

authorities. The Institute has found it necessary to instal its own electrical generator to ensure a constant supply, and steps are being taken in co-operation with the University of Tehran to put into operation a liquid-nitrogen plant.

As regards staff, the CENTO region countries have understandable difficulties in releasing good scientists to work at the Institute. Partly this is because trained scientists are in great demand in their home countries, and partly because of financial difficulties; the latter will, it is hoped, be surmounted. Technicians and junior laboratory staff are also hard to find, and there is a great need to train people for such jobs, as well as to overcome the social attitudes that tend to deflect people from them. The Institute offers training especially in electronics under D. R. Cockbaine, chief electronics engineer, and it is to be hoped that the CENTO countries will take full advantage of the opportunity; electronics servicing is an essential part of a nuclear science programme.

On the financial and administrative side, the Institute has a fair degree of autonomy within the broad lines of policy laid down for it. The finances are largely centralized in a single budget, from which all expenses are paid according to the Institute's own rules (which are based on those of the CENTO Secretariat);

this avoids the complications of having to deal with the separate regulations of four different Governments.

Certain aspects of the Institute's work presuppose co-operation with a national atomic energy authority. Any operation involving possible release of radioactivity outside the Institute itself may come in this category. The Institute's insect-labelling project is the most important immediate example, and waste disposal is another which will arise in the future (for the present all radioactive waste is stored). Relations have therefore been established with the Atomic Energy Commissions of the three countries of the region.

The immediate success of the Institute encourages the hope that it will become established as a scientific centre of high reputation in the Middle East. Its character may change somewhat, as the atomic energy programmes of Iran, Pakistan and Turkey get under way, and they begin to conduct their own radioisotope courses. (For Iran and Turkey especially, these will have the advantage of being in their own languages.) The future trend at the Institute may then be towards more specialized training and towards research projects. The benefits should be felt in many fields, owing to the wide ramifications of nuclear science.

OBITUARIES

Prof. E. P. Stebbing

PROF. E. P. STEBBING, whose death at the age of ninety occurred on March 21, must have surpassed the now almost legendary Sir William Schlich, whose pupil he was, both in the number of years he presided over a forestry school, and in the number of forestry students who passed through his hands. His influence on forestry was far greater in the educational field than in any other, despite his special interest and numerous writings on forest entomology and soil erosion.

Interest in entomology showed early when he was still under training for the Indian Forest Service at the Royal Indian Engineering College at Coopers Hill. In 1900 he had the distinction of being the first forest officer in India to be appointed to a scientific research post, that of forest entomologist, having served in an executive capacity as assistant and deputy conservator during his first seven years. The post of forest entomologist had only been sanctioned for two years, and was not renewed; but it so happened that the post of superintendent of the Indian Museum at Calcutta was vacant, and Stebbing was given an officiating appointment. When the Forest Research Institute was established at Dehra Dun in 1906 he was the obvious man to deal with entomology, and he worked there as Imperial forest zoologist until his return to Britain in 1910.

During his time in India and Burma he did a remarkable amount of pioneer work, the results being published as *Forest Bulletins* (8) and *Leaflets* (5), and *Indian Forest Records* (3) and *Memoirs* (5), dealing with insects injurious to many of the chief timber species, namely, teak, *Shorea robusta*, *Acacia arabica* and the conifers, as well as with the lac insect. His best-known entomological work is his "Indian Forest Insects of Economic Importance: Coleoptera" (1914). Stebbing's biological work was of a higher standard than his contributions to taxonomy, which obviously did not interest him so much; but in

those days he could scarcely have avoided it since so few of the insects with which he was concerned had been named and described.

In 1910 he was appointed lecturer in forestry in the University of Edinburgh, and nine years later became the first professor of forestry there. He had thus completed more than forty years when he retired in 1951 (*Nature*, 167, 670; 1951).

Stebbing travelled widely, having visited Macedonia (as transport officer during the First World War) and the U.S.S.R., and afterwards many of the British and French Colonies, especially in West Africa. The country of his choice was patently France, and annually from 1921 he took groups of students there for part of their training. He had many friends in the Département des Eaux et Forêts, and just before he retired he was doubly honoured by having the Croix de Chevalier de la Légion d'Honneur conferred on him, and one of the famous ancient oaks in the Forêt de Tronçais named after him.

On the topic of erosion, Stebbing was strongly of the opinion that the administrators were inexcusably slow in taking—or enforcing when necessary—soil conservation measures, by preventing further denudation of vegetation, restricting excessive grazing, and undertaking constructive works. From his writing and speeches on this subject, he might have been considered somewhat of an alarmist, especially as to the rate of the 'advance of the desert' everywhere, though with special reference to the Sahara.

His most enduring publication will undoubtedly be his historical book on the "Forests of India" (1926). It is truly monumental in size, approaching 1,900 pages in three volumes covering the subject in great detail from its beginnings in the 1850's down to 1925. For the third volume covering the period 1900–25, he was able to use freely memoranda prepared for him by a large number of serving officers, but in doing so he drew on his own experience and added his personal views, thereby making the story much more alive

and interesting than it would otherwise have been. He re-visited India and Burma in connexion with this work and was engaged on the preparation of a further volume to bring the history up to 1940 at the time of his death—I recently took over from him the task of completing and publishing it (extending it to the end of the British regime in 1947).

