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## THE HYDRAULIC COMPRESSED-AIR POWER PLANT AT THE VICTORIA MINE

Pressure Secured Without Moving Machinery—Cost and Efficiency

BY D. E. WOODBRIDGE \*

The clever adaptation of an old method of air compression in successful operation at the Victoria mine and mill, Ontonagon county, Mich., is now running every power consumer around the property. More than 82 per cent. of the ac-

river. At the foot of the canal three vertical, circular and smoothly cemented shafts were sunk 330 ft., each being 5 ft. in diameter, and ending in the roof of a large chamber. Down into this chamber project conical steel tubes. They continue

steel tubes between are shown in the illustrations.

The chamber into which the water from the canal falls is at this point 57 ft. wide by 22 ft. high, and carries these dimensions for 50 ft. and then narrows to a



VIEW OF THE DAM, A PORTION OF THE CANAL, THE COMPRESSOR HOUSE AND THE BLOW-OFF

tual power of the water is transferred to compressed air under a pressure of 117 lb., without the aid of any moving machinery, delivered to the air main dry and at the temperature of the water. As the installation of this compressor, including all expenditures, cost less than \$22 per h.p., and the construction of the dam and canal with all accessory expenditures was about the same, the cost of this power averages about \$2.25 per h.p. year, allowing 5 per cent. interest on first costs. It is practically automatic and, as there are no moving parts, it is a most durable installation. The plant was designed and built by C. H. Taylor, of Montreal, under a guarantee to develop over 4000 h.p. with an efficiency of 70 per cent.

### DETAILS OF CONSTRUCTION

Water is taken from the Ontonagon river, and is returned to it a mile farther down stream, after the benefit of a net fall of 71 ft. has been secured. A concrete dam 300 ft. long and 10 ft. high was built across the river, and from this a sufficient flow for the works was diverted to a canal that conveys the water needed a distance of 4000 ft. down stream. This canal has a sectional area of 350 sq.ft. There is a net drop of 71 ft. to the level of the

the shafts 16 ft. and flare to a diameter of 7 ft. 4 in. at the base, set above concrete spreading piers built upon the chamber floor. The concrete bottoms of the rock shafts, the conical spreading piers and the

width of 18 ft. and a height to the center of its arched roof of 25 ft. and so continues till it has reached a total length of 282 ft. Here the chamber becomes a tunnel with a height of 10 ft., and continues



VICTORIA STAMP MILL

\*Mining engineer, Duluth, Minn.



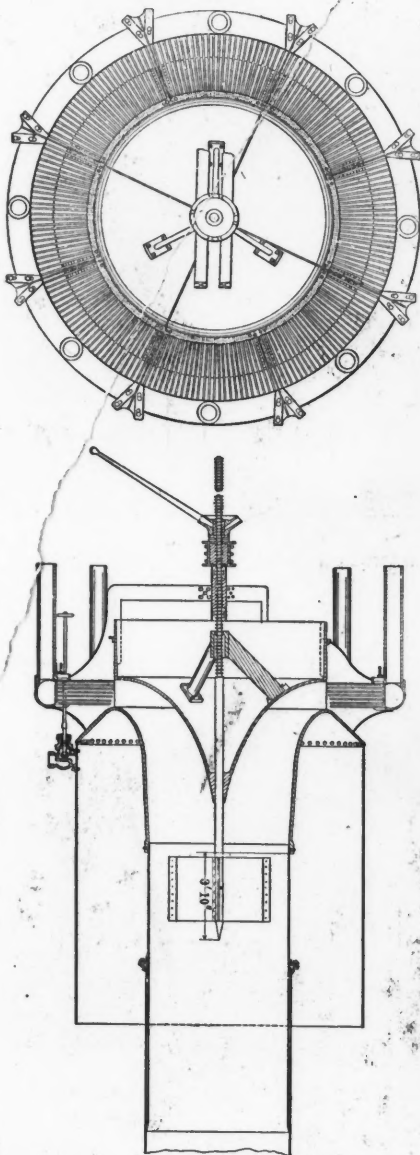
as such for 40 ft., where an incline shaft to the surface carries the water to the river. Compression takes place in this large underground chamber, excavated in rock. From the level of the forebay to the top of the water in the air chamber is 342 ft.; the water-power head from the forebay to the tail-water line is 71 ft. and the air-pressure head is therefore 271 ft. The air capacity of the underground chamber, between its water line and roof, is 80,264 cu.ft.

PRINCIPLES OF OPERATION

On the bottom of the forebay are the upper ends of the three cylindrical shafts, each in a steel tube rising 6 ft. above the base of the forebay. In this and forming its upper movable end, is telescoped an additional length which moves freely up and down so that it may be in any depth of water or may be so high that no water can flow over it, thus shutting off the operation of the plant. Above this is an annular pipe, or header, which is designed

intakes, through the small tubes, and into the column of water descending the main shaft to the compression chamber.

The space between the concave and convex cylindrical castings, shown in the drawing of the headpiece, is adjusted by dropping the concave casting down a lifting screw, which is also shown. In the hub of the spider supporting this casting is set a fixed nut, which revolves with the casting on the lifting screw. This opens or closes the space between the



PLAN AND SECTIONAL VIEW OF HEADPIECE, HYDRAULIC AIR COMPRESSOR



DISCHARGE END OF AIR CHAMBER. SUSPENDED END OF BLOW-OFF PIPE

A tunnel at 30 deg. incline was run from the upper end of the chamber to the surface, carrying the air main which conveys the power to the mine and the mill, and also a 12-in. blow-off. The space in this tunnel not occupied by these pipes is solidly filled with concrete. The blow-off, or discharge pipe, opens at the water level in the chamber 12 ft. below its roof, and terminates with an open end 5 ft. above the tail-race level. Its purpose is that of a governor.

to be below water level when the plant is in operation.

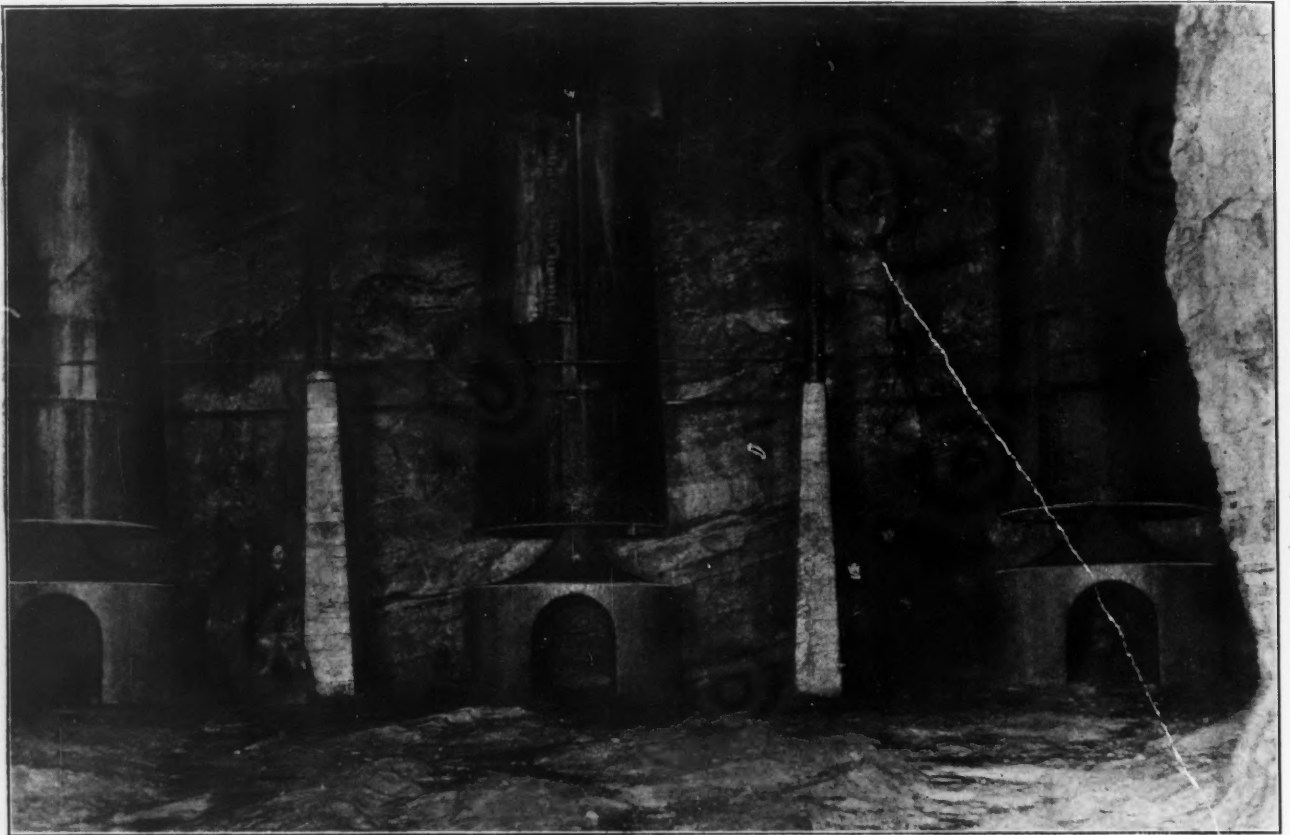
This header has an average diameter of 10 in., and is directly connected with two sets of tubes, one of which is composed of eight 7-in. verticals, the upper ends of which project above water line, and which are the atmospheric intakes. There are eighteen hundred 3/8-in. tubes projecting inward horizontally from the header. Over these, water flows downward and by its suction draws air down the atmospheric

castings and cuts off as much of the air feed through the horizontal tubes as may be desirable. The efficient point of feed being found, the concave casting may be set more or less permanently. Each headpiece is so formed that it is an inverted tank, or float, the whole construction being suspended by the lifting screw with the capstan nut supporting it fixed in I-beams of the building.

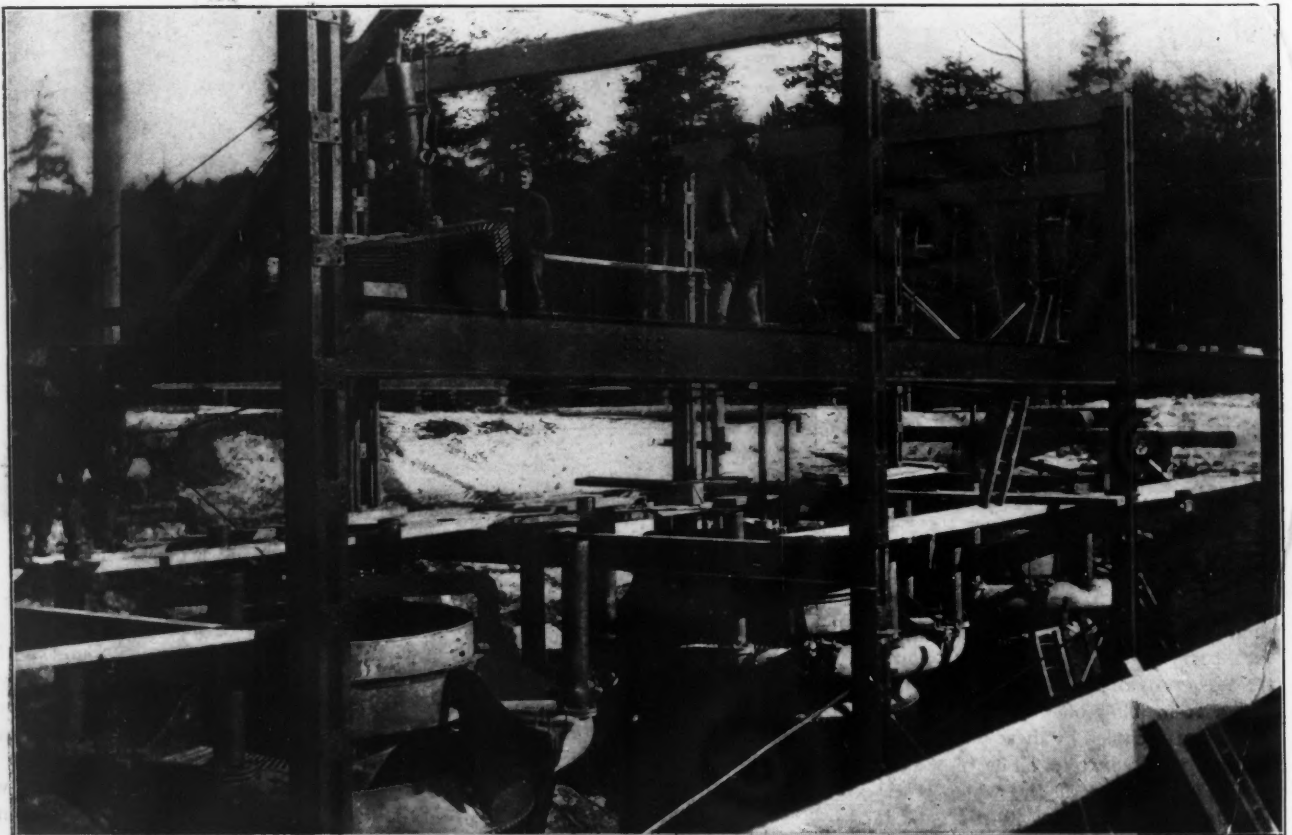
METHOD OF CONTROL

To operate the compressor, the head-



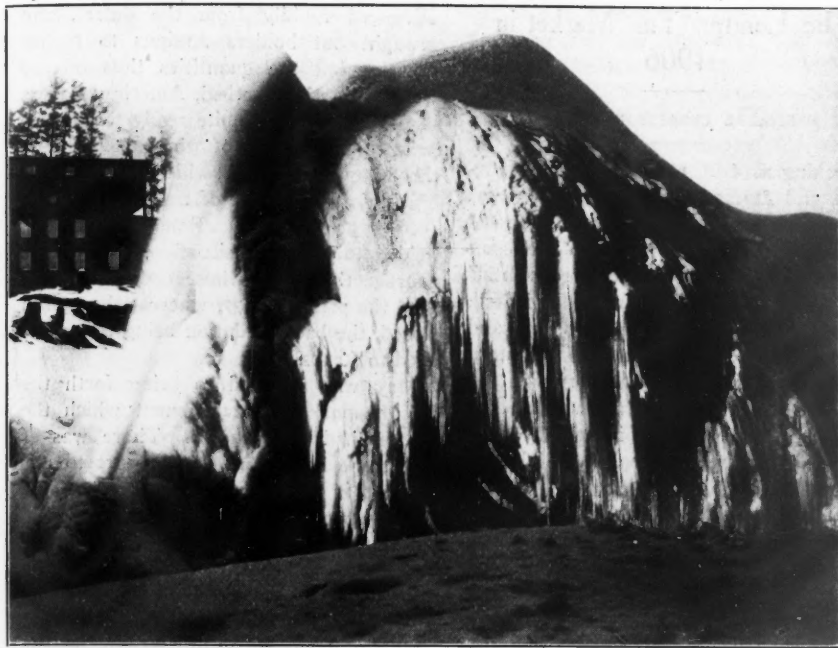


BASES OF SHAFTS AND SPREADING PIERS IN MAIN CHAMBER.



THE HEAD-PIECES DURING CONSTRUCTION





ICEBERG, 60 FT. HIGH, FORMED FROM BLOW-OFF

piece is lowered by turning the capstan nut until the lower rim of the upper conoid casting drops a few inches below the water level in the forebay; in this position the water rushes in between the mass of  $\frac{3}{8}$ -in. air tubes, entering the opening between the two conoid castings on its course to the shaft. The water, on passing the end of the small air pipes, begins to drop away at an increased velocity, causing a partial vacuum to be formed, drawing the air through the  $\frac{3}{8}$ -in. air tubes and inclosing small bubbles in the descending water and carrying them down the shaft, gradually compresses them, at the same time taking up the heat of compression.

At the lower end of the shaft the mixed volume of air and water is spread out in all directions by the conical cement pier, and slowly flows along the separating chamber to the outlet tunnel and shaft. The air rises through the flowing water, having sufficient time to separate and accumulate in the dome of the chamber, forcing the water down till it reaches the lower end of the 12-in. escape pipe. This it unseals and allows air to rise and mingle with the water in the pipe. The water becomes too light to resist the air pressure, and is forced out of the upper end at the surface. The surface air continues to escape, preventing the water from being forced down any lower in the chamber by the further accumulation of air. If air is drawn off through the 24-in. air main to the full capacity of the compressor, the water rises in the chamber till it seals the lower end of the escape pipe, filling it with water and preventing the air from escaping. It remains there until a further surplus is compressed, causing it to repeat its action. The water, free from air on reaching the end of the chamber and tunnel, flows up the incline shaft, discharging into the tail-race.



ARTIFICIAL GEYSER AT THE VICTORIA MINE

A constant height of 271 ft. gives a steady pressure of 117 lb. per sq.in., varying only when the compressor is overworked. In this case so large is the chamber, and so great the compressing capacity of the works (more than 36,000 ft. of free air per min.) that air may be drawn off at the rate of 72,000 cu.ft. per min. for a period of 18 min. without causing a drop in pressure of more than 5 lb., delivering double the power of the compressor during that period, and accumulating again as soon as the extra demands are withdrawn. It, therefore, has special advantages in cases of wide fluctuations of power and a limited supply of water.

#### AUTOMATIC REGULATION

The heads are raised and lowered automatically by means of an air connection by way of a small pipe in the side of the shafts from the chamber below. The base of this pipe is so placed that when the compression of air has proceeded sufficiently it lifts the rim of the lower conoid casting and prevents the further flow of

water over the 1800 atmospheric feet pipes, thus stopping compression. The tanks thus utilized to lift the conoid casting leak air automatically through an adjustable valve. As soon as the pressure below is relieved, they drop the casting back into place, and the automatic flow of water down past the mouths of the minute feed pipes recommences.

There are three vertical shafts for the reason that they give greater efficiency with less water during a dry season than one, and by this arrangement a very high efficiency is secured through a range of from 1000 to 5000 h.p. As the power requirements of the Victoria plants are about three-fourths of one head there has never been occasion to operate the three. With one head running at full capacity the surplus air escapes through the blow-off, throwing streams of mixed air and water fully 500 ft. into the air, like some mammoth geyser, with a frequency and height exceeding that of any of the famous geysers of the Yellowstone. The beauty is fully equal to that of the natural spouters.

#### EFFICIENCY OF THE PLANT

Air from this plant is conveyed about a mile to the mine, through a 12-in pipe. There it supplies 15 to 20 Rand drills; seven pumps of 150- to 200-gal. capacity each, raising mine water from a depth of 2200 ft.; one hoist running at a speed of 1500 ft. per min., and requiring 500 h.p.; other engines for cable lines, crushers, stamp and saw mills, shops, stamp head crushing 350 tons of rock daily, and other machinery. The mill inclosing the stamp head and mill engine is 500 ft. from the compressor. With these duties the gage pressure at the end of the air main has never varied.

Tests made by Messrs. Sperr and Hood, of the Michigan College of Mines, have shown the efficiency of the plant to be 82 per cent. when running at nearly maximum capacity. For all practical purposes it makes little difference in a plant of this sort, running on an abundant supply of free water, whether the efficiency is more or less, and perhaps if it were not for the resistance of the air bubbles descending the shafts it would be even higher than recorded.

### Iron in Sweden

Production in Sweden showed a moderate increase in 1906, and there was a larger demand. Production and exports for 10 months ended Oct. 31 were as follows:

	Production.	Exports.
Pig iron.....	440,900	108,600
Wrought blooms.....	131,200	20,200
Bessemer steel.....	63,200	.....
Open-hearth.....	224,600	.....
Total steel.....	287,800	.....
Wire-rods.....	.....	154,300
Bars, etc.....	.....	30,500

There was an increase in 1906 in the exports of 3600 tons in pig iron, 1900 tons in blooms, and 3000 tons in wire-rods.

## The London Tin Market in 1906

SPECIAL CORRESPONDENCE

Opening at £161 12s. 6d. for spot warrants, and £161 7s. 6d. for three months', the market was momentarily depressed by realizations for bull account. The result was a small contango in the three months' price. But buying orders predominated, chiefly for American consumption, and offers were readily absorbed. Eastern sellers were reluctant, and a rise in the Eastern exchange was unfavorable for importers, while stocks in the Straits seemed to be almost depleted. Thus a persistent rise culminated on Jan. 12. Thereafter a reduction in the Eastern exchange, and the approaching Dutch sale of Banka, facilitated a temporary relapse, but the American demand continued unabated, and speculation favored the rise—particularly when it was known that the Banka sale had realized the surprising equivalent of £169 2s. 6d. London prices quickly recovered, there being a particularly brisk demand for March dates. The closing days of the month brought forth a volume of demand which frustrated all bear tactics, and prices rose rapidly to £166 5s. for spot, and £165 7s. 6d. for three months', closing strong.

February revealed at the outset a reduction of 650 tons in the London stocks, notwithstanding large shipments from the Straits, and the price of spot warrants rose sharply to £167 2s. 6d. This was followed by a slackening in the American demand, with some pressure of bear sales. Advices from the East indicated shortage of labor and of material, and a renewal of American demand sufficed to absorb all parcels offered. On the other hand, the Welsh demand fell off, and confidence was disturbed by political complications, and the closing days of the month were comparatively uneventful, with spot warrants £165 10s., and three months' £163 15s.

March opened with a temporary depression, due in part to the statistics being less favorable than had been anticipated, while leading operators held aloof. Price drifted down, but this was the signal for renewed activity and an almost uninterrupted advance till the end of the month. About the middle of the month it was known that shipments from the East were on a very moderate scale, and an increasing demand for March and April dates helped to widen the backwardation on three months' warrants to £2 5s., March 16. Thenceforward it was a keen struggle between bull and bear, wherein the latter had ultimately to accept defeat. The closing prices were £169 for spot warrants and £166 for three months'.

April found abundant evidence of serious shrinkage in stocks, East and West, resulting in large dealings and a general anxiety to cover all commitments. Prices

advanced rapidly from the outset, and brought out holders anxious to realize thereby, but the quantities thus offered were promptly absorbed, American buyers in particular being quite ready to pay top prices. This state of things continued throughout the month, which will be memorable for its volume of trade and for the record prices paid. Some realizations helped to ease the situation, and to encourage the bears, whose operations lowered the price to £177, whereat the month closed, the backwardation being thus widened to £6 10s.

May was destined to bring forth the most remarkable development which the market had ever known. There was at first some hesitation, due in part to uneasiness in the money market and to the shrinking values in copper and pig iron, but this was soon followed by bold buying, chiefly on behalf of consumers, whose orders had to be executed in London, Eastern sellers being reluctant to part with any large quantity. Moreover the statistics at the end of April disclosed the lowest total on record, 11,959 tons, with no prospect of early increase. Prices advanced by leaps and bounds, enormous profits were realized, and excitement was intense. The enhanced prices made bears venturesome, but the market resisted all attacks. Continental consumers who had hitherto bought cautiously, and only for immediate needs, now hastened to cover their probable requirements for the rest of the year. Tin-plates also were bought largely for American account. By the middle of the month spot warrants had advanced from £183 7s. 6d. to £215, and three months' from £177 15s. to £205, in a market scantily supplied. At this juncture there was some wavering, which was the signal for aggressive bear selling, followed by a general slump in values. By May 21 spot warrants had fallen back to £184, and three months' to £175, Eastern sellers having meanwhile put considerable quantities on the market. The situation, however, was full of risk for the bears, there being no sign of increasing supply or of any diminution in consumption. Accordingly the more cautious bears proceeded to cover their sales, and the advent of new orders from consumers combined to initiate a recovery to £190 15s. for cash, and £188 15s. for three months'. Fluctuations continued bewildering in their breadth and frequency. The Banka sale on May 29 went at the unexpectedly low average of £181 2s. 6d., and statistics showed an increase of about 400 tons. This latter fact was perhaps due rather to accumulation of supplies than to actual increase in production as compared with consumption; but bears made the most of it to force sales, while consumers—having covered their immediate requirements—were chary of further operations. The result was that this eventful month closed with an easy tendency, £181 15s. for spot warrants, and £181 10s. for three months'.



June began under more normal conditions, excitement having subsided. Prices eased off. Eastern sellers, alarmed at the recent fall in values, had made some concessions which were now withdrawn. The next noticeable feature was the cessation of American demand, due in part to trouble in the Chicago canning industry. Bull accounts in many cases were liquidated by disappointed holders, and some parcels arriving in London had to be warehoused. A further fall was the natural result, but an improvement set in later, prompted mainly by the covering of bear accounts for August and September, and also by the firmness of Eastern sellers. The market was irregular and subject to frequent bear attacks. Further decline was arrested by the firmness of Eastern sellers, and by improved demand for August delivery. The closing days of the month brought values up to £177 5s. for prompt, £175 15s. for three months', and £177 15s. for August dates.

July was chiefly noticeable for the premium commanded by warrants for August dates throughout the month. The opening days saw a steady decline in values. Eastern holders became restless after a long period of reserve, and consumers remained generally unresponsive. Bears, who at first covered their recent sales with some eagerness, were quickly to the front with renewed attacks on the market, while bulls were no less active in liquidating their holdings. There were sharp fluctuations. Pressure of sales by Eastern holders and the liquidation of short prompts by local speculative holders brought down values £2 in two days. At this lower range the market steadied, and fluctuations were thereafter moderate, consumers being more in evidence and bulls more enterprising. The periodical Banka sale realized the equivalent of £175 for delivery in London, which price was too inflated for the London market to follow. The end of the month found the statistical position favorable for an advance, and there was some important speculative demand for French account, besides good American demand. On the other hand, some apprehension was felt in regard to 1500 to 2000 tons, said to be held in the Straits for Chinese account, and not comprised in the statistics. A notable feature of the month was the disappearance of the backwardation on three months' warrants; it reached its maximum of £3 15s., July 2, gradually dwindled until July 17, when the price was uniform for cash and for three months', revived and reached 12s. 6d., July 19, again dwindled and was wiped out on July 30, when, after a long interval, a contango was established. Closing prices were £170 12s. 6d. for cash, and £170 17s. 6d. for three months'.

August gave promise of renewed American demand for which dealers hastened to prepare themselves, while holders were correspondingly reluctant to sell. The sit-

uation was rendered more acute by numerous orders from consumers, with the result that the first four days witnessed an advance. A sharp reaction followed, bringing down the cash price, partly induced by selling pressure on the part of Chinese dealers who had missed their opportunity and had taken alarm. Trade requirements were, however, too manifest to allow of any lengthy depression, and a gradual recovery ensued which, with few checks, lasted till the end of the month. New York orders were heavy and urgent, and a large general consumption was assured. Speculation was less active, being more absorbed in copper and iron, and prices improved mainly on the strength of consumptive demand. The contango on three months' warrants varied within £1 per ton, but had disappeared by the end of the month when the price was uniform at £184 15s.

September opened with a slight set-back in values, followed by quick recovery prompted partly by statistics, which revealed a decrease of 1207 tons during the previous month, partly by large and urgent American demand, partly also by the firmness of Eastern sellers in responding to English demand. A large business was done in English refined sorts. Toward the end of the month a steady advance ensued. The periodical Dutch sale fetched the relatively high equivalent of £188 15s., and was followed by renewed consumptive inquiry. Closing values were £191 for cash warrants and £190 7s. 6d. for three months'.

October opened with a sudden advance, both in copper and tin, the latter commanding £195 for cash warrants. This proved a temptation for bears, whose operations brought about a fall, followed by subsequent recovery. Smaller fluctuations followed with a rise to £197. By Oct. 25 the demand from America had become spasmodic, and the market was hardly prepared for the surprise which came from that quarter on Oct. 29, when brokers received instructions to sell quantities for early shipment from the United States at below current value. This was generally regarded as a crude stratagem, seeing that there were abundant indications of American stocks requiring replenishment rather than depletion. It served, however, to disturb the market with wild fluctuations. The panic was of short duration, and the month closed with a firm tendency, cash warrants commanding £192 12s. 6d. and three months' £194 5s.

November found the market ready for a sharp advance which, within three days, raised prices about £5 per ton. This, however, was too sudden to be sound. European operators held aloof in face of certain tactics adopted by American bears, while Eastern sellers showed willingness to make concessions for November and December shipment. A sudden drop of between £3 and £4 served to clear the situation. With small stocks and active

consumption a gradual improvement set in. The closing day of the month found prominent support withdrawn and the market subjected to a determined bear onslaught, notwithstanding the favorable indications apparent both in consumption and supply. Final quotations were £196 15s. for prompt cash, and \$197 for three months.

December opened with an initial advance, promptly followed by a determined onslaught by bears and consequent free selling from the East. This depression was generally attributed to American inspiration, and quickly gave way to a recovery. Meanwhile there was active demand for tin-plates, which was met chiefly by the Welsh makers, the American makers being too busy in other departments. Thereafter the market steadied, the speculative element being partly overshadowed by the abnormal situation in copper, and prices moved within narrow limits. The middle of the month found stocks moderate, bulls confident, and bears restrained by the optimism manifest in trade generally, while Eastern sales were but moderate, and at relatively higher prices than those ruling in London. Toward the close bear selling was again aggressive, being probably encouraged by the apathy of American consumers and by the stringency of money. Realizations of near prompts further tended to depress prices, and transformed the recent backwardation of 15s. into a contango of the same figure. The underlying strength of the market was manifested at the close, when prices stood at £196 and £196 15s., respectively, for spot and three months'.

### Canda Tempered Steel Jaw Plate

The Chrome Steel Works, Chrome, N. J., is placing on the market an improved wearing plate for Blake type crushers, consisting of a combination of forged and rolled chrome steel bars (forming the corrugations) inserted into a backing of tough open-hearth cast steel. The plate is constructed by placing into the mold, side by side, the forged steel bars, forming the wearing face, and casting the soft steel back around these bars, interlocking and cast welding the entire back of the plate to the bars. The face of the plate is afterward tempered to the desired degree of hardness. The tough open-hearth steel for the backing is of such a low carbon that it does not take any temper whatever, thus a plate combining both extreme hardness and toughness is obtained. The bars are furnished in sections of several widths so that plates for any size crusher may be conveniently constructed at a moderate cost.

Leasing mines, with or without option of purchase, has been gradually growing in favor in British Columbia, particularly in the Slocan.



## THE RAW MATERIALS FOR STEEL MAKING AT PUEBLO

### The Colorado Fuel and Iron Co.'s Supply of Ore, Limestone and Coke—Methods of Handling—Yards, Storage Bins, and Conveying Machinery

Iron ore for the blast furnaces of the Colorado Fuel and Iron Company's Minnequa works at Pueblo, Colorado, is obtained from three sources: Orient, Colorado; Fierro, New Mexico; and Sunrise, Wyoming.

#### THE ORIENT IRON MINES

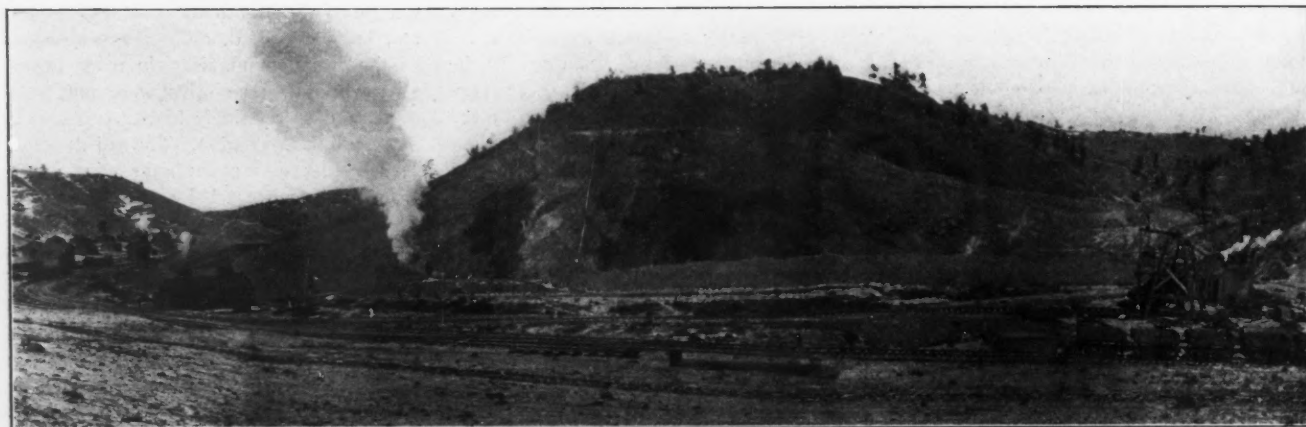
Orient is situated in the eastern part of Saguache county, Colorado, at an altitude of 9200 ft. It is on the Villa Grove branch (narrow gage) of the Denver & Rio Grande Railroad, 134 miles west of the Minnequa works at Pueblo. The

The ore in both mines is very hard, requiring, as is usual in the case of even average hard ore, especially tempered drills and heavy charges of powder to dislodge it. The average percentage of pure metallic iron in the ore from both mines at Fierro runs from 57 to 60 per cent. At first very little underground work was done at the Fierro properties, where the ore stands in immense dikes, and was originally quarried out in open cuts. The ore is loaded into steel truck cars, holding 2 to 4 tons, and carried

#### THE SUNRISE MINES

The Sunrise deposit is the most extensive and important now being worked by the company, and produces the great bulk of the ore used in the furnaces at the Minnequa works. The Sunrise mine proper is situated at an altitude of 4486 ft., in the north central part of Laramie county, Wyoming, 356 miles from the steel plant at Pueblo. It is on the northern division of the Colorado & Wyoming Railway (operated by a company auxiliary to the Colorado Fuel and Iron Company), which connects with the Burlington & Missouri River Railway, at Guernsey, and the Colorado & Southern Railway, at Hartville junction.

Before the advent of white men, the Indians resorted to this district to get the red ore for war-paint. In 1899 the Colorado Fuel and Iron Company secured a lease and option on some of the proper-



PANORAMIC VIEW OF THE MINES AT SUNRISE, WYOMING

Orient iron mine was opened in 1882, and for many years was the only source of supply for the furnaces at Pueblo. The ore is a brown hematite, and averages about 50 per cent. metallic iron. There have been five claims in the group which were worked by stopes reached through a rock tunnel 800 ft. long. This deposit has been almost entirely exhausted, and is now being cleaned up by contractors.

#### THE FIERRO MINES

Fierro is situated at an altitude of 7000 ft. in the north central part of Grant county, New Mexico, 690 miles south and west of the Minnequa works at Pueblo, by way of the Santa Fé Railway and the Hanover branch of the Silver City & Northern Railway. The '86 mine, since abandoned, and the Jim Fair were opened by the Colorado Fuel and Iron Company in 1899, the Union Hill in 1901. Ore from the Jim Fair is a mixture of 75 per cent. red hematite and 25 per cent. magnetite. Union Hill ore is a mixture of 75 per cent. magnetite and 25 per cent. red hematite.

down a gravity incline 100 ft. to a tippie above the railroad tracks. From the tippie the ore is dumped into a Gates crusher, is there broken into pieces of apple size and dropped into the railroad cars below. Now, as at the Sunrise mines, most of the ore is being taken out by the milling process of underground mining. The Fierro group continue to be good producers.

ties in the group which have since been bought. The company now owns or controls all the valuable properties in the Hartville iron district.

