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THE PROPOSED issue of \$200,000,000 bonds by the United States Steel Corporation, to replace an equal amount of preferred stock, will have to be further postponed. It is announced that the New Jersey Court of Appeals will not render a decision in the case until the September term; and in the mean time the injunction issued by the Court of Chancery will stand. The postponement will work no serious harm, though it may interfere with the company's plans.



IN THESE days when both speed and accuracy are demanded in all analytical determinations, the suggestion made by a correspondent in another column deserves to be considered. If a slight change in the assay-ton customarily used in determining gold values will promote the assayer's convenience and save time, there is no reason why it should not be made. Our correspondent is an engineer who has had wide experience in examining mines, and is also a practical assayer; and we think his note will be appreciated by our readers.



THE SO-CALLED "gold-bearing" shales of Western Kansas have been made the subject of a careful examination by the United States Geological Survey, and an abstract of the report based on that examination is given on another page. It fully confirms the opinions heretofore expressed in the ENGINEERING AND MINING JOURNAL, that the precious metals do not exist in the shales in quantities sufficient to make their extraction economically possible. At best the values contained are found not to exceed a few cents per ton by assay. They are so small, in fact, that extraction on a large scale would be impossible; by any process. We do not think that the "Kansas gold-field" deserves any more attention; and it will probably receive little, except from those who have been unfortunately persuaded to put money into it.



IN A RECENT article we referred to the probable production of tin in China. In this connection it is interesting to find in the latest market circular of W. T. Sargent & Sons, of London, a statement that "some interest has been shown in Chinese tin, in which a fair business has been done for June and July shipments from China, at prices about £10 below that of Straits tin."

The tin thus referred to comes apparently from the province of Yunnan in China, but as usual with Chinese products there is some uncertainty with regard to it. It is not definitely known whether there has been a recent development in the production of the metal, or whether high prices have drawn out some stocks which had been gradually accumulated. Further information as to these shipments will be interesting.



THE MODERN practice of organizing security-holding companies, which is especially convenient for speculative purposes, has its disadvantages so far as the investing public is concerned. Buyers of stock are, in fact, entirely at the mercy of promoters of such companies, since it is very easy for the latter to conceal entirely the actual value of the assets upon which the stock is based. Thus, to take one instance out of many, a property bought for \$60,000 cash was

capitalized at \$5,000,000, and a round lot of this stock—say \$4,500,000—makes an imposing item in the list of assets of another company. For the average investor, who has not means of tracing out the intricacies of such transactions, it is impossible to form any idea whatever of the real value of the assets behind the stock offered him. He is too apt to be imposed upon by the array of big figures, and to accept them at their face value; only to find out their real value later by unhappy experience.



### MARKET CONDITIONS.

**Iron and Steel.**—The iron market conditions remain practically unchanged. The disturbing element in the pig iron market is the fuel question. The Eastern Pennsylvania furnaces which use mixed anthracite and coke have generally been forced to go out of blast or bank their fires, as anthracite is not to be had, and they cannot get additional coke enough to keep going. This stoppage of production, though comparatively small, is sufficient to be felt in a time of active demand like the present. The Alabama furnaces are generally getting into blast again since the settlement of the coal troubles. Steel is in better supply, and there is less pressure for billets, or rather a better supply. In finished material the demand for structural steel continues to be the feature, and much bridge and building work is delayed by failure to secure the steel.

**Copper.**—The copper market has again been quiet with but little business reported. Manufacturers do not seem ready to take hold as yet, though their consumption continues large. It is evident that their stocks will soon be exhausted, and a better business will be done.

**Other Metals.**—Tin continues in moderate demand, though a fair business is doing to supply the current needs of manufacturers. Prices are weak.

Lead has been rather quiet, with about the usual sales to consumers at unchanged prices.

Spelter remains strong and active. The demand continues good from manufacturers, while smelters are not pressing sales. The prices of ore in the Joplin market remain very high. Our latest report shows \$42 per ton paid for the best ore, while standard ore, 60 per cent zinc, brought \$40 per ton. This is at the rate of 3 1-3 cents per pound for the zinc contents.

Silver has been quiet, with no special incident. The Chinese difficulty remains unsettled, with the probability that nothing will be done for some time, if at all.

**Coal.**—The miners' convention at Indianapolis is over, and no strike of the bituminous coal miners has been ordered; much to the relief of those who feared that some such action would be taken. The only thing done was to arrange for contributions in aid of the anthracite strikers. The Alabama strike has left some local troubles, but they will soon be settled. Transportation conditions are worse again, and the lake trade has suffered especially. Vessels are unable to get cargoes, and some apprehension is felt as to the supply of coal for the Northwest. If matters do not improve, it may be difficult to get the winter's supply through before navigation stops.

The seaboard bituminous trade has had no special features. The sales to consumers in the Eastern cities, who have heretofore used anthracite, are larger, and these are drawing heavily on local stocks, and interfering somewhat with the local trade.

The anthracite situation is unchanged. There is more talk of opening some collieries, but no action has been taken so far.



#### THE DALY WEST MINE EXPLOSION.

An explosion of dynamite at the Daly West Mine at Park City, Utah, on July 16, caused the death of 34 persons, and did considerable damage to the mine workings. The facts as given by local papers are briefly as follows. There was on the 1,200 feet level of the Daly West 200 feet from the shaft, magazines in which all the dynamite used underground was stored. Estimates of the amount in storage on July 16 vary, but local accounts put the quantity at 140 boxes, or 7,000 pounds. It is said that John Bergy, a powder man, had been seen to go into the magazine at times smoking and carrying a lighted candle in direct violation of orders. What happened the last time he entered will never be known. His body frightfully mangled has been found. Other miners working on the 1,200 feet level were also killed. The explosion did not do the damage that might have been expected, though on the 1,200-foot level timbers were blown out, pipes twisted into knots, track destroyed, and one compartment of the shaft was damaged. On the 900-foot level, where several men were working, the explosion attracted but little attention, and on the surface the report was not loud. The great volume of gas from the explosion caused nearly all the deaths. The Ontario Tunnel connects the Daly West, the Daly and the Ontario workings; and the Daly West workings also communicate with the Anchor. While these connections permitted a number of men to escape, yet they also allowed the noxious gases to penetrate the Ontario workings, and six men over a mile distant from the explosion were suffocated, some before they were aware of any danger. Most of the deaths were of men working on the 1,400-foot level of the Daly West, who were suffocated while attempting to escape.

The spirit of heroic self sacrifice that has been shown in so many mine disasters was not lacking, and volunteers eagerly braved the fatal gases in search of those who had been overcome. These rescuers perished, including a young man, John McLaughlin, who was overcome on his third trip down the shaft. Foreman Mimme, believing that further attempts at rescue would only lead to further loss of life, refused to allow volunteers to be lowered down the shaft.

A coroner's jury which investigated young McLaughlin's death censured the foreman for delaying an attempt to rescue McLaughlin, and expressed the opinion that the storing of large quantities of dynamite underground was dangerous. In the absence of any information as to the immediate cause of the disaster it is impossible to place the responsibility. However, it is clear that the laws of Utah governing the storage of explosives about mines need revision. It seems to be the general custom in that State—and the practice is not forbidden by law—to keep large quantities of dynamite underground. This practice is defended on the plea that dynamite at best is uncertain stuff, that the less it is handled, the less the danger, and that it is not advisable to lower it down a mine shaft every day. This plea is specious, but untenable. In the great mines at Butte and in those of the Lake Superior country, the large magazines are on the surface, but limited amounts of explosives are stored underground. It is entirely possible to take dynamite into a mine between shifts, or by a shaft not for the use of employees.

The Daly West explosion, like many other mine disasters, was probably caused by the careless act of one man. In this respect it emphasizes the necessity of

strict discipline in all mine operations and the criminality of mine officials who permit any relaxation of discipline, whether this relaxation is due to the easy nature of some foreman or is ignorantly demanded by some representative of organized labor.



#### DISCIPLINE AND DANGER IN MINES.

As an abstract proposition, the necessity of some sort of discipline in all industries which employ large numbers of workmen is perhaps not denied; but modern labor-unions and their sympathizers practically nullify it. For discipline is the obedience of one party to the rules or orders given by another, and in the case of a wage-earner it is the fulfillment of a tacit agreement. A man covenants to work for another, not for himself, at the expense of another.

In mining—above all, in coal mining—there are special reasons, both of economy and of safety, for the enforcement of a rigid discipline. And the indispensable element of such discipline is the instant discharge of an employee who violates a salutary rule, whether the offence cause disaster or not. But for the past two or three years, at least, under the rule of Mr. Mitchell and his organization, it has been impracticable to discharge a man without incurring an instant strike and demand for his reinstatement. I do not say that, on proof of clear violation of a rule recognized by the union as necessary, the discharge might not be ultimately approved by the union, with the consequence that the strike be officially declared "off." There may have been—I think there must have been—such instances, though they have not come to my notice. But what seems to be invariable is that even if the justice of a discharge be ultimately acknowledged, the employer is first fined for it by a considerable loss of money through a strike, and when he is forgiven nobody makes good his loss. He is treated like the Western traveler who was mistaken for another man and shot on sight, and who received while dying the sincere apology of his murderer for the unintentional error. Moreover, certain rules are not recognized by workmen as necessary. It has been notorious among colliery managers, ever since the invention of the Davy safety-lamp, that miners cannot be trusted not to open their lamps underground. They do this sometimes to get a better illumination than the wire-gauze safety-lamps of the Davy class permits. But more frequently they do it to light their pipes, for it is a tradition among colliery miners that the smouldering or dull red glow of the tobacco in a pipe will not ignite fire-damp; and hence, if the Davy gives no notice of the presence of this gas, it will be safe to open it for an instant, light a pipe, and close it again. It is true that in the ordinary smoking of a pipe the glow of the burning tobacco is not quite hot enough to ignite ordinary fire-damp, or some explosive mixtures of it with air; but I think it is not true of all mixtures, or of all mine-temperatures, and I know it is not true of all pipe-smoking; for I have myself (*N. B.—Not in a coal mine!*), when my candle had gone out underground, and my last match has been used in a vain attempt to relight it, brought paper to a blaze by placing it over the tobacco in my pipe, and smoking vigorously—thus getting a sufficient flame to light the candle withal. Evidently a common miner cannot be trusted to open his lamp or use matches in a fiery coal-mine; and smoking must be forbidden in such a mine. But the miners will not inform on each other for violating such rules, and if one of them is summarily punished by dismissal for so doing, *when nothing happened in consequence*, they are too apt to strike and demand his reinstatement.

As a consequence of this inveterate recklessness

among miners, much ingenuity has been expended upon devices for their detection as well as their protection. Safety-lamps have been made giving better light than those of the Davy type; and others, with interior bolts, only to be moved by the force of a huge electro-magnet kept in the office of the mine, so that they could not be opened without being broken. In one very fiery Saxon colliery which I visited many years ago the fire-damp came hissing in a sheet from a seam between the coal and the overlying rock; and the manager (my friend, the late Adolf Metzger, an engineer of extraordinary ability, experience and resource) dealt with it by setting along the top of each breast-wall, innumerable naked candle-lights, which ignited the gas as it emerged, burning it with ghastly blue flame to carbonic acid while it was still merely inflammable, and before it had formed an explosive mixture with the air of the mine. The carbonic acid he removed at once by powerful mechanical ventilation. The spectacle, 1,000 feet below the surface, of such a breast, with its diadem of blue flames, was somewhat startling even to me, who knew that these uncanny lights were really so many signals that the peril was past. In that place, however, the system worked well, though it could not have been employed where the fire-damp had accumulated in large bodies, to be released suddenly by some single blast, or when it was less definitely confined to a single seam for entrance. Moreover, I fancy that the system would break down after the mine had become so extensive as to have large areas of goaves, in which the gas could accumulate. In fact, it was applicable chiefly to working-chambers alone. Other parts of the mine, no doubt, would have to be carefully avoided as dangerous, or else thoroughly swept out by a powerful ventilating current. But my present purpose is simply to point out that this daring experiment was carried on, to avoid the necessity of giving safety-lamps to common miners, and trusting them to obey the rules necessitated by that system.

In this country, the prevailing system (practically, so far, in most of our fiery mines, though not in all) is one which likewise obviates almost entirely the use of the safety-lamp by the miners. It consists in the use of an overabundant mechanical ventilation, through currents actuated by powerful fans, and conducted to the points where they are needed by means of carefully-planned and vigilantly-watched airways and doors, and auxiliary underground fans. This involves the accumulation of gas in places where work is not going on. Only the responsible "fire-boss" carries a safety-lamp; and it is his duty to examine beforehand, every running day, all parts of the mine into which miners are to go. To such parts, the ventilating current is specially directed; and not until the fire-boss has declared them safe are the miners allowed to enter them with naked lights. This system is likewise inapplicable to some mines into which the gas enters fitfully or in sudden outbursts, too great to be immediately diluted beyond the danger-point by the ventilating current. But it has worked well under moderately uniform conditions. I had for five years general direction of a colliery in which it was employed, and which enjoyed the reputation of being one of the most fiery in the anthracite regions. In this instance the quantity of gas entering the mine was not too great to be controlled by the current from the big fan, though bubbles of it ascended through the water at the bottom of every gangway, and a thin sheet of it skimmed along the roof. Through the vigilance of the superintendent and the fire-boss, the previously bad record of the mine was reversed, and for more than five years there was no loss of life from explosion in that colliery, though more than once, men who had, in de-

fiance of rules, lifted their candles to the roof, or entered places not yet swept clean of gas and pronounced safe by the fire-boss, were more or less seriously burnt by the flashing of the accumulated gas. Moreover, we were at all times liable to disaster through careless meddling with the doors which determined the course of our ventilation for the day. But in those days (though they were the days of the "Mollie Maguires") the discharge of a man for such an offense did not involve an instant suspension of the colliery by a strike. So we had a recognizable degree of discipline, after all. My superintendent and my fire-boss were shot at by night, but not hit. The shot intended for the latter killed another man; and the murderer, aided by friends of "The Benevolent Order of Hibernians," escaped. But after all, the risk of assassination was more easily endured, I think, than the present certainty of trouble and loss through a sudden suspension of all work. In short, under our system, we did have some discipline; under present conditions, it is hard to maintain any.

It is reported that the recent awful colliery-explosion near Johnstown, Pa., was probably due to the carelessness of a miner lighting a match; and that, in the same colliery, only a few days before, a miner was found to have matches in his pocket. I would not pronounce judgment in this case, before a thorough inquiry shall have been made. But the hypothesis of some such origin of the calamity is made only too probable by the history of bituminous coal-mining in this country. The bituminous are not only more fiery than the anthracite mines, but the effects of fire-damp in them are greatly enhanced by the presence of coal-dust. Indeed, it is highly probable that such dust, lying in the mine, may by spontaneous combustion initiate a conflagration or explosion; and it is quite certain that bituminous dust, suspended in the mine atmosphere may (even when fire-damp is not present) propagate through many hundred feet of mine-workings the flame of a "blown-out" shot—that is, of one which, having been insufficiently tamped, ejects from the drill-hole a quantity of burning powder.

Now the miners, East and West, have been for years striving for the right to make coal-dust, and to be paid for it. The reason is, that by using an excessive amount of explosive, the miner paid by the ton could earn much more money if he suffered no deduction for the amount of dust thus made. The crude remedy of making such a deduction, though universally practiced, is very unsatisfactory. It puts all the miners at a colliery on the same footing; it offers no reward to those who economize powder (since they suffer the same deduction as their reckless fellows); and it is peculiarly irritating to the miner, who always fancies that he has been cheated. Moreover, the deduction from the gross weight of a miner's product at a given colliery may include also an allowance for the slate interpenetrating the coal—for the presence of which neither the miner nor his employer is responsible. This brings up the question, whether parties operating upon impure coal-seams shall be forced to pay their miners as much per gross ton of impure product as those pay whose gross product is purer. In other words, shall organized labor kill the enterprises which struggle already with natural disadvantages?

But it happens, not infrequently, that in spite of the established deduction at a given colliery, the miner finds that he can, after all, make more money (though he may make more dust) by using more powder or dynamite. If, after experiment, he finds this to be the case, no consideration of waste or peril will deter him. His obstinacy in this respect has been made the subject of special comment by leading

experts and authors, interested only to increase the safety and economy of bituminous coal-mining.

In the anthracite-regions, the unnecessary creation of coal-dust and other waste has been a matter rather of economy than of safety. As has been often set forth, the anthracite mining of thirty years ago sent, of 100 tons of coal in the ground, about 30 tons to market, losing the rest in underground pillars (usually never recovered) and in coal-dust, slaty coal, etc., wasted in the breaker. Economy was not seriously studied until the individual short-term lessees had been mostly replaced by large corporations, interested in future, as well as immediate, profits.

The loss of coal in pillars was remedied by leaving, at the first exploitation of a given area, larger pillars, the coal of which could be, as that of the smaller ones could not be, ultimately recovered in good condition for market. This required more capital and a larger outlay, which the individual lessees could not afford.

The loss of coal in culm and waste was patiently and ingeniously reduced by persuading consumers to use smaller sizes of anthracite. These had to be prepared by additional treatment and apparatus; and the ways of burning them effectively had to be devised and explained to users. Moreover, they had to be sold at very low prices; and although their use has been largely extended, it is not to-day, any more than it has been for thirty years past, economically desirable to produce coal-dust or small coal in mining.

