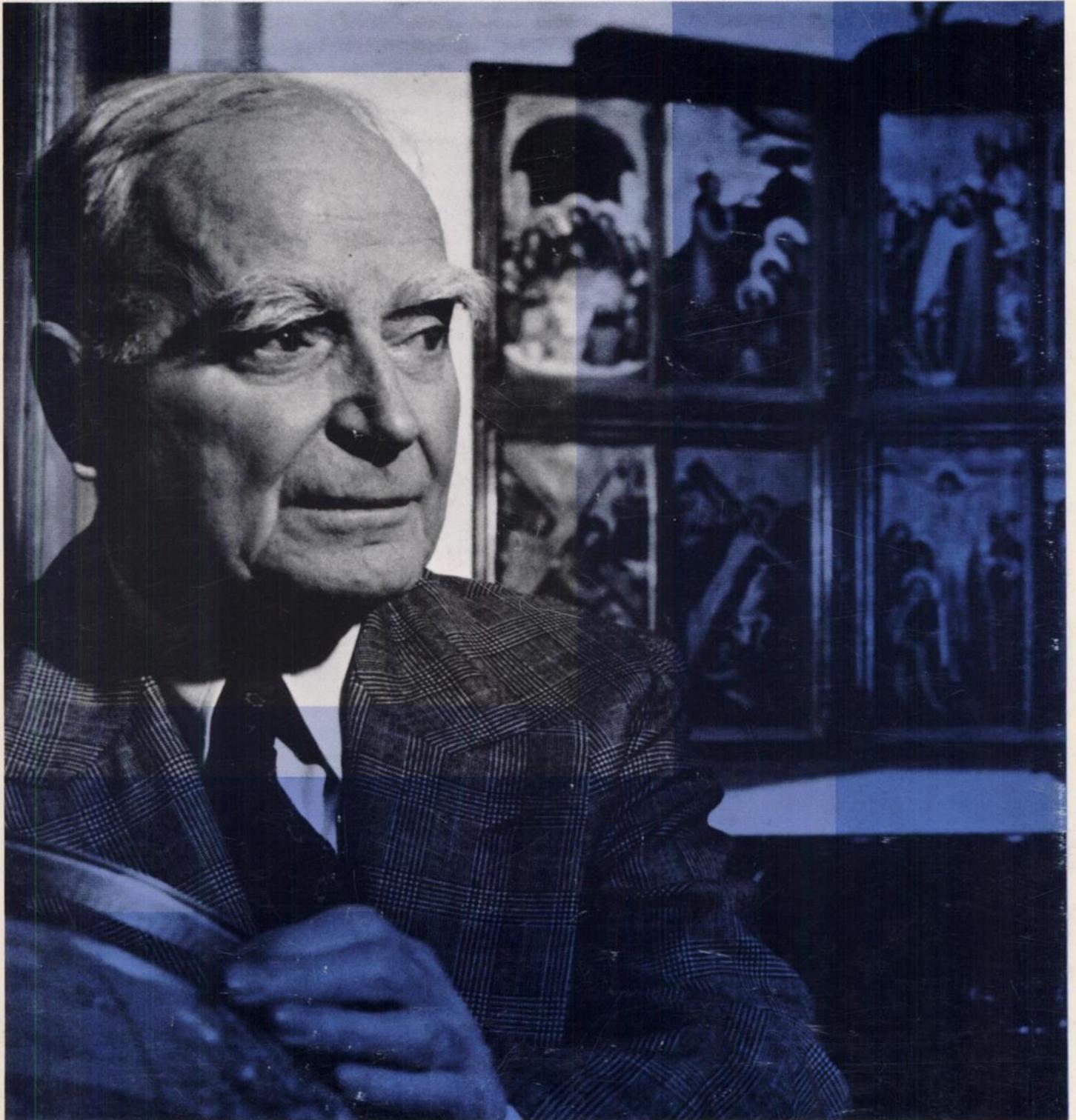


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COVER LEGEND

Our cover this month features George Henry Alexander Clowes (1877-1958), in whose memory the Clowes Lectures are held. (For this year's lecture see our lead article in this issue.) At the 10th anniversary of this lectureship it is appropriate to recall Dr. Clowes' role in cancer research and in the Association.

