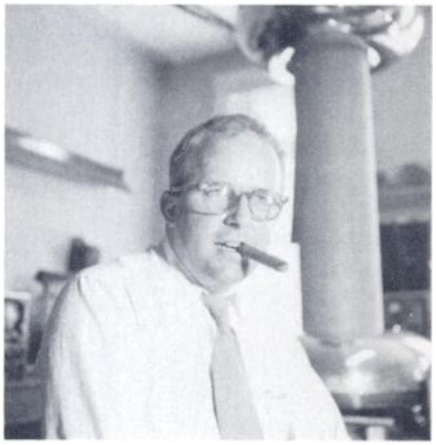
## IN MEMORIAM

# Norman "Jeff" Holter

# (1914–1983)

## A Historical Note and, as It Must Be, an Obituary



The designation that defines our specialty, "Nuclear Medicine" is the only one known to many and its origin known to only a few. The terminology that described the application of radioactive materials to diagnostic and therapeutic medicine evolved over a number of years and included many names. Early on, the navy referred to it as "Atomic Medicine," but the association with warfare made the name unacceptable. The Oak Ridge group coined the term "Isotope Medicine," but, as R.R. Newell noted, all medicinals, diagnostic or therapeutic, are composed of isotopes. Robert Ball wished to call it "Radiology" since the only G-M tube available to him was in the radiology department. Sam Seidlin objected and proposed "Isotopology." The use of the term "radioisotopes" probably originated from Oak Ridge by way of Paul Aebersold, whose Isotope Division was the early source of radionuclides. He learned the terminology at Berkeley while working with E. O. Lawrence, who, in turn, suggested "radioisotopes" from Joliot-Curie's article (1934). Although "radioisotopes" became a common term at that time, one person disagreed—Jeff Holter. His dissension was supported by Gross's objections that these "isotopes" were nuclear and not chemical and on Truman Kohman's proposal that a "nuclide" is any atomic species characterized by its protons and neutrons. William Sullivan, a former student of Fajan's, adopted the terms "nuclides" and "radionuclides" for his compilation of the Trilinear Chart of Nuclear Species. Although the term "radioisotopes" was used well into the 1960s to describe the products, laboratories, and medical practice, the suggestion by Jeff Holter to use the term "Nuclear Medicine," was adopted by the organizing members of The Society of Nuclear Medicine, has withstood the test of time, and has become the official designation for the medical application of radionuclides worldwide.

Norman "Jeff" Holter was born in Helena, Montana; 1 February 1914, a fourth generation Montanan. After attending Carroll College in Helena, he earned a Master's degree in physics at the University of California, Los Angeles, in 1937, and a Master's degree in chemistry from the University of Southern California in 1938. He spent the years during the Second World War with the Navy's Bureau of Ships doing research on ocean wave physics. When the Navy was faced with a new kind of explosion, they asked Jeff to set up the wave action and underwater instrumentation at the Bikini Atoll A-Bomb Tests. The "bomb" furnished its own built-in tracer—a rather complex tracer but one that could be sorted out. Upon returning home he began charting the radioactive fallout patterns of atomic explosions from both the United States and Russia. When the H-bomb test came up, Jeff was recalled, this time by the Atomic Energy Commission, to help with instrumentation at Eniwetok.

In 1953, few physicians were interested in the application of "isotopes"—surgeons were not interested in treating hyperthyroidism with radioactive iodine, hematologists were not convinced by P-32 trials, and radiologists were skeptical of replacing 250 kVp radiotherapy with cobalt-60. Thus, medical societies were reluctant to provide opportunities on their agendas for such subject matter. For this reason Jeff felt that a society devoted to the medical applications of radioactive materials should be formed, and his first idea was to organize one in his state, the Montana Society of Nuclear Medicine.

It soon became apparent to Jeff, however, that interest in such a society extended beyond the borders of Montana. As a result, a group of scientists that included internists, radiologists, physicists, a cardiac physiologist,

and a pathologist met in the Davenport Hotel, January, 1954, in Spokane, Washington. At this meeting officers were elected and the descriptive words, "Nuclear Medicine" were used for the name of the society. The first annual meeting was organized to be held in Seattle, Washington, in May, 1954. An overwhelming 109 physicians, physicists, chemists, and technicians attended this meeting, representing about 12 states.

Jeff Holter was a persistent student. Aside from the usual formal education, he continued his studies at Heidelberg, Chicago, Oak Ridge, and worked in scientific photography under Ansel Adams, one of the most rigidly scientific recorders of nature. The study of recording transient natural phenomena and storing the data for subsequent evaluation was exactly what Jeff had attempted at Bikini and Eniwetok. As an example of his ingenuity Jeff devised a method for recording the propagation of an electrical wave through the living heart, storing the data, and displaying it later. A few hundred thousand physicians know his name from this instrument, the Holter Monitor. When my heart starts skipping, Jeff said, "they'll have the longest normal base line in history." In recognition of his contributions to the scientific community, Jeff received honorary doctorate degrees from Carroll College and Montana State University.

Jeff Holter is survived by his wife, Joan, three sons, one daughter, and a granddaughter. Although Jeff will be sorely missed by his family, friends, and associates in Nuclear Medicine, his family can be particularly proud of his contributions to medicine and science.

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