

Gold is derived from two classes of deposits, alluvial or placer, and lode. We cannot here enter at length into the discussion of methods of working such deposits; but it will be well to point out that placers and lodes present very different problems. Placers are sand or gravel deposits containing loose particles of native gold which can generally be separated by agitation with water. Lodes are solid deposits in which the gold is tightly locked. In some cases placers are frozen or otherwise solidified so that some process of disintegration is necessary. In the case of lodes disintegration is always a process which requires great expenditure of power. In many lode deposits moreover simple disintegration does not free the gold, and chemical treatment becomes necessary. Placers therefore are frequently worked very profitably for some time by men of small means without great expenditure for plant, and later operated on a more pretentious scale by the use of more costly apparatus. On the other hand, the working of lode deposits usually requires larger expenditures for plant early in their development. Consequently we find that most lode mines are operated by stock companies, by capitalists or groups of capitalists.

Those who prospect for lode deposits are seldom in a position to mine what they discover, but are encouraged by the fact that operators are continually on the lookout for good prospects. The discoverers of placer deposits usually work their claims, for a time at least.

Placer deposits are usually at or near the surface, while most lode deposits extend to some depth. Naturally from this feature alone great differences in methods arise, for placers can be worked in the open while the greater part of most lodes is more easily extracted underground. Placer deposits have, in most countries, been the first to be discovered and worked, the discovery of lodes following later.

The history of gold mining dates back many centuries. Long before the birth of Christ there were several mining centres in the eastern Mediterranean countries. The mines of Asia Minor and Macedonia were celebrated in the times of Herodotus and Strabo. The enormous wealth of the king of Egypt is supposed to have been largely derived from gold mines east of the Nile. India produced gold ages before the founding of Rome. The Romans had little gold in their own country; but by their conquests took possession of vast amounts. Spain, Portugal and Gaul were large producers of gold during the early days of Rome's greatness.

The discovery of the Americas marks the beginning of a new era in the mining industry. The colonies of Spain and Portugal were made to yield great streams of golden wealth. Africa, Russia and Siberia also outstripped in productivity the old mining centres of Europe. M. De Launay estimates that between 1492 and 1848 the production of gold rose to 636 millions of pounds sterling, or 4,621 tons, of which 80 millions came from America, 100 millions from Africa, 44 millions from Russia and Siberia and 20 millions from Europe. McLaren, however, estimates that during the period 1545-1840 the Portuguese and Dutch obtained 75 millions in Japan alone. Japan has been usually overlooked by historians.

In 1848 wonderful discoveries were made in California. The successful operations of many fortunate ones in that country led both to the phenomenal development of California and to the opening up of mineral deposits throughout the Western States and in British Columbia and Yukon.

Almost simultaneous with the disclosure of the wonders of California came discoveries in Australia. Ballarat and Bendigo became centres of great industry. Then other parts of Australia and New Zealand also were found to be rich in gold.

In 1887 came the discovery of the world's greatest gold field—the Witwatersrand, commonly called the Rand, South Africa. In 1896 wonderfully rich alluvial deposits were discovered in the Yukon and Canada became an important producer. In the United States, Colorado became one of the largest producers after the discovery of rich deposits at Cripple Creek in 1891. In Western Australia rich finds were made in the now famous Kalgoorlie camp in 1892. Kalgoorlie and Cripple Creek are the richest telluride goldfields in the world.

The precious metal deposits at Tonopah, Nev., were discovered in 1900, when the mining industry generally in Nevada had sunk to a very low level. The discovery greatly stimulated prospecting and led to the revival of mining throughout the State. The district has produced silver and gold to the total value of more than \$60,000,000.

The discovery of gold at Goldfield in 1902 was a direct outcome of the development at Tonopah. The total production from Goldfield to the end of 1913 was over \$65,000,000 in gold and silver.

The Transvaal produced in 1914 8,394,322 oz. fine gold. The total production from the beginning of operations in 1884 to the end of the year 1914 amounted to 102,830,226 oz., valued at over \$2,000,000,000. The operating companies have distributed \$500,000,000 in dividends. The number of employees during the last five years has averaged over 200,000. Salaries and wages paid during 1914 amounted to over \$60,000,000.

In Canada there was little interest in gold mining previous to the great California discoveries. In 1857 rich placers were located on the Fraser, Thompson and Columbia rivers in British Columbia, and that Province has ever since produced large quantities of gold.

In British Columbia, Williams creek and Lightning creek, in the Cariboo district, have been especially productive. More recently discovered placer deposits in the Atlin division, Cassiar district, now surpass in output those of Cariboo. Now outrivalling any of the placers in British Columbia are the lode deposits at Rossland discovered in 1890, and in the Boundary district.

In Nova Scotia the first discovery was made in 1860. Since 1862 Nova Scotia has been a regular though never a very large producer of gold. In Quebec gold was obtained as early as 1823 in the Chaudiere district, and in 1863 rich gravels were found on the Gilbert river. Since that time the district has been the scene of more or less mining activity; though the total production is small. Gold was found in 1865 at Marmora in Eastern Ontario and in 1871 in the Lake of the Woods district, Western Ontario. By far the most important deposits known in Ontario are those in the Porcupine district, discovered in 1909. As early as 1869 gold was known to occur in the Yukon river; but it was in 1897 that the riches of the Klondike were discovered and Yukon became Canada's chief source of the yellow metal. While the amount of gold won by hand methods in the Klondike has fallen off greatly, production is still large owing to the operations being carried on by strong companies working on a large scale with methods and machines specially devised for the novel conditions. The Yukon should continue for years to yield much gold.

A considerable proportion of the gold produced in Canada comes from ores treated by smelting for baser metals. Of the total production in 1914 (\$15,925,044),