All in all, this is an impressive and comprehensive collection of papers which document very thoroughly the recent progress in this brave new field. The enterprise of Edinburgh University in fostering many of the developments reported has been amply rewarded, and Professor Michie is to be congratulated on the success of his vigorous initiative in building up his own group and also organizing these very successful conferences. STANLEY GILL

MACHINE PROGRAMMING

Basic Machine Principles

By J. K. Iliffe. (Macdonald Computer Monographs.) Pp. 86. (Macdonald: London, 1968.) 25*s*.

THIS book, like others in the series which I have examined, has been prepared with great care and introduces a great many technical details of machine code programming in a lucid manner. There is no doubt that the book will be useful to that class of person defined by the author: ". . . of primary interest to logic designers and programmers who occupy themselves with the boundary between the 'hard' and 'soft' parts of a computer". Because of this I would suggest that the title chosen for the book implies a far greater "hard" bias than the book has.

My difficulty in giving unconditional praise for this book lies not in the presentation of its material but in the principle adopted. Though there are advantages of introducing a hypothetical language for a hypothetical machine, these are outweighed, in my view, by the practical disadvantages to most readers of having to learn a system which they can never use. I think one learns far more from the experiences (often bitter) of putting programs through a computer than from a great deal of theoretical study. For this reason, study of the symbolic machine code of a common computer series is more practicable. But here is the author's dilemma. He is clearly dissatisfied with conventional computers and has proposed in his basic machine one which attempts to overcome some of their limitations. This will appeal to logic designers and software design programmers. For them the proposals and the very explicit sections on, for example, executive functions and virtual stores and paging are most valuable. The world will benefit if manufacturers make use of some of these ideas in the design of future machines, but by adopting this approach the author has produced a specialist book for a minority class of reader. This he has done extremely well.

R. J. ORD-SMITH

Obituaries

Dr H. W. Parker

DR HAMPTON WILDMAN PARKER, CBE, formerly keeper of zoology at the British Museum (Natural History), died on September 2 at the age of 71. He was a distinguished authority on herpetology.

Born, the son of a schoolmaster, at Giggleswick in Yorkshire, he was educated there and at Christ's Hospital and then served on the battlefields of France in the First World War. In 1919 he went to Cambridge with a natural sciences scholarship. He graduated with a first class in botany, zoology and chemistry, and in 1923 joined the staff of the British Museum (Natural History) to succeed Boulenger in charge of reptiles and amphibians.

Parker's numerous publications during the twenties and thirties were in two main categories: zoogeographical, that is, reports on the reptiles and amphibians of certain regions, usually based on collections of particular expeditions, and taxonomic monographs. His most important monographs were that on Microhylidae (1934) and his revision of the Australasian frogs of the family Leptodactylidae (1940). The amount of detailed and critical work that goes into this type of monograph is little understood by the general zoologist. The formal descriptions of species, the "synonymies" and the nomenclature itself contain highly concentrated factual and theoretical information. It is at the same time a work of reference and a working hypothesis, and Parker's monographs were of high quality.

Parker's work was interrupted by the Second World War, during which he was seconded to an administrative post in the Admiralty. On his return to the Museum, in spite of new responsibilities as head of the Department of Zoology, he found time for further systematic work, which was enlivened by interpretative discussions. He felt a little sore that his own university did not recognize systematic work as qualifying for its doctorate, and it may have been for this reason that he submitted a thesis to the University of Leyden, where taxonomy was appreciated. For a taxonomic and zoogeographical study of "The Snakes of Somaliland and the Sokotra Islands" (1949) and a lively "disputation" on the species concept he was awarded a doctorate by that university. His philosophical position was further exemplified by his contribution to a symposium on "The Species Concept in Palaeontology", published by the Systematics Association.

Parker made an excursion into ichthyology when in 1947 he went with Dr Harrison Matthews to the Isle of Soay in the Hebrides to study the great carcasses of the basking shark brought in by a fishery that Gavin Maxwell temporarily conducted there. Later he collaborated with Dr Boeseman to throw light on the probable inactivity of this shark in our waters during winter, when it sheds its long gill-rakers and so deprives itself of the means of filtering plankton, which at any rate is deficient in these latitudes in winter. After his retirement he helped Dr F. C. Stott to investigate and interpret basking shark material caught off the coast of Ireland. These studies have provided the greater part of our knowledge of the life history of *Cetorhinus maximus*.

Although he did no such original bionomic research for the group he was particularly interested in, Parker published in 1963 a much appreciated book on snakes treated as living animals related to their natural environments. Here his logical thinking and lucid style were deployed successfully in popular exposition.

Correspondence

Is Botany Dead?