The entire region has been systematically prospected with diamond drills, etc. The Chicago group, a short distance from the Sunrise mine proper, has been opened up during the past two years. In both the Sunrise proper and the Chicago, mil-



IRON MINES AT FIERRO, NEW MEXICO

\*The writer of this article is indebted to J. B. McKennan, manager of the Minnequa works, to H. A. Deuel, chief engineer, Minnequa works, and to other officials who kindly furnished material and assisted in other ways in its preparation.

lions of tons of ore have been "proved up." The production, although now large, is being constantly increased. When the company first began operations in the Sunrise mine proper in 1899, the open-cut system was employed exclusively. After the surface waste rock had been stripped down to the orebody the ore was loosened and broken up with black powder and dynamite, after which it was loaded by steam shovels directly into standard-gage railway cars on adjoining tracks.

Now the open-cut system has been largely replaced by the milling system of underground mining, the ore being handled through tunnels and shafts. A complete modern plant for the most economical handling of the ore has been installed. The ore is dumped from skips which discharge into bins, from which in turn the ore is drawn off into the automatic dump-cars and carried to the steel works. The ore is a red hematite, running about 60 per cent. in metallic iron, and occurs in great lens-shaped deposits.

Owing to the failure of the Burlington & Missouri River Railway to complete an extension to the new Chicago group on schedule time, and to other unforeseen delays in development and equipment, it was impossible to produce enough ore from the company's own mines, during a part of the fiscal year ended June 30, 1906, to supply the furnaces at the Minnequa works.

Accordingly 72,992 gross tons of iron ore were purchased from Lake Superior properties. Since the completion of the railroad to the new Chicago property, however, the company has been producing an ample supply of ore for present needs, and will be able in the future, as in the past, with the one exception noted, to meet from its own mines the increased demands due to the erection of the additional blast furnaces now projected.

Besides the producing iron mines mentioned, the company owns or controls iron-ore claims throughout its territory, and is carrying on prospecting at various points.

#### LIMESTONE AND DOLOMITE QUARRIES

All the limestone for fluxing at the steel works, was originally taken from the company's quarries, at Lime or San Carlos, six miles south of the Minnequa Works. Until 1897 this work was done under contract, but after the company began operations on its own account, more satisfactory results were obtained. The rock is torn loose from the bed by giant and black powder, and is broken with sledges to sizes convenient for loading on pit cars, in which it is hauled by mules and a gravity tram line to the Gates crusher, into which the cars automatically dump.

The rock, crushed to an average size of two inches in diameter, drops into bins from which it is drawn off into dump cars that carry it to the bins at the furnaces.

Although the quarries at Lime still furnish considerable limestone, the greater portion used at the plant now comes from Calcite quarry, about 90 miles west of the Minnequa works, on the Denver & Rio Grande Railroad. Here a very superior grade of limestone, running exceedingly low in silica, phosphorus, and other impurities, is found upon one side of a cañon, while on the other side is a deposit of dolomite, which is used extensively in the

open-hearth furnaces. The limestone and dolomite, broken up by hammers, are loaded into pit cars, which empty into gravity cars, which in turn, carry the stone by a gravity line to a tippie, where it is dumped into standard-gage cars and conveyed to the furnaces. There is no crusher at Calcite, but the limestone is broken by sledges to a practicable size. The dolomite is ground at the works.



BINS FOR ORE, COKE AND LIMESTONE AT MINNEQUA WORKS



## COAL MINES AND COKE OVENS

Partly owing to opposition from the men, coal-mining machines are little used in the properties, dependence being placed chiefly on the "diggers," armed with hand drills and picks, who work on a tonnage basis. The coal is loaded by hand into mine cars, which are hauled by mules and electric trams or gravity lines to the "tipple." There it is dumped automatically into railway cars.

The coal for coking is hauled to the washeries, where it is automatically dumped into bins from which conveyers carry it to crushers. After being crushed it goes to the "jigs," where the coal is separated from the slate, bone and rock. Later it goes to the "disintegrators," which reduce the coal to the consistency of cornmeal.

This "slack" is then loaded automatically into larry cars, which are run along the top of the bank of bee-hive coke ovens into which it is dropped. After burning for from forty-eight to seventy-two hours in the ovens, the residual coke is drawn out by men, known as coke pullers, armed with long rakes, and loaded with forks into automatic dump cars.

The coke used in the blast-furnaces at the Minnequa Works comes from the company's mines and coke ovens at Sopris, Starkville, El Moro, Tabasco, Segun-

a crusher, with a capacity of 150 tons an hour, located in the south yard, from which it is automatically conveyed into dump-cars and carried to the bins.

A very extensive or elaborate stock-handling system has not been deemed a necessity at the Minnequa works, because the haul from the mines to the fur-

bins are a massive steel structure 1760 ft. long, the sides and bottom being of heavy steel plate. The bins for each furnace consist of a series of coke bins on one side and a series of ore and stone bins on the other, divided by a number of cross partitions.

The necessity for an elaborate stock-



QUARRIES AT LIME, COLORADO



THE MINES AND PART OF THE TOWN AT SUNRISE, WYOMING

do and Tercio, all in the "southern field," or Trinidad district.

## METHODS OF HANDLING STOCK

When the automatic dump-cars carrying coke, limestone or ore, as the case may be, reach the steel works they are switched to a track which runs along the top of the blast-furnace bins into which they discharge their contents. Ore which requires crushing, is first passed through

naces is comparatively short, because a constant and regular supply is received each day, and because the winters in Colorado are comparatively open. The present bin system consists of a single row of bins extending the entire length of the furnace plant. The bottoms of the ore and stone bins slope about 45 degrees, and the bottoms of the coke bins slope about 40 degrees to the horizontal. The

handling system is also partly eliminated by the fact that comparatively few kinds of ore are used. Nevertheless, a considerable amount of stock is kept on hand at the works as a reserve in case of breakdowns at the mines, temporary suspension of railroad communication, or other causes of interference with the regular supply. The reserve supply of coke is usually kept stored in piles in the south yard. Parallel to the line of bins, along the old ore trestles, a large amount of ore and limestone is constantly handled.

A considerable amount of the ore, coke and limestone comes to the works in other than the automatic dump-cars, owing to the failure of the railroads to furnish a sufficient supply of these cars despite the fact that the company's auxiliary railroad owns a large number. All these non-dumping cars go to the trestles, where they are emptied, so far as possible, by two Dodge cranes, furnished with clamshell buckets, after which they are cleaned out by laborers with shovels. The two Dodge cranes run along a track of 20-ft. gage, composed of rails running 150 lb. to the yard. Each crane has an extreme radius of operation of 80 ft.

The cranes are operated by 150-h.p. motors, driven by a 220-volt direct current. Each of the clamshell buckets has a capacity of three tons for each grab, and can handle approximately 96 tons of ore per hour. These cranes transfer the ore and limestone either from non-dumping cars to dump-cars, from cars to stock pile or from stock pile to dump-cars. Dump-

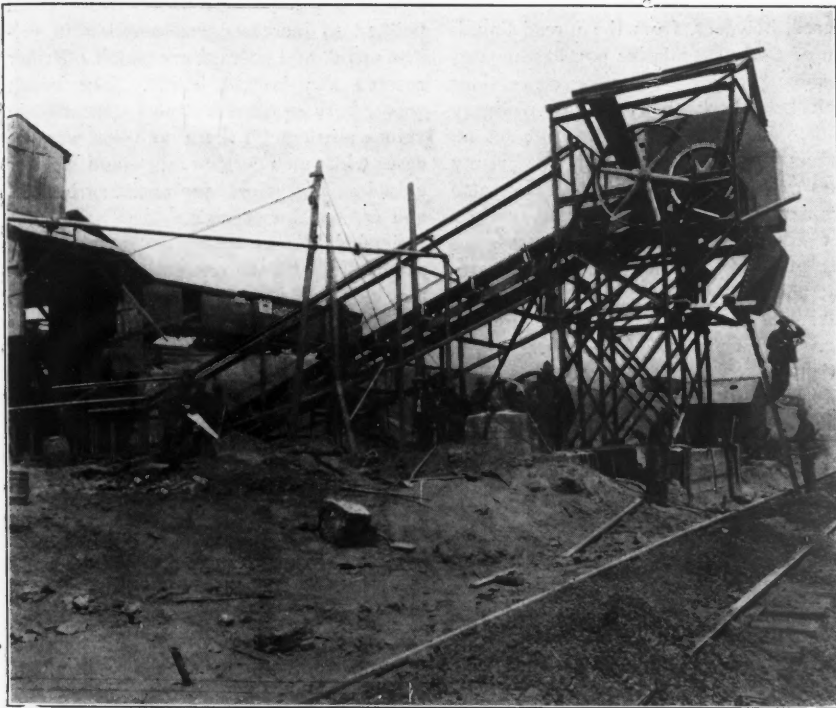


cars loaded in this manner from the stock piles are run along the top of the bins and dumped as in the case of the dump-cars that come direct from the mines.

Under the ore, coke and limestone bins is a standard-gage track upon which runs a trolley charging car driven by two motors and equipped with a Fairbanks 15-ton scale. The ore, coke or limestone drops from the bins into the car when the operator of the car raises the shutter of the bin with a lever. By means of a weighing attachment the operator is able to draw off into the car exactly the requisite amount of each material, thus insuring uniform charges for the furnaces. The charging car is then run to the skip pit, where the contents of the charging car are discharged into the skip car, which is hoisted with the charge along the skip bridge to the top of the furnace, where in turn the charge is dropped into the hopper about the upper bell.



COAL WASHERIES AT SEGUNDO, COLORADO



CONVEYER AT ORE CRUSHER

### Coal Mining in the Indian Territory

The mines operated by the coal department of the Missouri, Kansas & Texas Railway Company are the largest producers of coal in the Indian Territory. The four mines now being worked are located near Coalgate, Indian Territory, while the main offices are at Parsons, Kansas. Of the four mines now operating, Nos. 9, 10 and 12 are producing, while mine No. 14 is still in the period of early development. The first three mines are shaft mines, while the coal seam in the last operation is reached by a slope.

In all of these mines the coal shows a thickness of from 4 to 5 ft. The pitch of the seam is variable; at mine No. 9, the

bed dips 14 deg. to the south, while at mine No. 14, present prospects tend to show that the coal seam pitches 15 deg. to the north.

The Lehigh vein is the only seam worked, and produces a coal that answers fairly well for steam and domestic purposes. The deepest shaft is that at the No. 12 mine, where the coal is hoisted 650 ft. The combined size of the two hoisting compartments of the main shaft is  $7\frac{1}{2} \times 14$  ft., while the third compartment, above which is stationed a 14-ft. Crawford and McCrimmon fan, is  $2 \times 7\frac{1}{2}$  ft.

Another air shaft,  $7 \times 12$  ft. and 158 ft. deep, is equipped with one 22-ft. Duncan Foundry and Machine Company fan. The hoisting is accomplished by a Danville double direct-action engine, with  $24 \times 36$ -in. cylinders, having a drum 8 ft. in diameter. On the slope is installed a Litchfield double hoisting engine with  $10 \times 16$ -in. cylinders, having a 52-in. drum. The necessary steam for driving these engines is furnished by a battery of 3 steel tubular boilers, 20 ft. long and 66 in. in diameter. At the old No. 4 shaft are four 48-in. boilers which also furnish steam for operating a part of the general equipment.



PART OF 800 COKE OVENS AT SEGUNDO, COLORADO

## The London Spelter Market in 1906

SPECIAL CORRESPONDENCE

The opening of the year found producers sold well ahead, and only moderate quantities of the article in second hands. The galvanizing trade was very active, necessitating large purchases of spelter: and sheet zinc was in good demand. Under these conditions the market was firm at or about £29 10s. for specials, until Jan. 15. On that day there was a sensational fall in prices, due to forced sales of speculative holdings, involving a sudden drop of £1 per ton. Buyers naturally held off and awaited developments, with the result that within three days ordinary brands were offering at £27 12s. 6d., and specials at £28 2s. 6d. Jan. 22 there was a sharp recovery to £28 1s. 3d. for ordinaries, and prices strengthened during the next few days. But renewed selling pressure soon dissipated the improvement, notwithstanding producers still refused to make any concessions; and prices drifted down until the end of the month, when ordinaries were quoted £27 1s. 3d. and specials £27 7s. 6d.

February opened quietly, consumers being very reserved in face of the persistent decline, although producers remained firm in their demands. A slight improvement set in later, prompted by realizations on the part of bears; and price of ordinaries improved. This, however, was of short duration, for Feb. 13 a sensational fall in prices was caused by the operations of disappointed speculators, followed by further bear sales. Consumers' support was lacking, and the market was the sport of small holders who—toward the end of the month—depressed the price down to £25. The consuming industries, however, continued to be well employed, Galvanizers found no need to abate their selling prices, and there was considerable activity in sheet zinc. The month closed at a slight improvement from the lowest, ordinary brands being held for £25 3s. 9d. and special brands for £25 10s.

March opened with moderate buying on the part of consumers whose favorable attitude was, however, counterbalanced by persistent speculative selling; and within a week the price of ordinary brands had fallen to £24 5s. Producers, however, took a totally different view of the situation, and would make no concessions. Dealers ultimately found it difficult to obtain their supplies; and the influence of a strong buying movement on the Continent caused a sharp recovery of 10s. Consumptive demand supervening, a further advance brought the price up to £25 2s. 6d. Reports from all quarters indicated distinctly improved inquiry for sheet zinc, and it was hoped that the galvanizing trade would display similar activity. Purchases, however, were postponed; and disap-

pointed holders thereafter accepted lower figures. The undertone, however, was sufficiently steady to inspire more confidence; and the month closed at £25 for ordinaries, and £25 12s. 6d. for specials.

April brought abundant confirmation of the recent continental reports of depleted stocks and brisk consumption. Sheet zinc in particular showed increased activity. Galvanizers were soon aroused to enterprise, and there was some anxiety shown to cover requirements for May and June, forward delivery commanding slightly better prices than the early. In sympathy with other metals, spelter advanced in value throughout the month, particularly toward the close. Ordinary brands, which were obtainable at the outset at £25, closed at £26 15s. and special brands at £27.

May opened with renewed activity in the galvanizing trade, for which substantial quantities of spelter were bought. The continental markets were also active at advancing prices. The London market suffered, however, from the forced liquidation of a few speculative purchases, causing some producers to make concessions which held back the price of ordinary brands. May 11 an improvement set in, apparently in sympathy with the rising values of other metals. By this time also galvanizers were again in the market, sheet zinc had developed increased activity at home and abroad, with consequent advance in prices, and producers of spelter had sold out for some months to come, and were quoting impracticably high prices. Trade continued thus, with steady rise in values, until the end of the month, when ordinary brands commanded £27 12s. 6d. and specials £27 15s.

June found the market rather languid, in sympathy with other metals, although with no disquieting feature in itself. The Silesian producers had already sold out for the third quarter of the year. Galvanizers were busy, and the trade in sheet zinc was unprecedentedly large. The American market, which had lately been depressed, now took a strong upward turn and so dispelled any probability of exports from that source. Consumers bought boldly, finding producers unwilling to make any concessions. Thereafter continental dealers were active in pushing second-hand lots for sale, but at a reduced price all offerings were readily absorbed, although consumers now held aloof; and the month closed with a firm market at £27 5s. for ordinary brands, and £27 7s. 6d. for specials.

July opened at the reduced price of £27, and there the price remained for a week or more, with no active demand on the part of consumers and no pressure to sell on the part of producers. Speculators next came forward to re-sell, and prices gradually fell away in the absence of any support; but after £26 10s. had been accepted demand revived, inspired by unusual activity in the sheet-zinc and galvanizing trades and the prospect of good

autumn trade. At this point the market was disturbed suddenly by the pressure of second-hand sales. There was prompt response, however, and a speedy recovery, but the market lacked the genuine support of consumers, and final sales were at £26 7s. 6d. and £26 10s. for ordinary brands, and £26 15s. for specials.

August opened with business restricted in view of the holiday on the 6th and the market sensitive to the influence of small lots on offer. Influential buying soon gave it an improved tone, while producers were firm and quite willing to await events. Toward the middle of the month producers marketed large quantities on the continent; sheet zinc was in increased demand, galvanizers were booking large orders extending up to the end of the year and indicating large requirements in spelter, while speculators became less aggressive in the London market and gradually changed on to the bull tack. Toward the close some important orders from India pointed to increased consumption in yellow metal, and galvanizers shook off their reserve and bought boldly. The result was a very gradual but persistent rise in values all through the month—as was the case with metals generally—and spelter closed at £27 7s. 6d. for ordinary brands, and £27 10s. for specials.

September was a very active month in all metals, with the one exception of spelter, in which article the advance was but slow and unimportant. Continental producers were firm in their prices, having mostly sold out their production till the end of the year. The demand from galvanizers and brass manufacturers was sufficient to clear the market of all accumulations, by which time demand and supply seemed to be about evenly balanced. There was great activity in sheet zinc at frequent advances in price. The month closed quietly, but with a strong undercurrent, values being £27 15s. for ordinary brands, and £27 17s. 6d. to £28 for specials.

October opened with a steady aspect, but with little business passing, consumers having been sufficiently far-sighted to cover all early requirements. Oct. 3 dealers showed some impatience to realize on some speculative parcels in London, and prices were depressed. All weak holdings were cleared off and consumers again bought freely. Galvanized iron was in great demand, the trade being occupied to its full capacity. The market was strong, and though second-hand lots were again pressed for sale and values consequently declined, the month closed quietly, but with confident expectation of revival in demand, ordinary brands being quoted at £27 15s. to £28, and specials £28 to £28 5s.

November falsified the expectations of the previous month. The London market was listless and continental dealers became restless in consequence and made cheap offers to consumers, thereby forcing values down about 10s. Toward the middle of the month a large business developed with



home consumers, all cheap second-hand lots were absorbed and sheet zinc displayed great activity. The recent loss was soon retrieved and the month closed with a strong undercurrent, due mainly to the large expansion of the galvanizing trade and the firmness of producers, most of whom held for prices much above the London parity and for distant delivery only. Final quotations were £28 for ordinary brands and £28 5s. for specials.

December opened with a large business with consumers for delivery early in 1907, and at full prices. Efforts to depress prices met with little success, it being evident that little material was free for market purposes, and the trade in galvanized iron was persistently expanding. By the middle of the month dealers had sold well, and producers were holding for prices higher than those currently reported. Fluctuations were very narrow, but generally upward. Toward the close additional strength was imparted to the market by the advent of orders for yellow metal, and closing prices were £28 2s. 6d. to £28 5s. for ordinary brands, and £28 7s. 6d. to £28 10s. for specials.

### Cost of Electrolytic Production of Chlorine

BY GEORGE HERBERT HARRISON

The following particulars of the work done by 16 Hargreaves-Bird cells at the Piedmont, W. Va., works of the West Virginia Pulp and Paper Company, under license from the General Electrolytic Parent Company, Ltd., of Middlewich, England, during the month of May, 1906, will be of interest to the users of chlorine in the treatment of gold ores:

PERIOD, 31 DAYS.	
Amperes.....	2,600
Volts.....	56.92
Volts per cell.....	3.56
Electric h.p. used in cell room.....	198.5
Total e. h.p. used by plant.....	270.0
Steam consumed (boiler h.p.).....	24.7
Current efficiency.....	90.0 per cent.
Soda ash produced.....	120,900 lb.
Chlorine gas.....	81,511 lb.
Limestone used.....	247,758 lb.
Coke used.....	31,000 lb.

Each cell produces chlorine equivalent to 460 lb. of bleaching powder, 35 per cent., per 24 hours. The repairs on a Hargreaves-Bird plant amount to about \$1.25 per ton of the "bleach" produced. The cost of each cell, including royalty in England, is about \$1000.

Works on the Hargreaves-Bird plan have been put up at Piedmont, W. Va.; England; France; Spain; and one is being put up in Australia.

The advantages of producing free chlorine from salt, where chlorine is used for gold extraction, are great. Engineers can calculate the costs at their own mines from the particulars here given.

In the first nine months of 1906, the kingdom of Prussia produced 95,953,110 tons of stone coal and 34,671,252 tons of brown coal.

### The Lake Ore Trade in 1906

BY G. H. CUSHING

The season of navigation on the chain of lakes has been one of the most peculiar that the lake region has ever seen. There have been times when lake labor unions have combined to cut down the movement of commodities, unless their demands were satisfied. At other times combinations of vessel-owners have been made to affect the rates of transportation. At other times shippers have engaged in disputes which brought about serious entanglements affecting the supply of iron and its price, to the consumers. It has never before been seen that the dangers of a shortage of iron ore have arisen almost entirely from the inability of the Lake Superior region to produce the amounts which the furnaces have demanded. This has arisen from two sources. One of them is the fact that more furnaces have been placed in operation, demanding supplies from the Lake Superior region. Most of the furnaces have been active more continuously than ever in their history, and the sales of Lake Superior ore have been scattered over a wider area. The other condition, which is most striking, is that the high-grade ores are rapidly becoming more scarce, while the guaranteed content of ore is less than it has ever been, demanding that the ore shippers must increase their output to produce the same amount of iron. With the production of pig iron showing constantly new high records it is not surprising that the Lake Superior region should have difficulty in meeting the demands of consumers.

The customary difficulty with lake labor unions attended the opening of the season of navigation. This came earlier than usual and boats were soon put in operation. The lake carriers and dock managers had made the grave mistake, previously, of making contracts with lake unions which expired after the opening of navigation. When boats had been running for several weeks the demands of the mates' union, of the longshoremen, and of the tugmen who handle the boats in port, had to be met. This resulted in a tie-up of navigation, after the movement was well under way. The difficulties were afterward adjusted by a two-year contract with the longshoremen, the elimination of the mates' union as a factor, and a two-year contract with the tugmen. Navigation resumed activity. Ore shippers had planned, to supply the demand, to ship 38,000,000 tons. This must be accomplished in a season cut short by labor trouble, and with an urgent demand for coal pressing upon the shippers of that commodity, and the possibility of a heavy movement of grain. These things would naturally tend to cut down the amount of tonnage in the ore trade.

About the middle of the summer predictions were made as to the possibility of shipping the amount of ore that was necessary for the furnaces. These were based upon the knowledge that coal shippers had a late start, and would have to take a larger portion of the lake fleet later in the year. This would come at the time when the big movement of grain was on. Although there had been an enormous increase in the carrying capacity of the lake fleet, it was apparent the supply was not equal to these demands.

It may be said therefore, without fear of contradiction, the success of the lake shippers in moving upward of 38,000,000 tons of iron ore was directly due to the discomfiture of the shippers of coal and grain, who were prevented from fulfilling contracts by the car shortage which set in during the fall. That the ore shippers were not hindered by this same cause is due directly to the fact that the railroads, seeing they were so dependent for new equipment on the continued activity of the steel trade, set everything else aside and moved the ore as rapidly as it came down the lakes.

The fear of an ore shortage, existing in mid-summer, created an early demand for iron ore for 1907 delivery and consumers began to besiege shippers to make sales. These were held off until early in November, when almost the entire output for 1907 delivery was disposed of in a single week. The amounts sold each customer depended upon his needs in previous years, and his standing as a customer had a good deal to do with the allotment. It was found even then that the supply of iron ore would not go around and some sales were subsequently made at a premium, despite the fact that the regular advance had been to the highest level since the Mesabi range was discovered. There was a horizontal advance in prices of 75c. a ton on bessemers and 50c. a ton on non-bessemers, which with a reduction in the guaranteed content, brought the price of iron ore up 92c. a ton for bessemers above the level of the preceding year. The market price of Old Range bessemer was established at \$5, f.o.b. Lake Erie ports for base analysis, but the change in guaranteed content being taken into consideration, this was really equal to \$5.17 on the old basis. Bessemer Mesabi was sold at \$4.75; non-bessemer Old Range at \$4.20, and non-bessemer Mesabi at \$3.95. These prices were ultimately advanced 50c. on small sales, as a premium.

It was also apparent during the ore year that shippers have been more generally owners of their own fleets, to the exclusion, more and more, of the merchant fleets. At the end of the year they were so strongly entrenched as to be able to figure, with almost complete accuracy, on the carrying charges for next season, without taking the merchant fleets into consideration or consultation.



## THE MINES OF COBALT

The Buffalo, Coniagas, La Rose, Colonial Silver, King Edward, Green-Meehan and University Mines—Open-Cut and Underground Mining

BY REGINALD MEEKS

During the early development of the mines at Cobalt the prevailing idea was to get silver as cheaply and as quickly as possible. The richness of the ore at the surface was a temptation to open every mine by open-cut regardless of the loss which necessarily resulted from flying fragments after blasting. As the district settled down to business it was realized that the mining methods were in need of modification and many mines began to sink and drift. But open-cuts have not been entirely abandoned and nearly every property can show veins opened by that method. Protection is afforded by placing stulls across the opening and covering with boards or timber. There is a growing tendency toward shaft sinking, however, and it will not be long before mining will be carried on under ground and cross-cuts should disclose many "blind" veins.

### ORE STEALING

Nearly every camp mining high-grade ore or native metal suffers from petty thefts and Cobalt has been no exception. Ore worth \$1 per lb. is found in nearly every mine and it is not surprising that many pounds never find their way to the sacks of the rightful owners. The men are not searched and it is easy for miners to slip pieces of native silver into their pockets. One man will put a rich piece of ore on the end of a car going to the dump and his partner will later find and appropriate the lump. Many thousand pounds are carried away by visitors, although strict orders are issued against this practice.

I was told that a visitor, who was in reality a man financially interested in a mine, was approached by a miner who had two or three tons of ore for sale. This was undoubtedly purloined either by this man or by a "syndicate," because the vendor had no mining property.

### BUFFALO MINES COMPANY, LTD.

This company owns 40 acres in the town of Cobalt, lying immediately over the low westerly range of hills. From the standpoint of rich ore and large nuggets of native silver the Buffalo is not a show mine. But it has steadily risen as a producer and now its tonnage is among the best. There are few mines in Cobalt which have conducted as extensive underground work, and although drifting has in many cases been through barren rock, still the veins have been followed and much ore of a satisfactory nature has been mined.

### VALUE OF THE ORE

The average silver content of the ore is

about 650 oz. per ton. However, the output since May, 1906, has been 1128 tons, or 161 tons per month, which compensates for the lower grade of ore. There are few, if any, mines in the district which produce as cheaply as the Buffalo.

### COST OF PRODUCING

All cost of building, development, mining and everything else is directly charged to the ton of ore, and from July to September, inclusive, the average cost was



OPEN-CUT AT BUFFALO MINES

\$37 per ton. In October the cost for the month was increased by considerable building expense to \$64, which brings the average for the four months to \$44 per ton of ore loaded on cars. This is rather a low cost for mining in this district. It is estimated that of the actual mining cost one-half is charged to sorting the ore.

### GRADES OF ORE

There are three grades of ore shipped from the Buffalo: The high grade contains about 2000 oz. silver, 8 per cent. cobalt, 40 per cent. arsenic, and nickel unaccounted for; the low-arsenic ore contains less than 3 per cent. of this element, and the company agrees to pay \$2 per unit for all in excess of this amount. There is

practically no nickel or cobalt and from 125 to 1500 oz. of silver in the form of argentite and native metal; the "cobalt special" contains 8 per cent. cobalt, 45 per cent. arsenic and from 150 to 400 oz. silver.

The ore is shipped to the American Smelting and Refining Company, at Perth Amboy, the Balbach Smelter, at Newark, or the Canadian Copper Company, at Copper Cliff, Ontario.

### UNDERGROUND DEVELOPMENT

On No. 6 vein a shaft, 5x8 ft. inside dimensions, has been sunk to a depth of 130 ft. At the 70-ft. level development has progressed as rapidly as possible. There are 390 ft. of drifting and 100 ft. of crosscuts. The vein is tortuous and has been lost at times, but was found again by short crosscuts. The wall rock seemed to be much

shattered. There is a 4-in. high-grade smaltite vein, and a 14-in. low-grade vein containing little arsenic. Drifting has begun at the 130-ft. level.

No. 5 shaft is down 70 ft., but it is not expected to intersect No. 5 vein until it reaches the 100-ft. level. Surface openings at No. 5 show a 4.5-in. smaltite vein, and a 20-in. low-arsenic vein, which are mined together as one grade.

No. 4 shaft has been sunk 48 ft. and at the 70-ft. level a drift is to be run. There will be no showing from this shaft until the vein is cut.

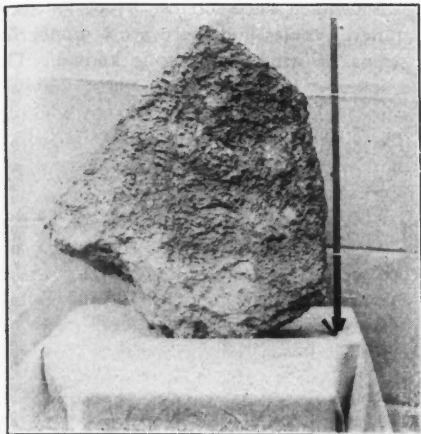
No. 4 vein consists of 3 in. of smaltite carrying very low silver values. No. 3 shows 10 in. of shipping ore in places, but

not enough work has been done to determine the value of the vein.

Of the 40 acres belonging to the company only 16 have been carefully explored. There are nine known veins on the property.

**EQUIPMENT**

The power house contains one 100-h.p.



280-LB. SILVER NUGGET FROM LA ROSE MINE

Jenks return water-tube boiler, one Canadian-Rand 6-drill compressor operating six No. 2 drills underground, and there is also a hoist.

The usual buildings are on the property and the management is excellent. The officers are as follows: Charles L. Dennison, president; George C. Miller, secretary and treasurer, and Tom R. Jones, superintendent. The capitalization consists of 1,000,000 shares of \$1 par value, of which 900,000 have been issued, and the balance retained in the treasury. So far one dividend payment, amounting to 3 per cent., has been made, which was at the

company is almost a close corporation, only a small fraction of the stock having been issued to the public. The bulk is owned by three individuals.

There have been seven veins so far discovered on the 40 acres known as J. B. 5, and it is claimed that they are very rich and of good width. However, a request to go underground was refused by both the president and the superintendent. There was no disposition to decline information regarding the working, but an underground visit was not permitted.

**DEVELOPMENT**

The main shaft is down 80 ft. to the 1st level, and is being sunk to the 2d level. The other shaft is down 95 ft. At these depths the formation has been proved to be entirely conglomerate. Drifting has been done on the veins as follows: On A vein, 110 ft.; on No. 1, 300 ft.; on No. 2, 80 ft.; on No. 3, 140 ft.; on No. 4, 70 ft. A 168-ft. cross-cut connects Nos. 2 and 4 veins and another, 68 ft. long, connects Nos. 1 and A. All ore, except from sinking, is taken out by over-hand stopping, and very little timber is required.

**GRADES OF ORE**

The ore is sorted into 1st grade, 2d grade and tailings. There is practically no native silver in the ore, which consists of 8 to 10 per cent. cobalt, 1.5 to 2 per cent. nickel, 50 per cent. arsenic, and varying amounts of silver. The 1st grade carries 2000 oz. or over; the 2d grade 60 to 70 oz., while the tails run less than 30 oz. The cost to produce ore was stated to be \$60 per ton, including all development and equipment charges, and to date the production has realized \$600,000. Of this all but \$40,000, which was the total expendi-

measurements, and are fitted with a cage which hoists a car, and the ore is conveyed across a trestle to the ore house. All hoisted rock is handled by gravity.

The new boiler-house will be 25x38 ft. and the engine-room 30x28 ft. At present air is supplied by the Trethewey company's compressor, but the Coniagas peo-



A VEIN AT THE LA ROSE MINE

ple are installing a new 12-drill compressor and two 80-h.p. boilers.

There is also a large ore-house, an ore storehouse, blacksmith and carpenter shops, dry-house, sleeping camp, etc.

R. W. Leonard is president; A. Longwell, secretary, and J. Reddington, superintendent.

**LA ROSE MINING COMPANY**

The deepest shaft in the Cobalt district is on the La Rose property, which consists of 40 acres known as J. S. 14. The shaft is down 320 ft., and consequently the owners are in a position to actually know more concerning the continuity of silver values at depth than anyone else in the district. But access to underground workings at this depth is denied everybody, and so it is impossible to state anything first hand. However, the management has stated that the vein shows good values in the lower workings.

**NUMBER OF VEINS**

There are 10 distinct veins on the property, and underground development is being carried on from two shafts. No 1 is down 100 ft., and No. 2 has been sunk to a depth of 320 ft., as was before stated. Work began in July, 1904, and has been continued steadily. Little beside the surface equipment could be learned, and that



ORE-HOUSE, TRESTLE AND SHAFT AT CONIAGAS MINE

rate of 1 per cent. per month for three months.

**CONIAGAS MINING COMPANY**

The name of the company spells the contents of its ore. It has combined the chemical symbols for cobalt, nickel, silver and arsenic, and has arrived at a "catchy" and unique title. This

ture, and a working surplus, has been paid in dividends.

**EQUIPMENT**

The power-house is equipped with one 60-h.p. boiler, one 50-h.p. hoist, and one 16-h.p. generator set. The shaft houses are 18x20 ft. and 50 ft. high; the two-compartment shafts are 8x5 ft., inside



information is of small consequence in such an important mine.

#### RICHNESS OF THE ORE

That the veins are exceedingly rich there is no doubt. The rock coming up from the workings was a mixture of smaltite, niccolite and native silver; two pieces of vein matter weighed nearly 1000 lb. each, and would probably assay 500 to 600 lb. (av.) silver. One nugget, shown in the illustration, weighed 280 lb.; its size is shown by the 2-ft. rule alongside; the thickness was about 8 in.

#### EQUIPMENT

In the power-house there are one 17-drill compressor, one 4-drill compressor, one 150-h.p., and one 90-h.p. boiler, one 100-lamp generator set, one Lidgerwood and one Jenks hoist.

The shaft houses are 24x50 ft. and 25 ft. high. They are furnished with 8x12-ft., two-compartment shafts and bucket

when it was known as the Hanson mine. The present owners are installing commodious quarters for the men and adequate machinery to operate on a considerable scale. The production at present is curtailed on account of the volume of development work and the installation of the plant and buildings. There are three shafts being sunk, one of which, on D vein, is to be the main operating shaft, the other two being more in the nature of prospecting shafts. To meet the main shaft three tunnels are being driven and these will intersect at a depth of about 200 ft. from the surface. The veins on this property are all in a hilly formation and necessitate considerably more sinking than other properties in the district.

