and (2) the production of ethyl alcohol formed from the ethyl acid sulfate by further dilution. The important physical data to obtain in this case are the partial pressures of the reacting constituents.

Another reaction that is of real interest both to the scientific man and the applied scientific man is the reaction between propylene and hydrogen sulfide to produce an alkyl acid sulfide. A direct determination of the equilibrium constant at 573° K. indicated a $\triangle$ F.° of + 3,000 cal. There are no data in the literature that would indicate the accuracy of this determination.

Considerable polymerization of the propylene occurred in the presence of catalysts such as phosphoric acid on activated charcoal. A quantitative analysis of this polymer is extremely difficult.

The study at the present time is along two lines: (1) the development of a catalyst that will eliminate this and other side reactions, and (2) the determination of the $\triangle$ F.° by means of heat capacity measurements. Both methods hold out some promise.

Still another reaction which is of interest to many is the reaction between ammonia and ethylene to produce ethylamine. A study was first made of the reaction itself in order to determine directly the equilibrium constant. A silent electric discharge was used in the place of a catalyst. At 298° K., $\triangle$ F.° found from these data was approximately + 1,200 cal.

Again the difficulty was due to analytical methods, especially those involving the determination of the amount of ethylamine formed. There were indications of side reactions taking place. Unknown amines apparently were formed. Preliminary results do, however, agree with some rather qualitative work done on the reaction by Francesconi and Ciurlo.[7] It will, of course, be necessary to determine by what, if any, amount the equilibrium is displaced by the discharge.

Further work will be done in the hopes of improving the methods of analysis. If these fail, an attempt will be made to procure a catalyst that will eliminate the side reactions or the $\triangle$ F.° will be determined by heat capacity measurements.

The author wishes to acknowledge the assistance of Messrs. M. Gallagher, H. R. Duffey and F. T. Barr, who have done the experimental work and who have contributed many worth-while ideas.

OBITUARY

WILLIAM JACOB HOLLAND

WITH the death of Dr. William J. Holland, which occurred on December 13, 1932, a distinguished figure in the world of science passed away. He was the dean of American entomologists, the author of innumerable publications in this field. But Dr. Holland was far more than an eminent entomologist of world-wide reputation—he was a naturalist of a universality of erudition which is but rarely found among scientific men of the present day. With a prodigious memory, a keen understanding of the diversity of scientific problems, he was at home in the manifold domains of learning. Above all, he was a man of outstanding intellectual and spiritual culture, and that is why his loss has created an irreparable void in the community with which he has been associated for nearly three scores of years and within the ranks of his fellow workers in the scientific field.

William Jacob Holland was born in Bethany, on the island of Jamaica, on August 16, 1848. His family was of Moravian extraction, residing for a long time in Salem, North Carolina. From there his father was sent as a missionary to the West Indies.

From early boyhood Holland was trained in studies of natural history. Upon graduation from the Moravian College and Theological Seminary at Bethlehem, Pennsylvania, in 1867, he received the degree of bachelor of arts from Amherst College in 1869. For a year after graduation he served as principal of a high school in Amherst, and the following year occupied the same position at Westboro, Massachusetts. Having been ordained into the Moravian ministry he entered Princeton Theological Seminary and concluded the course in 1874. Subsequently he joined the Presbytery of Monmouth and came to Pittsburgh as pastor of the Bellefield Presbyterian Church, which position he held until 1891. In the course of his pastorate Dr. Holland devoted much time to scientific studies. He went to Japan as a member of the United States Eclipse Expedition in 1887 and used this opportunity in a very profitable way for various biological investigations. In 1891 he was made chancellor of the Western University of Pennsylvania, now the University of Pittsburgh. In 1898 his friend, Andrew Carnegie, invited him to assume the responsibilities as director of the museum founded by this steel magnate. This office was held by Dr. Holland with signal success until 1922, when he became director emeritus of the Carnegie Museum. Under the administration of Dr. Holland the museum attained the rank of one of the most important scientific institutions of its kind on the continent. Dr. Holland performed the duties as vice-president of the Carnegie Hero Fund from 1904 to 1922, and upon his election as president of that body became a member of the Carnegie Corporation.

[7] Francesconi and Ciurlo, *Gazz. chim. ital.*, 53: 598, 1923.

