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JOHN PUNNETT PETERS

1887—1955

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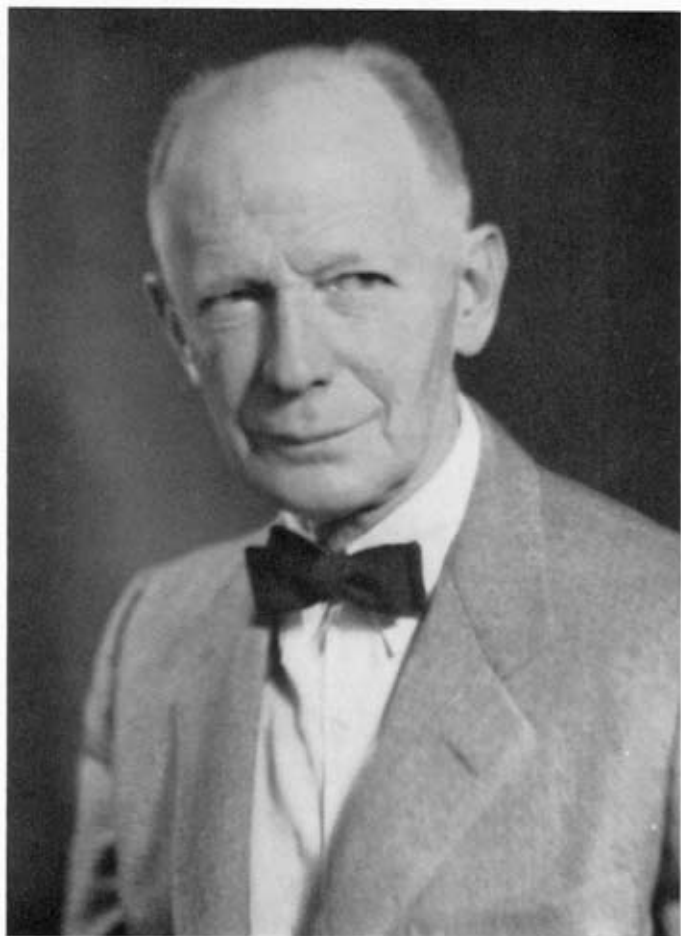
*A Biographical Memoir by*

JOHN RODMAN PAUL, CYRIL NORMAN HUGH LONG

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*Biographical Memoir*

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John P. Peters

# JOHN PUNNETT PETERS

*December 4, 1887—December 29, 1955*

BY JOHN RODMAN PAUL AND CYRIL NORMAN HUGH LONG

JOHN PUNNETT PETERS<sup>1</sup> was born in Philadelphia on December 4, 1887, the son of the Reverend John P. Peters, D.D., former rector of St. Michael's Protestant Episcopal Church in New York City, and of Gabriella Brooke Forman. As a baby he was taken to the Near East where his father, having developed special archaeological interests, went under the auspices of the Archaeological Museum of the University of Pennsylvania. This expedition was described later in an account entitled: *Nippur: or Explorations and Adventures on the Euphrates*. The discoveries resulting from the expedition led to a spirited discussion which focused upon the interpretation of the archaeological data and was to become known as the "Peters Controversy." Thus, the young Jack Peters was brought up in an atmosphere of crusade, particularly as his father, having relinquished his association with the Museum on his return to this country, had found time among other duties to devote his energies to a series of vigorous campaigns to reform municipal affairs in New York City.

His mother was a musician of no mean talent and this too left a deep impression on Jack Peters. He was always fond of good music and of playing the piano. It would seem that his subsequent life exemplified these family traditions.

