

an interesting account of the oceanic food chain, while Dr A. Nyberg, director-general of the World Meteorological Service, expands on the possibilities of a universal weather service.

The second section, on the adaptation of man to his environment, includes essays on contraception, hallucinogens, gerontology and reanimation, while the third section discusses nuclear reactors, real time computers in medicine and bionics. The composition of the fourth section, which aspires to cover problems of research and development, may give some ground for surprise. In reviewing the period in question many might include on their list of interesting advances topics from cosmology, oceanography, molecular biology, immunology and particle physics. The editors have selected none of these topics; instead they have included in their limited space an interesting but not primarily important article on melanin, two articles on photochemistry and a discussion of the lattice energy of ionic crystals. If the articles here selected are intended to represent the major themes of contemporary interest, the editors' judgment would seem to be seriously awry. For which reason this is probably the least satisfactory section of the book; its best piece, which does not properly belong to it, is a discussion of the conservation of works of art and the restoration of those damaged in the Florence floods.

The next section, devoted to the mathematics, logic and philosophy of science, is a praiseworthy attempt to cover a not particularly tractable subject. But the value may well be questioned of including an essay on the theory of distributions which almost inevitably will lose the non-mathematical reader in its first few paragraphs. The last section of the book, "The Politics of Scientific Research", discusses the science research policies of various countries, excluding the USSR, more by way of description than analysis, and without attempt at serious comparison. The newspaper style articles which begin the book are perhaps an artificial but certainly successful means of conveying to the general reader some of the immediacy of science.

In substance the book contains a wide variety of attractively presented information, is well planned except in its fourth section, and is excellently produced. But although the publishers presumably know their business, it is hard to see for what class of reader the book is intended and by whom it will be bought. Its price puts it beyond the shelves or coffee table of most individuals, and librarians may consider that it is not a work of reference, because it does not attempt to give an inclusive coverage of its chosen field. The clarity of a publisher's intentions may always be questioned when it is left to the blurb writer, not to the editor in his preface, to state the purpose of a book, and such is the case with *Scienza e Tecnica 68*. The volume will apparently be "useful both for the specialist who wants to find an authoritative account of current research in fields other than his own" as well as for the general reader. In the English speaking world at least, this purpose is more topically and cheaply covered by the relevant scientific magazines, and even among readers of Italian the only buyers on impulse may be those who already possess the parent encyclopaedia, to which indeed the articles in the book are copiously referenced.

N. M. L. WADE

career in biochemical research which spanned only 16 years but sufficed to establish him as an internationally recognized authority on the mechanism of biological electron transport.

Redfearn was educated at Wallasey Grammar School, which he left in 1943 to join the Royal Air Force. Early work with airborne radar, and later service as a flight sergeant instructor in the education branch, confirmed him in his resolve to devote himself to science, and provided him with an understanding of electronics which was to stand him in good stead in his later work. On demobilization in 1947 he spent a short period in industry before entering the University of Liverpool in 1948; he gained his B.Sc. with honours in biochemistry in 1952. Working under the supervision of Dr J. Glover on the biogenesis of vitamin A and retinoic acid, Redfearn took his Ph.D. in 1954 and was appointed to a lectureship at The Queen's University, Belfast, where he continued and extended this work. His return to a lectureship at Liverpool in 1957 coincided with the discovery, by Professor R. A. Morton and his colleagues, of coenzyme Q (ubiquinone). Redfearn's interest in this work was immediately aroused and he developed methods, which are still widely used, for the isolation and characterization of the oxidized and reduced forms of the various quinones. His work was instrumental in establishing ubiquinone as a physiologically important electron carrier and in defining its site of action.

In 1962, Redfearn was appointed to a senior lectureship in biochemistry at the University of Leicester. Here his teaching experience and enthusiasm proved most valuable in developing the newly established department and in planning for the move and integration of that department into a separately housed school of biology. In 1964, the University of Leicester conferred on Redfearn a personal professorship; in the same year the University of Liverpool awarded him the D.Sc. degree.

