

College, London, and by Mr. Douglas at the Royal Aircraft Establishment.

The history of the development of the mechanical testing of timbers is not without interest. The system followed in most laboratories is practically that devised by the United States Forestry Service, and is the outcome of a scheme proposed in 1891 by Mr. B. S. Fernow, then chief of the U.S. Forest Service. At a somewhat earlier date, the Prussian Government had laid down a basis for timber testing; and Fernow stated that the two methods were practically the same, except that in the United States "the need of practically applicable results has been kept in the foreground". The American system received a further development about 1902 when it was adopted in the newly-established Forest Products Laboratory at Madison, Wisconsin. In 1920, the U.S. Forest Service requested the American Society for Testing Materials to consider the standardising of timber tests, and the methods then formulated were adopted in 1925 by the newly instituted British Forest Products Research Laboratory. Before this, they had been substantially accepted in the procedure of the Forest Products Laboratories in Canada, India and New Zealand. They have also been adopted by Australia, the Federated Malay States and to some extent by Sweden, Poland and Japan.

The Committee points out that its investigations are only concerned with mechanical tests on small 'clear' specimens of timber—that is to say, specimens which are free from knots, shakes or other defects. The work of forest products laboratories, it realises, is concerned with both large and small specimens.

It is impossible here to follow the Committee through the investigation work carried out which enables it to form its conclusions. It should be mentioned that the testing methods in use at the time had been adopted as standard ones and included the British standard specification for methods of testing small clear specimens of timber (No. 373—1929) issued by the British Standards Institution. Although from a practical point of view the tests

were the best that could have been devised with the knowledge then available, it was generally felt that several of the methods commonly employed were open to criticism from a scientific point of view. An opinion in this sense expressed to the Department in 1928 by Prof. C. F. Jenkin led to the appointment of the Committee which has presented the report now before us.

The Committee's Report concludes with the following: "Broadly speaking the several purposes for which mechanical tests for timber are, or may be, undertaken may be classified as follows:—

I. Tests which regard timber from the point of view of the physicist as a material for scientific examination, apart from any intended practical application.

II. Tests which regard timber from the point of view of the engineer as part of a structure that is to be designed to carry certain loads or perform other specified duties.

III. Tests appropriate for the grading of a number of timbers or for judging of their conformity to a given specification."

"Much, but by no means all, of the work of a Forest Products Laboratory falls within the third category and may properly involve methods of testing which would not be appropriate for the first purpose or even the second. On the other hand, tests suitable for the first purpose, or the second, are often attended by difficulties and restrictions which would put them out of court as matters of routine. It is clearly desirable that, subject to these considerations, the interpretation of all tests should be intelligible and their results definite; but it should be recognised that in providing for the various purposes here roughly indicated, tests of widely different character must be contemplated and they will be subject to different canons of criticism."

Timber testing has a growing value in the world of to-day, and the work of this Committee will be received with high approval and gratitude by research centres throughout the world.

National Inland Water Survey

THE paper on "National Inland Water Survey" by Dr. Brysson Cunningham, read at the meeting of the Royal Geographical Society on March 11, set out the scope of a survey required, not merely to serve the responsibilities of the Ministry of Health in regard to water supply for domestic purposes, but also to meet the needs of industry and commerce, the possible development of hydro-electric motive power, the requirements of irrigation, fisheries and navigation, the drainage of low-lying lands, the prevention of floods and other equally important matters. It defined a national survey, in the technical and only satisfactory sense of the word, as a comprehensive and accurate measurement and complete registration, so far as may be practicable, of all the water to be found in a country, whether contained in lakes, rivers, streams, wells, artificial reservoirs, or subterranean strata and cavities. A survey, it stated, should be regarded as a purely scientific undertaking, necessitating special technical knowledge and supervision and in order to ensure its absolute impartiality, where so many different and possibly conflicting purposes are to be served, it should, as recommended by the Committee of the British Association, be

conducted by an organisation "independent of any interest in the administration, control or use of water", such an organisation being available in the Department of Scientific and Industrial Research, which is equipped for work of this kind and possesses the essential scientific authority.

Proceeding to outline the programme of a survey, attention was directed, in connexion with rainfall, to the work of the British Rainfall Organization, which for a number of years past has carried out in an admirable manner the superintendence, collection and publication of data. Evaporation and soil absorption have not yet received the degree of attention needed for the purposes of a survey. It is also a regrettable fact that, up to the present time, there has been no department, or central organisation, constituted to deal with direct hydrological measurements of the amount of water actually derived from rainfall. While certain undertakings take gaugings for their own purposes, these are relatively few and the observations are not accessible by the public. The determination of run-off, that is, the bulk of the water which, following rainfall, escapes to the sea, constitutes therefore the greatest field of activity for

the survey. The records of the Thames Conservancy at Teddington Weir were instanced as one of the few cases of really effective river measurement. In England and Wales, much assistance in regard to stream gauging can be rendered by the Catchment Boards instituted under the Land Drainage Act, 1930.

