

GEORGE B. ROTH

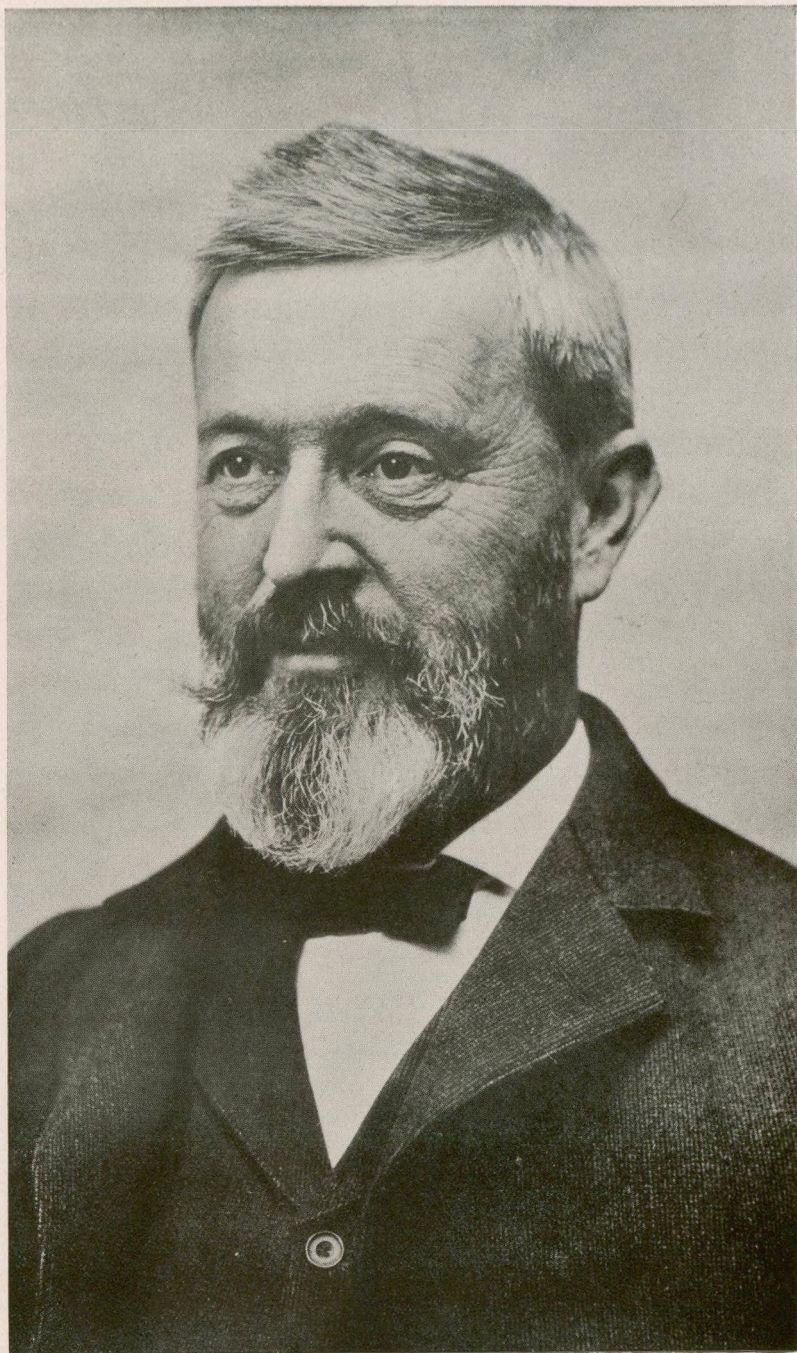
**An early American Pharmacologist :
HORATIO C WOOD
(1841-1920)**

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Dr. HORATIO C WOOD
(1841-1920)

An early American Pharmacologist : Horatio C Wood ⁽¹⁾ (1841-1920)

The history of the preorganization period in American pharmacology is yet to be written. Although this period is rather nebulous, both as regards the personages connected with it and the influences then at work, certain individuals stand out prominently as forces which brought the spirit of inquiry into therapeutics and who did much to usher in the experimental method as the prerequisite to the treatment of disease by drugs.

Perhaps the one who should be given the credit of being the chief among the pioneers in American pharmacology is HORATIO C WOOD, one of Philadelphia, Pennsylvania's noted Quaker sons of the later nineteenth century period, who was distinguished not only as a teaching scientist, active in the field of botany, entomology, physiology, pharmacology and pathology, but also as a therapist and teacher in the domain of neurology and internal medicine. As a matter of fact, he was commonly thought of as a neurologist and therapist and shared honors in the former field in Philadelphia with his distinguished contemporary and friend, S. WIER MITCHELL. His pupil and life-long friend, Dr. H. A. HARE, the noted therapist, although regarding him as a fellow therapist, upon the death of Dr. WOOD, distin-

(1) His name appears in the Dictionary of American Biography as HORATIO CHARLES; in the Dictionary of American Medical Biography (KELLY and BURRAGE) as HORATIO CURTIS.