#### DEVELOPMENT

A large amount of the work being done is in barren ground, sinking and driving

and the comfort of the men is being attended to.

At present the force consists of 65 men, 40 of whom are on development work. When the power equipment is completed the force will be increased to over 100 men on mining and development work will be pushed rapidly. Two 10-hour shifts are maintained at this mine.

Seventeen veins on the property show mineral values and there are a number of seams of which nothing is known. The veins are in the diabase formation and show values of native silver in smaltite. The officers are as follows: Otto Germer, president; A. M. A. Richardson, secretary; L. D. Baldwin, treasurer.

#### KING EDWARD MINING COMPANY

This is a holding company, owning and operating two adjacent claims known as the Watts Mine and the King Cobalt Mine.

*Watts Mine*—This property was originally known as the New Ontario Cobalt and Silver Mining Company, Ltd., and is situated on lot 25, northeast quarter of the north half of section 3, concession 5, of Coleman township. It comprises 40 acres.

There are four veins on the property, three of which are being worked. A shaft 65 ft. deep has been sunk on No. 1 vein and a tunnel has been driven to within 30 ft. of the shaft. The vein is nearly 4 ft. wide and shows 14 in. of shipping ore, consisting of argentite, pyragyrite or ruby silver, native silver and a little smaltite. Six miners and two muckers are working on this vein and the work is done in three shifts of eight hours each.

No. 2 vein is being worked by open cut and the vein has been stripped for a distance of 20 ft. A shaft is now being sunk and it is expected that this will intersect the main working tunnel at a depth of 180 ft. An open cut also exposes No. 3 vein and when machinery arrives, sinking and driving will be pushed forward rapidly. The main tunnel should be intersected at about the same depth as in the case of No. 2 shaft.

*King Cobalt Mine*—This property consists of 40 acres and is being worked by the same management. When installed, the same equipment will operate both mines. There are three veins of the same character as those in the Watts mine, and in all cases there seems to be very little smaltite and niccolite showing.

The principal working is a tunnel which has been driven for 170 ft. A shaft has been sunk for a distance of 30 ft., but this has been abandoned, and in the future ore will be taken out through the tunnel. There are six men at work and the necessary buildings are being constructed.

The King Edward Mining Company employs at present 60 men on both properties. A bunk-house, boarding-house, blacksmith shop, ore-house, office, etc., are being built, and boilers, a 15-drill compressor, additional drills and other machinery are on the way.



NOVA SCOTIA MINE

hoists. The ore dumps on a 1-in. grizzly and the rock not passing through the bars (95 per cent.) is hand-sorted and sacked according to grades.

There are 80 men employed, of whom about 37 are on underground development and mining. Of these 37, twenty are drill runners and 17 are mucking.

The usual buildings are installed at this mine; they consist of office, bunk-house, blacksmith shop, boarding house, stables, etc.

The company is closely held and no stock has been issued to the public. The officers are as follows: John McMartin, president; L. H. Timmins, vice-president; N. A. Timmins, manager. Capt. John Harris is superintendent.

#### COLONIAL SILVER MINING COMPANY

The vendors of this property were Messrs. McLeod and Glendenning who acquired it from a man named Hanson

to strike the veins showing on the surface. The veins do not show as rich material as some in the district, on account of the small amount exposed and because of the elevation of the property. However, in sinking their shafts and in the open cuts some rich ore has been taken out and the ore-house contains about 25 tons of first- and second-grade ore. No ore has so far been shipped.

#### BUILDINGS

The surface equipment consists of an office, two bunk houses accommodating 50 men each, a boarding-house 90x30 ft., a compressor house 45x55 ft. containing a 30-drill air compressor, stables, store-house, blacksmith shop, and an ore-house.

The power house now in process of construction will contain three 100-h.p. boilers, and a 200 electric light generator. All buildings are to be heated by steam



## UNIVERSITY MINE

Within the past few weeks the owners of the Timmins or La Rose mine have acquired practically the entire ownership of the University mine. There are a number of veins on the property, but so far only two are being worked. No. 1 vein has been opened by a 100-ft. shaft, and drifting for about 165 ft. has been done at the 50-ft. level, and for 150 ft. at the



6-IN. VEIN AT UNIVERSITY MINE

2d or 100-ft. level. The shaft goes down on No. 1 vein at what is believed to be the center. No. 2 vein has been traced for nearly 400 ft. At the corner of the bunk-house there has been uncovered a vein, about 6 in. wide, showing almost solid dyscrasite, or silver-antimonide. The surface has been removed for a distance of only 10 ft., however.

## SHIPMENTS

Since Aug. 1, 1906, there have been shipped 80 tons of ore and from 30 to 40 tons are ready for the smelter. Previous to the above date five cars were shipped from the property. The equipment consists of power plant, camp-house accommodating 70 men, shaft-house, ore-house, etc. A new 12-drill compressor, steam and electric-light plant are being installed. The property consists of 56 acres, 11 of which are under Giroux lake, and is capitalized for 100,000 shares of a par value of \$10. H. G. Adler is superintendent.

Permission to go underground was refused.

## GREEN-MEEHAN MINING COMPANY

This property, located in the southwest quarter of the north half of lot 14, concession 1, Bucke township, is the only shipper in this township. The property lies about three miles northeast of Cobalt. So far 13 veins have been uncovered in five of the 40 acres, but active operations are confined to four veins. Of these No. 1 vein is the most important and has been stripped for a distance of from 75 to 100 ft., and open cutting has been done for 89 ft. along the strike (north-south) and to a depth of from 20 to 30 feet.

## VEINS AND COUNTRY ROCK

The veins lie in the Kewatin series of rocks, consisting of greenstones, schists and porphyries, and vary in width from an inch or so up to several feet. The mineralized portion will average about 6 in. in width and consists of smaltite, native silver, with some argentite in a few places. The mine has been worked since about Nov. 1 only, but 57 tons of shipping ore have been taken out so far. The men have been living in tents and log cabins, but a commodious frame building is now completed and a suitable equipment has been ordered and is on the way. This will consist of two 100-h.p. boilers, one compressor with capacity of 1000 cu.ft. free air per minute, hoists, drills, etc. At present a jib-crane hoist is in use and work is necessarily slow. The 60 men now employed will be increased to 100 by Jan. 1. The capitalization of the company consists of 2,500,000 shares of a par value of \$1 each. Of these 1,500,000 shares have been issued, the balance remaining in the treasury for the purpose of acquiring other

## Labor at Banka

According to the *Straits Times*, the coolies now imported for mining purposes in Banka seem to be mostly the offscourings of China. They give trouble the moment they land on the island. New arrivals are now at once guarded, on landing, and are kept apart before being, as soon as possible, inspected and packed off to the mines. Difficulties so beset the direct recruiting of coolies in China that they have to be engaged at Singapore. To mend matters, the Government has decided to undertake itself the sending back of coolies from Banka to China. It had been found out that time-expired miners who paid their own passages for the most part never went farther than Singapore. There they gambled away or spent their savings. On becoming destitute, they again fell into the hands of recruiters. The Government, to prevent this, has decided to see that they get back to China in possession of their savings. Arrange-



OPEN CUT AT GREEN-MEEHAN

property or for the benefit of stockholders. The officers are: C. A. Foster, president; C. A. McInness, vice-president; C. C. Robinson, secretary and treasurer, and C. A. O'Connell, superintendent.

A shortage of labor is now complained of at Broken Hill, New South Wales. Already some of the mines are offering higher wages.

ments have also been made by the Government for money orders and remittances for the benefit of returning coolies.

Heretofore the only use of cobalt has been for coloring glass, enamels and porcelains, but it has been recently discovered that cobalt is useful in the manufacture of storage batteries.

## The London Lead Market in 1906

SPECIAL CORRESPONDENCE

The year opened rather hopefully for trade generally, soft foreign lead being then obtainable at £17 10s. ex-ship. The first business consisted mostly of speculative purchases, which tended to strengthen the market, but the early pressure of spot parcels checked the advance, while consumers bought moderately. Disappointed holders then pushed sales, and prices became irregular in consequence. More speculative buying set in, followed by American and Russian orders, which absorbed large quantities, and a gradual improvement was recorded. Thereafter came some selling orders, which had to be executed at best prices obtainable, with consequent reluctance on the part of buyers, and the month closed quietly with foreign at £16 5s., and English at £16 8s. 9d. per ton.

February found the available supplies rather scarce, and spot parcels in request. A fractional improvement resulted; but consumers were unwilling to cover more than their immediate requirements, and concessions had to be made by those anxious to sell for March onward. Later dealers' purchases, "bear" covering, improved demand for home consumption, and the reported outbreak of a troublesome fire in the Broken Hill mines, all combined to stiffen prices which—with occasional fluctuations—rose to £16 1s. 3d. for foreign, and £16 3s. 9d. for English, whereat the month closed with a steady market.

March found buyers rather reserved, particularly when it became known that the Broken Hill mines had resumed their normal output, although this was partly contradicted. During the first eight days prices dropped about 15s. under pressure of sales; but a recovery set in, prompted by combined speculative purchases and bear covering, and the month closed with foreign at £15 17s. 6d., and English at £16 2s. 6d.

April started with a downward tendency induced by the abstention of consumers, coupled with the pressure of large accumulations in dealers' hands. Then came a gradual recovery which—with little interruption—continued till the close. Toward the close of the month the buying—which had been rather spasmodic—became more determined, particularly for forward delivery, and was supposed to be largely for American account. English consumers, being taken unawares, followed with substantial purchases, and the closing prices were £16 5s. for foreign, and £16 7s. 6d. for English.

May found consumers encouraged by marked improvement in the building trade. Their purchases coincided with larger inquiry from the Continent, and

with substantial shipping orders from America. Spot lots, which at first appeared plentiful, were thus readily absorbed. Prices advanced till inquiry slackened after the execution of large orders, and sellers predominated, and the next few days saw a decline of about 15s. in values. Thereafter the volume of business was about normal, and fluctuations were unimportant, and mostly upward. Toward the end of the month news came of serious subsidences in Broken Hill Block 10 and Central mines, with damage to mills, which pointed to curtailment of the Australian production, and caused an improvement in prices to £16 17s. 6d. for foreign, and £17 for English.

June found buyers still active under the influence of the Australian reports, consumers willingly following dealers' lead and covering requirements a good way forward. The market, however, was sufficiently supplied, and offered but little scope for speculators, and fluctuations were at no time sensational. Toward the end of the month, a good demand set in for export which, together with a good general consumption—particularly in the United States—rather stiffened prices. Closing values were £16 13s. 9d. for foreign, and £16 18s. 9d. for English.

July opened with a downward tendency, due mainly to the public marketing of various holdings, and in sympathy with other metals. Toward the middle of the month spot parcels were scarcer, and prices hardened somewhat. Home consumers bought more freely, and sellers offered reluctantly. The price improved, followed by a slight reaction; but the consumptive demand was sufficient to absorb all parcels arriving. The last two or three days of the month found demand satisfied, and sales could only be effected by making concessions, the last business recorded being £16 12s. 6d., English being held for £16 16s. 3d.

August found the market rather quiet after recent heavy buying, but without any pressure to sell, and with plentiful indication of large requirements in the near future. Consumptive demand soon asserted itself, and was followed by important orders for export, notably for Russia. This active demand was well maintained throughout the month, when foreign brands were quoted £17 10s., and English £17 12s. 6d.

September was an active month in this, as in metals generally, and a slow but steady advance was manifest throughout. Trade demand was excellent, and sufficient to absorb all incoming supplies. Bears were tempted into selling for forward delivery, but their operations were of no avail to stop the advance. Offerings were scarcer from day to day, and the general expansion of trade soon made it apparent that supply was unequal to demand. Closing prices were £18 10s. to £18 12s. 6d. for foreign brands, according

to time of delivery, and £18 15s. to £18 17s. 6d. for English.

October brought evidence of growing consumption and a serious depletion of available supply. The larger consumers were quick to apprehend the situation, and they bought with more than customary boldness. Speculative purchases followed, and the price rose steadily until £20 was reached, Oct. 11. This figure tempted numerous sellers to push sales for extended delivery, and the next few days saw a relapse. Consumption, however, was too active to justify such risk, and offers were in many cases withdrawn, the result being a sharp recovery. Later the metal markets generally were adversely affected by financial trouble, and a gradual decline ensued. The month closed steadier, however, with foreign brands £19 2s. 6d. to £19 7s. 6d., and English £19 5s. to £19 10s.

November revealed a dwindling supply for early delivery, particularly in London, where an advance of about 5s. was soon established. Toward the middle of the month this scarcity was relieved by fresh arrivals, and prices eased off. Fluctuations were narrow throughout the month, and closing values were £19 5s. to £19 7s. 6d. for foreign brands, and £19 10s. to £19 12s. 6d. for English.

December revealed some scarcity of supply at the outset, but this was counteracted by early arrivals, and for about 10 days the market showed little animation. The undercurrent, however, was strong, it being evident that the consuming trades were but poorly covered, while supplies were no more than normal. Dealers now began to buy freely in anticipation of consumptive demand, and demand was stimulated by postponement of the law prohibiting the manufacture of white lead in France. The result was an advance to £20 for foreign brands, £20 7s. 6d. being asked for English, March delivery commanding 5s. premium. At these figures the market remained steady till the close.

### Changes in Mexican Laws

Consul-General A. L. M. Gottschalk, writing from Mexico City, says that in the course of the coming year Mexico is to see much useful legislation of the practical sort, which will tend as well to protect certain classes of bona-fide concessionaires as to further the industrial, agricultural, and general economic well-being of the country itself. The contemplated mining legislation will show little radical change, but will have for its effect the codification of a number of decrees, circulars, and laws promulgated during the experience of fourteen years into convenient form. Petroleum and coal, it is said, will remain the property of landowners as a right inherent with their title, and will not, like the precious metals, be considered "products of the subsoil" denounceable by whoever discovers their existence.



# THE ZIEGLER PROCESS FOR COKING PEAT

A New Method Now Being Successfully Used in Germany

BY OTTO K. ZWINGENBERGER

In a speech delivered September, 1906, at the opening of the Minnesota State Fair, J. J. Hill advised the people to be careful in the use of coal and iron ore, for the supply of these presents of nature might be exhausted in some decades of years. Nature at any time allows a substitute and will do so when in future ages the coal famine will menace our descendants; we see already in our day the consequences of the lavish use of wood. As considerable wood is used for the production of charcoal, the description of a successful technical process for the coking of peat, allowing us an excellent substitute for charcoal, will be of public interest.

Peat as a fuel has been used from very ancient times, especially in Germany and in the Netherlands, and it is in Germany that modern methods of manufacture have been worked out. For many years inventors have spent much time and money in various processes, but the most of them were only carried out in experimental plants and never passed this first step of development. By far the most modern, scientific and rational method of utilizing peat is that of converting it into coke with the recovery of the by-products. Martin Ziegler, a prominent chemical engineer, first established this process as a perfect industrial success.

PLANTS IN OPERATION

There are three works now in which his ideas are carried out; the first plant was built in Germany at Oldenburg, the

\*Chemical engineer, 143 W. 64th Street, New York City.

second was created by the Russian Government at Redkino, and the last and most modern is located at Beuerberg in south Germany. The Ziegler process consists in carbonizing air-dried peat of about 25 per cent. water in upright retorts. The preparation of the raw peat to get it ready for the coking is a work which requires a good deal of practical experience, the local conditions of the peat bog having a great influence on this work. There are

several mechanical devices for digging the raw peat and other facilities in handling; but it would be too much to give here a description of all the possibilities. If a peat bog like this at Beuerberg contains many woodsticks, the peat is cut with a spade in rectangular pieces, and by a conveyer given to a peat machine (Fig. 1). This peat machine has screw knives which break up the fibrous structure of the peat, knead and mix the mass and press it forward to a mold which shapes it into bricks of about twice the volume of an ordinary building brick. These bricks are then exposed to sun and air to be dried. The waste heat of the furnaces, mixed with air, can be used advantageously in a drying chamber to finish the drying process.



FIG. 2. TOP OF THE RETORT OVENS



FIG. 1. PEAT MACHINE. IN THE BACKGROUND ARE HEAPS OF AIR-DRIED PEAT

The air-dried peat is added at the top of the retort ovens (Fig. 2), and from time to time the peat coke is drawn off from the bottom of the retorts into cars (Fig. 3) which are covered air tight and taken outside to cool. As already mentioned, the Ziegler process saves the by-products of the destructive distillation, as paraffin, phenolates, gas oil, ammonia, acetic acid, ethyl alcohol and non-condensable gases; the latter are used to heat the retorts, therefore the only fuel required is coal or wood to heat the ovens for the first charge and when the gases become available the plant sustains itself.

ANALYSES OF THE PRODUCT

The best peat is used for peat coke; the peat running a little higher in ash is used for so called "half coke." The table of resulting products is as follows:

Peat coke	33 per cent.	Half coke	45-50 per cent.
Tar .....	4-5 per cent.	Tar .....	2 per cent.
Tar water	41 per cent.	Tar water	38 per cent.
Gases....	22 per cent.	Gases....	15 per cent.

## Analysis of peat coke:

	Peat Coke.	Charcoal.
Carbon.....	87.8 per ct.	86.0 per ct.
Hydrogen....	2.0 per ct.	1.9 per ct.
Nitrogen.....	1.3 per ct.	1.3 per ct.
Sulphur.....	0.3 per ct.	0.3 per ct.
Oxygen.....	5.5 per ct.	5.2 per ct.
Ash.....	3.2 per ct.	3.0 per ct.
Water.....	0.0 per ct.	0.0 per ct.

The calorific effect of peat coke is 14,500 B.t.u. Peat coke is in any line like charcoal; it is tough, of fair weight and can be shoveled. It is superior to charcoal as it has the same strength as ordinary coke, and has a metallic sound when struck. It is largely used for metallurgical purposes, as for the manufacture of charcoal pig iron, machine and armature work. At Lohmalkalden, peat coke is used for blast-furnace work and at the Krupp-Gruson works it is given preference for hardening armor plates. It is used as filter carbon, as a substitute for anthracite and charcoal.

Half coke is produced as a substitute for a good coal for boilers, locomotives and other furnaces; it is very similar to peat coke, almost as firm, but burns with somewhat more flame; it is not hygroscopic and can lie for a long time in water without its surface being permeated.

## Analysis of half coke:

Carbon.....	73.89 per cent.
Hydrogen.....	3.59 per cent.
Nitrogen.....	1.49 per cent.
Oxygen.....	14.52 per cent.
Sulphur.....	0.20 per cent.
Ash.....	2.50 per cent.
Moisture at 105° C.....	3.80 per cent.

The calorific effect of the half coke is 12,400 B.t.u.

impregnation of wood or it is treated according to the general principles of tar distillation, turning out gas oil, paraffin, creosote oil and asphaltum. The gas oil can be separated into two kinds of about 0.835 and 0.885 specific gravity respectively; both kinds are of good value as they are used for motor cars, gas engines and lighting purposes; the heavy one is also an excellent lubricating oil. The

tained are acetate of lime, methyl alcohol, sulphate of ammonia (by neutralizing the ammonia with sulphuric acid). The solutions of both the ammonium sulphate and the lime acetate are concentrated by the waste heat of gases from the retorts. The ammonium sulphate is well known as a fertilizer, the methyl alcohol is of the same composition as that obtained from wood.



FIG. 3. AIRTIGHT CARS FOR COOLING COKE

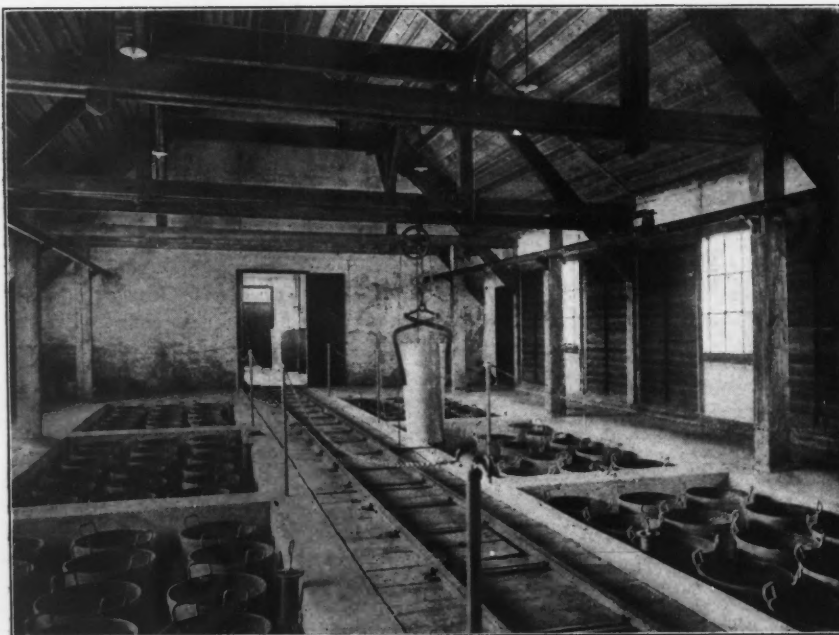


FIG. 4. PARAFFIN HALL

## BY-PRODUCTS

The tar obtained from peat by the Ziegler process approaches the brown coal tar, but generally it contains more phenolates. It is easily separated from the tar water by heating, the different specific gravities of the fluid enabling an easy separation. The tar can be used for the

paraffin (Fig. 4) is largely used for the manufacture of candles, of insulated cables and wires. Creosote oil (containing carbolic acid) is used for the impregnation of railway sleepers, for disinfection, etc.

The tar water with the due quantity of lime is treated with steam in a column apparatus and the products finally ob-

It is used in the chemical industry for the manufacture of aniline dye-stuffs and of pharmaceutical preparations. The acetate of lime is the raw material for many chemical preparations, especially for acetic acid and acetone, which is used for gunpowder. The amount of the by-products changes somewhat as to the condition of the raw material.

The following table gives a view of the output of the smallest type of a Ziegler peat-coking plant, handling per year 35,000 tons of air-dried peat in 4 retort ovens:

33.3 per cent. of peat coke =	11,655 long tons.
0.4 per cent. of ammonium sulphate =	140 long tons.
0.6 per cent. of lime acetate =	210 long tons.
0.2 per cent. of methyl alcohol =	70 long tons = 23,300 gal.
5.0 per cent. of tar =	1,750 long tons, which contain about
245,800 gal. of light oil.	
80,800 gal. of heavy oil.	
117 long tons of paraffin.	
504 long tons of creosote and carbolic acid.	
78 long tons of asphaltum, etc.	

The coking of peat was already tried a long time ago in Germany, but it was generally carried out in bee-hive ovens and its disadvantages always caused the interruption of the work.

## ADVANTAGES OF THE PROCESS

The advantages of the Ziegler process are: The economical utilization of the waste gases and the superior distribution of the heat; the more perfect exclusion of air from the coking chamber; the continuous work and therefore long life of the retorts by avoiding their cooling down;



the superior strength of the coke; an increase in output of coke and by-products. An enlargement of a Ziegler coking plant requires in the same ratio an increase of the unskilled labor for the production of air-dried peat, but requires only some few men more for running the coking and chemical plant, this point in the saving of by-products being of the highest importance for the economy of the process.

There were many prejudices and misunderstandings to be overcome, for the opinion of many people is that peat is a valueless material, and never would turn out a useful coke. By the request of the Prussian State Department of Commerce and Trade the first Ziegler plant at Oldenburg was investigated by a prominent German engineer and his report was favorable to the coking process and plant; some short-comings he stated regarded exclusively some parts of the architecture of the buildings.

As the fuel question is very important for some American States with immense

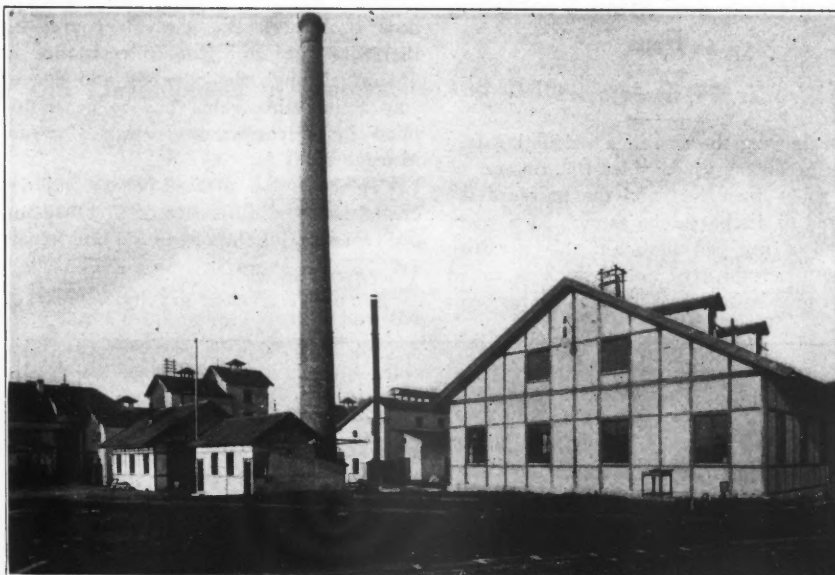


FIG. 6. GENERAL VIEW OF THE BEUERBERG PEAT-COKE PLANT

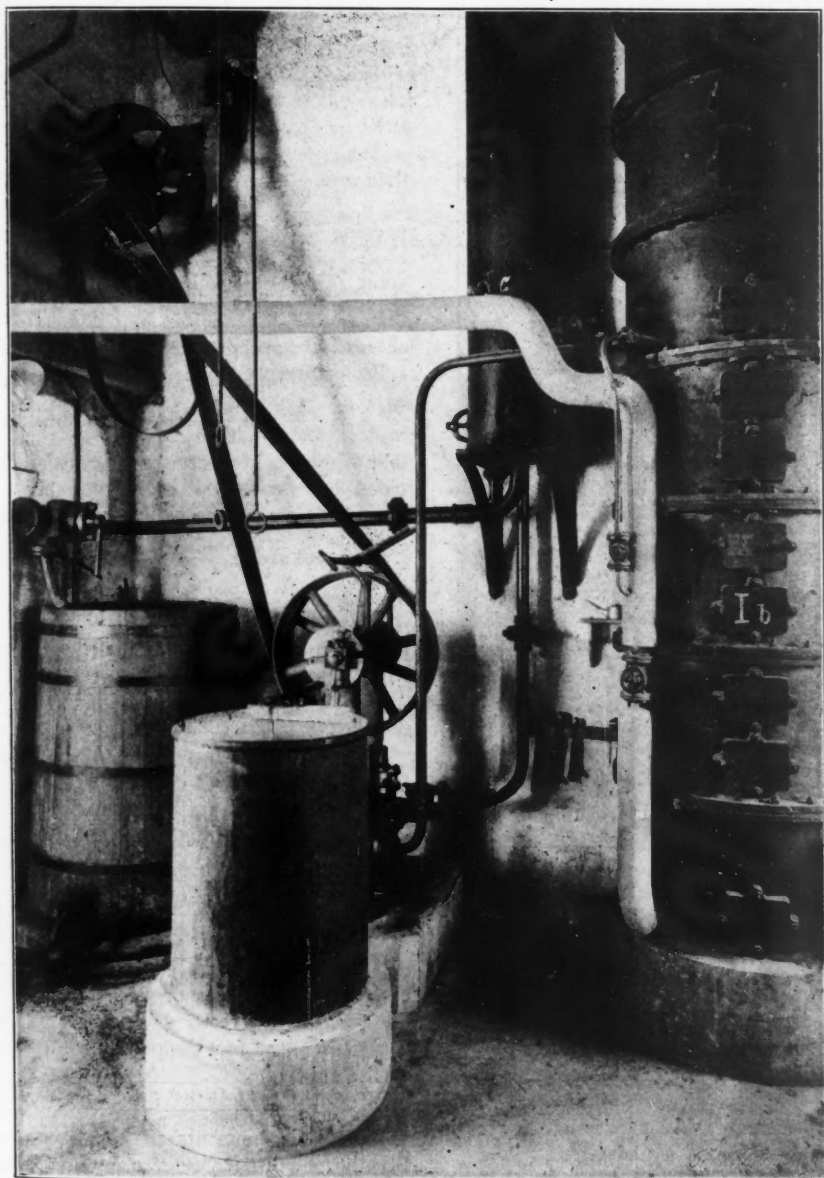


FIG. 5. COLUMN APPARATUS FOR WORKING UP TAR WATER

peat bogs, pictures of the most modern Ziegler plant at Beuerberg, south Germany, are shown. They were taken in 1906. The solid structure of the buildings, a characteristic of many German industrial works, would be moderated in many countries; especially in warm climates the furnaces could stand in the open air protected by a roof against rain.

### Increase of British Coal Exports

Consul F. W. Mahin reports from Nottingham that the sale of British coal to foreign countries has made a remarkable advance this year (1906.)

The cause may in the future be mistaken for the repeal of the export duty on coal, but the fact is that this year's foreign sales far exceeded those of previous years before that duty was removed on November 1. Prior to that, this year, the increase of British coal exports over the whole of 1905 exceeded 6,000,000 tons, and would have been still greater had not many shipments been purposely delayed till after November 1 to escape the tax. The gain in 1905 over 1904 in coal exports was only 1,250,000 tons.

The great increase of exports this year is attributed partly to Germany's decreased output, making that country unable to supply the usual demands upon its mines from Spain, France, and other countries, and partly to enlarged consumption in those countries. These now look to Great Britain. This trade with those countries is in a large part merely a return of what was lost after the imposition of the export duty of a shilling a ton in 1901. The duty has yielded about \$10,000,000 a year. It is hardly probable that it caused a loss of that amount to British mines in value of exports, but there is no question that a serious loss did result.

## Calculations for Mine Ventilating Fans

BY J. F. MAX PATITZ\*

In figuring the size of a ventilating fan, it is necessary to consider the amount of air to be furnished and the pressure required to discharge the same. At a given speed a fan can maintain this pressure over a certain area only, which is called the equivalent or capacity area. This term

by a fan varies directly as the velocity of flow  $v$  through the equivalent area  $a$ ; therefore  $V = av$ . Due to resistance in flowing through the opening, and due to contraction, this value has to be multiplied by a coefficient  $f$ , thus  $V = fav$ . Murgue gives  $f = 0.65$ .

The velocity  $v$  in feet per second depends upon the difference of pressures on the two sides of the opening  $a$  and equals  $\sqrt{2gH}$ .  
 $g =$  acceleration of gravity.

The pressure of air in inches of water is proportional to the square of the peripheral velocity  $u$  (in feet per second) of the impeller.

$$h \text{ (theoretical)} = \frac{12u^2}{g} \frac{d}{do}$$

Due to leakage, eddies, etc., this theoretical value has to be multiplied by a coefficient  $c$ , which has to be determined from actual fans.

$$\text{No. 2. } h = \frac{12cu^2}{g} \frac{d}{do}$$

This expression may be written thus,

$$h = \frac{12c\pi^2 D^2 d}{60^2 g do} n^2$$

$D =$  diameter of impeller in feet.

$n =$  number of revolutions per minute.

As can be seen from the formula, the pressure  $h$  varies with the square of the number of revolutions and  $\frac{h}{n^2} =$  constant for a given fan.

From formula No. 1 the equivalent areas may be found,

$$a = \frac{V}{\sqrt{h}} \left( \frac{1}{f \sqrt{\frac{2g}{12} \frac{do}{d}}} \right)$$

Let

$$\frac{1}{f \sqrt{\frac{2g}{12} \frac{do}{d}}} = L,$$

then  $a = \frac{Lv}{\sqrt{h}}$  and for a given fan and opening  $a$ , the expression  $\frac{V}{\sqrt{h}} =$  constant. From this follows  $\frac{V_1^2}{V_2^2} = \frac{h}{h_2}$ ; that is, the squares of the volumes discharged are proportional to the pressures.

From formula No. 2 it also follows that  $\frac{n_1^2}{n_2^2} = \frac{h}{h_2}$ ; or  $\frac{h_1}{n_1^2} = \frac{h_2}{n_2^2} =$  constant; that is, for a given fan the pressure divided by the square of the number of revolutions is a constant quantity.

As found above,  $\frac{V_1^2}{V_2^2} = \frac{h_1}{h_2}$ , then  $\frac{V_1^2}{V_2^2}$  is also equal to  $\frac{n_1^2}{n_2^2}$  or  $\frac{V_1}{V_2} = \frac{n_1}{n_2}$ ; that is, the volumes are proportional to the number of revolutions, or  $\frac{V_1}{n_1} = \frac{V_2}{n_2} =$  constant.

The two coefficients  $c$  and  $f$  being determined, it is easy to calculate other sizes of fans of the same type provided the velocities of air through the fans and the shapes of blades, etc., are made proportional to those of the original fan.

A fan moves  $V$  cu.ft. of air against a pressure of  $h$  in. of water. The work it is doing is therefore  $V \times h \times$  weight of cu.in. of water  $\times 144$ , or  $5.2 Vh$  ft. lb.

As  $V$  varies directly as  $n$ , and  $h$  as the square of  $n$ , the foot pounds of work vary as the cube of  $n$ .

The total shipments of tin from the Stanthorpe district, Queensland, during the past quarter amounted to 65 tons 9 cwt., of the approximate value of £7500.

