width, made up of sedimentary rocks of early Paleozoic age; these rocks and their relations to the mountains behind them formed the major study of the expedition.

The rocks in places are rich in the fossilized remains of small sea animals which serve to date the strata, and the collecting of these fossils engaged the special attention of Messrs. Dunbar, Leith and Morris, while Mr. Ingerson studied the great masses of igneous rocks that were thrust up through the older rocks at Bonne Bay and around the Bay of Islands as a result of disturbances deep within the earth's crust. At Cow Head the party studied the extraordinary Cow Head conglomerates, with blocks of all sizes up to 600 feet in length, the largest of the kind known anywhere. From Labrador they brought back to Peabody Museum specimens of the reefs made by the "Archaeocyathinae."

THE LANGMUIR AWARD OF THE AMERICAN CHEMICAL SOCIETY

DR. FRANK HAROLD SPEDDING, instructor in chemistry at the University of California, was presented with the Langmuir Medal of the American Chemical Society for his research on the structure of the atom, at the eighty-sixth meeting of the society, held in Chicago from September 10 to 15. Dr. Spedding addressed the Division of Physical and Inorganic Chemistry on "Energy Levels in Solids."

The prize was established by Dr. A. C. Langmuir, brother of Dr. Irving Langmuir. It provides for "recognition of the accomplishment in North America of outstanding research in pure chemistry by a young man or woman, preferably working in a college or university." To be eligible for the award, "a candidate shall not have passed his thirty-first birthday." "Outstanding research" is construed to mean work of unusual merit for an individual standing on the threshold of his career. Dr. Charles L. Reese, president-elect of the American Chemical Society, was chairman of the committee on the Langmuir Award. Other members were Professor Arthur E. Hill, New York University; Professor Hobart H. Willard, University of Michigan; President James Bryant Conant, Harvard University; Professor Harold C. Urey, Columbia University; Professor Homer B. Adkins, University of Wisconsin, and Dr. John Johnston, director of research for the United States Steel Corporation.

The committee has issued the following account of the work for which the award has been made:

Beginning his research in collaboration with Dr. Simon Freed and continuing alone, and with other collaborators, Dr. Spedding has, by extensive experimental and theoretical investigation, opened a wide new field of spectroscopy, which is of the utmost importance in the understanding of the chemical and magnetic properties of the rare earths.

In this extremely difficult study of the many lines in the absorption spectrum of crystals at temperatures ranging from room temperature to the temperature of boiling hydrogen, the first important result was that obtained with samarium. It had already been supposed, from the magnetic behavior of samarium, that it exists in more than one state, the relative amounts varying with the temperature.

This was confirmed, and from a study of the intensities of the absorption lines at different temperatures, it was possible to calculate the relative amounts in the different states and their difference in energy.

The next important subject dealt with in these researches was the study of intermolecular electric fields, concerning which much information has been obtained by studying the shift in the spectral lines caused by the substitution of one salt of gadolinium for another. This information was further advanced by a study of crystals with different types of symmetry.

It was next attempted to study the absorption spectrum of crystals of the rare earths salts in a magnetic field, and it was found possible to obtain what is known as a Zeeman effect, and a Paschenback effect, which has been of the greatest service in classifying the spectral lines, and interpreting the exact spectroscopic definitions of the normal and excited states of the elements of the rare earths.

A study of aqueous solutions of salts of the earths was then carried on, in which evidence was obtained of the orientation in the coordination zone of hydrated ions in solution. The study of the spectrum of light reflected from powdered crystals was then undertaken and led to several curious and at first mysterious phenomena, which have since been fully explained.

The result of all these investigations carried on by Dr. Spedding and his collaborators is that the interpretation of the spectroscopic terms in solid crystals is now reaching the same degree of completeness as that obtained in the study of gaseous spectra.

It is well known that the study of the spectra of gaseous substances gives very definite and detailed information concerning the structure of the atom in the gaseous state. It has, however, been very difficult to get any definite information regarding the solid state. For this reason the spectra of rare earth compounds obtained by Dr. Spedding are of great importance. The sharpness and amount of detail in these spectra are really quite extraordinary and the information that they are capable of giving is therefore extensive.

The important contribution of Dr. Spedding has been, however, to the interpretation of such spectra. It is quite true that spectra of certain solids like this have been known in more or less extensive form for a number of years, but it is only recently that any progress has been made in their interpretation and in this work of interpretation Dr. Spedding has played a leading part.

