OBITUARIES

Dr. W. F. P. McLintock, C.B.

WILLIAM FRANCIS PORTER MCLINTOCK, formerly director of the Geological Survey of Great Britain, was born in Edinburgh on February 2, 1887, and was educated at George Heriot's School and the University of Edinburgh. He graduated in 1907, with special distinction in botany, in a remarkable science class of a dozen students which yielded two directors of Geological Surveys (Heron of India was the other), two principals and one professor in Dominion universities, and two heads of departments in the Indian Civil Service.

Following a Civil Service examination in mineralogy, McLintock was appointed assistant curator in the Museum of Practical Geology. Four years later, in 1911, he was promoted to take charge of the geological galleries of the Royal Scottish Museum; and when the Geological Survey and Museum was reorganized in 1920 under the directorship of (Sir) John S. Flett, he returned with Flett from Edinburgh to London, this time as curator. The Museum and Library at 28 Jermyn Street, built in 1851, had long been a reference centre for economic geologists and mining engineers, and a rapid growth of the collections there reflected McLintock's ever-helpful advice to the many that sought it.

In 1927, the Royal Commission on Government Museums recommended the transference of the Museum of Practical Geology to South Kensington, and under Flett's direction McLintock spent the following years in planning the new Museum. His clear-cut and revolutionary ideas on the need for a popularization of geology found small support in a tour of European institutions and met with little encouragement in some academic quarters at home; but a happy co-operation with H.M. Office of Works enabled him to achieve his ideals when the Geological Museum was opened to the public in 1935, at the centenary of the Geological Survey. Nothing in recent years has done more to promote the study of geology in Britain. From an attendance of 18,000 a year in Jermyn Street, the annual number of visitors soon soared to more than 250,000 and to-day exceeds 300,000.

When war came, the Museum was taken over as headquarters of the London Civil Defence Regional Organization, and the collections and library were in part dispersed to the country. McLintock, then deputy director of the Geological Survey, became responsible for the administration of the Survey's war effort, initiating departments dealing with raw materials for atomic energy, exploration geophysics, underground storage of petroleum, and other strategic fields. By 1945, when he succeeded as director, he had plans fully prepared to meet the heavy tasks of re-organizing the Survey on a much-expanded peacetime programme and rapidly restoring the Museum to public service. On completion of this work he resigned in October 1950.

McLintock's publications include a variety of papers on Cornish and Devon minerals, and on the zeolites of Mull; a model account of the Strathmore meteorite, the flight of which he himself observed from an Edinburgh street and which he acquired for the national

collections the next morning: a guide to the Geological Museum's collection of gemstones, now in its third edition; and a petrographical study of unusual pseudo-igneous rocks collected by him in Persia, which were shown to be sediments fused in the combustion of oil and gas seepages long since extinguished. In a long and fruitful collaboration with Dr. J. Phemister, he organized and carried out pioneer gravitational and magnetic surveys at many localities in Britain, to demonstrate the usefulness of geophysical methods in geological exploration.

Many will recall the brilliance and pungency of his conversation, the precision of his long memory, the independence of his judgment, and the sharpness with which he devastated all that was hollow and unsound; but perhaps those colleagues who shared with him the long night watches in war-time London appreciated best his unswerving loyalty to the Geological Survey and unselfish devotion to the interests of its staff. He died suddenly in Edinburgh on February 21, following a happy decade of retirement, with his wife, in the Perthshire countryside.

C. F. DAVIDSON

Prof. S. A. Mitchell

PROF. SAMUEL ALFRED MITCHELL, formerly director of the Leander McCormick Observatory, died in his eighty-sixth year at Bloomington, Indiana, on February 22. Born at Kingston, Ontario, he graduated at Queen's University, Kingston, in 1894, took a degree at Johns Hopkins University and became instructor and professor of astronomy at Columbia University. In 1912, he was appointed director of the Leander McCormick Observatory, Virginia, a post that he held until his retirement in 1945.

His chief work there was the determination of stellar parallaxes by photographic methods. He was a member of the Commission on Stellar Parallaxes of the International Astronomical Union from its foundation and followed Schlesinger as chairman of the Commission in 1928. He was also a member of the Commissions on Variable Stars, Solar Physics and Solar Eclipses. He was chairman of the last-named Commission from 1935 until 1950 and remained a member of it until 1958.

It is for his work on eclipses and on his speciality throughout, the chromospheric spectrum, that Mitchell will be best remembered. He went on ten eclipse expeditions—four in the United States and one each in Sumatra, Spain, Norway, Niaufoou (or Tin-can Island), Canton Island and Canada; in only three cases were the eclipse observations entirely spoilt by clouds—California in 1923, Norway in 1927 and Canada in 1932. Probably he saw the corona on more occasions than any one else. His book "Eclipses of the Sun" gives an account of his experiences.

Mitchell received the Watson Gold Medal of the U.S. National Academy of Sciences and was elected an associate of the Royal Astronomical Society in 1933, shortly after he had become qualified by naturalization as a citizen of the United States.