After receiving his early education at Trinity School in New York City, 1896-1900, young Jack Peters was sent, in the hope, he used to

<sup>1</sup> For assistance in the preparation of this biographical memoir, the authors are indebted to Evelyn B. Man, an investigator in Dr. Peters's laboratory for many years.

say, "of tempering his somewhat incorrigible nature," to St. John's Military Academy at Manlius, N. Y. He graduated in 1904 as "top boy," with distinction in English, the classics, and swimming. It was a tradition in the Peters family to attend Yale and to enter at sixteen. Jack Peters was no exception. But young though he was, he seemed to have felt self-sufficient in college, a little scornful perhaps of the exaggerated collegiate spirit of his day but not too scornful to "make the swimming team" and win prowess as a fancy diver. He graduated in 1908 with a B.A. degree and, after returning to Manlius for one year to teach English and Latin, he entered the College of Physicians and Surgeons, New York City, where he received his M.D. degree in 1913. His ability during two years of internship at the Presbyterian Hospital, then on 60th Street in New York, was recognized, and he was subsequently chosen for a two year appointment there as a Coolidge Fellow in Clinical Medicine. Of the old Presbyterian Hospital and the Medical Service there, he used to reminisce with reverence and affection.

World War I interrupted this period of training. Commissioned in the Army Medical Corps early in 1917, he went overseas that spring as a member of the Staff of Base Hospital No. 2. Shortly afterwards when this staff took over the British Hospital No. 1 at Étrétat, France, he became chief of the Medical Service. Both his military school background and his fellowship in clinical investigation served him in good stead in this post. For in spite of heavy clinical duties at a base hospital during war time he found time to collect data for articles based on observations made during this period of stress.

Following his return to New York after World War I, he "rattled around there," as he used to say, for a year or two. First, in 1919-1920, he was a Fellow of the Russell Sage Institute of Pathology and Instructor in Internal Medicine at Cornell University Medical College, with a simultaneous appointment as Adjunct Visiting Physician at Bellevue Hospital. Later, in 1920-1921 he was engaged in research studies in the fields of bio- and clinical chemistry at the Hospital of the Rockefeller Institute and during this time he was offered and ac-

cepted an appointment by Vanderbilt University School of Medicine as Associate Professor of Internal Medicine but, on reconsidering at some length, he resigned. At the Rockefeller Institute he was briefly associated with as brilliant and active a group of clinical investigators as had ever been gathered under one roof in this country. He became there a charter member, and perhaps one of the most vigorous members of the "Van Slyke School," which has left no small mark on the biochemical aspects of medicine. Other members of that group including Donald Van Slyke were: Baird Hastings, William Stadie, Glen Cullen, and Harold Austin, all of whom have held important chairs in outstanding medical schools. Van Slyke, Hastings, and Stadie are members of the National Academy of Sciences. It was at the Hospital of the Rockefeller Institute that Peters met Francis Blake, James Trask, and William Stadie. When Blake was chosen to be Professor of Medicine at the newly reorganized Yale University School of Medicine he invited Peters, Trask, and Stadie to join him there. And so in 1922, as Associate Professor of Medicine, Jack Peters came back to Yale, his workshop or his arena until his death thirty-three years later. Francis Blake, Jack Peters, Grover Powers, and Samuel Harvey became part of a small but select nucleus which had been gathered together under the aegis of Dean Winternitz and which was to transform the Yale University School of Medicine within less than a decade from a second-rate institution to one worthy of the University. Such transformations were in order, for it was an important period in the history of American medical education, when Abraham Flexner's report on the medical schools of this country was beginning to bear fruit. In the vanguard of this movement, which was subsequently to become nationwide, a small number of medical schools were being reorganized and transferred from a part-time to a full-time basis, for example, the Yale Medical School, the University of Rochester Medical School, and the Vanderbilt Medical School.

