PART IX

MINERAL RESOURCES OF BARBADOS

By R. H. EMTAGE, Esq.

Building Stone.—A fair quality of limestone, much of it suitable for building purposes, is everywhere to be found on the island. The quality is very variable, ranging from porous "drip-stone"—a freestone—to silicious shelly marl, of no value even for road-metalling.

Water filters are made from these drip-stones, for which there is local inquiry as well as a small export demand from Demarara and neighbouring islands.

All buildings of any size or permanence erected on the island are built of this limestone, a good quality of which can be obtained by careful selection. This improves in quality by exposure, and is practically indestructible. The surfaces must in all cases be plastered for residences, to avoid the damp due to the porous nature of the stone.

This limestone also furnishes all road-metalling.

Lime.—Lime of variable quality is burnt from this stone, and a little export business is done to Demarara and neighbouring islands.

Manjâk.—At what date the existence of this mineral on the island first became known is difficult to trace, but apparently it was brought to notice at an early date in the island's history, for the following official reference, dated 1676, by the then Governor (Atkins) is on record: "There is a kind of metal, much resembling cannel coal in Lancashire, called *Moniack*, with which sugar is boiled." Schomburgk is also responsible for the statement that the mineral is probably identical with *Mountjack*, which he states is referred to in Sloane's "Natural History of Jamaica" as occurring in the hills of that island, and as being used as fuel by the early privateers. [The writer has referred to two editions of Sloane, but has failed to find the reference.]

But although the surface outcrops have frequently been

dug and used as fuel under several plantation furnaces in the "Scotland" district, yet no systematic attempt had ever been made to mine manjâk until it was brought to the notice of certain Boston people in 1895.

They were evidently attracted by its high calorific properties, and forming themselves into the Boston Fuel and Power Co., sent out a representative to report. He succeeded in interesting the late Mr. Walter Merivale, M.I.C.E., then manager of the local Railway Co., who promptly started the pioneer mining on the College Estate, at a spot marked *Bituminous Coal* on Schomburgk's map of 1848.

Starting with the idea of mining a cheap fuel, it was not long before those engaged in this pioneer industry discovered that manjâk, some of which was sold to the Railway Co. at $5 per ton, was an almost pure bitumen of exceptional value in the paint and varnish trades. Indeed, a report obtained from the Belgian Mineralogical Bureau on samples submitted for analysis contained the remark that "it is surprising to find a bitumen of such exceptional purity in nature." No doubt one of the main causes of the depreciation of the value of the mineral in its early days in those markets where its value should have been known and appreciated was the fact that it was called by the trade name of "*Asphalt*," or "*Asphaltum*," which is the usual term for low-grade bituminous compounds used on road-making or pavements, and which may contain percentages of bitumen ranging between 42 (*e.g.* Trinidad Lake Asphalt) to 6 or less (*e.g.* many limestones of France and U.S.A.). The Boston people who were first interested in the mineral soon gave it the trade name of *Glance Pitch*, which, of course, referred to its brilliant lustre; and the term "*Asphaltum Glance*" is used by Wall and Sawkins in their memoir of Trinidad. But to-day Trinidad adopts the name *Manjâk* for the more inferior bitumen which is mined in that island; and perhaps they are wise in their generation, *for the excellence of the Barbadian quality* has caused the name *Manjâk* to be known wherever high-grade or insulating black varnishes are made. Nor is the name confined to the trade, for Prof. D. A. Sutherland, who made extensive experiments of bitumens and bituminous compounds for insulation work, refers to *Manjâk* among the hard bitumens in the published report of those experiments, December 1903; and every American publication on