Thereto hangs an amusing story. When he married he was still a Canadian, and according to the law of the United States at that time his wife became a Canadian. Later he became naturalized as an American citizen, but the law had meanwhile been altered and the wife's nationality no longer followed her husband's; Mrs. Mitchell remained a Canadian under United States law but became American under British law. Later, wishing to visit her son, who was studying in England, she had to be naturalized as an American citizen in order to get a passport to come to England!

F. J. M. STRATTON

Dr. George A. Edwards

GEORGE A. EDWARDS, associate research scientist in micromorphology, at the Division of Laboratories and Research, New York State Department of Health, died in Albany on March 1, at the age of forty-six.

Dr. Edwards was a graduate of Tufts University 1939, and received his Ph.D. in biology from Harvard University, 1947. Prior to going to the New York State Department of Health in 1956, Dr. Edwards had been professor of general physiology, co-ordinator of research, and co-founder of the Marine Biological Laboratory, University of São Paulo, Brazil, from 1952; he was a corresponding member of the Brazilian Academy of Sciences.

In the Second World War, Dr. Edwards was aviation physiologist attached to the Air Force in the development of equipment for high-altitude flying and survival techniques for air-sea rescue. Dr. Edwards did extensive research on nerve and muscle physiology, pharmacology, and morphology. His recent publications in electron microscopy included also studies of the ultra-structure of several dimorphic pathogenic fungi and the micromorphology of human bronchogenic carcinomas.

NEWS and VIEWS

Physics at Liverpool: Prof. J. M. Cassels, F.R.S.

PROF. J. M. CASSELS has been appointed to the Lyon Jones chair of physics at the University of Liverpool in succession to Prof. H. W. B. Skinner, who died in January. Prof. Cassels was educated at Rochester House School, Edinburgh, St. Lawrence College, Ramsgate, and Trinity College, Cambridge. Although best known for his many contributions to high-energy physics, his earliest work was performed at the opposite extreme of the energy-scale in nuclear physics when he carried out an elegant and painstaking research in the scattering of very slow neutrons by solids, using the Cavendish Laboratory cyclotron in collaboration with R. Latham. His introduction to high-energy physics was at the Atomic Energy Research Establishment, Harwell, where he worked with the 175-MeV. protons of the synchrocyclotron between 1949 and 1953, producing many papers on nucleon-nucleon scattering and high-energy nuclear interactions. From there he moved to the bigger synchrocyclotron at Liverpool, first as a lecturer and in 1956 as professor of experimental physics. His main research interests were now in pion physics, and he built up a strong group working in this field. He was elected to the Royal Society at the early age of thirty-four. In 1959 he took an appointment at Cornell University with R. R. Wilson, where he has been using the 1.2-GeV. electron synchrotron in electron scattering experiments. He was closely associated with CERN during its earliest days, and has maintained close contacts with high-energy physics at the Atomic Energy Research Establishment and the Rutherford Laboratory.

Metallurgy at Leeds:

Prof. J. Nutting

PROF. J. NUTTING, who succeeds Prof. N. J. Petch (see *Nature*, 183, 1643; 1959) in the chair of metallurgy in the University of Leeds, was educated at Mirfield Grammar School, Yorkshire (1935-42), and then at the Department of Metallurgy, University of Leeds (1942-45), where he was awarded the degree of B.Sc. with first-class honours in metallurgy. During the period 1945-48 he worked under the late Prof. Preece on the overheating and burning of steel and was awarded the degree of Ph.D. in 1948. He

then went to Cambridge and worked for one year in the Cavendish Laboratory as a scientific officer for the British Iron and Steel Research Association and there joined with Dr. V. E. Cosslett and Prof. E. Orowan on the development of techniques for applying the electron microscope to metallurgical problems. In 1949 he became a demonstrator, and in 1954 a University lecturer, in the Department of Metallurgy, University of Cambridge. For the past twelve years he has worked on problems of phase changes in both ferrous and non-ferrous alloys and on the relation between phase changes and mechanical properties of alloys. He has been particularly interested in electron microscopy and its application to these problems of alloys. He has travelled and lectured widely at scientific conferences and in 1951 was awarded a Nuffield travelling fellowship to visit Canada and the United States.

A New British Computer

ON April 6 there was demonstrated in London the first commercially built British digital differential analyser. This machine, the *Corsair*, has been produced as the result of the joint activities of the Royal Aircraft Establishment, Farnborough, and Semiconductors, Ltd. The differential analyser as such is an old device, but the use of digital circuits to perform the operation of integration has infused it with new life and accuracy. The main attraction of a differential analyser, considered as an analogue device, is that it performs continuous operations such as integration at a much higher rate than is possible with a programmed digital computer. Analogue computing elements are, however, inaccurate, and it is difficult to attain precisions of more than about 1 per cent. The digital differential analyser overcomes this trouble by reducing the integration to digital summation, because this can be performed simply and at very high speed. In digital circuits accuracy is no problem, so that the *Corsair* is able to attain an accuracy of better than 0.01 per cent, which quite outclasses purely analogue devices.

The new computer uses about 2,000 transistors of which nearly 700 are of the surface barrier type, the characteristics of which permit the direct current