The Yale University School of Medicine went through the throes of reorganization at this time. The task of changing over from a

school run by mature and busy practitioners of medicine and surgery, who could devote only a fraction of their time to teaching, to one run by young but eager clinicians, clinical investigators, and full-time teachers was not easy, particularly as there had been some controversy in the Corporation of Yale University as to which type of medical school was desirable. One group of advisers had held out for a school for "medical practitioners," claiming that the small-town atmosphere of New Haven and the general attitude of local practitioners in Connecticut was far from academic; that the school should identify itself with its own community needs and not with the monasticism of medical research, which more properly was the prerogative of a school in a big city. They felt that the Yale School could never hope to compete scientifically with the medical centers in Baltimore, New York, or Boston. But the academic point of view triumphed, due to the foresight of Dean Winternitz and President Angell.

Such a situation was to become an ideal challenge for Jack Peters and others of the new faculty group. In spite of the limited and antiquated quarters in the old New Haven Hospital, originally available for medical patients and for laboratories in the 1920s, which hardly adorned the full-time cause, this small group of clinicians was not deterred from developing a full-time Department of Medicine which quickly made its mark. Busy laboratories were established and new life and a new spirit were breathed into this feeble medical school which, in the course of a few years, was transformed to a first-rate institution.

In 1927 Yale added an honorary M.A. degree to Dr. Peters's scholastic achievements and he was appointed John Slade Ely Professor of Medicine, a post which he held until his death on December 29, 1955. He was to have retired in June, 1956, after thirty-four years of full-time service in the Department of Internal Medicine.

During the period of his association with the Yale University School of Medicine, Dr. Peters built up a laboratory of clinical chemistry which was to become the proving ground not only for his many interests and activities but for those of many others.

The bibliography at the end of this memoir lists over two hundred carefully prepared and published articles which speak for his industry and his diversity of interests. Here one can find contributions to the understanding of diseases of metabolism; electrolyte and acid base equilibrium; nephritis; water exchange; the interrelation of proteins, carbohydrates, and lipids in metabolism; the role of the thyroid in health and disease; medical education; and the role of the government in medical care.

During most of this busy period he and his wife, Charlotte Hodge Peters, were very active figures in the life of the Yale University School of Medicine. They had four children and in spite of Dr. Peters's many responsibilities in the Medical School he was a conscientious and devoted parent. His recreations were his flower garden, competitive sports, especially tennis and golf, and playing the piano. He went at them with the same intensity and wrinkling of his brow that accompanied his professional work. On his sixtieth birthday a group of his friends presented him with a grand piano.

Something should be said at this point about his physical appearance in middle age. He was slight in build, with red hair which soon gave way to baldness. Clearly a man who never spared himself, he sometimes brought himself to a state of pallor and undernutrition which was frightening to his friends and his doctor, although it was normal for him. His unrelenting determination to drive himself was obviously something no one could control or influence, for it was part of him and came as a result of his capacity for sustained work, during which time he hardly stopped to eat or rest. This also reflected in some measure his philosophy: To him it was a besetting sin for anyone, least of all a physician, who should know the basic facts of life, *to live carefully* as far as health and comfort were concerned. His connotations of the meanings of the two words contentment and corruption were almost synonymous, or so it seemed.

Although Dr. Peters was identified with clinical studies throughout his life, it should be emphasized that most of his investigative work was based on a profound knowledge of physical chemistry and biochemistry. Even though he would have been the first to deny any

special competence in these fields, it is quite evident from even a brief perusal of his publications that he was one of the foremost biochemists of his time. He represented, along with a distinguished group of his contemporaries, the modern approach of medicine to the study of disease, a study in which signs and symptoms are to an ever-increasing degree interpreted in the terms of aberrations of normal biochemical processes.

This concept of medicine, so universally accepted and practiced today, had its beginnings at the end of the first World War when an enlightened group of young clinicians saw and applied the work of such men as Van Slyke, Folin, Benedict, and others to the problems of the clinic. It is not too much to say that the remarkable advances in medicine of the last forty years are based on the application of the methods of chemistry and physics to the age-old problems of disease and have in large measure displaced both in diagnosis and treatment the empiricism that had dominated medicine for centuries.

