

uralist, rather than that of zoologist or anatomist. His almost life-long connection with museum work in four celebrated institutions gave him an unusually wide knowledge in the field of natural history. Many voyages in boyhood to far-away countries with his master-mariner father were, in his case, good preparation for the work he was to do, and to which, in fact, he was very early inclined.

It is fifty years since I found him in charge of the extensive work of preparing museum exhibits then going on in Ward's Natural Science Establishment. Whether the French preparateurs were engaged in osteological, taxidermal or other lines, they all submitted loyally to his judgments, as he explained his criticisms in their own language.

A score or more of well-known naturalists who found their way to Rochester at different times as amateurs are indebted to him for useful training in museum methods.

His genius in that direction was strongly developed. Although most of them, like Lucas himself, had common-school education only, they eventually secured recognition in the field of natural science.

While college training undoubtedly has its advantages, the young man who knows what he wants to do and is persistent can make headway without it. Lucas believed in manual training. His skill with small tools and his drawing were excellent. Angling was his favorite outdoor recreation, and the rods he made himself were the equals of those sold in the shops. He helped me mount my first tortoise, and for separating carapace from plastron, quickly riveted a small saw blade in the handle of a toothbrush, making an instrument that has been serviceable for light sawing purposes ever since. Humorous and kindly as he was, those who worked with him can not forget his ever-ready helpfulness.

He went to the National Museum in 1882, where notable exhibits in osteology, paleontology and the results of other labors as curator remain as his monuments. His work as curator-in-chief of the Brooklyn Museum, to which he was called in 1904, was distinctly that of an up-builder.

Recognized as an ideally equipped museum officer by reason of his curatorial successes, he was called in 1911 to the directorship of the American Museum of Natural History, where many instructive installations bear witness to his scientific knowledge and good taste. It is important to note that his associates everywhere greatly valued his opinions.

There was another side to the character of Dr. Lucas which we find of greater interest than the official positions he so ably filled. Stevenson says—to quote from memory—if a man love the occupation that supports him, the gods have called him. In-

tensely devoted to his daily work and his natural history studies, Dr. Lucas dwelt under a happy star. Since he had a taste for the best literature and was naturally studious and decidedly gifted as a writer, his published papers remain as permanent contributions to the subjects he strove earnestly to elucidate.

He took many an effective shot at scientific errors as they flew, without anybody's feelings being hurt by his marksmanship. He had a genial way of winning out in his controversies.

During the late nineties, while he was my neighbor in Washington, his regular evening occupation was the preparation of zoological articles for Johnson's "Universal Cyclopaedia," then being published in eight volumes. Having had this work within reach ever since, I find it easy to testify to the value of his contributions thereto.

While his writings are to be found chiefly in scientific journals and government documents, he provided two books for the publisher—"Animals of the Past" and "Animals Before Man in America."

We were associated in the fur-seal investigations of 1896-97 in Bering Sea, where Dr. Lucas undertook anatomical studies having an important bearing on certain matters of international controversy, with the result that vital claims made on the American side were substantiated.

He greatly enjoyed the prolonged struggle over the Bering Sea question, and exclaimed again and again, "We shall beat them on that point." Commenting on the way that matters already well disposed of wouldn't stay put, he quoted, "Per aspera ad astra," and provided an additional demonstration.

We have known no more gifted critic in the field of museum effort. Few curators can point to more illuminating labels than those he wrote by the hundred.

Since these lines are written at sea, with no opportunity to look up his scientific papers for comment, it is impossible to make this sketch what it should be.

CHAS. HASKINS TOWNSEND

NEW YORK AQUARIUM

SCIENTIFIC EVENTS

SOIL EROSION

MR. HUGH HAMMOND BENNETT reports to the U. S. Department of Agriculture that more than 513,000,000 tons of soil are being washed out to sea each year from the farms of the United States, and the Mississippi River system alone is responsible for 428,000,000 tons.

Mr. Bennett states that this is a minimum estimate for the Mississippi. More comprehensive methods of measurement devised recently indicate that

these figures do not allow adequately for the heavier material carried along the bed of the river. Neither does this estimate take into account the fact that a great deal more material is washed out of the fields than ever reaches the sea. Much is stranded on the way and causes inconvenience to man by creating sandbars, filling up river channels, covering fertile fields with flood *débris* and the like.

