lands of the Sink are widely different from those hitherto investigated in the case of Krakatau, the cooling lavas of the Hawaiian Islands, newly-made land about the mouths of rivers, etc. The chief features in the re-vegetation of the beaches successively exposed each year by the recession of the water are described in detail, but the following were the chief points to be taken into account in noting the progress of re-vegetation. As the salt content of the water increased by about 18 per cent. in each succeeding year, each emersed strand would be saturated with a soil solution of the concentration and composition prevalent in the period preceding emergence, and the desiccation of the emersed strands would proceed at a rate determined by the character of the soil (*e.g.* its capillary raising power), and by the composition of the infiltrated lake water. The re-vegetation of the strand bared in 1907 was chiefly due to the rising water picking up seeds lying on the surface and leaving them on the wet flats, but since that year the plants invading the new strands were carried there as seeds by the wind, by flotation, or by birds, only those plants surviving as could withstand the rapid warming of the shallow water on the mud flats, which increased its toxicity for seeds and seedlings, and the rapid desiccation of the surface soil, which increased the difficulties of the rooting and establishment of the plants.

The report is illustrated by thirty-two beautiful collotype plates, and interesting as are the results already obtained, the continued investigation of the phenomena presented by the re-vegetation of this sterilised desert basin area under difficulties which will become increasingly great as evaporation proceeds will doubtless yield even more valuable results in the future. F. C.

## FINISHING TEMPERATURES OF RAIL STEEL.

REPRINT No. 38 of the Technologic Papers of the Bureau of Standards, by Messrs. Burgess, Crowe, Rawdon, and Waltenberg, deals with observations on the finishing temperatures and properties of steel rails. The principal objects of the research were to "determine from measurements taken in representative rail mills, the present American practice regarding the temperatures at which rails are rolled, to demonstrate the ease and accuracy with which such temperatures may be measured, and to find out what the 'shrinkage clause' in rail specifications really means."

The authors have found that ingots for rails are rolled at temperatures ranging from 1075° to 1150° C., and that the variation from one ingot to another in a series of 20 to 40 is only 10° to 20° C. The rails are finished at temperatures which may vary between 880° and 1050° C., but which usually come within 50° C. of 935° C. With uniform mill practice the rails of 100-lb. section will be finished at some 10° to 20° C. hotter than 90-lb. rails, and about 50° C. hotter than 75-lb. rails. The melting or freezing range of such steels extends from about 1470° to 1530° C., *i.e.* to nearly the melting point of iron. The critical Ac 1 point was found to occur within 7° C. of 732° C. for the ten samples of Bessemer and open-hearth steels examined. On cooling the corresponding Ar 1 point occurs between 680° and 650° C.

In all cases, therefore, the temperature at which the rolling of the rails ceases was at least 200° C. above the critical point, and there is no doubt that the rolling temperatures could with advantage have been carried much lower than they actually were. A rail of 100-lb. section, cooling freely in the air from 1070° C., reaches the recalescence point (Ar 1) in about 8½ minutes; and the maximum difference in temperature between the centre and the outside of the head is about 85° C. at 1000° C., becoming 0° at the recalescence point. A comparison of the "shrinkage clause" specification with the expansion of rail steel shows that this clause permits the finishing of rails at 1120° C., which is 450° C. above the critical range of such steel and is *above* the temperature at which many rail ingots are rolled in practice. In its present form, therefore, the clause has absolutely no significance.

## FOREST ENTOMOLOGY.

A VALUABLE Bulletin (Entom., No. 7) of the Canadian Department of Agriculture on forest insect conditions in British Columbia, has been lately issued by Mr. J. M. Swaine. The author deals mostly with the Scolytidæ injurious to the more important species of pine, spruce, and fir; he gives interesting summaries of the life-histories, illustrated by excellent figures of the beetles, their larvæ, and their characteristic brood-galleries in the bark of the trees.

The "large larch sawfly" (*Nematus erichsonii*)—notorious for its ravages in the Cumbrian Lake district—continues to occupy the attention of zoologists in the University of Manchester. Mr. R. A. Wardle contributes to the last number of the *Journal of Economic Biology* (vol. ix., No. 3) some notes on the life-histories of two of its parasites hitherto unrecorded; these are *Zenillia pexops*, a Tachinid dipteron, and *Hypamblys albopictus*, an Ichneumon-fly. The first-stage larva of the latter, with its relatively big head, elongate tail-process—variously interpreted as a blood-gill or a pro-leg—and paired, limb-like outgrowths on the body-segments, is remarkable. Several of these young grubs may occur in one sawfly caterpillar, but apparently only one of them is able to pass through the subsequent larval stages and become in due course a pupa. There appears to be rather severe competition among the various parasites of the Nematus, so that there may be danger of their weakening one another in the process of reducing the numbers of their host.

The pine weevil (*Hylobius abietis*) is one of the most abundant of our native woodland insects. Mr. J. W. Munro has lately published (Proc. R. Phys. Soc. Edinb., vol. xix., No. 6) the fullest account yet available of the reproductive organs in both sexes.

## AUSTRALIAN HANDBOOKS FOR THE BRITISH ASSOCIATION.[1]

IN connection with the recent meeting of the British Association in Australia, official handbooks were issued for the Commonwealth and for all the States—Western Australia, South Australia, Victoria, New South Wales, Queensland, and Tasmania. Copies of all were distributed among the visiting party, in most

[1] The Commonwealth of Australia. Federal Handbook prepared in connection with the 84th meeting of the British Association for the Advancement of Science, held in Australia, August, 1914. Edited by G. H. Knibbs. Pp. xvi+598. (Melbourne: Mullett.)

Handbook and Guide to Western Australia. Prepared for the Members of the Advance Party of the British Association for the Advancement of Science. Pp. vi+118. (Perth: F. W. Simpson, 1914.)

Handbook of South Australia. British Association for the Advancement of Science. Australian Meeting, 1914. Adelaide. Joint Editors: D. J. Gordon and V. H. Ryan. Pp. 328. (Adelaide: R. E. E. Rogers, 1914.)

British Association for the Advancement of Science. Australian Meeting, 1914. Handbook to Victoria. Prepared under the direction of the Victorian Executive Committee, by A. M. Laughton and Dr. T. S. Hall. Pp. xvi+382. (Melbourne: A. J. Mullett, 1914.)

British Association for the Advancement of Science, 1914. Handbook for New South Wales. Pp. xiv+621. (Sydney: E Lee and Co.)

Our First Half-Century. A Review of Queensland Progress. By Authority of the Government of Queensland. Pp. xxviii+258. (Brisbane: A. J. Cumming, 1909.)

British Association for the Advancement of Science. Tasmanian Handbook. Pp. iv+348. (Hobart: J. Vail, 1914.)