Peters's contributions to these advances did not lie merely in the application of the work of others to his particular problems. He and his colleagues devised methods, such as those for the determination of the bases in body fluids and for the micro-determination of iodine, that became standard for such analyses. Their work was as meticulous, well-controlled, and reproducible as any devised by professionals in this field.

In spite of his recognized eminence as a biochemist, an eminence capped by the publication of the monumental volumes by Peters and Van Slyke,<sup>2</sup> Dr. Peters carried into this new world of medicine his conservative views on the use of these new tools in the practice of medicine. He insisted that they be used only by those who clearly understood the basic knowledge of physics and chemistry that underlay their usefulness in the treatment of human disease. His views on

<sup>2</sup> *Quantitative Clinical Chemistry*. Vol. 1: *Interpretations*, by J. P. Peters and D. D. Van Slyke, and Vol. 2: *Methods*, were first published in 1931 and 1932 respectively. The second edition of Vol. 1 (which was completed without the active assistance of Van Slyke) appeared in 1946. Dr. Peters's other book, *Body Water*, was no less a contribution to clinical chemistry.



this are well-summarized in an address he gave to the New York Academy of Medicine in 1934.<sup>3</sup> In part he said:

“It is hard to believe that in this subject almost the whole of the great mass of literature and knowledge (the two are quite distinct) has been developed in the course of two decades, since Bang, Folin, Van Slyke, Benedict and others presented to the physician, at just the moment when vena puncture was becoming a common procedure, practical methods for the analysis of blood. These methods were born in the physiological and chemical laboratories and were put into the hands of clinicians who had neither the analytical training to utilize them, nor the physiological and clinical education necessary for their interpretation. This is not said entirely in a spirit of criticism; because there is reason to be proud that clinicians have been found with critical judgment and industry great enough to overcome these initial handicaps. Their contributions have not been confined to pathology, but have extended back to the mother sciences of physiology and chemistry. Nevertheless, this knowledge was secured by the noblest only after false steps. Furthermore, as in all virgin fields, no step of any kind could be taken without the discovery of something new and these discoveries came in such confusing profusion that it was impossible to take time to separate gold from dross. The great mass of exploiters, trained in purely clinical fields and reasoning in the usual simple and direct manner, that no two things can coexist without being related, immediately began to connect chemical abnormalities with specific diseases, without consideration of the fact that physiology deals with functional disturbances and cuts along other lines than pathology. Too many of these conclusions reached in the first heyday of excited exploration have received the unmerited sanction of tradition and threaten to be transmitted as part of accepted medical lore to the next generation, which deserves better at our hands.

“It is, perhaps, deplorable that clinical chemistry sprang into active

<sup>3</sup> A Critical Estimate of the Value of Laboratory Procedures in Disorders of Metabolism. *Bull. N.Y. Acad. Med.*, 10: 415-444.

life during the period of therapeutic nihilism when medicine felt its duty done if it gave the patient a name to die by, perhaps illuminating it with a placebo. This spirit only exaggerated the tendency mentioned above, to connect diseases with chemical abnormalities and, for a long time, diverted attention from what is at least as important an aim of physiological chemistry, the logical direction and control of the treatment of the disorder which the analyst has revealed. The clinician, meantime, was provided with his chemical tools only one at a time—to be sure in such rapid succession that he had not time to perfect himself in the use of one before the next appeared. Nevertheless those which custom had made first familiar received a lasting preference which has given them undue authority, to the exclusion of others. The continuous appearance of new models of old techniques made selection even more difficult. As these new models were frequently simplifications and not improvements, preference was too often given to inferior procedures.”

Another point on which he insisted to the last days of his life was that the evidence received by the clinical chemist must be evaluated along with and not separate from that obtained by the long established precepts of clinical medicine. On this matter he was terse and immovable in his opinion:

“In conclusion, I can only reiterate the opinions that I expressed earlier: that it is unfortunate in the extreme to limit the application of chemical analysis of the blood to any select group of technical procedures or to any one class of diseases, or to treat the information secured by these analyses as if it were separable or distinct from other types of clinical information.”

