time, their populations might be expected to oscillate like those of *Lucilia* rather than to grow logistically like yeast populations. The fact that they have not previously been recorded as doing so is only partly due to the paucity of appropriate experiments; for, as the following discussion shows, food limitation may produce other effects, and other kinds of factors may supplement or completely replace competition for food as the dominant controlling agency[3].

Populations of animals with low rates of reproduction may not be inherently oscillatory when controlled by competition for food, for there is evidence[1] that, if *Lucilia* had a power of increase of less than twice per generation, its population would approach the steady density asymptotically. Data obtained in the *Lucilia* experiments also indicated that if larval and adult competition for food operate together, increasing larval mortality, combined with falling fecundity with increasing density, may so check multiplication that little or no overshooting of the steady density occurs. According to the relative intensities of the two kinds of competition, sustained oscillation of reduced amplitude, damped oscillation, or asymptotic population-growth would be produced. It is suggested that such interference between the two oscillation systems caused the stability of the *Drosophila* populations studied by L'Heritier and Teissier[4], for the high larval mortality they record indicates both direct control by food and a high reproductive-rate that otherwise would cause oscillation.

The prompt destruction of starvation-weakened surplus animals by inimical environmental factors can prevent oscillation and limit the population a little below the maximum density permitted by the available food. Predators that cannot readily attack vigorous prey may exercise such control, their own populations then being limited at a level indirectly determined by the food supply of their prey.

When healthy prey are readily attacked by predators, it is the space-property of the food, not nutriment, that is decisive. Thus entomophagous parasites search over the surface of food plants for their hosts, and make these so scarce that barely sufficient can be found by the parasites to maintain their own numbers. The densities of parasites and hosts oscillate both in space and in time, the general level of the hosts being held far below that permitted by available nutriment[5].

Density-dependent reaction to the space-property of food is also dominant in the control of populations of those stored-product insects that have been studied experimentally. Frequency of contact is the critical factor, fecundity falling and egg-destruction increasing with density[6,9]. The fact that near-constant adult populations were obtained in some experiments[7] with *Tribolium*, whereas in others there was marked oscillation[8], is presumably due to fecundity and mortality being affected by population-density in different relative degrees in the experiments (cf. *Lucilia* and *Drosophila*). The oscillations of various amplitudes observed in populations of *Trogoderma*[8], *Gnathoceros*[8], and *Callosobruchus*[9] appear to have a similar underlying cause.

Behaviour reactions of animals may also profoundly affect populations. Thus intra-specific strife induced by dearth of food or of favoured situations, and often accentuated by the territory habit, causes the death of the weaker animals or prevents these from successfully rearing offspring[10], so tending to stabilize populations; whereas mass migration induced by high densities, as with locusts, causes violent long-period oscillations.

Occasionally change in the physical environment is dependent on density. Thus crowding of *Rhizopertha*[11] causes the infested grain to reach a barely tolerable temperature, so limiting reproduction to the replacement-rate; and *Daphnia*[12] populations oscillate because of delayed effects of oxygen depletion or of the accumulation of metabolites.

It is evident from this discussion that populations do not conform to any single pattern, such as the logistic curve; but there is a single dominant controlling mechanism, namely, density-dependent reaction. This governs the general levels of populations, usually in some relation to the availability of food; and it produces stability or oscillation mainly according to the degree of delay between the initiation of reaction and its effective operation.

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NEW SOUTH WALES UNIVERSITY OF TECHNOLOGY

THE laying of the foundation stone of the New South Wales University of Technology at Kensington, near Sydney, took place on Saturday, February 25. In brilliant sunshine, representatives of the Australian universities, accompanied by distinguished visitors, walked in academic procession to the dais, where the foundation stone was set by the Governor of New South Wales, Lieutenant-General John Northcott. The premier of New South Wales, the Hon. J. McGirr, unveiled a tablet commemorating the incorporation of the University by Act of Parliament. The Minister for Education, the Hon. R. J. Heffron, who had been closely associated with the development of the N.S.W. University of Technology since its inception in 1947, also took part in the ceremony.

More than one thousand people attended the ceremony; among the distinguished guests present were Lord Nuffield, ministers and members of both Federal and State Parliaments (the Prime Minister being represented by the Hon. E. J. Harrison, Minister for Defence), the Deputy Premier of New South Wales, the Hon. J. J. Cahill, Minister of Public Works, the High Commissioner for the United Kingdom, a number of other consular representatives and many senior executives and managers of industrial and commercial organisations. Among the university representatives present were Sir Charles Blackburn, chancellor, and Mr. Justice E. D. Roper, deputy chancellor, of the University of Sydney, and Prof. R. C. Mills, chairman of the Interim Council of the Australian National University, Canberra, Sir John Medley, vice-chancellor of the University of Melbourne, Prof. D. B. Copland, vice-chancellor of the Australian National University, Canberra, Prof. G. A. Currie, vice-chancellor of the University of Western Australia, Prof. S. H. Roberts, vice-chancellor of the University of Sydney, Prof. J. J. Stable, president of the Professorial Board, University of Queensland, and Prof. T. Hytten, vice-chancellor of the University of Tasmania.

