with the text and show how the subject has advanced since the text was written. This disagreement is excellent for the mental development of the student. It creates a more critical attitude and helps destroy the feeling that the written word is absolute truth. As an example, I have a habit of demanding that definitions be made at the time required and not committed to memory with the expectation that they are fixed and inflexible. It is by changing our definitions that advances are made, and I hope to impress this upon the students. In the same way I require that mathematical expressions be derived for the particular purpose at hand and not memorized to use as a mental crutch for all similar problems. I expect the student to understand the ideas underlying the formula so that it can be derived easily at any time rather than committing to memory a group of symbols.

As a cultural subject of the first rank and as a medium for mental development, chemistry has exceptional educational merit. The modern philosophical point of view has made it possible to utilize it much more fully for these purposes. For the most truly cultural use the subject must be made rigorous and sound rather than factual. The laboratory gives the teacher an excellent opportunity to use it to its fullest extent. Because it is so widely taught and because it is of such potential value, we should insist that its teachers be competent and above all be adequately trained in the subject and have its modern point of view.

OBITUARY

EDWIN OAKES JORDAN

EDWIN OAKES JORDAN was born in Thomaston, Maine, on July 28, 1866, and died on September 2, 1936. He took his bachelor's degree in science at the Massachusetts Institute of Technology in 1888 and the degree of doctor of philosophy at Clark University in 1892 where he had been fellow in morphology for two years. Caught in the migration from Clark University to the newly founded University of Chicago, he came to the latter in the fall of 1892 as associate in anatomy. In 1895, however, he was made assistant professor in bacteriology—one of the earliest academic appointments in this country in general bacteriology—and thus began a steady advance (he was given the rank of professor in 1907) and expansion leading to the organization in 1914 of the department of hygiene and bacteriology of which he was the head until his retirement in 1933. The previous year the university awarded him the Andrew MacLeish distinguished service professorship.

He was married in 1893 to Elsie Fay Pratt, who survives him. There are three children: Henry Donaldson, professor of history in Clark University; Edwin Pratt, physician and clinical instructor in Rush Medical College of the University of Chicago; and Lucia Elizabeth, physician and married to Dr. Charles L. Dunham, assistant in medicine at the University of Chicago.

Dr. Jordan soon built up a well-organized center in bacteriology. The number of students, advanced as well as beginners, grew large and many are the bacteriologists now scattered far and wide in various lines of work who received instruction from him and inspiration from his quiet enthusiasm for the advancement of bacteriology. He was a clear, kindly and cultured teacher, placing the emphasis on fundamental principles. He was a master of exact statement. In 1899 he published a translation of Hueppe's "Principles of Bacteriology," but his main contribution in that line is his "General Bacteriology," a leading textbook from its first publication in 1908 and now in its eleventh revised edition. Himself an active investigator from the start, his laboratory was always a focus of significant research on bacteriologic and sanitary problems. He was ever on the lookout for able students who might be trained in research. As the general interest in public health developed his influence increased in widening circles and with it the recognition of the scope and importance of his work.

He took active part in the work of many scientific associations. He was a founder and president of the Society of American Bacteriologists, which elected him to honorary membership on his retirement. In the American Public Health Association he was an influential member of a committee on methods of water analysis, the report of which, a standard of its kind, has passed through several editions. He was president of the Chicago Pathological Society in 1906 and of the Institute of Medicine in 1932. He was for a time a member of the medical fellowship board of the National Research Council and served for several years on the International Health Board of the Rockefeller Foundation and later as a member of the board of scientific directors of its International Health Division. He also served on the council of foods of the American Medical Association. The health commissioner of Chicago leaned heavily on him for guidance, and when the present board of health was organized he was one of its members.

A paragraph may be devoted to his relations to the John McCormick Institute for Infectious Diseases, of which he was a trustee. He was joint editor of the *Journal of Infectious Diseases,* published by the institute, from the issue of the first number in 1904.

To his influence and active concern in its conduct, especially in the early years, the journal owes more than to any other factor. Soon after the formation of the institute in 1902 it appeared that the cost to the public of diphtheria antitoxin was excessive. By way of practical demonstration the institute, under Dr. Jordan's guidance, organized a serum division for the manufacture of diphtheria antitoxin and sale at cost. Dr. Jordan had complete charge of this division until it was discontinued as no longer needed. He edited the *Journal of Preventive Medicine,* also published by the institute, until it was taken over by the *American Journal of Hygiene,* when he became co-editor of the issues relating to epidemiology.