In the anthracite-region the excessive production of such material by the individual miners was checked, after the long strike of 1875 (if I remember correctly) by a happy thought—whose I do not know, nor can I now recall whether the idea was then entirely new. Namely, while the schedule of wages was so arranged that the miner should be always sure of a certain minimum, and yet should receive a proportionate advance of pay with each advance in the market price of coal, the unnecessary production by him, through the excessive use of explosives, of dust and small coal, were prevented by the fixing of an arbitrary high price for the powder which he was obliged to purchase from his employers. This price was so adjusted as to make it unprofitable for the miner to use more powder than proper economy of coal would permit. On the other hand, the scale of wages was so devised that a miner, duly economical of explosives, would receive a fair remuneration. Nothing ever worked better for all parties (including the nation, which is interested in the protection of its limited treasure of anthracite) than this combination of a fixed minimum, a sliding scale of wages and an arbitrary price for the explosives furnished to the miner. For 15 years there was no complaint under the operation of this system. But, as everybody who knows the anthracite-region is aware, 15 years is about the period at the end of which the young men, who have never had the excitement of a strike, are ready to outvote the old men, who have had enough of strikes. Taking advantage of this fact, Mr. Mitchell and his organization inaugurated the strike of 1900, and, in their search for available reasons, lit upon the tyrannical sliding scale and the awful price of powder as the most plausible. The anthracite miners' unions, intoxicated with the prospect of battle and victory, abandoned at once the best system which they ever had, or ever will know; the philanthropic press remarked in chorus that, whatever else be right or wrong, this outrageous extortion in the price of powder was clearly iniquitous, and must cease; and finally the operators themselves, under the persuasion, perhaps, of Senator Hanna, sacrificed the powder-price, together with the sliding scale, and thus let go nearly all that had been gained for econ-

omy by the patient endeavors of more than a quarter of a century. It is true that they did not formally recognize Mr. Mitchell and his organization. But it is equally true that the concessions they made were construed as a victory for him; and they are now suffering the consequences. Having succeeded in getting powder at market price, he is insisting upon "a fair ton" in the estimation of product to be paid for, denouncing as iniquitous the variable deductions made at different collieries, etc., etc.

All signs indicate an early collapse of the strike. I have no personal interest in the result either way; but, as a citizen of the United States, I hope the operators will stand firm, at all costs, for discipline and economy in mining, and will not sacrifice, for any sentimental or political reason, their duty as trustees, both of private property and of public wealth.

R. W. RAYMOND.

#### ELECTRIC MINE PUMPS IN GERMANY.—

An electric pump shown at the Dusseldorf Exposition by the firm of Haniel & Lueg, of Dusseldorf-Grafenberg, is thus described by *London Engineering*: "The dynamo is a 750-kilowatt machine, on a non-inductive load; the pressure is 2,000 volts, with a frequency of 50; the motor acts as a flywheel. The current is supplied to the underground pump motor through two cables formed of three wires, each 95 square millimeters in section. Two cables are used in order to have one available should the other get damaged in any way. The underground pump motor is a 650 horse-power machine. It takes in the current direct, but as a means of safety and for controlling purposes the pump-room is provided with a switch for switching off the current, and with an ammeter. The motor is keyed direct on the pump shaft, thus doing away with all intermediate parts for the transmission of power. The motor acts as a flywheel. The mining company specified that the speed of the pump should not exceed 60 revolutions per minute.

"The pump is of the double-acting differential type, with cranks at 90°, and is worked from the primary machine without starting resistance. A starting device renders it possible to switch in the pump as an hydraulic motor, by doing which the pressure of water in the delivery pipe acts automatically first on the larger section and then on the differential section of the plunger, and starts running the motor. As soon as 15 to 20 revolutions are reached, a signal is given to the driver of the primary plant at the surface, and the current supply to the motor is switched in. The pump is so designed that all the fittings are placed as far as practicable to the rear of the motor. All the piping is underneath the floor of the pump room, and the flanges which have to be carried higher than the floor level are so protected that should they leak in any way the water would escape to the rear, and not reach the motor. The valve-chests and air-chambers are steel castings, and the valves are of phosphor bronze. A jet arrangement is resorted to for the air suction from the suction air-chamber, and an air-slucce for supplying the delivery air-chamber. The whole plant when once started requires but very little supervision; this is a great advantage in the case of mine-draining pumps."

#### LIQUID FUEL ON AUSTRIAN RAILROADS.

—The Austrian State Railroad authorities are about to make some experiments on a large scale with petroleum residue firing on the locomotives in the Lemberg District of the system. A commission has also been dispatched to Russia to inquire into the system of liquid-fuel firing used on the railways in that country.

#### AMERICAN COAL IN DENMARK.—

United States Consul J. C. Freeman writes from Copenhagen that his report on "American Gas Coal in Denmark" has led to important orders for American gas coal from France and other European countries.

## SINKING A DEEP COAL SHAFT AT ATCHISON, KANSAS.

BY WILLIAM R. CRANE.

That part of the coal fields of Kansas which lies in the northeastern part of the State, along the Missouri River, has been worked since 1870, but owing to the depth of the workable coal stratum (700 odd feet), comparatively few mines have been opened up. Only two companies and the State penitentiary mine were operating in the district up to 1898. The production of these and the number of men employed at that time were approximately as follows:

	Tons.	Men.
Leavenworth Coal Company.....	113,000	310
Home-Riverside Company.....	200,000	450
Penitentiary Mine.....	65,000	350
Total for the district.....	378,000	1,110

Since then the Home-Riverside Company has bought out the Leavenworth Coal Company, and now controls all of the mines operating within four or five miles of Leavenworth.

In 1898-99 a shaft was sunk, and later, for a short time, coal was mined at a point several miles west of Lansing, but this mine is at present idle.

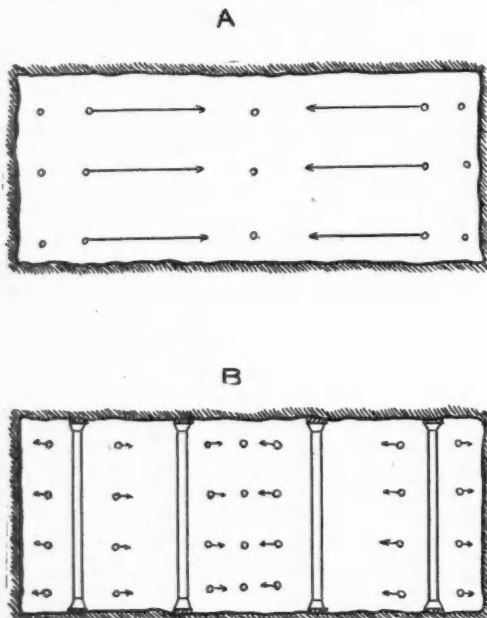


FIG. 1.—PLAN OF HOLES IN BOTTOM OF SHAFT.

In the Summer of 1900 a prospect hole was drilled by a diamond drill,  $2\frac{1}{2}$  miles below the city of Atchison, on the right bank, looking southward, of the Missouri River. The stratum of coal mined at Leavenworth, at a depth of 713 feet, was pierced here at a depth of 799 feet. Drilling was resumed, discovering another stratum of coal at a depth of 1,126 feet. The last stratum passed through is 36 inches in thickness and of fairly good quality. Previous to this, the same coal stratum had been discovered by drill at the Leavenworth Coal Company's mine (now the Home-Riverside No. 3), and a shaft was sunk to it, but owing to the excessive amount of water met with it was abandoned and closed up to the first stratum, which is the one mined at all points in the district at the present time.

In the Fall of 1901, the Atchison Coal Mining Company began sinking a shaft, with the intention of working both the upper and lower strata. The shaft is located about two miles below Atchison, a few rods back from the river. After reaching a depth of 63 feet a stratum of quicksand was struck, which ran into the shaft, causing a cave-in at the bottom. This extended upward, loosening the cribbing and causing it to pull apart at a number of places. A large volume of water also entered with the quicksand, which it was found impossible to remove with the means at hand. As a result the shaft was abandoned, a new site chosen, several rods further back from the river, and another shaft started. Instead of letting the work out on contract, as was done in the first case, a superintendent was hired to oversee the work, the company furnishing all supplies and funds.

The new shaft has at present reached a depth of over 250 feet, and is proceeding in a satisfactory manner. Fortunately it was located far enough from the river to avoid the bed of quicksand that stopped the first shaft, and passed through limestone strata instead.

*The Sinking Plant.*—The plant as installed for sinking the shaft is simple and efficient. The superintendent, C. W. Pullen, is in charge, and has adapted himself to the existing conditions with considerable ingenuity. The machinery and appliances employed by the first parties were turned over to the new management, which thus labors, to a certain extent, under the disadvantage of having to utilize appliances not in many respects especially adapted to the work in hand.

A light frame building shelters the boiler and coal-bin, air-pumps and hoister. The hoister is a direct acting, single drum hoisting engine, built by Houston & Gamble, Cincinnati, Ohio. It is driven by duplex 8-inch by 12-inch sliding valve engines, and is fitted with a standard friction clutch, hand brake and link motion reversing gear. A  $\frac{3}{4}$ -inch steel hoisting rope is used. Two air-brake pumps are employed in place of an air compressor, and, for convenience, are mounted on heavy timber supports on either side of the boiler. It is claimed that the air-pumps have a capacity of 30 and 45 cubic feet of air per minute, discharging into a receiver, which in turn delivers it to the drills at a pressure of 80 pounds to the square inch. A 40-h. p. boiler, part of the former outfit, is used as an air receiver, and answers the purpose very well indeed.

Two  $2\frac{1}{2}$ -inch Sullivan air-drills are employed in sinking in lime and sandstone. Three sizes of bits are used— $2\frac{1}{4}$ , 2 and  $1\frac{3}{4}$  inches, for a depth of hole of about  $4\frac{1}{2}$  feet. The drills are mounted on 7-foot extensible columns. Eight-foot hand drills are em-

ployed in working shale and soft sandstone, the cutting edges of which are  $1\frac{3}{4}$  inches. A small blower driven by a 7-h. p. vertical engine, at a speed of 120 revolutions per minute, furnishes air to the bottom of the shaft.

five feet above the platform, and held there until the two hooked chains are connected by means of the hooks engaging with the bail eyes; then the bucket is slowly lowered. The bucket, under the action of the three supporting chains, describes an arc of a circle and comes to rest on a car, which runs back and forth on a track below the projecting framework. The car is an ordinary heavy platform car, provided with trunnions at the ends. Supported by and hinged to the trunnions is an iron framework or holder, with one side cut away. This holder is made of heavy strap iron, and is formed to fit the sides of the bucket, the upright straps of the holder being formed into hooks facing inward, the purpose of which is to prevent the bucket from slipping from the holder on emptying it of its contents. The holder must be revolved, or turned part way over, at least, in dumping, to accomplish which a train of gear wheels is fastened to one of the trunnions, which meshes with a gear wheel fastened to the holder pivot, and is driven by a crank. By means of this arrangement an operator can revolve the holder regardless of the weight it contains. The bucket when lowered seats itself within this holder, the chains are unhooked, and the car is free to be run with its load to the dump. The car is of necessity a side dump, so that by keeping the back parallel to the edges of the dump the handling of waste and building of the bank is rendered comparatively easy.

The shaft is  $15\frac{1}{2}$  by 7 1-3 feet in the clear, and is divided into three compartments—two hoisting compartments, 6 by 7 1-3 feet each, and an air shaft 2 2-3 by 7 1-3 feet. Little water is met with—so little, in fact, that a  $1\frac{1}{4}$ -in. column pipe, connecting with a small boiler feed pump, readily exhausts all that enters the shaft.

*Method of Sinking.*—The method of sinking in

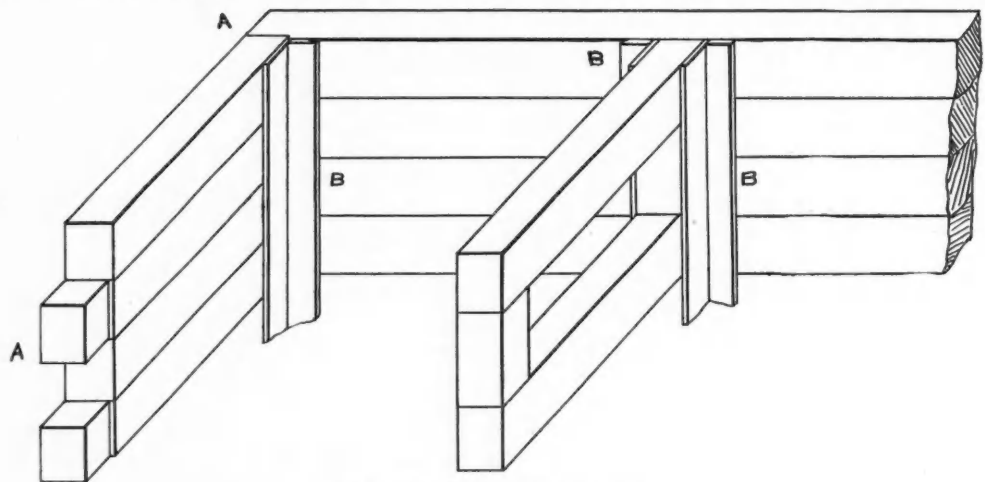


FIG. 2.—TIMBERING FOR SHAFT.

ployed in working shale and soft sandstone, the cutting edges of which are  $1\frac{3}{4}$  inches. A small blower driven by a 7-h. p. vertical engine, at a speed of 120 revolutions per minute, furnishes air to the bottom of the shaft.

The gallows, or head frame, is 32 feet to cap, and is made of 6 by 6 inch and 6 by 8 inch pine timber. The back stays extend from the top of the frame to a point about 12 feet distant from the base of the frame. The corner timbers of the frame are given a batter of about 2 inches to the foot. The top sheave is 4 feet in diameter. At a point about half way up and projecting from the side of the gallows frame, on the side of the dump, is built a framework which is the full width of the head frame. Fastened to the two extreme outer points are two chains, which terminate in hooks. The shaft end of the hoisting rope is provided with about six feet of chain, which also terminates in a hook. The buckets employed in hoisting the dirt from the shaft are made of 3-16-inch sheet iron, weighing 800 pounds each, and having a capacity of 1,000 pounds. When filled the bucket is hoisted to the top, passing through a trapdoor, hinged and counterpoised, which opens and closes on the passage of the bucket. On passing the mouth of the shaft, the bucket is raised about

shale, which formation predominates, differs considerably from that employed with limestone, and, when it occurs, sandstone. The arrangement of holes when blasting shale is shown in Fig. 1, A. Nine  $6\frac{1}{2}$ -foot holes are drilled, the middle three being vertical, while the remaining six, three to the end, are inclined towards the center at an angle of about 30 degrees. Each hole is charged with five sticks ( $2\frac{1}{2}$  pounds) of Aetna No. 2 dynamite, making a total charge of 22.5 pounds. The nine holes are fired simultaneously by battery. The three pot-holes, placed at each end, are to straighten up the shaft. The average rate of advance, in shale, is about seven feet per day. Eight-foot steel hand or churn drills are used for drilling.

Sinking in limestone and sandstone, especially the former, is considerably more difficult than in shale. A larger number and a different arrangement of holes must be employed. The arrangement of holes is shown in Fig. 1, B. Air drills, which are mounted on columns, as shown, are used, both end columns being moved once, and the center one three times, for a complete round of holes or one advance. Eight holes are drilled at the first setting of the columns, four at the second setting, and in the case of the third setting four holes are also drilled.

At the first setting of the column the eight holes are drilled at a slight inclination, the next setting producing four holes to each column, which incline still more towards the center; the last four central holes are vertical. The arrangement of holes is then according to the American center cut system. The center, or wedge, is blasted out first.

The average depth of holes in limestone is about 4½ feet, and each hole is charged with 2½ sticks (¼ pounds) of Aetna No. 2 dynamite. The total charge is then about 35 pounds. The average advance made in limestone is between four and five feet.

When sandstone is worked the general arrangement and depth of holes, as well as charge placed, does not differ much from the practice in limestone, ranging, however, according to hardness, from the full charge employed with limestone to a charge intermediate between shale and limestone. The rate of advance will also vary from six to four feet.

**Method of Cribbing.**—The cribbing timbers are cypress, and the following sizes are used: 4 by 6 inches, 4 by 8 inches, and 4 by 12 inches. The wall plates and end pieces are alternately notched one inch to receive the ends of other corresponding parts, Fig. 2, A. Buntions made of 6 by 8 inch timber divide the shaft, and support the wall plates at intervals of 16 inches, and have two-foot centers. They are kept the proper distance apart by 16-inch studdles, and both buntions and studdles are held together and built into a vertical partition by supporting strips or lacing, which consist of 2 by 4 inch and 2 by 6 inch planks, placed as shown in Fig. 2, B. Lacing strips are also placed in the outer corners of the shaft, both to support the timbers and give the shaft a symmetrical appearance.

Bearing frames are placed at convenient points, especially above strong and solid strata, as lime and sandstone. The cribbing is kept within from 15 to 20 feet of the bottom of the shaft, and as the greater part of the material passed through is shale, there is no danger of wrecking or injuring the timbers from flying fragments of rock.

The cost of sinking and cribbing was given as \$7 per foot. The sinking of this shaft will be watched with considerable interest by the engineers and mine operators in this and neighboring districts, especially after the failure of a similar attempt at Leavenworth, as noted above. In this case, after reaching the coal by shaft, the water entered so rapidly and under such high pressure as to render futile every attempt to beat it back. An attempt was then made to fill the shaft with mine dirt up to the first coal stratum, but the water continued to rise and fill the workings above. The water was then pumped out until sufficient room was given to place a seven-foot crib work bulkhead, which was set projecting under a stratum of limestone some feet below the upper coal stratum. The crib was caulked and every precaution was taken to make the arrangement water tight, but in spite of all the water forced its way around and through both bulkhead and stone, and has proved an unending source of trouble and expense, as it introduces much water into an otherwise dry mine.

The development and extraction of the coal, when the shaft is finished, also promises to be of an interesting and exceedingly difficult operation, as both the top and bottom of the coal is sandstone—3½ feet in both cases, and each showed, while drilling, every indication of furnishing a large volume of water.

**BRITISH IRON IMPORTS.**—Imports of iron ore into Great Britain for the six months ending June 30 were, in long tons:

	1901.	1902	Changes.
Spain .....	2,183,004	2,547,525	I. 364,521
Other countries .....	386,360	508,992	I. 122,632
Totals .....	2,569,364	3,056,517	I. 487,153

The other countries included Greece, Sweden, Algeria and Newfoundland. Imports of pig iron for the six months were 117,884 tons, of which 6,736 tons were from the United States. In the first half of 1901 the imports were 62,010 tons, of which 27,267 tons were from the United States.

**PRODUCTION OF COKE IN 1901.**

SPECIAL CORRESPONDENCE.

Washington, D. C., July 23, 1902.

