



Charles Holmes Herty

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CHARLES HOLMES HERTY

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Charles Holmes Herty was born December 4, 1867, at Milledgeville, Georgia. His father, Bernard Richard Herty, was born in Milledgeville in 1844, the son of James Herty, a substantial citizen. Bernard Herty enlisted in the Confederate army at the age of 17 years and rose to the rank of Captain. After the war, he returned to Milledgeville to become the leading druggist of the region. Charles Herty's boyhood ambition, to be a druggist also, remained with him to his university days at Baltimore. He and a younger sister were orphaned at an early age, both parents dying before he was 11 years old. Left in somewhat straitened circumstances, Herty always acknowledged gratefully the particular care of an aunt, Miss Florence I. Holmes of Athens, Georgia, who survives him.

Surrounded by relatives and family friends, his boyhood was a happy one. He grew up keenly interested (and successful) in outdoor sports and games, the interest being maintained throughout his life. Graduating from the local school, the Georgia Military Academy, he went to the State University at Athens, taking a Ph.B. in 1886. He entered the Johns Hopkins University in the fall. It was a period of intense intellectual activity at that institution, with a relatively large

body of graduate students and few undergraduates. The graduates almost completely dominated the extrascholastic activities and Herty was soon active in them, particularly in glee club and baseball. He was easily the most popular and best loved student of his time. He justified his extracurricular activities because he had now abandoned his ambitions to be a druggist in favor of a teaching career in chemistry and wished to have an appeal to his prospective students, independent of scholastic ability. In 1890 he attained his Ph.D. His dissertation entitled, "The Double Halides of Lead and the Alkali Metals," was a sound piece of work and he returned to a study of double halides later. At this time neither Gibbs' Principle, the phase rule, nor modern techniques were available for guidance. People spoke vaguely of molecular compounds as distinct from atomic compounds and suspected that persistent work in the field would give a clue to the meaning of the also vague concept of valency.

Herty became Assistant Chemist of the Georgia State Experiment Station in 1890 and a year later, 1891, instructor at the State University. He was advanced to Adjunct Professor in 1894 and held the appointment until 1902. In 1895 he married Miss Sophie Schaller of Athens and in 1899 real-

ized a long-time desire by going to Berlin with his wife and two young children. After a year in Berlin listening to Witt and Körner, he went to Zürich to renew his interest in valency by studying with Werner. Returning to Georgia in 1901, he made contact with the U. S. Bureau of Forestry, for Witt's caustic criticism of American methods of obtaining turpentine rankled in his memory and was confirmed by visits to the pine belt. The Naval Stores industry was languishing. Herty was concerned with possibilities for restoring it. His invention of the now universally used cup and accompanying technique was revolutionary, the old boxing method being quite abandoned, with a saving of many millions of dollars. In 1902 he became a regular member of the Forestry Bureau's staff, remaining to 1904. During the years 1904-05 he was with the Chattanooga Pottery Company in connection with the manufacture of his cup.

Financial security now attained, Herty welcomed a return to academic work with the call to head the Department of Chemistry at the University of North Carolina. He was a successful teacher, logical, persuasive and with a never-flagging enthusiasm. Venable and Baskerville had done noteworthy research on the rare earths, and Alvin S. Wheeler had started his long series of investigations on pine oils. Promptly Herty returned to a study of the double halides of platinum and potassium, going on to study the halides and thiocyanates of mercury and lead. While with Werner he had published on the cobalt-ammonia chlorides and he returned for a while to the study of coordination numbers. The reaction of ammonia with ethylphospho-platinic chloride was studied and the compound previously found by Rosenheim was shown to have a formula strictly in accord with the Werner theory. This publication marked the culmination of Herty's contribution to theoretical or pure chemistry. Henceforward, all his interest in chemistry was as a means for improving the material conditions of people: specifically, to develop industry. He had been writing about turpentine, along the lines he developed in Bulletin No. 40 of the U. S. Bureau of Forestry, which became a classic in the literature of turpentine; and, in 1908, the same year in which his paper on coordination numbers appeared, he reported studies on pine products. He found little change in the optical properties of samples of turpentine gathered throughout the year; the turpentine from the black pine, *Pinus*

serotinus, is little used, but was found to be rich in limonene and to absorb more oxygen than the turpentine from the common source, *Pinus heterophylla*. These were followed in the next few years by further studies of pine products, cotton seed oil, soaps, leather, etc. Of particular interest is the paper delivered before the Eighth International Congress of Applied Chemistry on "The Past, Present and Future of the Naval Stores Industry," and his efforts to obtain isoprene from turpentine. He showed pinene and not dipentene to be the source. Herty served as Dean of the School of Applied Science at the University of North Carolina, 1908-11.

