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HARRY GIDEON WELLS

1875—1943

A Biographical Memoir by
ESMOND R. LONG

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Biographical Memoir

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Hyden Wells

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BY ESMOND R. LONG

Harry Gideon Wells was born at Fair Haven, a suburb of New Haven, Connecticut, on July 21, 1875. He came from substantial Puritan stock on both sides of his family. His progenitors were English as far back as there was any record. His most distinguished ancestor was Thomas Welles, second Governor of Hartford Colony. He was related to but not directly descended from Gideon Welles, Secretary of the Navy in Lincoln's cabinet. Some branches of the family used the spelling Welles. The name Gideon recurred frequently.

His father was Romanta Wells. His grandfather also had this curious given name, which appears to have had some special significance for H. Gideon Wells' great grandmother. Romanta Wells had intended to study medicine, and, as a preparation, at the age of fourteen, started an apprenticeship in a Hartford drugstore. In the early sixties he moved to Fair Haven to work in a larger store. He later bought a drug store of his own, and shortly afterwards married the daughter of a neighbor, Emma Tuttle. The plan to study medicine never materialized and Romanta Wells remained in either the retail or wholesale drug business all the rest of his life. The Tuttle were described by Gideon Wells as conservative farming people, landloving, churchgoing and moderately prosperous.

School and College

Young Harry Wells went to several grade schools in Fair Haven and the New Haven into which Fair Haven was eventually absorbed. By his own account his grades were good except in conduct, and, like many other men who ultimately achieved distinction, he was suspended from school—in his case briefly—for a schoolroom prank.

After he learned to read, the major part of his education was derived from his independent efforts. He read everything in the house, including all of Appleton's Encyclopedia, and much

of it several times. This taste persisted and his knowledge of current literature in his later years was extraordinary.

He entered Hillhouse High School, the only high school in New Haven, in 1889, choosing the scientific rather than the classical curriculum, a three-year course recognized as preparing for the Sheffield Scientific School. Even at that early date he intended to be a doctor. He was at least as much interested in athletic sports at the time, and for two years of his high school course was sports writer for a local paper.

While he was in high school the family moved from the Fair Haven home to a house on Trumbull Street in New Haven, a remarkable location from an academic point of view, for on this street, in the short space of one block, lived Samuel W. Johnson, founder of agricultural chemistry in America, and the distinguished biological chemists, Russell H. Chittenden, Lafayette B. Mendel and Thomas B. Osborne. At the time, however, Wells was more interested in the Yale athletic heroes, with one of whom, Amos Alonzo Stagg, he later came to be intimately associated at the University of Chicago.

Wells entered the Sheffield Scientific School of Yale University in the fall of 1892 after graduating from the Hillhouse High School of New Haven, "without honors or complaints," according to his own statement. In his third year he took a course in biochemistry under Chittenden and Mendel which he described fifty years later, after a lifetime of critical analysis of teaching, as "the best organized and most thorough course I ever took," which "served as the basis and background" for the rest of his life's work.

Earlier in the curriculum he had studied paleontology with Othniel C. Marsh, who was famous as the discoverer of important stages in the evolution of the horse, but who was admired particularly by the students as the personal and intimate friend of Buffalo Bill, who had been Marsh's guide in the Dakota Bad Lands. Wells had courses under other distinguished teachers, but it was Mendel, principally, who developed his interest and capacity. Wells wrote "he was one of the greatest teachers I ever knew. I adored him as a student, worked with him whenever I could, and felt as if he were my big brother when I went

for advice." In the shuffle of assignments, Wells prepared his thesis under Sidney Smith, professor of zoology. The thesis was an ambitious study of comprehensive scope entitled "The Comparative Anatomy of the Bile Tracts of Carnivora, Herbivora, and Omnivora."

Yale University and the Sheffield Scientific School remained a second home for Wells all his life. He returned frequently for study with Mendel during vacation periods from the University of Chicago, and occasionally collaborated with others of the distinguished faculty there or in summer months at Woods Hole. He developed especially fruitful associations with Frank P. Underhill and Thomas B. Osborne.