According to the report of Edward W. Parker to the United States Geological Survey, the production of coke in the United States in 1901 amounted to 21,795,883 short tons, value at \$44,445,923, as compared with 20,533,348 short tons, valued at \$47,443,331 in 1900, and 19,668,569 short tons, valued at \$34,670,417, in 1899. The increase in production in 1901 over the preceding year was 1,262,535 short tons, or 6.15 per cent. The value of the product, however, showed a decrease of \$2,997,408, or 6.3 per cent.

Notwithstanding the fact that the extraordinary demand for coke which developed with the expansion of the iron and steel industries in 1899, and continued through 1900, was maintained throughout 1901, the average price per ton showed a decline from \$2.31 in 1900 to \$2.04 in 1901. Mr. Parker looks upon this decline as a natural return to normal prices from the unreasonably high figures which prevailed in 1900. During the Spring of 1900, owing to the unprecedented demand for coke, there was at times a condition of affairs bordering on a famine, and prices were abnormally high. In 1901 over 5,500 new ovens were added to the number in use in 1900, transportation facilities were better, and prices, while higher than for 20 years, except in 1901, were not out of reach.

The total number of ovens in existence in 1901 was 64,001, as compared with 58,484 in 1900.

The States which showed the largest increases in production during 1901 were Pennsylvania, whose output increased 998,622 short tons, and Virginia, whose output gained 221,974 short tons. Other increases in production were unimportant. There were five States in which decreases were shown, the principal losses being sustained by West Virginia and Tennessee.

The production in the several States during 1901, as compared with 1900, are shown in the following table:

State or Territory—	Production.	
	1900.	1901.
Alabama .....	2,110,837	2,148,911
Colorado a .....	618,755	671,303
Georgia .....	73,928	54,550
Indian Territory .....	38,141	37,374
Kansas .....	5,948	7,138
Kentucky .....	95,532	100,285
Missouri .....	2,087	4,749
Montana .....	54,731	57,004
New Mexico .....	44,774	41,643
Ohio .....	72,116	108,774
Pennsylvania .....	13,357,295	14,355,917
Tennessee .....	475,432	404,017
Virginia .....	685,156	907,130
Washington .....	33,387	49,197
West Virginia .....	2,358,499	2,283,700
Illinois, Indiana, Massachusetts, Michigan, New York, Wisconsin, Wyoming .....	506,730	564,191
Total .....	20,533,348	21,795,883

a Includes Utah.

The growth of the coke making industry during the last 20 years is shown by the fact that in 1880 the United States made 3,338,300 short tons; in 1890, ten years later, the product amounted to 11,508,021 tons; in 1900 it had grown to 20,533,348 tons, and reached the maximum of 21,795,883 tons in 1901.

Since 1893 the production of coke in the United States has included that made in by-product retort ovens, and in 1901, 1,179,900 short tons, or a little over 5 per cent of the total, was by-product coke. The manufacture of coke in by-product ovens has shown a considerable increase since the first Semet-Solvay ovens were built at Syracuse in 1893, but last year was noticeable rather for the new ovens building than for any decided increase either in the number of completed ovens or in the increased output. There were 1,096 by-product ovens building at the close of 1900, but only 80 of these were added to the completed ovens in 1901, increasing the total from 1,085 to 1,165. The production of by-product coke increased from 1,075,727 short tons to 1,179,900 tons. There were, however, at the close of 1901, one and one-third times more ovens of this type building than were in existence in that year. The total number of by-product ovens building at the close of 1901 was

1,533. The ovens completed and building at the close of 1901, according to the type of ovens were as follows:

	Ovens built.	Ovens building.
Semet-Solvay .....	375	210
Otto-Hoffman .....	730	896
Newton-Chambers .....	60	...
Schniewind .....	...	427
Totals .....	1,165	1,533

Of the 1,165 by-product ovens in existence at the close of 1901, 595, or a little more than half, were operated in connection with iron and steel plants, and of the 1,533 ovens building at the close of the year 1,176 will be directly associated with blast furnaces or steel works. The ovens under construction at the close of the year included, of the Semet-Solvay type, 60 at Dunbar, Pa.; 120 at Ensley, Ala., and 30 at Delray, Mich. Of the Otto-Hoffman ovens there were 232 at Lebanon, Pa.; 564 at Buffalo, N. Y. (both plants being built for the Lackawanna Iron and Steel Company), and 100 at Camden, N. J. Of the Schniewind ovens (an improvement made by Dr. F. Schniewind on the Otto-Hoffman), there were 200 building at Sparrow's Point, Md.; 212 at Sharon, Pa., and 15 at Wyandotte, Mich.

**THE ELECTRIC LIGHT IN EXAMINATION OF GEMS.**

According to the *Electrical World and Engineer*, M. Chaumet, in Paris, has recently made some experiments with a view to the use of such rays in the determination of the value of gems. Becquerel noted years ago the fluorescence of diamonds under the influence of various colored rays. Chaumet has ascertained that there is a close relationship between this fluorescent property and the brilliancy of diamonds under artificial light, particularly candle light, which brings out most clearly the quality of first-class stones. Diamonds that sparkle most vividly are not always those cut in the most regular shape, but those showing the greatest amount of fluorescence when examined with violet light. While diamonds that are non-fluorescent when exposed to this light simply take a violet coloration, the most sparkling stones show a notable fluorescence of a very luminous and clear blue. Diamonds, whatever their quality, always offer the same transparency to Röntgen rays, so that it is impossible to differentiate them by means of radiography. In a jewel-case in which are grouped diamonds of all qualities, the gems, when illuminated by violet light, assume different tints, some showing a vivid blue brilliance, while others are of a sombre violet. As soon as the electric lamp is put out, all degrees of phosphorescence are noticeable, the jewel-case appearing to be studded with violet or blue glow-worms, some very bright, others almost extinct; and the most sparkling stone will be found to be the best. In the course of his experiments, M. Chaumet has observed a curious fact with respect to a yellow diamond with numerous facets which showed remarkable golden reflections in daylight as well as in artificial light. The violet light produced no fluorescence in this case, but gave rise in place to flashes of an intensely red color, particularly noticeable on the feather-edged sides. A violet pencil of rays was projected upon this yellow diamond for a few minutes, when the experimenter found to his surprise that the yellow color had changed to dark brown, the stone thus losing four-fifths of its commercial value, which, however, was recovered after some hours. In experimenting on the action of the various rays on rubies, M. Chaumet has ascertained that the Siamese stones are of scarcely appreciable fluorescence under violet light, while all the valuable Burmese rubies are intensely fluorescent, exhibiting a clear vivid red light that puts them in evidence when they are mixed with stones from Siam, which remain sombre.

**NEW COAL MINES IN BOHEMIA.**—The Brux Mining Company, which has for some time past had coal-boring operations in hand at Haar, near Ossegg, Bohemia, has just struck a seam of coal at a depth of only 600 feet.

## JOHN W. MACKAY.

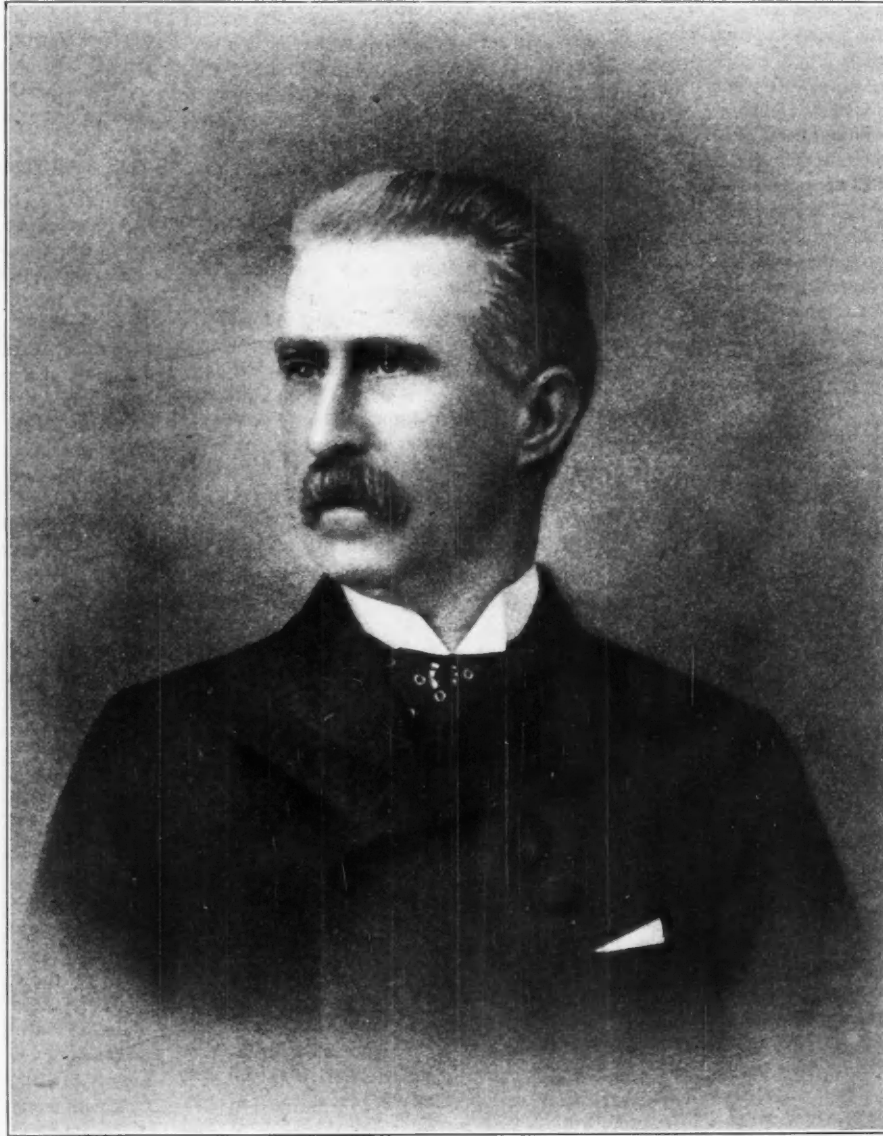
With the death of John William Mackay, which occurred in London on Sunday evening, July 20, the last of the four famous Bonanza kings of the Comstock lode has passed away. Although Mr. Mackay had not been in robust health for some time his death was entirely unexpected, and comes as a painful surprise to his many friends in this country. The immediate cause of his death is given by the physicians as heart failure, which appears to have been superinduced by heat prostration and congestion of the lungs. He was first taken seriously ill after going down town on Tuesday, July 15, which happened to be the hottest day of the year. His condition was not considered serious at first, and it was not until Saturday that anxiety was felt for him. He began to sink on Saturday morning, and died peacefully and without pain Sunday afternoon.

There has been no more picturesque character in all the romantic history of the development of our Western mining regions than that of John W. Mackay. He was born in Dublin, Ireland, on November 28, 1831, being nearly 71 years old at the time of his death. He was not quite 10 years of age when he emigrated to the United States with his parents, who were poor but of good stock. His school days were short, and at an early age he was apprenticed to the shipbuilding trade in the yards of William H. Webb. He was 18 years of age when the news of rich discoveries of gold in California fired him with an ambition to seek his fortune in the far West, but it was not until two years later, in 1851, that he became his own master and could follow his desires. He crossed the plains with a party of 25 other goldseeking adventurers. His first attempt at gold mining was on placer ground at Alleghany, Sierra County, at which he was partially successful, and managed to save a part of his winnings. The returns, however, were not sufficient to satisfy one of Mackay's ambition, and he abandoned the project in order to try his hand at deep mining at Virginia City, Nevada. At his initial attempt here he lost all his savings, and then went to work as a timber man at a daily wage of \$4. His courage, energy and ambition, added to a personal charm which won friends everywhere, made others willing to help and trust him.

In 1863 he formed a co-partnership with J. M. Walker, who had emigrated from Virginia, Mackay having in the meantime experienced many changes of fortune. In the following year (1864) Messrs. James C. Flood and William O'Brien, whose acquaintance Mackay had made in San Francisco, bought an interest in the firm, which in 1865 obtained control of the Hale & Norcross Mine. This property yielded the firm a profit of something over \$500,000. In 1868 Walker's interest was purchased by James G. Fair, afterward United States Senator from Nevada, and he, with Mackay, Flood and O'Brien became the Bonanza kings. Walker is said to have lost by bad investments all he had made by this deal, and died in poverty.

With the proceeds obtained from the operations of Hale & Norcross the four partners secured control of a group of claims, seemingly barren, or nearly so, part of which had been prospected and abandoned

by William Sharon, another famous pioneer, who had made a fortune on the Comstock. Several of these claims were united into Consolidated Virginia. They spent \$200,000 in prospecting without result. Stockholders refused to pay any further assessments, and the four partners gathered in the stock at almost nothing, and having secured control levied assessments of over \$200,000 more, which was all spent in development. This work was carried on during 1870, 1871 and the first nine months of 1872. In October, 1872, when their funds were practically exhausted, the bonanza was struck, and their fortunes were made. In 1875 the market value of Consolidated Virginia stock was \$160,000,000. Five years before it was valued at less than \$50,000. The end of the bonanza period came in 1880. Mackay and his associates are said to have taken \$150,000,000 out of the mine.



JOHN WILLIAM MACKAY.

During the high tide of prosperity on the Consolidated Virginia, Mackay, Flood and Fair established the Bank of Nevada in San Francisco, with a capital of \$10,000,000. Mackay withdrew from this in 1887, after the institution had been seriously crippled by an unsuccessful attempt to corner the wheat crop. Mackay and Fair came to the rescue of the bank, re-established its credit, and then Mr. Mackay withdrew.

While continuing to own interests in mining properties, Mr. Mackay had not been actively engaged in mining for 20 years preceding his death. He became a financier, and was interested in many large enterprises, the most important of which was, with James Gordon Bennett as his principal associate, the organization, in 1884, of the Commercial Cable Company and the Postal Telegraph Company, and these, like most of Mr. Mackay's enterprises, have prospered. During the last few months Mr. Mackay had interested himself to a great extent in the proposed Pacific

cable scheme. At the time of his death he was president of the Mackay-Bennett Cable Company, president of the Postal Telegraph Company, and president of the prospective Pacific Commercial Cable Company; vice-president of the new sugar refinery at Yonkers, N. Y., of which Augustus Spreckels is president; director of the Southern Pacific, and director of the new proposed railroad from Havana to Santiago, in Cuba. He was one of the largest owners of the White Knob Copper Company of Mackay, Idaho. He was interested with Charles D. Lane in the Wild Goose Mining Company at Nome. He was heavily interested in the Sprague Elevator and Electrical Works of New York.

In San Francisco Mr. Mackay owned half the Nevada Block, the Grand Opera House, and a large lot at the southeast corner of Market and Fourth streets. He owned, together with Flood, the Buriburi ranch of about 1,000 acres in San Mateo County, the Coleman tract of about 1,500 acres in and adjacent to the city of San Rafael, and 3,000 acres of timber land in Mendocino County. He owned several thousand acres of woodland in Nevada, between Reno and Truckee. In New York city he owned the Postal Telegraph Building, a 16-story structure, and he was the largest owner of the Commercial Cable Company's building, a 21-story structure, and the property adjacent to it. He owned the *Territorial Enterprise*, a newspaper at Virginia City, Nev.

Mr. Mackay was a member of the Pacific Union Club of San Francisco, and of the Merchants' Exchange. In religion he was a Roman Catholic, and two of his warmest friends were the late Bishop Montague, who had jurisdiction over Northern California's mining regions and a large part of Nevada, and Archbishop Riordan. Mr. Mackay for a long time virtually supported the Catholic Orphan Asylum and its 130 children at Virginia City, Nev. In New York he maintained five or six of the free beds in hospitals in memory of his son William, who died half a dozen years ago at the age of 26.

John William Mackay was noted among those who knew him for his high sense of honor, for his quiet, genial disposition, for his kindly hospitality and open-handed generosity. His was a nature that prosperity could not spoil. He was simple in his tastes, disliked notoriety, and upon several occasions refused political honors. He was an ideal type of the successful Western American, although a large part of his later years were spent abroad. He left a widow, one son and an adopted daughter.

**MINING MACHINERY EXPORTS FROM GREAT BRITAIN.**—Exports of mining machinery from Great Britain for the half-year ending June 30 are valued by the Board of Trade returns as below:

	1901.	1902.	Changes.
European countries.....	£40,667	£21,253	D. £19,414
South Africa.....	52,609	103,013	I. 50,404
India.....	37,410	34,100	D. 3,310
Australia.....	69,787	38,503	D. 31,284
New Zealand.....	3,095	7,846	I. 4,751
South America.....	21,875	19,332	D. 2,543
United States.....	183	215	I. 32
Other countries.....	46,229	46,796	I. 567
Totals.....	£271,855.	£271,058	D. £797

The large gain in exports to South Africa was slightly overbalanced by the decrease in those to other countries, the chief losses being in shipments to Australia and to European countries.

**TESTS FOR GOLD AND SILVER IN SHALES FROM WESTERN KANSAS.\***

By WALDEMAR LINDGREN.

The assertion that certain clay shales of Western Kansas contain gold and silver dates back seven years. In 1895 a company of men—among them a certain H. H. Artz—sunk a shaft near the Smoky River, in Trego County, prospecting for zinc. It is stated that some indications of this metal were found, but of more importance was the announcement that the soft clay shales encountered contained a notable percentage of gold. It soon became known that the same clay shales extended through a large part of Ellis County, and were especially well exposed in the bluffs lining the Smoky Hill River, in the southern part of that country. A great number of assays were made, by different persons, of these shales, and a large percentage of the samples were said to contain gold and silver.

The asserted amounts vary considerably. Dr. J. T. Lovewell, of Topeka, in a paper read before the Kansas Academy of Science, 1902, states that he has made many hundreds of assays and supposes that the average values are \$2 to \$3 per ton in gold and silver, the latter metal always accompanying the gold. One series of 100 assays gave an average of \$10 per ton. Dr. Ernst Fahrig, of Philadelphia (*Kansas Daily Capital*, Topeka, May 3, 1902), obtained from actual mill runs in an experimental plant an average of \$2.80 per ton. One of these runs yielded 2.6 ounces silver and \$1.36 gold per ton, and another of them gave an aggregate value of \$6.75 per ton. The Kansas Pioneer Gold Shale Company, advertising its stock in the principal papers of St. Louis, Chicago and New York, states the value as \$8 to \$10 per ton, and computes the wealth contained in one acre of shales to be \$5,250,000. Others, among them Prof. E. Haworth, of the Kansas State University, have denied that the shales contain gold in notable quantities.<sup>1</sup>

The statement of tenor obtained by assays are usually accompanied by the explanation that the values are extremely irregular; different assays from the same carefully mixed pulp giving widely differing results.