It would not be in keeping with Dr. Peters's character to view each one of his various capacities independently. Measure should, however, be taken of him as a *clinician*. Primarily he was an exponent of the type of internist who had both grown up with and developed the philosophy of the full-time physician. To him each patient was an individual who was to be approached with sympathy and whose aberrations from the standpoint of normal physiological processes de-

served clinical investigation. This called for continued visits to the wards or sickroom morning, noon and night. Sundays and holidays were no exception. Dr. Maurice Strauss has stressed the precision of his clinical judgment, the attention to minute details in diagnosis, the evenings which continued into the morning hours when he moved between laboratory and bedside measuring the changes in carbon dioxide and dehydration of the acidotic patient.<sup>4</sup> For those clinical problems which were less acute, he was not less sparing of his time, much of which was spent in advising a patient to learn to live not *for* his disease but to carry on as completely as possible *with* his disease—in other words, to lead a life as far as possible unhampered by fear or other handicaps. From nine to ten each morning he was available by telephone to those patients who needed the support and encouragement of his advice to lead the type of life which he regarded as being best for them.

Metabolism rounds three times a week and every other Sunday were a tradition for more than thirty years at the Yale University School of Medicine. Famous for their length, content, and geographical coverage in the hospital, they could be readily identified from afar by the “football huddle,” produced by the participants straining forward to hear Jack’s words of wisdom (not without reason was he known as “Whispering Jack!”). But the words were well worth catching, for the audience was usually quite aware of the extent of his knowledge of experimental and clinical medicine, and the notes which he dictated were models of analysis of patho-physiologic processes as opposed to mere diagnostic labeling. The picture of him most familiar to his clinical colleagues is one in which he is standing outside a patient’s door, surrounded by students, internes, residents, and devoted members of the Metabolism Service, which he had gone to great lengths to organize and build up, his brow wrinkled, his face worried as he talked of the patient’s problems and what the case represented.

<sup>4</sup> Maurice Strauss: Physician and Citizen—John P. Peters, M. D., *New Eng. J. Med.*, 254 (1956):344.

At least as important as other contributions was the influence which he had on a host of physicians and investigators. Few young men, trained in his metabolic service and laboratory, failed to have their intellectual curiosity stimulated or to learn how to handle themselves in the laboratory. As his major approach to clinical medicine hinged upon the chemical laboratory, he strove to make his laboratory an example. There was no double standard for "routine" and "research" chemical techniques; the same procedures were applied to both, and duplicate determinations were performed without exception in all analyses. Into this laboratory went every person who worked in his department, be he medical student, research fellow, or staff member. Each investigator had to master each regular biochemical technique. And, at least prior to the onset of the recent era of "project research," each investigator performed *with his own hands* the chemical analyses required in his particular problem. This was before the period when it became fashionable to "give" technicians to young men starting upon a research career. Indeed the whole idea of project research was a concept which Jack Peters regarded as an abomination.

This independence of thought and action was inherent in Dr. Peters's character, but it also reflected his times. He was fortunate in that his medical and scientific education was carried out when it was reasonably possible for a gifted individual to master both the art and science of medicine. There is no team of investigators trained in separate disciplines that can match, in fertility of imagination or capacity to bridge and illuminate apparently unrelated areas of knowledge, the individual who in his own mind encompasses several fields of knowledge.

Perhaps the enormous accumulation of unrelated facts collected in the last twenty years in the medical sciences alone will make it increasingly difficult for such men to appear in the future. It may continue to be necessary as it largely is today, that medical research be conducted by teams or groups devoted to a specific purpose. If this is so, then the often doubtful gains of such a method of research may well be cancelled by the loss of such men as Dr. Peters. For he

represented, both in his personal and scientific life, the older concept of an educated man, one whose understanding of life and the phenomena of nature was garnered not from the opinions of others, but from knowledge that he alone possessed, one whose opinions were formed on his own interpretation of the evidence. Such men are often disliked, even though they are envied, for their wisdom is frequently regarded as too progressive, too likely to disturb the accepted order of things. Yet in time we learn to appreciate their contributions to knowledge and to feel that those of us who lived and worked along with them were fortunate to know men who were not afraid to speak the truth even at the risk of social displeasure and ostracism.

