sake and not infrequently made important discoveries of new substances whose presence had been indicated by the use of his precise analytical methods. Thus, for example, he isolated the interesting sulfur-containing compound "thiasine" from blood corpuscles and later identified this substance with ergothioneine, which had hitherto only been encountered in ergot. In similar fashion he was led to the isolation from blood of a beautifully crystalline compound of uric acid and ribose, and the guess may be hazarded that this totally novel discovery gave him as much personal satisfaction as any of his other investigations. Benedict's work in the field of metabolism covered an extensive range. Many fruitful investigations were carried out on glycosurias of various types and on the creatine-creatinine problems, while his work on the relation of the kidney to ammonia formation and excretion was stimulating and distinctly upsetting to the currently accepted doctrines. For a long time Benedict was associated with the Memorial Hospital in New York City and in conjunction with his old pupil Sugiura was responsible for a vast amount of useful information concerning the influence of various chemical and other agents on the growth of tumors.

In 1920 it became necessary for various reasons to find a new home and new managing editor for the *Journal of Biological Chemistry*. The home was provided through the generosity of Cornell University Medical College, and in spite of considerable hesitation, Stanley Benedict, who had long been one of the journal's most distinguished contributors, was at last persuaded to accept the managing editorship. The personal sacrifice involved was immense, but until the day of his death he gave of the very best that was in him to further the interests of the journal and the science that it represented. In this labor of love he was ably supported by Miss Smalley and her devoted associates. Probably few people except editors know much of the never-ending grind and human difficulties entailed in the successful editing of a scientific journal. The *Journal of Biological Chemistry* has indeed been fortunate in this respect, and Benedict has set a standard that will not easily be surpassed. He was an editor who really edited and was not content to pass for publication indifferent material simply because it happened to originate from individuals or institutions of standing. To some extent he had Samuel Johnson's dislike of impairing the clarity of expression of his views or judgments by surrounding them with a sugar coating of innocuous words. He was direct, forceful, tenacious in argument, but absolutely unswayed in his judgments by any consideration other than the facts as he saw them. His intimates knew that under a somewhat stern exterior he was the kindliest and friendliest of men, with a keen sense of humor and a very charming smile. Indeed, Benedict was always susceptible to a little innocent raillery and would go more than half way to meet a joke. On one occasion in early days when as editor he had decided, against the views of at least one of his colleagues, to amputate a good many of the final "e's" that terminate the names of so many biochemical compounds, a solemn request as to whether he proposed similarly to abolish the final "e" in the name of his patronymic liqueur "Benedictine" brought an immediate suspension of operations.

Few men had less desire for honors than Benedict. He was a member of the National Academy of Sciences, a past president of the Society of Biological Chemists and received many other notable distinctions, all of which he bore with a refreshing lightness.

He was born in Cincinnati on March 17, 1884, son of Professor Wayland Richardson and Anne Kendrick Benedict. His father was professor of philosophy and psychology at the University of Cincinnati. His maternal grandfather was A. C. Kendrick, professor of Greek, Hebrew and Sanskrit at the University of Rochester and a member of the American committee for the revision of the King James version of the Bible. He graduated from the Universities of Cincinnati and of Yale, and taught at Syracuse University and Columbia University before going to Cornell University. In 1913 he married Ruth Fulton, of Norwich, N. Y., a well-known ethnologist, who survives him. He had also three sisters, each of whom has achieved professional distinction.

Benedict's memory will long be cherished by his university, by the journal he loved and served so devotedly, and by his many colleagues and friends, who found in him a source of both stimulation and good fellowship.

H. D. DAKIN

GRAFTON ELLIOT SMITH

SIR GRAFTON ELLIOT SMITH was so well known and had so many friends and colleagues in this country that some comment on his life and personality and his contributions to science may be acceptable, even though SCIENCE does not usually print obituary notices of foreign men of science.

With regard to his childhood and youth, not long ago he told one of his recent students that when he was a very young boy he began to collect fossil ferns, which were found near his birthplace at Grafton, New South Wales, Australia. When about fourteen years old he attended an evening lecture on the brain, in which the lecturer described the complexity of the convolutions of the human brain and added that many of these convolutions did not even have names or definite boun-

daries. He resolved not only to give them names but to discover their functions.

