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# Park Spearin Gerald



Park Spearin Gerald, M.D. was born in Omaha Nebraska, earned his BS degree from Iowa State University in 1943 and his MD from Creighton University in 1947. He completed an internship in pediatrics at Strong Memorial Hospital in Rochester, NY in 1948 and began what became an illustrious research career in pediatrics by working in infant nutrition with Benjamin Kagan at Michael Reese Hospital in Chicago. In 1951 he entered the U.S. Army and served with distinction as a pediatrician in the 11th Field Hospital in Augsburg, Germany.

In 1953, Gerald was attracted to Children's Hospital by Louis K. Diamond. He served as a junior and senior assistant resident in pediatrics until 1955 and became a research fellow in that

year. He was promoted steadily through the ranks, becoming an associate professor with tenure in 1967 and a full professor in 1970.

Gerald's contributions to the burgeoning field of hemoglobin genetics were rapid and remarkably important. In 1952, just two years following the start of his fellowship, he described for the first time an abnormal hemoglobin that, in the heterozygous state, causes methemoglobinemia. This was the first clinical confirmation that amino acid mutations close to the heme pocket of globin could alter the valence of iron in the heme plate and thereby reduce the affinity of hemoglobin for oxygen. His observations also demonstrated (albeit indirectly) that globin chains are constantly interacting with one another within the red cell. Thus, the heterozygous state for hemoglobin M induces cyanosis.

At that time Henry Kunkel had just developed starch block electrophoresis to provide a method of separating normal and abnormal hemoglobins in bulk from clinical samples. Gerald adapted the method and confirmed the observations that  $\beta$  thalassemia trait is usually associated with an increased percentage

of hemoglobin A2. This became the standard diagnostic test for the disorder. He also discovered Hemoglobin Lepore, the first fusion hemoglobin to be described, and with Huehns and Shooter, described the abnormal globin chain in hemoglobin G. Gerald was also the first to note the increase in fetal hemoglobin seen regularly in aplastic anemia and other forms of marrow failure. The cause of that peculiar “reverse switching” is yet to be determined.

For all of this work, Gerald received the E. Mead-Johnson Award for Research in Pediatrics in 1962, but that signal event only marked the mid-point of his career.

In the late 1950s, Louis K. Diamond realized that clinical genetics would soon become a specialty of its own, and had the wisdom to send Gerald for a fellowship with Penrose at the Galton Laboratory at University College, London. There Gerald devoted himself to human genetics and the growing field of cytogenetics. He returned to Children’s to establish the first human genetics research and training program at Harvard. The training program was also one of the first in the United States and there were few clinicians capable of directing its clinical component. That role was assigned to Thomas Cone, a superb clinician with an encyclopedic knowledge of rare pediatric syndromes.

Cone writes: “About 15 years later I joined Park’s Genetic Unit at the Children’s Hospital as a clinician and as one who had developed a talent to recall unusual syndromes. Park was my mentor and he, a skilled researcher, and I, as a clinician, organized a clinical genetics and birth defects unit. Park had the rare talent of bringing together members of both his clinical and research staff and involving both groups in what all of us felt were masterful teaching sessions. He often combined both groups on ward rounds; this required, in my opinion, a special talent to balance the interests of the clinician and researcher. Park’s daily morning conferences revealed him to have acquired an almost encyclopedic knowledge of his field. His staff rarely mentioned any genetic disease that he had not yet read about.”

“Park by disposition was not one who shared his personal life with others but all of us respected his devotion to his family. By nature, he had a conservative bent and the only area where I and he were at odds was on the subject of the role of religion in bioethical decisions.”

Indeed, Park Gerald was a Midwestern conservative, but his personal views were just exactly that: personal. He never permitted his own views to influence academic decisions.

Though Gerald was a well-read and knowledgeable clinician, his first love was research, and his contributions to clinical research in genetics were profound.

Kurt Hirschhorn, emeritus chair of pediatrics at Mt. Sinai writes . . . . “After his extensive work on human hemoglobin abnormalities, Dr. Gerald turned his attention to the field of human cytogenetics in which he made a number of substantial contributions. From the clinical point of view, he clarified the neuropathology of trisomy 13, described several translocations and deletions, and reported on

chromosomal abnormalities in constitutional aplastic anemia. Much of his effort was devoted to the early and important attempts at mapping human genes to specific chromosomes, both by clinical correlation and by the use of somatic cell hybrids. He was deeply involved in the important survey studies to elucidate the frequency of chromosomal abnormalities in newborns and young children. In the field of basic cytogenetics, he wrote several seminal papers, together with the late Sam Latt, on the basis of the then new staining methods for the specific identification of chromosomes, the action of alkylating agents on the chromosome damage in Fanconi Anemia, and the microscopic analysis of DNA replication. Finally, he was involved in important studies of the behavioral development of children with sex chromosome abnormalities. These broad-based activities in the field of human cytogenetics contributed greatly to the development of this important field.”

As Park Gerald approached retirement he began to plan the continuation of the Division of Genetics at Children’s and recruited Samuel Latt, a molecular geneticist as his successor. Gerald retired in December of 1981 and Latt succeeded him. Tragically, Latt died suddenly in September of 1988 and was succeeded by Louis Kunkel who leads the Division with great distinction today. The choice of Kunkel is particularly significant because his father, Henry Kunkel stimulated so much of Gerald’s interest in hemoglobin.

In the last few years of his tenure, Park Gerald began to explore an interest in medical informatics well before computers had entered medicine in any significant way. Gerald was writing programs to make the recovery of genetic information both doable and convenient. Gerald’s wife, Jill writes . . . . “During the early 1980s Park foresaw the impact that computers would soon make and set out to learn all he could about them. He introduced some of the very first PCs at Children’s. After Park retired, he pursued his passion for computers full time, reviewing books and software among other things. He became a very active member of the Boston Computer Society, writing articles for the PC Report and teaching various computer courses. Park also chaired the Artificial Intelligence Users Groups and was on the Board of Directors. In recognition of his extensive contributions, the Boston Computer Society awarded him a Lifetime Family membership.”

Park Gerald was a remarkably productive investigator. He made important contributions that impacted hemoglobin genetics, cytogenetics, the entire field of clinical genetics and medical informatics. He created one of the first divisions of clinical genetics in the United States and developed the leadership to maintain it after his retirement. Children’s Hospital and American pediatrics owe him a substantial debt of gratitude.

David G. Nathan, M.D., *Chair*

Chester Alper, M.D.

Thomas Cone, Jr., M.D.

Louis Kunkel, Ph.D.

Fred Rosen, M.D.