His son, Dr. HORATIO CHARLES WOOD, Jr., in a personal communication under date of July 6, 1938, wrote as follows: "His middle name was not CURTIS but simply 'C'."

"The story as he told it to me was that his father wanted him named HORATIO CURTIS after himself, but that his mother wanted him to be HORATIO CHARLES; so they compromised on HORATIO C."

"My father was always very insistent, often to the confusion of publishers of his writings, that no period be placed after the 'C' because it was not an abbreviation but his full middle name."

guished him by naming him "the pioneer in American pharmacology," a distinction to which it seems to me he is justly entitled.

Dr. WOOD was born on January 13, 1841, in the "city of brotherly love," being a descendant in the ninth generation from the English Quakers who came over with WILLIAM PENN. Although a Quaker by birth, he was a militant force in his professional life.

His father (named HORATIO CURTIS), a successful business man in his home city, started him on his educational career at the early age of three and at four years he was sent to the Friends' boarding-school at Westtown, where "he was the smallest boy in over two hundred pupils" and where the small boy "often received a most valuable lesson in physical tenacity and endurance of punishment without flinching; qualities which in manhood, when tempered by age and judgment, are very valuable."

Later on he attended the Friends' Select School in Philadelphia, a course which he states "saved him from the herd-teaching of a university education." Here he received instruction in Latin, Greek, mathematics, and in the construction and derivation of the English language, proceeding to a point beyond most of the colleges in those subjects.

His interest in natural science began in earnest at the age of thirteen when he made the acquaintance of Professor JOSEPH LEIDY of the Philadelphia Academy of Sciences, who finding him crying over his inability to handle and study specimens in a display case in the Philadelphia Academy of Natural Sciences, arranged with the President of that society that the lad should have access to such cases as he should desire, and thus his native interest in the natural sciences was fostered.

Botany was the first of the sciences to engage his attention, his first paper published in 1860, at the age of nineteen, being contributions to the carboniferous flora of the United States, and appearing as a publication of the Philadelphia Academy of Natural Sciences. A second paper on the subject appeared in the same year and the third and last in 1866. His first paper on the fresh water algae of North America also appeared in 1867 among the publications of the Philadelphia Academy of Natural Sciences. This was followed by ten others, which included a quarto of 270 pages published by the Smithsonian Institution

of Washington in 1872. The Smithsonian publication contained nineteen colored and two uncolored plates, all reproductions of 360 microscopic drawings made by himself.

His first paper on entomology appeared in 1861 and by 1869 he had published fourteen papers in various scientific journals, all of these papers dealing with myriapoda. His work on the myriapoda came to the attention of AGASSIZ who in 1866 offered to put his recent collection of Brazilian myriapods at Dr. WOOD's disposal for study and classification.

He twice collected specimens for the Smithsonian Institution, first in the Bahamas, and later in unknown regions of the Mexican border of Texas. In the later expedition he was one of the first white men on record to see the Grand Canyon of the Rio Grande.

He entered the medical school of the University of Pennsylvania⁽²⁾ from the Friends' Select School of Philadelphia, matriculating in the session of 1859-60, his preceptor being Dr. J. E. RHOADS. At that time in order to graduate, the medical school not only required attendance upon two complete courses of lectures, and a graduation thesis, but the attainment of the age of twenty-one, so that it was not until 1862 that he received his degree in medicine. The subject of his graduation thesis was "Enteric fever." The first year after graduation was spent in the Blockley Hospital as resident physician and during the next year he occupied a similar position in the Pennsylvania Hospital.

Following his residency in these two civil hospitals of Pennsylvania he joined the medical service of the United States Army, then engaged in Civil War. Returning to civil life in 1866, he immediately became affiliated with his alma mater as a private teacher or quizmaster in the Medical School. This same year, 1866, he was given the Chair of Botany in the Auxiliary Faculty of Medicine in the University, a position which he occupied for ten years. His experience as a quizmaster was the chief means by which he perfected his technique in the art of teaching. In his instruction he successfully combined the qualities of the investigator with that of the clinician. He thoroughly inspired his pupils, all of whom regarded him as a great medical teacher. It was his desire to teach them not only "to think but to try."