Medical School

The depression of the early nineties, which forced Wells' father out of business in New Haven, was responsible for Wells' settlement in Chicago. In the summer of 1893 Wells' father and mother visited the Chicago Worlds Fair. In Chicago, Wells Sr. saw new opportunity and purchased a retail drug business on the West Side in a location close to Rush Medical College. Wells spent the summer of 1894 in Chicago, and actually, before his graduation at Yale, began his study of medicine that summer. His father's store was also the office of a unique character in surgery in the Middle West, Dr. E. W. Lee, the preceptor of the still more famous surgeon John B. Murphy. Lee's son, a practicing physician, took Wells on horse-and-buggy rounds and both of them assisted Murphy in experimental surgery. Wells' mind was made up; only the choice of a medical school remained. There were three good ones in Chicago, and on the advice of Murphy he chose Rush Medical College.

He still had to return to New Haven for his final year at Sheffield Scientific School. He graduated in 1895, not yet 20 years old. He spent the summer in Connecticut, much of it in the companionship of a cousin by marriage, Bertha Robbins, the future Mrs. Wells.

In September 1895 he returned to Chicago to commence his course at Rush. By fortunate chance he resided in a boarding house where Dr. and Mrs. Norman Bridge took their meals.

Bridge was a member of a famous group which included James B. Herrick, Frank Billings, Nicholas Senn, James N. Hyde, Bertram Sippy, Walter Haines and Ludvig Hektoen. Learning of Wells' previous training in biology, Bridge introduced Wells to Hektoen, and so began an association close, fruitful, and without interruption to Wells' dying day.

Wells went through the grueling course at Rush with distinction, "made County," finishing second in the severe competitive examination for the Cook County Hospital internship, and later was appointed Fellow in Pathology under Hektoen at Rush. With him, in a similar position, was Howard T. Ricketts, who later discovered the "rickettsiae." By that time both were veteran investigators. Wells had worked on "Fourth of July tetanus" and Ricketts on the etiology of skin infections. Wells had won the Benjamin Rush Medal with a paper on "The Physiology and Therapeutics of the Thyroid Gland and its Congeners," which was published in the Journal of the American Medical Association and brought a characteristic short complimentary note from William Osler in Baltimore. His most notable research accomplishment was the independent discovery of the etiology of blastomycetic dermatitis. Gilchrist of Baltimore had already described two cases, however, in a paper Wells had not yet seen.

Post Graduate Study

The fellowship in pathology did not provide a living, and Wells supplemented his three-hundred-dollar salary by tutoring, conducting quiz classes, and for a short time only, by the practice of medicine. He took the practice of a well-known, aging Chicago physician, Henry M. Lyman, and held it without great interest or success for a little more than a year, relinquishing it to accept an offer as assistant to Hektoen in the Department of Pathology in the rapidly developing medical school of the University of Chicago, with which Rush Medical College had become affiliated.

His formal education was not yet completed, however. At Chicago, whenever he had time, he took courses in chemistry under Julius Stieglitz, for whom he developed deep admira-

tion and affection. From then on his work in pathology was always influenced by his understanding and appreciation of chemical processes.

On April 2, 1902 he married his Connecticut companion and friend Bertha Robbins. Two years later, after promotion and an increase in salary, he and Mrs. Wells left for a year of study abroad. Landing in Italy, they toured through Switzerland and much of Germany before reaching their destination, Berlin. On the way Wells visited many of the most celebrated German medical investigators, including Ziegler, von Recklinghausen, Kossel, Marchand and Ehrlich. He was now an assistant professor, traveling in a land showing profound respect for academic rank. In Berlin he entered the laboratories of Ernst Salkowski, the leading and almost only chemical pathologist of the time. Here he commenced his ultimately well-known studies on calcification. It was only an interim occupation, however. His real objective was Emil Fischer's laboratory, which he entered after a few weeks of waiting. He was doubly fortunate in his assignment, which was in Fischer's own room, under the immediate supervision of Emil Abderhalden. Others in the room included two future Nobel Prize winners, Fritz Pregl and Otto Warburg. Wells developed a profound admiration for Fischer, whom he considered "the greatest chemist who ever lived." Fischer was then finishing his monumental work on the proteins. Each student in the laboratory was assigned an analytic problem in the field. Two of Wells' good friends from Chicago were there at that time; in describing their work Wells wrote "Le Count got goose feathers, Herrick got fish scales and I analyzed horse hair."

