cipitation only being effected by an increased addition of zinc and a further fouling of the solution.

Satisfactory precipitation, from an economic point of view, is more a question of ultimate value than actual metal content. The 'barren' solution after gold precipitation may contain a few grains per ton as compared with a corresponding 'barren' solution after silver precipitation which may contain as many pennyweights. Each may be referred to as the residue after satisfactory precipitation, but it is obvious that the question of zinc content is more important in the case of the treatment of gold ores where a complete or nearly complete precipitation is essential, a small percentage of the metal representing a high money value. In either case the precipitation is at maximum efficiency at the commencement of operations and deteriorates with the accumulation of zinc in the solution.

In conclusion, it may be added that, in piecing together the above notes, a deal of recognized information on zinc precipitation has been included for the sake of clarity. I wish to acknowledge the fact and would make especial reference to J. E. Clennell, whose handbook on cyanide solutions is of especial interest and value.

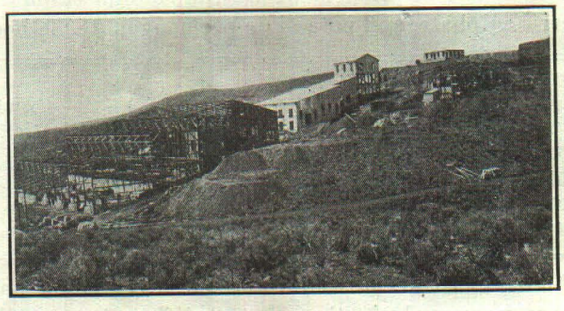
Minerals in Persia

Writing in the *Near East*, M. Charles Brouard, a mining engineer, who has spent many years prospecting and traveling in Persia, gives interesting details regarding the mineral wealth of that country. In M. Brouard's opinion, Persia will be one of the great oil-producing countries of the future. Apart from this, it will produce large quantities of gold, silver, copper, lead, and iron. The province of Azerbaijan, with the goldfields of the Kalu river, is generally considered as the richest in mineral wealth, but geological considerations seem to point to Luristan as equally worthy of the attention of European capital. The same remarks apply to Turkish territory situate immediately beyond the western frontier of Persia. Copper ore is frequently found. The most frequent forms are chalcopyrite, malachite, azurite, and chalcosite. M. Brouard discovered an extensive manganese orebody in the vicinity of Kerman, and says that on the whole the manganese group is represented by better ore than that found in the Caucasus. The pyrolusite contains lime, practically no phosphorus, and yields an average of 40% manganese. With regard to bitumen, an interesting discovery which M. Brouard made along the Top é Khazab, in the Kuh Jahak, was a four-mile deposit of bitumen. "The rocks here were dripping bitumen from all their cracks. The bitumen itself lay as a soft bed two to five feet deep at the bottom of the river. As a rough analysis showed, its purity is nearly equal to that of Utah. Its nearly complete solubility in carbon bisulphide and the distillation products denoted the presence of a large quantity of fluid hydrocarbons, not many gaseous products, and only a negligible quantity of sulphur; its specific gravity was 1.25." The country gives promise of future development.

Progress at the Buckhorn Mine

This property is situated in Eureka county, Nevada, and is controlled largely by those interested in the Goldfield Consolidated Mines Co. At the Buckhorn mine both north and south branches of the haulage adit are being driven, and raises from this adit to the levels above have been started.

The Buckhorn mine produces an ore of a talcy nature containing about 40% silica. The scheme of treatment in the 300-ton mill under construction is as follows: Ore is dumped into a steel storage tank of 550-ton capacity, from which it passes over a shaking-screen with 1-in. apertures, the oversize being crushed by a 10 by 20-in. Blake crusher. The crushed product and screen undersize go to a revolving trommel 12 by 36 in., oversize going to



BUCKHORN MILL.

15 by 40-in. rolls, choke fed. Undersize from the trommel, with the roll product, is fed to a 6-ft. Hardinge conical ball-mill with spiral feed. Two bucket elevators, one being a stand-by, with 19-ft. centres and a 12-in. belt, lift the pulp to two 45-in. Akins classifiers. These work in closed circuit with two 5 by 18-in. tube-mills. The final overflow from the classifiers goes direct to the Dorr agitators. These are filled by a distributor, agitation being through the centre column and distributor, the arms raking pulp to the centre. Agitation is done in three vats in series. From these the slime goes to three Dorr thickeners from which the thickened pulp is run to a second battery of three, here meeting with solution from revolving filters and other barren solution. The overflow from the second three flows into the first three, and overflow from the first three is precipitated by zinc dust. Slime is treated on four Oliver filters, and the residue is agitated by four vortex mixers and discharged. The mill buildings will soon be covered, and machinery is now being installed. About 25 men are engaged on construction of the power-plant at Beowawe, and the 30-mile transmission line to Buckhorn is practically completed. S. J. Kidder is general manager of the property.

The Wettlaufer Lorrain mine at Cobalt shipped the following ore during 1912:

Class.	Pounds.	Silver, oz.
First	349,954	561,050
Second	219,939	56,785
Concentrate	385,451	191,184
Bullion	673	6,979
Total	956,017	815,998