Realm of Gold

(Continued from Page 17)

posits his head lamp on a table while his name and number are checked off a list. In this way payroll accounts are kept and a safety check is made to make sure no miners are missing.

The surface installations of a gold mine are like the branches of a tree. They sprout from the shaft-trunk and get their sustenance from the minerals absorbed out of the earth by the ever-spreading tunnel-roots. Finally they yield their marketable golden produce. These branches of the mining plant are: the shaft headgear, engineering workshops, engine rooms, stores sheds, compressor and boiler works, dressing and shower rooms, and the General Offices, housing, secretarial and accounting divisions, survey and sampling offices, and pay offices.

But the largest installation is the Reduction Works into which the ore enters in gray, pebbly chunks, passes through a complex series of processes, after which emerges glittering blocks of solid gold.

The Cyanide Process

When the broken ore and waste rock have come up the shaft, the mass is roughly sorted as to size, then fed along conveyor belts to mammoth jaw crushers and gyratory crushers until all is reduced to lumps about 3/8 inch thick. These lumps are flooded with water and poured into tube mills—large rotating cylinders —in which the rocks are ground to a fine pulp. Size sorting continues—the fine particles move forward and the coarser particles go back for regrinding. Then comes the Cyanide Process, the process which saved South Africa's infant gold mining industry in 1890, when it first made large scale extraction of minute grains of gold from huge masses of ore economically worthwhile. In this process the pulp is introduced into large tanks of cyanide solution and agitated until the fine grains of gold are separated. Rotary suction filters now draw off the gold-bearing solution from the rest of the pulp, which is called slurry or slime. This slurry, once pumped directly to dump heaps, is now sent on to a uranium plant where another process extracts the element so vital to nuclear science. Uranium has become so valuable a by-product of the gold mining industry today that it ranks as South Africa's third most profitable export behind gold and wool.

The gold-bearing cyanide solution is chemically treated with zinc dust which precipitates the gold into a black slime deposit. This deposit is again treated with acid, then filtered, calcined, and smelted.

Finished Gold Product

The last stage in the Reduction Works is pouring the molten gold from long-handled crucibles into stout molds. When the gold has cooled, it emerges in gleaming ingots shaped like bread loaves, and weighing 1000 troy ounces each. (There are 12 troy ounces to the pound.) The ingots are transported under heavy guard to the Rand Refinery, the world's largest, where through further smelting the last fractions of silver and impurities are removed. The finished gold product comes in 24 carat, 100% pure bars of 400 troy ounces each, three of them together weigh 100 pounds. The bars, now ready for sale, are stored in the safeguarded vaults of the South Africa Reserve Bank, eventually to be consigned to treasuries of nations throughout the world, with the U.S.A.'s Fort Knox buying the greatest share.

Despite the fact that from a ton of ore

(Continued on Page 61)