

declined offers of technical assistance. "I'd get along faster," he is reported to have said, "if I got an expert organic chemist to work with me, but it is more fun to do it myself."

Howell's scientific publications include some eighty titles. Starting as a student of Newell Martin, it was but natural that his attention would be attracted to the fields that interested his teacher, namely, the physiology of the heart, of the circulation and of the blood. And so we find that Howell's first papers deal with the heart beat and with certain aspects of the physiology of blood; indeed, coagulation of the blood and the physiological action of the salt content of the blood can be regarded as his major fields of research.

One of his earliest contributions consisted in showing that serum albumin is not essential to the nourishment of the heart, as had been asserted by European physiologists, but that it was the inorganic content of their perfusion solutions that had maintained the beat of the heart. It was his interest in salt action that led to the demonstration by him of the possible significance of potassium as an inhibitor of the heart. Potassium is now known to be intimately connected with at least some of the acetylcholine mechanisms of impulse transmission. However, its exact role in that process remains to be determined.

Howell's name is conspicuously identified with the investigation of the process of blood coagulation; he is credited, among many other significant findings, with the isolation of some of the more important chemical factors that play a role in coagulation, such as cephalin and heparin. At the age of 77 he published a finding of the greatest interest, namely, that in extrauterine life blood platelets, a source of cephalin, are formed primarily in the lungs; and just prior to his death he was busily investigating a new blood coagulant.

The position Dr. Howell occupied in American physiology may be evaluated by the recognition accorded him by his colleagues. He was one of the twenty-eight charter members of the American Physiological Society and, excepting Hare and Jastrow, was the youngest of the group. To him was accorded the honor of reading the first paper at the first meeting of the society. He was its third president and was younger by many years than were either of his predecessors at the time they served in that capacity. He was re-elected to the office five times. He was chosen by the American physiologists to be the president of the first and only International Physiological Congress to meet in the Americas. He was editor of the "American Textbook of Physiology," published in 1896, the first cooperative effort of the kind on this side of the water. He was a member of numerous national honor societies and an honorary member of several foreign

societies. He was the possessor, also, of a number of honorary degrees, including his M.D. degree, which was given by the University of Michigan.

One of Dr. Howell's striking personal characteristics was a mildness and cheerfulness of manner, yet he held firm but carefully weighed convictions. They were never, however, obtruded on casual acquaintances. His strength of intellect, his wisdom, his moral fiber gave him the peace of mind and the sympathetic understanding of his fellow men that were so apparent to all who knew him well. He enjoyed particularly the simple things in life—music, the out-of-doors and the comradeship of his family. He possessed a remarkable ability to express his thoughts in conversation, in the classroom and before assemblages, whether scientific or general, with a directness and a simplicity of verbiage that invariably charmed his hearers. He will be remembered not only as an accomplished and meticulous investigator, an inspiring teacher and as an able and considerate administrator, but equally for his personal attributes—a calm, simple philosophy of life and the ability to live in the light of that philosophy.

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### EDWARD O. SPERLING

IN the closing words of many a scientific paper there will be found a heartfelt tribute to some skilful artisan, heartfelt because the author knew that the artisan's skill was beyond his own. Glass-blower, instrument maker, optician, these craftsmen have all played their part in the advancement of science and indeed have made many a brilliant research possible.

Edward Sperling was a master craftsman in the art of blowing glass. Joining the staff of the National Bureau of Standards in 1907, he devoted his skill for the succeeding thirty-eight years to the construction of equipment which would facilitate the bureau's work. Recognition of his ingenuity and masterly workmanship quickly spread beyond the confines of Washington. Scientists the country over asked for his help in constructing equipment that was beyond the skill of other men. Although his formal education did not go beyond that of the public schools, the Civil Service Commission gave him in his later years a unique professional status comparable with that of scientists holding doctorate degrees. He was in truth the dean of his profession in Washington.

The last rites were said for Edward Sperling on May 14 in the presence of bureau scientists with whom he had worked for years. The importance of his contributions in helping others can hardly be over-emphasized. Laboratory after laboratory bears in shining glass mute evidence of his skill. But the

bureau staff will cherish likewise those admirable qualities of the man himself that so endeared him to his friends.

