



By Ralph Keeler

## SALTING<sup>1</sup>

It often happens that Mother Nature is not as generous in her distribution of minerals as the owners of mining properties would like; in such cases unscrupulous promoters often attempt to help the situation by "salting" the prospect or the mine.

"Salting" as the term is used in mining is, in effect "sweetening"; that is, the deliberate placing of gold, silver, or high grade ore in a mine or in samples to give a false impression of the value of the property. It has probably been going on ever since the first gold mine was found, since there has always been, and probably always will be, a certain number of crooks hanging about the mining industry.

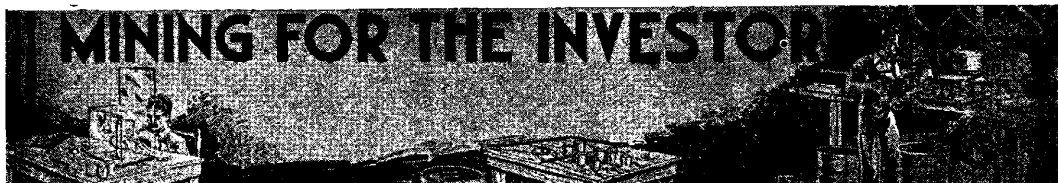
Crooked promotion and salting go hand in hand in the misrepresentation of mines. Both are criminal, and are punishable in the United States, the penitentiary being the maximum penalty in some of the mining states, and heavy fines in others.

It therefore becomes necessary for the examining engineer to keep a cautionary thought in the back of his head all of the time on each and every assignment to the effect that he is always open to salting, and that he should take every care to prevent it. The engineer can not relax his vigilance on the sealing or boxing or locking of his samples in preparation for

the assayer. Not until the final calculations have been made, and the results carefully checked for inconsistencies, can the engineer consider his job done.

The basis of an engineer's detection of salting is on the principle of inconsistency of results. If for example, scratched flakes of placer gold are found in a sample from a lode mine, the engineer can be sure that Mother Nature had considerable help in putting them there (a case of this type happened in the Baguio district, a few years ago). If gold is found in a region where the geologic structure and general indications point to the impossibility of such a discovery, the engineer would do well to recheck his samples (this inconsistency was prominent in the imaginary "Bicol gold field" some two years ago). When several distinct types of diamonds, rubies, garnets, sapphires, emeralds, and amethysts are presumably "found" on a property, (an association practically impossible in Nature) the engineer would do well to investigate the promoters—such an example was the Great Diamond Hoax perpetrated in the United States in 1872.

<sup>1</sup> This chapter was prepared with the cooperation of Professor V. V. Clark, head of the Mining Department, University of the Philippines.



There are many different ways of salting samples. Gold filings may be surreptitiously added to the samples themselves. Gold dust may be fired from a shotgun into the face to be sampled, or it may be included in a dynamite charge before a face is broken down. The engineer must watch lest gold chloride be injected into his samples with a hypodermic syringe. Amalgam may be dropped into the sample box. Holes may be bored in wooden or steel sample containers, and gold introduced. Gold solution may be sprayed over open samples. Some of the favorite tricks of the old-time salters were the use of a cigarette in which gold had been inserted, the ash being flicked into the sample; chewing tobacco loaded with gold particles which a clever spitter could adroitly place in the sample; pipe tobacco salted, and then spilled carelessly over the samples; home-made candy salted, and more clever spitting; particles of gold in the beard or mustache, and a few shakes or scratches at proper intervals; gold dust under the finger nails, to be dusted over the sample when the engineer wasn't looking; gold dust in the nostril and a timely sneeze over the sample; high grade concealed in the clothes for judicious distribution; gold dust in sandwiches or other food, to be added to the sample box during the lunch hour when quartering is unfinished. All of these methods, and many more have been used; millions of dollars have been stolen as a result of such salting.

If a silver property is under examination, the materials used for salting may be silver filings, silver nitrate in powder or solution, all applied as in gold salting. If a copper property is under examination, then copper filings, powdered chalcopryrite (sulphide of copper and iron), copper sulphate either powdered or in solution, may be used as described above. This applies particularly to drilling large disseminated low grade copper deposits.

Lead or zinc salting is not so common as in the case of the precious metals, for the main reason that their percentage in ore can be guessed quite easily by the experienced engineer if in commercial quantities.