Dr. Holland was an active member of the board of trustees of several institutions of higher learning, and carried on the duties of Belgian Consul for some years after the world war. He had the distinction of becoming the founder of the American Association of Museums in 1907, and remained president of the association until 1909. He was a member of scores of scientific societies, among them the Zoological and Entomological Societies of London, the Entomological Societies of America, Washington, New York, Cambridge, Germany, France, Russia and Brazil; the American Zoological Society, Royal Society of Edinburgh, American Philosophical Society and several foreign scientific academies. He was a councilor for the Association for International Conciliation, a member of the Academy of Natural Sciences, Philadelphia, the Pennsylvania Historical Society, Historical Society of Western Pennsylvania and Moravian Historical Society.

Dr. Holland was the author of numerous scientific treatises and books, notably of "The Butterfly Book" and "The Moth Book," which became sources of reference for specialists and were chiefly instrumental in stimulating a wide-spread interest in lepidopterology among amateurs in this country. He also wrote many scientific papers published by the United States Government and the Zoological Society of London. The Encyclopedia Britannica applied to him as to a leading specialist in the museum field for the preparation of a survey of the history of scientific museums. For the last thirty-four years he edited the *Annals* and *Memoirs* of the Carnegie Museum. Washington and Jefferson College, Amherst College, Dickinson College, New York University, Bethany College, St. Andrew's in Scotland and the University of Pittsburgh conferred degrees of honorary doctorate upon him.

One of the most significant scientific achievements of Dr. Holland was connected with the paleontological explorations of the Carnegie Museum which were directed by him in Utah, Wyoming, Montana and North Dakota. The finds of these expeditions resulted in many discoveries, including the celebrated *Diplodocus carnegiei,* the original skeleton of which is adorning the gallery of fossils in the Carnegie Museum, whereas nine replicas were presented to the leading scientific institutions in Europe and both Americas. In recognition of his contributions to science Dr. Holland received decorations from Belgium, Austria-Hungary, Italy, Russia and Spain.

In his busy life, Dr. Holland found time to attend to many public responsibilities of diversified nature. For instance, he took an active part in the development of the water system in the City of Pittsburgh.

Dr. Holland passed away amid his favorite labors, lending his concentrated attention, as throughout his life, to various problems of natural history advanced by recent investigations. Until the end he remained absorbed by the adventurous spirit of scientific research, responsive to the lure of exploring some new avenue of the ever-widening horizons of knowledge. He lived a life of exceptional usefulness. Endowed with a profusion of gifts, among which his linguistic abilities were by far not the least, he cultivated his native talents and molded them into a personality of unique qualities and values. A churchman, a leader in education, the father of the Carnegie Museum in Pittsburgh, a man of learning honored far and wide by academies, international congresses and universities, Dr. Holland will not only be mourned sincerely, but his achievements will also not fail to remain an inspiration challenging the best within us.

A. AVINOFF

CARNEGIE MUSEUM
PITTSBURGH, PENNSYLVANIA

RECENT DEATHS

GEORGE P. ADAMSON, chemist and formerly director of research of the General Chemical Company, New York City, died on February 16. He was sixty-eight years old.

DR. CLARENCE HENRY ECKLES, chief of the division of dairy husbandry at the University of Minnesota, died on February 13, at the age of fifty-eight years.

DR. CARL L. CORRENS, honorary professor of botany at the University of Berlin and formerly director of the Kaiser Wilhelm Institute for Biology, has died at the age of sixty-eight years.

HORATIO WARD STEBBENS, associate professor of mechanical engineering at Stanford University, died at the Stanford Hospital in San Francisco on February 2, following an operation several days before. Professor Stebbens, who has been at Stanford since 1914, was graduated from the University of California and the Massachusetts Institute of Technology, and prior to teaching, had been connected with various engineering projects.

THEODORE SAUNDERS DUNN, associate professor of mining engineering at Stanford University, was killed instantly when struck by an automobile on the Stanford campus the evening of February 3. Professor Dunn was a graduate of the Missouri School of Mines, and besides having practical experience with a number of mining corporations, and serving as a captain in the engineers during the World War, had served on the faculties of the Missouri School of Mines, South Dakota School of Mines and Georgia School of Technology, going to Stanford in 1930.