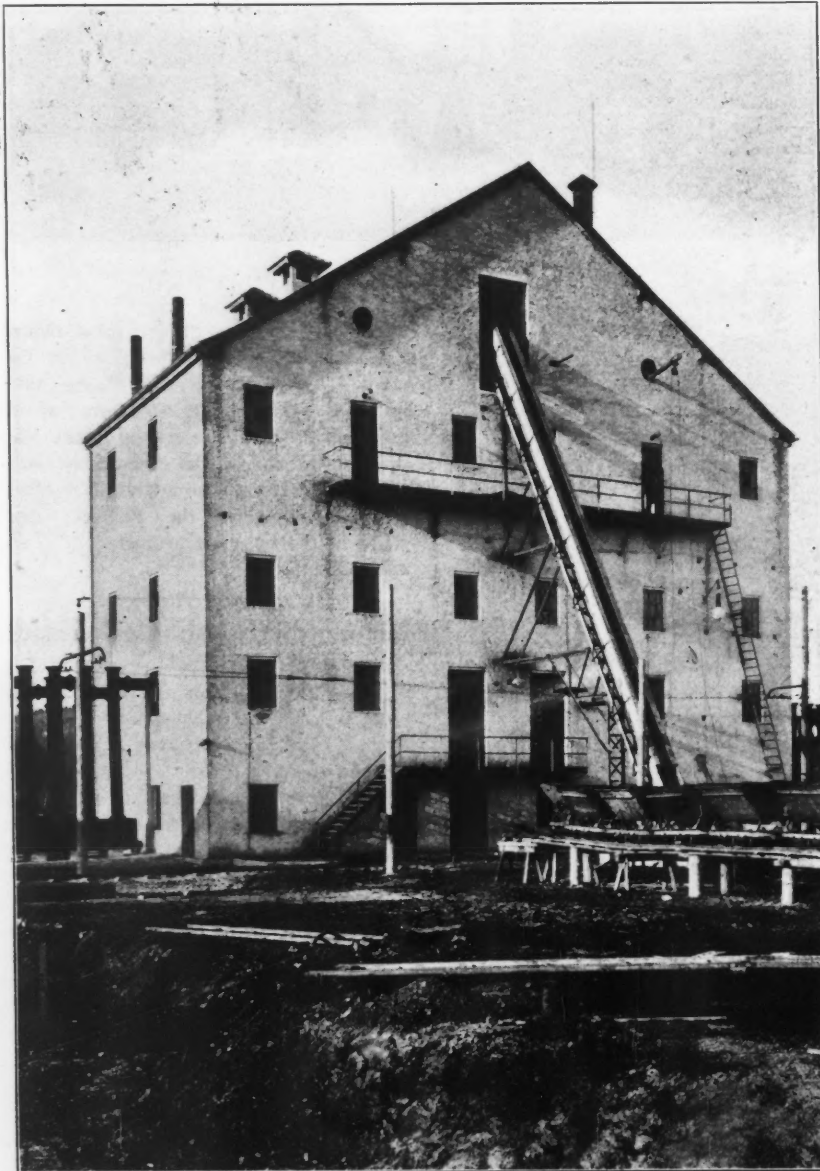


FIG. 7. FURNACE HOUSE, ZIEGLER PROCESS

has been introduced by Murgue, who made thorough investigations of mine ventilators, to facilitate comparisons of different fans.

The equivalent area of a fan may be described as the opening in a thin wall between two vessels holding air of different pressure, through which flows the specified volume.

The quantity  $V$  in cubic feet delivered

$H =$  height of column of air in feet equal to difference of pressure.

Usually  $h$  is given in inches of water,

$$\text{thus } v = \sqrt{\frac{2gh}{12} \frac{do}{d}}$$

$do =$  weight of cu.ft. of water.

$d =$  weight of cu.ft. of air.

Substituting this expression for  $v$  in formula  $V = fav$ , we have,

$$\text{No. 1. } V = fa \sqrt{\frac{2gh}{12} \frac{do}{d}}$$

\*Consulting mechanical engineer for Allis Chalmers Company, Milwaukee, Wis.



## COLLIERY NOTES

### Details in the Operation and Development of Anthracite and Bituminous Mines

Every main haulway should have refuge holes alternating on each side of the road, and not more than 40 ft. apart.

In order to properly protect electrical machines, it is important that the armature bearings should not be allowed to wear down and the armature catch the pole pieces.

Practical results in the Pennsylvania bituminous district show that on an average, each mining machine will produce about 50 tons of coal per 8 hours, cutting 65 ft. of face to a depth of 5 ft.

In the panel system of mining, the method of driving the cross entry to its limit and then working the last room first and bringing the pillars back at the same time is now being generally adopted.

Where a shunt- or compound-wound motor is used, it is generally best to have a friction clutch, so that the motor can be started with no load, and after the motor has attained full speed the load can be attached by means of the friction clutch.

In shaft sinking the pulsometer is an exceedingly useful and handy pump, and will not only force water to a height of 80 ft., but will pump mud when not too thick. The absence of exhaust steam makes this instrument particularly useful for sinking purposes.

It is better to gain 50 per cent. of the coal seam on the advance work and then secure 45 per cent. on the retreat, than to gain 75 per cent. on the advance and to lose nearly all of the remaining tonnage, besides the evil effects of a squeeze that may result from improper development work.

About 15 per cent. of the men killed in coal mining are victims of gas or dust explosions. As an average for the past 10 years it is estimated that in 65 per cent. of the fatal accidents that have occurred in coal mining the responsibility for the disastrous results have been traced to the victims themselves.

Experiments have shown that it is easier to work in a mine where the air current has a velocity of 500 ft. per min. and the atmosphere a temperature of 100 deg. F., than where the temperature is 85 deg. and the current only 250 ft. per min. This is due to the fact that the evaporation of the perspiration on the workman's body refreshes and gives him new energy.

To install a 15-machine plant, capable of producing from 600 to 800 tons of coal in 8 hours, the cost for the power plant, mining machine, pipes and all other accessories, including the foundation, boiler setting, and complete cost of installation

would be about \$14,000. The total expense for maintaining and operating such a plant would amount to \$5500 per year as a maximum figure.

Recently collected statistics with reference to the coal-mining industry show that for every working day in the year our coal mines produce a total of more than 1,000,000 tons of fuel. It is, however, appalling to think that for each working day we sacrifice the lives of seven men, which means that one man is killed for every 180,000 tons of coal mined. It is also true that more than twice this number of men are seriously injured each working day.

The total production of coal in the Indian Territory for the year ending June 30, 1906, was 2,966,812 tons, a decrease of 4149 tons from the production of the previous year. The total value of the coal produced was \$5,446,099, and the average selling price per ton of run-of-mine coal was \$1.84, an increase in the selling price of 1.7c. per ton. The production of coke for the year was 59,088 tons, as compared with 41,193 tons produced in the preceding year. The average selling price of coke for the year was \$3.90 per ton.

In all cases where a miner has been overcome by the gases in a mine an emetic should be at once administered if the victim can still voluntarily swallow. To enforce this emptying of the stomach it is recommended that a solution of sulphate of zinc, containing 30 grains to the ounce, be administered in doses every 10 minutes until emesis is produced. After this treatment has been administered, it is advisable to put two teaspoonfuls of the aromatic spirits of ammonia in a cup of water and cause the patient to swallow this solution. Ammonia acts as a stimulant more satisfactorily and quickly than alcohol.

The newest innovation that has taken place in the method of operating a coal mine is the substitution of concrete for the present system of mine timbering. The experiments along this line are being made by the Reading Coal Company at Shamokin, Pennsylvania. A plant for the manufacture of these cement props will be erected at the North Franklin colliery, Trevorton, from which place the new style of timbering will be sent to all the other collieries. The Reading Company has spent considerable time and money in determining the best method for preserving mine timbers, and the present step seems to indicate that in the future cement will replace the present method of timbering with wooden props.

One cause of mine fires not generally

considered is from allowing an incandescent electric lamp to lie on a heap of coal dust while lighted. Other experiments have shown that when a lamp is laid on a heap of ordinary cotton waste, the latter material will catch fire in 15 or 20 min. In the case of coal dust, a lamp has been known to fire such fine fuel in 45 min. To prevent such accidents, it is most essential that electric lamps, when not in actual use, should always be suspended and not allowed to come in contact with any material object. A further precaution is to have each bulb inclosed in a wire casing.

In our issue of September 29, 1906, under the head of Colliery Notes, there appeared a paragraph stating that an explosive should contain a small percentage of nitrate of potash, and furthermore, that if nitrate of sodium is present, the explosive is deliquescent and absorbs too much moisture from the air. Since one of these ingredients is present in many of the well known explosives now on the market, the suggestion made is consequently misleading. Coal mining differs materially from metal mining, and many explosives that act satisfactorily in hard rock are most undesirable for use in a coal mine. Explosives may be roughly divided into two classes, those which produce a shattering force, and those which act in a propulsive manner. The former are known as high explosives and their detonation is very rapid; for this reason it is not advisable in coal mining to use an explosive containing too large a percentage of nitrate of potash, since this latter element makes the compound too sensitive to shock, and consequently dangerous. Nitrate of sodium, when present in too large a proportion, causes the explosive to absorb a considerable quantity of moisture from the air. Experience has shown that in most coal mines, where the coal is not shot from the solid, a low explosive, producing a propelling or heaving effect, is best. There is really no uniformity of composition in the various explosives that are now manufactured; for instance, Atlas powders contain only 2 per cent. sodium nitrate; Giant powders contain 40 per cent and Vigorite contains 60 per cent. of this ingredient. The variation in the quantity of nitrate of potash present in explosives is likewise great: Hercules powders contain from 2 to 30 per cent.; Gelatine dynamite contains 18 per cent.; Stowite 20 per cent.; Dualine 20 per cent.; Gelignite 27 per cent.; Rendrock 40 per cent., and Brugere powder 46 per cent. nitrate of potash.

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## Mine Drainage Districts

A bill for the creation of mine drainage districts, prepared by a committee appointed by the American Mining Congress and adopted at the recent session of the congress, is to be introduced at the present session of the legislature of Colorado. The legislatures of other States are to be asked to adopt the same bill. The object of this bill is to provide for united action in unwatering certain mining districts, which experience has amply proved cannot be accomplished on the principle of *laissez faire*. The advantages of a common drainage system in many mining districts are so obvious that no further argument on that point is required. The question is as to the framing of the present bill. It is to be said at once that the committee which prepared it was of superior character and enjoyed, both from its own members and from the outside, technical and legal advice of the highest class. However, the committee itself would be the last to declare that its work is free from imperfections, or is anything more than the best it could offer.

We think that the proposed bill contains some dangerous features. Its basis is valuation of mines as assessed for purposes of taxation. But the assessment of mines for direct taxation is uncertain, unscientific and often unequitable. Ten or more persons owning property to the amount of at least one-third of the total assessed valuation may secure the creation of a drainage district, and such a district upon decree becomes a municipal corporation and may issue bonds which are a lien upon all property within the boundaries of the district. Owners who may oppose the creation of a drainage district have the right of a hearing before the decree is made, but only as to the material allegations of the petitioners. Unless they can then prevent the organization of the district they run the chance of losing their property through foreclosure by bondholders; and anyway are subject to a tax of 5 per cent. on assessed valuation.

The animus of the committee and of the American Mining Congress has been unquestionably to secure the greatest good for the greatest number, but when it is proposed to effect what with human shortsightedness may be erroneously conceived to be the greatest good by means which may involve the saddling of liens upon the property of dissenters, it is easy to

foresee that grave injustice may result. Mining property is different from real estate. When its ore contents are gone its value also is gone. The value of an orebody is the net yield obtainable from it, but the net yield possible varies with time. Under the proposed law the far-seeing who consider that their property may increase greatly in value merely by leaving it idle may lose their natural right to do as they please because of the wishes of a spendthrift minority. Or it is conceivable that an abortive drainage tunnel might lead to the practical confiscation of a district, which subsequent advance in geological, mining or metallurgical science might prove to be rich. To put it graphically, the man who locks away a block of apparently worthless mining stock with the thought that some day it may prove valuable (and occasionally that happens) might lose all chance under the operation of the proposed law.

We believe that this proposed law should receive very careful consideration before it is passed. It has been well fath-ered, and has received open discussion at a representative meeting of mining men, who passed a resolution advocating its passage. Nevertheless, it must be admitted that the discussion was hasty and inexhaustive. The courts are slow to uphold legislation which may work injustice to the individual where property rights are concerned. It would appear that some equitable amendment might be made which would secure the benefit of joint action without the danger of confiscation of any property.

## Frauds in Mine Promotion

Everyone is aware that the gullible public has recently been, and is still being, loaded up with worthless mining stocks on which it will soon find it has lost a lot of money, that has fattened the sharks. In this, history will simply repeat itself. The words of warning which the JOURNAL and all the reputable mining men have spoken are for the most part ineffectual because they do not reach the persons upon whom the fraudulent promoters chiefly prey. What can be done to protect the unwary? The common answer is to enact more legislation. National legislation is suggested as the best means of solving the problem by Henry K. Pomroy, president of the New York Stock Exchange, and A. Chester Beatty, of the



Guggenheim Exploration Company, in recent interviews published in the *New York Sun*.

We agree with Mr. Pomroy and Mr. Beatty in their suggestion that our legislators may usefully study the British corporation law. We think that there ought to be a Federal corporation law. But even at present our States have laws for the punishment of fraud, which, if enforced, would make the confidence men more alive to the danger they run. Moreover, the administration of the Postoffice Department is a powerful agent in discouraging the business of these gentry.

The present trouble is not so much the absence of suitable laws as it is the difficulty of presenting proof of fraud to the proper authorities. This is the crux of the question and the swindlers know it. The small investors, to whom the fraudulent promoters appeal, are unable to investigate even if they were wise enough to do so. The inhabitants of the districts where the properties are alleged to exist often are quite ignorant of the advertisements in the East, and even if they were disposed to take the trouble, do not know how to reach the proper authorities. Anything approaching a State *visé* of company promotions would be objectionable on many grounds, and might be more dangerous than the present situation.

We fear that there is little hope of preventing a gullible public from being rankly swindled so long as it continues to be gullible; and the swindlers all know that new groups of fools are developing all the time. However, it would help if the newspapers should be more careful in accepting the advertisements of mining promotions, and the passage by the States of a law like that which the American Mining Congress is advocating would bring more closely home the danger of making false statements in such matters.

### Open-hearth Steel and the Bessemer Process

The large new steel plants and the additions to existing mills now in process of construction will almost without exception make use of the open-hearth process. For making rolling-mill steel the bessemer converter seems to have lost favor. The United States Steel Corporation has during recent months authorized the construction of nearly a hundred open-hearth

furnaces, and not a single converter plant has entered into its plans. The increased capacity of independent plants is to be supplied almost wholly in the same way.

The reasons given for this desertion of the process which is still supplying the bulk of our steel is the waning supply of low-phosphorus ores and the increasing difficulty of meeting the specifications of consumers. The average phosphorus content of the iron ore received at lake ports is steadily, although slowly, rising and the percentage of metallic iron is as steadily falling. Without reopening the discussion concerning the relative merits of open-hearth and bessemer steels, it may be said that the prejudice against the product of the converter has not diminished during the last few years, and the requirements of steel construction have grown more exacting. A few months ago a mill producing open-hearth steel rails had no difficulty in disposing of its entire output for the current year at an advance of \$1 above the market price.

There is, however, no danger that the process which Sir Henry Bessemer gave to the world will become obsolete. Probably no year has added more converters to the total number in use than 1906. Although the picturesque vessel has lost favor in the heavy rolling mill, it has found occupation elsewhere. It offers advantages for supplying small quantities of steel at very high temperature, which renders it a valuable adjunct to the foundry. Small converters have been found especially useful in the production of light steel castings, and many were installed during 1906 for that purpose.

It seems, therefore, that the process which was at first thought impracticable except in the very largest works is now more highly esteemed in establishments where the output is relatively small.

### Magnetic Separators

Since renewed attention was attracted to these machines by the great success of the invention of the late J. Price Wetherill, there has been a great development in their forms and mechanism, and in the methods of their application. Magnetic separators are now standard machines, and are in wide use. It is useful to understand the fundamental difference between the two grand types, viz., the high intensity and the low intensity. The former require much more power than the latter, but, they will make separations of

minerals of low magnetic attractability, which remain unaffected by the machines of low intensity. In order to enable the latter to operate at all, the ore must be converted by roasting into a more highly magnetic form, and the cost of roasting often is more than an offset of their economy in power and lower first cost. In the case of some ores, however, such as blende-siderite, roasting and separation by low-intensity machines may give a higher grade of product than does raw separation by high-intensity machines, and the commercial result may figure out better. Consequently, if that class of ore were alone to be treated, the choice might be for a roaster and low-intensity machines.

But when it is a case of treating a variety of ores, some of which can be separated only by a high-intensity machine, the choice is determined by different considerations. The high-intensity machine will perform all of the separations of strongly magnetic material that the low-intensity machine will make, and is capable of far more delicate adjustment and of effecting separations between minerals of several different degrees of magnetic permeability.

### Lake Copper Consolidations

Rumors are current of a large consolidation of Lake Superior copper companies under Amalgamated auspices. Tamarack, Osceola, Copper Range and Isle Royale have been named, together with several minor companies. It is said that the Ojibway Mining Company has been organized, with \$100,000,000 capital stock, as a holding company, in which the others will be practically merged. In the excited condition of the Boston market, these rumors find ready belief. It is not possible to secure either confirmation or denial at the present time; but the probability is that there is a foundation of truth in them. The Amalgamated has long sought to secure a hold in the Lake country, and may be taking the opportunity now, though it is certainly paying a high price if rumors are correct.

THE ACTION of the Homestake company in giving its miners an eight-hour day has caused trouble for the smaller mines in the Black Hills, many of which cannot afford any increase in cost. The miners in several districts have struck, and insist upon eight hours there also.

## ROUND MOUNTAIN CAMP, NEVADA

### Its Location, Geology, and Mining Activities

BY GEORGE A. PACKARD\*

Round Mountain camp is located on the east side of the Big Smoky valley, about half-way between Tonopah and Austin, at an altitude of from 6000 to 6400 ft., the total elevation of the mountain from which the camp is named being not more than 400 ft. above the adjacent valley. The district is reached from Tonopah via Manhattan. This latter distance, about 55 miles, I covered in an hour and 43 min. in Hofman's Winton, but the 18 miles from Manhattan to Round Mountain required over three hours in the Austin stage. The ride furnishes an excellent example of the abuse of the United States mining law, for the ground along the entire route is staked out in claims, not 10 per cent. of which show even rock in place, but all preventing the legitimate prospector from exercising his vocation unless he wishes to take chances on a row, physical or legal.

Round Mountain was discovered, or re-discovered, early in 1906. When the original discovery was made I do not know; but there is a dump good for 100 ft. on the north side of the butte, which must have been weathering some years, to say nothing of an old cabin used for a mess. The mountain itself appears to be a mass of rhyolite, the slides showing under the microscope some hornblende and biotite, with an occasional spherulite from rapid cooling, and marked flow structure. In many places, as on the Fairview and Sphinx, it is so kaolinized as to be almost white,

while in other places, as in the Red Top tunnel, it is a gray brown, but always with numerous quartz phenocrysts. To the north and east of the Round Mountain proper, near the limit of the Fairview, is a light granite, almost entirely quartz and feldspar, but with a little muscovite. It has a gneissoid structure and has apparently

been subjected to considerable shearing pressure.

#### DEVELOPMENT OF THE PROPERTIES

The camp was still young at the time of my visit, in October, but already several tunnels and shafts had reached a depth of 100 ft. or more. The greatest development is on the property of the Round Mountain Mining Company, where several incline shafts have been sunk. The Fairview also developed its ground with inclines on the vein, while the Sphinx, with the only hoisting plant installed at that date, had a vertical shaft nearly 200 ft. deep, from which a crosscut was to be driven.

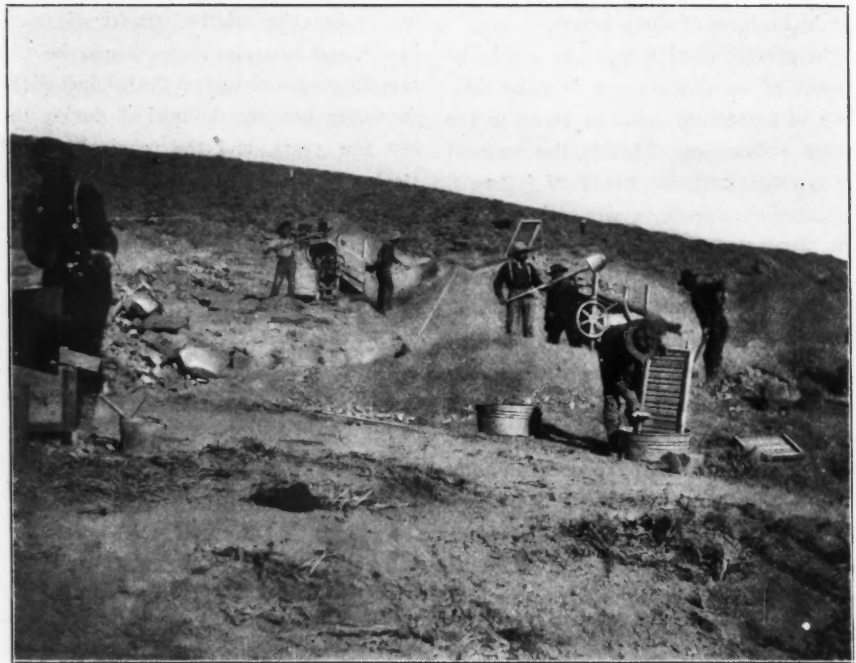


FIG. 2. DRY WASHING ON SUNNYSIDE CLAIM

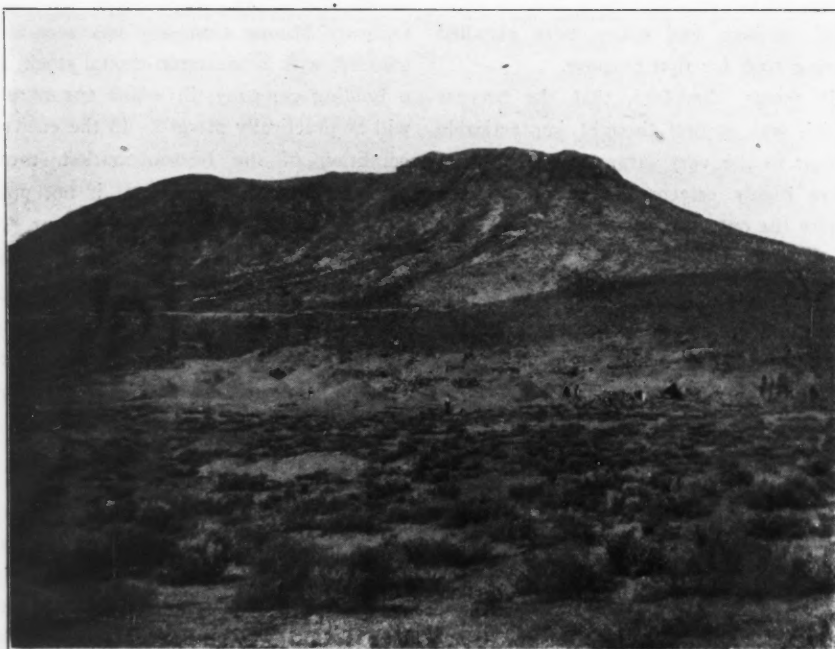


FIG. 1. ROUND MOUNTAIN, FROM THE SOUTHWEST

The ore is a silicification of the rhyolite, perhaps along shearing planes, since there is often one well defined wall. It is, however, apparently not the most silicious rock that carries the most value, since I got an assay of only \$2 on one very quartz piece; while another piece, heavily stained with iron, but less silicious, had a solid seam of gold an eighth inch thick. This was particularly interesting, as the quartz phenocrysts of the original rock could still be seen with the pure gold twined about them, plainly resisting replacement longer than the ground mass.

The fact that at two shafts on the Round Mountain vein not 200 ft. apart the strike varied 30 deg., and that the dip shows an even greater variation in the same distance, considered with the gneissoid structure of the granite and the leached and altered appearance of the rhyolite, makes the miner hope that the geological conditions are favorable to a good camp.

In October there was not sufficient work done to reach any conclusions as to the size of the orebodies and the area over

\*Mining engineer, Boston, Mass.



which they might be found. A small custom mill near a stream two miles away was running on ore from two leases and the Round Mountain company were laying foundations for a mill on their property. The light line along the base of the mountain in Fig. 1 is the pipe line.

#### METHODS OF OPERATION

To me the most interesting operation

off into the tub, as shown in the right foreground of Fig. 2. Subsequently this accumulated concentrate is put over the machine a second time and the tailings sacked and held for shipment or further treatment. I was told that the product carries \$40 to \$60 per ton. The concentrate from the second handling is washed

#### RESULTS AND VARIATIONS

There are 20 men employed on the property. The two machines, working 10½ hours per day, handle about 35 tons. The daily clean-up runs from \$300 to \$1000, the upper edge of the area worked giving the lower value and the middle proving the best. The depth of the gravel varies from 1 to 3 ft., increasing at the pits at the lowest edge to 6 ft. or more. Here it is largely granite wash and the values are low. Fig. 3 and Fig. 4 (photographs taken at Manhattan) show another way of accomplishing the same object. Here water is hauled in barrels and dumped into a large tank. The gravel is shoveled upon a platform, shown near the bend in the sluice, and the water from the tank is then drawn off through the sluice-box, the gravel being fed in from the platform. The water from the sluice returns to a pit dug below the tank. It is then raised in a box attached to one end of the long pole which is seen in the foreground of Fig. 4. To do this a man walks up the plank, which is seen just beyond the tank in Fig. 3, and, jumping off, catches hold of the other end of the pole and, lying over it, his weight brings the box up to the level of the top of the tank and the water is then automatically discharged into the tank for further use.

The saving by the dry-washing machines is not claimed to be over 70 per cent., while the saving by the Manhattan method is undoubtedly much higher. The disadvantages of the latter method lie in de-

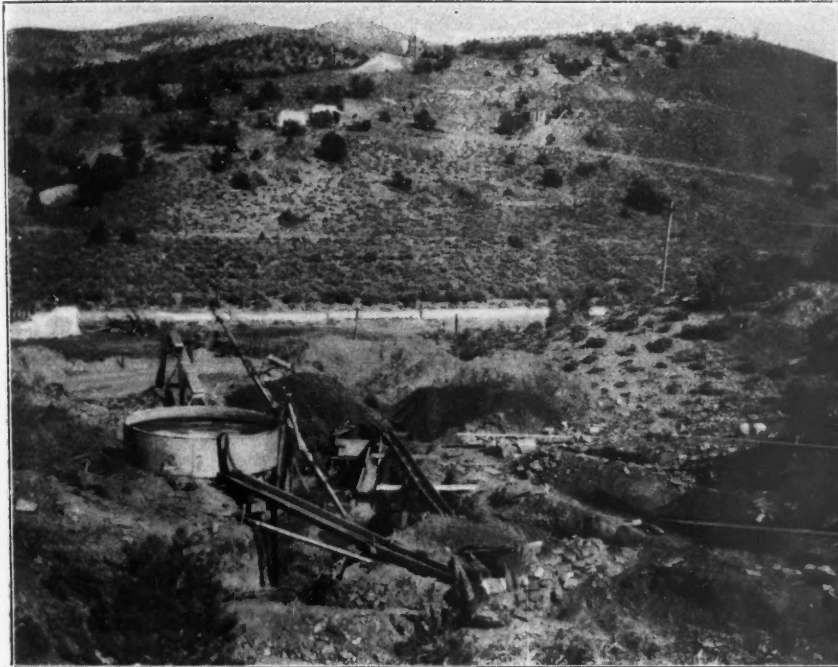


FIG. 3. WASHING PLANT AT MANHATTAN

was the dry washing on the Sunnyside claim, which is illustrated in the accompanying photographs. Fig. 1 shows a view of Round mountain from the southwest and gives some idea of the area covered by this work. Fig. 2 gives a good idea of the whole operation. Large rocks, of which there are few, are picked out by hand. The gravel is then thrown against the usual type of sand screen, having 1-in. openings, and is ready to be shoveled upon the dry washers. The top of this is a screen with ¼-in. openings, from which the oversize is delivered by a piece of sheet iron 2 ft. beyond the end of the machine. The undersize is returned toward the head end and fed upon a frame covered with a coarse, heavy cotton cloth, across which are riffles about 4 in. apart. This frame forms the upper side of a bel-lows operated by turning a crank. The succeeding puffs of air through the cloth agitate the gravel and, aided by the slope of the frame, it is discharged at the lower end.

The man in charge of the machine turns the crank while his assistant throws 100 shovelfuls on the screen, this operation requiring about 15 min. The machine is then stopped and the frame removed and replaced by another. The gravel and gold which is retained by the riffles is brushed



FIG. 4. LEVER FOR LIFTING WATER

in an ordinary gold pan and the gold and black iron, of which there is a large amount, separated by a magnet. The man on the left in the illustration is preparing a sluice-box to be used when water is obtained through the pipe line.

creased capacity, greater expense, and the difficulty of finding a man whose stomach will stand the pressure necessary for operating the pole for a longer time than is absolutely necessary to secure money enough to last while hunting another job.

## CORRESPONDENCE

Discussions by Our Readers of Various Topics of Interest

### Depreciation of Smelting Plants

The importance of a proper allowance to be made on an industrial plant comes primarily to the attention of an engineer when he is called upon to design a plant and estimate its rentability (earning capacity). As Mr. Boggs correctly remarks, we are unable to foretell the future. Local conditions, past experience, supply and demand of the articles manufactured, possible decline in the market value of the manufactures turned out in the plant under consideration, all enter into the estimate, and require an engineer's most careful attention to forecast the life of the plant to the best of his ability. When we speak of the life of a plant, it is not so much the life of the materials that enters into its construction, but its industrial life. That methods change in course of 10 years to a remarkable extent can easily be proved in the case of smelting plants. Mechanically, the methods of working copper and lead ores have experienced great improvements in the history of both metallurgies. It is the depreciation due to the introduction of new methods which shortens the life of a plant, and is of greater importance than the actual wear and tear of the machinery, as Dr. Raymond very correctly points out.

To give an industrial plant a longer life than 10 years is hazarding on dangerous grounds. I do not know of any industrial enterprise, where too large an allowance for amortization crippled it. But I do know of many failures, which were directly due to the shortsightedness of the directors to write off sufficient for amortization.

Where the policy is prevalent to declare high dividends, draining thereby the depreciation fund, a company is very frequently put to the troublesome task of increasing its capital stock. Increasing the capital stock—not for entering an entirely new enterprise—but to *improve the old works*, meets rightly enough with suspicion. Germany's successful industrial growth and development can be attributed largely to the systematic carrying through of the amortization principle, which makes large sums available to apply in practice the increasing number of new inventions.

But a point not dwelt upon in any of the articles that appeared on this subject in the JOURNAL is the factor labor plays in the amortization principle. If an engineer is called upon to design a large sized smelting plant, one of the most difficult

questions to decide is *how* modern a plant shall he build. In the United States this question is far less acute than in some Mexican or European industrial centers, where labor is cheap. In America, with expensive labor, and with an assured life for a plant of 10 years, it pays in most cases to put in labor-saving appliances, keep them in order, and figure their depreciation. But here in Mexico we are often confronted with the question, are we safer in building a plant using considerable labor, and meeting this expense daily, or is it more advantageous to put in the most modern labor-saving appliances and write off the increased amount of amortization, due to the higher cost of this plant. Where a plant is designed for a mine with known ore reserves, on which can be counted with almost absolute certainty, this question can be answered with but little difficulty. But when designing a custom smelter, the responsibility of building a very costly plant is great and demands circumspection. Here the life depends more on the ore supply than the life of the plant proper, and if a life of 10 years is questionable because of the possible exhaustion of the ore supply in that particular district, it may be inadvisable to curtail the profits by going to very large expenditures simply to have a modern plant. Scarcity of labor, which raises the price of labor, may of course dictate a plant with labor-saving appliances.

To cite an instance, here in Mexico in custom lead smelters, with properly arranged beds, bedding costs about 2c. per ton when the bedding is done by labor entirely, costing two pesos per 24 hours. This can hardly be reduced with ore bridges, conveyers, and similar mechanical means for stocking ore, where only 1000 tons or thereabout are treated daily. Such appliances are costly, and the saving of the cheap labor hardly will meet the increased rate of amortization.

I need not call attention to the fact that a 1000-ton copper or lead smelter can be built with a capacity of two tons per man per day, or 10 tons per man per day, and when we go above 1000 tons, the ratio of tonnage to men employed can be reduced to 15 tons per man per day. Here we have low amortization charges (as the plant using much labor has usually lumber buildings and less costly appliances), higher labor cost per ton of material treated, due to quantity of labor employed, the risk of labor strikes, labor inefficiency, etc., against low labor cost per ton of ma-

terial treated, increased amount of amortization, smaller risks of shut-downs due to labor troubles, etc.

We often hear statements how cheaply some of these modern plants operate, but often the proportionate share per ton of material treated of the increased amortization, smaller risks of shut-downs due capital investments are not included in such statements. I make it a rule when reporting on an industrial enterprise never to allow less than 10 per cent. amortization. Where the life of machinery is known to be less than 10 years, I allow amortization accordingly. In addition, I reckon interest on the money invested at from 3 to 5 per cent.

I have at different occasions observed that engineers, figuring on the rentability of an enterprise, would not add the proportionate share of amortization and interest on the invested capital to the cost of the manufactured article. They would figure the manufacturing cost, and from the profits realized, would set aside at the end of each year a "certain" sum for amortization. This is a very dangerous policy, and often deceptive, as it gives the cost of manufacture considerably lower than it really is, and only too often this "certain" sum instead of being retained is distributed in the form of dividends. In a brick plant for instance, where the cost of manufacture per thousand brick is \$3.50, exclusive of amortization and interest, I would add this quota, and carry it on the books. If the plant cost \$60,000, and turns out 40,000 bricks per day, with 300 working days per year, we have to add, with 10 per cent. amortization and 5 per cent. interest, 75c. to every 1000 bricks turned out. Should the plant shut down or the company be dissolved before the expiration of 10 years, whatever moneys were not spent in reconstruction can be divided among the stockholders. In a copper-smelting plant, which cost \$750,000, treating 1000 tons daily, to the cost of treating every ton should be added, using the same figures (10 per cent. and 5 per cent.), 37.5c. per ton.

Under certain conditions, lumber construction is preferable to steel and concrete, as a money investment. At the present stage of our industrial development cases like the one I am going to cite are rare, and hardly come into question with the present status of copper and lead technology, in which labor-saving appliances require strong materials to carry the usually heavy loads. I have in



mind the East Helena plant. When this smelter was rebuilt, the question arose, is it cheaper to build in lumber, or in steel and concrete. The cost of both installations was figured, their amortization and interest on the capital invested, advantages accruing from each type, the increased fire risk of the lumber buildings, and the loss of the profits during a complete shutdown in case of total destruction by fire. It was decided that the lumber construction was still the cheaper, and so the smelter was built with lumber. Such economical questions are ordinarily hard to decide, but in this case the American Smelting and Refining Company had a great deal of statistical material which assisted in the determination. Bearing such a case in mind, a lumber-built plant, apparently not "modern," is by no means a criterion to an engineer's ability.

I call to mind the thoughtful remark of a financier that most industrial enterprises when financed look well on paper, in most cases even brilliant, but that most of them have their infantile infirmities. An insufficient allowance for amortization and interest, figured into the cost of manufacture, is one of them.

HERBERT HAAS.

Torreon, Coahuila, Mexico, Dec. 12, 1906.

### The Duties of an Engineer

Will you kindly define for me the duties of an engineer in charge of construction, where said construction consists chiefly of iron and steel work in metallurgical furnaces and other industrial plants? It is understood that the duties asked about are simply those of the field engineer, who is not concerned with the design and who acts neither as superintendent nor as foreman of an erecting gang.

D. M.

Buffalo, N. Y., Dec. 20, 1906.

[The duties of an engineer in charge of construction are to see that the construction is properly done. He must see that the materials supplied conform to the specifications, and must see that the work of erection is done in proper manner and in conformity with the designs. If in the course of the construction it should develop that the designs are defective, he should call the attention of the designing engineer to the matter, and should give his reasons. It would be outside of his right or duty to make any alteration in the designs; but in the event of discovery of an apparent error, it would be his duty to suspend the work until a decision could be obtained from the engineer responsible.