In Berlin Wells took advantage of the city's extraordinary wealth of scientific meetings. On one occasion he heard the epoch-marking paper by Schaudinn on the discovery of the spirochete of syphilis.

In Paris, on the way home, at the instigation of the American consulate, which had learned that an American pathologist was there on a visit, Wells assisted in the identification of the brandy-preserved remains of John Paul Jones, who had been buried obscurely in the city a hundred years before. Wells corroborated

a French pathologist's diagnosis of chronic nephritis in the shrunken kidneys, a disease from which Jones was suspected to have suffered in his last years. It must have been with great satisfaction that Wells watched the elaborate parade down the Champs Élysées that preceded the return of the immortal admiral to the United States.

Research

Back in Chicago in 1905 Wells entered on his most productive period. Hektoen was his chief, but was fully occupied with his continuing duties at Rush Medical College. Ricketts held a position like that of Wells, but was out of residence most of the time, so that Wells had a free hand in developing the new department.

The faculty was a distinguished one, with such men as Franklin P. Mall and Llewellys Barker in anatomy, Jacques Loeb and later A. J. Carlson in physiology, A. P. Matthews in biological chemistry, Edwin O. Jordan in bacteriology, and Walde-mar Koch, nephew of the great bacteriologist Robert Koch, in pharmacology. Wells and Koch were particularly close until the latter's untimely death in 1911.

In the years from 1905 to World War I Wells made the investigations that led to his general acceptance as the country's chief authority on the chemical aspects of pathology and immunology. A research on fat necrosis, which resulted in a clear understanding of this condition, was counted as fulfilling requirements for a Ph.D degree in pathology. This was followed by a series of papers in the general field of autolysis, which did much to establish the fundamental nature of degenerative processes and tissue necrosis, as well as such practical matters as the differential staining of tissues in these abnormal states. Mendel's influence was evident here. Mendel had put him to work on a problem of purine metabolism in the mollusc, and Wells capitalized on the results by applying them to a variety of pathological problems in man. Many of his students were assigned problems in the same field.

A problem of great interest to Wells was the evolutionary development of the purine enzymes in animals. Man, unlike most

animals, does not possess the enzymes necessary for oxidation of uric acid to allantoin, a deficiency predisposing him to uric acid calculi in the kidneys and the metabolic disorder gout. Using animals from the New York Zoological Park, furnished him from time to time by its Director, Dr. W. T. Hornaday, Wells discovered that the higher primates, i. e., the chimpanzee and orang-outang, but not the smaller monkeys, resembled man in their lack of the enzyme uricase.

In Chicago Wells continued studies on calcification that he had commenced with Salkowski, and published particularly noteworthy papers on metastatic calcification, which led, in 1911, to an invitation to give a lecture on the general problem of pathological calcification before the Harvey Society in New York.

An ingenious investigation by Wells removed certain misunderstandings with respect to the phenomenon of fatty degeneration of the liver. This degenerative process was thought to be due in part to the inability of the liver to carry out its normal oxidizing processes. Using hydrazine, introduced in experimental pathology by Underhill, to damage the liver lobule centers, and phosphorus to injure the lobule peripheries, he caused a profound fatty degeneration of the liver in experimental animals. Applying the standard test for the presence of the oxidizing enzyme for uric acid he found to his surprise that that oxidative mechanism, at least, was still intact.

