

Institute and the Rothamsted Experimental Station—and that its close proximity to Harwell continues to be useful in work with radioactive tracers.

One previously neglected area of research is the effect of micro-organisms in the soil on nutrient uptake in root systems. It seems that metabolically active micro-organisms on the surface of roots absorb a great deal of plant nutrient at the expense of the plants, but that nutrient transport in sterile soil is far more efficient, with greater uptake in the centre of the root and more even distribution overall.

At Wantage, radioactive tracers are being used extensively to study nutrient uptake in field conditions, and the comparative efficiency of various types of systems. This supplements work already being carried out on the growth and development of root systems in water culture. One by-product of these studies is a device using the attenuation of beta radiation for measuring the water in soil to a depth of 70 cm. Nylon pads are placed between a radioactive source and a Geiger counter; the attenuation of beta radiation varies with the mass of material between source and counter, so that the water absorbed by the nylon pads can be directly related to the beta radiation recorded at various levels.

Graduates for Industry

Graduates are 20 per cent more plentiful this year than last, but there has been an increase of only 10 per cent in the number of postgraduate grants awarded by the Science Research Council. Professor Brian Flowers, the chairman of the SRC, has said that compared with 1967 there will be between 600 and 1,000 more good quality graduates in science and technology who will not find grants and will be available for industry.

To what extent has industry benefited from this situation? Most companies have now finished their recruiting campaigns at the universities and have made their offers. But final acceptances have not yet been received and it is too early to judge the exact results for this year. The general impression, however, is that the SRC's policy has had little or no identifiable effect on graduate recruitment.

In the words of one veteran recruiter, "Graduates are hungrier this year and there are a lot of social scientists looking for sales jobs". Most companies have seen more people this year but there has been no marked change in quality. ICI has the impression that higher quality graduates are easier to get, but Shell has noticed no difference in quality from previous years. Twenty per cent more graduates applied for interviews with GEC, but this is in part attributable to the favourable publicity brought about by the recent merger with AET. In recent years GEC has noticed a progressive improvement in the quality of electrical and mechanical engineers from certain universities, but it is hard to detect any alteration in this trend effected by the policy of SRC. Ford finds that graduates who had applied for SRC grants are in general of the same quality as those who had not applied.

A more definite change is apparent in the recruitment of postgraduate students. Several companies have received more applications from postgraduates this year, probably because the slowing down of the expansion of new universities has brought fewer new academic posts on to the market.

The SRC itself does not yet have the figures with which to appraise the results of its policy, but if the impressions so far gained in industry are correct, it seems that some of the graduates disappointed of grants have turned elsewhere than to industry, perhaps to teaching or to various short term jobs.

Technology at Teddington

THE reorganization of the National Physical Laboratory now seems to be complete, judging by the annual report of the laboratory for 1967 (HMSO, 24s.). The changes have been designed to fit the laboratory more closely to the technological needs of industry, and have involved the division of the NPL into three groups—the measurement group, the materials group and another referred to in the report simply as the "third group" but which can be called, without too much injustice, an engineering sciences group. This third group is concerned with aerodynamics, autonomies, mathematics and ships, and last year took over the hovercraft unit at Hythe. One result of the reorganization has been the setting up of committees to oversee the activities of the NPL—chiefly a steering committee which prepares an annual report and a research programme for the ensuing year, and presents these to a second committee, the visiting board. The function of the visiting board seems to be to convey the report of the steering committee to the Royal Society and to the Ministry of Technology, the twin masters of the NPL. The report now published is the second annual report of the steering committee. The chairman is Professor Brian Flowers, the chairman of the Science Research Council, and he seems quite satisfied with the NPL as it is now, and with the programmes of the groups. The steering committee adds that it has considered the need for a new large high-speed wave-tank for the ship division but realizes that this is not the time to ask for such a costly facility. Professor Flowers, the would-be sponsor of the 300 GeV machine, knows that as well as anybody.

Will Indians Survive?

THE American Indians are splendid subjects for the study of the adaptation of human communities, as the International Biological Programme (IBP) has quickly recognized. To begin with, the date and place of their arrival is more accurately known than for any other population group. The land bridge across the Bering Strait was open only between 26,000 and 10,000 years ago and the present Indian inhabitants, from the Yukon to Tierra del Fuego, are descended from the migrants who crossed then. The rapid spread across the continent means that a homogeneous ancestor group quickly colonized a great variety of habitats. Although isolation was complete for more than 15,000 years, and although even today there are a few communities in South America still operating a Stone Age economy, the integrity of these groups cannot be expected to last much longer.