The investigations of the British Association Committee were briefly described, and Dr. Cunningham then proceeded to review the methods and organisations adopted in certain other countries, namely, Canada, the United States, France, Germany, Switzerland and Italy. A number of lantern slides were exhibited illustrative of typical apparatus and installations in operation in the respective services. It was shown that in all these countries, in addition to rainfall measurement, great importance is attached to the consistent gauging and measurement of river- and stream-flow and to the publication of the results obtained, so as to be accessible by all who are interested.

Dr. Cunningham urged that it should be considered an essential part of the duty of those in charge of a survey to disseminate information and advice to local authorities and others engaged in the exploitation of water supplies and the control of floods. Finally, he said it would largely nullify the value of a survey if it were limited to the mere collection and filing of records and statistics. The keynote of the organisation should be active research.

Fungi of South Australia

A VERY useful series of handbooks on the flora and fauna of South Australia is prepared by the British Science Guild (South Australia Branch) and published by the Government of South Australia. The editorial committee shows that "there is an admitted lack of inexpensive but accurate books dealing with the plants and animals of South Australia, and it is felt that the absence of such has been a real handicap to young Australia, and so to the progress of Australian Science".

Handbooks on the general flora, mammals, fishes, the building of Australia and the succession of life, crustaceans, and reptiles and amphibians have already been published, while seaweeds, spiders, moths and butterflies, ants and birds are to be described in future volumes. The gratuitous services of recognised authorities on particular subjects have been obtained, whilst the Government of South Australia publishes the volumes at low prices. In spite of the serious depression through which South Australia has been passing, the Government has shown a commendable breadth of vision, and earned the gratitude of all scientific workers by continuing to publish this series.

Part 1 of the handbook on "Toadstools and Mushrooms" before us is by Prof. J. B. Cleland, chairman of the Handbooks Committee, and combines scientific exactitude with a simplicity of statement which should bring the knowledge within reach of any intelligent person. The introductory sections are particularly well written. They deal first with general questions of distribution and activity, and then with uses of fungi, poisoning, fungi and art, localities affected by different species, fungi and bush fires, larger fungi eaten by mammals, insects and other animals, luminescence of fungi, fairy rings, mechanical force

exerted by fruiting bodies, methods of collection and preservation, and descriptions of special terms used in classification.

This takes up forty pages of closely-printed text, and the remaining 138 pages are devoted to a general classification of the higher fungi, and to a detailed classification of the Agaricaceae. The system adopted for the latter combines the orderly, reasoned groupings set forth by Carleton Rea (in "British Basidiomycetæ") with the convenient detail of Claussen's subdivision by spore colour. This combination is used by the foremost students and teachers of mycology in Great Britain. Convenient keys to the species, as well as to the genera, are given.

Thirty-five photographs and drawings and six coloured plates enrich the text, and the price of five shillings is certainly extremely low for such a volume. Copies may be obtained from the Government Printer, North Terrace, Adelaide. British students of mycology can find a wealth of helpful description for many of our native species.

University and Educational Intelligence

CAMBRIDGE.—The Department of Scientific and Industrial Research has offered £2,300 for building and equipping an extension to the Low Temperature Research Station on its southern side. It is to be used in perpetuity for scientific research and in the first instance for research on problems arising out of the preservation and handling of foodstuffs. In the letter making this offer, it is stated that the Committee of Council has had under consideration the possibility of further extensions of the Station in the future, and that the only areas where such extensions appear to be practicable are at the southern end of the eastern side of the Station and at its north-eastern corner. Having regard to the developments which have taken place since the Station was first erected, the Committee considers it desirable that these two areas should be reserved against future needs.

The Smith's Prizes are awarded to H. G. Booker, of Christ's College, and L. Howarth, of Gonville and Caius College. Rayleigh Prizes are awarded to A. F. Devonshire, of Trinity Hall, T. E. Faulkner, of Gonville and Caius College, and F. Smithies, of St. John's College.

EDINBURGH.—The Senatus Academicus has resolved that the honorary degree of LL.D. be offered to the following, for conferment at the Graduation Ceremonial to be held on June 28 :—The Right Hon. Lord Bledisloe of Lydney, Governor-General and Commander-in-Chief of New Zealand; Dr. Nicholas Murray Butler, president of Columbia University, New York; Dr. James L. Garvin, editor of the *Observer*; Mrs. M. M. Ogilvie Gordon, geologist, and vice-president of the International Council of Women; Prof. J. Graham Kerr, regius professor of zoology in the University of Glasgow; Prof. John Laird, regius professor of moral philosophy in the University of Aberdeen; Sir George Macdonald, formerly secretary of the Scottish Education Department, archaeologist, numismatist and historian; Mr. John Donald Pollock, Surgeon-Commander R.N.V.R. medical service during the War; Dr. A. N. Richards, professor of pharmacology in the University of Pennsylvania; The Hon. Lord St. Vigeans, formerly chairman of the Scottish Land Court.