These and other studies laid the foundation for his well-known *Chemical Pathology*, first published in 1907, which reached its fifth edition in 1925. Wells followed a unique method in preparing this book, the original stimulus for which he attributed to Hektoen, to whom the book was dedicated. He was a prodigious reader of the literature and collector of the latest information in the many fields of his specialty. Whenever he encountered a problem on which he felt he could not write satisfactorily he initiated a research upon it. His growing book guided him into many of his studies, including autolysis, calcification, fatty metamorphoses, lipases and differential necrosis in parenchymatous organs.

A series of investigations of great importance for immunology were carried out in collaboration with the distinguished protein

chemist Thomas B. Osborne. Using the technic for anaphylaxis in the guinea pig, sensitizing them with Osborne's pure vegetable proteins, and challenging the animals with the same or related proteins, Wells established the dependence of specificity in reaction on the chemical nature of proteins rather than their biologic origin. This work led to the second of his three books, on *The Chemical Aspects of Immunity*, first published in 1925, with a second edition in 1929, which was translated into German, French, Russian and Roumanian.

His third book, *The Chemistry of Tuberculosis*, with Lydia DeWitt and Esmond R. Long as co-authors, was the outgrowth of a series of investigations under the sponsorship of the Otho S. A. Sprague Memorial Institute, an organization established in 1911 by A. A. Sprague of Chicago, under the terms of the will of his brother Otho S. A. Sprague, a Chicago capitalist. On the advice of Dr. Frank Billings, a member of the Board of Directors of the new organization, the income from its endowment was used for medical research, and Wells was named the first Director. With funds available for assistants he promptly instituted a series of investigations in several fields. One of special importance was the chemotherapy of tuberculosis. The stimulus for this came from Ehrlich's discovery in 1909 of salvarsan and its effect on syphilis. With salvarsan as a model Wells put Dr. DeWitt on a long and ultimately deeply disappointing research on the drug treatment of tuberculosis. By coincidence Paul A. Lewis at the Henry Phipps Institute of the University of Pennsylvania was attacking the same problem by similar methods at the same time. Both used dyes having more or less capacity to penetrate the tubercle, the dyes carrying a combined metal, such as arsenic or mercury, or some other toxic radical as a bactericidal agent for the tubercle bacillus. These two patient and unsuccessful investigations served one great purpose, the refutation of extravagant claims abroad for numerous products put forth on a commercial basis as cures for tuberculosis.

In the current (1949) encouraging development of chemotherapy of tuberculosis, William H. Feldman, one of the earliest investigators of streptomycin, recalled a statement made by

Wells, at the conclusion of this long and fruitless research, that the chemotherapy of tuberculosis must await the development of new principles. These have perhaps been discovered in the use of the sulpha drugs and antibiotics.

The Sprague Institute was concerned with many investigations besides that on tuberculosis. Laboratories were established at Rush, where R. T. Woodyatt worked on diabetes, and in the Children's Hospital on Chicago's North Side, where fundamental studies were made on pediatric problems by H. F. Helmholz, Samuel Amberg, C. A. Aldrich and others. Probably the most exciting study in the Institute, however, was a long investigation by Maud Slye on the genetics of cancer. As a student of Professor C. O. Whitman of the Department of Zoology, Miss Slye had noted the frequent occurrence of cancer in certain inbred strains of mice. Wells gave her an opportunity to breed mice on an enormous scale in an investigation which lasted from 1911 to 1942. A great and historic controversy, which raged at meetings of the American Association of Pathologists and Bacteriologists and the American Association for Cancer Research, developed between Miss Slye and Clarence C. Little of the University of Michigan, later of Bar Harbor, who was conducting similar investigations, and whose interpretations of the phenomena of inheritance of cancer differed radically from those of Miss Slye. Wells championed Miss Slye most forcefully. His part in the investigation was the diagnosis of the developing tumors, hers the selective breeding of the animals. After thirty years he was willing to admit that Miss Slye must have been wrong in many of her concepts, but to the end he gave her the principal credit in this country for establishing the fact of inheritability of cancer, whatever its exact mechanism might be.

