Hal Downey, Pioneer Hematologist

Hal Downey, known throughout the world for over a generation as the father of American hematology, died on 9 January 1959, at the age of 81. A graduate of the University of Minnesota (B.A., M.A., Ph.D.), he had been on its teaching staff from 1903 to 1946. He taught histology and zoology in the department of animal biology until 1929; thereafter, as professor of anatomy, he taught histology and hematology in the Medical School. After his retirement in 1946, he gave lectures in hematology for two years at the Mayo Clinic and continued his research activities in the department of anatomy until shortly before his death.

For nearly a half century (1913–1959) Dr. Downey was the American editor of the *Folia Haematologica,* one of the world's earliest and most widely recognized journals of hematology (Leipzig). In 1938, after seven years of incessant labor, he edited the *Handbook of Hematology,* the first encyclopedic work on blood and blood-forming organs in health and disease in the English language, written by 34 contributors and comprising 3136 pages in a set of four volumes.

In recognition of his universally known pioneer work on the morphology of blood cells and their genesis, Dr. Downey received many honors, among them the Outstanding Achievement Award of the University of Minnesota, in 1951 and the Distinguished Service Award of the Minnesota chapter of the Sigma Xi Society, in 1957; to him were dedicated a national conference on "Leukocytic Function," held in 1954 at the New York Academy of Sciences; the Hal Downey Laboratory of Hematology in the Durban Medical School, University of Natal, Union of South Africa; and Katsuji Kato's *Atlas of Hematology,* in two volumes, 1954.

Downey was born on 4 October 1877 at State College, Pennsylvania. For over eight years his father taught mathematics and astronomy at State College, then transfered to the University of Minnesota where, after a career as professor of mathematics, he became dean of science, literature, and arts. Dr. Downey's mother was a singer. On an extended sojourn in Europe, she took Hal along and placed him in a Hannover *Realgymnasium,* where he was educated for six years with such efficiency that, after returning to the United States, he finished high school in one and a half years. During the Spanish-American War he enlisted in the Army and served in the Philippines in Company A of the 13th Minnesota Volunteer Infantry (1898-99). In 1905 he was married to Iva Clare Mitchell, whom he met at the University of Minnesota. They had three children, Phyllis, Richard and Jean, all of whom were graduated from the university.

After he obtained his doctorate (1909), Dr. and Mrs. Downey went to Europe, where they spent 15 months. Here, he received additional basic training in hematology. In Berlin, he studied under Pappenheim, the world's most eminent clinical hematologist, from whom he learned the import of nuclear structure, as seen in dry smears, as a means of identifying the different types of blood cells. In Strassburg University he worked with Weidenreich, for many years the outstanding anatomic hematologist, and he learned from him, in an extended investigation of the formation of lymphocytes in lymph nodes and spleen, the technique of the proper study of blood cells and blood-forming organs in sectioned material.

Hal Downey

It was my good fortune to be one of Dr. Downey's earliest graduate students, this at a time (1918) when morphological hematology was in its hectic formative period and far from its status today. Mast cells were regarded as mucoid degenerating lymphocytes (Pappenheim). Dr. Downey proved this view to be erroneous by showing that histogenous mast cells can develop from lymphocytes in lymph nodes. For a graduate thesis, Dr. Downey gave me the problem of investigating the mast cells in the lower vertebrates. It was while working with him at Minnesota that I learned to know him as a teacher, scientist, friend, and family man. As a teacher, he was meticulously precise and exacting, giving to his students with uncompromising grace the benefits of his own excellent training, prodigious reading, and widely diversified and extensive research. As a scientist, Dr. Downey loved research more than teaching, for his life's aim was to advance our knowledge in morphological hematology, and thereby to help clinicians interpret properly the variant and at times puzzling dyscrasias of the blood and blood-forming organs. As a man, his friendly, mild demeanor, honesty, humility, humor, and, above all, his unwillingness to assume the flare and trappings of grandeur mark him as one to be studiously emulated in our time and country.

