87, Folder 8; Robert Rose to Franklin Hobbs, June 10, 1938, Box 87, Folder 8; Lucy Chambers to Franklin Hobbs, July 1, 1938, Box 87, Folder 8.

73. Herty to Alex Sessoms, June 27, 1938, Box 112, Folder 4; Herty to Dr. Warren Coleman, July 7, 1938, Box 4, Folder 7; Herty to Holmes Herty, July 8, 1938, Box 138, Folder 6.

74. Charles Carpenter to Telamon Cuyler, July 15, 1938, Box 4, Folder 7; Lucy Chambers to Frank Klarpp, July 21, 1938, Box 40, Folder 14; Eloise Hooper to Lucy Chambers, July 25, 1938, Box 138, Folder 7; Lucy Chambers, interview with *Savannah Morning News*, August 11, 1963, “Charles Holmes Herty,” Vertical File, Georgia Room, UGA Library.

75. *New York Times*, July 28, 1938, p. 19, July 29, 1938, p. 16. See also *Savannah*

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