(2) He is listed in the catalogue of the alumni of the medical department of the University of Pennsylvania as HORATIO C WOOD, Jr.

As was the custom at that time, every teacher in a medical school was also engaged in the practice of medicine. This was true of Dr. WOOD, but it is said that he never allowed his practice (largely consultative) to interfere with his teaching duties. His early practice was devoted largely to the handling of neurological and psychiatric cases. In 1873 he was elected clinical lecturer on nervous diseases in the Medical School of the University of Pennsylvania. Two years later he was made its Professor of Nervous Diseases, a title which he held until 1902. His book, "Nervous Diseases and their Diagnosis," which appeared in 1892, was the culmination of this phase of his professional life.

In 1876 he was also made Professor of Materia Medica and Pharmacy to which title was added that of General Therapeutics, the following year. HOLMES' facetious remark that the early medical school teachers "occupied not a chair but a settee" was indeed exemplified by the appointments of Dr. WOOD. This joint professorship continued until 1906, when ill health forced his retirement from teaching, at which time he was made an Emeritus Professor.

The claim for the recognition of Dr. WOOD as the chief figure among early American Pharmacologists rests mainly upon three phases of his activities: (1) his connections with organized physiology, the parent society from which organized pharmacology developed, (2) his publications in the field of pharmacology and experimental therapeutics, (3) his influence upon the "Father of American Pharmacology"—Dr. ABEL.

The American Physiological Society, the forerunner of organized pharmacology, was formed on December 30, 1887, at which meeting Dr. WOOD was in attendance. His name will be found recorded in the list of charter members, also as being a member of the first council, which served the society in 1887-8. He attended a number of the early meetings of the society and was selected by the society to represent them at the Triennial Congress of American Physicians and Surgeons which met in Washington in 1888.

Dr. WOOD's publications numbered about three hundred, over fifty of which dealt with physiology, pharmacology and experimental therapeutics. Among these are his classics on the North American Hemp and Hyoscine.

Other papers dealt with studies on the action of atropine, veratrum, amyl nitrite, the oxytocic action of quinine, the vasomotor action of ergot, the action of alcohol on the circulation, the biological behavior and action of ethyl bromide, the volatile oils, the anesthetics, strontium and chloramide.

In this connection it should be stated that these papers were largely based upon laboratory findings obtained through the use of animals.

The papers on American Hemp (*Cannabis Sativa*) and Hyoscine, were the first pharmacological reports on these agents to appear in any literature. The introduction of these substances into therapeutics followed closely upon the publication of the original papers.

The characteristic thoroughness with which Dr. WOOD attacked a pharmacological problem is well exemplified by his examination of hyoscine. In his delightful reminiscences he states: "My attention was attracted by a rather acrimonious controversy in the European medical press concerning hyoscyamine. There was on the market an impure form of hyoscyamine, so called, a blackish liquid, and also the pure crystalline hyoscyamine. Studying the current literature, it became apparent that impure hyoscyamine was many more times potent than the pure. I wrote to MERCK, asking if he had ever chemically examined the impure hyoscyamine and had obtained anything out of it except hyoscyamine. It appeared that his chemists had isolated an alkaloid which they called hyoscine. This I studied, first thoroughly on dogs, then on myself, then on my wife, then on patients, and published the results; later I received a note from MERCK, offering to furnish me without charge any product he had and which I might want for experimentation; also he offered, if I had any chemical research in contemplation, to put all the chemists I needed at my disposal."

Many times was he compelled to appear before legislative bodies, governing councils, and members of anti-vivisection societies, to defend his experimental work with animals, and each time he silenced (for the time being) his opponents by his masterful defense of the experimental method.

His research publications, together with his keen interest in rational therapeutics, led to the publication of his monumental work in 1874 entitled, "A treatise on therapeutics, comprising

materia medica and toxicology, with especial reference to the application of the physiological action of drugs to clinical medicine."

This book was a revolt against empiricism or, as he harshly puts it, "clinical experience." It was "the outcome of his studies on animals," his aim being "to make the physiological action of remedies the principal point in discussion" and not secondary as had been the custom in preceding works on therapeutics. In his introduction to the first edition he states: "Experience is said to be the mother of wisdom. Verily she has been in medicine rather a blind leader of the blind." A further quotation from his introduction to the first edition reveals the breadth of his therapeutic horizon and indeed makes him one of the medical prophets of the 19th century. It reads as follows: "A primary knowledge of the end to be accomplished and a secondary acquaintance with the instruments are a necessity for successful human effort; and until the sway of this law is acknowledged by physicians, medicine can never rise from the position of an empirical art to the dignity of applied science. Until within a comparatively recent period, it has been impossible to comply with this law. But, through the advances made by the pathologists and by the students of the natural history of disease, we are fast learning the methods in which nature brings the body back to health."