In 1915 Herty was president of the American Chemical Society. An important accomplishment in his administration was the census of American Chemists. In his first presidential address, at New Orleans, he called attention to the resources of the South in raw materials and man power. At Seattle he called attention to the need of more research to supply deficiencies created by the World War, and for cooperation between University laboratories and industry. He suggested acquisition of governmental supplies of raw materials and strong tariff protection. Again President in 1916, in his address in New York he stressed the importance of financial support to make the teaching of chemistry more attractive to competent instructors, the necessity of better training of students going into industry, the desirability of government stores of raw materials, investigation of fuel and potash resources, tariff protection of new American industries, and popularizing chemistry with the laity. In 1916, the A. C. S. News Service was inaugurated. Herty had become accustomed to a much wider audience than the University and was ready to accept the editor's chair in 1917 when expansion of the activities of the American Chemical Society brought a full-time editorship for the *Journal of Industrial and Engineering Chemistry*. He remained with the *Journal* for five years, making it the foremost in its field, and a monument to his talents.

Starting with the motto "Coöperation," a trenchant pen soon showed he could be otherwise than gentle and suave when occasion warranted, and editorials on a wide range of subjects had far-reaching effects on the American industry, particularly in the manufacture of dyes. It is impracticable to cite, much less discuss, the list of subjects. It was the strenuous post-war period. Chemi-

cal education policies, protective tariffs, stimulation of the manufacture of synthetic organic substances, the organization of the Chemical Warfare Service owe much to his incisive and logical editorials. During the war settlement period, September, 1919, he was sent abroad by President Wilson to arrange for the purchase of impounded dyestuffs. This led to the organization of the Textile Alliance for the protection of American purchasers and forming of a domestic dye industry. From it has come the Textile Foundation with its valuable support of research with the funds then accumulated.

In 1921, yielding to the plea that he was, definitely, the best equipped man for the place, he gave up his editorship to become president of the Synthetic Organic Chemical Manufacturers Association, a new organization he had been vigorously advocating. His familiarity with technical procedures coupled with highly developed national gifts were very successful in persuading federal legislation. He retained this position until 1926. His interest in questions of public import was undiminished and it was at this period that he took every practicable occasion to urge studies of synthetic and natural remedial agents for internal medicine, and to further the activities which finally led to the passage of the Ransdell bill, in 1930, assuring the establishment of the National Institute of Health. It was their mutual conviction of the need for a coöperative alignment of medicine and chemistry that brought Herty and Francis P. Garvan together about 1918 and led to that association so important for the coming years. In 1926, feeling that his personal task had been accomplished with the secure establishment of the dye and pharmaceutical industry in the United States, he retired from his administrative duties. He became advisor to the Chemical Foundation, and for two years was engaged in the promotion of research in chemotherapy. Still retaining a connection with the Chemical Foundation, he opened a consulting office in New York in 1928 and maintained it until 1935. His major effort was to direct attention of financial interests to the industrial possibilities of the South Atlantic States with their great resources in raw materials. The Naval Stores industry was prominently in mind and, inevitably, consideration of other uses of the huge cover of pines on the Atlantic littoral. The subject was not entirely new to American chemists. The possibilities of removing the resins

yielding a raw material suitable for alcohol or cellulose products had been studied but without practical outcome. A considerable and growing production of Kraft paper existed.

Herty maintained that the secretion of turpentine and resins being a protective device of nature, young pines should be relatively free of them, and the wood as suitable for pulping as spruce or other commercially used woods. He found the resin content of young slash pine to be less than one per cent., comparing favorably in this respect with spruce. Moreover, pine makes a relatively rapid growth and at four to eight years of age compares favorably with spruce of perhaps fifty or sixty years growth. He maintained, further, that pine naturally reseeded itself and given favorable conditions would come in spontaneously in cut-over lands, thus assuring a continuing pine stand without cultivation. Other observers maintain there is a natural cycle of tree growth, hardwood following pine, and left to itself a long period elapses before pines again are the dominant growth. No one doubts, however, that with cultivation, pines will follow pine, and at moderate costs. To obtain consideration of industrialists and financiers, laboratory experimentation and pilot-plant demonstration were needed. These facilities became possible in 1931 with a grant of fifty thousand dollars from the Chemical Foundation, supplemented by twenty thousand a year for five years from the State of Georgia, and substantial support from the city of Savannah. Dr. Herty had been appointed director of research for paper and pulp of the Georgia State Department of Forestry and the Chemical Foundation equipped the establishment known as the Savannah Pulp and Paper Laboratory. In a few years it was shown that the slash and other pines of the South yielded a fine grade of white newsprint. On March 31, 1933, the *Soperton News*, a weekly, was printed on paper made by Herty. In October, 1933, with three refrigerator cars loaded with pulp and transported to Thorold, Canada, a carload of entirely satisfactory news-print was procured, without any untoward incident. Nine newspapers of Georgia used it in their editions of November 20. And this *tour de force* was followed in 1936 by organization of a company by Southern capital for the erection of a plant near Lufkin, Texas, and the manufacture of newsprint. Over a dozen plants for production of cellulose products from pine have recently been added to those al-