After studying anatomy and medicine at the University of Sydney, N. S. W., he took up the practice of medicine in that province. At that time, as he said, his youth protected him from having many patients, so he was free to collect the wonderfully primitive egg-laying and pouched mammals of Australia, to dissect them and to study the construction of their brains. His observations in this field were both original and important and led to the publication, chiefly in the leading English scientific journals, of a series of papers on the structure and evolution of the brain of the duck-bill (*Ornithorhynchus*) and other primitive or archaic mammals, including the South American edentates. In many cases he succeeded in showing that there was a definite relationship between the peculiar mode of life of the animal and the development of certain parts of the brain.

He left Australia to accept a fellowship at the University of Cambridge, and after two years was called to Cairo, Egypt, to become professor of anatomy at the Government Medical School. It was during this period that he extended his studies to the brains of primates, beginning with the lowly lemurs of Madagascar and Africa and working upward through the series to the "spectral tarsier" of Borneo, the marmoset and other monkeys of South America, the macaques and other Old World monkeys, finally to the anthropoid apes and man.

As a result of these and later studies, he gained an increasingly penetrating insight, first, into the progressive complications of the main regions of the brain during the course of evolution from fish to man and, second, into the relations between special areas and groups of brain cells on the one hand and particular responses on the other.

Since the elder Huxley was always his ideal, he spared no pains to translate even the most technical results into diagrams and simple descriptions which people of intelligence could readily comprehend, and no one who was ever privileged to hear him lecture would be likely to forget the experience.

At Cairo, his friend Professor (later Sir) Flinders Petrie soon plied him with delightful anatomical puzzles presented by the mummified remains from the tombs of the ancient Egyptians. Here his studies of the skulls and skeletons soon showed that the earlier Egyptians, who had narrow skulls, had been invaded at a certain period by a round-skulled people of Asiatic and more or less Armenoid appearance. The Egyptian embalmers took care to preserve the heart, kidneys and other organs separately and then to replace them within the body, and Professor Elliot Smith found that after certain restorative measures had been applied these ancient tissues could be sectioned, stained and studied under the microscope. This proceeding enabled him to hold post-mortem examinations on the bodies of persons who had been dead for several millennia. Moreover, he found that in certain cases the embalmers had made serious mistakes, transposing or omitting certain organs and presumably causing some rather embarrassing situations in the world of shades.

Almost in spite of himself, Elliot Smith extended his interests from purely anatomical fields to widening circles of cultural anthropology and it was indeed on this side of his career that he was best known to the world at large.

From Cairo he returned to England to occupy the chair of anatomy at the University of Manchester. For the past fifteen years he was head of the department of anatomy of University College, London, and there continued his work on the comparative anatomy of the brain but found time to write a whole series of books and papers in defense of his theory that civilization had originated in Egypt and had spread thence through Asia Minor and Persia to India, China and eventually to Central and South America. On this last topic he encountered the unanimous opposition of leading American archeologists and ethnologists, who maintained that in the case of at least the more advanced native American civilizations there is the most detailed and cumulative evidence of their having attained their peculiar cultural characteristics exclusively in the Americas, so that such resemblances as they do show to certain Old World cultures, as, for example, in the use of the truncated pyramid, the idea of the feathered serpent, the practice of mummification and the like, have more probably arisen independently in the New and Old Worlds through parallel or convergent development, that is, through similar reactions to similar situations, originating in the basic identity of human desires, motives and mentality the world over.

Elliot Smith took an active part in the study and discussion of the fossil Piltdown skull, the *Pithecanthropus* of Java, the *Sinanthropus* of China, as well as the *Australopithecus* of South Africa, the "Lady of Lloyds," and other fossil human crania. In these fields he sometimes contested the conclusions of his life-long friends, Sir Arthur Keith and Dr. Eugen Dubois, the discoverer of the *Pithecanthropus,* but the resulting discussions were invariably important, especially as aids in the sifting out of errors due partly to incomplete preservation of material.

