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Joseph Gilbert Hamilton, M.D.,

Professor of Medical Physics and Director of the William H. Crocker Radiation Laboratory, University of California succumbed to leukemia in February, 1957, at the age of forty-nine.

Dr. Hamilton was born, raised and educated in California. His college training was in chemistry, followed by study of medicine, both studies at U.C. He received his M.D. in 1936 after completion of his internship at the University of California Hospital. At this time he was especially interested in neuropsychiatry, but he was also becoming fascinated by the cyclotron produced radioactive isotopes which were first available during this period. Dr. Hamilton applied his knowledge of chemistry to the cyclotron preparation of radiosodium with which he began the first studies of sodium movement in the body; this was in early 1936. This first adventure in the Radiation Laboratory led him to spend his life there in the production of radioisotopes and their application to the problems of biology and medicine. Soon he performed his promising studies of the use of radioiodine to diagnose the range of thyroid functions in humans. Studies of thyroid metabolism developed throughout the world on a large scale through use of radioiodine and astatine. He had immediately recognized the possibility of using the selective radioiodine uptake in the thyroid to measure thyroid function and to use larger radioactive doses to irradiate the gland for suppression of hyperactive states. With his associates he demonstrated the therapeutic effectiveness of I^{131} in the treatment of human hyperthyroidism, a treatment that has largely replaced surgical thyroidectomy. Dr. Hamilton's lifelong interest in the metabolism of radionuclides was set during this period and he remained thereafter actively associated with medical research program of the Lawrence Radiation Laboratory.

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Folder No.	5-2-1962
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J. G. Hamilton - 2

During the war Dr. Hamilton vigorously undertook the operative supervision of the 60-inch cyclotron as well as of much of the research to which it led. In 1948 he was appointed Director of the Crocker Laboratory. During this period, modification of that cyclotron raised the energy twice, from 16 to 20, to 24 Mev for deuterons, maintaining the useful current of particles at high levels. The alpha particle energy was increased from 28 to 50 Mev. He actively participated in the cyclotron redesign. His published notes on yields from nuclear reactions disclose keen appreciation of the technical problems of cyclotron operation.

For the Manhattan Project Dr. Hamilton and his co-workers in the Crocker Laboratory produced a steady flow of findings on the preparation of various carrier-free radionuclides and the biological effects of their ingestion. He was keenly aware that the biological problems arising from fission product contamination needed to be anticipated; this was his dedicated life work. Throughout the first decade of the atomic age his studies of radionuclides retention, especially of radioactive strontium and transuranic elements, constituted the principal source for estimation of tolerance limits of these substances. The report of the International Commission on Radiological Protection shows that more than half of the estimated values of permissible dose for internal radiations are based on studies carried out at Crocker Laboratory. His pioneer development of autoradiography was instrumental in predicting the toxicity of the specifically localized bone-seeking isotopes and has also contributed to the understanding of the mode of bone formation. In addition to this work on metabolism of elements Dr. Hamilton had begun experimental irradiation of organic liquids by the cyclotron beam of particles, and important addition to knowledge of chemical effects of

3006793

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Notes	
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J. G. Hamilton - 3

radiation.

One of his last observations (unpublished) was made when fallout was first becoming evident. He added to that information by showing that radioiodine fallout contaminates cattle largely by the extent of their feeding on fresh grass. He predicted accurately that humans would be very much less contaminated by fallout radioiodine.

In 1945 Dr. Hamilton was appointed Assistant Professor of Medical Physics in the newly formed division of the Department of Physics, becoming Professor in 1950, with corresponding promotions in the School of Medicine to Professor of Radiology and Experimental Medicine. Dr. Hamilton, concerned with his responsibilities to the scientific community, showed great loyalty to his students and associates. He was active in the University and in scientific societies and served on numerous committees of the National Research Council, the U.S. Public Health Service and the Atomic Energy Commission and was medical consultant to the Division of Biology and Medicine of the AEC.

Dr. Hamilton participated in many of the first applications of radioactive isotopes to problems of our age. He anticipated with his work this present important field of science. His contributions to radiation research are a fitting memorial to so productive, dedicated and enthusiastic a scientist. He is greatly missed by the scientific community.

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