problem requires a system tailored to the special demands on it and the need for further experiment was admitted. Where machines have been used, it seems too early to generalize on their merits or demerits, and consideration of the replacement of the human brain by a machine in a system of retrieval only emphasized the need for any machine to have a good master.

Panel 5 discussed the organization of information for storage and retrospective search. There were twenty preprinted articles in this section, many dealing with the classification or coding of information in specialized fields, in such a way as to enable mechanical retrieval. Words were regarded as being too imprecise for large-scale mechanical information retrieval, and it was suggested that a rigorous mathematical theory of systems should be sought for future development. Further study was proposed of language and the nature of communication—a multi-stage process with the interplay of ideas in a highly unorganized state. In the meantime, the solution of narrow practical problems seemed the more profitable line of advance. Even with a high-speed machine of long memory, the intellectual problem of searching the literature will remain. Machines require careful programming, and it was stated that all they can achieve is to do clerical work more quickly.

Panel 6 concerned itself with the possibility of a general theory on the organization of information for storage and retrospective search. This gave rise to a great deal of discussion, and for those who are expert in one or more systems this may well turn out to have been a profitable occasion, for it appeared that no existing theory can be directly applied, and much more experiment, discussion and thought will be necessary before a general theory can be evolved. The greatest difficulty is to provide for the interaction between the inquirer and his information sources; thus, any general theory must accommodate the learning process and the consequent need to modify itself continuously. It seems likely that, with so much interest in the subject, something constructive may emerge within the next few years.

Panel 7 covered a wide range as it discussed the responsibilities of governments, scientific societies, universities and industry for improved information services and research. The Panel took an early opportunity of pointing out that the only indispensable person in the whole subject is the scientist, and that through his societies he is the principal maker and user of scientific information. Scientific

societies should, if possible, be self-supporting in the publication of original work, but any help required in the secondary information services should have government support, as scientific information is a national resource. As a user, the specialist usually organized his own search, and it was suggested that universities might encourage, more than is done at present, young research workers in learning how to use the literature of their subject as well as how to produce it by the better writing of their papers. Scientific societies might encourage authors not only to submit abstracts but also provide key index words to facilitate the editing of abstracts and indexing.

Nowadays some national governments are large-scale users and producers of information and have responsibilities for its proper distribution. This varies from the small country with a relatively recent acquaintance with scientific research, where information services receive their main support from international agencies, for example, from Unesco through a regional office, to large scientifically advanced countries where national funds are provided on a large scale and where government agencies provide a plan for stimulating and supporting scientists and engineers in dealing with information problems. Whatever method is employed, the whole-hearted co-operation of those who produce the information is necessary.

In the international field the work of the Abstracting Board of the International Council of Scientific Unions was cited as a good example of co-ordination of existing services. The Panel was not in favour of trying to establish an international scientific information centre at present, but rather favoured the co-ordination of national services, for example, through national library services. The trend should be towards more national centres and more international co-ordination. A statistical survey of the economics of the various types of national centres would be helpful in this connexion.

There were no formal conclusions of the Conference, but hopes were expressed that some more formal international organization might follow, possibly through national academies of sciences. Whether this happens or not, the participants in this International Conference on Scientific Information were stimulated by attending it, and it will not be surprising if they in turn stimulate further action towards a renewed consideration of the many and growing problems of scientific information services in their respective countries. That those concerned in the United States are active is obvious.

D. C. MARTIN

OBITUARIES

Sir Hubert Wilkins

THE death occurred in New York early in December of Sir Hubert Wilkins; he was seventy years old. He will be remembered as a pioneer both in arctic and in antarctic travel.

Wilkins first visited the Arctic as second-in-command of Vilhjalmur Stefansson's Canadian Arctic Expedition which went north in 1913. Wilkins remained a member until 1917 and during these years he became expert in travel on arctic pack-ice. He himself, however, was always keener on air travel and was probably the first man to fly in the Antarctic. His flights in the Arctic, after more than

one attempt, culminated in 1928 in an adventurous journey from the north of Alaska to Spitsbergen, for which he received the Founder's Medal of the Royal Geographical Society. His arrival in the latter region stirred the people of Great Britain as no other arctic flight had done. He wrote an exciting dispatch describing the journey for *The Times*; it was one of the best travel reports ever written.

An important feature of Wilkins's explorations was his work as a naturalist. He made collections in Australia; and he joined Shackleton on the *Quest*, for example, as a collector of natural history specimens. Wilkins was also in the Antarctic with

J. L. Cope in 1921 along with T. W. Bagshaw and M. C. Lester.

One of his most spectacular proposals, however, was his putting forward the idea of taking a submarine under the arctic pack-ice, and by the effort which he made with Lincoln Ellsworth in 1931 he was thus anticipating the successful voyages made by a later *Nautilus* in 1958.