The carefully prepared, clearly presented, creative contributions of Dr. Downey on blood cells and blood-forming organs number over 50, there being, in addition, numerous reviews and essays on hematological subjects. His publications comprise investigations on the lymphatic tissue of the kidney of *Polyodon spathula*; the production of lymphocytes and large mononuclears from the reticulum in lymph nodes and spleen (with Weidenreich); the origin of plasma cells, mast cells, eosinophils, neutrophils, erythrocytes, and hyaline bodies; the origin of blood platelets, Dr. Downey having been among the first to confirm Wright's theory of their origin from megakaryocytes; the histopathology of Gaucher's disease (large-cell splenomegaly) (with Mandelbaum); intra-vitam

staining of histiocytes and macrophages; reaction of blood and tissue cells to acid colloidal dyes; development of mammalian spleen (with Thiel); alterations of lymphocytes by which infectious mononucleosis now can be clinically diagnosed even when the heterophil agglutination test is normal (with McKinlay); the myeloblast under normal and pathological conditions; a method for studying leucocytes (with Slider, in McClung's *Handbook of Microscopic Technique*); the nature of cells (especially as regards nuclear structure) found in monocytic leukemia and leukemic reticuloendotheliosis (presented in a chapter in his *Handbook of Hematology* and in a large series of papers published jointly with his students). Other jointly published papers are those on the origin of megakaryocytes in the spleen and liver in atypical myelosis; the blood picture of the newborn; regeneration of lymph nodes and bone marrow; hematologic and histologic study of myeloid megakaryocytic hepatosplenomegaly; and regeneration of thymocytes after irradiation. Among his later papers are "The megaloblast-normoblast problem"; "Development of histiocytes and macrophages from lymphocytes"; and "The reaction of the great omentum to pipe tobacco tar," this 1959 paper being the result of a study in cancer research.

For thousands of his pupils and hundreds of his graduate students, the memories of the man and his work will have lasting strength and inspirational force, for Dr. Downey was indubitably America's greatest morphological hematologist. His accomplishments in the advancement of our knowledge of blood cells and blood-forming organs rank with those of the world's greatest pioneer creators of hematology—Pappenheim, Naegeli, Maximow, Weidenreich, Ferrata, Jolly, and Minot. The record of the conference held in his honor under the auspices of the New York Academy of Sciences is a recent published effort (1955) to honor him in the eyes of the scientific world and of his family.

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News of Science

Congress Acts To Give States Radiation Control Authority; HEW's Role Increased

Legislation passed in the closing days of Congress has led to some definitive steps towards settling the long controversy over responsibility for developing and enforcing public standards for radiation safety. The Atomic Energy Act has been amended with respect to state regulatory authority over health and safety aspects of atomic energy activities, and the new National Radiation Council, formed by executive order in mid-August to advise the President on radiation matters, has become a permanent body established by law. These actions were effected by a bill that was passed in both houses on 11 September. Senator Clinton P. Anderson (D-N.M.), chairman of the Joint Committee on Atomic Energy, sponsored the measure, S. 2586, which was presented to the House as H.R. 8755 by Representative Carl T. Durham (D-N.C.), vice chairman of the Joint Committee. The bill that was passed was an amended version of S. 1987, and of its counterpart, H.R. 7214, introduced in May. The chief amendment was the addition of the clause on the National Radiation Council.

The need to change the Atomic Energy Act to permit greater federal-state cooperation has been a subject of concern to the members of the Joint Committee since passage of the act in 1954. Both Anderson and Durham have in past years unsuccessfully introduced bills that would have given the states such regulatory authority over atomic energy activities as they were ready to assume.

They have now been given this authority. The new legislation clarifies the role of the federal government, on the one hand, and of state and local governments, on the other, with respect to the regulation of byproducts, sources, and special nuclear materials, in order to protect the public from radiation hazards. It authorizes the AEC to withdraw its control over certain materials, principally radioisotopes, but not over more hazardous activities, such as the licensing and regulation of reactors. It requires that federal and state radiation standards be compatible and authorizes programs to assist the states to assume independent regulatory jurisdiction. The new law does not authorize a wholesale relinquishment by the AEC of its regulatory responsibilities, but only a gradual, carefully considered transfer on a state-by-state basis as individual states become qualified.

The section that establishes the Federal Radiation Council was added to give the new council the prestige and permanence of a statutory background. The section does not modify the basic functions of the council as described by the President in his executive order, but simply increases its membership from four to five by including the Secretary of Labor (see "News of Science," 28 August).

The Joint Committee report to the Senate on S. 2568 emphasizes that the committee was informed that the provision for the Radiation Council would meet with no objections from the director of the Bureau of the Budget or the Secretary of the Department of Health, Education, and Welfare. It was the budget director who this spring coordinated a study within the executive branch concerning the allocation of radiation-control responsibilities among federal agencies and the transfer of functions to states.

Roles of AEC and HEW

This study, which resulted in the formation of the Radiation Council, was precipitated by growing disagreement as to whether the Atomic Energy Commission or the Public Health Service should