He classified drugs according to their physiological effects, a manner of treatment which has been followed almost universally since that time. The treatise was broadly adopted by the medical schools in this country, it being so popular that it passed through fifteen editions. Furthermore, it was the principal American text book in materia medica and therapeutics for over thirty years. As has been recently expressed, "it had probably more influence than any other single book (in this country) in the originating of the idea of pharmacology as a distinct subject in the medical curriculum."

If one were to evaluate Dr. WOOD's accomplishments in pharmacology by either past or present standards, it would be found that he was justly entitled to membership in the American Society for Pharmacology and Experimental Therapeutics, the organization effected in 1909 by the American Pharmacologists through a cleavage from the American Physiological Society of which he was a charter member. At this time he had already retired from active

scientific life, due to ill health, a fact which no doubt accounts for his name not appearing on the list of charter members of the new society.

Although the capacity for research and organization was well developed in him, his laboratory did not become the mecca for the development of future pharmacologists, as did that of Dr. ABEL, "The Father of American Pharmacology." Many causes may have contributed to this, chief among them being the lack of funds for research, together with the crude nature of the "instruments of precision" which they possessed at that time. Nevertheless his laboratory was famous enough to attract Dr. ABEL to it, for in a personal communication to the writer in November, 1930, Dr. ABEL wrote: "It may interest you to know that I was a research assistant, without pay to H. C WOOD of Philadelphia in the summer months of '84 when he was working on the alkaloids of the atropine series. I did his blood pressure and respiration experiments for his research but I cannot say whether he ever published his findings or not. WOOD wanted me to stay with him to assist him in editing a journal, etc., and at the same time to continue my medical studies at the University of Pennsylvania. I had already decided to enter the Laboratory of KARL LUDWIG of Leipzig. I accordingly left this country in August of 1884."

Dr. WOOD's connection with the Pharmacopoeia of the United States covered almost three decades, two of which he served as the President of the Convention. The influence of the pharmacopoeia upon pharmacology, through the establishment of standards, especially for potent drugs, can not be readily overstated. In 1902, the Pharmacopoeia of the United States was officially represented by Dr. WOOD at the Brussels Conference called by the Belgian government to establish an International Pharmacopoeia, his knowledge of pharmacology being one of the chief reasons for his selection.

Early in his career, he was offered Professorships in the College of Physicians and Surgeons, also in the Bellevue Hospital Medical College, both of New York City; he declined both. Later in life he was invited to become the Professor of Therapeutics in the Johns Hopkins University, also the Professor of the Theory and Practice of Medicine in Jefferson Medical College, but again considered it best to remain faithful to his alma mater.

Dr. WOOD's accomplishments brought to him not only renown, but many honors. He was elected a member of the National Academy of Sciences in 1879 being listed in the section of Physiology and Pathology.

For his work on "Thermic Fever, or Sunstroke" he received the Boylston prize of the Massachusetts General Hospital and a special prize awarded by the Philosophical Society of Philadelphia.

He was President of the College of Physicians of Philadelphia in 1902 and 1903, also as previously stated, of the United States Pharmacopoeial Convention from 1890 to 1910.

His editorial experience included the editorship of *New Remedies* (1870-73); *Philadelphia Medical Times* (1873-80); *Therapeutic Gazette* (1884-90); *United States Dispensatory* (1893-1907).

His chief recreation was hunting, mainly of large game, a sport which took him to many of the remote places of the world. He hunted in Devonshire with Sir VICTOR HORSLEY on the mainland opposite the Isle of Skye, with Professor FRASER of Edinburgh and with others in many of the then little explored regions of western and northwestern America.

Dr. WOOD's philosophy of life is to be found in his reminiscences which were written after many years of suffering. He succinctly states it to be: "Kindness and sympathy alike toward the highest-born and the strongest, and toward the lowest and weakest."

In his early manhood he was very active in the Methodist Church and maintained his interest in the Church until his retirement.

His religious faith he summed up in these words: "The long bitter years of suffering have taught me to wish for speedy death, with the hope and faith that the sacrifice of Christ and the mercy of the Lord would bring me to Beatitude."

He had no fear of eternal punishment or death. He could see no final fate in death other than "an escape from a life of suffering to an eternal sleep." "And so, striving during life to do the right as it is given us to see the right, may we go out with the cheery cry 'What of the night, brother, what of the night'."

His death in his eightieth year resulted from pneumonia on January 3, 1920, burial occurring in the city of his birth.

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