

Technology. It has been specified that these officers should not only be distinguished academically, but should also have a good background of industrial research.

On March 1, 1948, professional degree courses of four years duration were established in civil, electrical, mechanical and mining engineering. These undergraduate courses are of a type unique in Australia. They are spread over four years and have been organised on a system requiring full-time day attendance at the University of Technology for approximately half the year (March to September), and practical experience of a planned nature in industry for the remainder of the year. A number of industrial and Government departments are interested in this form of training as it provides a means of training their cadets both academically and in the practical aspects of engineering. For this reason they have nominated students to attend these courses, paying their fees and the ordinary cadet rate during their periods in industry. Students' attendance at the courses is also counted as part of their service for seniority grading and salary purposes. In addition, a number of scholarships have been granted with liberal living allowances, particularly from the coal-mining industry, which is anxious to secure skilled personnel.

Additional degree courses in chemistry and chemical engineering were instituted on March 7, 1949. On the same day the first postgraduate course—that of electronic engineering—was commenced. One of the major functions of the new institution will be to provide a wide range of such postgraduate courses. Further degree courses in technology will be established in March 1950.

Students admitted to degree courses at the N.S.W. University of Technology are required to have entrance qualifications at least equal to the standard of the usual university matriculation, and, in addition, mathematics is necessary.

Courses already in operation compare favourably both in subject content and in lecture and laboratory time with courses at leading world universities and technological institutions of the higher range overseas. Every course established to date has been carefully reviewed and approved by advisory committees consisting of competent men in each technological field, comprising the executives of major industries, their chief engineers, and senior educationists from recognized higher educational institutions.

Special features have been introduced in the planning of courses. The first is the extensive practical experience in industry which supplements lecture and laboratory work at the University. For example, engineering students in the new courses gain approximately five months experience in industry each year, this practical work being carefully organised and supervised in every detail. Secondly, there will be in all faculties compulsory courses in language, literature, history, economics and psychology. Such courses will avoid the handicaps which arise from narrow specialization. Graduates will thus be not merely technical experts, but technical experts with a broad understanding of human affairs. The University will offer also the usual social and athletic activities of university life.

A further feature of the organisation of the new University will be the facility available to students already in employment and enrolled in appropriate courses at the technical colleges to transfer at certain stages to degree courses at the University of Tech-

nology. Conversion courses are also being arranged to permit those in possession of technical qualifications from technical colleges and other universities to resume their studies in order to secure the degree or higher degrees of the new University. The first of these courses will commence in 1950. Such facilities, in conjunction with a system of scholarships, living allowances and reasonable fees, will extend the highest form of tertiary education to the large group of capable technical students in New South Wales for whom there are no suitable courses of study at existing universities, or who are debarred from attendance at present courses by reason of economic circumstances.

The incorporation of the New South Wales University of Technology by the State legislature is an event of great importance in the educational development of Australia. The aims and functions of this new institution are similar to those of the world-famed technological institutions in the United States and of the technical universities of continental Europe which have done so much towards the industrial development of their respective countries.

The governing Council of the new University, in the exercise of its functions, will co-operate to the full with the University of Sydney and other universities, the Commonwealth Scientific and Industrial Research Organisation, the Department of Technical Education and other Commonwealth and State institutions devoted to science and research. It is confidently expected that the University of Technology will be accorded similar co-operation by those who are interested in the educational and industrial advancement of Australia.

1946

ACADEMIA SINICA (1928-48)

UNDER the title "Academia Sinica (1928-1948)" there has been published a very readable account of the foundation and work of Academia Sinica, which has its headquarters at Nanking, and of the thirteen associated research institutes. Appendixes give the constitution of the Council and list the administrative and research staff.

Although organised so long ago as March 1941, the Institute of Mathematics was formally established only in July 1947. Its present staff consists of three research fellows and one research associate with junior assistants, and current work covers the theory of series and of numbers, differential geometry, topology, abstract algebra and mathematical statistics. Pending the completion of a new building, the Institute is sharing the rooms of the Institute of Physics at Nanking. The latter Institute was established in March 1928; but moved into its present quarters in 1948. Its seven research fellows, two part-time research fellows and four research associates have been concerned with determinations of the radium content of minerals and of the purity of radium nitrate by physical methods, the radioactivity of minerals and the restoration of ancient bronze pieces; and when equipment is ready, work on the preparation of large single crystals of desired orientation, the mechanical behaviour of very fine single-crystal wires, the behaviour of the lattice of polycrystalline wires, the effect of stress upon residual magnetism and coercive force, and the relation between magnetostriction coefficient and the stress effect of coercive force is projected.

