as a cause chiefly in relation to the gross lineaments of the ensemble.

In a large fashion geodynamics is intimately associated with certain branches of geology, as sedimentation, while geomorphology connects physiography with geography. The dynamic interlude representing the active phase of physiography weaves the basic threads of geologic history.

OBITUARY

JESSE WALTER FEWKES

THE death of Jesse Walter Fewkes removes one who was an outstanding influence in the formative period of American archeology, particularly the archeology of our great Southwest. He was born at Newton, Massachusetts, on November 14, 1850, of parents whose ancestral lines in America extended back to the seventeenth century. In 1871 he entered Harvard and he graduated four years later with honors in natural history, besides being elected to membership in Phi Beta Kappa.

In 1874, while he was still an undergraduate, two papers on electrical subjects were published by him, but the year before he had come under the influence of Louis Agassiz in the latter's school at Penikese Island, Buzzards Bay, and this experience probably led him to turn his attention wholly to zoology. At any rate he took up graduate work in natural history and, after receiving the degrees of A.M. and Ph.D. in 1877, he continued zoological studies at Leipzig under Rudolph Lueckart between 1878 and 1880. Later he spent several months in Naples and at Villa Franca on the south coast of France as holder of the Harris fellowship. After his return to America he received an appointment as assistant in the Museum of Comparative Zoology at Harvard where, from 1881 to 1889, he had charge of the collections of the lower invertebrata. In 1881 he accompanied Alexander Agassiz to Key West and the Dry Tortugas for the study of marine life and two years later he visited the Bermudas on a similar quest. Every summer, from 1884 to 1887, he was assistant in charge of the younger Agassiz's marine laboratory at Newport, R. I., but in the spring of 1887 he pursued scientific studies at Santa Barbara, Santa Cruz and Monterey, California, as a guest of Augustus Hemenway, of Boston, and in the summer of 1888 he studied in Paris and engaged in field work in marine zoology at Professor Lacaze Duthier's zoological station at Roscoff, Brittany.

Dr. Fewkes's visit to California proved to be a turning-point in his career, for it was then that he came in contact with the culture of the Pueblo Indians, which excited in him an interest still further stimulated by the enthusiasm of Mrs. Mary Hemenway. In 1889 and 1890 he undertook field work among the Zuñi Indians of New Mexico, and in the latter year he made use of a phonograph—the first time, it is believed, that it was so employed—in the recording of Indian music. In 1891 he became director of the Hemenway Southwestern Archeological Expedition and editor of the *Journal of American Archeology and Ethnology,* established to publish the results of its investigations. During the same year he began those studies of Hopi ceremonials for which he became especially noted and which probably constitute his most enduring contribution to American anthropology. His description of the Hopi Snake Dance, which appeared in 1894, was a pronounced factor in spreading the knowledge of this striking rite and stimulating popular interest in it.

The Hemenway expedition having been invited by the Spanish government to participate in the Historical Exposition held at Madrid in 1892–93 to commemorate the discovery of America by Columbus, Dr. Fewkes was given charge of the exhibit and he was a member of the jury of awards. In recognition of these services he was honored by Maria Cristina, queen regent of Spain, with the decoration "Isabel la Católica," grade of knight. In 1894 King Oscar of Sweden presented him with a gold medal, "Litteris et Artibus," for his work in anthropology.

After returning to America Dr. Fewkes resumed investigations in the Southwest, but they were soon brought to an end by the death of his patroness, Mrs. Hemenway, in 1894. The collections made under his direction during this period are in the Peabody Museum at Cambridge.

In May, 1895, Dr. Fewkes received an appointment as ethnologist in the Bureau of American Ethnology at Washington along with the honorary title of collaborator in the division of ethnology in the United States National Museum, and the connection which he established with the bureau at this time continued unbroken until his resignation and retirement from active service in 1928.

This constituted a turning-point in his career in another direction because, although he continued to publish the results of his work among the living Hopi for many years afterward, his field excursions now became mainly archeological. From 1895 until 1901 the scene of these investigations was in and near the Hopi country in Arizona, but in 1902–04 he made a diversion to the West Indies in continuance of an interest

which he had exhibited as far back as 1891, and he devoted the field season of 1905 to northeastern Mexico.