An engineer in charge of construction is practically the superintendent of construction. The only distinction that can be made is between an engineer in charge of construction and an inspecting engineer. An inspecting engineer would have no responsibility as to the execution of work aside from questions pertaining to conformity of design, but if he should dis-

cover that the work was not being done in the most economical manner, it would be his duty to report that fact or opinion.—  
Editor.]

### Use of Bore Holes in Mining

The recent article on this subject, by Richard Lee, reminds me of an interesting use of a bore hole in mining that I once heard of in Missouri. The case was in Washington county, where the small pipe veins of galena are worked in a very primitive manner. The veins, which lie nearly flat, are not ordinarily more than 6 or 7 ft. wide, nor more than 12 in. in thickness. The miners of the district, who always work on their own account in parties of two or three, leasing from the land owner, try to break as little ground as possible. A drift 4 ft. in height is regarded as very commodious, and ordinarily they make a drift (it might better be called a burrow) large enough only for a man to crawl through on all fours. Sometimes they go 300 or 400 ft. away from the shaft with such a hole.

In the case I have in mind, the miners had gone something like 400 ft. away from the shaft, and finally the dragging out of the ore in candle boxes became too inconvenient even for a Missourian. There happened to be a drilling outfit in the region at the time, and the bright idea occurred to these miners to have an 8-in. hole put down from the surface to the stope where they were working. This having been done, they constructed a long bucket of light sheet iron, about 6 in. in diameter, erected a light derrick on the surface and hoisted their ore and waste through the bore hole.

MINING ENGINEER.

New York, Jan. 14, 1907.

### Better Maps and Better Methods

Referring to F. W. Parson's "Colliery Surveying and Office Methods," begun in your issue of Sept. 8, it is safe to say that there is hardly a mine manager or superintendent appreciating the close connection between successful operation and thorough, comprehensive engineering, who will not say a loud Amen to all Mr. Parsons says. It has always been past my understanding why, first, operators themselves cannot all be brought to see the great advantage of properly made maps; secondly, why the great commonwealths, whose principal resource is coal, do not, through their mining bureaus, compel the operators, as a unit, to furnish the right sort of maps. If we cannot rely on the mine map to stop the frightful loss of coal due to the present system of management, it is apt to go on indefinitely; but even if adequate maps fail to stop the loss, the masses of the people, whose resource the coal really is, would at least have the

means of finding out how much is lost and how much is won.

Going back to Mr. Parsons' valuable suggestions, my experience concurs very closely with them except as to numbering inside stations. The necessity for numbering outside stations is obvious and does not crowd the notes or complicate them. With inside stations; however, the writer always found it preferable to locate the stations with reference to a breakthrough, a room or chute neck or an intersecting entry and thus dispense with naming or numbering them. The paint mark in use to denote stations is placed on the rib to right and opposite the point, thus enabling the sightman or transitman to locate it, after first getting its general location from the notes. The same is true of room work where they are not driven on centers and taken up from plummet lamps.

C. H. THOMPSON.

Windrock, Tenn., Dec. 22, 1906.

### New Publications

"Mica and the Mica Industry." By George W. Colles. Pp. 130; illustrated. 6x9 in.; cloth, \$2. Philadelphia, 1906: Franklin Institute.

Contents: Mineralogy. Geology of the granitic micas. Geology of the pyroxenic micas. Geographical distribution. Historical. Mining and milling. Uses. Statistics. Conclusions.

This work, together with the monograph by F. Cirkel, which was recently published by the Mines Branch of the Department of the Interior, Ottawa, Canada, gives us a rather complete literature on an interesting, though comparatively unimportant, commercial mineral. While the work of Mr. Cirkel was prepared with especial reference to the mica industry of Canada, the present work is designed on comprehensive lines, it having been aimed by the author to incorporate all the previously published information of value or importance.

The material which is comprised in the volume was published originally as a series of papers in the *Journal* of the Franklin Institute. They manifest an exhaustive study of the subject, and it is useful to have them in this convenient book form. So far as we are aware, no previous writer has ever pointed out the classification of the micas into granitic and pyroxenic, nor the fundamental differences in constitution, nature and origin that go with this classification. This is perhaps the most important contribution that has been made to the literature of the subject. A highly important feature of the book is the statistical review of the industry, which, although based on previously published figures, has been recast in the light of expert study, whereby the value has been greatly increased.

## Patents Relating to Mining and Metallurgy

### UNITED STATES

The following is a list of patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the ENGINEERING AND MINING JOURNAL upon the receipt of 25 cents. In ordering specifications, correspondents are requested to name the issue of the JOURNAL in which the notice of the patent appeared.

- Published Week Ended Dec. 11, 1906.*
- PROCESS FOR MANUFACTURING CEMENT FROM BLAST-FURNACE SLAG—Heinrich Colloseus, Berlin, Germany. No. 837,918. Filed March 22, 1905.
- SURVEYOR'S REEL—Edward H. Holden, New York, N. Y. No. 837,931. Filed May 11, 1906.
- RELEASING BLOCK OR HOOK—Angus A. McIntosh, Alexander, Ontario, Canada. No. 837,948. Filed March 28, 1906.
- EXPLOSIVE CARTRIDGE AND METHOD OF MAKING SAME—Francis I. duPont, Wilmington, Del., assignor to The I. Du Pont de Nemours Powder Company, Wilmington, Del. No. 837,958. Filed Aug. 31, 1905.
- VALVE GEAR FOR PNEUMATIC ROCK DRILLS—Carl Weldmann, Würselen, Germany, assignor of one-half to Paul Hoffmann, Elserfeld, near Siegen, Westphalia, Germany. No. 837,990. Filed June 17, 1905.
- HOIST—Benjamin F. Henry, San Pedro, Cal. No. 838,025. Filed Nov. 22, 1904.
- MEANS FOR DRAWING AND LOADING COKE—William M. Nixon, Chattanooga, Tenn. No. 838,049. Filed Aug. 22, 1906.
- MINERS' PIT CAP—Royal E. Pitcher, Osage City, Kas., assignor of one-half to Chas. W. Swenson, Osage City, Kas. No. 838,054. Filed June 16, 1905.
- ORE-CONCENTRATING TABLE—Frederic W. Sherman, Park City, Utah. No. 838,058. Filed April 20, 1905.
- CONVEYER—George W. King, Marion, O., assignor to The Marion Steam Shovel Company, Marion, O. No. 838,119. Filed June 3, 1905.
- BUCKET FOR DREDGES—George W. King, Marion, O., assignor to The Marion Steam Shovel Company, Marion, O. No. 838,120. Filed June 2, 1906.
- MERCURY FEEDER FOR ORE CRUSHERS—Peter Kirkegaard, Deloro, Ontario, Canada. No. 838,191. Filed Sept. 17, 1904.
- PULP DISTRIBUTER—David Lonie, Fairview, British Columbia, Canada, assignor of one-half to Henry Lee, Fairview, Canada. No. 838,196. Filed Dec. 5, 1905.
- HOISTING BUCKET—Almon E. Norris, Cambridge, Mass. No. 838,206. Filed July 22, 1906.
- ELEVATOR BELT—Charles E. Taylor, Bremen, Ohio. No. 838,221. Filed April 6, 1906.
- PERCOLATOR—Charles E. Trehwella, Forestville Conn., assignor to American Silver Company Bristol, Conn. No. 838,224. Filed Oct. 10, 1906.
- ELECTRIC FUSE—Leonard B. Buchanan, Woburn, Mass. No. 838,235. Filed April 2, 1906.
- GUIDING APPLIANCE FOR DRILLING MACHINES—Edward M. Kinsella, Bisbee, Ariz. No. 838,339. Filed Aug. 24, 1905.
- HOISTING BUCKET—Almon E. Norris, Cambridge, Mass. No. 838,352. Filed July 27, 1906.
- PROCESS OF HARDENING STEEL—Shirley N. Brayshaw, Hulme, Manchester, England, assignor to George Nash, New York, N. Y. No. 838,375. Filed June 8, 1906.
- ROTARY COMPRESSOR OR PUMP—Lebbeus H. Rogers, New York, N. Y. No. 838,458. Filed Sept. 9, 1904.
- AIR COMPRESSOR—Lebbeus H. Rogers, New York, N. Y. No. 838,459. Filed Nov. 7, 1904.
- TAPE COMPASSES—Edmond L. Saxton, Lansing, Mich. No. 838,463. Filed July 12, 1906.
- CONCENTRATOR—John P. Shumway, Los Angeles, Cal. No. 838,468. Filed April 12, 1904.
- COAL-MINING MACHINERY—Davy V. Sickman, Denver, Colo. No. 838,469 and 838,470. Nov. 23, 1903.

*Published Week Ended Dec. 18, 1906.*

- METHOD OF PRODUCING A BLACK OXIDE ON THE SURFACE OF STEEL—Emil Jabulowsky, Pforzheim, Germany. No. 838,546. Filed Feb. 2, 1905.
- SEPARATING CYLINDER FOR GOLD DREDGERS—Robert H. Postlethwaite, San Francisco, Cal., assignor to Risdon Iron and Locomotive Works, San Francisco, Cal., a corporation. No. 838,579. Filed May 15, 1905.
- EARTH AUGER—George Frank, Titonka, Iowa. No. 838,614. Filed Sept. 18, 1906.
- SEPARATING TANK—Edmund B. Kirby, Rossland, British Columbia, Canada. No. 838,626. Filed Dec. 17, 1903.
- PYRO-ELECTRIC FURNACE—Finis E. Roach, Chicago, Ill. No. 838,647. Filed Oct. 11, 1903.
- CONVEYER—Charles D. Seeberger, Yonkers, N. Y. No. 838,654. Filed May 28, 1902.
- HOIST—James R. Sharp, Chicago, Ill. No. 838,655. Filed Dec. 28, 1905.
- SAFETY DEVICE FOR ELEVATORS—Chas. H. Leffingwell, Cleo, Okla. No. 838,726. Filed April 20, 1906.
- STONE CRUSHER—Wilhelm L. Veiten, Kornthal, Germany. No. 838,921. Filed July 26, 1905.
- GAS PRODUCER—William H. Bradley, Belleville, Pa., assignor of one-fourth to Alexander Gilliland, one-fourth to William C. Bradley, Bellevue, Pa., one-eighth to M. E. Webster, Chicago, Ill., and one-eighth to Sara L. Bradley, St. Louis, Mo. No. 838,946. Filed Feb. 23, 1906.
- HEAD MOTION—Abel Guionneau, Denver, Colo. No. 838,982. Filed Sept. 2, 1905.
- MINER'S LAMP—Peter S. Keenan, Kemmerer, Wyo. No. 839,002. Filed July 28, 1906.
- ROTARY KILN—William R. Warren, New York, N. Y. No. 839,053. Filed Jan. 19, 1906.
- PROCESS OF TREATING ORES—John E. Greenawalt, Denver, Colo. No. 839,065. Filed March 27, 1905.
- MINER'S CAP AND LANTERN HOLDER—Walter A. Lattimore and William V. Parmley, St. Clair, Pa., assignors to Lattimore Manufacturing Company, a firm composed of Harry B. Davis, Thomas E. Ferree, Charles E. Breckons, Harries L. Daddow and Walter A. Lattimore. No. 838,070. Original application filed March 18, 1905. Divided and this application filed June 30, 1905.

### GREAT BRITAIN

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy.

*Published Week Ended Dec. 8, 1906.*

- GOLD-EXTRACTING APPARATUS—T. E. Beaumont, London. An apparatus for extracting gold from ore by passing the pulp up through a chamber in which the heavy gold particles are collected, and afterward collecting the lighter gold particles by passing through an electrolytic depositing apparatus. No. 23,319 of 1905.
- ELECTROLYSIS OF FUSED SALTS—E. A. Ashcroft, London. Improvements in the inventor's method of producing metals by the electrolysis of fused salts or ores, consisting in first electrolyzing the ores or salts over a metal and then using the alloy so formed as an anode in another cell and so fractionally precipitating the metals of the alloy on the cathode. No. 26,813 A of 1905.
- IRON OXIDE FOR PIGMENT—C. F. Wolffing, Honningen, Germany. An improved process for obtaining a black oxide of iron suitable for a base for paints, by blowing ammonia through waste solutions or pickling liquors. No. 1050 of 1906.
- COAL WASHER—G. H. Rayner and the Hardy Patent Pick Co., Sheffield. Detailed improvements in coal washers of the traveling type, chiefly for the purpose of removing any muddy matters that settle. No. 1660 of 1906.
- EXTRACTION OF SODIUM NITRATE—J. R. Beaver and R. Nordenflycht, Valparaiso, Chile. Improvements in the plant used for extracting nitrate of soda from caliche. No. 7478 of 1906.
- WASTE-HEAT FURNACE—F. C. Knight, Salt Lake City, and H. V. Pearce, Denver, U. S. A. In metallurgical furnaces in which tortuous flues are interposed between the furnace flue and the stack, a method of construction so that the waste heat of the furnace may be utilized in heating the gases as they enter the stack and so revive the draft. No. 8071 of 1906.
- COAL CUTTER—H. Baum and R. Gansen, Dudweiler, Germany. In coal cutters which

swing round an upright a method of regulating the motion of the tool so that it cuts a straight and not a curved furrow. No. 11,822 of 1906.

ELECTRIC SMELTING FURNACE—H. Röchling and W. Rodenhauser, Volklingen, Germany. In electric smelting furnaces where induction currents are employed the use of two or three secondary circuits. No. 12,329 of 1906.

LINING FOR TUBE MILLS—H. P. Barry, Waihi, New Zealand. Making the lining of tube mills of honeycomb shape and using rough pieces of grinding material bedded in the cells. No. 16,395 of 1906.

UTILIZING ZINC RESIDUES—G. Stolzenwald, Roumania. A method of utilizing zinc-retort residues by mixing with zinc ore and heating in a reverberatory furnace. No. 18,134 of 1906.

*Published Week Ended Dec. 15, 1906.*

ZINC OXIDE EXTRACTION—R. W. E. MacIvor and M. Fradd, London. A modification in the method of extracting zinc oxide from ores by lixiviating and digesting with zinc chloride. No. 23,977 of 1905.

COAL APPARATUS—G. Smith and the Hardy Patent Pick Co., Sheffield. An automatic apparatus for extracting fine coal from coal-washing plant. No. 25,135 of 1905.

BORE-HOLE APPARATUS—C. Erlinghagen, Nordhausen, Germany. In apparatus for measuring the deflection of bore holes, method for preventing the apparatus from turning. No. 1957 of 1906.

BORE-HOLE APPARATUS—C. Erlinghagen, Nordhausen, Germany. In apparatus for measuring the deflection of bore holes, an improved method of automatically recording the variations. No. 2781 of 1906.

CONVEYOR—J. M. Scalley, Lanark. A conveyor for carrying coal from the working face to the wagons, so obviating shoveling and breaking. No. 3953 of 1906.

COAL-CUTTING MACHINE—F. Kresl, Vienna, Austria. In undercut coal-cutting machines arranging the carriage so that the tool is always parallel to the slots already cut, and so that the motor can be brought as close to the fan as possible. No. 6016 of 1906.

IMPROVED CORE DRILL—M. Boof, Strassburg, Germany. An improved drill for bore holes, which carries up the core intact. No. 12,247 of 1906.

STACKER AND DISTRIBUTER—H. W. Blaisdell, Los Angeles, Cal., U.S.A. Apparatus for distributing and stacking tailings coming from leaching vats. No. 18,898 of 1906.

BASIC SULPHATE OF LEAD—E. Toelle, Mulheim, Germany. Producing basic sulphate of lead by adding the requisite quantity of sulphuric acid to lead oxide and stirring continuously. No. 19,718 of 1906.

*Published Week Ended Dec. 22, 1906.*

COAL WASHING BELT—C. Burnett, Durham. Improvements in the inventor's endless belts for washing coal, especially fine coal. No. 23,713 of 1905.

MINERS' ACETYLENE LAMP—B. Noidner, Breslau, Germany. An acetylene lamp for miners' use, the improvements relating to means of adjusting the burner and reflector. No. 24,743 of 1905.

PULVERIZER—C. W. Ogden, London. Improvements in pulverizers of the type where a number of pivoted hammers revolve at great speed. No. 1872 of 1906.

MINE GATE—H. Houghton, Wegan. Improvements in gates for mine cages, the object being to prevent interference to the passage of wagons in and out. No. 3821 of 1906.

SAFETY OIL LAMP—W. Best, Morley. Improvements in miners' safety oil lamps with the object of allowing the light to come out in a vertical direction as well as horizontally. No. 6556 of 1906.

ROLLER CRUSHER—S. R. Krom, New York, U. S. A. A crushing machine in which a series of rollers mounted on short freely-pivoted cranks are driven at a high speed and run against the hardened inner surface of a ring, the centrifugal force causing a very heavy crushing pressure. No. 13,389 of 1906.

COAL JIGS—I. Christ, Tamaqua, Pennsylvania, U. S. A. Improvements in jigs used for separating coal from slate. Nos. 15,285 and 20,894 of 1906.

ROCK DRILL—B. H. Locke, New York, N. Y., U. S. A. A rock drill with a central bore for bringing water to the working face, and having a series of holes from the central bore to the outside, only that one being opened which is next to the working end; as the drill wears, so each successive hole is opened out. No. 23,078 of 1906.



## Personal

Mining and metallurgical engineers are invited to keep THE ENGINEERING AND MINING JOURNAL informed of their movements and appointments.

H. W. Hardinge, of New York, visited Cobalt recently.

Godfrey D. Doveton is at the Esperanza mine, El Oro, Mexico. He will be in Denver early in March.

The permanent address of Robert Peele is care School of Mines, Columbia University, New York City.

R. B. Lamb, mining engineer, is acting as manager for the Barnes-King Development Company, of Kendall, Montana.

G. A. Denny, mining engineer, of London, is examining mines in Butte, Mont., in the interest of his English associates.

Wilbur E. Sanders, mining engineer, of Helena, Mont., is engaged on professional work in the Greenwater district, California.

George W. Maynard, mining and metallurgical engineer, of New York, returned recently from a prolonged visit to Mexico and Arizona.

J. F. Whiteaves, assistant director of the Canadian Geological Survey, has been awarded the Lyell medal by the British Geological Society.

C. L. Rood, who recently retired from the management of the Ontario and Daly mines, at Park City, Utah, has gone abroad for the winter with his family.

Frederick W. Denton has been appointed general manager of the mines of the Copper Range Consolidated Company, in the Lake Superior region.

James E. Chapman, of Atlantic, Michigan, spent a few days in New York recently, and has now gone to Matehuala, Mexico, where he is engaged in engineering work.

John J. Daly, president of the Daly Judge Mining Company, at Park City, Utah, and wife have sailed for Europe, where they will remain during the balance of the winter.

Juan Felix Brandes will return from Germany to the United States in January. From New York he will proceed directly to Colorado, California and Mexico, to inspect mining properties.

Edward K. Judd, for two years on the JOURNAL'S editorial staff, has resigned and has become an associate of Sillwell & Gladding, assayers and engineers, 55 Fulton street, New York City.

Winthrop C. Neilson, of Philadelphia, has been chosen president of the Republic Mining and Manufacturing Company, of Georgia. He succeeds his father, lately deceased.

L. W. White and Robert Addie, of London, England, accompanied by Alexander McNab, of Scotland, all mining men,

spent several days in Butte, Mont., recently inspecting mining ground.

Walter Hovey Hill, for a number of years connected with mining and railroad enterprises in the West, has become consulting engineer for the Silverman companies, at 25 Broad street, New York.

Jesse Scobey, acting for the Pride of the West Mining Company, has closed an agreement of sale of that property to the Duquesne Mining and Reduction Company. He is now in Guadalajara, Mexico.

The management of the Ontario and Daly mines, at Park City, Utah, is now under the direction of Ernest Bamberger, manager of the Daly West Mining Company, who takes the place of C. L. Rood, resigned.

Francis F. Coleman, formerly with the Westinghouse and Allis-Chalmers companies, and recently with the Traylor Engineering Company, has joined the Lidgerwood Manufacturing Company as publicity manager.

N. V. Hansell, of Hamilton & Hansell, mining engineers of New York, is at present in Sweden, where he will remain until the latter part of February. While there he will study the latest developments in the magnetic concentration of iron ore.

Edgar D. Stone, for several years mining expert for the Southern Railway, whose headquarters were established at Chattanooga, Tenn., Aug. 15 last, has resigned his position, having been appointed resident manager of the mines and washer plants of the Etna Steel and Iron Company, with headquarters at Etna, Georgia.

E. E. Olcott, Christopher R. Corning and Robert Peele, mining engineers, of New York, announce that the firm of Olcott, Corning & Peele has been dissolved by mutual consent, Robert Peele having withdrawn on account of increasing obligations of other engagements. The business will be continued by E. E. Olcott and C. R. Corning, under the firm name of Olcott & Corning, at 36 Wall street.

F. W. Sherman, who is well known as the manager of the concentrating mills of the Daly-West Mining Company, at Park City, Utah, has, together with associates, built shops in Salt Lake City, where a specialty will be made of manufacturing various kinds of concentrating machinery, especially those machines which are used in the Sherman process of wet concentration. The name of the company will be the Sherman Engineering Company.

H. J. Lamborn has been appointed superintendent of power and plant in the Yale & Towne works, to succeed F. A. Waldron, who resigned about a year ago. Since 1902 he has held the position of mechanical and electrical engineer in charge of the magnetic separating plants of Witherbee, Sherman & Co., at Mineville, N. Y. (on Lake Champlain). S. E. Dauchy, assistant superintendent, will continue under Mr. Lamborn.

## Obituary

James Clayton, who died in Brooklyn, N. Y., Jan. 5, aged 85 years, was for many years engaged in the manufacture of pumps, and later of air compressors. He introduced a number of improvements in compressors. He was born in England, and came to the United States in 1849. He retired from business five years ago.

William G. Neilson, treasurer of the Keystone Drop Forge Works, of Chester, Penn., and president and treasurer of the Republic Mining and Manufacturing Company, died suddenly from heart disease, in his office in the Harrison building, Philadelphia, Dec. 29, at the age of 64. He had been identified with the iron trade from his youth, and when a young man he was for a time connected with the American Iron and Steel Association. As president of the Republic company, Mr. Neilson was interested in the development of the Georgia bauxite mines, and was an authority on the production and uses of that mineral.

Robert H. Sayre, who died, Jan. 4, at his home, in South Bethlehem, Penn., was born in Columbia county, Penn., Oct. 13, 1824. In 1840 he joined the engineer corps engaged in enlarging the Morris canal of New Jersey. His next important work was on the surveys and construction of the Back Track Railroad, between Mauch Chunk and Summit hill. In 1852, after 11 years' service with the Lehigh Coal and Navigation Company, he was elected chief engineer of the Delaware, Lehigh & Susquehanna Railroad—now the Lehigh Valley—and he supervised the extension of the system north and east. He later became second vice-president, and under his direction the extension to Buffalo and other branch lines were built. Mr. Sayre was one of the promoters of the Bethlehem Iron Company, and became general manager in 1886 and vice-president in 1891. He was well known throughout the anthracite country, from his long connection with the Lehigh Valley Company.

## Societies and Technical Schools

*Canadian Mining Institute*—The ninth annual meeting of the Canadian Mining Institute will be held at the King Edward Hotel, Toronto, on March 6, 7 and 8. The usual single fare rate will obtain over all Canadian transportation lines. An interesting program of papers has been arranged. Members are requested to notify the secretary as early as possible of their intention to attend.

*Ontario Technical Schools*—An important announcement was made by Hon. Dr. Pyne, Ontario Minister of Education, in a speech at Barrie, Ont., last week. He dwelt on the necessity of technical training in connection with education, and stated that technical schools, manned by

efficient instructors, and fitted up with the necessary equipment to carry on the work, were bound to become a recognized feature of the provincial educational system.

### Industrial

Furnace A, of the National Tube Company, at Benwood, W. Va., is to be overhauled and rebuilt.

The Minneapolis Steel and Machinery Company, of Minneapolis, Minn., has recently opened an office at 1300 West Eleventh street, Kansas City, Mo., under the management of Louis Bendit, for the sale of the Munzel gas engine and suction gas producer.

During the first four days of January, this year, the Weber Gas Engine Company, Kansas City, Mo., made sales of multiple-cylinder gas engines and suction gas producers to the International Irrigation Company, Spokane, Wash.; the Fabrica de Vernado, San Luis, Potosi, Mexico; the Pekin & La Marsh Drainage Company, Peoria, Ill.; M. J. Lee & Co., Portland, Oregon; H. L. Schroeder, Chicago, Ill. The size of the plants named varies from 60 to 300 horse-power.

W. S. Barstow & Co., of New York, and Portland, Ore., have contracted to do all the electrical work for an 800,000-bbl. cement plant to be located on the outskirts of Montreal, Canada, for the Fordwick Company. The works will use about 2500 h.p. of the electric motors, and will take current from the Shawinigan power plant, 80 miles from Montreal. The property of the company is about two miles in length by 600 ft. in width, along the St. Lawrence river. Provision will be made for storing, adjacent to the works, 40,000 tons of coal.

The patents covering the Box electric drill have been bought by New York parties from Box & Sayer, of Denver, their contract with the H. D. Crippen Manufacturing Company having been terminated. Some slight changes in the drill have been made to correct certain mechanical defects and the drawings, patterns, jigs and templates have been shipped to New York, so that the drill may be manufactured under the direct supervision of the new owners. In the near future the latter will be in a position to make prompt delivery of drills, when full announcement will be made.

The Great Western Rolling Mill Company, of San Francisco, Cal., has been promoted to work up the scrap iron and steel left by the earthquake and fire. It is estimated that there is 400,000 tons of scrap in the ruins which it would not pay to ship East for re-rolling. It is proposed to cut the metal and to re-melt it in an open-hearth furnace. A mill is being built at Rodeo, Cal., near the ocean front. The plant occupies 100 acres. Emile Benjamin, purchasing agent for the company,

is in Pittsburg placing orders for open-hearth furnaces, one continuous-heating furnace, muck mill and 10-, 16- and 20-in. rolling mills. It is proposed to use scrap bought along the Pacific coast, although it is believed that the metal taken from the San Francisco ruins will keep the mill in operation for years.

The Pelton Water Wheel Company, San Francisco, reports unusual activity and marked tendency toward high speed, large power units. For example, the California Gas and Electric Company is installing a Pelton wheel of 10,500 h.p. maximum capacity. The Telluride Power Company, of Colorado, is adding to its equipment one 5000-h.p. wheel operating under a head of 900 ft. and one 4000-h.p. Pelton wheel under 1800 ft. head. This company has installed a continuous lap-weld, high-pressure pipe made by the Ferrum Company, of Germany, which the Pelton Company introduced in this country. The Siskiyou Electric Power Company, of California, has ordered two Pelton wheel units, each of 2000 h.p. capacity, these being in addition to the present water-wheel equipment.

### Trade Catalogs

Receipt is acknowledged of the following trade catalogs and circulars:

Sturtevant Mill Company, Boston, Mass. Series 96, Roll Jaw Crushers. Pp. 8, illustrated; paper, 7x10½ in.; 1906.

Scully Steel and Iron Company, Chicago, Ill. Stock List. Pp. 144, illustrated, indexed; paper, 4½x7 in.; Jan. and Feb., 1907.

The Hendrie & Bolthoff Manufacturing and Supply Company, Denver, Colo. The King Screen. Pp. 19, illustrated, paper; 5x7 in., 1907.

Western Electric Company, Chicago, Ill. Hawthorne Works for the Manufacture of Power Apparatus. Pp. 23, illustrated; paper, 8x11 in.; 1906.

Chicago Pneumatic Tool Company, Chicago, Ill. "Ideal Power," Miscellaneous Machinery, December, 1906. Pp. 32; illustrated; paper, 6x9 in.

John A. Traylor Machinery Company, Denver, Colo. Bulletin "D." Traylor Standard Jigs and Jigging Machinery. Pp. 12, illustrated; paper; 7x10 in., 1907.

The Marine Iron Works of Chicago, Chicago, Ill. Catalog No. 17. Marine Engines, Boilers and Machinery. Pp. 84, illustrated, indexed; paper, 6x9 in., 1907.

Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1501. Allis-Chalmers Belted Corliss Engines. Pp. 20, illustrated; paper, 8x10½ in.; September, 1906.

American Diamond Rock Drill Company, 95 Liberty street, New York City. Catalog No. 26. The Diamond Drill and Its Work. Pp. 86, illustrated; paper, 6x9 in.

Stephens-Adamson Manufacturing Company, Aurora, Ill. "Conveying and Transmission." Belt Conveyors and Conveying Machinery. Vol. 1, No. 7. Pp. 24, illustrated; paper, 6x9 in.; Dec., 1906.

American Locomotive Company, 111 Broadway, New York City. Ten Wheel Type Locomotives Weighing Less Than 150,000 lb. Pp. 54, illustrated; paper, 6x9 in., 1907.

Ingersoll-Rand Company, New York. Catalog No. 36. Ingersoll-Sergeant Air and Gas Compressors. Pp. 183, illustrated, indexed; paper, 6x9 in.; 1906. Form 45A. Ingersoll-Rand Rock Drills. Pp. 24, illustrated; paper, 6x3 in.; 1906.

St. Louis Machine and Tool Company, St. Louis, Mo. Circular A, Miscellaneous Well Drilling Machinery and Supplies. Pp. 21, illustrated; paper, 8x10 in.; 1907. Circular E, The St. Louis Center Beam Driller. Pp. 12, illustrated; paper, 8x10 in.; 1906. Circular I, Drilling Tools. Pp. 18, illustrated; paper, 8x10 in.; 1906. Circular K, Belting, Rope, Smith Tools, Hose, Etc. Pp. 8, illustrated; paper, 8x10 in.; 1906. Circular L, Steam Engines and Boilers. Pp. 6, illustrated, paper; 8x10 in.; 1906.

### Construction News

*Carlisle, Alabama*—The Straight Mountain Coal Company is preparing to open coal mines and will need hoists and other machinery. The office is at Gadsden, Alabama.

*Citrus County, Florida*—The Mutual Mining Company is opening phosphate mines and will need washers and other machinery. J. R. Williams, Alachua, Florida, is manager.

*Baker City, Oregon*—The Virtue Mines Development Company proposes to establish a water-power electric plant on Eagle creek. J. K. Romig, Baker City, is president and manager.

*Yerington, Nevada*—The Nevada-Douglas Copper Company is installing some mining machinery. The company is arranging to build a mill and smelting works. Walter C. Orem, Salt Lake City, Utah, is manager.

*Grand View, Tennessee*—The Grand View Coal and Timber Company has started to develop coal lands, and will be in the market for hoisting, haulage and other machinery. W. C. Marshall, Chattanooga, Tenn., is the manager.

*Pine Creek District, Gilpin County, Colorado*—Denver and Eastern people have taken an interest in the Yellow Medicine Gold Mining Company, owning the Black Dog group in the Pine Creek district. They are arranging for the installation of machinery and heavy developments. L. J. Mountz, 315 Kirtredge building, Denver, Colo., is manager.



## Special Correspondence

San Francisco Jan. 10

It is expected that the Tonopah & Tidewater Railroad, known as the Borax Smith line, will be running trains into Greenwater, Inyo county, by June 15 next. The present terminus of the road is at Front, and a tri-weekly stage service is now in effect to that point. By the middle of this month it is hoped that a daily stage coach each way will be put on. A wagon road is now being built through Amargosa cañon. Freight rates have been reduced and goods are now delivered within reasonable time. The removal of Greenwater to the new town of the same name on the townsite of Ramsey will soon be an accomplished fact. The old town was up on the side of a mountain and difficult of access. That is why it was considered best to select a new location. All the frame houses of any account will be taken to the new Greenwater. Work is being prosecuted upon a number of the better known properties. Development thus far has materially improved the district, and there is every reason to believe that by spring there will have been opened up some very good showings.

The Union Oil Company's steamer "Argyll" has sailed from San Francisco with the first cargo of California oil that is to be piped across the Panama isthmus and re-shipped to the points on the Atlantic coast. This is the first vessel of the new line. The pipe line was installed by the Union Oil Company, and there will be a regular line of vessels carrying oil from this coast to the canal zone.

Two complete sections and a part of a third section of the oilfield at Coalinga, involving 1760 acres, have been purchased from 14 companies by a London syndicate, known as the Coalinga Oil-Fields, Ltd., which is headed and represented in this State by Balfour-Guthrie & Co. The transfer approximates a valuation of \$2,250,000. Among the properties involved are all of section 34, three-quarters of section 26, and all of section 14. Among the companies enlisted are Forty Oyama, Westmorland, Pittsburg Coalinga, Pittsburg, McCreary, 340 Oil Company, Star Oil Company, O. Heath Company and the West interest. All these claims are in section 34. In section 26 there are the Arline, the K. W. Oil Company and 80 acres unnamed. In section 14 there are the Tavern and the Avon. The property brought values ranging from \$1000 to \$4500 an acre. The holdings of the Coalinga Oil-Fields Company already embrace 3600 acres and the added properties will place under its control 5360 acres. Recently the price of oil, which was down to 13 and 14c., has gone up to 25, and the Associated Oil Company will not sell now for that price.

A Los Angeles Oil Company has bought a site for an oil refinery on the Solano

county shore of Carquinez straits between Vallejo and Benicia. The new corporation plans to build a wharf 500 ft. long into the bay and to build an immense oil refinery for crude oil which will be brought from the southern fields. A spur track three miles long is to be built by the Southern Pacific Company from Benicia to furnish shipping facilities for the plant. The company will build a large number of big steel tanks on the hills back of the works. The new concern has already ordered 500 tons of structural steel for the commencement of building operations.

The Wildman-Mahoney properties and other mining claims at Sutter creek in Amador county have been sold. The purchaser was the Mother Lode Gold Company, which is made up mainly of Eastern men. Mr. Overholt, of Pittsburg, is president. The Pacific Coast directors are Homer Wilson, John A. McIntyre, John Ross, Jr., and Jackson Dennis. Negotiations had been going on for a year. The Wildman-Mahoney mines have been worked since the early days of mining in California. The Wildman was discovered in 1850.

Between October and January over 5000 mining locations were filed in San Bernardino county. The locations are nearly all on the desert side of the San Bernardino range and in various spots from the mountain range to the Colorado river.

State Mineralogist Aubury has protested to the Governor of the State, the Senators and Congress on the subject of using the building stones of other States than this in the State or Federal buildings now being constructed in California. "It is unnecessary," says Aubury, "to go to Wyoming or to Arizona or to any other outside point to get sandstone for the construction of a Federal building at Los Angeles or anywhere else in this State. I believe that it is both fair and wise to give the materials produced in California a fair chance when large structures are to be erected here by the Government."