These were only a part of Wells' studies on cancer. His semi-weekly autopsies at the County Hospital and later autopsies at the Albert Merritt Billings Hospital of the University of Chicago gave him abundant material for study. He was so well known by that time as a chemical pathologist that it was often overlooked that he was a general pathologist and morbid anatomist of the first rank. He was one of a small but distinguished

group of pathologists in this country when American pathology was escaping from German tradition and becoming an independently American discipline. Wells, who never overlooked an opportunity for research in a chance discovery at an autopsy, and who combined detailed studies with broad perspective on the problem, contributed a large element of common sense to the increasingly complicated subject of cancer diagnosis.

His other researches in general pathology included studies of such diverse problems as waxy degeneration of muscle, primary cortical atrophy of the adrenal gland and post operative pulmonary embolism. The latter was rare in his County Hospital days, but all too frequent at Billings. He attributed its increase in incidence to improvement in surgery, pointing out that in the old days of inferior technic most blood clots at the site of operation were slightly infected and therefore inclined to adhere safely to their vessel walls.

He was at all times a prodigious worker, but never an impatient, hurried or self-pitying one. For years he worked in his laboratory or his office five nights a week and Sunday mornings. His assistants grew up with the idea that this was normal. But it was fun, not labor. Many nights Mrs. Wells came over and the two departed at 10:00 o'clock for the second feature of one of the local movies. Wednesday, his day for visiting the Sprague Institute laboratories on the North Side, was also his day for trap shooting at the Lincoln Park Gun Club, which was conveniently located near the Children's Hospital. After his autopsies at the County Hospital, while his assistants were cleaning up, he used to slip out the back door of the morgue and enter the Chicago Cub baseball park, across the road, where all cares were dropped. He was an expert student of the game, knew every player, and remembered all the scores.

Teaching

As a teacher he was superb, chiefly because he made every student work. He was a relentless quizzer, but enlivened every discussion with humor, sometimes caustic, always sparkling. He never lectured to students. He enjoyed teaching the first courses in pathology, but later, when his administrative duties

were too heavy, transferred this responsibility to his assistants. He retained charge of the autopsy course, however, until his retirement. Students registered for it if they possibly could; his assistants took it as a matter of course. Hundreds of students remember "Path 3" as one of their most fascinating experiences in medical school. The members of the class, in rotation, "took" each autopsy, working up the case and cutting sections for the whole class. Diagnosis on class days had all the elements of an intriguing game.

Twenty-six students took a Ph.D. degree in pathology under Wells, a large number in a field where the M.D. degree is ordinarily considered sufficient. Many combined the research leading to the Ph.D. with the course for the M.D. degree. Some, but not many of these men, became general pathologists. Most entered special fields, as diabetes, nutrition, cancer and tuberculosis, their later interests reflecting spontaneous stimulation under Wells, or, not infrequently, an unrelated chance development. Wells did not force these interests. What he said of Hektoen was eminently true of himself. Once, when asked the chief element of Hektoen's influence on young men, he said, "He encouraged individuality. He never tried to mould them to a pattern or impose his own upon them. He noted the strongest and best qualities in each and encouraged the men to develop them." In 1939 his students and friends arranged for a portrait by the Chicago artist Wayman Adams, which was presented to the University of Chicago in an official ceremony.

World War I. Roumania

The year 1917 brought about a profound change in Wells' life, as in that of countless others. In July of that war year, out of a clear sky, after searching elsewhere for opportunity to be of service, he was offered a commission in a Red Cross mission to Roumania, then struggling desperately against invading German forces, and suffering from a succession of epidemics of cholera, typhus and typhoid fevers and other infectious diseases, and a mounting toll from famine.