OBITUARY

DR. ARTHUR POWELL DAVIS, consulting civil engineer, living at Oakland, California, past president of the Society of Civil Engineers and director of the

U. S. Reclamation Service from 1902 to 1920, has died at the age of seventy-two years.

MISS ELIZABETH H. SMITH, assistant plant pathologist at the University of California, was instantly killed in a traffic accident at Berkeley, California, on August 21.

PROFESSOR WILLIAM GRANT CRAIB, Regius professor of botany at the University of Aberdeen, a student of Oriental plants, died on September 1.

DR. SEBASTIAN RECASENS, formerly dean of medicine at the University of Madrid, died on August 14, aged sixty-four years.

Nature reports the following deaths: Mr. W. J. Lewis Abbott, known for his contributions to the prehistory of England and collection of flint implements, aged eighty years; Mr. H. F. Tagg, for nearly forty years keeper of the museum at the Royal Botanic Garden, Edinburgh; Dr. A. W. J. MacFadden, formerly senior medical officer in charge of the Food Department of the Ministry of Health, on August 16, aged sixty-four years, and Dr. V. H. Veley, lecturer in science in the University of Oxford in 1879–1903, joint translator of "The Handbook of the Polariscope" and author of "The Micro-Organism of Faulty Rum," on August 20, aged seventy-seven years.

SCIENTIFIC NOTES AND NEWS

DR. RUFUS COLE, director of research at the hospital of the Rockefeller Institute, received *in absentia* the honorary degree of doctor of science from the National University of Ireland, Dublin, during the recent annual meeting of the British Medical Association.

THE Elisha Kent Kane Gold Medal of the Geographical Society of Philadelphia has been awarded to Mr. Owen Lattimore in recognition of contributions to geographical knowledge in Central Asia. The results of Mr. Lattimore's explorations accomplished in a five months' camel caravan expedition from Kweihua, on the border of Mongolia, to Urumchi in Chinese Turkestan, are to be found in his book "The Desert Road to Turkestan," published in 1928 by Methuen. Subsequently Mr. and Mrs. Lattimore spent several months in explorations in western Turkestan, returning to America by way of India. Early in October Mr. Lattimore will lecture on his investigations in Manchuria and Mongolia before the Chicago Geographical Society and at the Field Museum.

IN recognition of the important assistance he has rendered to the Field Museum, Chicago, in carrying out its botanical work in the joint project with the Rockefeller Foundation, the board of trustees of the museum has elected Dr. B. P. Georges Hochreutiner, director of the Botanical Garden at Geneva, a corresponding member. This is a class of membership conferred only on scientific men or patrons of science residing in foreign countries who have rendered eminent service to the museum.

DR. MARTIN BENNO SCHMIDT, professor of pathology at Würzburg, reached his seventieth birthday on August 23.

DR. EDWARD H. KRAUS, professor of mineralogy and crystallography and dean of the College of Pharmacy at the University of Michigan, has been appointed dean of the College of Literature, Science and the Arts. Dr. Louis A. Hopkins, professor of mathematics, will succeed Dr. Kraus as head of the summer session. Dr. Howard B. Lewis, head of the department of physiological chemistry, has become dean of the College of Pharmacy.

DR. EDGAR ALLEN, formerly dean of the University of Missouri School of Medicine, takes up his work as professor of anatomy and head of the department at Yale University at the beginning of the college year. Harold Saxton Burr, professor of anatomy since 1929, Yale University School of Medicine, has been appointed E. K. Hunt professor of anatomy and head of the section of neuro-anatomy to succeed Dr. Harry Burr Ferris, who has become professor emeritus. Dr. George M. Smith has been made research associate in anatomy with the rank of associate professor. Dr. Harry M. Zimmerman, of the department, was recently promoted to an associate professorship.

PROFESSOR OTTO STERN, experimental physicist and former head of the Institute of Physical Chemistry at the University of Hamburg; his assistant, Professor I. Estermann, and Professor Ernst Berl, chemist and professor at the Technical University at Darmstadt, have joined the scientific staff of the Carnegie Institute of Technology, Pittsburgh.

RECENT promotions in the science departments at the Ohio State University include the following: Dr. Laurence H. Snyder and Dr. Clarence H. Kennedy, of the department of zoology, and Dr. Albert D. Frost, of the department of ophthalmology, from associate professors to professors; Dr. David F. Miller, of the department of zoology, Dr. E. F. Almy and Dr. R. C. Burrell, of the department of agricultural chemistry, and Dr. P. B. Stockdale and Dr. W. A. P. Graham, of the department of geology, from assistant professors to associate professors; Dr. W. H. Bennett and Dr. Harald H. Nielsen, of the department of