

officers, and a careful study of the report proves that research work of the very highest value, not only to the Department concerned but also to the country as a whole, is being carried out.

The programme of research for 1936 indicates the lines of work to be undertaken under the different branches; but in some cases it is noted that suggested work must be postponed until there is an officer available to undertake it.

In the *Malayan Forest Records*, No. 12 (Malay States Govt. Caxton Press, Ltd., Kuala Lumpur, 1936), Mr. H. E. Desch, wood technologist, discusses "Commercial Timbers of the Malay Peninsula. No. 1, The Genus *Shorea*", botanical notes being contributed by the forest botanist, Mr. C. F. Symington. Mr. Desch had started a series of articles on Malayan timbers in the *Malayan Forester* but gave them up in order to concentrate on the production of this record, as a new method of treatment had become necessary.

"Further investigation disclosed," says the author, "that the then-accepted groups, in the case of timbers of the genus *Shorea* particularly, were arbitrary and unworkable. For example, having described the timber of *nemesu* (*S. pauciflora*), it was found that the description fitted timbers of the *meranti tembaga* (*S. leprosula*) type in most essential respects, while the timbers of species allotted, at that time, to the

*meranti bakau* group were not really dissimilar. It was apparent that the attempt to set up divisions in a group of timbers so similar to one another was impracticable, while the assumption that differences did exist was responsible for some of the prevailing misconceptions and might well lead to further inaccuracies." Mr. Desch therefore decided to classify the timbers of a genus on their anatomical structure, general appearance and physical properties, irrespective of existing conceptions of classification. The first genus to be so treated was *Shorea*, the most important source of timber in the Peninsula, and it has been found that the classification of species conformed closely with Mr. C. F. Symington's parallel botanical studies.

Concentrating on the more salient features of groups of species, 47 species have been dealt with in six more or less natural divisions, but repetition has not been entirely eliminated. This overlapping was felt to be unavoidable until features of specific significance are better understood.

The treatment of his subject is both useful and instructive and although, as Mr. Desch says, the publication is a compromise in an endeavour to cater for those interested in the scientific study of wood, and those engaged in the practical utilization of timber, it is none the less interesting for that reason.

## Education in England and Wales\*

THE report of the Board of Education for the year 1935, published under the title "Education in 1935", is, in the main, like those of previous years. The volume is, as usual, a compendium of facts and figures duly arranged in successive chapters, dealing all too briefly with subjects which range from the elementary school to adult education, as well as the museums at South Kensington and Bethnal Green which are financed out of the Board's vote, and the whole miscellany is supplemented by tables of statistics, of which it may safely be said that they are more detailed and elaborate than those which are supplied by the Ministry of Education of any other European country. It is, in fact, not so much an account of 'Education in 1935' as a bare record, with little by way of comment or suggestion to relieve it, of the Board's administration during the year in question.

In one respect, the report makes a welcome new departure. The year of King George V jubilee has provided an occasion in an opening chapter for an interesting survey of education since the King's accession in 1910, a period which has witnessed "a more conscious recognition of the claims of the individual and a greater emphasis on the development of each child according to his bent and capacity". Though there is no room for complacency, it will scarcely be denied that there has been marked progress over the whole field. The abolition of half-time attendance at elementary schools, and of exemptions before fourteen years of age, has resulted in an increase of 87 per cent in the number of children over thirteen in these schools; out of 20,854 schools,

4,760 are new or have been extensively enlarged; the education given in the schools is less bookish and more practical, the percentage of schools for children over 11 which make provision for handicraft having risen from 23 in 1910 to 65 to-day: lastly, the re-organization of the elementary system with its provision for "advanced instruction", as adumbrated in the Hadow Report, though long overdue and still incomplete, has at least gone so far that 55 per cent of the older children are in reorganized schools.

The developments in technical education include the establishment of grouped courses and of the scheme of examinations for National Certificates. The provision in the Act of 1918 for a system of part-time day continuation classes for adolescents of 14-18 years is discreetly referred to as "a plan which would . . . have had a profound influence on the system of Technical Education and the relations of the schools with industry and commerce". This is an understatement. It would, we think, be true to say that this provision of the 1918 Act, had it been implemented, would have had social and educational results not less important than those which have followed from the Act of 1902; and the failure of successive Governments to tackle the problem of adolescent education is one of the most lamentable omissions of post-War statesmanship.

As for secondary education, the years from 1910 to 1935 cover nearly the whole period during which secondary schools have existed as an integral part of the State system of education. The growth in the number, size and efficiency of these schools, in which the elementary school teacher of to-day will usually have been educated and from which the technical schools and colleges now derive a large proportion of their students, may justly be regarded

\* Education in 1935, being the Report of the Board of Education and the Statistics of Public Education for England and Wales. (London: His Majesty's Stationery Office, 1936.) 3s. 6d. net.

as the most notable educational advance of King George V's reign. The extent of that advance can only be measured by comparison with conditions in pre-War days, when teachers were ill-paid and too often ill-qualified for their important tasks, when the pupils came late and left early—the average length of school-life being less than three years—when nothing had been done to co-ordinate examinations or to reduce their number, when sixth form work was ill-developed and the flow of secondary school pupils to the universities was in some areas a mere trickle and in a large number of schools non-existent. For information as to the conditions which exist to-day the report must be consulted.