The mission left Vancouver, B. C. on August 1, arrived in Yokohama August 14, and after an extraordinarily interesting

trip through Siberia and Russia during the Bolshevist revolution reached Jassy, Roumania, on September 16. The trip and the new responsibilities were unlike anything Wells had ever experienced. The mission arrived in that part of Roumania not overrun by the German Army at a time when at least half a million people had fled from Wallachia to Moldavia, together with nearly two million retreating Roumanian and Russian soldiers. Wells described them as a "horde of exhausted, demoralized, underclothed, underfed people crowded into a country unprepared in every way to rise to the situation." Remarkably, however, the epidemics, which were at their height when the mission was organized, had already waned considerably. Dangerous foci of infection remained, to be sure. Wells, together with Dr. Roger Perkins, Professor of Public Health of Western Reserve University, was assigned the task of making a survey of the medical state and needs of that portion of the country remaining in Roumanian hands. The tour, which took them from remote country districts to the front line of the Roumanian Army, made them familiar with diseases now almost unknown in the United States, of which typhus and typhoid fever were the most serious. Typhus was being brought under control, but they encountered many cases in hospitals throughout the small towns and not a few in the homes.

Typhoid fever was endemic, aided by a stupendous plague of flies. Vaccination was effective, however. Wells and Perkins discovered the interesting fact that the disease was more prevalent in Roumanian officers than privates. The explanation was that vaccination was compulsory for enlisted men but not for officers.

Malnutrition was widespread. Pellagra and nutritional edema were outstanding problems. Fortunately, within the preceding few years, knowledge of the deficiency diseases had developed greatly and the remedies were clear if not always available. The relation of a protein-low diet to the so-called war edema was becoming understood.

The recommendations of Wells and Perkins were approved and implemented by orders from the States which would have insured medical personnel and supplies. Unfortunately the

Russian collapse occurred at this time, and it became necessary for the mission to return to the United States—again by way of Siberia and the Orient, in a trip of surpassing geographical and political interest, which brought the party home in mid-December 1917.

Wells' experience with Roumania was far from concluded, however. In October 1918, Colonel Anderson, his chief on the first trip, asked him to join another mission to the Balkans, which now, after the German retreat from Greece and Siberia, could be reached from the Mediterranean. Wells accepted, and sailed from New York with the mission, after innumerable delays, on November 13. The armistice two days before had thrown all planning into confusion. In London and Paris an entire reorganization was affected, which resulted in Wells' appointment as chief of a Red Cross mission to Roumania with an unofficial position as liaison officer with the Food Administration, which, under Herbert Hoover, was engaged in fighting famine throughout eastern Europe. The responsibility for relief among 16,000,000 people and a budget of a million dollars, exercised in a maze of difficult diplomatic problems, was an exciting experience for a man with an almost exclusively academic background. He was an able administrator, however, and proved successful. The mission reached Galatz, Roumania in February 1919, where it was greeted by a cheering throng for whom the ship's stores spelled the end of famine. Warehouses were established and in spite of the most discouraging difficulties with transportation, medical supplies, food and other assistance soon streamed to the most distant parts of the country. Wells' recently acquired knowledge of the deficiency diseases was invaluable, and he himself learned much more in the course of his duties.

From a personal point of view the mission was of extraordinary color. He became familiar with Roumania and the surrounding countries and well acquainted with the Roumanian royal family, from whose hands he received the Star of Roumania. He returned to America in June 1919, as from another world, and took up the duties he had dropped two years before.

Recreation

Wells had a great and lasting interest in sports. Fishing was his favorite and perhaps his best, although he was expert in all to which he devoted himself. His graduate students will remember the seven-foot tarpon which adorned one wall of his office. He liked bass fishing best, however, and probably his happiest memories were of the September vacation periods he and Mrs. Wells spent at Tenderfoot Lake in northern Wisconsin, an isolated spot where they could relax completely, with fishing, canoeing, swimming and evenings of bridge, which they both enjoyed. He made occasional quick trips to the Mississippi River during the academic year, to fish for bass, and one of the most compelling inducements, when he was asked to accept a lecture engagement, was an opportunity for fishing or duck or quail hunting.