At the request of the American Medical Association through its committee on scientific research he wrote a masterly review and digest of the literature on epidemic influenza,[1] with special reference to its causation, which crystallized the existing knowledge and stands as a guiding landmark in the literature of the disease.

It was in zoology under Charles O. Whitman that Dr. Jordan studied for his doctor's degree. His thesis was on the water newt, Diemyctylus. This training did much to give him the broad biological background which is characteristic of his later work. The awakening of his interest in bacteriology and sanitary science took place earlier, however, and was ascribed by him to the influence of one of his instructors at the Massachusetts Institute, namely, Wm. T. Sedgwick (1855–1921), the great pioneer epidemiologist and sanitarian. In 1888 Sedgwick was appointed biologist to the Massachusetts State Board of Health, and under him as chief assistant Dr. Jordan carried on investigation[2] of the purification of water and sewerage until he took up the fellowship in Clark University in 1890. The tracing by Sedgwick of the typhoid epidemic in the Merrimac Valley to the water of a polluted brook surely made a deep impression on his young assistant. It is noteworthy that Dr. Jordan was one of the authors of a biography of Sedgwick[3] and that in 1934 the American Public Health Association awarded him the Sedgwick Memorial Medal for "distinguished service in public health." Here it may be mentioned also that the University of Cincinnati conferred on him the honorary degree of doctor of science and that in the spring of 1936 he was elected a member of the National Academy of Sciences.

No attempt will be made now to analyze in detail Dr. Jordan's investigations, which not infrequently were carried out in conjunction with pupils or assistants. These investigations may be divided roughly into three main groups—those dealing with problems in pure bacteriology, those dealing with problems in medical bacteriology and those dealing with problems relating to public health, sanitation and epidemiology. Of the first group may be mentioned studies on bacterial metabolism, pigment production, motility, variation; studies on the biology of the influenza bacillus; studies on intestinal bacteria; and studies over many years on the paratyphoid-enteritidis group to the knowledge of which he added much. In the second group are his studies on bacterial food poisoning and food-borne infection begun systematically about 1915.[4] In 1930 he made the discovery that certain common forms of food poisoning with acute gastro-intestinal symptoms may be caused by toxic products elaborated in foods by contaminating staphylococci. He was engaged to the last in actively investigating the production by bacteria of enterotoxic substances. The third group of investigations will be summarized in their relations to practical applications. Dr. Jordan did not recognize any well-defined demarkation between pure and applied science; he found ample occasions in the applied science in his field to carry on work of fundamental scientific significance. He had a keen sense of social responsibility and welcomed opportunities for practical service in the promotion of public health. The full list of his varied activities in that direction would be long and impressive. He was a frequent and highly valued consultant in regard to problems of water supplies and epidemic diseases, at first especially typhoid fever. In connection with the controversy about the Chicago drainage channel, in which he was adviser to the Sanitary District of Chicago, he took a leading part in experimental and other work of fundamental importance on the self-purification of streams. That was in the years 1899 to 1903. From then on he followed closely the effects of preventive measures on the incidence of typhoid fever and other diseases, including diphtheria. His interpretations of the statistics stimulated improvements in city water supplies and thus hastened the effective prevention of water-borne typhoid. He published the records of studies of many typhoid outbreaks. He was influential also by investigation and discussion in the development of a sound basis for the pasteurization of milk for general use. Unobtrusive but patient and tactful, he handled practical problems with singular effectiveness by reason of a firm grasp of basic principles coupled with good judgment.

Finally, it should be said that all Dr. Jordan's writ-

[1] "Epidemic Influenza; a Survey," pp. 599. Chicago: 1927, American Medical Association.

[2] Special Report, Massachusetts State Board of Health, Part 2, 1890.

[3] E. O. Jordan, G. C. Whipple and C.-E. A. Winslow: "A Pioneer in Public Health, William Thompson Sedgwick," 1924. Yale University Press, New Haven.