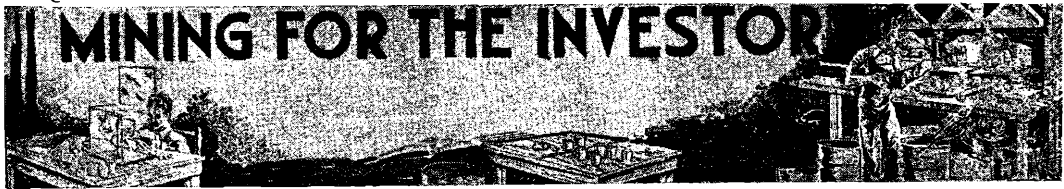
V. V. Clark, an examining mining engineer of long experience says: "Mercury salting has come under my observation only once on a mercury mine examination. It was so clumsily done that the mercury flask was found in the brush near the sluice box. It was used the night before and afforded unmistakable evidence as to the source of the large and inconsistent accumulation of free mercury in the sluice box.

"Nor has salting placer platinum ever come to my attention, either in literature or in my own practice.

"In the Philippines two new methods of placer salting came into my personal experience. On one property which was under a P200,000 option, I had a strong suspicion that the samples were being salted, but was unable at first to detect the source or the method. Two women were employed as panners to recover the gold values. Since the results continued to show inconsistencies, it was decided to bring in an independent drill crew and panner, of known reliability, to check the work of the two women panners. Consistency in the new crew's work at once appeared. Then the women panners were replaced by the new crew; consistency took the place of the former suspicious results. This concentrated suspicion on the women panners, but still the method had not been disclosed.

"Finally one of the women panners became conscience stricken and confessed: These people scratched a great deal. A small pocket almost invisible was sewn on the ladies blouse near the shoulder—within this was hung a small sack containing gold dust.

"When a doelang (or batea) of gra-



vel was being washed down to the concentrate, and with fingers wet, the lady would have to scratch, a finger found its way inside the slit, gold adhered to finger, and on resuming the panning operation the adhering salt was washed into the concentrates. This case happened on the Islands of Luzon.

"On the island of Mindanao I employed a woman panner. She was observed to pan tramp gold from a river bed between pannings of samples from our own drilling. I carefully watched her bring this river panning and permitted her to continue until she made bold to show up a heavy gold return from barren blue clay in which gold could not occur. She was discharged forthwith.

"Her successor, another woman, was honest but slow. Then we put our proven panner on the job. In the course of time an inconsistency developed; we watched the drillers and soon furtive glances from a native working on the dump box gave a clew. Finally he made bold to throw into the box a No. 3 colour, (weighing about 16 mgr.) which in a short time came, to the panner. On examining this colour under a glass it had one edge turned over and showed a hammer mark on top, and an anvil mark on the under side of the colour. This man was also discharged.

"Thereupon the work continued to the conclusion without further attempts to salt. But at the end of the campaign it was proved, by checking the previous driller's holes, that his samples had been consistently salted without his knowing it, throughout preliminary drilling of the same tract.

"All of which goes to prove that an engineer must be up on his toes all of the time with respect to anticipating salting from most innocent sources, and from assistants and laborers picked up locally. It is frequently imperative to use local laborers for drilling and other rough work for underground lode work or placer in connection with

sampling operation, but other arrangements should be made if possible.

"In the latter case the best safeguard is to have a number of trusted and tried assistants brought from headquarters. They can be detailed to watch sampling, the sample sacks, boxes, trunks, or whatever kind of container is used for carrying samples from the mine to assay office, watching in relays, and never allowing the samples to be out of their sight.

"And even then vigilance must not be relaxed. If it is a custom assay office the fluxes must be examined and assayed, and an assistant must watch the crushing and reduction operations, and see the whole process through even to the weighing. Reject samples must be replaced in their respective sacks, properly numbered, sealed, and boxed, with a view to reassaying if inconsistencies appear in the results.

"And that is where the "Law of Inconsistency" plays its part. Where inconsistencies appear run them to earth immediately, and do not rest until they are cleared up, or fraud is proved. It might require a trip back to the mine, to obtain conclusive evidence. But in this connection dummy samples and duplicate samples, not consecutively numbered, but bearing a code number, are frequently useful in throwing a salter off the track.

"Moreover, no matter how clever a salter is, it is impossible for him to be consistent in the amount of salt applied to check samples, as the bulk and weight of samples vary considerably. And that is where the law of Inconsistency shows up the "salter" every time.

"One of the best salting stories that ever came to my ears, was told to me by an American engineer who was commissioned to examine an alleged rich placer mine in Alaska. This engineer took a well known assistant engineer with him from the States. On arriving at the property, which was in a remote district, he found the owners (three partners) on the ground await-

ing his arrival. It was a hydraulic gravel mine, extensively worked. The Engineer and his assistant began sampling the banks and soon discovered that gold salt had been shot into all of them.

“Without disclosing their discovery to the owners, they continued their work, using the recovered gold salt over and over again in such a clever

way to indicate to the owners that they were obtaining phenomenal values. The owners became excited, and finally offered to buy back the option at a high premium. The deal was made, before the engineers got out of the district before the owners discovered the hoax and they never told that they had been beaten at their own game.

*(To be continued)*

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