One of Wilkins's earlier associations with Lincoln Ellsworth had led to an important flight across a sector of Antarctica in December 1928. On this occasion a message reached Britain from Wilkins, who was on board ship, that Ellsworth had got into difficulties after reaching the edge of the Ross Barrier together with his pilot, Ben Eielson. This led the British Colonial Office to arrange that the *William Scoresby* should be diverted at short notice to the Antarctic, and Ellsworth and Eielson were picked up without difficulty.

Wilkins, on these flights in December 1928, had stated that Graham Land was insular. This led to much confusion at the time and attempts to identify places in Graham Land such as Stefansson Strait and Crane Channel. The matter was not cleared up until the Rymill Expedition began surveys in 1934. Wilkins had, in fact, regarded as straits what in reality were glaciers. At the time, however, Wilkins's claims to have discovered 'Hearst Land' and 'Stefansson Strait' were a source of controversy.

Hubert Wilkins was one of the earliest explorers of the air age, and his picturesque figure with his short, trim beard made him well known and popular in the United States, where he had made his home.

J. M. WORDIE

Prof. Florence A. Mockeridge

FLORENCE ANNIE MOCKERIDGE, emeritus professor of botany in the University College of Swansea, died on December 18 at the age of sixty-nine.

Florence Mockeridge studied first at Woolwich Polytechnic (Penfold gold medallist) and then at King's College, London, as a Merchant Taylor's Company Scholar. She graduated with first-class honours in the Pass B.Sc. in 1909 and again in the Honours B.Sc. in 1910 and was awarded the Carter Gold Medal of King's College. During 1911-17 she undertook research with Prof. W. B. Bottomley, first as a Layton Research Student and later with grants from the Board of Agriculture and Fisheries. During this period she was engaged upon pioneer studies on nitrogen fixation by *Azotobacter* and on the growth-promoting substances ('auximones') of natural manures. Her published researches in this field led, in 1917, to the award of the D.Sc. (London). During 1917-22 she was successively demonstrator and University lecturer in botany at King's College and, continuing her researches, demonstrated the presence in natural manures of nucleic acid degradation products, including the purine bases, and examined their growth-promoting activities.

In 1922, Dr. Mockeridge was appointed independent lecturer in botany in charge of the Department of Biology of the newly established University College of Swansea. Here, in improvised accommodation and with a very small staff, she built up, over a period of thirty-two years, the reputation of the honours degree in botany and directed the work of a succession of research students. Her outstanding ability as a teacher and her scientific achievements in the face of inadequate facilities and often indif-

ferent health were recognized by her election in 1936 as the first professor of botany in the College. She long pressed for the establishment of separate Departments of Botany and Zoology, and when, shortly before her retirement in 1954, this was to become possible by the decision to erect a new Natural Sciences Building (*Nature*, 179, 124; 1957) she planned the new facilities with great care and wisdom in full knowledge that their use would be for her successors.

Prof. Mockeridge also played a big part in the development of the University College, being dean of the faculty of science during 1933-35 and again during 1941-43, vice-principal during 1949-51 and, for many years, treasurer of the Student's Representative Council. She took a deep personal interest in the welfare and continuing progress of her students, whose affection and respect for her were recently expressed by their presentation to the Department of Botany of her portrait in oils.

She was always much sought after as a lecturer all over South Wales. For many years she was editor of the *Proceedings of the Swansea Field Naturalists' Society*. On her retirement she became chairman of the Science Committee of the National Museum of Wales and a member of the Gwent Hospitals Management Committee.

H. E. STREET

Sir Ralph Pearson, C.I.E.

RALPH SNEYD PEARSON, who died on December 8, aged eighty-four, was educated at the Royal Indian Engineering College, Coopers Hill, and joined the Indian Forest Service in 1898.

After service as a territorial forest officer in the Bombay province, he was posted to the Forest Research Institute, Dehra Dun, to take charge of the recently formed Economic Branch in 1909. Until 1920 he had to work largely single-handed, devoting special attention to the adoption by the railways of antiseptically treated sleepers to relieve the heavy demands on the supply of naturally durable timbers. He also surveyed the possibility of using bamboo for paper-making on a commercial scale.

In 1920 the Economic Branch was much enlarged by the formation of several sections dealing with special aspects of the utilization of forest products, and Pearson was sent to Canada and the United States to recruit specialists to take charge of some of them. It was then that the results of the work he had done before and during the First World War began to gain the general acceptance they have since received with great benefit to Indian industry.

In 1925 he retired from the Indian Forest Service and returned to Britain, where he was appointed director of the new Forest Products Research Laboratory (Department of Scientific and Industrial Research), which he built up very much on the lines of his branch at Dehra Dun. There he remained until 1933, when he had to retire for reasons of health.

He was made C.I.E. in 1920 and was knighted in 1933; he received the honorary degree of LL.D. of the University of St. Andrews.

The author of several monographs on various forest products, his chief work was "The Commercial Timbers of India", written in collaboration with the late H. R. Brown, of the New York State College of Forestry. He was a good shot and a very keen cricketer who was always very popular with his staff.

He married Constance Ommaney, who died in 1938, and he is survived by two sons and a daughter.

W. A. ROBERTSON