G. H. A. Clowes was born in Ipswich, Suffolk, England. He was educated at the Royal College of Science (London), received the Ph.D. degree from the University of Göttingen at the age of 22, and subsequently studied at the University of Berlin and the Pasteur Institute. His formal training occurred during the period of scientific and philosophical ferment centering around Darwin and Huxley, and he visited or worked in the laboratories of Tallens, Metchnikoff, Bucher, and Ehrlich. During this time he developed three recurrent interests: a knowledge of and facility with immunology, a fascination with fermentative metabolism and its relationship to growth, and a belief in the "magic bullet" approach to therapy.

In 1901, G. H. A. Clowes came to the New York State Institute for the Study of Malignant Disease at Buffalo, an institution now known as the Roswell Park Memorial Institute. He immediately established a strain of tumors for chemotherapeutic testing. While engaged in this endeavor, he made the outstanding observation that rats, in which a previous transplant had spontaneously regressed, developed immunity to further transplants. This led him to search for an antigen to confer immunity against cancer, a thrust in cancer research that is receiving new impetus daily.

The American Association for Cancer Research was organized during meetings held on May 7 and 8, 1907, with 11 charter members, predominantly with backgrounds in pathology and surgery; among these were James Ewing, Harvey Gaylord, William Coley, George Crile, and Leo Loeb. The youngest was G. H. A. Clowes, age 29.

While at Buffalo, Clowes pursued chemical and physicochemical research on models of the structure of living cells. He devised oil-in-water emulsions that were converted to water-in-oil by adjusting the relative concentrations of sodium and calcium ions. These observations, published between 1913 and 1916, provided new insights into the structure of biological membranes and led Clowes, in the 1930's, to return to his studies of the effects of lipids and carcinogenic hydrocarbons on membranes and the necessity of lipoidal solubility for drugs to penetrate cells.

In 1918, he joined the U. S. Chemical Warfare Service, where he became particularly intrigued with mustard gas and its mechanism of action. To study its action on susceptible cells he was led to the Marine Biological Laboratory at Woods Hole, Massachusetts. Here he began a study of the effects of drugs on the fertilized eggs of sea urchins and starfish. His interest in the metabolism of these living, dividing, and differentiating preparations continued until his death.

In 1919, Clowes joined the Lilly Research Laboratories as a re-

search biochemist and a year later was made director of the laboratories, a post which he held for 25 years. On Christmas day of 1921, Clowes left his family to hear Dr. Banting read his famous paper describing the epoch-making isolation and use of insulin in the treatment of diabetic dogs. Tremendously impressed by this work, he offered the services of the Lilly Research Laboratories in working out the problems involved in the development and large-scale production of a stable and pure product. In a remarkably short time after Banting's discovery, some 800,000 diabetics were able to live essentially normal lives.

Throughout his years as a successful director of an industrial research laboratory and, indeed, until his death, he maintained active research programs of his own. He supervised a laboratory which, in addition to insulin, provided the first hematinic, local anesthetics; antiseptics; sulfonamides; and penicillin. The reversible inhibition of mitosis by halogenated phenols was discovered in his laboratory. This observation led to investigation of the role of flavoprotein oxidations and elucidation of the processes of oxidative phosphorylation.

Clowes served the AACR as a delegate to the international congresses of 1908 and 1913. He was elected vice-president of the society for the 1937-1938 term and served as president a year later. A member of many scientific societies, he was also a director of the Jackson Memorial Laboratory, a trustee of the Marine Biological Laboratory at Woods Hole, and a member of the Visiting Committee of the Department of Chemistry of Harvard University and of the Advisory Council of the Department of Biology of Princeton University. He was Priestly Lecturer at Pennsylvania State College and a recipient of the Banting Medal for his contribution to the control of diabetes.

Clowes retired in 1945 but continued active laboratory investigations as Research Director Emeritus until his death on August 25, 1958, two days before his 81st birthday.

At the suggestion of a Lilly associate familiar with Clowes' role in the AACR, the company contacted the Board of Directors offering to establish a Clowes Memorial Award to be administered by the AACR. This offer was accepted at a meeting of the Board of Directors held on April 6, 1961. The Board decided that the memorial would take the form of a special lecture, the speaker being selected by the Program Committee with the concurrence of the Policy Committee. The success of the Clowes Memorial Lectures has served as a model for the establishment of the David A. Karnofsky Memorial Lecture in The American Society of Clinical Oncology.

In these days of rapid advancement in molecular biology, as the nation considers the control of cancer as a national goal, the contributions of G. H. A. Clowes stand in clear perspective. Clowes' overview would have been both a refreshing and instructive guide.

We acknowledge with thanks the assistance of Dr. Irving S. Johnson of the Lilly Research Laboratories for supplying the historical data.