As a teacher, Stebbing had very definite ideas of what was best for his students, and kept as firm a rein on the curriculum as he did on his horse. He always rejected any suggestion of loading up his undergraduate course with more basic science, considering that practical forestry had not yet advanced enough for it to be of any value: his course was accordingly more weighted on the technological side than elsewhere—which might not have been expected in view of his own early specialization. Possibly he was inclined to overstress the model of advanced European practice, rather curiously adding an overdose of engineering and surveying appropriate to India and Burma in the old days.

No account of Stebbing's life would be complete without reference to his personality. Small and spare, he was exceptionally 'tough' both on foot and as a horseman, and remained so until an unusually advanced age. Stories of his walking performances still persist in India, while his equestrian ride from his home in Kent (Romden Castle) to London in 1935 when he was sixty-five was no isolated feat.

During much of his time at Edinburgh, Stebbing had the largest number of students among the four university schools of forestry in the United Kingdom. Many of them had been sent from overseas, and these and many others are serving or have served in the forest services of Britain and all countries of the Commonwealth; in fact, cases could be quoted where the large majority of the officers of the Forest Department were his men. One can safely prophesy that his record will never be repeated, and he will long be remembered in all forestry circles.

H. G. CHAMPION

Prof. E. J. Kraus

DR. EZRA JACOB KRAUS died at Corvallis, Oregon, on February 28 at the age of seventy-four. He was distinguished throughout the United States both for his massive contribution to scientific horticulture and for his flair for friendship with young botanists. He graduated from Michigan State University in 1907 and spent the first eleven years of his academic career in Oregon State College. In 1919 he went from Oregon to the University of Wisconsin; after a few years there he accepted an invitation to a chair in the botany department in the University of Chicago, where he stayed until his retirement in 1949.

The scientific work for which Kraus is remembered is his analysis of the balance of carbohydrate and nitrogen in plants in relation to fruiting. He demonstrated that many crop plants did not bear fruit unless a balance was maintained between these two classes of compounds. Some of his disciples greatly over-simplified his ideas by talking loosely about a carbohydrate-nitrogen ratio (or even a C/N ratio); but Kraus himself always realized that the relation between chemical composition and fruiting was a subtle and complex one, and he was impatient of these facile simplifications. Kraus's ability to diagnose why crops failed to bear fruit was quite astonishing. He showed (for example) how low

yields in the apple orchards in the Hood River valley were due to over-manuring coupled with early pruning. A score of other examples could be cited, where fruit growers were able to improve their yields by controlling the balance of carbohydrate and nitrogen by means of simple horticultural practices: manuring, pruning, ringing and the like.

In Chicago he turned his attention to the anatomical effects of plant growth hormones, and (during the War, when he was attached to the U.S. Department of Agriculture) to the use of hormone-like chemicals for weed control; in both these fields he did important work.

But in the memories of hundreds of students Kraus will survive as a man rather than as a research worker. His influence on the graduate students who passed through his hands was enormous. It was conveyed through a quiet approach, a slightly cynical modesty, a bubbling sense of humour, and above all an impression that the priority which Kraus put first in his life was to spend time with young men, to talk to them, to travel with them, to pass on to them his enthusiasm for scientific horticulture. He was a capital 'debunker': indeed his interest in applied science and his suspicion of pure science sometimes led him to distrust research which seemed too sophisticated, and the succession of young men who had the privilege of his friendship remember with zest his mocking pragmatism.

Kraus disliked administration and committees, and he retired early (partly on account of illness) to spend the rest of his life doing the work he loved in the place he loved. From 1949 until his death, as a visiting professor of horticulture at Oregon State College, he devoted his time to horticulture, especially to the production of new varieties of chrysanthemums, and to cultivating his friends. He died after a long and painful succession of illnesses.

Kraus received wide recognition for his distinction in American botany. He was president of the Botanical Society of America in 1933 and of the American Society of Plant Physiologists in 1928, and he won many medals and prizes for his horticultural work. Much of his work is inevitably out of date: but his influence on a generation of botanists will endure.

E. ASHBY

Sir Leonard Woolley

CHARLES LEONARD WOOLLEY, who died on February 20, nearly eighty years old, was perhaps the most internationally famous archaeologist of his generation. This reputation was built upon far more than the fact that he best represented the ordinary man's notion of an archaeologist, namely, a digger-up of the lore, but especially the treasures, of antiquity. Certainly this was his life's work, and certainly his successes in it were outstanding. He was constantly in the field (in Egypt, Syria, above all in Iraq), he never belonged to any institution, he never undertook to teach students (except by practical example to his assistants), and he scarcely attempted academic literature in his subject.

Yet even among those few who could have worked so widely and so hard as he, many would have fallen short for want of certain talents which Woolley possessed. First, by some scarcely explicable gift, he could find the most rewarding spot to work, whether it was the choice of Atshanah (the ancient