He was an excellent shot with any gun, and almost unbeatable in trap shooting. He made the varsity team in that sport at Yale. Trap shooting and golf were his chief forms of outdoor relaxation in Chicago. Even as a student at Rush he did a little shooting. He liked to recall that one day on a picnic he taught the little daughter of his landlady to shoot a .22 rifle, and that in later years, as Mary Hastings Bradley, she became a famous lion hunter. In his later years, even after heart trouble had greatly restricted his activities, he kept up his quail shooting, a sport he could enjoy because, as he said, he could sit on a stump and let the birds come to him.

He was a good golf player, and one who took the game with unusual seriousness. He was less skillful than at fishing and shooting, analyzed his mistakes with painstaking thoroughness, and had his son take movies of his stance and swing so that he could improve them. He played regularly with colleagues from Rush and a few of his graduate students, and there is no doubt that the sport helped to keep him in good physical condition.

Later Years

After the University of Chicago developed a four-year course in medicine in 1926, and the Pathology Department moved into

handsome quarters adjacent to the Albert Merritt Billings Hospital, Wells' research and teaching were much curtailed. Administrative duties consumed most of his time and energy. His students made more autopsies than he, although he continued to direct and teach the autopsy class, and used the findings of many a unique autopsy for a significant pathological report. He spent an immense amount of time building a museum of gross pathological specimens, which would be the pride of any teaching institution.

He was active in the American Association of Pathologists and Bacteriologists, of which he was president in 1919, the American Association for Cancer Research, of which he was president in 1915 and 1919, the American Association of Immunologists, the American Society of Biological Chemists, the American Society for Experimental Pathology, and other professional societies in the fields of his special interests. The September-October number of the 1941 volume of the American Journal of Pathology, official publication of the American Association of Pathologists and Bacteriologists, which Wells served for many years as a member of the Editorial Board, was issued in his honor, and made up entirely of articles by his former students. He was elected to the National Academy of Sciences in 1925.

The last eleven years of his life were burdened by ill health. In February 1932 he had a sudden attack of what at first appeared to be a general myositis. In a few days it was all too evident that a major circulatory disturbance had occurred. His pulse slowed and after a time stabilized at just half its normal rate, where it remained for the rest of his life—a complete heart block. He spent many weeks in bed during a stormy period of convalescence, but ultimately acquired a reasonably good compensatory hypertrophy of the heart, so that he could return to his desk and a seminormal life. Within a few years, however, grave deterioration in hearing developed. It was the chief factor in reconciling him to retirement, which took place October 1, 1940. He could no longer quiz, as he had for 45 years, and felt that his teaching days were over. He was succeeded as head of the Department of Pathology by his colleague, Dr. Paul

R. Cannon, who had taken over many of the administrative responsibilities of the Department during Wells' illness.

In Florida in the early spring of 1943 symptoms of intestinal obstruction developed. He was too good a physician and pathologist not to recognize the underlying cause, and he and Mrs. Wells returned to Chicago for an operation for what he had correctly diagnosed as carcinoma of the cecum. Unfortunately his weakened heart proved unable to stand the strain of the operation. He died on April 26, 1943, at the Billings Hospital, to which he had given long and devoted service, at the age of 67.

Mrs. Wells maintained their home in Chicago for a time, and later returned to her old family homestead in Connecticut, where she and Gideon Wells had often met in their youth. Their only child, Gideon Robbins Wells, who graduated in medicine at Harvard University and served as a medical officer in the North African, Italian and Far Eastern theaters in the second world war, also took up his residence and the practice of medicine in Connecticut.

In applying chemical methods to the study of morbid processes Wells was a pioneer in the development of pathology. His *Chemical Pathology* was an outstanding contribution to the literature of medical science. After more than twenty years, although long out of date in its extensive list of references, it is still the standard work in its domain. Largely bibliographical, it is independent in its organization, and is responsible for an orderly division of chemical pathology into fields.