This emphasizes the importance of a conference held recently in Washington under the sponsorship of the Pan-American Health Organization and the IBP. With the opportunities for studying the 16 million American Indians in mind, the chairman of the conference, Dr James V. Neel, said that "Ours is the last

generation of scientists that will be able to study the quickly disappearing examples of primitive man. The simple fact is that at present we know virtually nothing about how selection works in man. One way of understanding the genetic impact of our rapidly changing environment is from the baseline supplied by detailed knowledge of primitive man in his primitive ecosystem".

Studies among the Yanomama Indians of Venezuela and Brazil have already revealed a remarkable degree of genetic differentiation between villages, thought to be the result of the fission-fusion pattern which dominates village proliferation. Work with transitional groups also shows that rapid and subtle changes take place in the health of communities subjected to even quite small changes of environment. A high incidence of gallstones and diabetes is a feature of such Indian groups and is well documented from the south-western United States. Moreover, there is a shift in the type of intestinal microflora after contact with civilization. The accident proneness common among Indians in contact with Western civilization has yet to be explained. In his summing up Dr Neel noted that, whereas "we tend to view many of these surviving primitive groups as representing extremes of adaptability, they have lived under their conditions far longer than we under ours, and it is only an act of faith that we will adapt to our man-made environment as successfully as they to theirs".

Patients Without Care

The unhappy plight of out-patients in British hospitals is well documented in a report published on July 18 by Mr Gordon Forsyth and Dr R. F. L. Logan for the Medical Care Research Unit at the University of Manchester (*Gateway or Dividing Line*, OUP, 21s.). The report is based on a survey of 13,600 out-patients referred for the first time to clinics in eleven groups of hospitals in England and Wales, and therefore covers about 0.3 per cent of the five million people who attend hospital each year as out-patients. Between them, the 80 hospitals selected for the survey serve about two million people. The report has the merit of showing precisely where the function and management of out-patient departments fail and speculates, albeit cautiously, on how the present structure might be improved.

Even where trivialities are concerned, the report reveals that the out-patient service leaves much to be desired. Signposting for out-patients is frequently absent or ambiguous. Toilet facilities are often inadequate. More often than not, the appointments system breaks down because hospitals tend to over-book at the beginning of a clinic to ensure against non-arrival or lateness of patients. In a nutshell, "scant regard is paid either to natural anxieties experienced by patients, or to basic human dignity". Much of the trouble, the report suggests, stems from ambiguities about responsibility for day to day management of departments.

A more serious charge is that departments often fail to carry out adequate clinical investigation. Thus laboratory tests were not carried out on half the patients in the survey with peptic ulcers. A quarter of those with menstrual disorders were similarly neglected. Not one of the departments visited had its own out-

patient theatre for minor surgical operations. The authors of the report say that there is inadequate communication between consultants and the referring general practitioners, and that appointments are often needlessly delayed. Another criticism in the report is that little cross-referral takes place between specialties in the clinics and that patients are rarely referred to medical social workers.

In view of the crammed programme of which consultants complain, Mr Forsyth and Dr Logan question the nonsensical prolonged attendance at out-patient departments of patients with minor complaints such as common prolapse. Consultants questioned during the survey seem to have had the impression that general practitioners ask for specialist help too readily, and they would like to see more junior hospital medical staff assisting in out-patient departments. What, then, is to be done? Mr Forsyth and Dr Logan offer little advice in this connexion, but do fly the old kite for opening hospital facilities to general practitioners. They also emphasize the need to make a continuous review of the referral of patients, and suggest that consultant units may have to give way to area specialist departments under chiefs of service who would take over many of the responsibilities of the laymen who often, at present, find hospital administration too exacting.

Flood Research

A GRANT for the study of flood control in Britain was announced last week by Mr Edward Short, the Secretary of State for Education and Science, during a visit to the Institute of Hydrology. The study will cost £250,000, and will be conducted in collaboration with the Water Resources Board during the next three to five years. The minister stated that the problem of flood control must be tackled much more efficiently and scientifically than it has been until now, and hoped that this study would lead to nation-wide standards. Part of the study will be to analyse data from the various river flood boards in order to give an accurate basis for decisions in the future. At present, decisions on such engineering problems as bridge heights and river bank reinforcements must be made in a haphazard way because of a lack of accurate data, the minister added, and the study will help to define the programme of research needed to produce the design data required by civil engineers for flood control.

The institute, which comes under the aegis of the Natural Environment Research Council, already studies all aspects of hydrology—precipitation, stream flow, evaporation and storage changes within the soil and bedrock, soil physics, geology and micrometeorology—and is concerned with drought as well as flood. Mr Short noted that "water shortage for domestic and industrial use is already apparent, particularly in the south-east, and is likely to become so serious as to impair development of the area in the not too distant future".

In an attempt to learn more about the factors that control river flow, the institute is studying seven "catchment areas" or river basins, measuring rainfall, evaporation and storage changes in the soil and bedrock in order to understand the water balance under different soil and land use conditions. To simplify these