

(2) From the fringe patterns the precise profile and the actual volume of removed material can be derived. The particular cuts illustrated vary in depth from a half to four light-waves, and all show a high degree of symmetry.

(3) All the figures, in particular Fig. 5c, show that the abrading wheel forms a clean-edged cut with no tendency at all to produce ploughing up at the boundary or distortion beyond the obvious geometrical boundary. The slight rounding at one edge in Fig. 5c may very easily arise either from a minor wobble on the cutting wheel or slight eccentricity.

(4) A most surprising feature is the shallow flatness of all the cuts. The approximate included angle across the minor axis derived by measurement, or, for example, roughly obvious from Fig. 5c when scale differences are remembered, is close to 176° . Yet the included angle of the double conical grinding wheel as measured both before and after grinding is 110° . This striking discrepancy seems to indicate considerable elastic flattening of the conical metal cutting wheel at the cutting edge (with consequent recovery). It is possible that wobble of the cutter contributes to this by broadening the abrasion mark, yet an elastic flattening over only a quite small depth suffices. That the flattening is most violently severe is, of course, clear from the very existence of the fringes, for an included angle of 110° would be an impossibly large angle for showing wedge fringes, particularly with multiple beams. It would be of interest to perform the experiment with a diamond wheel if that were possible; but then the inevitable small radius of curvature would prove prohibitive.

It is thus clear that any direct geometrical method for estimating the volume of the cut based upon the geometry of the recovered wheel will be completely false and liable to very great error. Such a volume estimate can only be made, if required, with the help of interferometry. For routine test purposes, it will be necessary to restrict measurement to the length and breadth of the abrasion unless interferometric procedures are available.

The observations are being extended to include other crystallographic directions in diamonds.

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THE NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY

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AN Act to incorporate the New South Wales University of Technology was approved by the New South Wales Parliament in its third session which terminated during April. The University has been established as a body corporate with perpetual succession and statutory authority to assume responsibilities similar to those undertaken by other Australian universities.

The Act defines the objects of the new University to be: (a) the provision of facilities for higher specialized instruction and advanced training in the

various branches of technology and science in their application to industry and commerce; and (b) the aiding by research and other suitable means of the advancement, development and practical application of science to industry and commerce.

Action is being taken in accordance with the legislation adopted by Parliament to constitute a governing Council to exercise full control over the activities of the new University. The Council will consist of thirty members and be representative of Parliament, industry and commerce, the trade unions, technical education, professional bodies, the University of Sydney, and the teaching staff of the new University, its undergraduates and graduates. Increased representation of the graduate body is to be provided as soon as a sufficient number of graduates have completed University of Technology courses.

The governing Council, under the authority given to it by the Act, (a) may provide courses in applied science, engineering, technology, commerce, industrial organisation and such other related courses as it deems fit, and may, after examination, confer the several degrees of Bachelor, Master and Doctor, and such other degrees and such certificates in the nature of degrees or otherwise as it thinks fit; (b) may from time to time appoint deans, professors, lecturers and other officers and employees of the University; (c) shall have the entire control and management of the affairs, concerns and property of the University; and (d) may act in all matters concerning the University in such manner as appears to it best calculated to promote the objects and interests of the University.

The Council has also been given power to establish and maintain branches, departments or colleges of the University of Technology at Newcastle, Wollongong, Broken Hill, or such other places in the State of New South Wales as the Council deems fit.

Provision is made for the acceptance by the Council of gifts and bequests made to the University. Any land acquired for University purposes is to be vested in the University of Technology. Special investigations may be carried out in any technological or scientific matter at the request of any authority, firm or person, and subject to fees charged by the Council.

A building comprising 21,000 sq. ft. of floor space is being altered structurally to serve as the first research centre of the University of Technology, and a considerable amount of machinery and equipment is on order. Industrialists will be invited to bring their problems to the University of Technology, and it is hoped that a number of research projects will be commenced this year.

The University has already made considerable progress under the guidance of a Developmental Council appointed in August 1947 by the Minister for Education, the Hon. R. J. Heffron. The need for such early development was stressed by the urgent demands for skilled technologists and applied scientists by expanding post-war industry. A decision was accordingly made by the Developmental Council to avail itself of existing technical education facilities until such time as the University of Technology could make use of its own buildings, staff and equipment.

The erection of the first University building is now being undertaken on a large area of land at Kensington reserved for university purposes. Applications have also been invited both in Australia and overseas in connexion with the appointment of professors to occupy eight foundation chairs at the University of

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.

19/6

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.