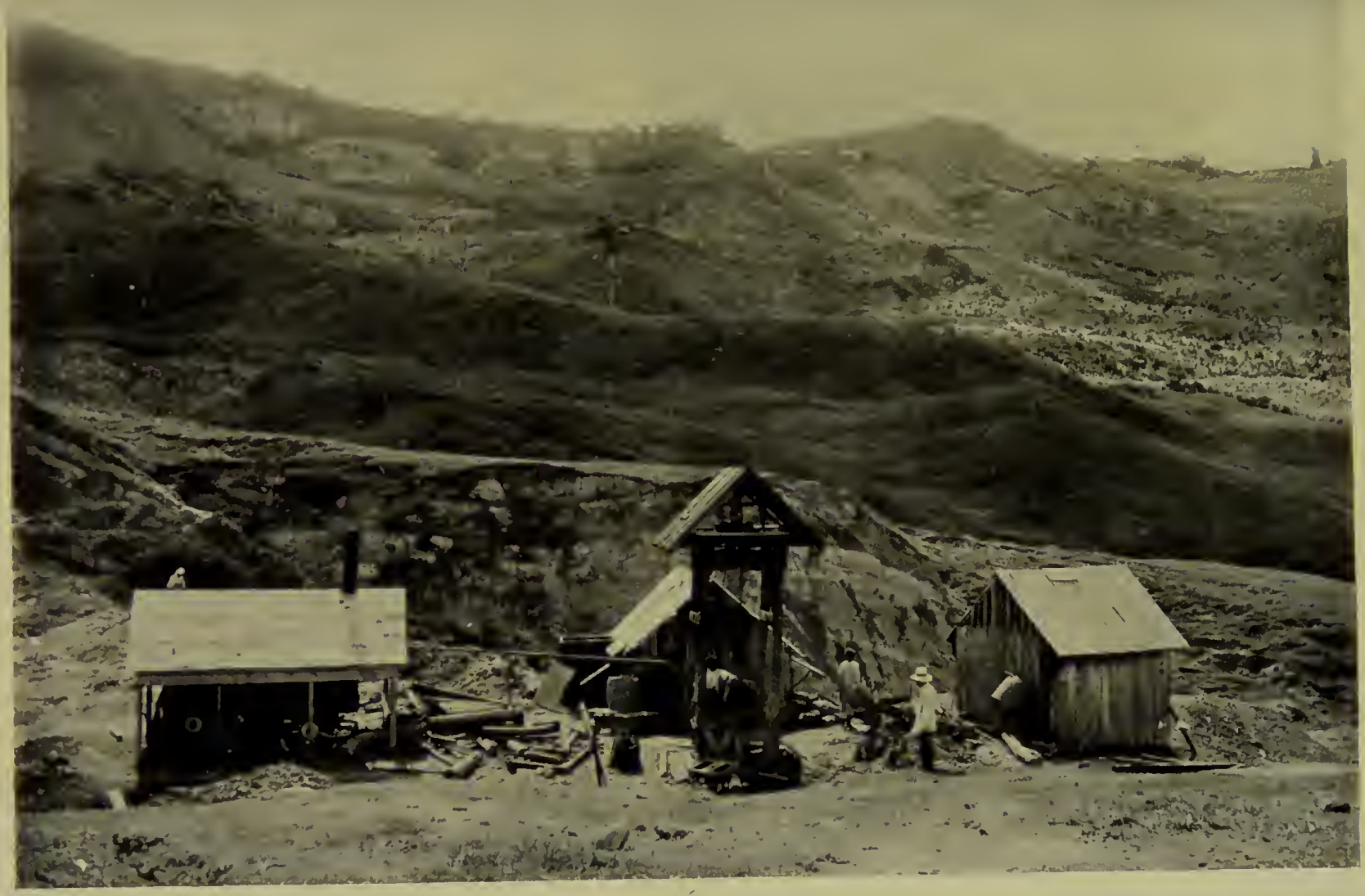
Economic Geology of recent years has special reference to *Barbados Manjâk*.

The main superiority of *Manjâk* over *Gilsonite* and other popular natural bitumens for the varnish and japanning trades is due to its intense black colour, in which respect it was more nearly approached by *Nigrite* and *Wurtzilite* of the United States, which are no longer mined.