Indeed Dr. Peters should be remembered as a nonconformist and reformer, both scientifically and politically. Life to him was a contest, whether he was playing tennis, growing roses, or engaging in controversy with his colleagues. The portrait would be incomplete without mention of his uncompromising stands, his stubbornness, his impatience with those who failed to rise to the heights which he demanded of himself, his devastating criticism. The inclusion of these elements only serves to round out the picture of a man unswerving in his principles and to emphasize the strength which lay in his dedication to principle.

As a clinician he was tireless in giving time to those patients who needed constant care, attention, and advice. Almost every day he saw patients in his office in the hospital (by appointment) and he had a large "practice" indeed, considering all his other responsibilities in the research and administration field, and considering that no personal remuneration came to him for his services to those who would ordinarily be considered as "private patients."

He also made his own rules of practice and there was no denying that he had strong views on the care of patients and how they should be handled, views to which he rigidly adhered, although they often brought him into opposition with other members of the medical profession. As a consultant, in which capacity he was called frequently, he did not believe that the ideal physician could rightfully serve in the capacity of a diagnostician alone, but that the physician's respon-

sibility, from the moment he saw the patient, extended beyond that of trying to determine what was wrong. An inextricable part of the doctor's job was the task of directing the type of therapy to be used, and subsequently the taking of steps to see that this therapy was carried out to the letter. One can easily see that his patients, whether seen in consultation or not, became devoted to him as *their* doctor, and also that his attitude took a good deal of understanding on the part of the referring physician—and was never understood by some of them.

It was inevitable that such a philosophy as he held would not be limited to the small cosmos which revolved around the Yale School of Medicine. Early in the 1930s he became convinced that the medical profession in this country was fast reaching a point in which a considerable part of its idealism was being lost. If no one else was ready to fight to retain this, at least he was. Named as secretary of an informal committee of physicians from various sections of the country in 1937, Dr. Peters outlined certain principles which, he believed, would make for the betterment of medical care. After small beginnings the movement eventually had far more impact than most of us visualized at that time.

The reforms for which he fought concerned the need of local, state, and even federal support for hospital construction, medical research, medical education, and the adequate care of the "medically indigent." The significance of clinical investigation as part of the function of a good medical service was also emphasized. This committee of physicians, which was later referred to as the "Committee of 400," kept Dr. Peters as secretary from its inception in 1937 until 1954. Indeed he maintained an interest in this cause up to the time of his death; about two hours before his first severe attack of coronary occlusion, from which he never fully recovered, he was arranging for a small group of the Committee to meet in New Haven, in November, 1955. During the early life of this Committee, its members, and Dr. Peters in particular, were continually in conflict with the American Medi-

cal Association over national policies for the practice of medicine.<sup>5</sup> During the 1930s and 1940s these views were considered to be radical. Today the needs expressed by the Committee, many of which were in opposition to the American Medical Association, have not only been generally recognized, but also effective action has been taken by Congress to provide federal programs of hospital construction and of medical research and education.