Elliot Smith drew to his laboratories a notable assemblage of students and junior colleagues, among

whom may be mentioned: Davidson Black, the describer of the Peiping skull (*Sinanthropus*); Raymond Dart, describer of the *Australopithecus* of Taungs, South Africa; Wingate Todd, the well-known anatomist of Cleveland, Ohio; Frederic Wood-Jones, author of "Man's Place among the Mammals"; W. E. Le Gros Clark, author of "Early Forerunners of Man"; H. H. Woollard, author of monographs on the brains of *Tarsius* and other primates; H. A. Harris, now professor of anatomy at Cambridge University; Joseph Shellshear, formerly professor of anatomy at Hongkong University; D. E. Derry, of the Government Medical School at Cairo, Egypt; W. J. Perry, of the Section of Cultural Anthropology, University of London; John Beattie, Conservator of the Museum of the Royal College of Surgeons, London; Una Fielding, who, it is to be hoped, will complete and publish Elliot Smith's text-book of anatomy, and many others.

It is well known among his students and associates that Elliot Smith freely gave stimulating suggestions and ideas to those around him and gladly assisted them in the testing and development of both his own and others' problems. He was also admired and influential among English zoologists and vertebrate paleontologists, who followed his work, especially on the evolution of the brain, with keen interest. His work in cultural anthropology, although far more widely known, will not, in the opinion of many of his colleagues, constitute so enduring a monument to his memory as will his studies on the comparative physiology and evolution of the human brain.

On the side of public service, Elliot Smith was for many years the trusted adviser of the Rockefeller Foundation, which sent him on special missions to the United States, England, Egypt, China and other countries. It was doubtless due partly to his advice that the Rockefeller Foundation gave its powerful backing to the sciences of anatomy and zoology in all these countries.

In personal appearance, at least in his later years, Sir Grafton Elliot Smith somehow suggested the best portraits of George Washington. In his lectures there was a certain polish and grace joined to an intense sincerity and becoming modesty. He loved to tell jokes on himself, of which he had a choice collection. To him science knew no national boundaries and both as a man and a scientist his genial influence was felt in many countries, especially Australia, England, Canada, Holland, the United States and China.

WILLIAM K. GREGORY

AMERICAN MUSEUM OF NATURAL HISTORY

RECENT DEATHS AND MEMORIALS

DR. JULIUS O. STIEGLITZ, professor of chemistry and chairman of the department at the University of Chicago, died on January 10, in his seventieth year.

DR. FREDERICK V. COVILLE, botanist of the U. S. Department of Agriculture, with which he had been connected since 1888, died on January 9. He was sixty-nine years old.

DR. DAVID FRASER FRASER-HARRIS, secretary of the faculty of medicine of the University of Birmingham, England, and formerly professor of physiology at Dalhousie University, Halifax, N. S., died on January 3 at the age of sixty-nine years.

DR. R. F. C. LEITH, until his retirement in 1919 with the title emeritus professor of pathology and bacteriology at the University of Birmingham, died on December 14 at the age of eighty-two years.

LIEUTENANT COLONEL SIR DAVID SEMPLE, specialist in tropical disease, died on January 8. He was first director of the Pasteur Institute in India. On his retirement in 1905 he accepted service under the Government of India to organize the Central Research Institute of India. He was eighty years old.

Nature announces the following deaths: Sir Herbert Jackson, formerly director of the British Scientific Instrument Research Association, on December 10, aged seventy-three years, and Dr. A. A. Robb, author of works on aspects of relativity, on December 14, aged sixty-three years.

MEMORIAL exercises in honor of the late Julius Arthur Nieuwland were held at the University of Notre Dame on Sunday, January 10. Religious exercises took place in the morning. In the afternoon the program was presided over by the Rev. Francis J. Wenninger, dean of the College of Science, University of Notre Dame. Speakers taking part in the ceremonies and their subjects were as follows: "Father Nieuwland the Botanist," Dr. Marcus Ward Lyon, Jr., formerly assistant curator, U. S. National Museum; "Father Nieuwland the Chemist," William Stansfield Calcott, director, Jackson Laboratories, E. I. du Pont de Nemours and Company; "The Energy Balance of Star Systems," Dr. Arthur Haas, professor of physics, University of Notre Dame; "The Vanishing Floras of Northeastern America," Brother Marie Victorin, professor of botany, University of Montreal; "A Relativistic Theory of Atomic Structure," Dr. George David Birkhoff, Perkins professor of mathematics, Harvard University, and "Large Molecules in Science and Life," Dr. Hugh Stott Taylor, David B. Jones professor of chemistry, Princeton University.