All the mines at Grass Valley still remain closed down owing to the miners' strike. The expected compromise was not carried out this week. The Mine Operators' Association and the Miners' Union has thus far been unable to agree. The mine operators formulated a communication to the Miners' Union, in which they asked the miners to return to work on the old scale, pending a settlement of the trouble, and threatening to break off negotiations unless the proposition were accepted. The operators promised definite answer to the miners' demands within 24 hours if the miners returned to work. At a special meeting the miners rejected the proposition, and said they would return to work only under an eight-hour schedule. The millmen, cyanide workers, engineers and surface workers have themselves organized a union, but have not yet become involved in the present strike trouble. The

managers say that if they concede the demands which have been made upon them by the union they want a guarantee from that body that there will not be any further disturbance for a given time, say a few years. This they want in the form of a written agreement. But the officials of the union say that it is not within their power to enter into such an agreement, under the rules of the Western Federation of Miners. The operators are angry at the action of the union in calling the miners out of the North Star mine, which had already established an eight-hour day. They seem to have settled down to a period of idleness. All the mines, large and small, in the district, belong to the association and will stand together in the settlement of the conditions. The men have been peaceable and none of the mines has been troubled by the idle miners or their sympathizers.

Salt Lake City Jan. 11

An important deal has been consummated in New York affecting Park City mining properties. After negotiations covering a period of several years, Jacob E. Bamberger, president of the Daly West Mining Company, has acquired a controlling interest in the Ontario and Daly mines, together with all the water, power and other rights pertaining thereto. It is not known here what disposition is to be made of them, yet the impression prevails that they will be merged in some form with the Daly West Company.

The management of the Utah Consolidated Mining Company has decided on a location for its proposed smelting plant, to be used after the abandonment of the present plant at Murray, nine miles south of Salt Lake City. The site selected is on the west side of the Oquirrh range of mountains, near the town of Tooele, in Tooele county, and directly west of Bingham. It is planned to drive an 11,000-ft. tunnel adit, which will tap the ore-bodies of the company's Highland Boy mine about 1000 ft. below the present lowest workings. Pending the completion of the adit, however, it is the intention to construct and operate an aerial tramway over the mountain from the mine to the smelter site. The mouth of the proposed adit will be between one and two miles from the smelter. The company will build several miles of railroad tracks to connect with the main lines of the San Pedro, Los Angeles & Salt Lake and Western Pacific railroads.

The fuel situation, as far as the Consolidated Mercur Gold Mines Company is concerned, is very much improved. During December the battery of roasters in the mill was closed. A few days ago a portion of them were placed in commission again.

The management of the Garfield Smelting Company, one of the units of the American Smelting and Refining Company, has experienced much annoyance on

account of a short fuel supply, and the plant has not run at any time at more than one-fourth its capacity.

The Mountain Lake Consolidated Mining Company, operating in the Big Cottonwood mining district, near Alta, has completed the purchase of some additional ground near its Steamboat property. Just before the holidays the tunnel adit, through which the mine is being developed, broke into high-grade copper ore. Jesse Knight, of Provo, is the heaviest shareholder in the company.

It is likely that another low-grade gold district will be opened in Utah. Late discoveries made on the west side of Utah lake, in Utah county, indicate this. The deposits are reported to be extensive, and in character are similar to those of the Camp Floyd, or Mercur district. The Pelican Point Mining and Development Company has been organized at Provo, with Judge Warren N. Dusenbury as president; Walter Parks, vice-president; Hyrum F. Thomas, secretary, and Eugene Marcus, treasurer. Enough work has been done on the property to justify the erection of a cyanide mill and plans are now being made to install one in the near future.

The Nevada Douglas Copper Company, operating at Yerington, Nevada, but with headquarters in Salt Lake, has recently placed an order for heavy mine equipment. The company will soon begin shipments of ore, using traction engines for transportation purposes between the mine and Wabuska, a point on the Nevada & California railroad; this to continue until railroad facilities are provided. E. P. Jennings, a Salt Lake engineer, recently made an examination of the mine and estimates that it contains 10,000,000 tons of available copper ore, averaging  $3\frac{1}{2}$  per cent. Plans are being made to build a mill and smelter during the present year. Walter C. Orem, of Salt Lake, is manager of the company.

The Century Gold Mining Company, operating in the Park Valley, Utah, mining district, has appeared in the dividend column again, the directors having posted one for payment this month, the amount being \$5000. A stock dividend of 1651 shares has also been declared. P. W. Madsen, of Salt Lake, is manager of this company. The past year has been devoted largely to development work.

During the year 1906 there were sold on the floor of the Salt Lake Stock and Mining Exchange 14,555,391 shares of stocks for which was paid \$9,478,984.

Suit has been filed in the district court against the Silver Bell Mining Company, with properties at Park City. The complainant is H. E. Larson, a stockholder, who asks the court to enjoin the defendant from selling 5000 shares of stock on the ground that the late assessment of 25c. a share was illegal; that the charter of the company does not permit of an assessment of more than 10c. a share at one time.

The property of the Eureka-Swansea Mining Company, in the Tintic mining district, is now controlled by Jesse Knight, of Provo. A deal to that effect has recently been consummated.

#### Indianapolis Jan. 14.

The Indiana legislature is in session and only one bill relating to mines has been introduced. The bill provides that the owners and operators of mines shall provide free bath-houses and lockers for coal miners, to enable miners to wash and change clothes before returning to their homes after a day's work.

A shippers bill is being prepared by the mine operators and retail coal men, providing for a reciprocal demurrage law which will enable shippers to collect from railroad companies damages for delayed consignments and allow railroad companies a reasonable demurrage charge for cars that are not unloaded within a given time.

Governor Hanley in his message recommended the giving of greater power to the railroad commission, so as to enforce penalties against railroad companies for failure or refusal to receive coal cars from each other and transport them, also power to break up blockades and otherwise compel the roads to give more speedy transportation of coal and other freight.

It is understood that the miners will not ask for a shot-firing law. Miners from Illinois say the law in that State has proven of little or no benefit to the miners.

The eighteenth annual convention of the United Mine Workers of America will convene in this city, Jan. 15. This convention promises to be one of the quietest and most uneventful that has yet been held by the organization. It is possible, however, that some question may be sprung to arouse discussion, but there is nothing of the kind in sight. The attendance will be much less than usual, as many unions will be represented by proxy. Governor Hanley will make the address of welcome. The real work of the convention will follow the reports of the committees. Doubtless one of the chief matters to be considered is the best plan to be adopted to restore the joint conferences with the operators. It is known that the operators generally are opposed to restoring the joint conferences with the international association, and it is evident that this fact is deplored by the mine workers; hence the effort to restore it.

#### Scranton Jan. 14

The miners of Luzerne county in the anthracite region are asking members of the State legislature to introduce a bill at the present season to regulate the use of electricity in the mines. It is claimed that the exposed wires which carry the current underground are a menace in low places and that many lives are lost. It

is proposed in the bill to provide that the current shall be reduced to 250 volts and that fewer cars be hauled on each trip. The bill also contains regulations to prevent explosion in case the wire breaks and emits sparks by coming in contact with the rail, thus igniting the gas.

One of the greatest nuisances in the anthracite region is the frequency with which holidays are observed by the foreign element. This was illustrated when the English speaking people and the foreigners celebrated Christmas in December and last week the followers of the Greek orthodox church insisted upon celebrating their Christmas, thus causing the English speaking people to be idle also. The evil is not so much that the foreigners are idle, but their absence makes it necessary to shut down the mines, thus compelling all the employees to be idle. It frequently happens that one additional day is necessary after the holiday to rest, so that two days are involved in each celebration. Each nationality has its own peculiar holiday, and all these added to Mitchell day, Labor day, eight-hour day as well as the State and national holidays means a decrease in the output.

A claim has been put forward that the sulphur water which is pumped from the mines in the anthracite region kills typhoid germs. Scranton has more than 1000 cases of typhoid, and the sewage matter is discharged into the Lackawanna river, which empties into the Susquehanna river, from which a number of small towns derive their water supply. With the serious epidemic in Scranton the State board of health issued a warning to the towns in question that their water supply was infected. The medical men in Scranton took exception to this, and pointed out that tests had been made to demonstrate that nothing whatever could live in the river after it had received the sulphur water. It is true that no life can be found in the Lackawanna river and the tests failed to reveal the presence of germs of any kind, in that portion where the mines are situated. Higher up, where the water is not contaminated, there is an abundance of trout.

#### Toronto, Ont. Jan. 14

Tenders for mining rights to 23 acres of the bed of Kerr lake, in the Cobalt mining area, were opened by the Ontario government, Jan. 9. The competition was very active, as six tenders were put in, the sums bid ranging from \$23,000 to \$178,500. The latter tender, which was accepted, was made by Charles E. Potter, Toronto, and A. G. F. Ross, Montreal, representing a syndicate of subscribers in both cities. The sale is subject to a royalty of 10 per cent. on the gross value of the output. When the property was offered a few weeks ago, without any royalty stipulation, the highest bid received was \$51,500, and it was withdrawn from sale. It is



generally supposed that the absence of any offer which the government could consider at that time was due to neglect, interest being concentrated on Cobalt lake, which was offered simultaneously. The government will provide means of access to the shores of the lake, and there is also a small island which may be utilized in mining operations. The syndicate has applied for incorporation as the Kerr Lake Crown Reserve Mining Company, Ltd., with \$2,000,000 capital. The names of H. M. English, E. C. Berkinshaw, E. M. Wilson, W. H. Blain, D. C. McTavish and Percy P. Dean appear as provisional directors.

A new mining camp is being formed in the Temagami forest reserve, where important discoveries have recently been made. It is situated some four miles northwest of Sucker gut, an arm of Lady Evelyn lake, and is known as New Cobalt. A line of steamers will give good water communication as soon as navigation opens. The recent find of White Brothers was in this area. Darby Brothers' location has a vein with good cobalt content from 11 to 24 in. in width. On some of the properties the veins have been stripped for several hundred feet and some trenching has been done. This camp is likely to be the scene of great activity as soon as spring opens.

Prospecting is going on actively in the Larder lake gold area, notwithstanding the season. A large syndicate, represented by J. H. Tighe and R. R. Tighe, experienced miners, are prospecting extensively with a force of men in charge of Edward Dobbin. They recently staked claims along the northeast part of the lake.

London Jan. 8

During the last few years I have from time to time referred to the Capillitas Copper Company, which was formed in 1901 for the purpose of acquiring from local owners the mines of that name together with smelters in the province of Catamarca, Argentine Republic. At the time of flotation it appeared to me that far too much money was being paid for the property and that the working capital subscribed was not sufficient. The former owners had worked the mine for a long series of years and the ores had been rich enough to pay for carriage over the Andes on mule back. When the transfer was made the richer ores were exhausted, but J. S. MacArthur reported that there were large bodies of ore in the mine that would pay, if a rope-way were built to supersede mule carriage, and if more modern smelters were erected. The present state of the company after the lapse of these five years is very disheartening. The capital subscribed on two occasions has been spent; debentures to the amount of £70,000 have been issued, this money also laid out; and the balance on current account is still on the wrong side, the security for the loan

being the ore ready for shipment. The smelters have been erected, and the aerial ropeway was completed last summer. Owing to the responsibility for erecting the ropeway being divided between the company and the makers, blunders were made in the building of the standards and the necessary alterations have not yet been completed. To crown the misfortunes it has been found that the reserves of payable ore are strictly limited.

R. A. Varden, of Bainbridge Seymour & Co., went out to the mine last summer to make a general inspection of the state of things and his report was very discouraging. He found that the copper contents had shrunk to 1 per cent. and the bornite and chalcopyrite had changed to iron pyrites, while other ores, such as galena and blende, had made their appearance. A good many changes have been made in the directorate and staff, and Darcy Weatherbe is going out as general manager to try his luck.

The shares of a London company called the Arizona Consolidated Copper Mines, Ltd., are being introduced on the mining market here. This company must not be mistaken for the well known Arizona Copper Company. People who adopt names similar to those of prosperous neighbors are always open to criticism. The properties belonging to the "Consolidated" are the Chilicothe, Lowland and Sciota, at Clifton, Ariz., and they are in the midst of the copper-producing area. The promoters state that there is sufficient ore "in sight" to warrant the erection of a 40-ton furnace, some of the ores being high enough in copper to smelt direct while others will have to be concentrated. The engineers who report on the property are not known over here, nor are the directors distinguished men. It would be of interest to your readers in this country if some of your correspondents in Arizona could give information.

Johannesburg Dec. 10

Considerable discussion is going on over the eight-hour day. A few mines have adopted the eight-hour day of their own free will, but the labor organizations are beginning to demand it. There are a few mines where the eight-hour shift is workable, but conditions vary, and on the deep-level mines the introduction of an eight-hour day will cause inconvenience and add to the expense. There are mines where its introduction will come as a shock, for although the men are underground for nine to ten hours, they do not do much more than six hours' work.

If there are any people in the world that have less cause for kicking they are the artisans of the Rand. The skilled man here receives a higher wage than in most parts of the world, and he works less than in other countries. As yet the miners have not clamored for an eight-hour day.

## General Mining News

*United States Metals Refining Company*—This company intends to add to its copper refinery, at Chrome, N. J., smelting furnaces, and two stands of converters. Construction will be begun this spring.

### ALABAMA

*Alabama Consolidated Coal and Iron Company*—Joseph Hoadley, the new president of this company, has just made an inspection of the properties of the company in this State. He was accompanied on his trip by Col. T. G. Bush, former president, and Morris Bush, general manager. Mr. Hoadley announced plans of development by his company, stating that a locomotive works would be erected at Gate City, near Birmingham, and that he had recommended to his company the erection of a large steel plant at Lewisburg, six miles from Birmingham, besides other extensions.

*Republic-Tennessee*—John A. Topping, president of the Republic Iron and Steel Company and chairman of the executive board of the Tennessee Coal, Iron and Railroad Company, has been in the Birmingham district, looking over conditions and watching progress being made on improvements and developments. Directors of the Republic-Tennessee combination, including John W. Gates, are expected in the Birmingham district. There is talk of further mergers in that section, the Republic-Tennessee companies to take over properties of another coal and iron company in the State.

*Straight Mountain Coal Company*—This company has bought a tract of coal land on Sand mountain, near Carlisle, and has begun work on development. The managers' office is at Gadsden.

### ARIZONA

#### GRAHAM COUNTY

*Arizona Copper Company, Ltd.*—This company reports its production for the month of December as 52 short tons of copper. The small output was due to the floods at Clifton, which stopped production nearly all the month. From Jan. 1 two furnaces have been running.

### CALIFORNIA

#### AMADOR COUNTY

*Argonaut*—The controlling interest in this property, at Jackson, has been sold by W. F. Detert to W. K. Matthews, of New York, and W. A. Manson, of Chicago. The mine has been paying dividends a number of years, and is one of the famous mines of the State.

#### BUTTE COUNTY

*Copper*—Warner & Wilkes have discovered good copper ore at Sawmill Peak, near Magalia.

*Platinum*—At the Yuba mine, in Morris

ravine, above Oroville, the gravel is found to contain considerable platinum, and care will be taken to save this metal in the future.

## CALAVERAS COUNTY

*Chapman*—At this gravel mine, San Andreas, 11 men are at work, and the electric power line is being extended to it, when the hoist will be put in place.

*Three Star*—At this mine, near Angels, a body of rich ore carrying free gold and galena sulphurets has been found. The mine is under bond to San Francisco men.

## EL DORADO COUNTY

*Mount Pleasant*—This mine, near Grizzly, Flat, Fred Beedle, superintendent, is turning out free-gold rock. The shaft is 1000 ft. down.

*Lucky Marion*—Litigation having ended, this mine at Greenwood is to be reopened and worked on an extensive scale.

## HUMBOLDT COUNTY

*Henderson Group*—Sample lots of copper ore from these new mines, at Horse mountain, paid very well at the smelter, and as a result numerous other copper claims have been located in the vicinity and are being prospected.

## INYO COUNTY

*Darwin*—The Defiance and Independence mines have been bonded to M. E. Eppinger and R. Watson. On the Lucky Jim 15 men are at work, and are steadily shipping ore. At the Giroux Verdi, a gasoline hoist has been put in.

*Furnace Creek Copper Company*—The shaft on this property at Greenwater is now 385 ft. deep, and will be sunk to water level as quickly as possible.

## KERN COUNTY

*Tiger Head Mining Company*—This company, near Rosamond, has purchased the Ella mine at that place for \$10,000.

## NEVADA COUNTY

*Orzalli & Shebley*—At this mine, Chicago Park, the ore being taken out runs \$40 per ton, and a five-stamp mill is kept busy crushing it.

*California*—This old mine, at Deadman's Flat, is again being worked for the first time in many years.

## PLACER COUNTY

*Imperial*—This company has completed a 10-mile ditch and constructed a large impounding dam for the mining débris.

*Hermann*—A new steam plant for hoisting and milling power has been installed, and the 40-stamp mill is kept busy crushing ore.

*Hidden Treasure*—The air-shaft to the tunnel of this extensive drift mine at Bullion is at last finished. Timbers and material may be handled through the shaft.

## SAN BERNARDINO COUNTY

*Yucaipe Valley*—More or less mining has been done at this point for some

years, but with little success. Of late, however, some claims have been taken up which show good promise.

*Bagdad-Ludlow Mining and Milling Company*—This new company, S. S. Watson, president, has bonded 30 claims near the Bagdad-Chase property, at Stedman, and will put in a hoisting and pumping plant.

*Hexagon Mining Company*—This company has taken over the claims of the Desert Venture Company, in the Whipple Mountain region, between Needles and Parker, and will develop them.

*Bagdad Group*—This group, at Camp Rochester, is now owned by the Bagdad-Chase Mining Company, the officers of which are John N. Beckley, Buffalo, N. Y., president; Edgar Van Etten, Boston, Mass., vice-president; B. E. Case, Rochester, N. Y., treasurer; John H. Stedman, Rochester, N. Y., treasurer. The group has been worked for several years. The ore is treated in the company's 50-stamp mill and cyanide plant at Barstow.

## SHASTA COUNTY

*Uncle Sam*—This mine, at one time a large producer while owned by the Sierra Buttes Mining Company, is again being operated with 40 miners at work.

*Blue Bell*—E. P. Connor has discovered a small but rich ledge within a few hundred feet of the post office at Harrison Gulch. This discovery is corroborative of the contention that this townsite is mineral ground, which was the main question in the litigation at that point.

## SIERRA COUNTY

*Lucky Frank*—This mine, in Wolf Creek, near the Nevada county line, is turning out rich specimen ore. It is owned by Mr. Bluett and F. T. Smith, of Nevada City.

## SONOMA COUNTY

*Copper*—A vein of copper ore is reported as having been found in the western part of the county, some distance from Cazadero.

## TRINITY COUNTY

*Bonanza King*—The new 40-stamp mill will start up as soon as the electric power line is completed. There is plenty of rich ore on the dumps to keep the mill running.

## COLORADO

## GILPIN COUNTY

*Important Merger*—Phillip Mixsell, of Idaho Springs, and J. C. Fagan, of New Jersey, have completed arrangements with English capitalists for the transfer of the Ophir-Burroughs, Gold Coin and Ivanhoe properties on Quartz hill, Nevada district, in conjunction with property situated in Clear Creek county. The first payment on the property is to be made within 30 days. It is understood that a considerable amount of new machinery will be required for the proper

equipment of the property. P. Mixsell, Idaho Springs, is to be manager.

*Derigo*—Nashville, Tenn., people have become interested in the Derigo group at Wide Awake, have practically completed the purchase of the property, and have purchased the Douglas mill. They will arrange for the erection of a tramway for handling their ores from mine to mill next spring and will also add a concentrating plant to their amalgamation mill. G. H. Elling, Ernest & Crammer building, Denver, is manager.

*Eldorado*—E. S. Moulton, of Central City, Colo., has taken a lease and bond on this property, in Spring gulch, and is arranging for the installation of a steam or gasoline hoisting plant.

## JEFFERSON COUNTY

*Gypsum Deposit*—A large body of gypsum has been encountered in the tunnel being driven for the American Cement Plaster Company, of Lawrence, Kan., the ledge at this time showing up nearly 12 ft. wide, and it is claimed that the quality is the best. The gypsum was found near Morrison. The American Company intends to erect a mill of 200 tons daily capacity near Denver as soon as the deposit is proved up.

## OURAY COUNTY

*Camp Bird*—This company's report for December shows that the mill ran 29 days, crushing 7193 tons ore, which yielded 10,938 oz. bullion and 521 tons of concentrates. Sales of bullion amounted to \$184,995. Working expenses were \$42,995 and construction \$1652, leaving a balance of \$140,348 for the month.

## SUMMIT COUNTY

*Colorado Consolidated Dredging Company*—This is the title of the company of New York and English capitalists which has taken over the interests of the old American Gold Dredging Company and is to operate the Swan and Blue river placer tracts. This company is going to start at once on the construction of new dredge boats and to put the two old ones in order.

*Buffalo Placer Company*—This company will put in a complete hydraulic plant and work its large tract of placer ground near Dillon on the hydraulic plan on a large scale. The management expects to handle about 8000 to 10,000 yards per day. This ground has been thoroughly tested and average of the wash give a general return of 25c. per yard.

*Wellington Mines Company*—This company is making good on its consolidation of the Wellington, Oro and Orthodox properties. Last week it was reported that a new vein of gold-bearing carbonate ore had been discovered, and further evidence of its continuity is being obtained along the line on the Oro property. In prospecting the surface, Superintendent Cummings uncovered it again this week 150 ft. from the point of original discovery. It varies in width from 26 to 4 ft.



and within it is a streak of ore 6 to 10 in. wide that is well charged with gold. Peter L. Cummings has been appointed superintendent of this company.

TELLER COUNTY—CRIPPLE CREEK

*Drainage Tunnel*—At a meeting of the committee the past week it was decided to construct the intermediate tunnel or the one known as the Gatch Park bore. Just when work is to be commenced is not definitely known, but in all probability it will be soon. It is also understood that a bill will be introduced into the present legislature for the division of the State into mining drainage districts, and an effort will be made to obtain State help in the construction of the tunnel. As it is, nearly a million dollars has been subscribed by the various mining companies for the construction of the tunnel. It has not yet been decided who is to be the superintendent of the work.

*Portland*—The regular quarterly dividend of this company has been declared. It amounts to 4c. per share, or \$120,000. The property is in excellent condition. It is understood that the winze below the bottom level is showing very fine ore. Sinking the shaft will probably soon be commenced. F. M. Kurie, of Victor, is manager of the property.

*Isabella*—The annual meeting of this company will take place, Feb. 4, in Cheyenne, Wyoming. The property is situated on Bull hill, and is producing considerable ore. The mill that was recently erected is now running and making a good record. George Kilburn, of Cripple Creek, is in charge of the property.

*Little Clara*—The Union Leasing Company has taken a lease upon the north end of this property, and will commence sinking a shaft at once. It is hoped to find the extension of the rich ore-shoot that is now being worked by Hodges & Marsh, on the south end of the property. The Hodges lease continues to produce ore at a good rate.

FLORIDA

*Mutual Mining Company*—This company, organized at Savannah, Ga., to develop phosphate and timber lands in Citrus, Sewanee, Marion and other counties in Florida, will erect a modern phosphate plant to have a capacity of 25,000 tons annually. New equipment needed includes two 125-h.p. boilers, two 75-h.p. engines and two 12-in. suction 10-in. discharge pumps. Officers of the company are George F. Armstrong, Savannah, Ga., president; J. R. Williams, Alachua, Fla., vice-president and general manager.

GEORGIA

TERRELL COUNTY

John R. Irwin and associates are arranging to open limestone quarries on a large scale at Dawson.

INDIANA

SULLIVAN COUNTY

*Illinois Midland Coal Company*—This company has filed articles of incorporation in Indiana. The company will invest \$80,000 in coal lands and in mines and operation in Sullivan county. The headquarters will be at Sullivan and Thomas Gregory will be general manager.

INDIAN TERRITORY

CHOCTAW NATION

It is reported that iron deposits have been located 20 miles south of South McAlester, and a branch of the Missouri Pacific, which is projected from Claremore, I. T., to Paris, Texas, will touch the property. Coal and limestone can both be had with short distances.

*Adamson Coal Company*—This company is opening six slope mines on the Wilburton branch of the Missouri, Kansas & Texas road, west of Wilburton.

*Great Western Coal and Coke Company*—On Jan. 1 the following officers of this coal company assumed the duties of their departments. John C. Reid is appointed general manager. R. H. Busby is appointed purchasing agent, in place of D. C. Welch, who resigned. W. H. Crawford is appointed auditor, which place was formerly held by Mr. Welch.

*McAlester Coal and Mining Company*—This company resumed operations Jan. 2 in mine No. 6, in which a serious explosion occurred two months ago. S. P. Allen is general manager.

*Chicago, Rock Island & Pacific Railway*—Work has been begun on a branch from a point between Alderson and Bache north to the mines opened recently by the McAlester and the Indian Coal companies, on the north outcrop of the Hartshorne coal.

KENTUCKY

BOURBON COUNTY

J. F. Caldwell of Millersburg, is organizing a company to develop lead mines, near that place.

MARYLAND

GARRETT COUNTY

*Beechwood-Cumberland*—This company has begun work on coal property lately bought. W. M. Wharton is president, with office in the Land Title Building, Philadelphia.

MONTANA

BUTTE DISTRICT

*Anaconda*—After a suspension of 44 days to permit of repairs in the shaft, work was resumed in the Anaconda mine, Jan. 7, and the property is now yielding its customary output of ore. Drifting at the 2400 is progressing rapidly. This is the deepest point at which the vein has

been opened in this mine or any other in Butte, although the orebody on the 2400 of the High Ore has been opened.

*Red Metal (Coalition)*—This company has placed its Rarus mine in shape for an increase of about 200 tons of ore a day. On Jan. 5 it finished the air-shaft connecting the surface and 1500-ft. level several hundred feet north of the main shaft, since which the lower workings have been receiving plenty of cool air. Up to the time the air opening was finished the workings were so hot that men could not work in them any length of time, and the output of the veins was curtailed. The company is driving its double-track tunnel from a point close to the new shaft on the Tramway toward the Rarus shaft with three shifts of men, and expects to finish the job early in April. The face of the opening is in 220 ft. and there is about 480 ft. of ground between it and the shaft. It will break into the latter at a depth of 210 ft. The tunnel will be the main outlet for the ore of the Rarus and will be equipped with the electric-haulage system. All timbers used in the Rarus, Tramway and Minnie Healey mines will be framed near the entrance to the tunnel and those for the Rarus will be transported through the tunnel.

*Trenton*—The company is cutting a station at the 2100 of the Gagnon, having finished sinking a few days ago. It is shipping about 400 tons of ore a day from the mine.

*North Butte*—Ore production by this company during December was about 1400 tons greater than that of any month since the company began operations. Its average was a little more than 1200 tons a day. The new vein intersected in Gem ground recently is said to be one of the best of the four from which ore is coming. It was opened by the crosscut heading for Berlin ground north of the 1600-ft. level of the Jessie.

*Butte Copper Exploration*—The company is installing a large pump on the south side of the shaft at a depth of 1000 ft. and expects to finish the work in a week. It is crosscutting north of the station to intersect veins, the face having reached a distance of 250 ft. from the station. Seams of good copper ore have been cut, but no large orebodies are in sight. It is supposed that the first large vein is only a short way from the face, but no attempt will be made to cut into it until the pump is in working order.

*Alice*—It is reported on good authority that mining will be resumed in Alice ground about Jan. 20. With the exception of work done by lessees, Alice territory has been dormant several years. Control of the property is now vested in John D. Ryan, managing director of the Amalgamated, and others, they having bought a majority of the 400,000 shares several months ago. Copper ore is known to lie

in some of the claims of the company, the Valdemere and Magna Charta especially.

**Butte Central & Boston**—The new hoisting engine on the Ophir mine of this company is ready for work and sinking from the 500-ft. level to the 1000 will be resumed in a few days. The upper levels are yielding silver-gold ore, and the ore of the north vein at the 500 carries some copper.

**Davis-Daly**—No ore has been struck in any of the properties owned by the company, but development work in the Smokehouse, Silver King, Mt. Moriah and Colorado claims is going ahead rapidly. The face of the crosscut south of the 1800-ft. station of the Original is about 1165 ft. in.

## NEVADA

### NYE COUNTY—TONOPAH

**Jackass Group**—An important strike has been made in one of the claims. The claims are situated about six miles southwest of the Midway mine, and in a direct line running between Tonopah and Lone Mountain. While recently sinking a prospecting shaft on No. 2 claim a well defined fissure vein carrying low-grade ore was cut. This shows that the great vein systems now so successfully opened in Tonopah extend away to the southwest, and suggests the probability of their junction with the valuable Lone Mountain system. The strike has had the effect of stimulating the re-location of a large area of the adjoining ground.

**Great Western**—The shaft has been sunk to a depth of 350 ft. The country is dacite—a formation which overlies the lode-bearing andesite. It is proposed to carry the shaft to 500 or 600 ft. before cross-cutting, in order to be well within the vein-bearing rocks.

**West End**—Development operations are being carried on as usual. No ore will be broken until shipping facilities are improved. Large reserves of high-grade ore have been developed.

**MacNamara**—Work is being delayed by the fuel famine, which is as acute as ever. Two shifts are kept at work in the mine on development work. It is probable that ore shipping will not be resumed for several weeks.

**Midway**—Operations are confined to development work. A large amount of high-grade shipping ore has been developed, but it cannot be mined on account of the lack of shipping and milling facilities.

**Ore Shipments**—Shipments of ore over the Tonopah Railroad for the week ending Jan. 3 were: Tonopah Company, 1200 tons; Belmont, 550; Tonopah Extension, 325; Montana-Tonopah, 80; total, 2155 tons. Shipments from Goldfield were 1700 tons, making a total of 3855 tons.

### NYE COUNTY—MANHATTAN

**Wolfstone**—A new power hoist has been

installed and sinking has been resumed, and will be continued regularly until the water level is reached. A trial shipment of 10 tons has been melted for an average return of \$200 per ton.

**Stray Dog**—Some rich ore is being stripped along the hanging wall of the ledge for a width of 15 in. As sacked it averages \$1000 per ton. This rich ore is being mined in the 100-ft. level, and it has been decided to sink immediately to the 200-ft. level in order to open the ledge at that depth.

**Toquima Copper**—The shaft is down 145 ft., and a contract has been awarded to sink it to a further depth of 200 ft. From the surface to 130 ft. the lode is wide and averages 12 per cent. copper. From 130 ft. to the bottom of the shaft the assays average a little higher copper.

**Manhattan Red Top**—An active development campaign has been decided upon by the management. Two veins have been cut in the prospecting shafts, which give promising assays. It is proposed to open them out in readiness for shipping to the mill, now in course of construction by the Tonopah Exploration Company.

### NYE COUNTY—BULLFROG

**Montgomery Consolidated**—A shipment of 150 tons of high-grade ore was made last week, and it is proposed to make another similar shipment in the course of a few days. The framework of the company's mill is being rapidly constructed, and a large force of men is employed in making a roadway up to the mine.

**Victor**—The tunnel is in 300 ft., and the winze continues in ore. The tunnel is expected to cut the vein, which outcrops and assays well, before the end of the present month.

**Montgomery Mountain**—The new shaft on the Black Bull claim has been re-timbered. It is 50 ft. in depth, and is in ore the whole distance. A power hoist is on the way from California, and when it is installed sinking will be resumed.

**Sunset**—A ledge has been encountered in the new shaft at a depth of 50 ft. It is 6 ft. in width and assays well. Sinking will be continued to the 100-ft. level before the ledge is opened out.

**Mayflower North Extension**—This property was recently acquired by a new company which has decided to carry on extensive prospecting work with the view of locating the Starlight ledge, which is believed to extend through the claims.

**Tramp Consolidated**—It is proposed to connect the Tramp shaft with the main Tramp tunnel by running a drift south from the shaft at a depth of 100 ft. below the Empress tunnel level. It will take three months to complete the work. The Tramp shaft is in high-grade ore and shipping ore is being broken in the Hobo and Denver claims.

### ESMERALDA COUNTY—GOLDFIELD

**Hayes-Monnette**—This famous lease

on the Mohawk mine is being worked to its full capacity. Shipments of high-grade ore are being made daily. The miners' strike did not interfere with the working of this lease.

**Black Cat**—A well defined ledge is reported to have been cut in the shaft at a depth of 18 ft. The mine is situated near the railroad, two miles north of the township, and due west of the sandstorm mine. Should further developments prove the strike of value it will lead to the development of a large area of new ground, and extend the known gold-bearing area.

**Mohawk-Daisy**—Sinking has been resumed and the shaft will be carried down to the 250-ft. level before next April. A new gasolene hoist will be erected shortly to facilitate the work. The work is being rushed in order to run a crosscut to cut the rich Daisy vein.

**The Oddie Lease**—The shaft on the combination Fraction ground has cut a quartz vein at a depth of 400 ft. The size and value of the vein have not been ascertained.

**St. Ives**—A quartz vein 3 ft. in width has been cut in a north drift from the 100-ft. level in the Codd lease. The ore averages \$100 per ton. The shaft is 150 ft. in depth, and will shortly be equipped with a gasolene hoist to enable sinking.

**Miners' Strike**—The threatened strike is over, the miners having voted to accept the mine-owners' offer of \$5 per day, with \$4.50 for laborers.

## OREGON

### BAKER COUNTY

**Clarkville**—At this old camp, near Baker City, Richard Eakman has a tunnel in 250 ft. He is drifting to find the old gravel channel believed to exist near Clark creek.

**Prairie Diggings**—At this mine, in the John Day district, ore has been found in a new crosscut tunnel, which looks well. Joseph Waddell is manager.

**Sanger**—A tunnel has been started on Eagle creek, near Baker City, which will open up this old mine at a point 1000 ft. below the mouth of the shaft.

**Virtue**—A new company has been organized to work this old mine, near Baker City. It is known as the Virtue Mines Development Company; J. K. Romig is president and manager. The property covers 400 acres and water rights on Eagle creek, where an electric power plant will be built. The old shafts are 500 and 800 ft. deep, respectively.

## PENNSYLVANIA

### ANTHRACITE COAL

**Duggan & Company**—The coal-stripping work on this company's property at Tresckow has been suspended, owing to the difficulty in securing labor.

**Lehigh Coal and Navigation**—This com-



pany has given six acres of land and \$12,000 to build a miners' hospital in the Panther Creek valley.

*Lehigh & Wilkes-Barre*—In this company's slope No. 21, at Tresckow, a 9-ft. seam of coal has been cut.

#### BITUMINOUS COAL

A tract of 2700 acres of coal land, at Rices Landing, in Greene county, is reported sold by J. V. Thompson, to an Eastern syndicate, for \$1000 an acre. The land fronts on the Monongahela river, and a branch of the Pennsylvania Railroad is under construction through the property.