[4] "Food Poisoning and Food-Borne Infection." 1917. Second edition, 1931. University of Chicago Press.

ings are of a remarkably high order of literary culture and style, general scholarship and soundness. The results of his work stand well the tests of time. He was eminent in teaching, in research and in the application of bacteriologic science to public health.

LUDVIG HEKTOEN

RECENT DEATHS

DR. WILLIAM BUCHANAN WHERRY, professor of bacteriology and hygiene at the University of Cincinnati, died on November 1, in his sixty-first year.

COMMANDER JOHN THOMAS WATKINS, who retired six years ago as chief of the Magnetic Division of the U. S. Coast and Geodetic Survey, died on October 29 at the age of sixty-five years.

JAMES A. HALL, professor of mechanical engineering at Brown University, died on October 29 at the age of forty-eight years.

ALEXANDER LARMOR, formerly McCrea professor of natural philosophy at Magee University College, Londonderry, Ireland, now affiliated with the University of Dublin, died on October 12. He was a brother of Sir Joseph Larmor, of the University of Cambridge.

SCIENTIFIC EVENTS

MAPPING OF AREAS IN NORTHWESTERN QUEBEC

WORKING mainly in areas that are being actively prospected and developed, field parties of the Canadian Geological Survey, Department of Mines, Ottawa, are mapping seven sections of northwestern Quebec this year. Geological investigations are under way in the Opemiska, Waswanipi, Malartic, Noranda and Amos areas, and in the Mistawak area to the north of the Normetal (Abana) property, with topographical projects in the Noranda and the Mistawak areas.

Investigations by G. W. H. Norman in the Opemiska area will furnish information for a detailed geological map. Operations at the Ventures controlled Opemiska property are the center of interest in this increasingly active mining field. Prospecting and development work is also proceeding on deposits in the vicinities of David, Simon, Gwillim and Father Lakes. In the course of his work Dr. Norman will visit recent mineral discoveries in the Opawica-Chibougamau area.

The eastern and western portions of the Waswanipi area are being mapped by B. C. Freeman and J. C. Sproule on a four-mile-to-the-inch scale. The work is intended to meet the immediate needs of prospectors.

H. C. Gunning and J. W. Ambrose are making detailed geological investigations in Malartic and Fourniere townships. During 1934 and 1935 the geology and mineral deposits along the Cadillac gold belt were mapped in detail, and the more important economic results were published early in 1936. Last year this belt was traced southeastwards to within three miles of the Canadian Malartic property, and attention was thus directed to several miles of potentially valuable territory. This year's work is intended to establish the relationship existing between the two principal gold camps in the area, and should further assist the development of intervening and adjoining territory.

An area to the east of Amos is being mapped by L. J. Weeks, in a continuation of the systematic geological mapping of this section of western Quebec as an aid to prospecting.

G. F. Flaherty commenced the detailed mapping this year of the Mistawak area lying between the Ontario boundary and the Waswanipi area. Bands of tuffs and sediments similar in character to those in Desmeloizes township to the south are being delimited, and prospects in the area are being examined.

M. E. Wilson is completing a geological study of the Noranda mine. This work is part of a study of various deposits in the area, and is designed to determine their modes of occurrence as an aid to future development.

A portion of the Noranda area, and the strip of country between Noranda and Malartic township are being mapped topographically by J. W. Spence as a control basis for later geological investigations. In the Mistawak area H. N. Spence is mapping a 6,000-square mile territory lying mainly to the north of the Transcontinental Railway. This work will provide maps for prospectors and settlers in the area.

ENDORSEMENT OF THE WORK OF THE U. S. WEATHER BUREAU BY CIVIL ENGINEERS

AN endorsement of the program and work of the U. S. Weather Bureau and a resolution urging public support for its efforts to enlarge and improve its service have been passed by the Board of Direction of the American Society of Civil Engineers. Calling for an increase in appropriations for the work of the Weather Bureau and naming six specific activities in which it believes expansion in personnel and equipment are needed, the board has issued the following statement:

> Contacts of the society's Committee on Meteorological Data, with the program and work of the U. S. Weather Bureau, have convinced the committee that the bureau should receive public support in its efforts to enlarge and improve its service. With this in mind, the Board of Direction of the American Society of Civil Engineers, at its fall meeting, voiced its approval of this government activity by adopting the following resolution: