

the top of the centre tube. Mercury is kept in the amalgamator in such quantity that there is a vertical height of about 30 inches of the liquid metal in the outer tube when the inner tube by its rotation is centrifugally emptied of mercury. Its rapid upward progress through the mercury is counteracted by a set of revolving blades, which keeps it agitated and separated in the mercury. On rising to the top of the column of mercury, a blast of air blows the ore along a pipe to waste pits or settling chambers as desired. The dry powdered ore having to pass through this column of mercury in a separated condition causes the finest particles of gold to come in contact with it and thus perfect amalgamation ensues. To show the superiority of this machine over those in ordinary use, it is reported that quantities of pyriteous ores, containing 4 ozs. 8 dwt. per ton was put through the apparatus with the result that only 4 dwts. 20 grs. of gold were left in the tailings, showing that 96 per cent. of the gold had been taken out, and in dealing with various descriptions of the refractory ores, from 92 per cent. to 98 per cent. of the gold has been extracted. These machines and the pulverizers are likely to come into great use in future gold mining operations.

They also have a Hydraulic Amalgamator for the amalgamation of free gold. Consists of a hollow column set in a cylindrical basin or miller revolving within another fixed basin charged with mercury, the slime or tailings from the mills are conducted into the hopper on the top of the shaft which is caused to revolve at about 30 to 40 revolutions per minute; the pressure in the column, about 10 feet, causes the material to pass through the mercury which is kept agitated and bright by the rotatory motion, the slime rising over the edge of the outer basin is discharged.

Large Casting in Italy.

The largest casting ever attempted in Italy was successfully accomplished at the ironworks of Signor Gregorini, of Levere, on the Lake of Isao, Lombardy. The colossal block of cast iron, measuring 14 cubic metres (494.43 cubic feet), and weighing 107 tons (105 English tons), is intended for the anvil of a 10-ton steam-hammer now being constructed for the Royal Arsenal of Spezia. The operation occupied twenty-three hours.

The World's Production and Consumption of Copper.

At a recent meeting of the shareholders of the Arizona Copper Company, held in London, England, Mr. G. Auldjo Jamieson gave a comparative summary of the world's production and consumption of copper, as follows:—

"The production of copper for the year 1879 was 149,000 tons all over the world; in 1883 it was 193,000 tons. In those years the production of copper had increased 11 per cent.—no very great increase after all, compared with the enormous increases during preceding and longer periods. The consumption of copper in England and France in 1883 was 91,334 tons, and in 1884 it was 107,143 tons—an increase in one year of 13 per cent. So that measured by these figures they had come up at last to this point, that the consumption of England and France—two by far the most important of the consuming countries—had outstripped the rate of increase in the supply. In the United States in 1883 the consumption was 58,000,000 pounds, and in 1884 it was nearly 96,000,000—an increase of 8,000,000 pounds. On January 1st, last year, the price of copper

was \$290 a ton and the stock visible and in hand, was 40,186 tons. On December 31st last, the price was \$236 a ton, but the stock on hand was only 36,638 tons. There took place during the year 18 per cent. of a fall in prices and 812 per cent. of a fall of the visible stock on hand. America, with which they were mostly concerned, had in 1880 to import its copper largely from Chili. In 1882 it exported 745 tons to England; in 1883 it exported to England 9,110 tons; and in 1884 it exported to England 17,309 tons. So that from 1880 when it was importing copper, there had been a rise from a negative quantity to a positive exportation of over 17,000 tons. The question was—Is consumption come up to the level of and is it likely to outstrip production? On these matters he could offer no observations that would be worthy of their consideration; but it was his duty to observe what was said by those whose authority carried weight. In the report of the most authoritative of the metal brokers in London, this statement was made in the end of 1881:—"We are apt to undervalue the fact that although the demand for electricity is still behind hand, we have nevertheless absorbed and more than absorbed all available supplies. Indications of the copper wealth of the world increased, but the cost of mining is not to be judged from sensational newspaper articles; and there are important sources of supply where not only will exploration cease, but actual production must be killed by present values. Isolated mines may be able to give us copper at a fabulously low price, but they may grievously mislead us as to the average cost of production; and if a little more hopeful feeling springs up, it sentiment which has throughout the year been against all markets, turn in their favor, we may a year hence look back on the value of copper to-day as a momentary depression at variance both with former experience and with the present circumstances of the consumption."

Minerals Found with Gold in New South Wales.