With the passage of the Lacey Act in 1906 providing for the creation of public parks or "national monuments" a new era dawned in the history of Southwestern archeology, and the services of Dr. Fewkes were at once enlisted by the Department of the Interior for the exploration and restoration of ruins upon the public domain. In 1906 and 1907 he explored and repaired the famous Casa Grande ruins of southern Arizona, but in 1908 transferred his labors to the Mesa Verde National Park in southwestern Colorado and continued there through the field season of 1909.

In 1911, he returned to the West Indies, visiting Cuba, the Isle of Pines and Grand Cayman, and, in 1912, the Lesser Antilles, but the following spring he went to Europe where he spent part of his time studying the West Indian collections in German and Danish museums. In 1915 and 1916 he resumed work at the Mesa Verde.

On March 1, 1918, Dr. Fewkes was appointed chief of the bureau of which he had so long been an active member. However, this appointment scarcely interrupted the course of his field investigations, which continued until 1923 in the region of the Mesa Verde. The principal ruins excavated and repaired by him in that park during his entire period of service there were Spruce Tree House, Cliff Palace, Square Tower House, Painted House, Cedar Tree House, Pipe Shrine House and Far View Tower, while the Hovenweep and Wupatki National Monuments were created in 1923 and 1925, respectively, as the result of his suggestions. His last outdoor work of importance was the excavation of Elden Pueblo, near Flagstaff, Arizona, in 1926.

As chief of the Bureau of Ethnology Dr. Fewkes also found time to interest himself in the archeology of the southeastern part of our country which he visited several times. His most important undertaking here was the excavation of the Weeden Island mound, near St. Petersburg, Florida, in the winter of 1923–24, and it is characteristic of his archeological optimism that his very last expedition consisted in a "reconnaissance" of the Piedmont region of South Carolina in June, 1927, looking toward more extensive investigations at some later period.

In April, 1925, Dr. Fewkes had to undergo a severe operation and, while he returned to the field, as noted, in 1926 and 1927, he never recovered fully from its effects. After his return from the South in 1927 he suffered a fall and, as a result of it, became so much weaker that on January 15, 1928, he resigned as chief but continued on the staff of the bureau until November. His death took place on May 31, 1930, his wife, who had been his constant field companion, preceding him by a few weeks.

Dr. Fewkes was a member of the National Academy of Sciences and an honorary or corresponding member of many scientific societies, American and foreign. He was secretary of the Boston Society of Natural History from 1889 to 1891, vice-president and chairman of Section H of the American Association for the Advancement of Science in 1901 and again in 1915, president of the Anthropological Society of Washington in 1909 and 1910, president of the American Anthropological Association in 1911 and 1912, and for more than thirty years he was on the visiting committee of the Peabody Museum of Harvard University.

In January, 1915, he was the official representative of the Smithsonian Institution at the inauguration of Dr. KleinSmid as president of the University of Arizona and had bestowed upon him by that institution the degree of LL.D. On the occasion of his seventieth birthday, November 14, 1920, a luncheon was given in his honor at the Smithsonian building, participated in by about forty of his friends, and a specially bound volume of letters of congratulation was presented to him. His last public act was the presentation of a bust of Louis Agassiz to the Hall of Fame on behalf of the American Association for the Advancement of Science and an unnamed admirer of the great naturalist. This took place on May 10, 1928, Dr. Fewkes being the only pupil of Agassiz then living able to be present.

His publications include, besides the two papers on electricity already mentioned, nearly seventy contributions to invertebrate zoology, mainly the Medusae, Echinodermata and Vermes, and about two hundred contributions to ethnology and archeology.

Dr. Fewkes was possessed of a genial and confiding nature and an effervescent enthusiasm which drew people to him and made them readily communicative of any information they happened to have regarding new types of ruins, unique pottery or mounds which had escaped scientific eyes, so that, from the quantity point of view, he was almost uniformly successful in his field expeditions. And in this way he made many openings for later workers, even though he did not exploit all the possibilities of an undertaking. For he was interested in variety of material, especially material of a novel character, rather than in associations of material, and the extension of his work interfered with its intensiveness. However, his unaffected pleasure in a new variety of artifact or an exceptional pottery design was something that the average man could understand and through his talks to tourists and in the lecture hall, and through press interviews,

he interested hundreds to whom a more rigorous student might have spoken in vain. In this way he created a "Pueblo consciousness" which drew other investigators to the field and provided popular support for their work, performing a similar service to that of Cushing at an earlier date on the side of ethnology. Thus the title "dean of American archeology" which, with advancing years, some of his admirers came to apply to him was not inappropriate. It was a term which his charm of manner set off to most excellent advantage, and he had a devoted circle of friends who will feel that his going has removed something peculiarly warm and winning from their lives.