In recent years, Redfearn's interests in ubiquinone and plastoquinone had widened into a general study of energy transductions in living systems. This was stimulated partly by two extended periods of work with Dr Britton Chance at the Johnson Foundation of the University of Pennsylvania and one with Dr Tsao E. King at Oregon State University, and partly by his collaboration with a lively group of research students and postdoctoral fellows who were attracted to join him at Leicester. Of particular note was the work which established rotenone as a specific inhibitor of mitochondrial NADH-oxidase, and the elegant elucidation of the two pathways by which electrons pass to separate terminal oxidases in *Azotobacter vinelandii*. At the time of his death, Redfearn was turning his attention to photosynthetic bacteria; his most recent and uncompleted work provides evidence that the structure of chlorobium quinone requires to be modified.

Eric Redfearn was a dedicated scientist, a loyal colleague and a delightful companion. His untimely death will long remain a source of sorrow to all who were privileged to know him.

H. L. KORNBERG

Dr H. M. Muir-Wood

HELEN MARGUERITE MUIR-WOOD, for more than thirty years one of the leading authorities on the phylum Brachiopoda, died as the result of a stroke on January 16, little more than a month before her seventy-third birthday.

Born in Hampstead, north London, she took her first degree at Bedford College in 1918 and later studied under Professor E. J. Garwood at University College, London, where she developed an interest in Middle and Upper Palaeozoic rocks and their brachiopod faunas.

In 1919 she was employed as a part-time curator in the department of geology (now the department of palaeontology), of the British Museum (Natural History), and the following year she accepted the position of assistant with full charge of the Brachiopod collections, a

OBITUARIES

Professor E. R. Redfearn

ERIC REGINALD REDFEARN, professor of biochemistry at the University of Leicester, died on March 6 in a road accident which also took the life of his elder son. Redfearn's death, at the tragically early age of 43, ended a

post she held, with appropriate promotions, until her retirement in 1965 at the age of seventy.

During a full working life Helen Muir-Wood produced more than fifty memoirs and papers on all aspects of the Brachiopoda including a monograph on the Carboniferous Productoids and memoirs on the Jurassic and Palaeozoic faunas, not only of Great Britain, but of India, Sikkim, Malaya, Irak, Persia, Palestine and Somaliland. She held office as a member of the Council of the Geological Society of London, the Palaeontographical Society, the Ray Society and the Systematics Association.

Although her chief research interests included the morphology, systematics and evolution of the Lower Palaeozoic to Recent genera, she became particularly well known in the thirties for her pioneer work in establishing a classification of Mesozoic genera and species on their internal structures which were ascertained by transverse serial sections. This technique, hitherto used only broadly by a few continental workers, provided the first major step forward in the understanding of the evolution and morphological variation of the group, replacing the somewhat arbitrary methods adopted by S. S. Buckman.

Some of the early research work in connexion with her ideas on the classification was made possible by an award of the Lyell Fund which was presented to her by the Geological Society in 1930. On the completion of this work and in respect of her earlier publications, she received the degree of Doctor of Science from the University of London in 1934.

During the Second World War, from 1942 to 1945, she served in the secretariat of the Admiralty at Bath and although this took her away for a time from her palaeontological researches, she managed to maintain an interest by collecting fossils from beds of the Great Oolite Series exposed in the Bath-Bristol district.

After the war she returned to work at the British Museum (Natural History), continuing her researches on Middle and Upper Palaeozoic genera. In 1950 she agreed to joint authorship, with Dr G. A. Cooper of the Smithsonian Institution, Washington, on a work exclusively on the Productoid genera and for this purpose visited the United States on two occasions. The result of this collaboration appeared as "Morphology, classification and life habits of the Productoidea (Brachiopoda)" in 1960 and was quickly recognized by brachiopod workers as being one of the greatest contributions to the study of the phylum. It was largely as a result of her researches in connexion with the publication that she was invited by the American editorial board to contribute, supervise and partly edit the Brachiopoda section for the *Treatise on Invertebrate Palaeontology*. This tremendous undertaking required a concentration of both mental and physical resources second to none, but despite this she willingly accepted the additional post of deputy keeper of the department of palaeontology, British Museum (Natural History) in 1955, involving herself with a host of administrative problems which she discharged with consummate skill and her usual thoroughness. This appointment, previously held only by a male member of the department, counted for more than a major triumph in her life, for her views were distinctly those of a feminist. These views may have been strengthened by her early difficulties in establishing herself in what had always been a strictly masculine profession.

