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The Paris Exhibition. The exhibits of Tunis, Persia, Norway, Sweden, Great Britain, Canada, Germany, the United States, Italy, Holland, Portugal, Denmark, and South America. 1 illus.
- IX. CHESS RECORD.**—Biographical Sketch of F. E. Brenning, of New York, with Portrait and one of his Problems.—Letter Problem.—The Huddersfield College Tourney No. 1.—Chess in Literature.—Solutions to Problems.

SILVER MINING IN MASSACHUSETTS.

Early in 1873, considerable public interest was awakened and some speculative excitement aroused by the announcement in local journals of the discovery of mines in the vicinity of Newburyport, Massachusetts, which were yielding even at the surface ores rich in silver, and in some cases containing appreciable amounts of gold. The reports were, as is usually the case under like circumstances, greatly exaggerated, and those who expected to find gold in nuggets and silver in the native state were considerably disappointed to encounter both metals only in the form of sulphurets, the one occasionally in auriferous pyrites, the other in argenticiferous galena and in gray copper (tetrahedrite). The first assay of the new found galena showed that one ton of the ore represented a value of \$179, lead and silver together, the latter existing in the proportion of 68 ounces to the ton, and as other trials resulted in even more promising data measures were at once set afoot to develop the mineral resources thus brought to light. With the speculative mania which ensued, whereby land hitherto deemed little more than a rocky desert suddenly became exceedingly valuable, and with the vicissitudes of the numerous concerns which were started to mine the precious metals, it is not our purpose here to deal; especially as at the present time the era of speculation seems to have gone by, and several mining experts of long experience in the silver mines of the West have entered (though in a limited way) upon the systematic development of certain veins, which offer, we are informed, every indication of large and valuable yields.

The region where the ores abundantly exist (for it is scarcely possible to break an outcropping rock without finding traces or even a good showing of galena) is a barren and forbidding tract, located about two miles to the southwest of the town of Newburyport. Over how large an area the metalliferous deposit extends no two estimates seem to agree. The geological formation, or rather lack of formation, almost defies classification, for it is evident that great natural forces have here been at work both to roughen the face of the country and inextricably to intermingle the strata. The metal bearing veins are known to ramify over an area of five by two miles, for a shaft sunk almost anywhere within these limits is reasonably certain to strike ore, and it is reported that in reality the metalliferous beds underlie a much more extended region. There is hardly a farmer in the vicinity who has not dug down and found ore, and mere well digging has brought to light some remarkably fine deposits. These little shafts, however, can hardly be counted, but beside nearly every one, and most of them appear to be abandoned, there is a heap of ore from which rich specimens of galena can easily be picked out. Occasionally this shallow excavation demonstrates the existence of a large vein, as in the case of the so-called "Big Quartz Vein," which, though prospected only to the depth of 30 feet, is found to be 18 feet wide on the surface, with outcroppings at a distance of some 2,500 feet. It lies between a wall of feldspathic trap or greenstone on one side, and a talcose slate on the other, and surface assays yield gold and silver in about equal value to over \$20 per ton.

It may be said of all the mining operations thus far conducted in the vicinity that they are little more than surface prospecting, a fact clearly apparent from the details of some of the principal mines given further on; and we are assured by experts, who have made special examinations, that deeper mining offers every prospect of substantial success. The difficulty, however, is lack of capital to put up the necessary works for treating the ores on the spot. Owners and parties interested in different mines all agree in stating to us that a mill, capable of handling the 200 tons (rough estimate) per day taken from the principal shafts, would probably prove remunerative to whoever would establish it; but where there were so many small disunited interests it was useless to expect the same result through co-operation. The fact seems to be that the mines that are still worked require all the available resources of the owners to keep them free from water, and the ore that is taken out simply lies in heaps in the sheds.

The mine known as the Merrimac is the largest, and besides has the most extensive plant. It is under the superintendence of Mr. Edgar Shaw, who informs us that one pocket of gray copper that was encountered in it yielded 8 tons of ore, which was sold at \$2,150 per ton in Liverpool. The pay streak of galena now being worked is 2 feet wide, and thus far 312 feet long, yielding about \$70 per ton. The shaft has a depth of 200 feet. This mine has been open about five years, and has paid 12 dividends, showing a net profit of about \$80,000. Owing to a defalcation and loss of funds its operations are at a standstill, although a new mill plant for concentrating the ore by the Hooper process has just been erected.

The China mine was opened in last September, and has a shaft 90 feet deep. The vein being worked is about 4 feet in width. About 300 tons of ore have been taken out, averaging in value \$200 per ton. Gray copper assaying as high as \$1,000 per ton, a few specimens of ruby silver, and considerable zinc are also reported to have been found. Of the other mines, the richest bonanza is believed to exist on the so-called Noyes property, where gold in the proportion of over 20 dollars' worth per ton is found in auriferous pyrites, besides a rich showing of silver in the gray copper and galena. In the Newhall mine, gold has been found in patches in the gray copper, and the ore has assayed at \$26 per ton.