The most common minerals that are found with vein gold are iron pyrites, which is never quite free from gold, and is sometimes exceedingly rich in it; iron oxide, which is for the most part derived from the decomposition of various pyrites; mispickel, in calcite, as at Lucknow, where the mispickel contains in parts over 2,000 ounces of gold per ton; also in calcite, at the Crow Mountains, Barraba; at Lake Cowal; at Humburg Creek; at Grenfell; at Solferino, in the Garibaldi Reef; at Merimbula; and also, it is stated, near Gunnedah. With mispickel at Carcoar, and at Moruya with silver sulphides also; with pyrrhotine and calcite, as at Hawkins Hill; with galena and zincblende at Grenfell; with galena, zincblende, magnetite, molybdenite, chlorite, and scheelite at the Williams mine, Adelong; tale, asbestos, and serpentine, near Gundagai; steatite, cuprite, malachite, tenorite and other copper ores, notably in the Canobolas and in the Winterton mine, Mitchell's Creek, near Bathurst, where it is also associated with barytes in well-developed although small crystals, and with mimetite, a chloro-arsenate of lead; it is also found with mimetite in the Adelong district; it is reported with tinstone in the cliffs at Eden, and with native arsenic at Solferino. Beautiful specimens of native gold, in malachite and red oxide of copper, have been yielded by the Kaiser mine, Mitchell's Creek, near Bathurst. Gold and native copper have been found together in quartz veins, and in the rocks through which

the veins pass. In alluvial deposits, gold is associated in New South Wales with a very large number of minerals; and it is remarkable that certain of them, such as platinum, osmium, sapphire, ruby, oriental emerald, and diamond have not yet been found *in situ*. Among other minerals, we have tinstone, titaniferous iron, magnetic iron, chrome iron, brookite, rutile, anatase, emerald, beryl, topaz, zircon, hyacinth, spinel, garnet, red and brown hematite, pyrites, binocide of manganese, galena, blende, tourmaline, magnesite, and many more of less value.—(*E. and M. Journal, N.Y.*)

The Deepest Mines Known.

The deepest mine, according to Humboldt, is an abandoned one at Kuttenburg, in Bohemia, where the lowest part of the mine is 629.33 fathoms deep. A staple which had been sunk from the workings of the colliery Des Viriers, at Gilly, in Province of Hainault, in Belgium, had attained the depth of 581.5 fathoms. The Adelbert mine, in the Pizibam district, in Austria, has a shaft 546.5 fathoms deep, according to M. M. Jans and Duhamel. An abandoned argentiferous copper mine, at Kutj Puhl, near Inspruck, in Tyrol attained a depth of 546.83 fathoms. The Sampson silver lead mine, at Andreasburg, in the Hartz mountains of Germany, is 468.66 fathoms deep. The Rosebridge colliery, at or near Wigan, Lancashire, England, is 403 fathoms deep. In the Zwicken district, in Saxony, coal is drawn from a depth of 434.5 fathoms. Duckin'old coal mine, in Cheshire, is 358.5 fathoms. At the Dolcoath tin mine, in Cornwall, the engine shaft is 350 fathoms. The Wheal Vor, a tin mine in Cornwall, containing rock kilas, in 1859 was 321 fathoms deep. A silver mine in the Konsberg district, in Norway, is 311.5 fathoms deep. The Wheal Mary Ann, a lead mine in Cornwall, is 300 fathoms deep. The Camphausen coal mine, in the Saarbruck district, in Prussia, is 275 fathoms deep. Ince Hall coal mine, Lancashire, is 300 fathoms; Worthington coal mine, Lancashire, is 300 fathoms; Ryhope coal mine, County Durham, is 271 fathoms; Renard coal mine, Anzin mines, France, is 272 fathoms; Pendleton coal mine, Lancashire, is 363.5 fathoms; Douglas Bank coal mine, Lancashire, is 262 fathoms.—JAMES V. MURPHY, in *National Labor Tribune*.

ASPHALT.

In about the centre of the island of Trinidad, just off the coast of Venezuela, there is an asphalt lake. It is said to cover about one hundred acres and is apparently inexhaustible. It is a black, sandy substance, and is believed to be crude rotten petroleum. A singular feature of the substance is that, although about fifty thousand tons are taken out of this lake annually, it constantly fills up so that there is no lessening of the supply. This singular lake of paving material is owned by the Venezuelan government, but leased to a company in Washington.

A lump of coal brought from the Victoria, Sydney, C.B., mines, is three feet five inches in height, nineteen inches wide, fifteen inches thick and weighs 400 pounds.

The returns relating to gold mining in the colony of Victoria for the first quarter of 1885, show a falling off in the yield to the extent of 8,351 oz. 4 dwts. 22 grs. compared with the preceding three months.