In recognition of her services to geology, Helen Muir-Wood received the coveted distinction of the Lyell Medal which was presented to her by the Geological Society in 1958.

Always sympathetic to the younger worker, Dr Muir-Wood will be remembered for her wise counsel by numerous enthusiastic research students, many now prominent names in this field of research themselves. Aware of the many pitfalls associated with the systematics of the group, she was always keen to guide the unwary newcomer to safe ground with liberal understanding and kindness.

ELLIS OWEN

University News :

London

DR J. E. HOULDIN, senior lecturer at Chelsea College of Science and Technology, has been appointed to the chair of electronics tenable at that college and Dr Richard Croese, reader at St. Mary's Hospital Medical School, has been appointed to the chair of physiology tenable at that school. The title of professor of bacteriology (infectious diseases) has been conferred on Mr D. A. Mitchison in respect of his post at the Royal Postgraduate Medical School.

Nottingham

DR J. W. BARRETT, research director of Monsanto Chemicals Ltd., has been appointed special professor of industrial chemistry, and Dr S. Shone, senior administrative medical officer of the Sheffield Regional Hospital Board, has been appointed special professor of medical administration.

Announcements

THE Nuffield Foundation has awarded its first travelling fellowship in tropical marine biology to Dr E. R. Trueman, senior lecturer in zoology in the University of Hull. He will work at the University of the West Indies, Jamaica, and intends to investigate aspects of the littoral and sublittoral fauna of the island.

THE Institute of Physics and the Physical Society have awarded the Maxwell Medal and Prize jointly to Professor K. W. H. Stevens, professor of theoretical physics at the University of Nottingham, and Dr R. J. Elliott of the University of Oxford.

THE following medals were awarded at the spring meeting of the Optical Society of America: the *David Richardson Medal* to Dr H. E. Edgerton of the Department of Electrical Engineering, Massachusetts Institute of Technology; the *1968 Adolph Lomb Medal* to Dr D. C. Sinclair of Spectra-Physics, Inc., Mountain View, California.

Meetings

ELECTRON Microprobe Analysis, July 31–August 2, Chicago (D. R. Beaman, The Dow Chemical Company, 241 Building, Midland, Michigan).

PROGRESS in Overhead Lines and Cables for 220 kV and above, September 16–20, The Institution of Electrical Engineers (The Conference Department, The Institution of Electrical Engineers, Savoy Place, London, WC2).

ERRATUM. In the announcement section of the March 23 issue of *Nature* (217, 1192; 1968) it was incorrectly stated that Professor W. Morgan was director of the Lister Institute of Preventive Medicine. The director is Sir Ashley Miles and Professor Morgan is deputy director.

ERRATUM. By an unfortunate misunderstanding in the *Nature* office, a number of references in the paper, "Late DNA Synthesis in Heterochromatin" by A. Lima-de-Faria and Halina Jaworska (*Nature*, 217, 138; 1968), were incorrectly quoted. The following changes should therefore be made. Page 138, column 1, reference 1 should be 1–3, references 2, 3 should be 4, 5; column 2, references 4, 5 should be 6, reference 7 should be 7–11. Page 140, column 2, reference 43 should be 44, 45. In the first line of Table 2 on page 140, the references 4, 57 should in each case be replaced by 4, 5, 52. In Table 3 on the same page, reference 44 in the first line should be 45 and reference 69 should be 44. In the last line, the group of references 29–43 should be 29–31, 34–38, 40–43; in the same line, references 42, 43 and 70–72 should be 70, 71, 42, 43, 35. On page 141, column 1, the group of references given as 2, 52 should be 4, 5, 52. Lower down, reference 55 should be 55, 56. In column 2, reference 57 should be 57–59.