A fire, which started Jan. 9, and was caused by an explosion of gasoline in the Painter mines of the H. C. Frick Coke Company, at McClure Station, has spread to near-by shafts and is causing serious damage. Four men were carried out of the Mill mine of the United States Sheet and Tin-Plate Company, and two out of the Home pit of Stauffer & Murray, near Scottsdale. All were overcome by black damp, driven into the mines by the McClure fire. T. B. Williams, mine inspector, has gone to the scene of the fire and a large force has been sent there by the Frick Company. The flames are spreading rapidly. The blaze was started by an explosion of gasoline used in a pump.

### SOUTH DAKOTA

#### CUSTER COUNTY

*Clara Belle*—In running a drift in this mine, near Oreville, at a depth of 265 ft., a vein of tin ore was encountered, 4 ft. wide. It was followed for 26 ft. The discovery is considered important, as the mine is on the tin belt. The ore assays about 2.5 per cent. metallic tin, and \$1 per ton in gold.

#### LAWRENCE COUNTY

*Strike*—A strike has been called by the Terry Peak Miners' Union, and as a result eight producing properties in that district have closed down, putting out of employment about 600 men, shutting down seven mills. The strike was called for the purpose of securing an eight-hour day, recently granted by the Homestake. The companies on whom this last demand was made did not feel that they could grant this. The miners and mill-men all went out at midnight, Dec. 31. The Turner and Galena men have also demanded the same hours but have not yet met with a reply.

*Esmeralda*—Work has been suspended until spring after a very satisfactory test run. Improvements cost over \$1500 and though only 15 stamps were dropping, yet the run of 1½ months netted a clearing up of \$1800 over and above expenses. In the spring the capacity will be increased.

*Arizona*—The force of men working on this property will be increased, owing to the satisfactory result of the visit of the Eastern capitalists interested in the com-

pany. The property is located near Galena and the orebodies are showing up well.

#### PENNINGTON COUNTY

*Cumberland*—Owing to the present coal shortage this property is closed for the winter. An additional five stamps will be installed in the spring when work is begun. The mill has been in operation several months and the clean-ups and extraction have been satisfactory.

### TENNESSEE

#### MARION COUNTY

*Grand View Coal and Timber Company*—This company has been incorporated at Chattanooga, Tenn., for the purpose of developing about 6000 acres of coal lands recently acquired from Messrs. O. F. James and C. E. James. It is stated that the company will develop the coal and manufacture coke, and is considering the erection of a cement plant. Incorporators of the company are Robert Marshall, Grier E. Tress, of Pittsburg, Penn.; D. M. Hertzog, Uniontown, Penn.; Charles W. Stauffer, Scottsdale, Penn.; W. C. Marshall, Dayton, Ohio. W. C. Marshall, it is said, will be the resident manager of the company, with offices at Chattanooga.

### UTAH

#### BEAVER COUNTY

*Talisman*—This company has had its properties surveyed for patent, and has also ordered some extensive mine equipment. The property is now a regular shipper.

#### JUAB COUNTY

*Lower Mammoth*—The most important development in the history of this property has taken place at a point 90 ft. from the shaft on the 1700-ft. level. The ore is largely of shipping grade. The deposit has been proved for 300 ft. in length.

*Yankee Consolidated*—The management of this property and that of the Beck Tunnel Consolidated have entered into an agreement making vertical lines rule as to the boundary between their respective properties. Late developments in the Yankee Consolidated have been of a most encouraging character.

*Tintic Ore Shipments*—During the past week Tintic mines sent 119 carloads of ore to the Salt Lake smelters for treatment, as follows: Ajax, 2; Beck Tunnel Consolidated, 8; Bullion Beck, 7; Carisa, 2; Centennial Eureka, 38; Eagle and Blue Bell, 9; Eureka Hill, 2; Gemini, 5; Grand Central, 3; Joe Bowers, 1; Mammoth, 14; May Day, 2; Paynter, 1; Scranton, 6; Swansea, 2; Tintic Iron, 4; Uncle Sam Consolidated, 1; Victoria, 6; Yankee Consolidated, 6 cars.

#### IRON COUNTY

*Big Fourteen*—A shipment of high-grade ore from this property was sold in the Salt Lake market recently, the con-

trols showing 3.78 oz. gold, and 597 oz. in silver to the ton.

*Jenny Gold Mining Company*—The construction of a mill of 40 tons daily capacity has been stopped temporarily, owing to the bad condition of roads over which it is necessary to haul supplies.

#### SUMMIT COUNTY

*Park City Shipments*—The output of Park City mines last week amounted to 1,852,000 lb., the contributing mines and amounts being: Daly Judge, 556,000; Little Bell, 105,000; Ontario, 99,000; Silver King, 1,075,000 pounds.

*Nelson-Queen*—Free gold ore has been developed in this property, assays showing values as high as \$70 to the ton.

*Ontario Drain Adit*—Prospects for the draining of the camp again through this adit, which has been closed for nearly two years as a result of caves, are growing brighter. Débris found in the main avenue, where it was broken into several weeks ago, was cleaned up. At a point 835 ft. from where the main adit was broken into, another cave was encountered, and is believed to be the last one of any consequence. A parallel drift will be run around it as was the case with the caves found nearer the entrance.

### WEST VIRGINIA

#### KANAWHA COUNTY

*American Coal and Fuel Company*—This company is arranging to develop a tract of coal lands. It is intended to open mines to produce 1000 tons daily.

#### MC DOWELL COUNTY

*Superior-Pocahontas*—The Baltimore *Manufacturers' Record* reports that this new company is expending about \$100,000 for improvements to the Davy Crockett and Helena coal properties, which were recently acquired. It can now be stated that the company will use twin tipples for making four grades of coal—smithing, egg, lump and run-of-mine—and a return conveyor line from each side of the mountain will be operated by one electric motor and clutch attachment. Other equipment which has been provided consists of electric motors for hauling, Sullivan machines for cutting coal with a capacity of from 2000 to 2500 tons per 10 hours, 600-h.p. boiler, two 200-kilowatt generators, General Electric, with Alfrey engine, 22x24 to each 200 kilowatts. All machinery has been contracted for. The company states that it has also purchased the Cletur Coal Company and the Blackstone Company, and will install electric haulage to be furnished from the above plant. Officers of the Superior Pocahontas company are: Justus Collins, Charleston, W. Va., president; C. J. Milton, Cincinnati, Ohio, vice-president; P. J. Riley, Hallsville, W. Va., manager and treasurer; J. A. Latham, Charleston, W. Va., secretary.

## PHILIPPINE ISLANDS

## BENGUET

*Benguet District*—A good deal of prospecting work is in progress. On the Copper Queen, south of Baguio, a vein 5 ft. wide has been uncovered, carrying copper sulphides. A three-stamp mill is in use. Other prospects are the Gray Horse, where a small stamp mill and a rope tramway have been put in; the Naptung, where two tunnels, respectively 160 and 100 ft. long, have been put in. This lode, so far, carries good values in gold.

*Autimok*—In this district Clyde, Peterson, Reavis & Clarke have opened up several well defined veins.

*Benguet Consolidation*—This company is doing much work on its Minnesota claim, the ore carrying gold and pyrite. The company has lately put up a three-stamp, quadruple-discharge Hendy stamp mill, and a 60-ton cyanide plant. The mill is operated by water power and the ore is conducted to the mill in standard ore cars over tracks and trestles. In the construction of this plant arrangement has been made for future enlargement.

*Bua Mining Company*—This company is doing very systematic prospecting and development work on many of its claims located on a series of veins, striking approximately east and west.

## LEPANTO-BONTOC

In the mineral region of Mancayan-Suyoc, A. P. Wright and Mr. Chambers have been developing some copper-gold properties. Mr. Chambers, by systematic development work, has recently cut the Manyan copper lodes at considerable depth.

## Foreign Mining News

## CANADA

## NOVA SCOTIA

*Dominion Iron and Steel Company*—The company, at Sydney, Cape Breton, has determined upon mining its own coal, and has just concluded the purchase of extensive coal areas in the immediate neighborhood of the works. The work of development will be begun forthwith and shipping piers will be erected. The surplus output will be exported. The area secured is estimated to contain several hundred million tons of coal.

The suit of the Dominion Iron and Steel Company against the Dominion Coal Company for damages for breach of contract has been commenced in Montreal and promises to be one of the most notable civil cases ever brought in the Canadian courts. Specific damages of \$68,580 are claimed for the increased price of coal bought from other companies up to Nov. 30, and \$400,000 for damages to coke ovens and furnaces, loss of profits and increased cost of production. The Steel

Company also asks that the value to it of the contract for 90 years should be assessed at \$15,000,000 and the Coal Company will be held liable for that amount.

## ONTARIO—COBALT DISTRICT

*Ore Shipments*—Official returns of shipments of ore from the Cobalt district over the Timiskaming & Northern Ontario Railway for December show an aggregate of 1,920,664 lb. The shipping mines were as follows: Nipissing, 798,656 lb.; Trethewey, 172,210; La Rose, 172,300; Coniagas, 162,405; Buffalo, 160,000; O'Brien, 128,355; Right of Way, 101,500; Drummond, 80,193; Kerr Lake, 74,300; Foster, 60,000; Silver Queen, 1000 pounds.

A considerable portion went to the smelter at Copper Cliff, Sudbury district, and several tons were brought to Toronto for experimental uses.

*Abitibi & Cobalt*—A camp has been established on this location at Cobalt, which lies just west of the Empress, and trenching is being carried on with the object of striking the Empress vein, which is believed to cross the property.

*Cobalt Contact Mines Company*—Two niccolite and smaltite veins, one of them carrying 16 in. of ore, are being worked. On a third vein of smaltite carrying free silver, 300 ft. have been stripped. Two shafts are being sunk, which are down about 40 ft. George Fillian was recently appointed superintendent.

*Empress Cobalt*—The shaft at this mine, Cobalt, has been sunk 28 ft. and the vein, which is 2 ft. in width at the surface, has widened. E. P. Kadleck is in charge of the work, which is being carried on by double shifts.

*Foster Mine*—Machinery for further development has at last been successfully installed at this mine, Cobalt, the task being one of great difficulty owing to the roughness of the roads. Modern dynamos have been received and it is expected that the drills will be at work within two weeks.

By latest news from this mine a tunnel between two shafts at a depth of 75 ft. has been nearly completed. The orebody between them will be stoped. The new equipment is expected to be in operation in about one month.

*Gamey-Smith*—On this location, Cobalt, a vein of native silver has been struck on the property, which has hitherto been non-productive.

*Sargeson*—On this property, Portage bay, Cobalt, 10 veins have been located, and on one of them, which has been uncovered for some 2000 ft. a shaft has been sunk. Twenty feet down native silver and cobalt have been found.

*Railway Reserve Mines, Ltd.*—The syndicate which recently secured mining rights to sections of the Timiskaming & Northern Ontario Railway will become incorporated under this title with a capi-

talization of \$1,000,000. A number of veins have already been located and one or more shafts will be sunk as soon as possible.

## ONTARIO—PARRY SOUND DISTRICT

*Consolidated Copper Company*—This company, which owns valuable properties in Foley, McDougall, Hagerman and Conger townships, Parry Sound district, Ont., is about to resume development work on a large scale. Some of the locations are said to carry platinum, and from one of the Hagerman township properties an exceedingly large mica crystal, which required four drill holes to dislodge it, has been taken.

## YUKON TERRITORY

The gold yield of the Yukon Territory, for the year ending June 30 last, was \$6,539,402, as against \$8,227,200 for the year previous. The dry season and the suspension of operations for the installation of new plants are assigned as the reasons for the decrease.

Justice Burbidge, of the Exchequer Court, will visit the Yukon during the year to try important cases arising out of the cancellation by the Canadian government of several hydraulic-mining leases for alleged failure on the part of the holders to comply with the conditions. The concessions involved are those of the Klondike Government Concessions, Ltd.; the Bonanza Creek Hydraulic Concession, Ltd.; A. B. Palmer, R. H. Palmer & D. Daig; Washburn, Ritchie & Scroggie. Should the court confirm the action of the government in forfeiting the leases, a large area of mining land will be thrown open.

Dr. Thompson, M. P. for the Yukon, will propose to the government the establishment of a mining school in Dawson. He suggests that three or four members of the Geological Survey should be located there during the winter months to take charge of the school.

## MEXICO

## GUERRERO

*Mitchell Mining Company*—This company shipped its first bullion, Dec. 17, from Acapulco via Panama to New York, approximate valuation of \$50,000. In the mine the orebody has been encountered on the 500-ft. level, giving approximately 5000 ft. long by 700 ft. deep, an average of 80 ft. across. On dip of orebody there was 30 ft. gained in every 100, with the first 148 ft. vertical.

## MEXICO

*Zacualpam District*—This district in the State of Mexico, which is held back because of the difficulties from the lack of railroad facilities, is making a good showing for the amount of work that is being done. The United States & Mexico Mining Company, made up principally of Mexico City capital, and of which H. L. Eisenhart, of that city, is president and



general manager, is operating the Coronas mines, which are showing up well. The company has practically decided on the erection of a 20-ton mill, though just what process will be applicable to the ores has not been fully decided. Near the Coronas are the mines of the Carboncillo y Anexas Company, which has just declared its first dividend of \$1 each on 3000 shares.

SONORA

An unusually bad winter in the Arizpe district has badly demoralized transportation.

**Las Chispas**—This mine has had a year of good and profitable production. It is the only mine in the neighborhood of Arizpe of which this can be said. Ore stolen from this mine has been marketed as the product of other prospects in order to form a basis for the flotation of stock. Investors in the neighborhood should be careful to act solely on the advice of their own engineers. The outlook for another satisfactory year for Las Chispas is good. Many curious reports regarding the property are seen in the press of the Southwest, but all of them are misleading. J. W. Miller has succeeded R. H. Cromwell as superintendent.

**Oro Maximo**—This has stopped working, and was reported to be in the hands of creditors some time ago. This is a group of claims surrounding the old Picacho mine. Considerable machinery was brought in to this property, some of which has never been used.

AUSTRALIA

NEW SOUTH WALES

A flotation of considerable interest has been effected in London, that of the Nymagee Copper mine, which is one of the important producers in New South Wales. The flotation has been effected by the people who are identified with the Lloyd Copper Company, owning properties at Burruga, N. S. W.

ASIA

INDIA—MYSORE

**Kolar Goldfield**—The gold output for December is reported at 49,981 oz. bullion, which is 3494 oz. more than in November, but 4220 oz. less than in December, 1905. For the full year the total was 627,700 oz. bullion in 1905, and 576,287 oz. in 1906; a decrease of 51,413 oz., or 8.2 per cent. The bullion reported in 1906 was equal to 518,658 oz. fine gold, or \$10,720,661 in value.

Coal Trade Review

NEW YORK, Jan. 16

The coal trade in the West continues in much the same condition as it was a week ago. Transportation was just beginning to show some improvement, when severe weather set in, with snow in the Northwest, at once increasing demand for coal and delaying its delivery. In

several States attempts are being made, by organization, to secure better service from the railroads; but it will take time for these to have any effect. In the larger cities supplies are generally good, the trouble in securing coal being felt most in the small towns and villages.

In the East the coal trade has been generally quiet and unchanged. Car shortage is an element, but not to the same extent as in the West. Steam coal is generally in demand along the seaboard, but domestic coal is dull, owing to the continued mild weather.

**Petroleum Exports**—Exports of mineral oils from the United States for the full year were, in gallons:

	1905.	1906.
Crude oil.....	102,264,625	118,664,999
Naphthas.....	26,828,456	25,114,155
Illuminating.....	858,829,713	827,727,219
Lubricating.....	110,901,506	146,715,235
Residuum.....	66,733,457	63,292,493
<b>Total.....</b>	<b>1,165,557,757</b>	<b>1,181,514,101</b>

Paraffin is included in lubricating oils. The total increase in 1906 was 15,956,344 gal., or 1.4 per cent.

COAL-TRAFFIC NOTES

Shipments of coal and coke originating on the Pennsylvania Railroad Company's lines east of Pittsburg for the year to Jan. 5 were as follows, in short tons:

	1906.	1907.	Changes.
Anthracite.....	64,885	48,251 D.	16,634
Bituminous.....	573,885	523,755 D.	50,130
Coke.....	227,395	213,157 D.	14,178
<b>Total.....</b>	<b>866,105</b>	<b>785,163 D.</b>	<b>80,942</b>

The statement for 1906 covers one day more than that for the present year.

The coal and coke tonnage of the Pennsylvania Railroad lines east of Pittsburg and Erie for the full year was as follows, in short tons:

	1905.	1906.	Changes.
Anthracite.....	4,615,888	4,580,018	D. 35,870
Bituminous.....	30,386,521	32,398,081	I. 2,011,560
Coke.....	11,327,153	12,732,989	I. 1,405,836
<b>Total.....</b>	<b>46,329,562</b>	<b>49,711,088</b>	<b>I. 3,381,526</b>

This shows a decrease of 0.8 per cent. in anthracite; gains of 6.6 per cent. in bituminous, 12.4 per cent. in coke, and 7.3 per cent. in the total.

Coal tonnage originating on the line of the Southern Railway for the 10 months ending Oct. 31 was, in short tons: Tennessee district, 1,277,645; Alabama district, 1,511,235; total, 2,788,890 tons.

Shipments of Broad Top coal over the Huntington & Broad Top Railroad for the year to Jan. 12 were 35,284 tons.

The coal and coke tonnage of the Chesapeake & Ohio Railway for the five months of its fiscal year from July 1 to Nov. 30 was as follows, in short tons:

	Coal.	Coke.	Total.
New River.....	2,260,908	78,816	2,339,024
Kanawha.....	1,442,383	35,260	1,477,643
Kentucky.....	66,030	.....	66,030
Connecting lines...	199,740	42,742	242,482
<b>Total.....</b>	<b>3,968,861</b>	<b>156,818</b>	<b>4,125,179</b>
<b>Total, 1905.....</b>	<b>3,491,795</b>	<b>184,163</b>	<b>3,675,958</b>

The total increase was 449,221 tons, or 12.2 per cent. Deliveries of coal and coke originating on the line were: To points

west of mines, 1,836,475 tons coal and 30,887 tons coke; points east, 648,683 tons coal and 4371 tons coke; tidewater, 1,283,463 tons coke.

New York

Jan. 16

ANTHRACITE

There has been a marked dullness in the hard-coal market, due primarily to the mildness of the weather during the past week. Car supply showed a slight increase during the first few days, but later there was the usual falling off which has occurred during the last few weeks. Demand is not very brisk, and there is very little to report about the market in general. Small sizes are almost entirely out of the market, but egg is in fairly good supply. Local retail dealers are not inclined to place large orders just at present, and producers are necessarily obliged either to withhold shipments or else curtail production in order to prevent flooding the market. Prices remain at \$4.75 for broken, \$5 for egg, stove and chestnut. Steam sizes are \$3 for pea, \$2.25 to \$2.50 for buckwheat, \$1.50 for rice, \$1.40 for barley, all f.o.b. New York harbor shipping points.

BITUMINOUS

The Atlantic seaboard soft-coal trade is somewhat easier in spots, and there seems to be a smaller demand for coal in New York harbor, but farther East the demand continues strong. The weakness in New York harbor is attributed to the mild weather. Car supply seems to be improved slightly in some quarters and there are better receipts of coal from West Virginia. Prices continue about the same, although mild weather would indicate a softening of prices if it continues. Good grades of soft coal may be purchased at about \$2.85 f.o.b. New York harbor shipping ports, with lower grades bringing \$2.65@2.75.

Trade in the far East is active and considerable coal is being absorbed. There does not seem to be as great an accumulation of tonnage as there is along the Sound. This is probably on account of better facilities for discharging and because the tonnage is better distributed.

Trade along the Sound is active and is taking large quantities of coal. Shipment to this territory is checked to some extent by accumulations awaiting discharge.

New York harbor market is soft, there being quite a little coal offered at this time and unabsorbed. All-rail trade is active and good prices are being procured at varying rates, according to quality, from \$1.25@1.50 f.o.b. mines being the price obtained for good grades of steam coal.

Transportation from mine to tide is very slow, coal taking from a week to ten days to run through to New York harbor shipping ports. Car supply has improved since the first of the year to a small extent. In the coastwise trade small ves-

sels are in fairly good supply. Freight rates from Philadelphia are as follows: To Boston, Salem and Portland, 95c.@\$1; to the Sound, 85c.; all include the loading and discharging clause.

### Birmingham Jan. 14

Every ton of coal being mined in Alabama is in strong demand, with prices at a favorable point. The car situation shows a little improvement. The operators claim that the only drawback to the coal market is the transportation facilities. Almost the total output of the Alabama mines is for consumption in the State. There is some coal sent out and several carloads a day are exported to Mexico, but as a general proposition the coal is being consumed right in this district.

M. M. Kuffner, assistant State mine inspector, has tendered his resignation to the governor of the State, effective Jan. 31. His term of office does not expire until May. He has accepted a position as superintendent of mines with the Davis Creek Coal Company.

J. M. Gray, State mine inspector, is spending some time now in Montgomery with the legislature, seeking amendments to the mining laws of Alabama.

### Cleveland Jan. 15

The coal market has been easier all during the week, mainly as a result of the soft weather. The slackened pace of consumption has resulted in an accumulation in the yards of the consumers. This has brought about the customary condition where some of the shippers, having to get rid of material on hand, have sacrificed it rather than pay the car charges. The market is just a little easier. Mine-run Ohio coal is selling at \$1.15 at mines; No. 8 district coal at \$1.10, and Pennsylvania at \$1.15 at mines.

The short production of domestic lump and the absence of any material production of three-quarter coal, such as is normally shipped up the lakes, has resulted in a stiffening of the demand for slack. Ohio is now worth about \$1.10 at mines and Pennsylvania slack is a little higher at 90@95c. at mines.

The demand for the strictly domestic coals is easy enough to permit shippers to get ahead of their orders. The prices have not changed, general selected Massillon lump being quoted at \$2.30 at mines.

The coke market is steady. Most of the sales for the year have been made, and there is only a moderate demand at \$4@4.25 for the best grades of 72-hour foundry and \$3.50@3.60 for furnace coke.

### Indianapolis Jan. 12

The past week was perhaps the quietest midwinter week experienced in the Indiana coal industry for a number of years. The mild weather lessened demand at the mines and also aided the railroads to deliver the

consignments that were overdue. As a rule there is an advance in price of coal at the mines during the first week of the year, but none has been announced so far and none will be, unless a severe cold spell should stimulate the demand.

### Pittsburg Jan. 15

Coal—Some large annual contracts have been made within the past few days at prices ranging from \$1.15 to \$1.20 a ton for mine-run coal. These rates are from 20 to 25c. a ton higher than the prices named a year ago, before it was known that an advance in the mining rate would be enforced. For prompt shipment prices are somewhat lower than a week ago and are on the basis of \$1.20 to \$1.30 for mine-run. There is a better car supply and the majority of the railroad mines are in operation. The river mines are running full and energetic efforts are being made to load a large tonnage to be sent to lower ports in a few days. The rivers are at flood stage and when the waters recede will be navigable for several days. The Pittsburg district miners' convention closed on Saturday. Francis Feehan was re-elected president.

Connellsville Coke—The coke market continues strong with prices about the same as a week ago. Furnace coke for prompt and February shipment is quoted at \$3.40@3.50; for the first half at \$3.25 @3.35 and for all year at \$3@3.10. Foundry coke for the first six months is quoted at \$4@4.25 and for deliveries extending through the year at \$3.85@4. The Courier reports the production in the Connellsville region for the week at 292,189 tons and in the lower region at 118,747 tons. The shipments aggregated 14,905 cars distributed as follows: To Pittsburg, 4786 cars; to points west of Pittsburg, 8357 cars; to points east of Connellsville, 1852 cars.

## Foreign Coal Trade

Jan. 16

Imports of fuel into France for the 11 months ending Nov. 30 were, in metric tons:

	1905.	1906.	Changes.
Coal.....	9,393,630	13,165,820	I. 3,772,190
Coke.....	1,460,190	2,062,200	I. 602,010
Briquets.....	359,420	508,580	I. 149,160
Total.....	11,213,240	15,736,600	I. 4,523,360

The imports were chiefly from Great Britain, Germany and Belgium. Exports from France for the 11 months were, in metric tons:

	1905.	1906.	Changes.
Coal.....	1,379,090	1,133,070	D. 246,020
Coke.....	217,820	156,740	D. 61,080
Briquets.....	54,870	32,680	D. 22,190
Total exports..	1,651,780	1,322,490	D. 329,290
Steamer coal.....	127,040	187,190	I. 60,150
Total.....	1,778,820	1,509,680	D. 269,140

The fuel bunkered, or furnished to steamships, in 1906 included 103,150 tons of coal and 84,040 tons of briquets. The exports were largely to Switzerland and Italy.

## Iron Trade Review

NEW YORK, Jan. 16

A heavy movement to buy pig iron for second-half delivery seems to have started. Consumers seem to have recovered from the slight uncertainty which marked the turn of the year, and to have made up their minds that it is safer to secure their supplies than to wait possible developments. Spot iron is practically out of the market for the time being.

In finished material new buying has not been heavy. Some contracts are being placed, but only of moderate size. A little rest is not unwelcome to most mills, giving them a chance to catch up on contracts. The structural market especially has been quiet.

Lake Iron Ore Movement—The figures compiled from the dock reports by the *Marine Review*, of Cleveland, O., show that in the season of 1906 a total of 85.5 per cent. of the iron ore shipped by water from Lake Superior mines reached the furnaces through Lake Erie ports. Receipts at those ports for the season were, in long tons:

Ports.	1905.	1906.	Changes.
Toledo.....	1,006,855	1,423,741	I. 416,886
Sandusky.....	51,202	35,847	D. 15,355
Huron.....	825,278	778,453	D. 46,825
Lorain.....	1,605,823	2,191,965	I. 586,142
Cleveland.....	5,854,745	6,604,661	I. 749,916
Fairport.....	2,008,621	1,861,498	D. 147,123
Ashtabula.....	6,373,779	6,833,362	I. 459,573
Conneaut.....	5,327,552	5,432,370	I. 104,818
Erie.....	2,112,476	1,986,539	D. 125,937
Buffalo.....	3,774,928	4,928,331	I. 1,153,403
Total.....	28,941,259	32,076,757	I. 3,135,498

Buffalo, which includes Tonawanda, shows the largest gain, and is now the fourth port in order of receipts. Ashtabula was the leading port, followed by Cleveland and Conneaut.

The stocks reported on docks at Lake Erie ports on Dec. 1 were, in long tons:

Ports.	1905.	1906.	Changes.
Toledo.....	368,024	281,000	D. 87,024
Sandusky.....	52,977	17,467	D. 35,510
Huron.....	208,023	245,499	I. 37,476
Lorain.....	271,695	336,321	I. 64,626
Cleveland.....	1,330,619	1,224,606	D. 106,013
Fairport.....	759,961	590,783	D. 169,178
Ashtabula.....	1,589,951	1,631,312	I. 41,361
Conneaut.....	976,976	1,057,424	I. 80,448
Erie.....	564,961	552,631	D. 12,330
Buffalo.....	315,780	315,412	D. 368
Total.....	6,438,967	6,252,455	D. 186,512

The stocks on docks make a fair showing. It is believed that stocks at furnaces are generally good.

The total shipments of lake ore by water for the season were 37,513,595 long tons. Receipts at Lake Erie ports, as shown above, were 32,076,757 tons. The balance of 5,436,838 tons is accounted for by deliveries at other points, such as South Chicago, Milwaukee and Detroit. The season movement to furnaces through the Lake Erie ports is figured as follows:

Stocks on docks, May 1.....	1,791,090
Receipts at docks.....	32,076,757
Total.....	33,867,847
Stocks on docks, Dec. 1.....	6,252,455
Delivered to furnaces.....	27,615,392

This is an average of 3,945,056 tons per month delivered to furnaces through the



season. An unusual proportion of the ore received last season was loaded direct on cars, and did not go into the dock pockets at all. It is certain that the dock stocks will be drawn down to a low point by May next.

### Baltimore Jan. 15

Among the exports for the week were 2489 tons steel rails to Havana and 1416 tons to Buenos Aires.

Imports included 3750 tons spiegeleisen, 772 tons ferro-manganese and 330 tons chrome iron. Arrivals of iron ore were one cargo, 5800 tons, from Cuba, and one cargo, 3850 tons, from Beni-saf, Algeria.

### Birmingham Jan. 14

Alabama manufacturers of pig iron are selling their product right along for delivery during the latter half of the year. Quotations are strong. Spot iron is very scarce, that is, for delivery during the first three months of the year. Such iron is bringing \$23.50@24.50 easily, with but little to be had. Second-quarter iron is not plentiful either. This sells at \$20@21 per ton, No. 2 foundry. Last-half iron is bringing \$18.50@19 per ton, No. 2 foundry. The manufacturers in this district are making effort to increase production, the raw-material supplies being the condition to this end. Transportation facilities are responsible for the curtailed raw-material supply.

Much iron is being shipped out of the Birmingham district and from the Southern territory right now, that is, compared to what was sent out during November and December. The car situation is improving, as northern and western railroads are sending a number of cars this way. However, while some relief is noted, the car situation is far from being entirely satisfactory. The traffic agents of the railroads, following a meeting held in Birmingham, announced that the advance of 25c. per ton would go into effect on all shipments made after Feb. 1. The manufacturers entered a protest to the advance on iron which accumulated by reasons of the car shortage.

The Tennessee Coal, Iron and Railroad Company will blow in Little Belle furnace at Bessemer in the next few days. Two other furnaces in this section should be ready for the torch in the next three weeks.

### Cleveland Jan. 15

**Iron Ore**—The principal interest in the iron-ore market for the week is the difficulty of the furnace interests to get the amount of iron they need out of the ore shipped down the lakes last season. Two weeks ago it was reported the iron-ore producers were paying rebates to the furnace interests, in some instances. It now proves that these payments are almost universal. It has been the case for sev-

eral years that furnace interests have had to pay bonuses, because the ore exceeded the analysis, it being an exception rather than the rule, where the ore fell below the guaranteed content. The present situation seems to be a reverse of that formerly seen. The slight falling off in dock stocks indicates that there is probably less iron for use during this winter than for the winter of 1905-6, as the amounts on furnace stock-piles are no greater now than then. There is hardly any possibility, however, the stocks will be exhausted before the new supply begins to appear.

**Pig Iron**—Resumption of the buying movement in pig iron for second-half delivery removes all possibility of a slump in the price for the time being. There are three elements of uncertainty in the market—the crops, the money situation and the ability of users of finished material to use steel on the basis of prices indicated by the present price of raw material. Aside from these things and looking at the market from the standpoint, purely, of buying orders, the market is firmly established on the present level, or higher, for the remainder of this year. Reports of an easier tone in basic are due to the efforts of some consumers to bear prices that they might cover needs for the first half of this year. Foundry iron for spot shipment is almost out of the question. There will not be any import iron available at seaboard for another two weeks. Domestic furnaces are sold up. Small lots are selling on the basis of \$25 at the furnace, with a few sales at \$24.75. Southern iron is held at \$23, Birmingham, but sales are difficult, owing to the congested condition of the furnaces and the scarcity of cars. For second-half delivery foundry prices have stiffened to \$22@22.50 at the furnace. Basic is selling on the same basis, and some Bessemer is also being sold at the same price for delivery during the last half.

**Finished Material**—About the only interest in finished material is the possible influence of raw material prices upon current values and the effect upon the trade. The center of interest is consequently the billet trade, which appears to be a little easier as to deliveries if not as to price. Re-rolling billets are obtained without much difficulty, although the market is stiff. In other things specifications against contracts are heavy, amounting to anticipation of contract provisions.

### Philadelphia Jan. 16

**Pig Iron**—The booking of a good many orders for work by mills, foundries, machine shops and establishments of all kinds accounts for the latest upheaval of orders for crude iron in the face of advancing prices. The only explanation given by some of our people who have bought within a few days is that they have the work to do, and they must have iron to do it with. The activity covers all

lines of crude iron, although basic leads; but it is impossible to obtain any specific information to cover this point. The foundries are starting out with their books filled with orders and more business is coming along. The smaller shops are also well sold up. The inquiries for all kinds of material into which iron and steel enter are accumulating, and it is clear that we are going to have a more active season. For these and other reasons pig iron is now being sought for and it is believed that the maximum limit of price has not been reached. Quotations for No. 1 X foundry are \$26@26.50; No. 2 X \$24@24.50; No. 2 plain \$23.50; gray forge \$22.50; basic \$24; Middlesboro No. 3, on dock, \$23.

**Steel Billets**—There is a difficulty in obtaining prompt delivery on recent inquiries for steel billets. Some buyers have permitted their stocks to run rather low, and they are now aroused to the necessity of contracting. Some of the larger consumers who have been following the custom of ordering far ahead are also in the market for the purpose of placing orders.

**Bars**—A revival of demand has set in, for practically the same reasons that have put about such activity in pig iron. A great deal of work is coming to the bar mills and there is still more in sight. For this reason consumers of iron and steel bars are deeming prudence to be the better part of valor and are in the market this week.

**Sheets**—Practically the same conditions are developing in the sheet industry, as is indicated this week in orders for the earliest possible delivery. The sheet people say that some of the larger consumers have been asking for a reservation of mill capacity in their favor, which they will guarantee to take up just as soon as they can see a little farther ahead.

**Pipes and Tubes**—The demand for merchant pipe, very urgent in this territory, is fair and for tubes the consumption exceeds all records. Prices have advanced and orders are rushing in.

**Plates**—The smaller buyers have been very active within the past week, covering some recent business. There are inquiries from some of the older customers who buy in a large way.

**Structural Material**—Railroad companies have recently resolved upon further improvements in bridge work and the structural mill people say that orders will soon be forthcoming. The capacity is so oversold that manufacturers are entirely indifferent as to whether they secure any business for several weeks to come. Local building requirements are coming up and material will be wanted for these purposes for spring delivery.

**Steel Rails**—The rail makers say that there is an abundance of business to be had by simply indicating to buyers that they are ready to accept it. There is a

good deal of business in sight for sections suitable for lumber and mine roads.

**Scrap**—The scrap market is very strong in all directions and No. 1 steel scrap and wrought railroad scrap are being taken as fast as can be furnished.