It was not long before mills were proposed and erected to extract the values from the clay shale. In 1900 a company was formed and erected a mill on the Smoky Hill River, 14 miles west southwest of Hays City. Some kind of a chlorodizing process was to be used, but no run was ever made, the superintendent and owner of the process, W. F. Miller, absenting himself unexpectedly before actual work had begun. In 1901 a smaller experimental mill was built near the works just mentioned by Mr. A. G. Gage, who used a variation of the cyanide process, and claimed to have extracted some gold during a series of short runs. In the Spring of 1902 the Kansas Pioneer Gold Shale Company built a mill, using the same process and supposed to handle 100 tons per day. This mill, which is located 11 miles southwest of Hays City, on the Smoky Hill River, has just started crushing and leaching in May, 1902. Finally, during the same month, a company was organized in Topeka called the Fahrig Mining and Milling Company for the purpose of constructing and operating a 100-ton mill on the Smoky Hill River. The Fahrig process consists in treating the ore with a salt of unrevealed composition and in precipitating the gold and silver by electrolytic methods.

The investigation of the Kansas shale deposits by the U. S. Geological Survey was undertaken in May, 1902. The actual work in the field occupied eight days, from May 12 to May 20, and was carried on from Hays City as a basis of operation.

Although attention was first drawn to the shales in question through prospecting work in Trego County, all the later developments have taken place in Ellis County, adjoining Trego County on the east. Ellis

is one of the western central counties of Kansas; its county seat, Hays, is 272 miles west of Kansas City, and located on the line of the Union Pacific Railroad, traversing the county from east to west. Although near the western limit of the "rain belt," the county produces much wheat and supports a numerous and well-to-do farming population.

The geology of this part of Kansas is described in a general way in Volume II. of the *Report* of the University Geological Survey of Kansas (Topeka, 1897). The rocks exposed are sedimentary and of Cretaceous age, excepting the sands and gravels along the river, which, of course, are of much later Pleistocene age. The two great divisions of the Cretaceous, the Benton and the Niobrara, cover the whole area. The beds of shale and lime lie nearly horizontal, but have a slight northeasterly dip.

Beginning from the top that part of the Cretaceous column with which we are here concerned is subdivided as follows:

Niobrara Group...	{ Smoky Hill chalk (300 feet). Fort Hays limestone (50 feet). Septaria horizon.	
Benton Group....	{ Blue Hills shale (100 feet) Ostrea shales (150 feet) Fencepost limestone (1 foot) Inoceramus horizon (5 feet) Flagstone horizon (10 feet) Lincoln marble (15 feet) Bituminous shale (30 feet)	Upper.      Lower.

Total thickness, about 660 feet.

The principal gold-bearing stratum is supposed to be that of the Benton group, including the Ostrea shales and the Blue Hill shales. It is stated that these rocks practically over the whole areas in which they occur, contain more or less gold and silver, though the metals may be rather irregularly distributed. Assays showing value are claimed to have been obtained in Trego County, along the Smoky Hill River, as far westward as the Benton shales extend. Further, all along the Smoky Hill River, in Ellis County, and also in Rush County, adjoining on the south. Values have also been claimed from assays of samples near Hays City; for instance, in the shales underlying the Fort Hays limestone four miles west of town. Finally, also along the Saline River, along which Fort Benton shales are also said to outcrop. All the mills, however, are located on Smoky Hill River southward of Hays City, and from this vicinity have also been taken by far the larger number of assayed samples.

In order to arrive at a reliable conclusion regarding the contents of these shales in precious metals, a number of samples tabulated below were carefully taken. The method used included, first, the clearing of a convenient exposure to a required depth, so as to obtain fresh material. Along the river bluffs the shales are very little altered and fresh rock comparatively easily exposed. The required thickness of shale being exposed (usually amounting to from 2 to 4 feet), a sample of from 20 to 30 pounds was broken down on a square of canvas; this material was then reduced to pieces about the size of a walnut or smaller, and this quartered down twice. It was then put into quart jars and securely sealed. The 19 samples taken were sent to Washington, D. C., and further examined. The shale in each lot was crushed, carefully mixed, and quartered down until the last half of the sample amounted to 1/2 to 3/4 pound. This quantity was finally ground and sieved through an 80-mesh screen. From this ground material the assays were made.

The fire assay, as well known, consists in smelting in crucible or scorifier with litharge or lead. The lead absorbs the gold and silver contained in the ore, and this gold and silver remains behind when the lead is driven off by a process of oxidization. For small and moderate amounts of the precious metals this is the most accurate method known, and in skilful hands always gives reliable results. The claim that "the fire assay will not bring out the values" is well known and reiterated to weariness, especially in districts where higher values are desired than nature put in the ores. True enough, the fire assay, like any other analytical operation, requires intelligent care and suitable ingredients. Where there

are large amounts of copper, zinc, tellurium and similar elements in the ore, this assay needs particular attention in order to prevent losses. As in every other quantitative analytical process there are sources of error in the fire assay. A very small quantity of gold and silver may be lost in the slag in the first smelting. This is generally inappreciable. But in cupelling the lead button there is always a certain loss of silver by absorption by the cupel, much less by volatilization. This loss may amount to several per cent in case of very poor ores and small silver beads, but is then practically negligible. The loss of gold during cupellation is ordinarily very much smaller than that of silver and practically nil. One often hears assertions that the proper values are not brought out by this assay, because of the extremely fine distribution of the gold. This is absurd, because the chemical reaction, that is, the absorption of gold and silver by lead takes place practically independently of the mechanical state of the precious metals. If anything, a fine division would be more favorable to the absorption by lead. In the same category may be put the assertion that gold in these shales is carried in the fumes from the crucible.

When one considers that the very minute particles in a low-grade paying ore, even after fine crushing, are likely to be securely locked up in grains of quartz or other refractory material, it becomes clear that the extraction of gold by chlorine, bromine or potassium cyanides, which have little effect on these enclosing shells, must be less effective than a fusion. In a fusion with proper fluxes these shells are completely disintegrated, allowing the molten lead to dissolve the precious metal almost entirely. The fire assay is in fact used in all cyanide and chlorination works to test ores and tailings.

This statement regarding the wet process also holds good for analytical work. Only in the case that the ores contain large quantities of gold or silver do the wet methods offer any advantage over the fusion and cupellation. Electrolytic quantitative tests of gold and silver are known, but rarely used, offering no advantage over other assays and requiring as much preliminary work in the elimination of other metals, as do wet tests by precipitation of the gold by hydrogen sulphide, zinc, oxalic acid or other means.

The accuracy of the fire assay varies, of course, with the quantity and character of the material, the purity of the reagents and the skill of the assayer. Dr. W. F. Hillebrand, operating on Leadville rocks, gives 0.005 ounce per ton as the limit of accuracy for silver assays. When using four assay tons in ordinary work one ought to easily determine quantities of 0.05 ounce of silver per ton, and 0.005 ounce, or 10 cents, per ton of gold.

The 19 samples were first assayed by myself in the laboratory of the Survey. The general proportions of the charge were as follows: 1 A. T. shale, 2 A. T., litharge was spread over the mixed charge and a layer of salt above this. Samples 1 to 8, inclusive, were assayed with a charge of 2 A. T. shale and the rest of the fluxes in the proportion given above. For the remaining numbers 1 A. T. was used. Samples 1, 3, 17, 18 and 19 were assayed without addition of nitrate of soda, and in case the lead button was too large it was scorified down to a suitable size. In the remainder of the samples, which contained much carbon, niter was added in varying proportions to obtain a convenient button.

For the purpose of collecting the gold, in case no silver was present in the shale, 1.5 to 3 milligrams of chemically pure silver was added to each assay, excepting Nos. 1 and 2. This was recovered, minus the minute losses chiefly caused by the absorption of the cupels. No gold was found in any of the samples, though in some of them minute black specks remained after parting the silver buttons. Some of these disappeared on ignition, while others remained; but upon examination with the lens failed to show the luster and color of gold.

The samples were then assayed in the laboratory of the Survey by Dr. E. T. Allen, who reports as follows: "I have examined 19 samples of shales

\*Abstract of a bulletin of the U. S. Geological Survey, now in press. Published by permission of the Director of the Survey.

<sup>1</sup>*Kansas Semi-Weekly Capital*, Topeka, June 6, 1902, *Mineral Resources of Kansas for 1898*, Lawrence, Kan., 1899.

from Western Kansas, collected by Mr. Lindgren, and find no gold in any of them. The samples were assayed in the crucible with about 1 part soda and 2 parts of litharge to 1 part of the ore, and since most of the shales contained considerable carbonate of calcium, from 1/2 to 2 parts of borax and some powdered glass were added to make the fusion thin fluid. Niter was put in to oxidize the excess of carbonaceous matter in all but Nos. 15, 18 and 19. Two assay tons of each sample were taken, except Nos. 7, 8, 10 and 12, where only one assay ton was used; 2 or 3 milligrams of gold-free silver were added to each crucible charge to collect the gold in case the quantity of silver in the shale should prove insufficient. This silver was recovered after cupellation, minus a very small and nearly constant loss, which is always caused by absorption by the cupels, volatilization, etc. When the beads were parted, the majority dissolved without residue. In several there remained one or two extremely minute, unweighable black specks. These either disappeared on ignition or else failed to develop the color and luster of gold, though they were examined carefully with a good lens."

In the previous work the added silver might easily have masked the presence of small fractions of an ounce of that metal per ton in the shale. Consequently, a third series of assays of the same samples were undertaken jointly by Dr. E. T. Allen and myself in order to ascertain whether small quantities of silver were present. The laboratory and all utensils employed were kept scrupulously clean, and we do not believe that there was any possibility of the introduction of gold or silver into the samples except from the litharge. The latter was obtained from the Pennsylvania Smelting Company, of Pittsburg. It was assayed in duplicate, using 10 A. T. in each charge with the following result:

No.	Silver, oz. per ton.	Gold.
No. 1.....	0.005	Distinct trace in 10 A. T.
No. 2.....	0.005	Doubtful trace in 10 A. T.

The particles remaining after parting were carefully examined by a microscope of high power.

The charges for the assays were in the main similar to those indicated above. Two assay tons of shales were used in all of the assays except in 11, 15, 16, 17, 18 and 19, of which 1 A. T. was taken. The assay of No. 3 failed and no more material was available. About 1 1/2 parts of litharge to 1 part of shale was used. The cupellation was undertaken with particular care to guard as much as possible against losses from absorption and volatilization. In the cases where weighable buttons were obtained the quantity of silver due to the litharge was subtracted and the figures given in the following table thus indicate the true amount of silver contained in the shale. Duplicate assays were made of six samples, marked "repeated" in the table. In the duplicates the niter method was divided and a charge made as follows:

The parting was effected in small glazed porcelain capsules and with very exceptional care. The residue after parting and annealing was examined by a petrographic microscope. In No. 5 we obtained from 2 A. T. two flakes of gold weighing together 0.01 milligram, equalling 0.005 ounces per ton, or a value of 10 cents per ton. In No. 13 several very minute, unweighable flakes of gold were discovered by using high magnifying powers; they could not be recognized by an ordinary lens.

In nearly all of the samples after parting and ignition almost microscopic, unweighable black specks were found. It was determined to subject these to more detailed examination. Under high magnifying power these specks appeared angular, irregular masses having a dark gray or black color and sub-metallic to metallic luster. A few of them were loose aggregates of the same substance, with occasional glints of silvery or yellowish luster as might possibly arise from included particles of gold. The appearance under the microscopic is that of graphite. Besides this substance only a few particles of oxide of iron were noted in the residue. A num-

ber of the black specks collected were then subjected to the following chemical tests: First, evaporated with aqua regia to dryness, the specks were still visible and seemed unattacked. We next tried burning in a stream of oxygen. The operation was difficult on account of the minute size of the particles, but in two separate trials the specks disappeared upon being treated in a current of that gas. In conclusion, we assert that these dark particles are neither gold nor platinum, though we suspect that in many cases they have been reported as traces of gold. We believe it most probable that these particles are graphitic carbon, contained in the silver. It will probably be objected that carbon could not without change pass through the oxidizing operation of cupellation. Be this as it may, the quantity of carbon obtained was certainly extremely small, and it is a known fact that silver has a decided tendency to unite with carbon under some conditions.

Contents of Gold and Silver in Samples of Shale.

No.	Silver, Oz. per ton.	Gold, Oz. per ton.	Total Value per ton.
1.....	None.	None.	...
2.....	0.007	None.	\$0.004
4.....	None.	None.	...
5.....	0.017	0.005	0.110
6.....	0.007	None.	0.004
7.....	0.022	None.	0.013
8.....	0.037	None.	0.022
9.....	0.097	None.	0.060
10.....	Probably none.	None.	...
10 (repeated).....	None.	None.	...
11.....	0.045	None.	0.027
11 (repeated).....	0.030	None.	0.018
12.....	Probably none.	None.	...
12 (repeated).....	0.030	None.	0.018
13.....	0.087	Microscopic trace.	0.052
13 (repeated).....	None.	None.	...
14.....	0.072	None.	0.043
14 (repeated).....	None.	None.	...
15.....	0.085	None.	0.051
16.....	0.037	None.	0.022
16 (repeated).....	None.	None.	...
17.....	0.095	None.	0.057
18.....	Probably none.	None.	...
19.....	Probably none.	None.	...

These results were further checked by assays made in the laboratory of the United States mint.

Although the quantities of silver have been given to the third decimal, as calculated from the weights of the beads, it must be understood that quantities below 0.01 or 0.02 ounce per ton are very doubtful under these conditions.

In all 77 assays were made of material taken from the 19 samples. The results indicate that minute quantities of silver are often contained in these shales and that some samples show the presence of very small quantities of gold. The same samples do not always give the same results when repeated, which goes to confirm the statement on page 1, that the metals when present are somewhat unevenly distributed through the rock. None of the samples contain silver or gold in economically important quantities. While, of course, it is impossible to say what may be contained in those parts of the shale beds which have not been assayed, it is extremely improbable that this material will ever be of economic importance as a silver or gold ore.

**PROGRESS IN MANCHURIA.**—The *Priamursky Viedomost* says that the construction of the Eastern China Railway has led to a great development of the trade of Manchuria. Thus, the authorities have received numerous requests for permission to undertake gold mining. There is such a great demand for glass and for articles made of glass that a glass works is to be started at Charbin. American representatives are very actively engaged in trying to find openings for American machinery in all directions.

**ZINC PRODUCTION IN UPPER SILESIA.**—Recent statistics show that in 1901 there were 24 zinc smelting works in Upper Silesia having in use 542 furnaces, of which 406 were gas fired. These furnaces contained a total of 23,934 retorts. The material used was 219,332 metric tons calamine, 253,770 tons zinc-blende, 3,013 tons linings and 3,604 tons zinc dross and flue-dust. There were used 1,160,052 tons coal and 41,418 tons fire-clay. The output was 107,977 metric tons of spelter, 1,182 tons of lead and 13 tons of cadmium. The average of spelter made was 22.5 per cent of the furnace charge.

**THE PICARD AND SULMAN METHOD OF ZINC SMELTING.**

Considerable attention, especially in England, has been directed lately to the Picard and Sulman method of zinc smelting, which has recently been applied on a commercial scale at Cockle Creek, N. S. W. Consignments of spelter therefrom have already been received in England. Before the erection of the works in Australia was undertaken the process was given a trial at the Emu works, in Wales, where upward of 4,000 tons of ore were treated by it during the last year, so that it may fairly be considered to have passed the experimental stage. Its details were communicated by the inventors, Messrs. H. Kirkpatrick Picard and H. Livingstone Sulman, in a paper entitled "A Dry Process for the Treatment of Complex Sulphide Ores," read before the Institution of Mining and Metallurgy, June 19, 1902. The title of this paper is very indefinite. In reality the process is simply one of zinc smelting, with a special method of preparing the charge for distillation, which it is claimed enables the successful treatment of such ordinarily undesirable ores as those of Broken Hill. The following paragraph is an abstract from the paper above referred to:

"The roasted ore is mixed with about 20 per cent of its weight of crushed coking coal, and the mixture is briquetted in any suitable type of machine, pitch or some other carbonaceous material being employed as binding agent. The briquettes are then distilled in the ordinary manner and in the normal time. They coke into coherent masses and thereby from a skeleton, which holds up the particles of reduced lead and the corrosive matte and slag, and thus protect the walls of the retort. The distillation furnaces at the Emu works are of the direct fired, Welsh-Belgian type, with 144 retorts arranged in six rows, the lowest being cannon pots. The ore treated assays 25 per cent Zn and 24 per cent Pb; it is mixed with 20 per cent of crushed coking coal and 5 per cent of pitch. The residues assay 5 to 8 per cent Zn. The recovery of zinc is about 70 per cent. The consumption of retorts is 3.7 per furnace per day, the average life being 35 to 42 days. The retorts are made by hand and cost 6 shillings apiece, which is high even for Wales. The residues, coked briquettes, drawn from the retorts are smelted from the retorts are smelted in the ordinary manner for recovery of their silver and lead smelting. This material is well adapted to lead smelting. The loss of lead during the distillation of the zinc is insignificant and but very little lead goes over into the spelter, the latter averaging 99 per cent Zn and only about 0.5 per cent Pb."