This continuous and heavy loss of the soil on which the very food supply of the nation depends is a most important problem that has to do with the use of our most vital resource—the land. To confine the menace within the bounds of reasonable safety will tax the best efforts and ingenuity of the nation.

Terracing the fields, contour ploughing and cultivation, wise forestry management, the conservation of forestry or grazing of sharply sloping lands that are sure to wash away if cultivated, and scrupulous attention to gullies while they are small to prevent enlargement are parts of the answer to this problem. The problem is so important that it demands the best cooperative effort of engineers, of chemists and physicists among the soil scientists and of practical farmers.

On the basis of the chemical analysis of nearly 400 surface soils it may be estimated that the amounts of material washed away from the fields of the country each year contain not less than 126,000,000,000 pounds of plant food. This is a loss about twenty-one times the annual net loss of plant food taken out of the fields by all the crops that are harvested. In a soil depleted of one or more of the elements of plant food essential to growth, it is usually possible to supply this in the form of fertilizer. But when the soil has been washed away the use of fertilizer is not effective. Measured on the basis of chemical analysis, the value of the phosphorus, potassium and nitrogen contained in the material washed from the fields each year would cost something in excess of \$2,000,000,000 if purchased at current market prices for the cheapest commercial carriers of these three essential plant foods.

GIFTS FOR THE STUDY OF DEAFNESS

GIFTS amounting to \$91,080, bringing the fund for research into the causes and methods of preventing deafness up to more than a quarter of a million dollars, have been announced by Dr. Arthur B. Duel, chairman of the board of trustees of the American Otological Society. This is half the amount which the society proposes to raise before July 1 in order to continue the studies started under a grant made by the Carnegie Corporation.

The research to which this fund is to be applied is being conducted by otologists in different medical

and educational institutions throughout the country, including the Harvard Medical School, Northwestern University Medical School and the Massachusetts General Hospital. A central bureau for direction of the research has been opened at the New York Academy of Medicine.

In commenting upon the importance of the investigation which the society hopes to make with this fund Dr. Duel said that the wide prevalence of deafness and the social and economic handicap it places upon a patient make this medical problem a particularly acute one. It has been estimated by some authorities that one out of every twelve persons suffers from some sort of ear affection.

The quarter of a million dollars which has been contributed or pledged to date includes a number of conditional gifts which will only be paid if the goal of half a million is reached by mid-year. One of these is a sum of \$100,000 promised by Mr. Edward S. Harkness.

All the gifts are to become a part of the permanent fund of \$2,500,000, which will be devoted to the study of diseases and affections of the ear in the hope of discovering methods of dealing with the problem of chronic progressive deafness.

The names of those whose recent contributions to this fund were announced include: Miss Isabel Valle January, \$25,000; The Lillia Babbitt Hyde Foundation, \$25,000; Mrs. Clarkson Cowl, \$6,000; Mrs. William H. Moore, \$5,000; Felix Warburg, \$5,000; George F. Baker, \$2,500; B. M. Baruch, \$2,500; Mr. and Mrs. Pierre S. du Pont, \$2,000; James D. Black, \$1,000; Dr. Ogden M. Edwards, Jr., \$1,000; Mrs. Frank C. Lowden, \$1,000; Mrs. Richard March Hoe, \$1,000; Mrs. John G. McCullough, \$1,000; Dr. and Mrs. Lewis R. Morris, \$1,000; Mrs. Herbert N. Straus, \$1,000; Miss Gertrude S. T. Thomas, \$1,100; Miss Emma C. Watkins, \$1,000; Mrs. Walter O. Whitecomb, \$1,000.

THE EINSTEIN BIRTHDAY CELEBRATION

THE fiftieth birthday of Professor Albert Einstein was the occasion of a celebration in New York City on the evening of April 16. The celebration was held under the auspices of the Jewish National Fund and the Zionist Organization of America. Messages were received from President Hoover, the Earl of Balfour and from the leading universities of America.

President Hoover was represented at the meeting by Ray Lyman Wilbur, Secretary of the Interior, who made the principal address. Other speakers included Mayor Walker, Count F. W. von Prittwitz, German Ambassador to the United States; Louis Marshall, Nathan Straus, Rabbi Abba H. Silver, Dr. John Haynes Holmes, Emanuel Neumann, Morris