

to civil engineering work rather than to what is popularly understood by building. Into this civil engineering category falls the work on highway bridges, on reinforced concrete structures and steel frameworks, and much of that on soil mechanics.

The investigation of the behaviour of composite steel-reinforced-concrete bridge deck slabs was continued during 1949, laboratory tests being carried out on a one-third scale slab, and full-scale tests were made, for the Ministry of Transport, to show the dynamic effect of a vehicle passing over a bridge. Some attention was also given to that interesting form of construction, the concrete shell roof, for which an entirely satisfactory method of design has yet to be developed. A test of a 60-ft. span shell barrel vault was made, and it is interesting to note that under a 50 per cent overload the deflexions were only of the same order as those observed due to temperature changes. Forty pre-stressed concrete floor-joists were tested for the Ministry of Works and investigation of the impact strength has been started; but there is no mention of more fundamental work on this material. It is satisfactory to see that once more the Station is giving some attention to the design of steel building-frames and that, using the same technique as was developed twenty years ago when the behaviour of a number of London buildings was investigated for the Steel Structures Research Committee, strain gauges have been fitted to the new Government buildings in Whitehall Gardens so that the stresses in the steelwork can be observed during each stage of building and during subsequent occupation. Laboratory tests designed to measure the effect of cladding, brick panel walls and reinforced concrete floors in relieving the steel framework are also reported as being carried out.

The activity of the Soil Mechanics Section during the year has been limited to three main lines: the study of the bearing capacity of soils in relation to foundations for large structures; excavations in difficult ground; and the stability of earth banks. On the theoretical side a general solution based on a theory of plasticity has been obtained for calculating an approximate value of the bearing capacity of foundations of all types, including footings and piles, in terms of the shear characteristics of the soil. Tables and graphs giving these bearing capacity factors have been completed for both clays and sands. A series of model tests has been carried out in the laboratory, using footings of various sizes and shapes located at different depths beneath the surface, and the results obtained so far have shown promising agreement with the theory. A study of the stability of the bottom of an excavation carried into water-bearing ground was being made, and results, summarized in a number of graphs, have already been obtained which should be of assistance to engineers in assessing the depth of penetration of sheeting necessary to ensure stability of the bottom of an excavation. Advice on the design, construction and maintenance of banks has been given to several river catchment boards, and work on electro-osmosis in soils has been continued.

In the building, as distinct from the civil engineering, field, interesting work has been carried out on the development of a satisfactory method of providing short bored pile foundations for houses on clay soils. Data of the safe bearing-capacity of such piles are now available, and the dimensions of suitable reinforced concrete beams, to span the pile heads

and carry the house walls efficiently, have been determined.

A block of four houses, completed in March 1949, was being used for a study of heating by the circulation of warm air, and two blocks of flats, under construction in the ancient village of Abbots Langley, were to be used for a full-scale investigation into methods of sound insulation. The need for these will be fully appreciated by those who live in orthodox houses built since the War, with floor joists of reduced depth and plaster-board ceilings, which make it possible for the children in bed to converse with ease with their parents in the sitting-room below.

It is clear from this report that, though some builders and architects may still not make full use of it, the Building Research Station, which now has a branch laboratory in Scotland and close contacts with the British Colonies, is doing great work, particularly on the practical side, and is making it known. Almost five thousand inquiries, an increase of 859 over 1948, were received during the year, and ten thousand requests for sources of information or copies of publications were dealt with by the Station library.

FOREST PRODUCTS RESEARCH BOARD

ANNUAL REPORT FOR 1948

AS an aftermath of the Second World War, work on research in many forest-products laboratories has had to be to some extent reorientated, as, for example, the great Madison Laboratory in the United States and the Research Institute at Dehra Dun and elsewhere. In the report for 1948 of the Forest Products Research Board and of the Forest Products Research Laboratory at Princes Risborough*, it is stated that during 1948 the highest priority was given in the programme of the Laboratory to those projects which bore upon the amelioration of the national timber situation, namely, to the accumulation of test and utilization data of new timbers, the search for substitute timbers and more efficient utilization. These investigations, mostly on timbers from Colonial sources, together with the very large volume of advisory and short-term work, now absorb most of the available time.

So far as the tropical and sub-tropical forests are concerned, it is very encouraging for the officers managing these forests to find that the possibilities have increased of being able to sell an increasing number of species of the mixed forest. Sylviculturally, it will render the work of obtaining the new crops to replace the old both more fascinating and, it may be hoped, easier. As in the past, one of the other staff usually called in when new timbers are coming up for consideration is the entomologist. Perhaps his investigations nowadays are more in connexion with the pinhole borers in hardwoods than in the old-time barkbeetle troubles with conifers.

The amount of advisory work in the Laboratory again exceeded the previous year by 10-15 per cent, and most of the time accruing from the recruitment of new staff has been taken up in dealing with it and with the tests on new Colonial timbers.

* Department of Scientific and Industrial Research. Report of the Forest Products Research Board, with the Report of the Director of Forest Products Research, for the Year 1948. Pp. v+46+12 plates. (London: H.M. Stationery Office, 1950.) 2s. net.