An issue arose in the last years of his life, however, in which he extended his championship from the area of medical care to that of civil liberty. He was dismissed on loyalty charges from his position as a member of one of the Study Sections of the Division of Research Grants and Fellowships of the National Institutes of Health. The anonymous charges were given no credence by close friends and associates who knew Dr. Peters, and those charges would not have been known to others had Dr. Peters been willing to accept the Loyalty Board's decision; but this Dr. Peters was not willing to do. Characteristically, he fought back, not merely to clear his name but also to challenge on constitutional grounds a loyalty procedure by which an accused person was denied the right to face and cross-examine his accusers. His case, carried to the Supreme Court of the United States (*Peters v. Hobby*, 349 U. S. 331), resulted in June, 1955, in a personal vindication for Dr. Peters, though to his sorrow the Court failed to rule decisively on the constitutional question. Although the victory was not complete, Dr. Peters had struck a blow in defense of civil liberty and the decision in his case made a substantial start toward a return from that hysteria which had prevailed in the United States in the years following the second World War.

After he reached the age of sixty-five his health began to fail rapidly. He had extended himself at this time beyond his physical capacities, and the last two years of his life were marked by a considerable degree of disability. Nevertheless, he was able to devote himself to writing three chapters on the metabolism of carbohydrates, lipids,

<sup>5</sup> Dr. Peters's views on this subject are expressed in at least ten of the articles listed in the bibliography.

and proteins, and he continued to see patients and to discuss their problems with young physicians and medical students almost up to the end. His colleagues will agree that his was a life which exemplified, from start to finish, a devotion to certain ideals to which he was faithful unto death. There are few of his colleagues who did not or could not profit from their association with a man of the caliber of Dr. Peters.



## CHRONOLOGY

- Born December 4, 1887, in Philadelphia, Penna. Son of Reverend John P. Peters and Gabriella Brooke (Forman) Peters. Died December 29, 1955.
- Married Charlotte Morse Hodge in 1915. Children: John Hodge Peters, M.D., Alice Richmond Peters (married David Baldwin Irwin), Richard Morse Peters, M.D., and Charles Hodge Peters.
- St. John's School, Manlius, N. Y., 1900-04. Yale University, A.B. 1908, M.A. (Hon.) 1927. Columbia University, College of Physicians and Surgeons, M.D. 1913.
- Interne, Presbyterian Hospital, New York, 1913-15. Coolidge Research Fellow in Clinical Medicine, Columbia and Presbyterian Hospital, 1915-17. Instructor in Clinical Medicine, Columbia, 1916-17. Research Fellow, Russell Sage Institute of Pathology, 1919-20. Instructor Internal Medicine, Cornell University Medical School, 1919-20. Adjunct Physician, Bellevue Hospital, New York, 1919-20. Associate Professor of Internal Medicine, Vanderbilt University, 1920-21. Research work, Rockefeller Institute, New York, 1920-21. Associate Professor of Internal Medicine, Yale University School of Medicine, 1921-27. Attending Physician, New Haven Hospital, 1921-55. John Slade Ely Professor of Internal Medicine, Yale University School of Medicine, 1927-55. Consulting Physician Norwalk and Stamford Hospitals, 1947-55.
- Capt. M. C. USR, 1917-19. Chief Medical Officer U. S. Base Hospital No. 2 (Presbyterian Unit), British General Hospital No. 1, Étretat, France.
- Fellow American Medical Association, Connecticut State Medical Association, New Haven Medical Society, Harvey Society, American Association Biological Chemists, American Association of Physicians, Society for Clinical Investigation, Society for Experimental Biology and Medicine, Interurban Clinical Club, Century Club, Nu Sigma Nu, Alpha Omega Alpha, Sigma Xi, National Academy of Sciences, Editorial Board of the *Journal of Clinical Investigation*, Editorial Board of *Metabolism*, Consultant to the Army Medical Center, Advisory Board Office of the Quartermaster General, U. S. Public Health Service Study Section. Secretary of the Committee of Physicians for the Improvement of Medical Care from its organization in 1937 to 1954.
- Publications: *Body Water*, 1935; *Quantitative Clinical Chemistry* (2 vols.), 1931; 2nd Edition of vol. 1, *Interpretations*, 1946. More than two hundred papers and book chapters on internal medicine, diseases of metabolism, electrolyte and acid base equilibrium, nephritis, water exchange, and the social aspects of medicine.
- Numerous radio, television, and public speaking engagements in the United States and Canada.
- Articles and obituary notes on Dr. Peters include the following: M. Strauss: Physician and Citizen—John P. Peters, M. D., *New Eng. J. Med.*, 254 (1956): 344; D. D. Van Slyke: John Punnett Peters, 1887-1955, *Trans. Assn. Am.*

