Treatment of Poor Ores.

A correspondent of the London Mining Journal furnishes the following highly practical comments on the utilizing of poor ores, a subject of paramount importance in the developing of mines. A great obstacle to the progress of all mining sections is the difficulty of making available the poorer ores. Low grades are the rule, high grades the exception. Every miner grades the exception. Every miner will take heart when he learns of a practical method of bringing his poor ores, now refuse, to yield a profitable return. "Chemicus"

"It is now very many years since Augustin drew attention to the fact that the roasting of silver ores with sodic chloride, and their sub-sequent lixiviation by a hot solution of the same salt, would enable silver to be extracted from ores of too low a percentage to be profitably treated in the dry way; and the introduction of Longmaid's process for the manufacture of sodic sulphate by the heating of various forms of pyrites with sodic chloride. resulted in Augustin's method being applied to the treatment of other than argentic sulphides. Claudet pushed the matter further. and by an additional chloridization succeeded in extracting gold as well as silver from these ores; while Sel-win, by adding hydrochloric acid to the solution of sodic chloride and actually boiling to ore therein, was enabled to materially increase the production of silver from ores of

low grade. It will be perceived that the principle upon which all these processes have hitherto depended is simply the decomposition of sodic chloride in the presence of silver, the subsequent solution of the ar-gentic chloride in hot brine, and the final precipitation of metallic silver by the introduction of metallic copper into the silver solution. Now, these chemical reactions cannot be earried out with theoretical exactness in actual practice with large quantities of ore, and thus it happens that hitherto the treatment has only been continuously applied where the proportion of silver has been sufficiently great to allow of a considerable percentage of loss, and yet for the remainder to more than cover the cost of the precess. This percentage of loss chiefly arises from imperfect chloridization of the ore when in the furnace, imperfect solution of the vat and imperfect decomposition of that salt in the precipitating tanks; and to such an extent do these im-perfections occur in practice, in many cases the hydro-metallurgical methods hitherto tried have failed to recover more than forty per cent.

Mr. Barnard has successfully remedied these defects by avail very same principles as those above described, and his ingenious above described, and his ingenious adaptation as an active agent of an element hitherto looked upon—when it happened to be present—as mere gangue fortuitously accompanying the silver ore is, in my mind, not the least of the merits of his invention. From what I can gain by perusing his specification, and by seeing his process in actual operation on a large scale at New Consols, he appears to regard the mixture of a certain amount of copper ore with ores containing silver as constituting the true method ver as constituting the true method of extracting the whole of the latter metal, while by selecting for his separation agent copper ores of too low a class to be merchantable, he secures the additional advantage of producing not only silver, but a sufficient amount of copper to much more than pay for the treat-

of the silver known by assay to ex-

ist in the ore before treatment.

This mixture of copper and ailver ores, though, probably (if the inventor will forgive me) but a happy inspiration on the part of Mr. Barnard, leads to a series of most interesting chemical reactions, a study of which fully accounts for the striking results obtained as regards the aimost perfect separation of silver which ensues. In the furnace the mixed eres are found to chloridize much more completely than silver ore alone; in the lixiviating vat a more perfect "leeching" than silver ore alone; in the lixiviating vat a more perfect "leeching" takes place from the fact of argentic chloride being more easily soluble in a combined solution of cupric and sodic chlorides than in simply the latter; and in the final stage of precipitation the iron or zinc used first sets free the copper from the solution, and, this being thus rendered "nascent" (the feature of which, I presume, gave the process its name) in the presence of a dissolved silver salt, exercising a most energetic action in reducing that metal. The reactions in the preenergetic action in reducing that metal. The reactions in the precipitating vats are also madered more complete by the employment of a jet of steam which, by maintaining a high temperature together with that condition of molecular disturbance, always observable when fresh steam is condensed below the surface of a liquid, materially accelerates the progress of chemical decomposition and substitution.

"The above observations are necessarily of a somewhat techni-cal character, but I trust they will be found to convey a clear idea of what I cannot help regarding as an invention likely to exercise a proinvention likely to exercise a prosound effect upon the fortunes of
mining. If I be correctly informed,
much of the material now being
profitably treated at New Consols does not contain more
than seven-eighths of one per
cent of copper, and three counces of silver to the ton—a significant fact, surely, and one which
should please the Duchy of Cornwall and other lords of mineral
properties, as well as being satisfactory to mining shareholders."—
Journal of Mines, Metals and,
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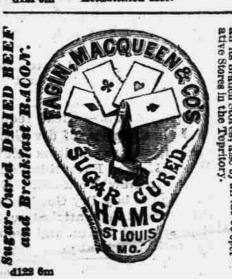
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