

from irrigated fields, and even then the labour of felling is greatly enhanced and leisure correspondingly restricted.

Prof. Hutton illustrated the point by describing the comparative agricultural years of the Angami and Sema Nagas, emphasizing the much more continuous labour of the latter on their dry fields, and the much greater leisure enjoyed by the former as well as a greater economic surplus from their irrigated terraces. This gave the Angami a much richer and more colourful social life, since more leisure and wealth are available for the fifth and sixth needs. Moreover, a concentration of population is possible, with consequent political influence and stability. He suggested further that the absence of leisure in dry cultivation may be a contributory factor in the specialization of village industries like pot-making and weaving, which (in the Naga Hills) are often alternatively practised in one village and *taboo* in a neighbouring one, and may thus have contributed to the formation of occupational castes. He described the difficulty, enhanced by ritual considerations and by the absence of perennial forest, of effecting a change from a dry to a wet economy; but when once achieved, such a change leads to much greater independence on the part of individual villagers and tends to reduce the power of individual chieftains.

Dr. E. R. Leach, who followed with a paper on dry rice cultivation in Burma and Borneo, took a very different view from Prof. Hutton. He repudiated any general dichotomy in the wet and dry cultivation, regarding them as complementary rather than alternative methods of agriculture, and treating the administrative condemnation of dry rice cultivation as based on incomplete knowledge and mere prejudice; advocates of a change from dry to wet, he said, ignore problems such as that of redistribution of labour involved in the change. Dr. Leach had worked out a most detailed analysis to compare the labour and results of three methods of agriculture: 'slash and burn' methods of cultivating on dry ground, cultivating with the hoe for dry or wet rice, and cultivating with the plough. The difference between them, he said, is more fundamental than that between dry and irrigated rice. His general conclusion was that the cultivation of dry rice is more productive in yield per unit of labour than wet

rice unless the plough be used. This conclusion, he maintained, is confirmed by the preference both among the Kachin of Upper Burma and the Dusun of Borneo for the cultivation of dry rather than wet rice where both methods were available. He suggested that the Angami terracing is due to military considerations rather than economic. With the plough, of course, the area cultivated by a normal household can be so much increased that there is a much greater economic surplus.

Prof. Christoph von Fürer-Haimendorf discussed the two preceding papers in the light of his experience on the north bank of the Brahmaputra in Assam, where the Apa Tani tribe, using hoes and not ploughs, support a population of 1,000 to the square mile on irrigated rice, of which they have a considerable surplus to trade for cattle and cloth to the neighbouring Dafas, who live in comparative poverty on the cultivation of dry rice, also by the use of the hoe, and have repeatedly to shift their villages as land becomes exhausted. This supported Prof. Hutton's view that irrigated rice is economically more profitable than dry. The Apa Tani system of wet cultivation preserves all the soil fertility and yields a perfectly balanced agricultural economy. The Apa Tani are a peace-loving people whereas it is the Dafas who have a bias towards war.

In the discussion that followed, it became pretty clear first that there was general agreement that, *provided* a long enough cycle of rest can be depended on, dry cultivation of the hillsides, which may be the only possible form of cultivation, need not in the long run be destructive of the soil fertility, or at any rate is not so wasteful or deleterious as administrative and forest officers are inclined to assert; and secondly, that the question of the economic return of irrigated as compared to dry rice, per unit of labour expended, depends very largely on the rainfall and on the presence of a perennial water supply, a point which largely accounts for the different views put forward by Prof. Hutton, from his experience of the Assam hills, and by Dr. Leach, whose experience is of the drier climate of Upper Burma.

It was perhaps a pity that the discussion of primitive techniques was so largely limited to agriculture; but the importance of the subject was not left in any doubt.

NEWS and VIEWS

Prof. G. R. Goldsbrough, C.B.E., F.R.S.

PROF. G. R. GOLDSBROUGH'S retirement from the chair of mathematics at King's College, Newcastle-upon-Tyne, breaks a long and distinguished association with the College. He is an old student of the College, who returned to it in 1919 as lecturer in applied mathematics; in 1928 he was promoted to a professorship, and he has been head of the Department of Mathematics for the last three years. His research work has been mainly on two lines: in hydrodynamics he has made important contributions to the dynamical theory of the tides, and in astronomy he has elucidated the classical problem of the divisions in Saturn's ring. He was elected to the Royal Society in 1929. His interest in astronomy and geodynamics has been of special value in connexion with the work of the University Observatory at Durham. In addition to teaching and research, Prof. Goldsbrough has taken a leading and influential

part in administrative and other activities in the University, and his sound judgment and advice have been greatly appreciated. He was sub-rector of the College for the period 1942-47; and among many other duties he undertook the arduous task of chairmanship of the Joint Recruiting Board. He was awarded the C.B.E. in 1948. His colleagues and old students will wish him in his retirement many pleasant years of fruitful activity. He has been succeeded at King's College by Profs. A. E. Green and W. W. Rogosinski (see *Nature*, September 18, p. 445).

Biological Chemistry at Aberdeen:

Dr. W. O. Kermack, F.R.S.

DR. W. O. KERMAK, for many years in charge of the Chemical Laboratories of the Royal College of Physicians, Edinburgh, has been appointed to the recently established chair of biological chemistry in

the University of Aberdeen. This appointment will be received with a great deal of interest by all in the biochemical field, and with an element of surprise perhaps by some, for the appointment is probably unique in scientific circles in that Dr. Kermack is blind. To proceed to such an appointment in a laboratory subject has something in it of an act of faith, based not alone on the high scientific attainments but also on the rich mental endowments and sterling qualities of the new professor.

