

East Africa. Planning to ensure that the most suitable use is made of land is receiving much attention, and in the Gold Coast the swollen shoot campaign continued vigorously. Up to August 1956 more than 14 million acres of land, including 4 million acres of cocoa, had been extensively surveyed in this campaign, and spraying by farmers against capsid made good progress. Spraying against black pod in Nigeria is being intensified, and the acreage lost through cutting out in the campaign there against swollen shoot has been more than made good by new planting. A campaign in Cyprus against the Mediterranean fruit-fly is estimated to have resulted in savings of more than £250,000 in citrus fruit.

Good progress was again made in the execution of development and welfare schemes, expenditure on which rose to just over £17 million, with a further increase of about £26 million in the value of schemes approved during the year. Most Colonial governments have now drawn up plans for the current quinquennium, and it appears that Colonial governments and other public bodies plan to spend £150 million a year on development over the next few years, of which it is hoped to raise £30 million annually from external loans; about £15 million a year from Colonial Development and Welfare funds; and £15-20 million a year from local loans. The continued slump in world prices for cocoa was reflected in a further decline in Gold Coast Government revenues, resulting in curtailed funds for development and a call for economies in day-to-day expenditure, and in East Africa there was a marked fall in revenue from import duties; elsewhere there were no significant changes in the trends of revenue and expenditure. Encouraging increases continued in the volume of air traffic within, to and from the territories, and as a result of the resolution on the need for research in tropical meteorology passed by the 1955 Conference of Commonwealth Meteorologists, arrangements were made for a survey of the research requirements for tropical meteorology, by Dr. A. E. Forsdyke, of the British Meteorological Office.

Of the 4,858 students in the three universities and four university colleges of the Colonial territories, 1,574 were in the University of Malaya, 941 in the University of Hong Kong, 625 at Makerere College and 609 at University College, Ibadan. While these institutions continued to rely mainly on the United Kingdom for new staff, increasing numbers of local candidates were becoming qualified for teaching and administrative posts, and seven promising young Colonial graduates went to universities in the United Kingdom to fit themselves for teaching posts in their own colleges and universities. The Royal Technical College of East Africa, which opened in April, had 250 students for its first full session in October, the Kumasi College of Technology had 607 students and the Nigerian College of Arts, Science and Technology 549.

The emphasis placed on preventive medicine in recent years is reflected in a more stable balance in health programmes, with the community and social approach absorbing a fair share of departmental resources. The pattern of morbidity is veering away from the preponderance of tropical endemic disease to something more akin to disease-incidence ratios in temperate climates and, with the exception of malaria in hyperendemic areas, most of the parasitic diseases are coming under firmer control, tuberculosis now causing most general anxiety. Mass campaigns

against yaws have met with notable success; but although 142 doctors were appointed to Medical Departments in 1956 through the Colonial Office, there were 135 vacancies outstanding at the end of the year. There were no widespread epidemics of the major acute communicable diseases, and in several non-tropical territories there are signs that tuberculosis is being successfully controlled. Recruitment of qualified nurses from the United Kingdom was maintained steadily throughout the year, but vacancies were only decreased from 165 to 102, and the acute shortage of nursing and midwifery tutors is causing anxiety. The training of nurses is still being given the highest priority in all territories. In June the Rockefeller Foundation made a grant of £17,000 to the London School of Hygiene and Tropical Medicine for research into the protein value of tropical dietaries and supplementary foodstuffs.

Of the 12,622 Colonial students in the United Kingdom and Irish Republic, 3,170 were scholarship holders and 3,365 were at universities; 1,295 were studying engineering; 1,075, medicine; 357, science; 308, economics; 117, agriculture; and 112, dentistry. Technical assistance projects in the Colonial territories under the United Nations Expanded Programme of Technical Assistance are estimated to cost 1,271,000 United States dollars in 1957, compared with 1,079,000 dollars in 1956. The report notes that the British teams participating in the international campaign against the desert locust in the Arabian peninsula were requested by the Government of Saudi Arabia to leave the country, and all personnel and equipment have been withdrawn.

## UNIVERSITY GRANTS COMMITTEE

### RETURNS FOR 1955-56

THE annual returns from universities and university colleges in receipt of Treasury grants for the academic year 1955-56, published by the University Grants Committee\*, records an increase of 3,489 in the number of full-time students, which now stands at 85,194, compared with 81,705 in 1954-55, 80,602 in 1953-54 and 81,474 in 1952-53, and it is expected that the number in 1956-57 will show a further and greater increase as the number of full-time students in the autumn term of 1956 was 4,623 greater than in the autumn term of 1955. In the English universities, full-time men students increased by 1,997 and women by 714; for Wales, the corresponding figures were 71 and 61; and for Scotland, 400 and 246. There were 5,536 full-time and 2,068 part-time students from overseas within the British Commonwealth, and 3,750 full-time and 1,756 part-time students from foreign countries; for 1954-55 the corresponding figures were 4,987 and 2,010 for the Commonwealth and 3,617 and 1,594 for foreign countries. Distribution of full-time students among the faculties showed no significant change, an increase from 17,327 to 18,133 in students of pure science representing from 21.2 to 21.3 per cent of all students, and an increase from 10,586 to 11,379 in students of technology, representing 12.9 to 13.3 per cent of the

\* University Grants Committee. Returns from Universities and University Colleges in receipt of Treasury Grant, Academic Year 1955-1956. Pp. 50. (Cmd. 211.) (London: H.M. Stationery Office, 1957.) 3s. 6d. net.

total numbers. Full-time advanced students of pure science numbered 3,399 (34.6 per cent); of technology, 1,538 (15.6 per cent); of medicine and dentistry, 1,015 (10.3 per cent); and of agriculture, 322 (3.3 per cent); 2,832 students were working for the teacher's diploma. Of the full-time students, 67,850 were reading for a first degree, 4,021 for a first diploma, and 12,668 were engaged in research or other advanced work, the corresponding figures for 1954-55 being 64,778, 4,099 and 12,212.

