

ordinary coal. According to calculations which were made at one time by M. Loucher, each horse-power-hour produced on a locomotive is equivalent to a consumption of 2.5 kilos. of coal. Consequently, the water-power yet to be utilised represents 20,000 tons of coal per hour, or, say, 180,000,000 tons per annum.

The author admits, of course, that certain industries cannot dispense with coal, but suggests the use of hydro-electric power wherever applicable. Railways such as the Midi, the Paris-Lyons-Mediterranean, and the greater part of the Orleans should be electrified. Large cities, like Paris, should follow the example of Lyons. He pictures the advantages to Parisians in respect of suburban transit, their industries, and lighting, had the Rhone barrage at Genissiat been completed before the war.

Certain trades, as has been said, can dispense with coal if electric power is available, such as the textile, chemical, and paper trades. Metallurgy, glass-making, pottery, and zinc refining use up enormous quantities of coal. But this state of things will not always persist; synthetic pig-iron will one day replace the present commodity; the electrometallurgy of zinc is now a practical proposition; the ceramic art is capable of modernisation; and electric bakeries are not merely utopian.

In addition to being a source of heat, "white coal" is also a source of cold; low temperatures are necessary for obtaining synthetic nitrogenous products, cyanamide, electrolytic potassium and permanganate—substances which could, under the new régime, be produced cheaply in France. Further, "white coal" would help agriculture, not only by providing manures, nitrates, and cyanamides, but for driving tractors, lighting farms, irrigating pasture land, working pumps, ventilators, drying plants, separators—and in a host of other ways.

E. S. HODGSON.

ETHNOLOGICAL WORK IN QUEENSLAND.

IN vol. xxix., part i., of the Proceedings of the Royal Society of Queensland, the president, Dr. R. Hamlyn Harris, under the title of "Some Anthropological Considerations of Queensland and the History of its Ethnography," supplies an interesting review, with a full bibliography, of the ethnological work which has been done in the State. In 1914, at Talgai, on the Darling Downs, a skull was found in a river deposit in which remains of Diprotodon and other extinct marsupials had already been discovered. The geological evidence is not quite satisfactory, but there are some reasons for believing that it belongs to the Pliocene period. Dr. G. A. Smith, of Sydney University, believes that it is the skull of a young Proto-Australian which is practically indistinguishable from that of a present-day native. It shows a very primitive facial skeleton, the jaw and teeth of which display remarkable features, even more primitive than those hitherto described in any human skull, except in Pilt-down. In particular are noticeable the great squareness and enormous size of the palate and teeth, and the semi-anthropoid nature of the articulation of the upper canines with their mandibular opponents. In the same neighbourhood, in 1906, a couple of rough implements of Palæolithic type were unearthed.

In the same paper Dr. Hamlyn Harris discusses some other interesting questions. The principal centre of mummification in Queensland was on the east coast, around Cairns and the Johnstone river, extending in a southerly direction. This singularly restricted area suggests that the habit of mummification was not introduced from Malaysia, nor *via* Cape York, but that it was brought from the far islands of Torres Straits by natives who were carried on to the north-eastern

coast of Queensland, more or less by chance. This in some measure corroborates the views of Prof. Elliot Smith, who suggests the Cape York Peninsula, *via* Torres Straits, as the hypothetical route in the migrations of the culture bearers who were responsible for the diffusion of the "heliolithic culture complex." Dr. Hamlyn Harris suggests that in geological times Australia was in land connection with Asia, not only with New Guinea, but probably also with Timor, and certain Queensland birds and animals are more closely allied to Asiatic than to Papuan species. He fully accepts the conclusion of Dr. Rivers and Prof. Elliot Smith that the oceanic cultures have been mainly derived from contact with other races. Mornington Island, on the Gulf of Carpentaria, preserves an almost unique example of Australian aboriginal culture which has not been affected by foreign influences.

THE SOILS OF HAWAII.

THE island of Hawaii is the largest of the group of Sandwich Islands, which were formally annexed to the United States in 1898. It is mountainous and volcanic, and the soil is highly productive; sugar and pineapples are the staple industries, but coffee, honey, hides, sisal, bananas, rice, wool, cotton, and rubber are also exported. As usual with American possessions, a strong agricultural experiment station has been developed; in this particular case the work was done under the auspices of the Sugar Planters' Association. The director, Dr. H. P. Agee, and the staff have carried out some excellent investigations on the problems connected with the local agriculture. The latest publication is by the chemist, Mr. P. S. Burgess, and deals with the soils of the island. These are of special interest because they are of volcanic origin, and are situated in a different climatic zone from our own, so that they differ in many respects from the ordinary soils of Great Britain or America, especially in their large content of oxides of iron and aluminium, and their small content of silica. Thus the average of a number of analyses is:—

	Fe ₂ O ₃	Al ₂ O ₃	SiO ₂	
Hawaiian soils ...	28.0	20.7	32.6	per cent.
American soils ...	3.8	5.1	85.5	" "

The soils to which we are accustomed have been formed in such a way that their chief constituent is insoluble silica or silicates; the Hawaiian soils, on the other hand, contain large quantities of iron and aluminium oxides; they are known as laterites; other instances occur in Java. This difference in composition especially affects the finest grade of material, the clay, which in the Hawaiian soils consists mainly of iron and aluminium oxides, while in the soils of temperate zones it consists chiefly of silicates. In consequence the behaviour to water is profoundly modified, and the hygroscopic coefficients and other constants are quite different from those obtained on normal soils.

Bacteriological investigations have been put in hand, but, as usual with American stations, the work is mainly concerned with the amount of decomposition effected by the organisms, and not with the organisms themselves. The results suggest that a detailed comparison of typical organisms would be of considerable interest.

So far as we know, the Hawaiian Sugar Planters' Experiment Station is the only station issuing English bulletins which has the opportunity of fully investigating laterite soils. It has, therefore, an unusually good range of problems. There can be little doubt that a detailed comparison of these soils with typical soils of the eastern seaboard of the United States would throw much light on the problems of soil chemistry and soil physics.

E. J. R.