When a chocolate-brown bitumen, *e.g.* Gilsonite, Grahamite (a more inferior grade approaching the Trinidad deposits), Elaterite, Wolongonzite, or Chapapote (of Cuba) are used in the manufacture of black varnishes, some non-elastic black pigment, usually bone ash, must be added, which largely destroys the elasticity and durability of the varnish. *No such addition is needed in preparing Manjâk varnishes.* On this very important point Prof. Sutherland, writing on insulation varnishes, remarks : "Its (bitumen) value to the maker of compositions for electrical purposes depends on many things, but chiefly on the nature of the pure bitumen . . . and most of all its capability of being drawn out into threads. Should it possess natural elasticity it is of exceptional value."

Barbados Manjâk is of two varieties, the *conchoidal* and the *columnar*. These terms denote the nature of the fracture of the mineral. The columnar is the more common variety, and when exposed to weathering action the fracture changes to *cokely* (resembling the crushed appearance of newly fractured coke or soft coal). The conchoidal is by far the more valuable, and a newly fractured specimen cannot be distinguished from jet, and in lustre and brilliancy is not inferior to obsidian.

The varieties exist in different localities, and it is very exceptional for both forms to be found in the same district. The alteration in form is, no doubt, due to the nature of the contiguous rocks : a plastic clay, by preserving the volatile constituents of the solidifying oil, produces a highly lustrous conchoidal manjâk ; while a porous sandstone, by absorbing much of the volatile matter, produces a less brilliant and more brittle material. That the manjâk veins are the result of the "faulting," and perhaps more particularly the "folding" (which is so much in evidence throughout the "Scotland" district), requires no proof. The iridescence of many of the outcrops (especially where they lie in contact



THE MANJÂK MINES, ST. JOSEPH'S

Photo W. Parkinson

with an oil-sand), clearly indicates the origin of manjâk. If further evidence on this point were needed, it can be had at a shallow mine where the gradual transition of the hydrocarbon from the liquid (at 195 ft. depth) to the solid and brittle state (120 ft.) can be clearly traced. [This is, so far as the writer can learn, the only instance on record where this natural transition can be seen.] The veins, which are all lenticular—the conchoidal ones extremely so—have a general N.N.E. trend, and a very variable dip, often approaching the vertical. The veins of columnar structure have proved in a few instances to be of true fissure type, and in such cases to be of fairly permanent extent. No true fissure conchoidal vein has yet been struck, but these frequently outcrop at the crests of local anticlines, and follow the dip of the anticlinal fold with ever-varying width.

The shattered and fissure condition of the veins resembles *Albertite*—an occurrence of New Brunswick which has been fully described by Dr. R. W. Ells, of the Geological Survey Department of Canada—rather than the more uniform structure of the Utah-Colorado *Gilsonite*, of which one vein is reported as attaining a thickness in places of 16 ft. with no admixture of rock. But unlike the albertite deposits, which were unworkable above 450 ft., the manjâk deposits are occasionally sufficiently productive to be workable within 40 ft. of the surface where weathering has not affected the quality. This is, of course, due to the higher price which warrants the working of smaller veins.

In the process of shaft-sinking much gas is encountered in contact with the oil shales and sands, and below the 200-ft. level the safety light of the pickmen has occasionally been put out by such "blowers." At one shaft, on reaching the 260-ft. level, mud was periodically thrown up for several weeks with sufficient force to spatter timbers 6 ft. from the bottom of the shaft. A fine white "gas-sand" is also encountered in certain localities, usually in lenticular masses.

Oil.—This increase of gas with depth in the manjâk mining speaks well for the continuance of the oil-sands, which everywhere outcrop in the district, but which have nowhere been properly tested owing to the absence of systematic drilling. That the entire district warrants careful oil prospecting is the opinion of many geologists—English and American—who have recently visited it.