Remarkably, few of his graduate students have specialized in the chemical aspects of pathology. He was a wise teacher of general pathology who refrained from restricting his students' interests to his own specialty. Most of them have developed their own inclinations, and can readily see where Wells' encouragement stimulated their independent tastes in research. Medical students who attended Rush Medical College and the University of Chicago from 1898 to 1940 will never forget him, for he was one of the most colorful members of a conspicuously talented faculty.

HARRY GIDEON WELLS—LONG

His closest friends will always remember him for his tireless industry, his keen humor, his affectionate regard for family and friends, and his vivid interest in the work and play all around him.

KEY TO ABBREVIATIONS USED IN BIBLIOGRAPHY

- Allg. mil-ärztl. Ztg., Wien = Allgemeine militärärztliche Zeitung
 Am. J. Cancer = American Journal of Cancer
 Am. J. Med. Sci. = American Journal of Medical Sciences
 Am. J. Physiol. = American Journal of Physiology
 Am. Med. = American Medicine
 Am. Rev. Tuberc. = American Review of Tuberculosis
 Ann. Int. Med. = Annals of Internal Medicine
 Arch. Int. Med. = Archives of Internal Medicine
 Arch. Neurol. Psychiat. = Archives of Neurology and Psychiatry
 Arch. Path. = Archives of Pathology
 Arch. Path. Lab. Med. = Archives of Pathology and Laboratory Medicine
 Arch. Surg. = Archives of Surgery
 Bull. Am. Acad. Med. = Bulletin, American Academy of Medicine
 Cancer Res. = Cancer Research
 Central. allg. Path. u. path. Anat. = Centralblatt für allgemeine Pathologie und pathologische Anatomie
 Deut. Archiv. klin. Med. = Deutsches Archiv für klinische Medizin
 Interstate Med. J. = Interstate Medical Journal
 J. Am. Med. Assn. = Journal of the American Medical Association
 J. Biol. Chem. = Journal of Biological Chemistry
 J. Cancer Res. = Journal of Cancer Research
 J. Exp. Med. = Journal of Experimental Medicine
 J. Immunol. = Journal of Immunology
 J. Indust. Hyg. = Journal of Industrial Hygiene
 J. Infect. Dis. = Journal of Infectious Diseases
 J. Lab. Clin. Med. = Journal of Laboratory and Clinical Medicine
 J. Med. Res. = Journal of Medical Research
 J. Path. Bacteriol. = Journal of Pathology and Bacteriology
 J. Urol. = Journal of Urology
 Med. News = Medical News
 Med. Welt. = Medizinische Welt
 N. Y. Med. J. = New York Medical Journal
 Phila. Med. J. = Philadelphia Medical Journal
 Physiol. Rev. = Physiological Reviews
 Prac. Med. Surg. = Practical Medicine and Surgery
 Proc. Am. Soc. Biol. Chem. = Proceedings, American Society of Biological Chemists
 Proc. Soc. Exp. Biol. Med. = Proceedings, Society for Experimental Biology and Medicine
 Reference Handbook Med. Sci. = Reference Handbook of the Medical Sciences
 Surg. Gynec. Obst. = Surgery, Gynecology and Obstetrics
 Trans. Chicago Path. Soc. = Transactions, Chicago Pathological Society

- Trans. Med. Chirur. Fac. Md. = Transactions, Medical and Chirurgical Faculty of Maryland
Trans. Nat. Tuberc. Assn. = Transactions, National Tuberculosis Association
Yale J. Biol. Med. = Yale Journal of Biology and Medicine
Zeit. Chemoth. = Zeitschrift für Chemotherapie und verwandte Gebiete
Zeit. Immun. = Zeitschrift für Immunitätsforschung und experimentelle Therapie
Zeit. Krebs. = Zeitschrift für Krebsforschung
Zeit. physiol. Chem. = Zeitschrift für physiologische Chemie

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