

he is dealing with the simple question of extraction for treatment. When he is endeavouring to prove the continuation of his ledge or lode, he will not hesitate to characterize as "ore" any rock of the same general kind that contains the smallest trace of the same mineral or minerals. Thus, while it may require three per cent. of copper in rock to make a milling or smelting ore, a tenth per cent. of copper in the same kind of rock may—in his judgment—constitute an "ore" connection between more valuable deposits and "prove" that they are parts of one lode. On the other hand, those who are interested in disproving the connection of the two recognized ore bodies will not as a rule, hesitate to deny that the practically worthless stuff forming the connection can with any propriety be termed "ore."

All seem to agree that a mineral compound that is commercially valuable is "ore" but beyond that the meaning can scarcely be considered as fixed and settled.

#### A HYDRO-MAGNETIC SEPARATOR.

Prof. Elmer Gates, of Washington, D.C., who as will be recalled claimed some years ago to have invented a method of utilizing the sun's heat for power purposes, has recently taken out patents on a so-called hydro-magnetic separator, by means of which he proposes to separate gold from magnetic iron or magnetite.

There is nothing specially new or startling in a magnetic separator, as a number have been invented. Mr. Thomas A. Edison brought out one several years ago, which has been made use of to a limited extent with excellent results, so it is claimed. Prof. Gates' apparatus, however, differs somewhat from those already in existence, and a few words regarding it will therefore be in place.

As already stated the object of Prof. Gates' device is to remove from the gold bearing sand the magnetic iron which such stuff always contains, as a preliminary to separating the gold as in the ordinary way, either by washing or by amalgamation. The apparatus consists of a copper drum, inside of which is an electro-magnet. The core of the magnet is made up of a number of iron plates with fluted edges on the pole face of one end, likewise within the drum, but which approach their fluted edges close to the inside of the copper periphery of the latter. Above is a hopper through which the sand is poured. As the gold, silica and magnetite pass through the hopper it necessarily touches the side of the drum, which is kept revolving by means of an electric motor. The drum, owing to the magnet inside it, draws the particles of magnetic iron out of the sand which naturally adhere to its surface while the sand drops into a receptacle below the machine. The particles of iron while magnetically held against the drum are moved downward by it over the wavy lines of force of the fluted magnet face and vigorously shaken so as to detach all foreign matter.

In practical mining work the gold would be left in with the silicious sand, which would subsequently be put through one of the ordinary processes, with a view to separating it from the precious metal. The magnetite once removed, the separation of the gold becomes comparatively easy, so much so that it is claimed that from two to five times as much of the yellow metal is derived from a given quantity of the raw material. The inventor states that his method is simplicity itself, and further that it costs but three cents for each ton of sand treated.

Another advantage pointed by the Washington professor is that the iron removed from the sand in the manner just described is an exceedingly valuable product. At an expense of eighty-five cents a ton it is proposed to reduce it by means of the electric current into lumps, in which form it may be sent to any smelting works.

As to whether the optimistic views of the inventor of this process will be fully realized in practice remains of course to be seen, but it certainly seems more plausible than the scheme suggested some time ago by Prof. Gates for utilizing the energy of the sun.—Electricity.

#### MINING AND SCIENTIFIC NEWS.

The Coeur d'Alene district of Idaho produces 48 per cent. of the lead used in the United States.

Of dividends from mining companies in the United States copper mines contribute 62.4 per cent.

The United States has not a single ship capable of being used in the installation of a sub-marine cable.

Three thousand tons of steel plates and angles for ship building were exported from the United States to the Clyde in December.

Ore is defined by the Engineering and Mining Journal as "a natural mineral compound of the elements of which one at least is a metal."

In New York city the manufacturers of electric automobiles have large and powerful trucks which are used for hauling disabled vehicles to the repair shop.

W. A. Clark is reported by a Boston paper to have been offered \$55,000,000 for the United Verde mine, in Arizona, by the Amalgamated Copper Company.

From present indications it looks as though the production of gold in Nova Scotia during the past year would fall considerably below that of the previous year.

During the present session the United States will appropriate \$480,000 as a beginning of annual grants to States and Territories for the establishment and maintenance of schools of mining.

The kingdom of Italy is known as one of the leading manufacturing countries in the world for the production of electrical machinery and kindred apparatus; it also supports a very heavy import trade.

Michael G. Mulhall, the famous statistician in an article contributed to the North American Review in July predicted that the United States census would show a population of 76,200,000. The count enumerated 76,295,000.

The demand for cement is increasing very rapidly all over the world and particularly in new countries. South Africa imported last year nearly 64,000 tons. England used to be the principal producer of the article, but Germany now does a larger business.

The value of gold and silver consumed in the industrial arts by the United States during the calendar year 1899 was: Gold \$17,847,178; silver, coining value, \$15,677,663; a total of \$33,524,841.

The bullion value of the United States standard dollar, as the highest price from 30th June, 1899, to 30th June, 1900, was \$0.48426, and the lowest \$0.45141, and at the average price \$0.46419.

In British Columbia the total amount of timber cut for the year ending June 30, 1900 is placed at 254,000,000 feet, of which 162,000,000 feet was exported over sea, 34,000,000 feet by rail eastward and 58,000,000 used locally in railway construction, mines and buildings.