SIR,—In 1964 at the tenth International Botanical Congress I made the point, that clearly needs reiteration, that botany is so far from dead that we now take almost for granted the services of plant physiologists to the study of crop growth; of mycologists and plant pathologists to the constant protection against fungi and bacteria of food growing in the field or kept in storage, and that we have accepted or almost forgotten that the origin of the vast new industry of weed control by selective herbicides was in the botanical study of the natural growth substances of plants. If the role of botany in the great areas of plant technology remains in doubt, let us recall how the leading research posts are commonly held by scientists who were trained as botanists, for example, the professors of agriculture in Oxford and Cambridge, and the heads of Rothamsted Research Station, the National Institute of Agricultural Botany and the Scottish Institute of Plant

Breeding from the Cambridge Botany School alone. Other botany departments continue to make similar contributions at all grades to the research staffs of institutes and teaching organizations throughout agriculture, horticulture, forestry and fisheries. It is not that botany is dead, but that the grossest ignorance prevails in the general public and even in scientific circles of what modern botany is like and what its achievements have been. Nor, of course, is it appreciated how greatly the subject has been modernized or the extent to which, both in teaching and research, botany courses regularly involve the most sophisticated physicochemical and mathematical techniques. This can be appreciated only by visiting laboratories and lecture rooms to see modern courses in full swing (and few opinions are based on such visits), but it can also easily be seen by examining the leading journals of botany, such as the *American Journal of Botany*, the *New Phytologist* or the *Annals of Botany*. It is at once apparent that most of their papers have a strongly experimental and quantitative approach and reflect the manner in which botanists today have adopted physicochemical and mathematical techniques, and clearly base their approach on discovery and evaluation of the causative mechanisms and processes involved in plant life.

The old mainspring of the subject, the elucidation of conjectural evolutionary origins by comparative studies of anatomy and life histories is now taught at more reasonable length, and in every area of research, even including taxonomy, modern experimental methods are making strong headway. Furthermore, although botanical journals reflect the fact that botanists are sharing in the advances of molecular biology at the biochemical and biophysical level, there is a large and growing interest in the biology of the whole organism, and of the whole organism in relation to its environment. The importance of this approach for the applied biological sciences, such as agriculture, horticulture, forestry and fisheries, needs little emphasis, but the realization of it is shown by such things as the successful inauguration of the new *Journal of Applied Ecology*, following the *Journal of Animal Ecology* and the *Journal of Ecology* by the British Ecological Society. It is equally apparent throughout the whole of the current International Biological Programme.

So long as one believes that the study of the whole organism is bound to have an increasing role in the future, one is committed, I believe, to the maintenance of the long established departments of botany and zoology, where the integration of many fields of research has long taken place around the whole plant and the whole organism. There are such tremendous repositories of important scientific information within the areas of these two old established subjects that there would be irretrievable loss in merging them into new schools of biology exploiting for the moment nothing but the most fashionable new approaches. It is impossible to forecast where in animal or plant biology the next breakthrough will occur and from what branch of enquiry, probably long dormant, growth will be stimulated by some new technique, new evidence or new mode of thought. Without the maintenance of the libraries, museums and, above all, the synthesizing courses centred on the whole plant or the whole animal, it would be difficult, if not impossible, for these new advances to arise, nor without an approach of this breadth will new generations be given awareness of the whole biological environment in relation to the life of man.

Yours faithfully,

H. GODWIN

Botany School,
Cambridge.

This letter refers to two articles in the November 9 issue of *Nature*, one on page 521 and one on page 541.—Editor, *Nature*.

Monod at Edinburgh

SIR,—Your correspondent, reporting on Professor Monod's address at Edinburgh in your issue of November 23 (*Nature*, 220, 744; 1968), produces, or repeats, a misquotation when he refers to my old definition of molecular biology as follows: "quoting Chargaff's 'chemistry without a licence'—". Lest this inferior version gain currency, may I quote what the "Old Chemist" really said in the dialogue *Amphisbaena* (Essays on Nucleic Acids, p. 176): "My definition, incidentally, would be that molecular biology is essentially the practice of biochemistry without a licence.".

Yours faithfully,

ERWIN CHARGAFF

Columbia University,
New York, NY, 10032.

University News

Dr F. Glockling has been appointed to the chair of inorganic chemistry at the **Queen's University of Belfast.**

Dr P. L. Marsden has been awarded a personal professorship in the Department of Physics at the **University of Leeds.**

Professor L. Brent, Southampton, has been appointed to the Pfizer chair of immunology tenable at **St Mary's Hospital Medical School, London.**

Appointments

Mr W. A. Cumming has been appointed director of the Radio and Electrical Engineering Division of the **National Research Council of Canada. Dr A. E. Douglas** has been appointed director of the council's Division of Applied Physics.

Announcements

The following medals have been awarded by the **Royal Society**: the **Copley Medal** to **Professor T. Reichstein,** formerly of the University of Basle, for his work on the chemistry of vitamin C and his studies of the corticosteroids; the **Rumford Medal** to **Professor D. Gabor,** Imperial College of Science and Technology and CBS Laboratories, Stanford, for his contributions to optics, especially by establishing the principles of holography; the **Davy Medal** to **Dr J. W. Cornforth,** Milstead Laboratory of Chemical Enzymology, and to **Professor J. G. Popják,** University of California, for their work on the elucidation of the biosynthetic pathway to polyisoprenoids and steroids; the **Darwin Medal** to **Sir Maurice Yonge,** University of Glasgow, for his contributions to evolutionary biology, particularly of the Mollusca; the **Hughes Medal** to **Professor F. J. Dyson,** Institute for Advanced Study, Princeton, for his work in theoretical physics, especially on quantum electrodynamics.

A Cooperative Institute for Research in Environmental Sciences has been established on the Boulder campus of the University of Colorado to promote research and teaching in these sciences, and to serve as a centre for multi-disciplinary collaboration between research workers from Boulder and the rest of the world. A visiting fellowship programme provides funds to enable scientists working in the fields of solid-earth geophysics, oceanography, radio propagation, upper and lower atmosphere physics and solar terrestrial relationships to spend a year with CIRES. Further information can be obtained from the Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Colorado 80302, USA.