JOHN R. SWANTON

RECENT DEATHS

COLONEL WILLIAM BOYCE THOMPSON, mining engineer and copper operator, who founded the Boyce Thompson Institute for Plant Research with an endowment approaching ten million dollars and who gave other large sums for public purposes, died on June 28 at the age of sixty-one years.

PROFESSOR CHRISTEN LUNDSGAARD, professor of internal medicine at the Royal University of Denmark at Copenhagen, formerly an associate of the Rockefeller Institute for Medical Research and a member of the American Society for Experimental Biology and Medicine, died on June 16. He was forty-seven years old.

Nature reports the death of Mr. Arthur Stanley Hirst at sea on May 4. Mr. Hirst was formerly an assistant keeper in the British Museum (Natural History). He was born in 1883.

DR. J. B. BRADBURY, for the past thirty-six years professor of medicine in the University of Cambridge, died on June 4 at the age of eighty-nine years.

THE death is announced of Dr. Kiyoo Nakamura, director of the Central Meteorological Observatory of Japan.

MEMORIALS

Industrial and Engineering Chemistry reports that the Northeastern Section of the American Chemical Society, through a committee composed of Lyman C. Newell, Arthur D. Little and James F. Norris, has announced the establishment of a gold medal to commemorate the many fundamental contributions made to chemistry by Theodore William Richards. The medal will be awarded by the Northeastern Section at intervals of two or three years for conspicuous achievements in chemistry, and is being designed by Cyrus E. Dallin, a sculptor who was an intimate friend of Professor Richards. An opportunity is offered the friends of Professor Richards to assist in securing the sum of ten thousand dollars which is required to cover the initial expenses and provide a trust fund yielding sufficient income for the successive medals and incidental expenses.

DEDICATION ceremonies for Atwater Laboratory, the new building to house the animal disease and the genetics departments of the Storrs Agricultural Experiment Station, Connecticut, were held on June 12. The laboratory of brick and brown stone, two stories and a basement, was erected at a cost of $42,000. It was named for Wilbur O. Atwater, professor of chemistry at Wesleyan University, first director of the Storrs Station and of the United States Office of Experiment Stations. On the program of the dedication were Dr. Edward C. Schneider, professor of physiology at Wesleyan; Dr. Edward H. Jenkins, director emeritus of the experiment station, and Dr. A. F. Blakeslee, vice-director of the Carnegie Station for Experimental Evolution in Cold Spring Harbor, L. I., formerly professor of botany at the Connecticut Agricultural College, Storrs. Dr. George Alan Works, president of the college, presided. Guests from many colleges and research institutions attended the ceremonies and the luncheon that followed.

IN commemoration of the twenty-fifth anniversary of the discovery of the spirochete that is the causative agent of syphilis, memorial exercises in honor of the discoverer, Dr. Fritz Schaudinn, were held, May 17, in the Zoological Institute, Berlin. At the same time, his workshop or laboratory was dedicated as the "Schaudinn Room." Professor Max Hartmann and Professor Hesse delivered the memorial addresses.

SCIENTIFIC EVENTS

NATIONAL HYDRAULIC LABORATORY

ON May 14 last, the following bill was signed by President Hoover:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby authorized to be established in the Bureau of Standards of the Department of Commerce a national hydraulic laboratory for the determination of fundamental data useful in hydraulic research and engineering, including laboratory research relating to the behavior and control of river and harbor waters, the study of hydraulic structures and water flow, and the development and testing of hydraulic instruments and accessories: Provided, That no test, study or other work on a problem or problems connected with a project the prosecution of which is under the jurisdiction of any department or independent agency of the government shall be undertaken in the laboratory herein authorized until a written request to do such work is submitted to the