LYMAN J. BRIGGS

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### RECENT DEATHS

THE death, at forty-three years, is announced of Dr. Albert H. Palmer, of the University of Toronto, for-

merly of the department of agricultural biochemistry of the Pennsylvania State College.

GEORGE T. SEABURY, since 1925 secretary of the American Society of Civil Engineers, died on May 25 at the age of sixty-five years.

DR. FREDERICK WILLIAM SHAW, professor of parasitology at the Medical College of Virginia, Richmond, died on May 29 at the age of sixty-two years.

## SCIENTIFIC EVENTS

### THE TECTONIC MAP OF THE UNITED STATES

A TECTONIC map of the United States was published in November, 1944, and is now on sale by the American Association of Petroleum Geologists.<sup>1</sup> In simple terms a tectonic map is one that depicts by symbols and patterns the geologic structure—that is, the lay of the rock strata, their folds and dislocations, and the position of volcanoes, salt domes and many other features.

The map has been in great demand during the five months since its publication, which suggests that geologists have previously felt a need for one and for the new viewpoint which it gives them on many geologic problems. Geologic maps which show the distribution of rocks at the surface are readily available, and one of the United States was published by the Federal Geological Survey in 1933. Tectonic maps which show the structure of these rocks, and of others underground, have been made before. These were mostly of small areas, and if larger areas were dealt with the maps were on a small scale. The present tectonic map, which measures about four by seven feet, is the first to show the geologic structure of a large part of the North American continent in considerable detail and on a reasonably large scale.

The tectonic map of the United States is the result of long planning and cooperative endeavor by American geologists and their organizations. It was compiled by the Committee on Tectonics of the National Research Council. The map was conceived when the committee was first organized in 1922, but actual work on it was not started until 1934, when Professor C. R. Longwell, of Yale University, assumed chairmanship of the committee. As organized by Dr. Longwell, the committee was a representative group of American geologists, including members from all parts of the country, and from the Federal Geological Survey, the state surveys, the universities and the petroleum industry.<sup>2</sup> The first compilation of copy was completed in 1940, and corrected copy was ready in 1941. War

conditions slowed the final editing, drafting and printing. The American Association of Petroleum Geologists undertook to finance the publication and distribution, partly because of the great interest which the map holds for petroleum geologists and partly because other possible publishing organizations were engaged in wartime duties.

The tectonic map is based in part upon published sources and in part on material that had not hitherto been published. Among the published sources are the numerous maps issued by the Federal Geological Survey. A large amount of unpublished material was furnished by petroleum geologists. On the map, the structure of the gently tilted rocks of the central interior region and the eastern and southern coastal plains is represented by structure contour lines. To a large extent these contours are derived from data obtained in the drilling of numerous wells put down in the search for oil and gas. This material was assembled with the aid of committees of the American Association of Petroleum Geologists and of the local societies of petroleum geologists.

A tectonic map is of more than academic interest. Geologists searching for ore deposits and petroleum must strive to open up new productive provinces as well as to extend the old ones. Local surface indications are by now thoroughly known, so that the approach is increasingly through the more subtle study of broad regional indications and conditions. Knowledge of the regional geologic structure is vital in such studies, and the tectonic map is a useful source for this information. Although the tectonic map was not conceived as either an economic or a war project, the wide use which has already been made of it in exploration for commodities needed in time of war is a source of satisfaction to all the members of the Committee on Tectonics.—PHILIP B. KING.<sup>3</sup>

<sup>1</sup> Inquiries regarding purchase of the map should be addressed to the American Association of Petroleum Geologists, Box 979, Tulsa, Oklahoma.

<sup>2</sup> Members of the Committee on Tectonics are C. R. Longwell, *chairman*, P. B. King, *vice-chairman*, C. H.

Behre, Jr., W. H. Bucher, Eugene Callaghan, D. F. Hewett, G. M. Kay, Mrs. E. B. Knopf, A. I. Levorsen, T. S. Lovering, G. R. Mansfield, W. H. Monroe, J. T. Pardee, R. D. Reed, G. W. Stose, W. T. Thom, Jr., A. C. Waters, E. D. Wilson and A. O. Woodford.

<sup>3</sup> Geologist, Geological Survey, U. S. Department of Interior; vice-chairman of the Committee on Tectonics, National Research Council. Published by permission of the director of the Geological Survey.