The paper of Messrs. Picard and Sulman fails to go into numerous details that we should like to know about. For example, the method of making the briquettes, their shape and physical characteristics, and the manner of charging them into the retorts are not described. It is only stated that a retort takes about 15 briquettes and the charging is effected by means of a shaped iron paddle. A furnace of 144 retorts, arranged in six rows of which the lowest is a row of cannons, takes seven tons of briquettes. There is considerable uncertainty throughout the paper as to whether the statements of results are reduced to the basis of raw ore or of roasted ore. However, this is not of much consequence, since the loss of weight in roasting Broken Hill sulphide of the character described is small. The cost of briquetting 30 tons of roasted ore per day was 5s. 6d. per ton, or a total of 165s. 6d., of which 6 tons of coal at 8s. 6d. per ton accounted for 51s., and 1.5 tons of pitch at 45s. per ton came to 72s. 6d. Deducting the cost of the coal, which would be used as reduction material under any circumstances, the actual cost of the briquetting for labor and material was about 3s. 10d. per ton of roasted ore, but this is partially offset by the smaller percentage of coal employed.

The distillation of zinc ore which is high in lead and iron is not new. It is done regularly by Belgian smelters, certain of whom distill regularly mixtures containing 5 to 8 per cent of lead and 10 per cent



or more of iron. There are few Belgian smelters who do not recover lead by jiggling the residues. The spelter is not necessarily greatly contaminated with lead. One European smelter treats habitually an ore assaying 14 per cent Pb. and makes of it a spelter containing no more than 1 per cent Pb. In distilling ores which form corrosive slags the reduction material always plays an important part in absorbing the slag, like a sponge, and keeping it away from the walls of the retorts the loss by breakage is not abnormal. There is therefore no novelty in distilling mixed ores and recovering their lead contents by subsequent treatment of the residuum. As to how far it is desirable for a smelter to go in reducing the zinc tenor of his ore and increasing the lead tenor is largely a matter of cost. Generally it is considered in Belgium that the zinc tenor of the ore should be upward of 40 per cent; the average ore distilled in Belgium assays about 45 per cent Zn.

The results reported by Messrs. Picard and Sulman are very interesting indeed because of the high tenor in lead of the ore distilled and the low percentage of reduction material employed. The latter is directly contrary to the approved practice in zinc smelting and would appear to indicate that the briquetting of the charge is advantageous, both in preventing corrosive substances from reaching the walls of the retort and in increasing the capacity of the furnace. It is upon this, indeed, that the only essential claim of the Picard and Sulman patent rest. United States patent No. 665,744, issued January 8, 1901, has a single claim, as follows: "The process of treating sulphide ores containing silver, zinc and lead, which consists in roasting the ore to the form of oxides, mixing the roasted product with carbonaceous material suitable for coking, forming the mixture into briquettes and distilling the briquettes under such conditions that they are first coked into coherent masses and finally the zinc reduced and volatilized, while the lead is reduced and the lead and silver retained in minute particles throughout the coke." Messrs. Picard and Sulman state in their paper that "in spite of its apparent simplicity our process has been found capable of complete patent protection in the principal countries and colonies of the world; whilst the grant of the United States, German and Scandinavian patents may be taken as evidence of novelty." Notwithstanding the grant of patents by the countries which make an investigation as to novelty, we are disposed to be doubtful as to it; at all events, the claim must be very narrow. The charging of briquettes with a carbonaceous binding material was certainly practiced in Belgium twenty years ago, where excellent results were claimed for the method, which did not, however, survive; among the others, increased life of the retorts was claimed. It would appear to us therefore that the only possible claim that Messrs. Picard and Kirkpatrick can hold would be the preparation of briquettes with "carbonaceous material suitable for coking," but inasmuch as in the specification it is explained that "bituminous coal or charcoal, anthracite, or similar material in conjunction with a coking or binding material, such as tar, molasses, or pitch, or similar suitable material, may be employed," it would seem to us rather difficult to differentiate this process from what has previously been done in the art.

**PEAT IN FRANCE.**—According to a report of the German Consulate in Paris, published in the *Nachrichten für Handel und Industrie*, issued by the German Ministry of the Interior, peat is found in 32 departments of France, especially in the Department of the Somme between Amiens and Abbeville, in Auvèrgne, in the Ardennes, in the Vosges and Limousin. Of the deposits of peat 159 belong to the communes and 342 are owned privately. In 1900 there were 51,000 metric tons of peat extracted by the communes and 44,000 tons by private proprietors. The average price per ton was 15 francs. The peat is used chiefly as fuel and the ashes as manure.

#### THE ADVANTAGES OF SMALL FANS FOR MINE VENTILATION\*

There is no need to emphasize here the necessity for good ventilation, nor to go into the causes of increase of temperature with increase of depth. It will be sufficient to assume that great quantities of fresh cool air will be required. As the mines, however, get deeper, and the workings more extensive, the question arises: Can this fresh cool air be carried through easily? Is there not a limit to the size and efficiency of a fan? It is easy to say, "Oh, we will continue to increase the size of the fan." But will this be practicable? Now the writer is a strong advocate of small quick-running fans for quantities of air up to, say 300,000 or 400,000 cubic feet, and he does not think that large fans will prove efficient for greater quantities. He admits that large open-running fans like the Waddle are capable of easily passing large volumes of air, and that large cased fans with évasé chimneys pass large volumes with little vibration. The cost of laying down, the upkeep, and to a certain extent the inefficiency, are, however, greatly against this class. By stating that to a certain extent they are inefficient, is meant that it is not so easy to adopt the amount of air produced by a large fan to the requirements of a mine as it is with a small one. If an increased output of air is required with a large fan there is the danger of disturbing the structure, while the cost of driving it for a small amount is great. With a small fan, however, the cost of driving at a small speed will not be great, and the speed can be increased just as required. The writer's object is to point out—(1) that the tendency in future will be to ventilate workings by means of one or more small quick-running fans; (2) that this method, instead of being inefficient and unsuitable, is both suitable and efficient as well as economical. Before reference is made to the way in which two fans may be used to ventilate a mine, let a little consideration be given to some of the terms used.

**Equivalent Orifice.**—Murgue, who has given the name of equivalent orifice to vex the souls of colliery managers, refers to it as an opening in a thin plate which represents the resistance met within the mine. That is to say, the area of the orifice or opening in the plate in passing a certain amount of air causes a water-gauge which is equal to the water-gauge produced by the passage of the same amount of air through the workings of the mine. The area of this opening can be found by dividing the square root of the water-gauge into the quantity of air in thousands of cubic feet per minute.

**Mechanical Efficiency.**—Mechanical efficiency of the ventilator is the ratio of the useful work performed per second to the work done upon the shaft of a machine per second. This is the most important quality in the fan. For no matter how much air it will pass even at a small water-gauge, it is clear that if the power to drive it is greater than it should be, a great loss is suffered, and the fan which will pass air with little loss between engine and fan and in the fan itself or in the output to outside air is certainly to be preferred. For a given ventilator the mechanical efficiency varies according to the dimensions of opening. If the opening remains the same, then the useful work is proportional to the cube of the velocity of the fan. That is to say, the speed of the fan regulates the amount of air discharged, and the useful work will be dependent upon this speed. The work lost is also proportional to the speed, since it is proportion to the output of air. It may be taken for granted that the amount of air discharged from the fan per minute is equal to about 75 per cent of the cubical contents of the fan multiplied by the number of revolutions per minute.

**Capacity of Output of Air.**—As already mentioned, the output is proportional to the capacity and the speed, but this is on the condition that the opening is increased proportionally to the radius. All ventilators are constructed to fulfil certain conditions which the manager knows to a certain extent beforehand, and are made in such a way that they will give the best results if these conditions are fulfilled. The

opening at ordinary speed is that which will give best results. The opening is constant for one type of fan, but of course it changes with different types of ventilators, and may be taken as a means of denoting the relative size and efficiency of the different fans.

**Manometrical Efficiency.**—This term refers to the water-gauge efficiency, and may be taken as the ratio of the actual water-gauge of the air and the theoretical water-gauge, determined from the openings and the capabilities of the fan.

Ventilators may be placed in any one of the following positions:—(1) One fan at the top of the upcast used to draw or exhaust the air; (2) a fan placed at the top of the downcast, forcing or blowing air through the mine; (3) two fans placed at the top of the upcast shaft; (4) two different upcasts each with a fan and having the same downcast.

**LARGE COAL CARS FOR BRITISH RAILROADS.**—The *London Engineer* says: "We learn that the Midland Railway Company has recently placed an order with the Leeds Forge Company for thirty 30-ton wagons, which it is believed are to be utilized for the conveyance of locomotive coal. The under frames and bogies are made throughout of patent compressed steel plates—a mode of construction by which—so it is claimed—can be obtained the lowest tare weight with the greatest factor of safety. The wagons are fitted with both the vacuum and hand brakes, and have a tare weight of 10¼ tons. To facilitate the unloading, three pairs of doors on each side of the wagons are provided. This type of wagon was recently submitted to several severe tests, each wagon being loaded with 90 tons of steel plates, 83 being distributed, and the remaining seven added to the center. The under frames showed the slight deflection of ⅞-inch. When the load was removed there was absolutely no permanent set or injury to any part. The under frames and bogies are of the standard pattern for high-sided mineral and covered goods wagons of the same capacity. The Leeds Forge Company has, we also learn, received an order from the Northeastern Railway Company for 50 bogie wagons, each of a carrying capacity of 50 tons. These wagons, which are on bogie trucks, and are also constructed of compressed steel plates, are nearly 40 feet over the buffers, 8 feet wide, with a tare weight of nearly 14 tons, and are, with one or two exceptions, of similar design to those on order for the Midland Railway."

**NEW RADIO-ACTIVE ELEMENT.**—A special cable dispatch from Berlin, of July 9, makes the following announcement: Professor Marckwald, of the Berlin University, announced at the last meeting of the Physical Society that he had discovered a new element. The element in question is radio-active and of extraordinary energy. Professor Marckwald has separated it from radio-active bismuth, so-called polonium, found in uranium ore. It consists, as Professor Marckwald discovered, substantially of ordinary bismuth and of a new metal in the proportion of a 1,000 to 1. The new metal can be separated by the electrolytic process. The rays it emits are something like those of the metal radium, but differ in being almost completely absorbed by paper as well as by glass. Professor Marckwald has proved that a porcelain tube heavily charged with electricity by rubbing immediately lowers its charge when a morsel of this metal weighing hardly a milligram is brought within a distance of one decimetre. A chemical analysis of the new metal is rendered very difficult by the fact that one ton of ore contains hardly one gram of it.

**AN ELECTRIC CEMENT PLANT.**—The electric appliances of the plant recently erected by the Alsen American Portland Cement Works are described in the *Electrical World and Engineer* of July 19. The works are on the Hudson River near Catskill, N. Y., and electrical power, generated at a central station, is used to operate all the machinery.

\*From the *London Colliery Guardian*, June 20, 1902.

**MACHINE DRILL CONTEST AT IDAHO SPRINGS, COLO.**

By H. FOSTER BAIN.

Among the Fourth of July attractions at Idaho Springs there was, this year, a novel contest, one in which various forms of air drills were pitted against each other under conditions as nearly equal as it was possible to make them. The contest was open to all comers, and any make of drill could be used, provided merely that the cylinder should not measure more than three inches and the last steel used should be 1 1/8 inches in diameter. There were 25 entries, of which two abandoned the contest without attempting to drill, nine abandoned it without making a record, and two were disqualified for having failed to drill the full depth of holes. The contest lasted through the 4th, 5th and 6th, and attracted a large number of mining men. The drilling took place immediately east of the Newhouse Tunnel, where a grand stand had been erected facing the bluff. Into the face of the latter a drift was run five feet, in order to get into the solid rock. The latter was the ordinary granite-gneiss of the region, and the drilling was across the formation. The ground was not quite so hard as at the breast of any of the long cross-cut tunnels now being run in the region, but was very much harder than vein matter. It represented fairly well the average conditions of cross-cut tunnel work in that district. The face of the drift was marked off into vertical strips six inches wide, and each crew was allowed to drill in any unoccupied strip. The crews tossed up for choice of position, two working at once. The general arrangements are shown in Fig. 1.

The contest included setting up and tearing down, as well as drilling. The conditions were that each contesting crew should set up its column bar, arm and machine, make connections and drill two nine-foot holes, one above the horizontal and the other below, neither to be at a greater angle than 25° from the horizontal. The machines, bars, etc., were then to be torn down and replaced on the ground as they were at the beginning. Air at 110 pounds' pressure was furnished from the tunnel plant.

The results of the contest as officially kept are tabulated below, being kindly furnished by Mr. H. N. Sims, one of the judges. Three makes of drills were entered: (1) Water Leyner, model 5; (2) Sullivan U. d; (3) Ingersoll-Sergeant, D24. The Leyner weighs less than either the Sullivan or the Ingersoll and has a smaller inlet air port. It has, however, more movable parts and requires more careful handling.

The results are interesting in spite of the fact that no such contest ever demonstrates the absolute superiority of a machine except under the exact conditions of the contest. The Leyner gained time in the setting up and tearing down, presumably because of being a lighter machine. Time was also made in changing drills, for the reason that there were no clamps to tighten and loosen. Much of the time was gained, however, as a result of the method by

which made the best record in this particular with the piston machine had been drilling long holes at the Monarch Tunnel. They were careful to use plenty of water, cut down the air occasionally, and did not crowd the drill through the last two feet. By this means they kept fairly clear of the mud. It is notable that each drill entered had to abandon holes because of "fitchering" or running into old holes.



FIG. 1.—GENERAL ARRANGEMENT FOR TWO DRILLS.

which the hole was kept clear of refuse. The piston machines lost time by reason of the drills becoming stuck. This was notably true on the deep-down hole. The fact that the long back holes were driven by them with greater ease than the down holes was a considerable surprise probably to most of the observers. The men had usually no especial difficulty

It would probably be unsafe to draw any very general conclusions as to the general applicability of the drills from a single contest such as this, but the inferences do seem warranted that high pressure air is more efficient than lower pressure, even with the slow striking type of drills. It also seems clear that any decrease in weight which can be made with-

**OFFICIAL RECORD OF THE MACHINE DRILLING CONTEST.**

Order of Drilling	Make of Drill	Runner	Helper	Time Settling Up			Time First Hole			Back or Down Hole	Time First to Second Hole			Time Second Hole			Back or Down Hole	Time Tearing Down			Total Time				
				H.	M.	S.	H.	M.	S.		H.	M.	S.	H.	M.	S.		H.	M.	S.	H.	M.	S.		
1.	Ingersoll.	W. W. Rogers.	H. C. Stull.	0	4	35	0	24	15	Back	0	1	20	0	34	30	Down	0	4	15	(1)	1	9	5	
1.	Leyner.	Gustavison.	Gustavison.	0	6	0	0	27	50	Down	0	1	10	0	27	40	Back	0	3	31		1	6	11	
2.	Ingersoll.	A. S. Pierce.	J. D. Sullivan.	0	4	35	(2)			Back												1	38	30	
2.	Leyner.	John Nelson.	John McIsaac.	0	9	5	0	21	27	Back	(3)														
3.	Sullivan.	G. A. Howatt.	Peter Brennan.	0	6	0	0	25	0	Back	0	1	0	(4)	1	0	45	Down	0	3	21	(4)	1	36	0
3.	Leyner.	Axel Strom.	Andrew Miller.	0	5	45	0	22	0	Back	0	0	20	0	17	20	Down	0	3	35	(5)	0	49	0	
4.	Ingersoll.	Owen Williams.	Alex. Horn.	0	5	15	0	24	45	Back	0	1	30	0	37	30	Down	0	7	0		1	16	0	
4.	Leyner.	J. W. Smith.	J. A. O'Donald.	0	7	0	0	46	0	Down	0	9	45	0	28	0	Back	0	3	45	(6)	1	34	30	
5.	Sullivan.	Dan Shea.	Geo. Fuller.	0	4	15	(7)																		
5.	Leyner.	Al. Barlow.	Al. Gooch.	0	6	20	0	22	10	Back	0	1	0	0	19	30	Down	0	3	9		0	52	9	
6.	Sullivan.	A. L. Owen.	John McCormac.	0	5	0	0	24	0	Back	0	1	0	(8)											
6.	Leyner.	Henry Hauser.	Theo. Grasser.	0	3	30	0	25	15	Back	0	0	45	0	40	30	Down	0	2	40	(9)	1	12	40	
7.	Ingersoll.	Oscar Wing.	Chas. Rydland.	0	4	30	0	33	0	Back	0	2	0	0	34	30	Down	0	3	13		1	17	13	
7.	Leyner.	Gus Carlson.	Ed. Shannon.	0	3	45	0	22	55	Back	0	0	50	0	18	30	Down	0	3	0	(10)	0	49	0	
8.	Sullivan.	F. Arlington.	Wm. Hand.	0	3	30	(11)			Back															
8.	Leyner.	T. F. Howard.	John Mathews.	0	3	25	0	24	50	Back	0	0	30	0	17	15	Down	0	3	0	(12)	0	49	0	
9.	Ingersoll.	Tom Vivian.	Al. Gooch.	0	4	10	0	31	50	Back	0	1	30	0	29	0	(13)					1	6	30	
9.	Leyner.	Bert Zeilor.	Geo. Wehman.	0	4	30	0	19	15	Back	0	0	45	0	17	10	Down	0	3	10		0	44	50	
9.	Sullivan.	Wm. Gartrell.	Wm. Irvin.	0	4	10	0	28	20	Back	0	1	0	0	23	40	Down	0	3	10		1	0	20	
10.	Leyner.	Alfred Ellison.	Al. Fredman.	0	3	30	0	17	30	Back	0	0	30	0	17	50	Down	0	2	55		0	42	15	
11.	Ingersoll.	Wm. Bennett.	Chas. Rowe.	0	4	0	0	32	10	Down	0	2	20	(14)			Back								
11.	Leyner.	Theo. Grasser.	Harry Hauser.	0	2	50	0	18	10	Back	(15)														
12.	Ingersoll.	Al. Fredman.	Alfred Ellison.	0	10	45	(16)																		

G. W. Newberry and Bert Daws, entered on Sullivan, and William Gartrell and Thos. Dunstan, entered on Ingersoll, abandoned contest without attempting to drill.