The proportion of assisted students was 74.9 per cent, compared with 72.9 per cent in 1954-55 and 71.9 per cent in 1953-54; for England as a whole this proportion increased from 74.9 to 76.8 per cent; for Scotland it increased from 59.5 to 62.2 per cent; and for Wales increased from 86.6 to 88.5 per cent. For the English universities and university colleges, excluding Oxford, Cambridge and London, 83 per cent were assisted students. The dependence on parliamentary grants was unchanged, the £26,986,519 received in 1955-56 again representing 70.4 per cent of the total income, that from fees increasing from 10.7 to 11.2 per cent, and payments for research from 5.5 to 6.0 per cent. Endowments represented 4.0 per cent, grants from local authorities 2.9 per cent and donations and subscriptions 1.0 per cent; for 1954-55 these figures were 4.1, 3.2 and 1.1 per cent, respectively. The ratio of staff to students continued to improve, the full-time teaching staff now numbering 10,202, compared with 9,810 in 1954-55.

Of the full-time students, 65,779 were in England (15,474 at Oxford and Cambridge, 19,029 at London), 4,626 in Wales and 14,789 in Scotland. Except for King's College, Durham, where the position was unchanged, the increase in students was distributed over all the universities and university colleges, approaching 10 per cent at Nottingham and Southampton. The proportion of full-time students living in colleges and halls of residence decreased to 27.5 per cent, although the total (23,415) was higher. Of those in residence, 8,110 were at Oxford and Cambridge, 12,186 at other English institutions, 1,268 in Wales and 1,851 in Scotland. The proportion of men in residence was 23.3 per cent and of women 40.1 per cent; whereas 38,072 students (44.7 per cent) were in lodgings and 23,707 (27.8 per cent) at home, compared with 42.3 and 29.3 per cent, respectively,

during the previous year. Of the 23,990 students admitted for the first time in 1955-56 (an increase of 6.8 per cent on the previous year), 22,414 were reading for a first degree and 1,576 for a first diploma; of those reading for a first degree, 1,572 were less than eighteen years of age and 12,317 were nineteen or more. Of the full-time students, 37,897 out of 49,790 men and 12,534 out of 15,989 women in England were receiving assistance by way of scholarships, exhibitions or other awards from public or private funds; for Wales, the corresponding figures are 2,866 out of 3,528 men and 1,228 out of 1,368 women; and for Scotland, 6,784 out of 10,715 men and 2,421 out of 4,074 women. Of the 63,763 full-time men students, 36 per cent were in arts, 22.2 per cent in pure science, 16.3 per cent in medicine and 17.6 per cent in technology; for the 21,431 women students, the corresponding percentages are 64.0, 18.4, 13.8 and 0.7, respectively. Medicine and dentistry claimed 51.1 per cent of the part-time advanced students, arts 35.1 per cent, pure science 9.5 per cent, and technology 3.4 per cent, compared with 52.2, 34.9, 9.2 and 2.7 per cent, respectively, during 1954-55.

The recurrent income of the universities and university colleges of Great Britain increased by £2,716,573 to £38,316,651, and in addition to the recurrent grant of £26,986,519 included in this total, the universities received from the Treasury in 1955-56 non-recurrent grants totalling £7,084,366 in respect of capital expenditure. Of the recurrent expenditure of £38,038,270, an increase of 9.3 per cent on 1954-55, 7.0 per cent was spent on administration, 69.1 per cent on departmental maintenance, 12.3 on maintenance of premises, miscellaneous expenditure amounting to 10.5 per cent. The largest increases were in departmental wages (technicians and laboratory assistants) amounting to 14.6 per cent, and in repairs and maintenance of buildings, at 14.7 per cent. Expenditure on libraries (excluding general maintenance of such buildings) increased from £1,352,244 to £1,468,512. Statistics for the expenditure on the libraries of individual universities and university colleges included in the tables of comparative statistics again show how far such provision is from being adequate to meet existing needs, quite apart from coping with the expansion now beginning.

## POLAROGRAPHIC WAVE ANALYSIS

By DR. D. C. MUNRO

Royal College of Science and Technology, Glasgow

**A** POLAROGRAM—the plot of current against potential for a cell consisting of a reference anode and dropping mercury cathode—is most frequently constructed for determination of the diffusion current and hence of the concentration of some molecular or ionic species in the solution surrounding the dropping electrode. The half-wave potential for the reduction wave may also serve to characterize the reducible species. Less commonly, the shape of the wave has been used for determining the number of electrons involved in the reduction process taking place at the dropping electrode. A method is now described for determination of the electron number of the electrode reaction by direct

measurement of the wave slope, and without the laborious graphing procedure used hitherto.

When reactions at the electrode surface are reversible, the shape of a polarographic reduction wave is described by the equation put forward by Heyrovsky and Ilkovic<sup>1</sup>

$$E = E_{1/2} - \frac{RT}{nF} \ln \frac{I}{I_d - I}$$

( $E_{1/2}$  represents the half-wave potential in volts,  $I$  is the current at any point on the wave, and  $I_d$  is the final diffusion current.) Such waves have been analysed by plotting  $\log I/(I_d - I)$  against  $E$  for points on the wave, and the number of electrons is