*Phys.*, 69 (1956):22-23; D. D. Van Slyke: John P. Peters, *Clinical Chemistry*, 3:287-93; P. H. Lavietes: John Punnett Peters: An Appreciation, *Yale J. Biol. Med.*, 29 (1956):175-90; and M. Miller: John P. Peters, 1887-1955, *Diabetes*, 6 (1957):99-103.

## KEY TO ABBREVIATIONS

- Am. J. Digest. Dis.=American Journal of Digestive Diseases  
 Am. J. Med.=American Journal of Medicine  
 Am. J. Med. Sci.=American Journal of the Medical Sciences  
 Am. J. Obstet. Gyn.=American Journal of Obstetrics and Gynecology  
 Am. J. Physiol.=American Journal of Physiology  
 Am. J. Surg.=American Journal of Surgery  
 Am. J. Trop. Med.=American Journal of Tropical Medicine  
 Ann. Int. Med.=Annals of Internal Medicine  
 Ann. N. Y. Acad. Sci.=Annals of the New York Academy of Sciences  
 Ann. Surg.=Annals of Surgery  
 Ann. Rev. Biochem.=Annual Review of Biochemistry  
 Ann. Rev. Med.=Annual Review of Medicine  
 Ann. Rev. Physiol.=Annual Review of Physiology  
 Arch. Int. Med.=Archives of Internal Medicine  
 Bull. N. Y. Acad. Med.=Bulletin of the New York Academy of Medicine  
 Conn. Med. J.=Connecticut Medical Journal  
 El día Méd.=El día Médico, Buenos Aires  
 Fed. Proc.=Federation Proceedings  
 Hosp. Council Bull.=Hospital Council Bulletin  
 J. Am. Dietet. Assn.=Journal of the American Dietetical Association  
 J. Am. Med. Assn.=Journal of the American Medical Association  
 J. Appl. Physiol.=Journal of Applied Physiology  
 J. Assn. Med. Stud.=Journal of the Association of Medical Students  
 J. Biol. Chem.=Journal of Biological Chemistry  
 J. Clin. Endoc.=Journal of Clinical Endocrinology  
 J. Clin. Invest.=Journal of Clinical Investigation  
 J. Lab. Clin. Med.=Journal of Laboratory and Clinical Medicine  
 J. Mt. Sinai Hosp.=Journal of the Mt. Sinai Hospital  
 J. Mo. State Med. Assn.=Journal of the Missouri State Medical Association  
 J. Urol.=Journal of Urology  
 McGill Med. J.=McGill Medical Journal  
 Med. Arts Sci.=Medical Arts and Sciences  
 Mil. Surg. J.=Military Surgeons Journal  
 New Eng. J. Med.=New England Journal of Medicine  
 Obstet. Gyn. Survey=Obstetrical and Gynecological Survey  
 Physiol. Rev.=Physiological Review

- Proc. Inter-St. Post Grad. Med. Assembly, N. Am.=Proceedings of the Interstate Post Graduate Medical Assembly of North America  
 Proc. Soc. Exp. Biol.=Proceedings of the Society for Experimental Biology of New York  
 Rev. Gastroenterol.=Review of Gastroenterology  
 R. I. Med. J.=Rhode Island Medical Journal  
 Trans. Assn. Am. Phys.=Transactions of the Association of American Physicians  
 Trans. Conn. State Med. Soc.=Transactions of the Connecticut State Medical Society  
 Wis. Med. J.=Wisconsin Medical Journal  
 Yale J. Biol. Med.=Yale Journal of Biology and Medicine

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