(1) Second hole 4 1/2" short; disqualified.  
 (2) First hole "fitchered"; contest abandoned; no record.  
 (3) Second hole ran into old hole; contest abandoned; no record; changed machine; no time allowance.  
 (4) Back head broke; 17 min. 45 sec. allowed for changing machine.  
 (5) First hole 3" short; disqualified.  
 (6) Time of first hole includes 6 1/2 minutes change of machine; no allowance.  
 (7) Ran into old hole; contest abandoned; no record.  
 (8) Broke steel in second hole; contest abandoned; no record.  
 (9) The 40 1/2 min. includes 15 min. drilling, 5' 1 1/2" on second hole, which ran into an old hole and was abandoned and a third hole drilled.  
 (10) First hole, 9' 3"; second hole, 9' 3 1/2".  
 (11) Contest abandoned; first hole "fitchered."  
 (12) First hole, 9' 3 1/2"; second hole, 9' 3 1/4".  
 (13) Abandoned contest before completing second hole; no record.  
 (14) "Fitchered" in second hole; contest abandoned.  
 (15) Ran into old hole and abandoned contest before finishing first hole.  
 (16) Six and one-half minutes allowed for changing valves on machine; "fitchered" in first hole at 37 1/2 minutes total time; abandoned contest.

In the actual cutting of the rock there was not much difference, the heavier blow of the piston machine compensating the larger number of blows of the hammer machine.

up to the time the holes attained a depth of seven feet, about the length of hole they were accustomed to driving. Beyond that, on the down holes, they had difficulties in keeping them clear. The team

out sacrificing necessary strength will promote rapid work. The superiority also of the method of clearing the hole by a steady stream of water is apparent here as in common core drilling.

## LEGISLATION AFFECTING THE MINING INDUSTRY.

SPECIAL CORRESPONDENCE.

WASHINGTON, D. C., July 22, 1902.

The session of Congress which has just closed was more than usually productive of bills interesting to mining men. Of the many introduced, only two, however, became laws. A few of the others were favorably reported and the majority went over under the head of "unfinished business."

On December 4, 1901, Senator Tillman introduced the first of the numerous bills of the year for the establishment of mining schools. The present movement for the establishment of mining schools in the several States and Territories originated, however, with the State University of North Dakota, in a bill drawn by President Merrifield of that institution, and introduced by the Hon. H. M. Johnson, in December, 1896. It was "an act to aid State schools of mines and mining departments of State universities." This bill was subsequently withdrawn, with the approval of the author, in order to give the right of way to a later bill by Representative Mondell, of Wyoming.

During the past year, the agricultural colleges of the country have made a vigorous attempt to capture the proposed appropriation for mining schools, contending that, with the exception of separate distinctive mining schools established by the State legislatures, the agricultural colleges should be the exclusive beneficiaries of any and all such Congressional appropriations.

The Tillman bill provides that a portion of the proceeds of the sale of the public lands be applied to the endowment and support of schools or departments of mining and metallurgy in the several States and Territories in connection with the colleges for the benefit of agriculture and mechanic arts that were established under an act of Congress in 1862. The amount appropriated is \$10,000 for the first year with an annual addition of \$1,000 until the annual amount paid each State or Territory is \$15,000. The appropriation must be expended only for geological instruction, mining engineering, metallurgy, research in road-building material and its proper application, and for the branches of learning pertaining thereto, including the various branches of physical, natural, and economic science.

On the day after Senator Tillman introduced his bill, December 5, 1901, Senator Depew introduced a similar bill to "promote and encourage the mining, mineral and metallurgical sciences of the United States." It provided for an appropriation of money arising from the sale of public lands for the purpose of endowing and maintaining a department of mining in the State or Territorial schools or colleges of mines now established or which may hereafter be established. The sum of \$15,000 was named as a starter, with an annual increase of \$1,000 for ten years until the annual amount paid each State or Territory should be \$25,000.

Mr. Hansbrough introduced in the Senate on January 21, 1902, a bill which provides for the construction of irrigation works for the reclamation of arid lands with the money received from the sale of public lands in Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington and Wyoming. Provision is made in the bill that in case the receipts from the sale and disposal of the lands mentioned are insufficient to meet the requirements for the support of the agricultural colleges in the several States and Territories established by Act of Congress in 1862, the deficiency, if any, in the sum necessary for the support of the colleges shall be provided for from any moneys in the Treasury not otherwise appropriated.

This bill, which was favorably reported January 28, 1902, and which became a law on June 17, is clearly framed in the interests of the agricultural element, and has not even an appeasing sop to console the mining men. The bill found favor in the eyes of many of the most influential Senators of the

West, who looked with approval on a scheme for the reclamation of their arid lands.

Mr. Hansbrough introduced in the Senate on February 13, 1902, a bill of his own to "promote and encourage the mining, mineral, and metallurgical sciences of the United States." It appropriates, for the more complete endowment and maintenance of State schools of mines or mining departments of State universities, the sum of \$5,000 for the first year and an annual addition of \$1,000 for five years until the annual amount paid each State or Territory shall be \$10,000. This is to be applied only to instruction in chemistry, metallurgy, mineralogy, geology, mining, mining engineering, mathematics, mechanics, drawing, milling, and kindred branches, with special reference to their application in the industries of life.

In this connection, a Senate bill introduced on October 10, 1901, by Mr. Teller and referred to

shall be paid to such mining department or school of mines and the other half to the college for the benefit of agriculture and mechanic arts.

Among the most significant mining bills introduced during this session are two which have for their object the establishment of a Department of Mines and Mining. They are identical in wording, but one was introduced in the House by Mr. Woods on December 18, 1901, the other in the Senate by Mr. Teller on January 27, 1902. The bills introduced by Senator Teller and Mr. Woods provide for the creation of a Department of Mines and Mining with a secretary at the head who shall be appointed by the President with the consent of the Senate, shall have a seat in the Cabinet, and shall receive a salary of \$8,000 a year. The bill also provides for an Assistant Secretary of Mines at a salary of \$4,000 a year, a chief clerk at a salary of \$1,800, and such other clerical assistance as may from time to time be authorized by Congress. This Department of Mines and Mining shall have general jurisdiction over all matters pertaining to mines and mining industries. There must be in the Department a bureau which shall gather, compile, and publish information in regard to the mines, mineral resources, and mining industries of the United States, and the Director of the Geological Survey is made the director of this bureau. The jurisdiction, supervision, management and control of mines and mining lands and mining industries now vested in the Interior Department and also the Geological Survey service, and all that relates and pertains to the same are transferred by the terms of this bill to the Department of Mines and Mining.

Of the numerous miscellaneous bills of interest to mining men which have been introduced in the Senate this winter, Mr. Stewart has fathered two. Both were presented on December 4, 1901. One, designed to prevent the monopoly of mineral lands, provides that no person shall locate a mining claim, whether the same be a lode or a placer claim, as agent or attorney for any other person, association or corporation; the other is to provide for the repayment of unexpended monies deposited to cover costs of platting and office work in connection with mining claims. The rules of the General Land Office demand that all persons seeking to obtain patents for mining claims should deposit a certain sum to meet the expenses of platting the mining claims and other office work in the office of the surveyor-general connected with the proceedings to obtain the patents. Senator Stewart's bill provides that any excesses in such sums over and above the actual cost of such platting and office work shall be repaid to the depositors. This bill was favorably reported on April 7.

A bill introduced on December 9, 1901, by Senator Gamble, provides for the establishment in each of the mineral States and Territories, under the supervision of the Secretary of the Treasury, of a mining experiment station at which shall be stationed an expert geologist, at a salary of \$3,000 a year and a competent and experienced chemist, at a salary of \$2,000 a year. The geologist and chemist at each station must keep an accurate record of every deposit of rock, cement, clay, or other mineral-bearing substance, the name of the party who deposited it with his post-office address, and also the particular place where such substance may be found. This information must be kept secret from all persons except the depositor for a period of 15 days after the delivery of the assay to the depositor. Each office shall have a public bulletin board on which shall be posted, at the end of 15 days, a full description of the mineral-bearing substance analyzed, the name of depositors of each lot, and the location of the country in which it is found. The same bill was introduced in the House of Representatives on December 17, 1901, by Mr. Martin.

One of the most important of the Senate bills of the year was introduced on March 12, 1902, by Mr. Kearns. Far-reaching in its effects if it becomes a law, it is yet one of the shortest and most concise on record. It is a bill to amend Section 2322 of the Revised Statutes of the United States so that the

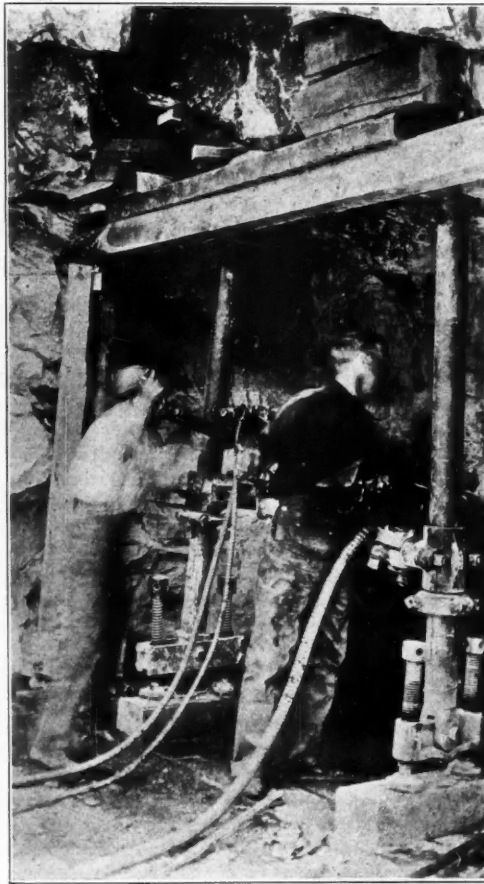


FIG. 2.—DRILLING CONTEST AT IDAHO SPRINGS; ELLISON WITH WATER LEYNER AND GARTWELL WITH SULLIVAN DRILL.

the Committee on Public Lands is interesting. It is intended to aid the State of Colorado to maintain a school of mines which is already established at Golden, Jefferson County.

Two bills designed to provide for the establishment of mining schools have been introduced in the House of Representatives at this session. One presented by Mr. Bankhead February 3, 1902, appears to be identical with that of Mr. Depew introduced in the Senate at the opening of the session.

The bill which seems to have received particular attention from the House Committee is that of Mr. Grosvenor, which was introduced January 13, 1902. This bill provides for an appropriation from money in the Treasury arising from the sale of public lands of \$10,000 the first year, with an annual increase of \$1,000 until the annual amount of \$20,000 is paid each State and Territory for the endowment of schools or departments of mining.

The bill was favorably reported on February 26, with the recommendation of an important amendment to the effect that in States where a mining department is already in operation at the State university, or where a school of mines is maintained by the State as a separate and distinct institution, one-half of the appropriation carried by the bill

locator or possessor of all claims located after January 1, 1903, shall have the exclusive possession and ownership of all the surface, and all veins and lodes contained within the surface lines extended vertically. This bill is felt by the majority of mining men to be a movement in the right direction.

Among the House bills of interest to mining men is one to establish a bureau of mines and quarries, which was introduced on December 10, 1901, by Mr. Gibson. This bill provides for an annual appropriation of \$50,000 for the purpose of establishing such a bureau in the Department of Labor. It shall be charged with the duty of investigating the condition, extent, operation, and output of all mines and quarries in the United States.

A bill that is reported to have received the approval of the Coal Miners' Union was introduced in the House on January 9, 1902, by Mr. Lacey. It was a bill to amend an act passed in 1890 for the protection of the lives of miners in the Territories. The amendment consisted of the substitution of the words "five thousand" for those of "thirty-three hundred," thus increasing the amount of ventilation that the owners or managers of coal mines must provide from 3,300 cubic feet per minute for every 50 ment at work in the mine to 5,000 cubic feet. The Committee on Mines and Mining reported this bill on January 24, recommending that it be passed. The greater portion of the coal in the Territories is mined in the Indian Territory which has no representation in Congress. This bill proposed, for instance, to increase the supply of air in mines of the Indian Territory until it equals that stipulated by the laws of the neighboring State of Kansas.

A bill similar to Mr. Lacey's, except for the addition of an important paragraph, was introduced in the Senate on January 31, 1902. In that paragraph it was stated that all shots in a coal mine must be fired by shot firers, but must *not* be fired until after all the miners and other employees had been hoisted out of the mine. This paragraph met with strong opposition on the part of some influential legislators. Mr. Penrose introduced in the Senate on February 12, 1902, an amendment which proposed to strike out the objectionable paragraph. Various mine owners declared it would be their financial ruin, if it became law, as the miners would spend most of their time in going and coming from the mine, if a law sanctioned their leaving it every time a shot was fired. But in spite of this strong opposition, the objectionable paragraph became a part of the law which was passed and approved on July 1.

Mr. Rodey is the author of a House bill introduced on January 14, 1902, for the purpose of authorizing the exploration and purchase of mines within the boundaries of private land claims. The main provision of the bill is that all gold, silver, and quick-silver deposits, mines, or minerals on lands embraced within any land claim confined by the decree of the Court of Private Land Claims, shall be free and open to exploration and purchase by citizens of the United States and those who have declared their intention to become so.

Late in the session, Senator Rawlins introduced a bill prohibiting leases of mineral lands in Indian reservations, and Senator Scott introduced one authorizing the Navajo Indians to lease mineral lands on a royalty basis.

On June 23, the Committee on Mines and Mining recommended the passage of a bill introduced on June 19, by Mr. Sutherland, providing for assessments on oil-mining claims. This bill as amended by the committee provides that where oil claims are located under the provisions of the Revised Statutes as placer-mining claims, the annual assessment labor may be done upon any one of a group of claims lying contiguous and owned by the same person or corporation, not exceeding five claims in all, provided that the labor will tend to the development or determine the oil-bearing character of such contiguous claims. The law now requires that upon each mining claim there shall be performed each and every year at least \$100 worth of work. The courts have held with reference to lode-mining claims that this annual labor may be done upon any one of a group

of mining claims, provided the said work tends to benefit the entire group, but the land department of the Government seems to be of opinion that the annual labor upon placer-mining claims must be done upon each of said claims.

The committee maintained that in the case of oil-mining claims the situation is different. It is necessary to bore wells to a great depth in order to determine whether or not oil exists in paying quantities. These wells are expensive, and it is the opinion of the committee that the industry itself will be more benefited by permitting the owner to spend his means in sinking a single well in order to demonstrate the possibilities of the property than it would to require him to distribute his means among several claims. In other words, it is better that \$500 should be spent in one place until the character of the oil deposit has been demonstrated than it is to require the same amount of money to be spent in five different places.

The establishment of a coinage mint at Tacoma, Washington, was proposed in the Fifty-sixth Congress, and the committee had this bill under consideration from the date of its introduction until February 11, 1902. In making its report, the committee called attention to the fact that there is naturally tributary to the proposed mint an aggregate annual output of gold and silver valued at from \$30,000,000 to \$50,000,000. On a basis of \$30,000,000 it is estimated that the saving to the Government would be in round numbers equal to the expense of maintaining and operating a branch mint at Tacoma. The same committee recommended on June 26 the passage of a bill for the establishment of a branch mint at Omaha.

The Coinage Committee also reported favorably on a bill to establish an assay office at Baker City, Oregon. The main reason given for this recommendation was the large production of gold and silver in the State of Oregon, which during the year 1900 amounted to \$1,898,613. An additional reason for the recommendation lies in the fact that a large percentage of the metal found is placer gold and free-milling ore of both gold and silver, which finds its way quickly to an assay office without the intervention of smelters or other reduction works.

#### THE CHILEAN NITRATE INDUSTRY.

SPECIALY CONTRIBUTED.

Since the formation of the producers' combination in March, 1901, there has been quite a change in the nitrate industry of Chile, commercially and financially. In the first year's operations under the combination the oficinas or nitrate plants have adjusted their producing capacity in accordance with the export demand. Heavy consumption by agriculturists and others has favored higher prices, with the result that many nitrate properties that for years were earning little or nothing are now able to divide substantial profits. The greater number of incorporated concerns now mining are of British origin. There are still some plants under individual management, but these are gradually giving way to the big companies. Periodically the Chilean Government sells at auction nitrate properties, and only last November disposed of 28 lots which brought 2,447,671 pesos (\$893,399). Most of these have been taken by incorporated companies which will erect new works to be taken into the combination. Before the November auction sale there were 85 oficinas, of which 66 were operating. These 66 works produced in the year 1901 a total of 31,258,687 metric quintals, which, owing to the regulation of the combination, was 1,215,895 quintals less than 1900. Of the 1901 production there were exported 27,386,112 quintals, and a quantity was used in the manufacture of blasting powder for use in mining the nitrate.

Speaking of mining, it is noteworthy that there are to-day comparatively few rich deposits that have not already been exploited. There is an enormous low-grade area, which is being worked at a profit since selling prices of nitrate of soda are higher and ocean freight rates lower than a year ago. It is

estimated that 20,264 men were employed in the nitrate industry last year, which shows a gain over 1900, when copper mining was more profitable to the laborer. Since the cut in the market price of copper, laborers have been more willing to return to the nitrate fields. Some months ago there were labor troubles at Chilean shipping ports, which caused much inconvenience to nitrate shippers. Subsequently, however, an amicable settlement was made by the companies, but now there are rumors that another strike is likely in September. Probably something will be done before that time to avoid trouble, since the nitrate shipping industry is supporting a line of steamers whose owners are also interested in the sale of this product.

New works are being erected in the various districts, and some that were started several months ago are nearing completion. By September 1 it is likely many new producers will be in the field.

The cost of production shows little change, since most large plants are equipped with labor saving devices.

Profits at late selling prices have been large enough to permit the payment of substantial dividends on the stocks of incorporated companies, besides leaving a good amount to be carried forward to amortization account, etc.

The future of the industry will depend on the consumption of nitrate of soda in the United States and Germany, principally, as any falling off in these markets means lower prices and reduced profits.

**BLAST-FURNACES IN FRANCE.**—On July 1 there were 97 blast furnaces in operation in France, against 93 on January 1, 1902, and 111 July 1, 1901. The daily capacity of the furnaces now in blast is 7,841 metric tons of pig iron, against 7,556 tons on July 1, 1901, the capacity showing an increase, although the number is less. There has been a considerable increase in the number of furnaces making Thomas or basic pig.