Dr. Kermack is an honours graduate in chemistry of the University of Aberdeen, where he received his B.Sc. degree in 1918. It was while a postgraduate research worker at Edinburgh that, in the course of an experiment, he met with the tragic accident which deprived him of all vision. To a lesser spirit such a catastrophe might well have spelt defeat; to Kermack it was but a challenge to re-orient his life to the steady continuance of his scientific work. That success has attended his efforts to a remarkable degree is seen in his activities in the spheres of mathematics, chemistry and music. His early research work was carried out in Oxford under the supervision first of Prof. W. H. Perkin and latterly of Sir Robert Robinson; his later work in colloid chemistry, on certain reactions of serum and cerebrospinal fluid, led on to the synthesis of compounds of possible antimalarial activity. This work has resulted in the synthesis of pyridoacridine and of *p*-phenanthroline derivatives, which have considerable chemotherapeutic activity on avian malaria. Dr. Kermack is joint author with Dr. P. Eggleton of "The Stuff We're Made Of" (1938); he is a D.Sc. of Aberdeen, was awarded the Freeland-Barbour Prize of the Royal College of Physicians, Edinburgh, the Macdougall-Brisbane Prize of the Royal Society of Edinburgh (1929), received the honorary degree of LL.D. of the University of St. Andrews in 1937 and was elected a fellow of the Royal Society in 1944.

Genetics at the John Innes Horticultural Institution

Dr. D. Lewis

DR. D. LEWIS is succeeding Dr. Mather, recently appointed to the chair of genetics at Birmingham, as head of the Genetics Department at the John Innes Horticultural Institution. Dr. Lewis was appointed from Reading in 1935 to work in the Pomology Department at the Institution. He has collaborated with Mr. M. B. Crane in the breeding of pears, raspberries and other fruits. For the last ten years, however, he has concentrated on the study of the incompatibility reaction in plants, using especially the Californian *Oenothera organensis*. He began with simple tests on the temperature relations. Later he introduced polyploidy and mutations, both spontaneous and induced, into his experiments. He has been able to split the incompatibility gene in *Oenothera*, with results of great physiological interest. He has also been able to calculate its natural mutation-rate in the sweet cherry, and at the same time use the mutations in producing self-fertile types in a hitherto self-incompatible species—a breeding device of great practical interest. Dr. Lewis' versatile experimental gifts should find suitable scope in his new post.

Women as a Labour Force in Britain

IN Broadsheet No. 285, "Employment of Women", *Planning* (P.E.P.) examines some of the implications of the task of maintaining, and if possible increasing, the female labour of Britain at a time when the num-

ber of women of working age is declining. The difficulty is enhanced by the even greater decline in the number of women under forty-five years of age, from whom the bulk of the female labour force is drawn. The broadsheet points out that it is very important that employers should not be unprepared for the probable fall in the number of women in employment during the next fifteen years. The Ministry of Labour should forecast the probable trend in the number of women available for work in the various industries and regions, and should make the findings widely known. It must then be considered whether rising productivity will make good the loss of women workers, and if not, what adjustments should be made; in particular, whether to try to maintain the proportion of women in certain industries and occupations, or whether to allow the proportion to fall in all. Two conclusions stand out: first, that any substantial increase in the number of women in employment must come from married women; and, secondly, that if the female labour force is not to fall greatly, there must be a big rise in the number of middle-aged and elderly women in employment. By far the most hopeful means is to extend the opportunities for part-time workers. This is a desirable solution from the women's point of view; but from the employers' aspect entails careful organisation, additional supervision, and flexibility. In compensation there is evidence that part-time workers give good service, that their output is often higher than that of full-time workers, and that absenteeism and labour turn-over do not compare unfavourably. The importance of improving working conditions and providing more nurseries is stressed, and also of employing women who are in jobs to the best advantage. Those who aspire to a skilled, professional or executive job should have the opportunity, and the size, composition and distribution of the female labour force must not be left to chance.

French Abstracts

THE *Bulletin Analytique*, published by the Centre National de la Recherche Scientifique, Paris, is an abstracting journal which appears monthly in two parts, Part 1 covering scientific and technical papers in the mathematical and physical sciences and their applications, Part 2 the biological sciences. The *Bulletin*, which started on a modest scale in 1940 with an average of 10,000 abstracts per part, now averages 35,000-40,000 abstracts per part. The abstracts summarize briefly papers in scientific and technical periodicals received in Paris from all over the world and cover the majority of the more important journals in the world scientific press. The scope of the *Bulletin* is constantly being enlarged to include a wider selection of periodicals. It thus provides a valuable reference book both for the laboratory and for the individual research worker who wishes to keep in touch with advances in subjects bordering on his own. A microfilm is made of each article as it is abstracted, and negative microfilm copies or prints from microfilm can be purchased from the editors. The subscription rates of the *Bulletin Analytique* for Great Britain are 4,000 fr. (£5) per annum for each part. The *Bulletin* is also issued in sections covering specific subjects. Subscriptions can be paid directly to the editors: Centre National de la Recherche Scientifique, 18 rue Pierre-Curie, Paris 5ème. (Compte-cheque-postal 2500-42, Paris), or through Messrs. H. K. Lewis and Co., Ltd., 136 Gower Street, London, W.C.1.