the roof of the mine and protects the workings from summer heat and winter rain. The neglect of making this provision has made future working more expensive and ruined many mines, by admitting surface water and falls of rock into the mine. The amount of ore left in the first fifty or more feet on the back of the vein and in the ore reserved in the 10 or 20 feet on each side of the shaft is not lost, for if the mine in future becomes exhausted in depth, these ore reserves always remain in sight as an asset which is available and can be extracted before the workings are abandoned, and it is the wisest plan to leave such parts to the last operation of the mine instead of the first stages of development, as is too often the case.—Ex.

VENEZUELAN COPPER MINES.

The copper mines of Aroa, located in the section of Yaracuy in the State of Lara, on the banks of the river Aroa. These mines were discovered in 1605, but during the whole period of Spanish rule over the country their yield was almost insignificant They are worked at present by an English company. The ore is found in a kind of slaty limestone and is principally chalcopyrite, called yellow ore, containing from 9 to 12 per cent. of metallic copper. This ore undergoes several transformations, being changed into red oxide and carbonate of copper. Nearly all the output is shipped to Swansea, England. From 1878 to 1861 there were shipped 329,213 tons of ore, averaging over 11 per cent. of copper, 53,053 tons of regulus, averaging over 27 per cent. These quantities represent in all 51,759 tons of metal, which at the average price of £54 per ton make a total of about $14,000,000. There are in all fourteen copper mines in the country.

PATENT PROCESSES.

The inventor of the patent process for extracting metals from their ores by the use of a set formula aims at securing his supposed discovery from general use by taking out a patent for it. In such a case the formula must be adhered to or the conditions of the patent are not carried out. The intention of the inventor is to use a set combination of chemical reagents to accomplish the reduction of the metals in the ores to the metallic condition. As almost all ores of the same class differ from one another, such a process must have a small application limited to only those of the same chemical composition and physical properties or the formula of the process has to be changed to suit the case or it will not have the desired effect. The question then arises, how far can a patent process be made to stretch to suit altered ore conditions and still hold good? In the case of one class of ore a dilute solution only is necessary, but with that of a higher grade or containing a larger percentage of metal or other refactory substances an increased amount of the reducing agent or precipitant is required to effect the change. The use of the formula would not be complied with and the patent would not apply. If the patent covered the use of certain chemicals in both large and small amounts the case would be different, as the discovery or invention would then consist of a new application of the substance for that purpose for which it had never been used before. The power of cyanide of potassium in solution to dissolve gold was long known before the invention of the MacArthur-Forrest process, which used it in that way on ore and accomplished the precipitation of the gold by the use of zinc shavings, etc. That was a case of patenting a process of ore reduction, not a set formula. It is the variation in ores of the same metal and at times the climatic or local conditions at the mine that often render a process of ore treatment unworkable or not practicable of application in every instance. Consequently the patenting of ore reduction processes is a common custom, and ignorance of chemical laws causes fake processes to be introduced over which the patent office does not or cannot keep a restraining power to grant only those which are tested and proven useful and good. To gain the confidence of the mine owners to experiment on their ores is the great difficulty in introducing a new process, as the worthless are as much canvassed and advertised as the good until their merits become known.—Ex.

HOW MINES INCREASE IN VALUE.

A contemporary quotes the figures at which some of the best known mining properties in British Columbia are now held, to show how mines increase in value as they pass into different hands.

The War Eagle, for instance, was purchased by Patrick Clark and his friends for a nominal sum. They incorporated it for $500,000 in one dollar shares. Then it was sold to the Goederham-Blackstock syndicate for $700,000. The War Eagle Consolidated Mining Co. was organized on January 22nd, 1897, with a capital stock of $1,000,000. The shares of this company have steadily advanced in price until now they are worth about $3.60 per share. This would make the value of the War Eagle $7,200,000—over 14 times the value of the company originally formed by Patrick Clark.

The present value of the Le Roi is compared with the time it was given to Col. Topping, in 1890, for recording fees, amounting to about $15. It is said that Col. Topping subsequently sold all his interest in this company for $50,000 to the parties who afterwards formed the Le Roi Mining and Smelting Co., with a capital stock of $2,500,000 in shares of $5 each. These shares were sold for a few cents when they were first placed on the market. The British America Corporation secured all the shares of the Le Roi Mining and Smelting Co. at a cost of $3,500,000. Then the Le Roi was brought out in London with a capital of £1,000,000 in £5 shares, an increase of $1,500,000 over the purchase price of $3,500,000. Since then the shares have appreciated in value till they now stand at over £7 a share. This is quite an advance over the $15 that Col. Topping originally paid for the mines, and nearly three times what the B. A. C. paid the original Le Roi Company for it.

The history of the famous Payne mine in the Slocan is another illustration of how the value of a good mine grows. This property was registered on February 9, 1897, with a capital of $2,500,000. At the outset the shares sold for considerably less than par. The control of this mine has now passed into the hands of Montreal capitalists, and the company has been reorganized on a basis of 3,000,000 shares of a par value of $1 each. The original stock is quoted on the Montreal Exchange at $4 per share. This would make the present value only a little short of $4,000,000.