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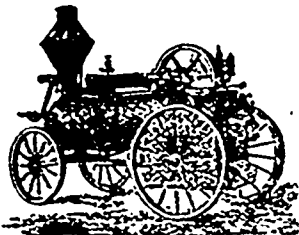
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GEORGE LAWSON, Ph. D., L. J. D.

Fellow of the Institute of Chemistry of  
Great Britain and Ireland.

## MINING.

### CHINESE SILVER MINING IN MONGOLIA.

By H. F. DAWES.

From the Engineering and Mining Journal.

In China all minerals are, theoretically at least, the property of the emperor, and the imperial permission must be got for the privilege of working them. A direct tax is levied on this privilege, and by simple command the emperor can close a mine at any time.

Occult geomantic influences are a large factor in determining the opening or the arbitrary closing of a mine. The location with reference to points of the compass, graves and natural objects may be really or professedly considered as indicating that those influences are favorable or unfavorable. The consequence is, of course, that for the authorization and encouragement of any considerable enterprise, friends at court, practical politics, and more or less bribery, are required. As a result, most Chinese mining is illicit, and is carried on in a small way only. Often along a single vein, or over a small section of mining country, a few individuals obtain rights over all the openings, most probably by loaning money to the head men of the operators and holding the mines as security for the debt. In such cases, perhaps for better security, all the ore is reduced in the works established by the creditors, who also handle all silver produced. As the head men are for the most part improvident, and the laws and customs for the collection of debts are stringent and peculiar, the "office men" or creditors acquire in time what is practically an ownership of the mines. Workings are often abandoned, and the title to them is passed back to the office men. They are also transferable, with the permission of the office holder. If he is not known he must pay the debts on taking possession; but they are a home-staying people for the most part, and unknown men seem to be the exception; so the debt usually runs on for the new man until transferred again or cancelled.

The office men have a large organized force, part at the reduction works and part at the mines. The former part consists of bookkeepers, store-keepers (for the office men supply the head men in great part with tools and materials,) and representatives of the office to oversee all details of the reduction of ore, and last, but by no means least, watchmen who are present day and night in every section or department. The mine force usually consists of an inspector and watchmen for each opening; but when the openings are isolated, or when inspectors or watchmen are increased because the mine is in bonanza, a cook and other functionaries are added. The inspector watches the interests of the office men, sees that the terms of the contract are fulfilled, is on hand when ore is being taken out, reports daily on the appearance of the headings, and keeps the office thoroughly posted upon matters in his district.

A promising outcrop is usually the starting point of the mining work. As soon as the miners have run in on it far enough to be under cover, they have in most cases sunk on it, probably following the ore or the most promising indications, no advantage being taken of opportunities for opening by adit tunnels. The shafts are more or less irregular, though some lifts of 60 ft. or more are exceptions, following small seams of spar, and in some cases merely the clay selvage. The timbers are about 3 in. in diameter, and when not used for shoring up bad ground, are placed across the ends of the shaft about 2 ft. apart, and alternately from one end to the other, to serve as ladders. In unproductive ground the shafts are never more than 3 ft. long. In open slopes stulls are similarly placed for climbing about on. They serve much better for ladders than the Mexican notched pole, can be travelled over more quickly and with heavier loads. When the vein is more flat, stulls are often set opposite each other, and on the foot-wall side a stick thrown across them serves as a foot rest. When the vein is flatter yet, steps are cut directly in the foot wall, and timbers are dispensed with entirely, unless needed for bad ground.

Very few large timbers are used in the mines. In bad ground, the galleries being for the most part small, the operators seem willing to take their chances of caving; but such shoring as is used when absolutely necessary is of the flimsiest character. The galleries are about 3 ft. high and 2 ft. wide, just of the size that a man can easily work in, seated on the floor or a small block of wood. As little waste dirt as possible is carried to the surface, abandoned workings being usually packed with it. Even galleries in use are gradually filled, so as to leave only just room enough to get through. No drilling is done or powder used, and all work is done by hammer and chisel. The hammers are of cast iron, weighing 6 to 8 lbs., with handles 6 in. long, and the chisels are of iron, tipped with steel, sharpened at the forge and tempered. The hammer-heads are worn in a short time into cup-shaped depressions, which the miners seem to think reduce the danger of missing the chisel head.

All the work is single-handed. The miner always sits while at work, with his lamp hanging from a twig wedged across the drift in a convenient position. Many of the lamps are beaten out of lead, filled with peanut oil and provided with twisted cotton wicks, which they spin themselves by hand. The waste that has to be taken to the surface is carried up in small shallow baskets on the shoulders of boys; poor ore is always taken up in this way and sorted on the surface near the mouth of the workings, while first-class ore is sacked underground and taken to the head men in small lots as fast as extracted. Most frequently rich ore must be taken from the vein only in the presence of the inspector. When 50 lbs. or more are collected it is carried to the storehouse of the office men as provided in the contract.

(To be continued.)