

*Notice of the Itabira and Santa Anna Mines, in Brazil.*

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THE Gold mines of *Itabira* and *Santa Anna* are situated at the foot of the peak of *Itabira*, near the small town of *Itabira do Matto Dentro*, about fifty miles north of the city of *Ouro Preto*, in the province of *Minas Geraës*.

(a) The containing rock at *Itabira*, as well as that beneath the auriferous bed at *Santa Anna*, consists of micaceous-iron-ore and quartz (*iron-mica-slate*) in alternating layers, of very different thickness, and of schistose structure.

(b) In both mines the directions and inclinations of the gold-bearing beds conform to the configuration of the neighbouring mountain, as well as to the structure of the contiguous rock;—a circumstance of common occurrence in *jacotinga* formations.

(c) At the *Itabira* mine the direction of the beds is S.E. and N.W. (magnetic\*), and the inclination about 40° N.E. The whole "country" contains gold in small quantity: the more productive bed, however, varies in thickness from 3 to 8 feet, and consists of sandy micaceous-iron-ore, friable quartz, and a little felspar clay (*jacotinga*):—even this is not rich; but the gold is dispersed through its whole substance with tolerable regularity. This mine is worked to a depth of 40 fathoms: 40 negroes are employed in it; and the produce is about 5 lbs. (troy) of gold per month. The shoot of gold is towards the N.W.

(d) At *Santa Anna* the auriferous bed bears E. and W. (magnetic\*), dips about 40° S., and is from 6 to 30 feet in breadth.

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\* The magnetic variation does not exceed one degree.

Its ingredients are much the same as those of the productive bed in the *Itabira* mine, of which indeed it is probably a continuation: the gold is pretty equally scattered through the whole mass; and, of that found near the surface, a considerable portion is crystallized in the octahedral form. This bed is overlaid by a conglomerate of earthy-red and micaceous-iron ores, which also affords gold;—the transition between them being by almost imperceptible gradations. This conglomerate, locally called "*canga*," also occurs at *Gongo Soco*, *Cocaës*, and *Agoa Quente*, and is common to all *jacotinga* formations. The mine is worked to a depth of 23 fathoms, an adit draining it to 17 fathoms from the surface: 80 slaves are engaged in it; and the present produce is about 3½ lbs. (troy) of gold per month; but in time past it has been much richer. The *shoot* of gold dips eastward.

(e) Both these mines are wrought by private Brazilian companies, and not a single European is employed in either of them. Two or three free-men are engaged as overseers, but all the labourers are slaves.

(f) Nothing can be ruder or more primitive than the operations generally. The works are carried on during the day only; and at night the various entrances to the mines are closed by locked gates. Both mines are entered by inclined planes, carried downward on the dip of the *shoots* of gold. At *Itabira*, indeed, this is the only mode of access, for there is no shaft or other opening at the surface. The miner's "*pick*" is used for breaking the rock; but the *shovel* and *wheel-barrow* are alike unknown. The ore is conveyed from place to place,—and indeed at *Itabira* is brought to the surface,—in shallow wooden bowls (*carumbès*) borne on the negroes' heads; the bowls being filled by scraping the ore into them with a kind of hoe (*enchado*). Some of the ore is drawn out of *Santa Anna* by means of a "*whim*;" but as this is worked by oxen, it is wretchedly slow.

(g) The quantity of water, in both mines, is very trifling; but the whole of that in *Itabira* is brought to the surface on negroes' heads in the same manner as the ore; and that below the adit at *Santa Anna* is raised to that level in the same mode.

(h) The surface-water is very scanty, and nothing can exceed

the care and watchfulness bestowed on it. This, indeed, is the chief obstacle to Brazilian gold mining; and the laws relating to its appropriation are most stringent. There seems little doubt but the quantity has, for a considerable time, progressively diminished: as the remains of extensive water-courses (*regos*) exist in many places, where there are now no fountains to supply them.

Conscious of the meagerness of the brief notice now submitted to the Society, I hope it will not be devoid of interest, since we know so little of the modes in which so valuable a metal is deposited: and, though other occupations must, for the present, confine my communications within very narrow limits, I trust they will show that my best wishes and warmest sympathies will ever attend the Society's prosperity.

W. J. HENWOOD.

*Gongo Soco,*

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