**BRITISH IRON AND STEEL EXPORTS.**—The exports of iron and steel, including machinery, from Great Britain for the six months ending June 30 are valued as below by the Board of Trade returns:

	1901.	1902.	Changes.
Iron and steel....	£12,764,861	£13,506,941	I. £742,080
Machinery .....	9,054,073	9,031,666	D. 22,407
New ships.....	4,973,570	3,053,256	D. 1,920,314
Totals .....	£26,792,504	£25,591,803	D. £1,200,701

The decrease this year was due entirely to the heavy falling off in new ships completed on foreign orders.

**BESSEMER CONVERTERS IN GREAT BRITAIN.**—The number of bessemer converters in use in Great Britain has been decreasing for several years, but in 1901 it was the same as in 1900. The total number reported last year was 76, of which an average of 59 were in use and 17 idle; against 62 in use and 14 idle in 1900. The average production of steel per converter for the year in 1901 was 27,225 tons. Of the converter steel made last year 1,115,985 tons, or 69.5 per cent, were acid, and 490,268 tons, or 30.5 per cent, basic steel.

**ELECTRIC DRILLS IN A QUARRY.**—The electric drills used at the quarry of the Alsen American Portland Cement Works, near Catskill, N. Y., are thus described by the *Electrical World and Engineer*: "The quarry is located about a half mile from the main building, connected by a tram road. Electric drills are used throughout, power being secured from the main generating plant by a pole line connection. At the quarry, a direct-current motor drives an alternating-current generator of low voltage and low frequency, from which the drills are operated. The drills are each provided with double solenoids, which are alternately energized, drawing the drill spindle up and down through the coil. A rotary motion is given to the spindle by means of a rifled rod, ratchet and pawl."

## RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

### SPECIALY REPORTED.

**WHAT INTEREST IN MINING LAND IS SUBJECT TO EXECUTION IN COLORADO.**—The owner of the title to mining claims made a deed for the same to B. who at the same time made a deed conveying the claims to a company which had contracted for their purchase. Both deeds were placed in escrow, to be delivered to the company in case certain payments were made; otherwise to be delivered to B. The company went into possession under the contract. It was held that under the laws of Colorado (Mill, Codes and Statutes, section 2,582), providing that every interest in land, legal and equitable, shall be subject to levy and sale under execution, B. had an interest in the property which was subject to levy and sale, since under the escrow agreement the deed to be was, in any event, to be delivered and to become effective; making B. in legal effect a vendor retaining title until payment of the purchase price by the purchaser.—*Green v. Daniels* (115 *Federal Reporter*, 449); United States Circuit Court of Appeals, Eighth Circuit.

**SUFFICIENCY OF DESCRIPTION OF LOCATION OF MINING CLAIM.**—The law of the United States (Section 2,324) provides that the location of a mining claim must be distinctly marked on the ground, so that its boundaries can be readily traced, and that all records of such claim shall contain such a description of the claim or claims located, by reference to some natural or permanent monument as will identify the claim. The court held that a claim, marked by a blazed tree at the point where the notice of location was posted, and on one of the boundary lines, and three corner stakes placed at stated distances from the notice and from each other, and the distance of the lines leading to and from a corner, at which no stake was placed, was accurately stated, was sufficiently designated to enable a surveyor to ascertain the exact limits of the location, and was therefore sufficient.—*Walsh v. Erwin* (115 *Federal Reporter*, 531); United States Circuit Court, Northern District of California.

**LIABILITY UNDER LEASE OF OIL AND GAS LANDS.**—A lease of oil and gas lands, executed July 25, 1889, required the lessees to drill a well within 12 months, or pay the lessor \$56 yearly as rent. Another article of the lease provided that the lessees should furnish gas to heat and light the dwelling on the premises demised on or before November 15. It was held that although the covenants were inconsistent, yet they were independent and lawful, and the lessees were not excused from furnishing the gas within the specified time by their neglect to drill a well. Such covenants run with the land, and in an action against an assignee of the lease for breach it is not necessary to allege that such assignee agreed to perform the covenants. It was also held that although the owner of the land had executed a deed of same, absolute on its face but only to secure a loan, and had assigned the proceeds of the lease, yet as the occupant of the dwelling and the only one damaged by reason of the breach relative to furnishing gas, he was the proper party to sue for such breach.—*Indiana Natural Gas and Oil Company v. Hinton* (64 *Northeastern Reporter*, 224); Supreme Court of Indiana.

**MINING COMPANY CANNOT EXEMPT ITSELF BY CONTRACT.**—Certain rules were posted in a coal mine, in different places, where it was supposed they could be seen by the employees. These rules warned the workmen against risking themselves near or under loose coal or bad roofs, and required them to ascertain whether the places where they were required to work had been made safe before entering them. It was shown that a miner who had been killed by a falling roof was unable to read, and therefore the rules could furnish no guide for his action in the matter. But the court held that such company could not escape liability for its own negligence by printing and pub-

lishing rules in and about the mine. Such rules it said were nothing but attempts to make laws, and so far as they are claimed to operate as a contract against the negligence and dereliction of the mining company, they were void, as against public policy. The general principle is that, a master cannot, by contract with a servant, in consideration of the employment, exempt himself from liability to the servant for injuries sustained through his negligence, such contract being void as against public policy.—*Himrod Coal Company v. Clark* (64 *Northeastern Reporter*, 282); Supreme Court of Indiana.

**DUTY ON BRASS SKIMMINGS.**—"Brass skimmings" is a variety of scrap brass, and, being fit only for remanufacture, is entitled to free entry under paragraph 505, act of July 24, 1897. Such merchandise is not dutiable under paragraph 183 as metal unwrought.—Appeal of J. Caldwell, Jr., from Collector of Customs at Detroit, Mich.; Board of General Appraisers.

### ABSTRACTS OF OFFICIAL REPORTS.

#### *Mond Nickel Company, Limited.*

The report of this company shows that on April 30, 1902, it had outstanding £125,000 in preference shares, £300,000 in ordinary shares, and £50,000 in deferred shares; a total of £475,000. The debts of the company were £41,934. The property of the company is valued at £295,828; patents, £100,000; materials, etc., £28,693; ore and products, £82,726; miscellaneous accounts, £9,687; total, £516,934.

The directors' report says: "The directors are pleased to be able to report the satisfactory progress of the company's business both in Canada and in England. Mining and smelting in Canada has been carried on continuously since last July, and the refining works at Clydach are now in operation. The directors wish to draw attention to the item in the balance sheet, ore on roast yards, and products in stock £82,726, the main portion of which is represented by high grade nickel and copper matte in stock and in transit, which has been produced at our smelting works. The whole of this stock has been valued at cost price (including general expenses from the incorporation of the company to April 30, 1902), which is much below its actual value. None of this matte having up to the date of the balance sheet been converted at the refining works into its ultimate products—copper sulphate and refined nickel—the directors have preferred not to open a profit and loss account."

At the annual meeting in London the following additional particulars were given by Dr. Ludwig Mond, the chairman, who said: "I have no doubt that all those amongst you who know anything of the difficulty of starting an enterprise such as this company has been formed to carry through, involving the development of mines, the erection and putting into operation of smelting works on the other side of the Atlantic, and the construction and starting of refinery works to carry out a new patent process, will not be surprised that we have not yet arrived at a stage enabling us to declare a dividend. But I am pleased to say that we have made a very great and substantial progress towards this end. Our mines in Canada have developed very favorably, and more especially out Victoria Mine No. 1—the only one which we have so far been operating. In this mine the ore has now been proved to a depth of 530 feet, while the lateral extension of the ore has proved to be larger than we anticipated. The grade of the ore throughout the mine has remained fully as high as it was in the upper levels, and the quantity now actually disclosed will supply our refining works for a good number of years. The exploration of our other mines is steadily proceeding; but we are not pushing it, as we have plenty of ore in hand. The smelting works at Victoria Mines, in Ontario, have been in regular and successful work since the month of August last year, and are producing nickel-copper matte of excellent quality at very reasonable

cost, the operating expenses being, since the plant has been in regular work, below the estimate your directors had before them at the time the prospectus was issued. Your refining works at Clydach, in the Swansea Valley, have taken longer to complete than we expected, owing to delays in the erection of the buildings and delivery of the plant by the contractors, which everybody who has erected works during the last two years has had to suffer from. About four months ago, however, we commenced putting the plant into work section by section, and, after the adjustments necessary in any new works, I am glad to say that we are now manufacturing refined nickel and sulphate of copper of good quality, and have now had all the plant working for a sufficient time to satisfy me that the works we have erected for carrying out my process on a large scale are as great a success as I anticipated."

#### *Tomboy Gold Mines Company, Limited.*

A preliminary report of the operation of this company's mines at Ouray, Colo., for the year ending June 30, 1902, has been issued from the London office. It gives the following financial statement: Unexpended capital, July 1, 1901, £22,482; profit brought forward, same date, £17,174; profit for 1902, £73,062; total, £112,718. The payments were: Capital expenditure, £50,591; dividends and bonus paid, £45,000; total, £95,591, leaving a balance of £17,127 forward to current year.

The directors' statement says: "It will be seen from the provisional financial statement attached hereto, that the profit realized and estimated for the year ending June 30, 1902, together with the undistributed profit carried forward from the preceding year amounts to £90,236. In view of this fact, the directors consider it is due to the shareholders to give their reasons for restricting the present dividend to the same amount as that paid in previous years."

"In consequence of the satisfactory development of the Argentine, Cincinnati, and other properties recently acquired by the company, it has been necessary to increase the capacity of the reduction works by the erection of a new 60-stamp gold mill, and while the expenditure under this head, as well as on account of the purchase and lease of the other properties mentioned, might fairly have been considered as a capital charge and met by an increase of capital, the directors, after careful consideration and consultation with their colleagues in the United States, arrived at the conclusion that it would be a more prudent policy, and more directly in the interest of the shareholders, to meet this expenditure out of revenue. In pursuance of this policy, a sum of £50,591 has been expended during the first 10 months of the year ending June 30, 1902, on the purchase and development of properties held under lease and bond, and in the preliminary payments for the equipment thereof, which, together with the dividend paid in December last, and the further distribution now made, accounts for £95,591, leaving a balance forward to the credit of the ensuing year of £17,127. It is estimated that a further sum of, roundly, £35,000 will have to be provided during the eight months ending December 31, 1902, for the completion of payments on account of the new mill and other improvements. The condition of the various mines comprised in the company's property justifies the directors in the belief that this expenditure can also be met out of profits during the next half-year without interfering with the payment of the regular dividend in December, after which period it is anticipated that all future profits, with the exception of the usual expenditure on permanent improvements incidental to every mining enterprise, will be available for distribution amongst the shareholders.

"The directors have great confidence that the policy they have pursued as outlined above will be generally approved by the shareholders, and that they will regard with satisfaction the fact that the productive value of the company's mines has enabled the directors to meet this heavy capital expenditure out of revenue, while maintaining the same rate of dividend as heretofore paid."

## BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail prices. These notices do not supersede review in a subsequent issue of the ENGINEERING AND MINING JOURNAL.

*University of Texas Mineral Survey. Bulletin No. 3. Coal, Lignite and Asphalt Rocks.* Austin, Texas; published by the University. Pages, 140; illustrated.

*Tarcoola and the Northwest District, South Australia.* By H. Y. L. Brown, Government Geologist. Adelaide, South Australia; Government Printer. Pages, 30; with maps.

*Coal-field of Recherche Bay, Tasmania.* By W. H. Twelvetrees, Government Geologist, Hobart, Tasmania; Government Printer. Pages, 16; with map.

*Commerce and Navigation of the United States for the Year Ending June 30, 1901. Volume 2.* Prepared by the Bureau of Statistics of the Treasury Department, O. P. Austin, Chief of Bureau. Washington; Government Printing Office. Pages, 1,260.

*Les Convertisseurs pour Cuivre.* By Paul Jannetaz. Reprinted from the *Memoires* of the Civil Engineers' Society of France. Paris, France; Ch. Beranger. Pages, 56; illustrated.

*Moody's Manual of Corporation Securities.* Third Annual Number, 1902. Edited by John Moody. New York; John Moody & Co. London; Effingham Wilson. Pages, 2,248. Price, \$7.

*United States Geological Survey; Mineral Resources of the United States. Production of Gypsum in 1901.* By Dr. Joseph Struthers. Pages, 14. *Production of Abrasive Materials in 1901.* By Joseph Hyde Pratt. Pages, 58. Washington; Government Printing Office.

## BOOKS REVIEWED.

*Die Gewichtsberichtigung der Eisenkonstruktion.* By Emil Bousse. Leipzig, Germany; Theod. Thomas. Pages, 142; with 58 illustrations.

A valuable compilation of tables for all those engaged in iron and steel construction work. The weights in kilograms are given for all shapes and sizes of rolled and worked material. Examples showing how to use the tables enhance the value of the book.

*Die Electrolyse des Wassers: ihre Durchführung und Anwendung.* By Viktor Engelhardt, Halle a. S., Germany; Wilhelm Knapp. Pages, 120; illustrated. Price (in New York), \$1.75.

This is a review of the manufacture of oxygen and hydrogen by the electrolysis of water. The author covers the field very thoroughly, detailing the several methods now in use. Full descriptions of the plants, amount of power required and all such data are given as well as the many uses to which the products are put. The cuts are good and the subject is treated in a very practical manner.

*The Science of Mechanics.* By Dr. Ernst Mach. Translated from the German by T. J. McCormack. Second Revised Edition. Chicago: The Open Court Publishing Company. London: Kegan Paul; Trench, Trubner & Co., Limited. Pages, 625; illustrated. Price \$2.

The publication of a new edition, translated from the latest German edition, of this standard book is a service to students of mechanics. Dr. Mach's work has stood the test of 18 years since the first edition was published, and the author has found no occasion for material changes in the body of the book, though he has made several additions. It would be superfluous to attempt any criticism at this time, and we have only to call attention to the fact that this edition is well printed and is issued at a moderate price.

*Pipes and Tubes.* By Philip R. Björling, London and New York; Whittaker & Co. Pages, 244; illustrated. Price (in New York), \$1.25.

This is a manual intended to describe pipes of all descriptions, their construction, the methods of jointing, connections, branches, etc. It covers pipes of wrought iron, steel, cast iron, copper, lead and wood, and also drain pipes of earthenware and cement. There are chapters on the testing of pipes, on laying pipes and on the various joints employed for different purposes. The tables appended give the friction of air, gas and water in pipes; flow of steam through pipes; standard sizes and weights of pipes and fittings, and other information of service to users of pipes and tubes.

*Directory of American Cement Industries and Handbook for Cement Users.* Second Edition, 1902. Edited by Charles Carroll Brown. Indianapolis and New York: Municipal Engineering Company. Pages, 740. Price, \$5.

This is the second and enlarged edition of a manual which must be exceedingly useful to engineers, architects, builders and all users of cement, as well as manufacturers of cement themselves. About one-third of the book is devoted to a general treatise on cement, its manufacture and uses; tests of cement and specifications; data for estimates, and other general information. The rest is occupied by the directory, in which are included a list of cement works, with a condensed description of each; lists of contractors, engineers, architects and large users of cements; laboratories and testing works; makers of machinery and supplies for cement manufacturers, and a variety of other information of service. The experience gained from the first edition has enabled the compiler to add very much to the value of the second, which seems to approximate very closely to completeness.

## CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested. Letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

*La Morena Mine, Mexico.*

Sir: Your correspondent in issue of July 5 has no doubt confounded the Morena Mine of the Hidalgo Mining Company with some other mine in the district, as La Morena is a perfectly dry mine, so far as developed to the 800-foot level, and no old Spanish workings exist below the fourth level.

Pay ore has been found and worked for years on every level down to the seventh—that is, the shoots that would stand shipping—where the end of the ore was supposed to have been reached, and important blocks still exist on all of those levels from the seventh to the surface, but were not worked out because of the presence of elements interfering with the lixiviation process. The fact of the matter was, the seventh drift skirted the ore on the foot wall side following a "false lead." On the basis of the ore not being encountered on the seventh level, the mine was condemned by several experts, and the mine lay idle for several years on the strength of their reports.

Shortly after entering the employ of the Hidalgo Mining Company, about a year ago, as superintendent of this mine, the writer became convinced that the ore had been left in the hanging wall, and recommended a cross-cut, which developed 12 feet of ore averaging 1,200 grams silver. Subsequent development by sinking from the seventh and drifting on the eighth level, developed the bonanza noted by your correspondent. The highest values are from the deepest ore. Native silver for the first time in this mine was encountered on the eighth level, and everything seems to indicate that the company is still on top of the bonanza, as not only the values but the thickness apparently increase with depth.

A winze from the seventh, sunk from a point 200 feet south of the point of discovery on the seventh level, in such a manner as to break into the hanging wall, developed the same ore in higher values and two meters in thickness, demonstrating that the ore body is even of more importance than was at first supposed.

G. A. BURR.

Parral, Mex., July 14, 1902.

*A Proposed New Assay-Ton.*

SIR: As time is money to a certain extent and short cuts in calculation are appreciated by chemists and assayers, why has not some one suggested a new assay-ton for gold ores in which the milligrams of assay button or parted gold will represent \$20 even per ton of ore, instead of \$20.67. Dr. Chandler's assay-ton of 29.166 grams has been a great convenience, yet the returns in ounces and decimals of an ounce in gold require calculations or the use of tables to reduce to terms of the almighty dollar as did the old assay charges of 200, 300 or 400 grains.

If we should use 30.143 grams of pulp then each milligram of gold would represent \$20 worth of gold at \$20.67 per ounce, and the subdivisions of the balance beam could be read directly in dollars and cents. Fractional assay tons could be made as usual. It is convenient to translate decimals of an ounce into dollars by multiplying by two and moving the decimal point. The operation is simple and mental, but it involves an error of rather more than 3 per cent.

As correctness can be secured with a saving of time there should be no objection raised to this proposed assay-ton in an age of exactness even in mining. In Australia, where assays are still reported in ounces, pennyweights and grains per ton of 2,240 pounds, the writer had his assayers use a charge of 653.33 grains of pulp, when the resulting gold could be read directly to pennyweights and divisions in grains, using a 1-10 grain rider.