The other mines are sinking shallow shafts, and are

worked in a spasmodic manner, as the owners have funds to devote to them.

So far as our superficial inspection of the mining region, and as the statements of those familiar with the operations extended, there seems to be no reasonable doubt as to the existence of the large metal bearing deposits alleged to exist. Nor in view of the general prevalence of rich looking ore already on the surface, and the results of apparently well authenticated assays, does it seem improbable that the value of the deposits is in any degree less than the experts on the spot allege. As to whether the refractory ores can practically be manipulated on the spot, so as to pay, and whether the products of the mines will hold out in uniform richness, these, besides many others, are questions for the mining engineer to answer after proper examination of the present status of the field. It is but right to say that the value of the mines has been disputed, and there seems to be a lack of exact information relative to them which suggests the idea that it might be to the interest of mining experts, as well as of public importance, to have more extended surveys and investigations made at an early day. Assays of specimens of galena, collected at random from numerous ore heaps at the mines, yield an average of \$27.96 per ton in gold and silver.

COUNTERFEIT COIN.

It would hardly be supposed that so large an amount as two million dollars in counterfeit silver and gold coin is now afloat in this country, but such, according to the estimate of Treasury experts, is the fact, and, moreover, the total is constantly increasing. This spurious money passes through thousands of innocent hands, until finally it is caught in the meshes of the nets laid by the Secret Service or is recognized by a lynx eyed expert in some large bank. Then the unfortunate holder becomes the victim of the counterfeiter's skillful rascality.

In order to imitate a coin successfully—that is, so that it will deceive, not the general public, because probably most persons never take a second look at the coin they receive, provided its appearance seems right, but the clerk or cashier moderately well accustomed to handling money—the counterfeiter must regard both execution, size, and weight. The last is most important in gold coin, because the least current weight of the latter is established, whereas in silver a coin of light weight, so long as the reduction is not manifestly too great, will pass. The standard weights and least current weights of gold coin are as follows:

20 dollar piece—Standard, 516 grains; least current weight, 513.42
10 " " " 258 " " 256.71
5 " " " 129 " " 128.36
2½ " " " 64.5 " " 64.18

Any decrease in weight below the latter figures subjects the holder to a loss equivalent to the difference. This decrease may occur by wear, or, as is very often the case, through sundry nefarious processes, which, though not properly counterfeiting, nevertheless belong to that species of crime.

These operations are perhaps the most dangerous to the community, because as a rule the coin preserves its appearance, is apparently genuine under the acid test, and in fact is genuine except in weight. It is impossible, for example, to tell whether a coin has been "sweated" or not without weighing it, and by sweating is meant the use of the coin as the anode in the electroplating bath, the gold being abstracted from it and deposited on another surface. Of course a uniform quantity is removed from the entire surface, and the imprint retains its original sharpness. As much as two dollars' worth of gold is sometimes taken from the double eagle in this way. A less scientific plan is one too commonly adopted by conscienceless jewelers, who when they want a little gold, instead of buying the precious metal, purchase a twenty dollar piece, file off with a dead smooth file a sufficient quantity, reburnish the place, and pass off the coin at full value. The most extensive fraud perpetrated on gold coinage is "splitting." The operator uses a fine saw to split the coin neatly in two. Then he gouges the gold out of the center until only a thin outside shell is left, and substitutes a silver and platinum alloy for the metal thus abstracted. The two parts are then joined with gold solder, and the edge is remilled. In this way, we are informed, gold to the value of \$15.50 has been taken from a single piece. The operation, however, generally destroys the ring or tone of the coin, leaving it, besides, either too light or too thick. Another swindle is to bore into the edge, and it is said that John Chinaman favors this game, buying up the pieces, sending them to China, so that his dexterous compatriots may there manipulate them in safety, and subsequently reimporting them to set them adrift upon the unsuspecting American public. The holes whence the gold is taken are refilled with silver, covered with gold solder, and the edges are neatly finished; but the light weight reveals the theft. From 5 to 7½ dollars' worth of gold has thus been taken from one coin, and the pieces of course have every appearance of being genuine. Real counterfeits—that is, coin wholly spurious because made of base metal—are almost invariably below weight. An exception to this, however, exists in a \$5 piece which is of the exact standard weight of 129 grains. It is composed of an alloy of gold and silver, and is worth from \$2.70 to \$3.40. Its appearance and tone are excellent, but it is thicker than the genuine coin, and hence may be detected by the gauge. Still it is one of the most dangerous counterfeits in existence.

As we have stated a silver piece passes current so long as the imprint is not badly defaced or weight greatly reduced. A hole through the coin, however, condemns it—a fact, we