ready operating in the Southeast. Some of them frankly admit Herty's influence in bringing them into existence.

The Savannah laboratory has produced high-grade alpha-cellulose which has been made into rayon, and is now investigating the practicability of utilizing in this way gum tupelo and other southern trees as well as pines. Now known as the Herty Foundation Laboratory, it is hoped that means will be found to establish it on a permanent basis, because of its obviously great value to Southern industry, as well as the most fitting of monuments to Herty.

Following the formation of the concept of farm chemurgy by Dr. William J. Hale, in close association with Dr. Herty the Farm Chemurgic Council came into existence, largely because of financial support by the Chemical Foundation and more perhaps because of the enthusiastic support of the late Francis P. Garvan. By reason of the nature of his work with pines, Herty inevitably took a leading part in this work. His addresses and exhibits were striking features at all annual meetings. Chemurgic problems in general including dry alcohol, sweet potato starch and conservation policies, particularly fire control, found frequent and forceful references in a long series of addresses and magazine articles. He continued to answer calls to public service and by presidential appointment was associated with General Hugh Johnson in the early work of the NRA.

Busy with his varied interests, a tired heart rebelled. In July, 1938, he went to a Savannah hospital. After three weeks he seemed to be making a complete recovery. On July 28, it is reported that he ate a good breakfast, and chatted with some early visitor. A few hours later the end came to the long, useful and happy life. He was seventy years of age.

He is survived by his sons Dr. Charles Holmes Herty, Jr., of Bethlehem, Pa., member of the American Chemical Society and a recognized authority on the chemistry of steel making, and Frank Bernard Herty of Brooklyn, N. Y.; his daughter, Miss Sophie Dorothea Herty, of Savannah, Ga., well known plant physiologist; a sister, Mrs. W. D. Hooper of Athens, Ga.; an aunt, Miss Florence Holmes of Athens, Ga.; many relatives and a host of friends. Mrs. Herty died in 1929. His private charities were many. While a vestryman at Chapel Hill, he devised a

pension system for retiring clergy; operating successfully in the diocese, the Episcopal Church used it as a model in 1917. He died a vestryman of St. John's, Savannah.

Aside from his professional work, his main interest was always in field sports. He is credited with introducing football to the South when he was on the faculty of the University of Georgia, and he served as Director of Athletics while at the University of North Carolina. On his many trips about the country he rarely missed an opportunity to attend a game of baseball. Adept at the traps in his younger years, he was always keenly interested in the hunting of upland game. He was an expert billiardist.

A recital of Herty's contributions, as here attempted, falls far short of a complete description of his many services, indirect as well as direct, to the cause of chemistry and industry in America. These services must await the perspective of time for adequate evaluation. But his memory long will remain green as it already bids fair to become a tradition. We can be grateful that he lived and that, as contemporaries in the American Chemical Society, we have shared in some measure in his distinguished merits.

Herty received the medal of the American Institute of Chemists in 1932. In 1934 he received a medal from the Herty Society organized in his honor by the Georgia State College for Women at Milledgeville, in a roster of distinguished scientific workers. He was the Edgar Fahs Smith lecturer at the University of Pennsylvania for 1937 and the Joseph W. Richards Memorial Lecturer before the Electrochemical Society in 1938. Fellow of the American Association for the Advancement of Science, he was a member of the Institute of Chemists, Society of Foresters, the Forestry Association, Institute of Chemical Engineers, the Society of Chemical Industry, the Electrochemical Society, the Society of Engineering Education, the Philosophical Society, the Franklin Institute, the London Chemical Society, the Société de Chimie Industrielle and the Société Chimique de France.

Herty held the Sc.D. from Colgate and Oglethorpe, the Doctor of Chemistry from Pittsburgh. He was made an LL.D. by the University of Georgia in 1928, by the University of North Carolina in 1934, by the University of Florida in 1937, and by Duke University in 1938.

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