

ZINC MINING IN KANSAS.

BY HARRY L. WOHLFORD.

From a small triangular area in southeastern Kansas—perhaps six miles wide at its base and ten miles high along its side—there have been mined, during a period of twenty-four years, lead and zinc ores to the value of more than thirty million dollars. The entire region presents a most curious aspect to the mining man from further west. On the surface may be seen the farmer busy with his grain or among his stock, while beneath him fifty, a hundred, and sometimes two hundred feet, the miners are toiling with pick and drill and blast. The discovery of mineral was made here in April, 1876, and since that date the productiveness of the mines and the working of them have continued unabated.

The galena, or lead ore, is the ordinary lead sulphide (PbS). It is a dark bluish black in color and is usually found in the form of cubes, varying in size from a pinhead to blocks six and eight inches across their face. There are also found here two, and in some localities three zinc ores, though the most important one is the common zinc sulphide (ZnS), containing about 67 per cent metallic zinc. When first brought to the surface its colors are widely diversified, many blocks forming the most beautiful specimens imaginable. Some retain their brilliancy indefinitely, others again lose their bright hues after a short exposure to the atmosphere. The miners have coined names for these multicolored ores, and they are known respectively as "rosin jack," "gray jack," "black jack," "peacock jack," etc., the last-named possessing colors with which the rainbow can scarcely vie.

Together with the lead and zinc ores are found a number of secondary ores and minerals. One of these is a double sulphide of iron, or "mundi," as the miners term it, having a specific gravity of 4.95. Its admixture with clean zinc is closely guarded against, as a small per cent of this impurity greatly affects the marketable value of the clean ore. Perhaps the most abundant of all the associate minerals is a calcium carbonate known locally as "tiff." It assumes various forms, though the most common one is crystalline. Some of the pieces taken from the ground are ravishingly beautiful, with their clustered crystals flashing in the sunlight and their translucent whiteness in sharp contrast against the somber colored blocks of lead. Aside from the ones mentioned there are yet other adulterants found in connection with the lead and zinc ores. One of these is a barium sulphate ($BaSO_4$), the other a calcium fluoride (CaF_2), though neither occurs throughout this district to any considerable extent.

The early history of the Short Creek district is one of crude methods, scanty results and illogical deductions. The mines were little else than surface prospecting, and the general opinion among the miners was that the ore deposits were of a superficial character and that no lower-lying bodies of ore existed. Since then strongly capitalized companies have taken in charge many tracts of land, deemed practically exhausted, and by means of huge centrifugal pumps have so thoroughly drained the ground that now deeper prospecting is found to be not only possible, but lucrative as well. Positive proof is shown by these deeper operations that greater bodies of ore lie below than above the hundred-foot level. The most rudimentary methods were employed by the early-day prospectors. A hoister-crane, dangerously weak-looking, with an ox or a slow-moving horse for motive power, a half barrel for a tub, and a sluice-box planted in the nearest stream, is a general description of the

average prospecting outfit. Now steam has taken the horse's place and the hoister sweeps and great iron tubs have forced the half barrels into the rubbish heap.

But of all the changes made, perhaps the most radical one was in the method of washing the ore-bearing earth. The sluice-box gave place to an affair known as a "jig tank," a large square box filled with water in which was suspended from uprights fastened at either



A TYPICAL KANSAS ZINC-ORE REDUCING MILL.

side an oblong trough, whose flat bottom was formed of iron bars. The interstices between the bars permitted the water in the larger box to pass upward through the wash-dirt in the trough, as it was raised and lowered by means of a long pole attached to a crosspiece above it. The wash of the water between the bars causes the ore, being the heaviest, to sink to the bottom of the trough, so that the flint and other waste might be shoveled from the top.

The crushers or mills throughout the district are capable of crushing and cleaning, during a shift of ten hours, from fifty to one hundred tons of ore-bearing rock at a cost ranging from ten to fourteen dollars per ton, much depending on the richness of the dirt and the facilities for rapid handling. The cost of one of these monsters is quite an item. Nothing worthy the name, even, can be erected for less than five thousand dollars, while many reach an approximate cost of from ten to twelve thousand.

There are now in the district more than a hundred mills, the greater part of them having been erected during the years 1899 and 1900.

Very little mining land is sold, the owner generally preferring to lease the ground on a royalty to some

and the waste during transit reduced to the minimum.

Antwerp in Belgium is progressing rapidly to the front as a consumer of American zinc. At present writing there has been pledged, by the producers in the Kansas zinc fields and the adjacent district in Missouri, more than a thousand tons weekly to the firm of J. Needham's Sons, of Antwerp. The through shipping rate will be less than six dollars per ton to land the ore in that city. It is fully believed by all the producers and operators in the two districts that this immense foreign market will very effectually regulate the price of zinc ore in the United States.

Mine ownership here is well distributed among the laboring class, and universal satisfaction and good will is always maintained. The fact that the mines have been operated since their discovery without a strike or labor trouble of any kind is ample proof of the feasibility of the system.

A CLEVER SALVAGE FEAT

We publish herewith a photograph relating to a unique salvage feat that has recently been accomplished in England. During the night of March 25 last, the steamship "Dinnington," while trying to make Portland Harbor during a heavy gale, was wrecked upon the outer arm of the new breakwater that is being constructed at Portland for the British Admiralty. The captain of the vessel missed the entrance and ran upon the rocks at full speed. It was high tide at the time, and a heavy southeasterly sea was running. The contractors for this breakwater have only just completed the submerged portion of the work, so that at high tide the structure is covered. A comprehensive idea of the speed at which the vessel was traveling at the time of the disaster may be gathered from the fact that she nearly jumped over the breakwater. There could not have been more than two feet of water covering the rocks at the time. The ship was caught by the rocks right amidships, and at low tide she was in the perilous position shown in our photograph. Four tugs were dispatched to her assistance, since it was thought that the damage to her hull was purely superficial, and that she could easily be hauled off. The combined power of these tugs, however, failed to move her, and closer examination proved that a sharp rock had penetrated her bottom amidships and she was jammed upon this as if fixed upon a pivot. The action of the waves severely bumped her upon the rocks, with the result that several other holes were soon torn in her sides, and she rapidly filled with water. After several attempts to salvage her she was abandoned by the underwriters, and it was proposed to destroy her.

At this juncture, the West of England Salvage Company of Penzance offered to recover the wreck. The work was pursued under the superintendence of Capt. W. E. Anderson, the officer engaged by the American government to report upon the disaster to the battleship "Maine." The task was beset with innumerable difficulties. The wreck was fully exposed to the fury of the southeasterly gales, which at that time of the year were raging furiously. On two occasions he had completed his arrangements for towing her off the



S. S. "DINNINGTON" WRECKED ON PORTLAND BREAKWATER—AFTER END OF VESSEL LYING IN 54 FEET OF WATER.

rocks, but each time had to abandon the work on account of the gales springing up and destroying all his plans.

There was another danger. The constant bumping of the vessel by the motion of the waves was knocking her bottom all to pieces, and she threatened to slip off the rock that was holding her securely. There was a depth of 54 feet of water at the stern, but fortunately the weight of this was counterbalanced by a

person or company who in turn sublet it to the actual miner. The second lessee collects a royalty of 20 per cent from the miner, 10 per cent of which he in turn is assessed by the land owner.

All ore is weighed upon the company's scales, and it is to them and not to the actual owner of the ore that the buyer makes the check.

Ore intended for shipment to foreign markets is sacked, so that the handling of it is greatly facilitated,

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