

ROAD CONSTRUCTION IN WAR-TIME

IN co-operation with the Ministry of War Transport, the Road Research Laboratory of the Department of Scientific and Industrial Research has now issued the second of a series of Wartime Road Notes*.

Road-building and road-maintenance in time of war differ in many respects and also in degree from peace-time practice. Not only are roads required for special and temporary purposes which demand different standards of design from those employed on the highways, but also speed in construction is vitally important and the use of local materials is a necessity. These war-time notes are intended to assist engineers in dealing with the special problems created by these conditions, and they present in brief form the latest findings of research and practical experience.

The recommendations in the first of these two publications refer to tar carpets (or thin surfacings) $\frac{3}{4}$ -1 in. thick and surface dressings, and are based on systematic full-scale trials supported by laboratory investigations. Bituminous carpets of this description have been introduced quite recently and are capable of providing a non-skid surface having a reasonably long life and costing less than the British standard surfacings. The nature of the aggregate as well as its grading determines the quality of the carpet. Crushed rocks are preferable, but gravel may have

to be used, and this has also been investigated. The recommendations, which can best be described as concise working instructions, cover the materials, the mixing procedure, and the laying of the materials on the road.

The second of the notes in this series has been prepared in collaboration with the Geological Survey and Museum, and supplies very necessary information as to the numerous sources in Great Britain of naturally coloured chippings such as might be used for surface-dressing roads and for similar purposes. It deals mainly with black or dark grey stones, and with the darker shades of red, brown and green. The colour of the rocks most widely quarried for use as roadstone are dark grey, pink, grey or buff, and whitish or pale brown or pale red as represented by such sources as Clee Hill basalt, Mountsorrel granite, dolomite and Hartshill quartzite. After describing the igneous rocks, the sedimentary rocks, metamorphic rocks and other potential materials, the note provides a valuable list of quarries arranged in three tables referring to three different groupings of colours.

Although an important consideration for the engineer, the question of strength is not discussed. It is stated, however, that the Road Research Laboratory is available at all times to answer inquiries or to amplify the contents of the notes where this is desired.

* Wartime Road Notes. No. 1: Recommendations for Tar Carpets and Surface Dressings. No. 2: Sources of Naturally Coloured Chippings in Great Britain. (London: H.M. Stationery Office, 1941.) 6d. each.

FOREST RESEARCH IN INDIA

THE annual report on forest research in India and Burma is issued in two parts (Manager, Govt. of India Press, Delhi, 1940 and 1941). Part 1 is devoted to the Forest Research Institute at Dehra Dun; Part 2 to provincial reports for Burma and the provinces of India, all of which have special research officers in one or more of such branches of forestry as silviculture, forest utilization, working plans and statistics, entomology and so forth. Perhaps only to those who witnessed the beginnings of research at the Forest Institute and out in the provinces of India and Burma are in a position to realize the great progress which the last three and a half decades have brought about in research problems in many branches of forestry. The reports must be consulted for a full appreciation of this statement.

That for the Institute for 1938-39 commences with the remark that although handicapped by serious financial restrictions the year in question had been for the Institute one of the busiest in its history; and the provinces, especially in silviculture and forest utilization, appear to have been engaged upon equally important work.

The most numerous inquiries were in connexion with the manufacture of paper and ply-wood; but smaller industries such as the making of pencils, umbrella handles and cigarette-holders were equally to the fore. Other subjects had reference to suitable woods for semi-industrial purposes, such as the use of bamboo as reinforcement in concrete structures, and the chemical values of a large range of minor forest products—a branch so long neglected at the Institute

owing to lack of funds. The co-ordination of the research of provincial research officers with that of the Institute involves a large amount of work—for inevitably the latter has to form a central clearing and co-ordinating centre for investigations carried out throughout India and Burma.

It has become evident that the staff sanctions for certain branches of the Institute in 1924 is no longer adequate to meet present-day demands. In connexion with minor products it is of interest to note that a permanent incumbent is to be appointed to the chemical branch of the Institute. This is apparently the result of a valuable report on the branch submitted by Dr. S. S. Bhatnagar, professor of chemistry at the University of the Punjab, after a visit to the Institute.

The War may have brought to the notice of smokers and the housewife that matches made in India are now on the English market. It was the Research Institute at Dehra Dun in the early years after the War of 1914-18 which assisted in establishing this industry in India. Umbrella handles have been mentioned above. In the days before the Institute a young Indian forest officer addressed a big umbrella merchant, stating that he had in his forests quantities of an excellent bamboo for umbrella handles. The price at length quoted by the merchant would not have paid for the cost of carriage of the bamboo from forest to the Indian coast! It required the establishment of the research institute to enable such problems to be elucidated—for research paves the way to utilization.