In regard to the output to the universities, Table 48 shows that 36 per cent of all the entrants in 1934–35 entered direct from State-aided secondary schools, and this figure does not take account of those who entered after an interval. The figures given on page 49 of the report show that 53 per cent of the open scholarships and exhibitions awarded at Oxford and Cambridge were won by pupils from the State-aided schools, and that in 1935 candidates from these schools gained 56 per cent of the first classes in the final honours schools and triposes (Part II) awarded to candidates from all schools in England and Wales. The flow of pupils to the universities has been encouraged by the institution of State scholarships, which will in future be open to candidates from 'public schools' as well. As to the after careers of the State scholars, it would appear that, in the period 1929–34,

50 per cent of these scholars (men 34 per cent, women 70 per cent) took up teaching, 20 per cent entered other professions and 13 per cent engaged in research. These figures, compared with corresponding figures for the previous five years, show a decrease of 8 per cent in those who entered teaching, an increase of 6 per cent in those entering other professions and 5 per cent in those who took up research work.

It may well be asked whether the report has anything to tell us as to what is actually going on in the class-rooms, practical rooms and science laboratories of the schools with which it deals. The answer must be in the negative. The scientific reader who wants, for example, to know what steps are being taken to devise a general syllabus of elementary science and whether biology is now receiving the attention it deserves, will find no answer to his question in the volume under review. Containing as it does much information which those engaged in educational administration will be glad to have at hand and, in its initial chapter, a valuable survey which the general reader may study with profit, it tells us scarcely anything of the actual work of the schools. Statutory requirements no doubt determine the form of the Board's report, and may to some extent limit its contents; but it is permissible to suggest that if the omission to which we have directed attention could in a measure be made good, the Board's annual reports would be of more general interest and incidentally secure a wider publicity.

F. B. STEAD.

## Immunity of Plants to Disease

THE third International Congress on Comparative Pathology met at Athens on April 15–18, 1936, and there were three main sections, namely, human medicine, veterinary medicine, and plant pathology. Reports of the various deliberations are now being published, and the first volume, from the Section of Plant Pathology, deals with plant immunity against disease-producing agents\*.

Dr. E. J. Butler reviewed the problem, and after insisting upon the relatively local reactions of plant tissue, through absence of any circulatory system, he recognized five types of immunity, namely, (1) that following a previous infection and affecting the whole plant, (2) resistance to further local infection in the immediate region of a previous attack, (3) immunity by 'vaccination' with a less virulent strain of the pathogen or of substances formed in diseased tissues, (4) intracellular acquired immunity, and (5) symbiosis, which might vary towards immunity with changing conditions.

Dr. J. Dufrenoy considered the role of amino acids and phenolic compounds in susceptibility or resistance of plants. He showed that resistance is due, not so much to the pre-existence of phenolic compounds in healthy plants before attack, as to the ability of the host to produce such substances when under the stimulus of the entering fungus. Several plant diseases exhibit zones of cells rich in anthocyanin or phenolic compounds, around the point of fungal attack. In *Vitis* hybrids, many concentric zones

follow attack by mildew, each made during a dry period. The intervening green zones indicate moist intervals.

Several interesting comparisons between animal and plant pathology were drawn by Prof. Ernst Gäumann. Animal immunity is more active than plant immunity, since animal parasites are introduced passively into an active host, whilst plant parasites must themselves gain entrance to a relatively passive victim. Prof. Domenico Carbone agreed with many speakers at the Congress, that there is no evidence for the formation of definite antibodies in plants; but described the diffusion of defensive substances from pieces of plant tissue kept in solutions, or gels, *in vitro*. Dr. J. Magrou maintained that phenomena which might be termed phagocytosis appear in the plant kingdom. Mycelial masses of the symbiotic mycorrhiza of orchids are, for example, often digested by the host.

Prof. Jean Politis directed attention to the part played by certain substances in the struggle of the plant against a parasite. He stressed the fact that the vacuoles containing such substances are derived from the cell nucleus, and are therefore under the same hereditary influences as the nucleus. The degree of hydration of the vacuole determines the susceptibility or resistance of the host, according to Prof. H. S. Reed, who also proceeded to review the influence of nutritive relations upon host-parasite reactions. Prof. A. J. Riker had a short but interesting paper on "Biochemical and Physical-Chemical Studies on the Bacteria which stimulate Atypical and Pathological Multiplication of Plant Cells".

\*III<sup>e</sup>me. Congrès Internat. de Path. Comparée, Athènes. Tome premier, Rapports, 2<sup>e</sup>me Partie, Section de Path. Végétale, "L'Immunité Chez les Végétaux". (Athènes: Editions "Flamma", 1936.)