### Pittsburg Jan. 15

One of the unexpected features of the week, which showed the strength of the tin-plate market, developed at the bi-monthly examination of the sales sheets of the American Sheet and Tin-plate Company yesterday, under the terms of the wage scale of the Amalgamated Association. The examination showed an average of the shipments in November and December to have been at \$3.50 a box, or 10c. a box above the base of the scale, and the workers employed in the union mills of the country will receive an advance in wages of 2 per cent. This is the first advance warranted by the sales for over six years and indicates that most of the low-price contracts taken early last year are filled. It was announced that another advance will be granted, and probably will be higher, when the next bi-monthly adjustment is made in March. The established price of \$3.90 a box for tin-plate is being well maintained and conditions are excellent. Mills were unable to accumulate stocks during the fall and winter months, owing to the great demand, and have business on the books that will keep them going for several months. It will be necessary to increase capacity to provide for the requirements of the spring trade.

The bi-monthly examination of the sales sheets in the bar-iron and sheet branches was not as favorable for the puddlers and finishers and the sheet workers. The average for iron bars was 1.50c., due to the filling of contracts taken by the Republic Iron and Steel Company at low prices, but since the first of the year the rate of 1.80c. has been strictly maintained. The price of sheets has been advanced since the last adjustment, but the average this time was not sufficient to permit an advance. It is expected that the workers will get an increase at the next settlement.

The whole market in finished products is decidedly strong and the mills are busy, but new contracts booked are light. Specifications continue heavy in all lines, particularly wire, wire products, plates and structural material. Rail business is light, the leading producer booking only a few thousand tons during the week. The Pennsylvania and Cambria companies continue to quote \$30 for standard bessemer-steel rails but are not being followed by other makers. It is believed these companies will sell at the established price of \$28 for second-half delivery but expect to get \$2 more for prompt deliveries. The merchant pipe mills are crowded with orders. The latest contract of importance

calls for 60 miles of 16-in. pipe for a gas line.

**Pig Iron**—A pig-iron buying movement, that may become general in a few days, opened last week. Sales to date aggregate over 80,000 tons, the bulk of which is for second-half delivery. The leading independent interest today closed contracts for basic and malleable bessemer iron aggregating 10,000 tons, standard bessemer, 4,000 tons and gray forge, 2,000 tons. The forge is for first-half delivery and was at \$22.25, Pittsburg, and the other was for deliveries beginning in February and extending through the year. The second-half basic and bessemer was at \$21.50, Valley furnaces, and for first half the standard bessemer was at \$23, and the malleable and basic at \$22. Late last week sales of bessemer and basic amounted to 35,000 tons, of which 20,000 tons was bessemer. The business was divided between the leading independent producer and the Bessemer Pig Iron Association, the latter looking 11,500 tons. The iron is for second-half delivery and was at the uniform price of \$21.50, Valley furnaces, the same rate at which several contracts were closed for No. 2 foundry iron. The Westinghouse Air Brake Company has closed contracts for over 25,000 tons of foundry iron for the last half, some of which is Southern iron. The Northern iron was at \$22.35, delivered, and is for shipment in the last half.

**Steel**—Billets are still scarce and prices asked continue high. For bessemer billets \$29.50@30 is quoted and for open-hearth \$32.50@33. Plates remain at 1.70c. and merchant steel bars are firm at 1.60 cents.

**Sheets**—There is no change in the market except that the demand for galvanized sheets is stronger and, owing to the high price of spelter, an advance may be ordered. Black sheets continue at 2.60c. and galvanized at 3.65c. for No. 28 gage.

**Ferro-Manganese**—There is but little change in the market, and \$81 to \$82 is quoted for prompt and from \$78 to \$80 for future delivery.

### Cartagena, Spain Dec. 29

**Iron and Manganiferous Ores**—Messrs. Barrington & Holt report that shipments for the week were nine cargoes, 28,950 tons dry ore, all to Great Britain. The Christmas holidays and wet weather have considerably interrupted business, and the mines will not be fully working until after the New Year. As shown above, shipments have been considerable, and the port is full of steamers waiting turn to load. Prices for iron and manganiferous ore are practically nominal, new business being much restricted, owing to miners and producers nearly all having sufficient orders in hand to keep them fully occupied for the next quarter or longer.

Quotations are, for iron ore, f.o.b.

shipping port: Ordinary 50 per cent. ore, 9s. 9d.@10s.; special low phosphorus, 10s. 3d.@10s. 6d.; specular ore, 58 per cent., 13s.; S. P. Campanil, 11s. 6d. Manganiferous ores, same terms, are 14s. 6d. for 35 per cent. iron and 12 per cent. manganese; no higher grades offered.

**Pyrites**—Iron pyrites, 40 per cent. iron and 43 sulphur, are quoted at 11s. 6d. per ton.

### Dusseldorf, Germany Jan. 2

The German Iron and Steel Union reports the output of the German blast furnaces in November at 1,061,572 tons of pig iron. This is a decrease of 12,302 tons from October; but there was an increase in the daily average, that for October being 34,641 tons, while that for November was 35,386 tons. For the 11 months ending Nov. 30 the total output was, in metric tons:

	1905.		1906.	
	Tons.	Per Ct.	Tons.	Per Ct.
Foundry iron.....	1,728,835	17.3	1,928,417	16.9
Forge iron.....	744,522	7.5	786,752	6.9
Steel pig.....	636,826	6.4	862,983	7.6
Bessemer pig.....	386,804	3.9	439,987	3.8
Thomas pig.....	6,461,552	64.9	7,390,290	64.8
Total.....	9,958,539	100.0	11,408,429	100.0

The increases in 1906 were: Foundry iron, 199,582; forge iron, 42,230; steel pig—which includes spiegeleisen, ferro-manganese, ferro-silicon and all similar alloys—226,157; bessemer pig, 53,183; Thomas, or basic pig, 928,738; the total gain being 1,449,890 tons, or 14.6 per cent.

## Metal Market

NEW YORK, Jan. 16

### Gold and Silver Exports and Imports.

At all United States Ports in November and year.

Metal.	Exports.	Imports.	Excess.
<b>Gold:</b>			
Nov. 1906...	\$1,963,757	\$ 8,934,958	Imp. \$6,971,201
" 1905 ..	1,137,318	5,202,790	" 4,065,472
Year 1906..	44,831,203	147,961,827	" 103,130,624
" 1905 ..	44,125,935	40,264,524	" 2,138,589
<b>Silver:</b>			
Nov. 1906..	4,411,830	2,914,157	Exp. 1,497,673
" 1905 ..	5,361,819	4,306,838	" 1,054,981
" 1906 ..	53,400,246	39,790,748	" 13,609,498
" 1905 ..	49,316,953	31,246,389	" 18,070,564

These statements cover the total movement of gold and silver to and from the United States. These figures are furnished by the Bureau of Statistics of the Department of Commerce and Labor.

### Gold and Silver Movement, New York.

For week ending Jan. 12 and years from Jan. 1.

Period.	Gold.		Silver.	
	Exports.	Imports.	Exports.	Imports.
Week.....	\$ 210,815	\$ 40,832	\$659,615	\$ 80,543
1907.....	216,815	210,079	1,191,596	180,927
1906.....	534,000	60,568	4,878,053	61,810
1905.....	5,074,500	58,926	1,465,238	36,745

Exports of gold for the week were to the West Indies and South America; of silver to London. Imports for the week, both gold and silver, were from Mexico and Central America.

The joint statement of all the banks in the New York Clearing House for the week ending Jan. 12 shows loans, \$1,048,808,700, a decrease of \$858,800; deposits,



\$1,008,922,400, an increase of \$8,344,100, as compared with the preceding week. Reserve account shows:

	1906.	1907.
Specie.....	\$178,329,500	\$177,601,600
Legal tenders.....	83,780,700	83,269,700
Total.....	\$262,110,200	\$260,871,300
Surplus.....	\$12,808,650	\$8,640,700

The surplus over legal requirements shows an increase of \$8,492,875, as compared with the previous week.

Specie holdings of the leading banks of the world on Jan. 12 are reported as below, in dollars:

	Gold.	Silver.	Total.
Ass'd New York.....			\$177,601,000
England.....	\$158,270,000		158,270,000
France.....	531,476,000	\$197,776,800	729,252,800
Germany.....	135,535,000	45,180,000	180,715,000
Spain.....	77,140,000	120,930,000	198,070,000
Netherlands.....	27,682,500	28,877,000	56,559,500
Belgium.....	17,040,000	8,520,000	25,560,000
Italy.....	160,165,000	22,999,000	183,164,000
Russia.....	587,900,000	23,425,000	611,325,000
Aust.-Hungary.....	232,165,000	58,900,000	291,065,000
Sweden.....	19,980,000		19,980,000

The banks of England and Sweden report gold only. The New York banks do not separate gold and silver in their reports.

The movement of gold and silver in France for the 11 months ending Nov. 30 was as follows:

	1905.	1906.
Imports.....	Fr. 742,322,000	Fr. 419,241,000
Exports.....	129,118,000	127,829,000
Excess, imports....	Fr. 613,204,000	Fr. 291,412,000
Silver:		
Imports.....	92,971,000	141,164,000
Exports.....	64,860,000	121,825,000
Excess, imports....	Fr. 28,111,000	Fr. 19,239,000

Imports of copper and nickel coins were 140,000 fr. in 1905 and 113,000 fr. in 1906. Exports were 292,000 fr. in 1905, and 200,000 fr. last year.

Shipments of silver from London to the East are reported by Pixley & Abell as follows, for the year to Jan. 3:

	1905.	1906.	Changes.
India.....	£ 363,000		D. £ 363,000
China.....			
Straits.....			
Total.....	£ 363,000		D. £ 363,000

Imports for the three days were £9000 in Mexican dollars from New York.

Indian exchange continues firm, and all the Council bills offered in London were taken at an average of 16.09d. per rupee. Shipments of silver to India have been light.

SILVER AND STERLING EXCHANGE.

January.	Sterling Exchange.	Silver.		January.	Sterling Exchange.	Silver.	
		New York, Cents.	London, Pence.			New York, Cents.	London, Pence.
10	4.84½	68½	31½	14	4.85	68½	31½
11	4.84½	68½	31½	15	4.85	68½	31½
12	4.84½	68½	31½	16	4.85½	68½	31½

New York quotations are for fine silver, per ounce Troy. London prices are for sterling silver, 0.925 fine.

Prices of Foreign Coins

	Bid.	Asked
Mexican dollars.....	\$0.53	\$0.55
Peruvian soles and Chilean.....	0.47½	0.49
Victoria sovereigns.....	4.85½	4.87½
Twenty francs.....	3.86	3.89
Spanish 25 pesetas.....	4.78	4.80

Other Metals

Daily Prices of Metals in New York.

January.	Copper.			Tin.	Lead.	Spelter.	
	Lake, Cts. per lb.	Electrolytic, Cts. per lb.	London, £ per ton.			Cts. per lb.	Cts. per lb.
	24½	24	107½	41½	6.00	6.70	6.55
10	@25	@24½				@6.75	@6.60
	24½	24				6.70	6.55
11	@25	@24½	108½	41½	6.00	@6.75	@6.60
	24½	24				6.70	6.55
12	@25	@24½		41½	6.00	@6.75	@6.60
	24½	24				6.70	6.55
14	@25	@24½	108½	41½	6.00	@6.75	@6.60
	24½	24				6.70	6.55
15	@25	@24½	108½	41½	6.00	@6.75	@6.60
	24½	24				6.70	6.55
16	@25	@24½	108½	41½	6.00	@6.75	@6.60

London quotations are per long ton (2240 lb.) standard copper, which is now the equivalent of the former g.m.b.s. The New York quotations for electrolytic copper are for cakes, ingots or wirebars, and represent the bulk of the transactions as made with consumers, basis, New York, cash. The price of cathodes is 0.125c. below that of electrolytic. The lead prices are those quoted by the American Smelting and Refining Company for near-by shipments of desilverized lead in 50-ton lots, or larger. The quotation on spelter are for ordinary western brands; special brands command a premium.

**Copper**—The market continues exceedingly quiet. The undertone remains as firm as ever, and on account of the shortage of supplies every sale that is being consummated makes an impression on prices, which are constantly advancing. The close is quoted at 24½@25c. for lake copper; 24¼@24¾c. for electrolytic in ingots, cakes and wire bars; quotations for casting are nominal at 24⅞@24¾c.

The London standard market remains very firm and closes at £108 2s. 6d. for spot, £108 12s. 6d. for three months'.

Statistics for the first half of the current month show an increase in the visible supplies of 500 tons.

Refined and manufactured sorts we quote: English tough, £109; best selected, £114; strong sheets, £140@150.

Exports of copper from New York for the week were 2127 long tons. Our special correspondent reports the exports from Baltimore at 526 tons of copper.

**Copper Sheets**—The base price of copper sheets is 30c. per lb. This price is subject to change without notice.

**Tin**—No change in the attitude of buyers is noticeable, and transactions in this metal have not increased to any extent. Everybody seems to be waiting for a lower market before entering into larger commitments. The close is weak at 41¼.

The London market has remained steady on a lower basis, and the close is cabled as £188 15s. for spot, £189 15s. for three months'.

**Lead**—The quotation remains unchanged at 6c. New York.

London reports a firm market, and the close is cabled as £19 17s. 6d. for Spanish lead, £20 for English lead.

The movement of foreign lead in the United States for the 11 months ending Nov. 30 is reported as follows, in short tons:

In bond, Jan. 1.....	8,148
Imports, 11 months.....	77,011
Total supplies.....	85,159
Re-exports, 11 months.....	44,444
In bond, Nov. 30.....	3,909
Total deductions.....	48,353
Balance.....	36,806

This balance has, presumably, entered into consumption in the United States.

**St. Louis Lead Market**—The John Wahl Commission Company telegraphs under date of Jan. 16 as follows: Lead is firm at 6.07½@6.10c. for Missouri brands.

**Spanish Lead Market**—Messrs. Barrington & Holt report from Cartagena, Spain, under date of Dec. 29, that the price of pig lead has been 91.75 reales per quintal, equal, on current exchange, to £18 13s. 7d. per long ton, f.o.b. Cartagena. Silver is 14 reales per ounce; exchange 27.49 pesetas to £1. Shipments for the week were 144 tons argentiferous and 66 tons desilverized lead to Marseilles.

**Spelter**—Business in this metal has been very satisfactory, and the shortage of near-by supplies has become more pronounced. For this reason the market retains its firm tone and closes at 6.70@6.75 New York, 6.55@6.60 St. Louis.

In the London market spelter has been pressed for sale, and lower prices are the consequence. The market over there closes weak at £27 for good ordinaries, £27 5s. for specials.

**Zinc Sheets**—The base price is \$8.40 per 100 lb. (less discount of 8 per cent.) f.o.b. cars at Lasalle and Peru, in 600-lb. case for gages No. 9 to 22, both inclusive; widths from 32 to 60 in., both inclusive; the lengths from 84 to 96 in., both inclusive. The freight rate to New York is 27.5c. per 100 pounds.

**Antimony**—There is no material change. Quotations are 25¾@26¼ for Cookson's; 25@25¾ for Hallett's; and 24@24½ for ordinaries. The market is from 1@1½c. below the import price, due to selling by dealers who bought considerably below the present prices and who are willing to dispose of their holdings. The market abroad is strong, and higher prices are looked for.

**Platinum**—Demand continues strong and prices high, with an upward tendency. Unmanufactured platinum is quoted at \$38 per oz. For good scrap \$31@31.50 is paid.

**Nickel**—For large lots, New York or

other parallel delivery, the chief producer quotes 45@50c. per lb., according to size and terms of order. For small quantities prices are 50@65c., same delivery.

**Quicksilver**—There is no change. New York prices are \$40.50@42 per flask of 75 lb., according to size and conditions of order. San Francisco prices are \$39@40 per flask for domestic orders, and \$37@38 for export trade. The London quotation is £7 per flask, with £6 18s. 9d. asked by jobbers.

**Aluminum**—Prices are steady and demand good. Prices for ton lots, or over, are: No. 1, over 99 per cent. pure metal, 30c. per lb.; No. 2, over 90 per cent., 34c. Small lots are 1 to 3c. higher, according to size. Rods, according to size, are 1c. per lb. up, over the price of ingots. Granulated metal is 2c. per lb. over ingots.

**Wisconsin Ore Market**

PLATTEVILLE, Jan. 12

The shut-down during the holidays curtailed the tonnage output to quite a considerable extent. Sixty per cent. ore sold at \$47. A few choice lots brought as high as \$50 per ton. There has been no decided improvement in the car shortage during the past week. The leading buyers showed a little more interest and a slight advance is looked for the coming week. Lead sold at \$82@90 per ton. Sulphur and drybone same as last week.

The camps of the district loaded are as follows for the week ending Jan. 12, 1907:

Camps.	Zinc, Lb.	Lead, Lb.	Sulphur Lb.
Platteville .....	320,160	40,750	...
Cuba City .....	278,360	36,000	...
Benton .....	237,180	...	...
Rewey .....	140,000	...	...
Buncombe-Hazel Green..	96,000	...	...
Galena .....	64,000	...	...
Livingston .....	53,000	...	...
<b>Total for week .....</b>	<b>1,188,700</b>	<b>76,750</b>	<b>.....</b>
<b>Year to Jan. 12 .....</b>	<b>1,980,940</b>	<b>136,750</b>	<b>.....</b>

Nothing of unusual interest occurred during the current week. Two new mills were started, but will not be in a shipping condition for several weeks.

Ore shipments from the Platteville district for the closing week in December were 1,234,785 lb. zinc ore, 95,000 lb. lead ore and 41,250 lb. sulphur ore, or pyrites. This makes the total for 1906, as specially reported to the JOURNAL, 78,703,585 lb. zinc ore, 3,756,535 lb. lead ore, and 4,130,160 lb. sulphur ore. This makes a total of 43,295 tons of all kinds.

**Missouri Ore Market**

JOPLIN, Jan. 12

The highest price paid for zinc was \$50.50 per ton, on an assay basis ranging from \$45 to \$48 per ton of 60 per cent. zinc, showing an average, all grades, of \$45.78 per ton.

The highest price paid for lead was \$87 per ton, with medium grades selling at \$83@86, and an average of \$82.34, all grades.

Although both minerals show a decrease in the shipment, compared with the previous week, occasioned by the car situation, the demand was very brisk and purchases were even made ahead of the output. During the past four weeks the Caney Zinc Company has developed a desire to purchase quantities of the highest grade zinc concentrate, an innovation for this company, and its purchasing agent has been treading on the toes of the buyers for all the smelters handling the best grade concentrate. As it is not considered good policy to raise prices too high with open weather at this time of year, there is lively skirmishing to fill orders for the high-grade ores. The Matthieson & Hegeler buyers are setting the price each week, which the Caney company must pay to obtain the best grades.

Renewed activity developed during the week in lead concentrates, with the Granby Mining and Smelting Company leading in the effort for an increased tonnage, and the Picher Lead Company playing a close second. It is understood that the St. Louis company made no advances in price, accepting as its share what ore came to it at last week's quotations.

Following are the shipments of zinc and lead concentrate from the various camps of the district for the week ending today:

	Zinc, lb.	Lead, lb.	Value
Webb City-Carterville.	2,072,710	494,360	\$69,471
Joplin .....	2,435,730	260,110	68,686
Alba-Neck City .....	1,370,620	.....	33,580
Galena-Empire .....	1,139,650	98,660	30,354
Duenweg .....	780,280	115,620	23,192
Badger .....	671,890	6,110	16,707
Oronogo .....	529,880	51,940	14,653
Prosperity .....	405,390	96,600	13,583
Aurora .....	593,290	26,370	14,404
Spurgeon .....	332,140	71,820	9,340
Granby .....	240,000	100,000	7,300
Baxter Springs .....	202,580	.....	4,380
Sherwood .....	74,470	29,110	2,935
Carl Junction .....	43,060	6,030	1,243
Zincite .....	51,680	.....	1,240
Wentworth .....	27,420	.....	620
<b>Totals .....</b>	<b>11,088,790</b>	<b>1,356,730</b>	<b>\$310,688</b>

Two weeks this year .....	22,259,370	2,061,230	632,850
Two weeks last year .....	21,091,540	2,309,840	578,425
Increase .....	1,167,830	671,390	54,425
Zinc value, this week .....	\$253,823	two weeks, \$508,575	
Lead value, the week .....	56,865	two weeks, 124,275	

The following table shows the average monthly prices of zinc and lead ores in Joplin, by months; the average for zinc being based on the prices of assay basis ores carrying 60 per cent. zinc.

ZINC ORE AT JOPLIN.			LEAD ORE AT JOPLIN.		
Month.	1905.	1906.	Month.	1905.	1906.
January...	52.00	47.38	January...	61.50	75.20
February...	52.77	47.37	February...	57.62	72.83
March.....	47.40	42.68	March.....	57.20	73.73
April.....	42.88	44.63	April.....	58.00	75.13
May.....	43.31	40.51	May.....	58.27	78.40
June.....	40.75	43.83	June.....	57.80	80.96
July.....	43.00	43.25	July.....	58.00	74.31
August....	48.83	43.56	August....	58.00	75.36
September.	46.75	42.59	September.	63.50	79.64
October...	47.50	41.55	October...	63.86	79.84
November..	49.55	44.13	November..	68.07	81.98
December..	49.00	43.68	December..	76.25	81.89
<b>Year.....</b>	<b>44.88</b>	<b>43.24</b>	<b>Year.....</b>	<b>62.12</b>	<b>77.40</b>

**Chemicals**

NEW YORK, Jan. 16.

**Copper Sulphate**—The market is firm with steady demand and no change is evident. Prices are unchanged at \$7.25 per 100 lb. for carload lots, and \$7.50 for smaller parcels.

**Nitrate of Soda**—The nitrate position for the past year is given as follows, in long tons:

	1905.	1906.	Changes.
Exports from W. Coast, S. America.....	1,627,000	1,720,000	I. 93,000
Deliveries .....	1,567,000	1,642,000	I. 75,000
<b>Surplus .....</b>	<b>60,000</b>	<b>78,000</b>	<b>I. 18,000</b>

The estimated deliveries are: To United States, 355,000; Great Britain, 107,000; European Continent, 1,140,000; other countries, 40,000; total 1906 deliveries, 1,642,000 tons. The combination is preparing for exports of 1,875,000 tons during the present year.

**Mining Stocks**

NEW YORK, Jan. 16

The general condition of the stock markets is uncertain still. The markets are being fed with huge blocks of new securities, and it begins to look as if a period of congestion, like that of a few years ago, was approaching. Speculation is halting, and depends on small fluctuations for the time being. The markets depend chiefly upon large operators.

While this is the case in the general market, there is a decided boom on in mining stocks, which is showing itself on opposite sides of the continent. The Boston exchange is wild over copper stocks; prices have risen rapidly, and there is a greater excitement than has been known for years. San Francisco is in much the same condition, the boom there being in the new southern Nevada stocks.

The New York market does not reflect this condition to any considerable extent, though there is more interest in mining stocks than for a long time past. Still, it is rather reflected than original.

The Amalgamated Copper directors will meet tomorrow, and decide on the rate of dividend for the quarter. As usual, there is much speculation about it; but it is impossible to forecast their action.

Boston Jan. 15

There has been one of the broadest and most active markets ever witnessed in this city for mining shares since the first of the year. Old standards have been put aside and new ones are stepping in. High records have been pushed away and new ones made. Stocks are being absorbed as never before and it would seem as if the end was not in sight. Combinations are the order of the day, and if one can believe all he hears, everything in the Lake Superior copper-mining district is to be



combined except the Calumet & Hecla. The advance in the market price of specialties the past week has been phenomenal and until today there seemed no limit to their flight. A moderate reaction was brought about in the late trading today, and this condition will be healthful indeed.

It is apparent that there has been steady buying of the best class of copper stocks and free selling of Amalgamated. From this it is judged that the various companies will be taken over by the Amalgamated Company and the latter's stock issued in exchange. Copper Range, Osceola, Tamarack, Allouez, Isle Royale, Centennial, Mohawk, Ahmeek, Seneca, Quincy, Arcadian, La Salle and a few others are the names conjured with at present as being parties in the combination to be taken over by the \$100,000,000 Ojibway Copper Company, a holding one. Already the combination has purchased land from the Union Copper, Land and Mining Company for its future development.

Calumet & Hecla made its newest high record today at \$960, being up \$60 for the week. Copper Range in a great burst of speed touched \$105, its best price on record, with almost a \$10 setback in 24 hours. The closing a week ago was about \$86. Tamarack rushed up \$39 to \$170, reacting \$8; Osceola \$7 to \$166, a record, reacting \$4; Quincy \$12 to \$126, reacting \$6; Allouez \$5.25 to \$74.25, a record, reacting to \$70; Isle Royale \$6.50 to \$36, reacting \$2.50; Mohawk \$13.25 to \$97, a record, reacting \$7; Ahmeek \$120, a record, and Seneca \$100, a record also. The last two are curb stocks, as is La Salle, the new one, which has sold at from \$23.62½ to \$24.62½. Amalgamated went up \$1.75 in the meantime to \$120.62½, reacting to \$118.50.

Other mining shares have risen in sympathy and the curb almost bulged out with the enormous trading there.

Trinity quieted down during the week, but began a new lease of activity Monday and today. The price today went to \$35.50, reacting \$1 from this, a net advance of over \$2 for the week. Arcadian took a dip to \$10, but is up to \$14.50 today. Calumet & Arizona rose \$5.50 to \$184, reacting \$3 today, and North Butte rose \$2 to \$120, with reaction to \$117. Butte Coalition rose \$2 to \$39, losing over one-half the gain. Old Dominion spurted \$3.50 to \$59.50, reacting \$2, and Parrot sold up \$3 to \$35, losing \$2 of it. Shannon made its price today at \$22.25, being up \$1.75 for the week.

Tecumseh has been stricken from the list, as a majority of its shares have been turned over for La Salle, three shares for four of the latter. Utah made its best record price Monday at \$79, but yielded to \$73.75 today, which is a net gain of \$7.50 for the week. Bingham rose \$2.50 to \$37, losing all of it. Adventure sold below \$5. A call for a 50c. assessment has been made, payable Feb. 5. This is the second instalment of a \$1 assessment

originally payable July 16, but later deferred. Michigan touched \$24.25, Franklin \$28.50, Boston Consolidated \$33.25 and Winona \$13.62½.

On the curb Davis-Daly has been a feature, with sales above \$19, and Raven has advanced to \$1.75. Majestic rose to \$4.62½, Keweenaw to \$16 and East Butte to \$18 per share.

Colorado Springs Jan. 11

In contrast with last week the market has been quite active on the local exchange. There has been a general decline in the whole market, owing to the heavy selling. Work was the feature of the market, selling from 20¼ down to 13½, and recovering on the call today to 18, with sales of over 71,000 shares for the week.

Elkton has also been a heavy trader, but its running mate El Paso has been less active and inclined to be weak. Aca-cia and Isabella were among the active traders on today's call.

San Francisco Jan. 10

There are very lively times in the mining-stock market in San Francisco these days, the volume of sales being almost unprecedented. Most of the transactions are in the stocks of the southern Nevada mines. Some days this week, after the board closed, the brokers continued trading on the sidewalks in the rain for a couple of hours. Generally speaking, the stocks have advanced of late, especially those of Goldfield. The San Francisco Stock and Exchange Board nominated officers today to serve for the year, these being the old officials without exception. The list includes A. B. Ruggles, for president; Joseph King, for chairman; F. L. Hadley, for secretary, and Charles D. Laing, for treasurer. The election will be held next Monday. A large undertaking has been decided upon by the brokers. The president, A. B. Ruggles, has been authorized to communicate with some Eastern expert, who can assist the board to organize a clearing house, through which the daily transactions of stocks can be cleared just as bank clearings are handled. The San Francisco mining-stock stockbrokers have decided that the present system of conducting business, and the perplexities that attend time sales, must be superseded by more modern methods. One effect of the change will be to stop the present running about from office to office, to get stocks that have been dealt in among the brokers. This will be a great saving of time and the economy in expense will also be considerable.

In Grass Valley, the leading gold-producing camp of California, a stock board has been organized and commenced operations. It is found that the miners there seem to have plenty of money to invest in mining securities.

Monthly Average Prices of Metals

AVERAGE PRICE OF SILVER

Month.	New York.		London.	
	1905.	1906.	1905.	1906.
January.....	60.690	65.288	27.930	30.113
February.....	61.023	66.108	28.047	30.464
March.....	58.046	64.597	26.794	29.884
April.....	56.600	64.765	26.108	29.984
May.....	57.832	66.976	26.664	30.968
June.....	58.428	65.394	26.910	30.185
July.....	58.915	65.105	27.168	30.113
August.....	60.259	65.949	27.822	30.529
September.....	61.695	67.927	28.528	31.483
October.....	62.084	69.523	28.637	32.148
November.....	63.849	70.813	29.498	32.671
December.....	64.850	69.050	29.977	32.003
Year.....	60.352	66.791	27.839	30.868

The New York prices are in cents per fine ounce; the London quotation is in pence per standard ounce, 0.925 fine.

AVERAGE PRICES OF COPPER

	NEW YORK.				LONDON.	
	Electrolytic.		Lake.		1905.	1906.
	1905.	1906.	1905.	1906.		
Jan....	15.008	18.310	15.128	18.419	68.262	78.869
Feb....	15.011	17.869	15.136	18.116	67.968	78.147
March..	15.125	18.361	15.250	18.641	68.174	81.111
April..	14.920	18.375	15.045	18.688	67.017	84.798
May....	14.627	18.457	14.820	18.724	64.875	84.867
June..	14.673	18.442	14.813	18.719	65.881	83.994
July...	14.888	18.190	15.006	18.585	66.887	81.167
Aug...	15.664	18.880	15.725	18.706	69.530	88.864
Sept...	15.965	19.033	15.978	19.328	69.667	87.831
Oct....	16.279	21.203	16.332	21.722	71.406	97.269
Nov....	16.599	21.833	16.758	22.398	74.727	100.270
Dec....	18.328	22.885	18.398	23.350	78.993	105.226
Year..	15.590	19.278	15.699	19.616	69.465	87.282

New York prices are in cents per pound. Electrolytic quotations are for cakes, ingots or wire bars. The London prices are in pounds sterling, per long ton of 2240 lb., standard copper.

AVERAGE PRICE OF TIN AT NEW YORK

Month.	1905.	1906.	Month.	1905.	1906.
Jan.....	29.325	36.390	July.....	31.760	37.275
Feb.....	29.262	36.403	August....	32.866	40.606
March....	29.623	36.662	Sept.....	32.095	40.516
April.....	30.525	38.900	Oct.....	32.481	42.852
May.....	30.049	43.313	Nov.....	33.443	42.906
June.....	30.329	39.260	Dec.....	35.836	42.750
			Av. year.	31.358	39.819

Prices are in cents per pound.

AVERAGE PRICE OF LEAD, NEW YORK

Month.	1905.	1906.	Month.	1905.	1906.
Jan.....	4.552	5.600	July.....	4.524	5.750
Feb.....	4.450	5.464	Aug.....	4.655	5.750
March....	4.470	5.350	Sept.....	4.850	5.750
April.....	4.500	5.404	Oct.....	4.850	5.750
May.....	4.500	5.685	Nov.....	5.200	5.750
June.....	4.500	5.750	Dec.....	5.422	5.900
			Av., year.	4.707	5.657

Prices are in cents per pound. The London average for January, 1906, was \$16.850 per long ton; February, \$16.031; March, \$15.922; April, \$15.959; May, \$16.725; June, \$16.813; July, \$16.525; August, \$17.109; September, \$18.266; October, \$19.350; November, \$19.281; December, \$19.609; year, \$17.307.

AVERAGE PRICE OF SPELTER

Month.	New York.		St. Louis.		London.	
	1905.	1906.	1905.	1906.	1905.	1906.
Jan....	6.190	6.487	6.032	6.337	25.062	28.225
Feb....	6.139	6.075	5.989	5.924	24.594	25.844
Mar...	6.067	6.209	5.917	6.056	23.825	24.563
April..	5.817	6.078	5.667	5.931	23.813	25.781
May...	5.434	5.997	5.284	5.846	23.594	27.000
June..	5.190	6.096	5.040	5.948	23.875	27.728
July..	5.396	6.006	5.247	5.856	23.938	26.800
Aug...	5.706	6.027	5.556	5.878	24.675	26.938
Sept...	5.887	6.216	5.737	6.076	26.375	27.563
Oct....	6.087	6.222	5.934	6.060	28.225	28.075
Nov....	6.145	6.375	5.984	6.225	28.500	27.781
Dec....	6.522	6.593	6.374	6.443	28.719	27.938
Year.	5.822	6.198	5.730	6.048	25.433	27.020

New York and St. Louis prices are in cents per pound. The London prices are in pounds sterling per long ton (2240 lb.) good ordinary brands.

STOCK QUOTATIONS NEW YORK Week Jan. 12. Table with columns: Name of Company, High, Low, Clg., Sales. Lists various mining and industrial stocks.

NEW YORK INDUSTRIALS. Table with columns: Name of Company, High, Low, Clg., Sales. Lists industrial companies like Am. Agri. Chem., Am. Smelting & Ref., etc.

PHILADELPHIA Jan. 12. Table with columns: Name of Company, High, Low, Clg., Sales. Lists local Philadelphia stocks.

PITTSBURG Jan. 12. Table with columns: Name of Company, High, Low, Clg., Sales. Lists Pittsburgh area stocks.

St. Louis Jan. 12. Table with columns: Name of Company, High, Low, Clg., Sales. Lists St. Louis area stocks.

COLORADO SPRINGS Jan. 12. Table with columns: Name of Company, High, Low, Clg., Sales. Lists Colorado Springs area stocks.

BOSTON Jan. 12. Table with columns: Name of Company, High, Low, Clg., Sales. Lists Boston area stocks.

BOSTON CURB. Table with columns: Name of Company, High, Low, Clg., Sales. Lists over-the-counter stocks.

NEVADA MINING STOCKS Jan. 16 (Revised by Weir Bros. & Co., New York). Table with columns: Name of Company, High, Low, Last.

TONOPAH STOCKS. Table with columns: Name of Company, High, Low, Last. Lists Tonopah mining stocks.

GOLDFIELD STOCKS. Table with columns: Name of Company, High, Low, Last. Lists Goldfield mining stocks.

BULLFROG STOCKS. Table with columns: Name of Company, High, Low, Last. Lists Bullfrog mining stocks.

MANHATTAN STOCKS. Table with columns: Name of Company, High, Low, Last. Lists Manhattan stocks.

LONDON. (By Cable.) Jan. 16. Table with columns: Name of Company, High, Low, Last. Lists London market prices.

SAN FRANCISCO Jan. 9. Table with columns: Name of Company, High, Low, Clg., Sales. Lists San Francisco area stocks.

Table with columns: Name of Company, High, Low, Clg., Sales. Lists various stocks.

Table with columns: Name of Company, High, Low, Clg., Sales. Lists various stocks.

New Dividends. Table with columns: Company, Payable, Rate, Amt. Lists dividend information for various companies.

Assessments. Table with columns: Company, Delinq., Sale, Amt. Lists assessment information.

Table with columns: Company, Delinq., Sale, Amt. Lists various stocks and their details.