The Institute of Astronomy, founded with Academia Sinica in 1928, is the successor of the Peking Central Observatory, and now controls the Purple Mountain Observatory and the Phoenix Hill Observatory at Nanking and Kunming, respectively. A photometric and spectrophotometric study of the sun, planets and stars with the 24-in. reflector, observations of Cepheids and variable stars with the Ross camera and the astrocamera, and studies on solar activities with the spectrohelioscope are planned. The Institute of Chemistry, also founded in 1928, now occupies part of the former Shanghai Science Institute. Its work has included the ultra-violet absorption spectra of simple polyatomic molecules, the synthesis of compounds related to the sex hormones and the chemistry of fused ring systems, the chemistry of the santonins, and the extraction of alkaloids from native plants and study of their structure. Some of this work has had to be suspended, and that now in progress includes studies of the kinetics of the reactions of alcohols, aldehydes and ketones with hypiodite solutions; phosphatases and the mechanism of their action; the application of the Hofmann reaction; the preparation of local anaesthetics; the effect of ions on the determination of sulphate; the determination of tungsten; the electro-deposition of metals and the determination of uranium in ores rich in columbium and tantalum.

The Institute of Geology, now re-established in Nanking, with eleven research fellows, four research associates and seven corresponding fellows, has explored the mining areas of Hupeh, the structure and tectonic history of the Tsinling range and the Nanking hills, coal-fields and mines in Kwangsi; the stratigraphical development, structure and mineral resources of the Nanking region and the mountain ranges between Szechuan and Kupeh and between Kweichow and Hunan. Quaternary glaciation has been discovered in the Lu-Shan and other areas, and most of the plant fossils collected from Kiangsu and elsewhere have been described; while in geomorphology the Institute has developed a new branch of geology.

The Institute of Zoology was formed in 1944, with the Institute of Botany, out of the Institute of Zoology and Botany organised in July 1934 to succeed the Metropolitan Museum of Natural History established in January 1930. Following these successive re-organisations, the Institute has turned its attention to fish biology, entomology, parasitology, protozoology and experimental zoology, but has not yet resumed work in oceanography. The research staff of the Institute of Botany comprises six research fellows and two research associates, and work in progress includes a survey of higher plants in eastern China, a continuation of the study of higher fungi of China, studies of freshwater Algae in south-western China, plant physiology, forestry, plant morphology and pathology, and cytogenetical studies on wheat, millet and sorghum.

The Institute of Meteorology, which returned to its original site in September 1946, is now engaged entirely in research on climatology, dynamical meteorology and long-range forecasting. A map of magnetic anomalies in south China is in preparation, and some phases of the theory of seismic waves are being studied. The Institute of History and Philology, established at Canton in 1928 and rehabilitated, after successive evacuations, at Nanking in 1946, is organised in four sections, two of which deal with archaeology and with anthropology and ethnology,

respectively. Much of the research work of these sections has already been published.

The Institute of Social Sciences, founded at Shanghai in March 1928, and moved to Nanking in January 1932, incorporated the Institute of Social Research, Peiping, in July 1934, and is now located at Li-Chuang, Szechuan. The staff of six research fellows, two part-time research fellows and four research associates is now engaged chiefly in the study of Chinese economy and finance arising out of war conditions, including a study of the national income of China. The Institute of Medicine, established in March 1944, is at present located at Shanghai, where a physiological unit, an organic chemistry unit (studying citrinin) and biochemical unit are at work, but is still being organised.

The Institute of Engineering was organised in March 1928, and its programme has included research on porcelain, on glass (taken over from the Institute of Chemistry), the metallurgy of iron and steel, timber in Yunnan, the design of internal combustion engines, extraction of cobalt oxide from crude ores, electroplating and plastics. The Institute is still located partly in Kunming and partly in Shanghai. The Institute of Psychology has now returned to Shanghai, where it was originally founded in May 1929, and a new programme of neurophysiological research is being planned in place of the studies in physiological and industrial psychology and comparative neuro-anatomy interrupted by the war in China.

10/6

ENDOCRINE GLANDS IN INSECTS

DURING the past fifteen years it has been proved that the processes of growth and reproduction in insects are controlled by hormones circulating in the blood. In some instances the source of these hormones has been well established. For example, the 'juvenile hormone' present in the young stages, which prevents the premature occurrence of metamorphosis, is a product of the corpus allatum. But there is still much confusion, both in knowledge and in terminology, about the organs which may be concerned in these hormonal mechanisms.

A memoir published recently by P. Cazal* should go far to clarify the subject, at least on the morphological side. This paper, which is abundantly illustrated with simplified anatomical drawings and exact histological figures, deals in great detail with the 'retrocerebral endocrine glands' and the associated sympathetic or stomatogastric system in all the orders of insects. A total of some 130 species of insects has been studied. There is fairly general agreement about the structures comprised within this system; they are the frontal ganglion, the recurrent nerve, the hypocerebral ganglion, the corpora cardiaca (for which Cazal proposes the name 'corpora paracardiaca') innervated from a medial and lateral group of ganglion cells in the pars intercerebralis of the brain, the corpora allata and the associated nerves.

The author subscribes to the analogy, developed by Hanström and others, between the retrocerebral system in insects and the hypophysis of vertebrates. In both we have an ectodermal epithelial rudiment (the adenohypophysis on one hand, the corpus allatum on the other), homologous perhaps with a

* "Les glandes endocrines rétro-cérébrales des insectes (étude morphologique)." By P. Cazal. Pp. 227. (Paris: *Bull. Biol. Fr. Belg.*, Suppl. 32, 1948.)