The president of the University, Wallace C. Wurth, announced three grants made to assist the work of the University. Lord Nuffield had provided, through the Nuffield Foundation, a Nuffield research professorship for mechanical engineering from a grant totalling £25,000 sterling over ten years. Such a research professorship in mechanical engineering is unique in the British Commonwealth, and this is the first occasion on which the Nuffield Trust has endowed a research professorship outside the British Isles. A sum of £15,000 has been provided by the mining companies at Broken Hill towards the provision of senior staff in mining engineering. The Commonwealth Government has approved the allocation of £20,000 over two years to assist the University in research work.

When laying the foundation stone, H.E. the Governor made special reference to the fact that, whereas in the past Britain has shown a lead to the Dominions in most matters, in the establishment of the first university of technology in the British Commonwealth, New South Wales has not only given a lead to the other Australian States, but also to the mother country. This is most appropriate in view of the increasing industrial development of Australia and the status that country now has in the affairs of the British Commonwealth.

An interesting feature of the proceedings was the delivery in turn by vice-chancellors of the Australian universities of messages of greeting to the new University. Mr. A. Denning, director of the University, read a number of messages which had been received from leading world universities and technological institutions overseas. These included greetings from President Killian, of the Massachusetts Institute of Technology in the United States; President Pallmann, of the Zurich Institute of Technology; Sir Edward Appleton, vice-chancellor of the University of Edinburgh; Sir Raymond Priestley, vice-chancellor of the University of Birmingham; Dr. David S. Anderson, director of the Royal Technical College, Glasgow; Prof. O. A. Saunders, professor of mechanical engineering in the Imperial College of Science and Technology, University of London; and Prof. Eric Ashby, vice-chancellor elect, University of Belfast. Messages were also received from Lord Eustace Percy, rector of King's College, University of Durham, and Mr. L. B. Robinson, managing director of the Zinc Corporation Group of industries, London. A personal message was read from Prof. M. L. Oliphant, Poynting professor of physics in the University of Birmingham, who will go to Australia in 1951 as director of the Research School in Physics of the Australian National University. After pledging his co-operation with the N.S.W. University of Technology, he stated that the occasion of the laying of the foundation stone of this institution was an event which may mark the beginning of a revolution in technical education in the British Commonwealth

BRITISH COUNCIL

REPORT FOR 1948–49

It will be recalled that on the opening day of the 1948 Conference of the Universities of Great Britain and Northern Ireland on December 17, 1948, there was some discussion of three resolutions concerned with encouraging the interchange both of young postgraduates and of teachers which had been passed at the Congress of Universities of the Commonwealth in the previous July; Mr. J. F. Foster, secretary of the Association of Universities of the British Commonwealth, had referred to the setting aside by the British Council of a definite sum for travel grants, to be administered by a joint committee of the Committee of Vice-Chancellors and Principals, of the Association of Universities of the British Commonwealth and of the Universities Advisory Committee of the British Council. Later in the discussion, Dr. A. E. Morgan explained briefly how the British Council came into this scheme, which was only a small beginning towards the great Imperial academic travel fund which was really required. For the academic year 1949–50 there would only be available from the British Council a sum of £6,000, obtained by reducing its awards of postgraduate scholarships from nineteen to eight, though Dr. Morgan hoped that this sum might be supplemented by funds from other sources.

The Council's own report for 1948–49* briefly records this development as starting in March 1949, but the analysis of expenditure included is for the year 1947–48, in which £12,136 is shown for travel costs of interchange of university staffs between Commonwealth and other overseas countries and the United Kingdom and £201,844 for scholarships and bursaries generally. Other items of expenditure which may be noted in passing are £34,124 for the work of the Council in general science, agriculture and medicine, £160,512 for books, book exhibitions, British Council publications and overseas press, and £67,730 for the purchase and distribution to Council libraries and other institutions of technical and other periodicals. During 1948–49, the Council awarded 242 new scholarships as compared with 272 in the previous year, and 119 of the latter holders continued during part or the whole of the second year. During 1948–49, sixty-two foreign scholarships for British students were offered by twelve countries through the Council, as compared with thirty-six in 1947–48. The short-term bursary scheme, designed mainly to enable industrial or social workers, technicians, local government officers, etc., to live in Great Britain for three to six months and pursue their normal occupations, developed considerably, and awards were made to 105 bursars from forty countries.

During the year, thirty-two summer schools were held in twenty-two countries overseas, attended by more than 1,600 persons, while summer schools at seven British universities were attended by a further 1,742. Besides this, vacation courses were arranged for overseas students at universities in the United Kingdom, and the Council also provided a special 'introduction course' for Council scholars on their arrival in Great Britain from countries where living conditions are widely different. The value of this student welfare work of the British Council has been since signally recognized by the Colonial Office, which

* British Council. Report for 1948–1949. Pp .147. (London: British Council, 1949.)