To silver ores the assay-ton of 30.143 grams is not so applicable, as an error of 1½ cents per ounce or thereabouts would be involved. There are many localities, however, where silver values are not, and need not, be taken into consideration. In these this assay-ton would be appreciated. If occasionally silver need be estimated a division of the weight in ounces per ton by 1.03 would be accurate within a small degree and would afford an approximate compensation for the absorption of cupel and slags in assaying low grade ores.

LOUIS JANIN, JR.

Tucson, Ariz., July 10, 1902.

*The Olalla Copper Mining and Smelting Co.*

SIR:—My attention has been called to various communications recently appearing in your JOURNAL relating to the properties, capitalization and prospects of the Olalla Copper Mining and Smelting Company.

The following statement giving the facts in regard to this company and its properties may be, in view of what has already been published, of interest to a large number of people who are more or less interested in this company, either as shareholders or through hearing of it or knowing those directly connected with it.

The company owns 63 mineral claims at and near Olalla, in Keremeos Creek Valley, Lower Similkameen, British Columbia.

In addition to these claims the company owns 320 acres of land comprising the town site of Olalla and the smelter site at that point. The charter for the Similkameen & Keremeos Railway, intended to be built as a local ore carrying line, was obtained by the original owners of this property and transferred to the present company upon its incorporation last November. This railway charter carries the right to construct and operate telephone and telegraph lines, in addition to the regular business of the railway. Three water rights for power purposes are also owned by the Olalla Company.

The principal development work done at Olalla consists of a cross-cut tunnel 600 feet in length. This tunnel has now attained a vertical depth of 500 feet. Several wide ledges of low grade pyritic ore has already been cut by this tunnel. It is the company's intention to extend this tunnel 200 feet further, when it is expected to intersect a strong body of pyritic ore, uncovered on the surface, and which this tunnel has been driven to open at depth, as well as to prospect the intervening formation, between the mouth of the tunnel and the point at which the principal ore body will be met.

This tunnel is driven on the Bullion Group. The large ore body to be cross-cut at depth by the above tunnel has been opened for over 600 feet along the surface at a vertical height of 680 feet above the floor of the tunnel. A large quantity of ore has been exposed by this surface work, but like all surface work, it does not enable a close estimate of ore actually in sight to be made.

Adjoining the Bullion is the Flagstaff Group. This property has had a large amount of surface work done, which shows up ore at six or eight different points. The chief work done on this group consists of about 75 feet of tunneling, surface stripping and open cut work.

The Opulence group has a shaft sunk to a depth of 45 feet. This shaft passed through about 35 feet of ledge carrying native copper. A second shaft down 15 feet on this property also shows up native copper in paying quantities. Considerable open cut work and stripping has also been done on this group. The Elkhorn Group has a tunnel over 100 feet in length showing excellent pyritic ore. A second tunnel 50 feet in length has been run, but has not yet reached the ore body. A considerable amount of stripping and surface open cut work has also been done on this property. The Golden Rule and Caledonia groups have been but slightly prospected, but each show ore of workable values through to the surface.

The ore on all the above mentioned properties is self-fluxing, occurs in large bodies, is of low grade, but owing to the favorable location can be worked at a profit. The company's Fish Lake group of claims are undeveloped. The Dividend Group has been opened by shallow shafts and open cuts over a space of several acres. The ore body on this property is largely siliceous. Heavy pyrrhotite bodies and streaks of arsenical iron also occur. The surface work on this group is being continued for the purpose of determining the most suitable point at which to commence permanent operations. The Riordon Mountain group shows a magnificent body of pyritic ore, largely siliceous, but carrying considerable iron, both pyrrhotite and arsenical. The work on this property is as yet confined to the surface and consists of two principal open cuts one 30 feet in length and some twelve feet in depth, one half in ore, and a second cut 40 feet in length and 2 to 6 feet in depth, all in ore.

The company has good buildings, tools and equipment of all kinds required for the work so far undertaken. The result of all work done is highly satisfactory, the ore opened and the geological conditions under which it occurs being of such a character as to inspire confidence.

The company's capital is \$8,000,000, divided into 320,000 shares, of a par value of \$25 each.

The conditions under which companies owning properties other than mines have to procure money for development purposes in this or the London market renders a large capitalization necessary. The company's shares are now being sold at the price of \$12.75, payable in instalments, or \$11.25 cash.

This statement contains the facts regarding the Olalla company, its properties, amount of development, capitalization and price at which its treasury shares are now being sold. The company's plan of development and financial and other prospects justify the belief that it will enter the list of permanent dividend-paying mines within the next three years.

W. C. McDougall, General Manager.

Olalla Copper Mining and Smelting Company.  
New York, July 15, 1902.

*Phenomenal Furnace Results.*

SIR: In the interesting article on "British Columbia Smelters," by Mr. E. Jacobs, published in your issue of July 5, reference is made to the quantity of ore smelted in the blast furnaces as "phenomenal." I presume the quotation from the Provincial press that the results produced are "hitherto unknown in the history of copper smelting" refers solely to the Dominion.

A comparison with the work done at the smelter of the Tennessee Copper Company may be of interest and call forth other and more interesting statistics on the subject from other copper smelting plants. The following is the record of the tons of charge, not including coke, smelted in a single blast furnace with the average tonnage per day:

	Furnace days.	Tons. charge.	Tons. per day.
1901 August.....	28	9,992	357
September.....	30	11,180	373
October.....	31	14,480	467
November.....	30	16,199	540
December.....	24½	12,494	510
1902, January.....	28½	15,616	548
February.....	28	15,707	561
March.....	31	17,341	559
April.....	30	15,712	524
May.....	31	16,086	519
Total (10 months)...	292	144,807	495
March 3.....	1	657	657
March 1-7.....	7	4,305	615

None of the above figures includes the coke used; they are correct, the charge scale weights being compared and corrected by railway weights at periodical cut-offs. A nine days' shut down at the close of the year on account of shortage of coke is allowed for, but ordinary stoppages for repairs, etc., are not. The charge smelted consisted of heap-roasted pyrrhotite ore with quartz flux and about 1,000 tons of converter slag per month. The boundary companies are to be congratulated upon their self-fluxing ore, but on the basis of tons smelted it is unimportant whether tons of charge or tons of self-fluxing ore are considered.

Since June 1 two furnaces have been in blast here continuously and successfully. The furnaces are water-jacketed, 56 by 180 inches at the tuyeres and 72 by 180 inches at the tops of the jackets. From the tuyeres to the charging floor is 18 feet. Charging is done directly from side-tip cars pulled by electric locomotives. Slag is moved in pots of 40 cubic feet capacity also moved by electric locomotives. Blast is furnished by specially designed Nordberg piston blowing engines, one engine for each furnace. These engines are cross-compound condensing; steam cylinders 13 and 24 inches by 42 inches; air cylinders 56 and 56 inches by 42 inches; air cylinder pistons 10 inches diameter and trussed; air valves of Corliss type 15 inches diameter, two inlet and two discharge to each cylinder. Usual speed maintained is 66 revolutions per minute. The blast pressure varies from 20 ounces to 40 ounces, but no attention is paid to this, regulation of the blast being made in revolutions of the engine.

The entire plant was designed and built under the supervision of Mr. J. Parke Channing, the consulting engineer of the company.

WILLIAM A. HEYWOOD,

Smelter Supt. Tennessee Copper Company.  
Copper Hill, Tenn., July 14, 1902.

**QUESTIONS AND ANSWERS.**

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert, nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.)

*Uranium Ores.*—Who are the purchasers of uranium ores?—J. T.

*Answer.*—In addition to the information heretofore given in this column—June 28, 1902, page 899—a correspondent sends us the following note: "A consumer of moderate quantities of good uranium ores is the Chemische Fabrik von J. E. Devrient Aktien-Gesellschaft at Zwickau, Saxon, Germany. This concern, however, is not in position to buy on the basis of an American assay, but would pay only after arrival of the ore, and according to their own assay and the weight found at the Zwickau works."

*Bismuth Ores.*—Who are the chief buyers of bismuth ores?—J. T.

*Answer.*—In reply to this—which covers also the questions of several other correspondents lately received, one of which appeared in our issue of June 28 last, page 899—some further information seems necessary. The production of bismuth is, and has been for a number of years, under the control of an international syndicate, a leading member of which is the Saxon Government Works, of Oberschlema. The supply of bismuth is much in excess of the demand, the consumption being limited. The chief use is in pharmaceutical preparations, a small quantity being also used in certain alloys. The market is already strained at times, and the offers of ores have been so large that the syndicate has reduced prices in order to avoid any disturbance of the market. Any increase in production would result in a fall of prices and in the accumulation of unsold stocks.

The English buyers of bismuth ores are Johnson, Mathey & Company, Limited, of Hatton Garden, London, E. C., England. This firm is well known in this country. It is best to say that buyers can and will take only limited quantities of the ore.

We are also informed by Mr. Paul Speier, of No. 1 Ernststrasse, Breslau, Silesia, that he is a buyer of both bismuth and uranium ores.

*Manufacture of Sulphuric Acid.*—Can you tell me where I might get some book or information in regard to the manufacture of sulphuric acid in connection with roasting processes?—J. R. V.

*Answer.*—The articles on sulphuric acid in *The Mineral Industry*. Volumes VII and IX, will give you much recent information on this subject. The standard work on the subject is Dr. Lunge's "Sulphuric Acid and Alkali."

*Magnesia in Slags.*—I am trying to secure some information as to the action of magnesia in slags from lead smelting furnaces. Hofman devotes very little space to it, and figures it generally as replacing lime. Is this altogether the case? Perhaps some of your readers who have had experience can give some data or information on this point.—H. G.

*Answer.*—This question was published in our correspondence column July 5, and is now repeated here.

All non-ferrous smelters, as a rule, figure magnesia—MgO—in as lime—CaO. The effect of MgO on the formation temperature of a slag was fully treated and illustrated by diagrams in a paper presented by Prof. H. O. Hofman at the California meeting, 1899, of the American Institute of Mining Engineers. This paper has been published in the *Transactions* of the Institute, and an abstract—with the diagrams—was given in *The Mineral Industry*, Volume IX, page 402.

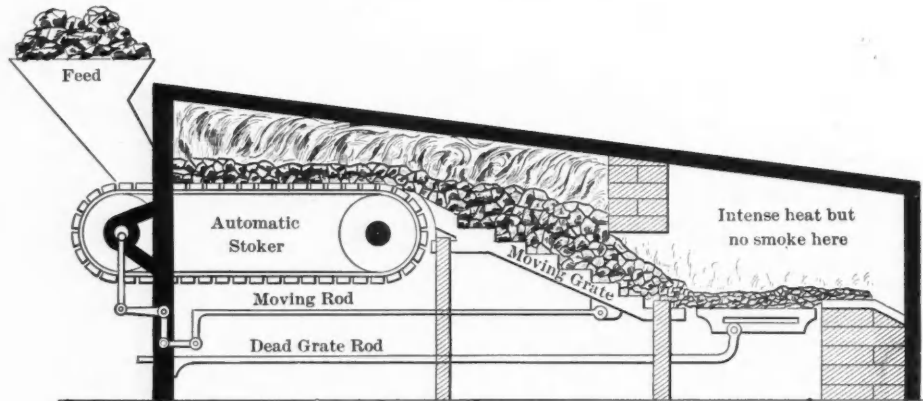
*Cyanide Poisoning.*—I have seen some casual references to directions in case of cyanide poisoning which have been issued by one of the Australian mining departments. Can you tell me anything about this?—C. T.

*Answer.*—We take the following statement from the *Australian Mining Standard* of May 29, last: "The Victorian Mines Department has done good service by issuing instructions, printed on linen for posting in cyanide works, on how to proceed with the treatment of a case of cyanide poisoning in the absence of medical assistance. The matter is one in which Mr. H. Jenkins, the Victorian Government

metallurgist, has taken keen and well sustained interest, and acting in co-operation with him, Dr. Martin, of the Melbourne University, recently made experiments in regard to the action of certain antidotes on cyanide poisoning, and it is he who has prepared the instructions which have now been issued, with a first aid apparatus and stomach pump. In the instructions it is set out that everything depends on prompt action, for the chance of recovery is extremely small after the lapse of a very few minutes if a fatal dose has been taken. The first care must be to neutralize the rapid poison by the antidote, and then to empty and wash out the stomach as soon and as completely as possible. The antidote consists of two solutions sealed up in bottles, and a sealed powder. The two solutions are to be first mixed in the tin vessel in which they are packed, by breaking off the sealed ends of the bottles. The tube containing the powder is also to be broken, and the whole of the powder added to the mixture, and the dose is to be administered as soon as can possibly be done. If the patient is still conscious he must drink the antidote at once, without waiting for the insertion of the stomach tube; but if not conscious and not responsible then a small gag must be firmly inserted between his teeth, so as to prevent the stomach tube from being bitten off, and the tube is then to be passed down his throat and into his stomach. The antidote is then to be poured down the tube, and is then to be followed by some water. In any case, either before or after the antidote has been taken, the stomach tube is to be inserted, and about half a pint of water is to be poured down it, the patient being placed in a reclining position, a little raised from the ground. The insertion of the tube may produce vomiting; this, however, is entirely favorable to the course of the treatment. When the last of the water is placed in the funnel, and before it has all descended into the tube, the funnel end of the latter is to be lowered so as to cause the tube to act as a syphon, and the stomach emptied, as much as possible, of its contents. Fresh water is to be poured down the tube and the stomach again emptied, and this is to be repeated several times, so as to thoroughly wash out the stomach. When this has been done the tube can be withdrawn. If the tube be not at hand, every endeavor must be made to induce

treated as is done in cases of partial drowning or suffocation by Dr. Sylvester's method.

"The package for treatment should consist of (1) a tin vessel with lid in which are packed an hermetically sealed bottle, containing  $7\frac{1}{2}$  grammes of ferrous sulphate dissolved in 30 c.c. water; (2) an hermetically sealed bottle, containing  $1\frac{1}{2}$  grammes of caustic soda dissolved in 300 c.c. water; and (3) a tube containing two grammes of magnesia. There should be also a gag for the purpose of opening the clenched mouth of the unconscious person, and a stomach tube that can be passed through the gag and down into the œsophagus into the patient's stomach. Finally it is urged that the apparatus should never be allowed to be removed from its place, and always kept in prominently marked positions in the works."



PEERLESS MECHANICAL STOKER.

#### PEERLESS SMOKE CONSUMER

At the present time when because of the scarcity of anthracite coal consumers in the East are forced into the use of bituminous coal, the proprietors of the "Peerless" smoke consumer are calling attention to their device illustrated herewith, which has for its object the smokeless consumption of soft coal. Fig. No. 1 exhibits the inner working of the stoker, the boiler not being shown. The hopper at the left and above the opening to the right receives the fuel. The grate consists of a series of endless chains run-

sition of the cinders. (2) A saving in fuel and labor and an increased capacity and general efficiency, effecting a total economy of from 15 to 20 per cent in the cost of steam production, compared with hand-fed furnaces. (3) No skilled labor is required. (4) Permitting the use of bituminous coal in cities and towns where the emission of smoke from chimneys and stacks is prohibited. (5) That the apparatus is made of the best material throughout.

One of these stokers has been installed in a furnace, and is now in operation at Stevens Institute, Hoboken, N. J., where it can be inspected by any one interested in the question of smoke prevention.

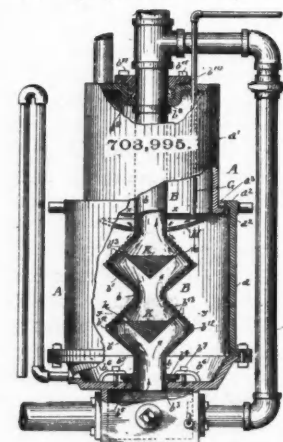
#### PATENTS RELATING TO MINING AND METALLURGY

##### 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 receipt of 25 cents.

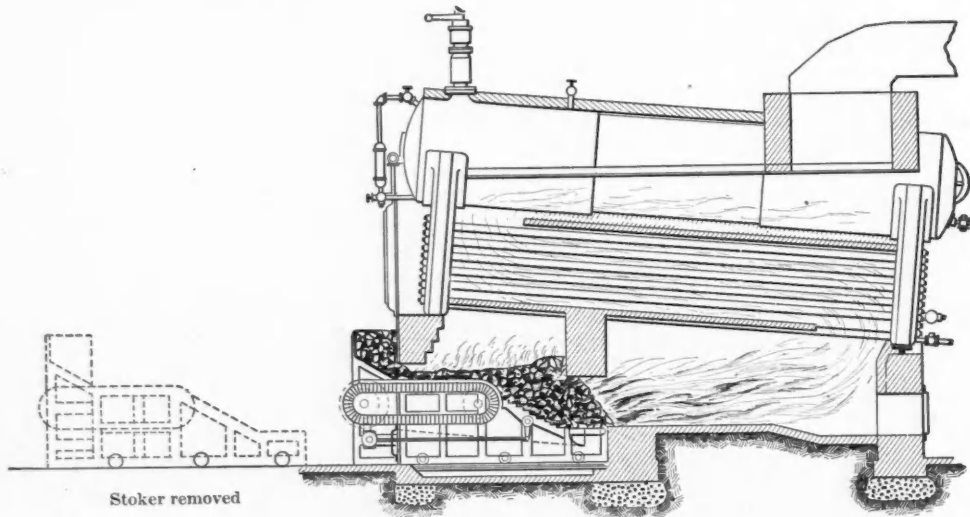
Week Ending July 8, 1902.

103,995. GAS-GENERATOR.—Fred E. Caton and Franklin B. Warring, San Jose, Cal., assignors to Caton's Foundry and Machine Company, San Jose, Cal., a corporation of California. In a gas-generator having an interior heater



or vaporizer over which the oil flows, an exterior casing inclosing said heater or vaporizer, said casing being constructed of telescopic sections, adapting a section to be slipped upon another to expose and afford access to the heater or vaporizer.

704,010. APPARATUS FOR CONCENTRATING MAGNETIC IRON ORES.—Thomas A. Edison, Llewellyn Park,



PEERLESS STOKER APPLIED TO BOILER.

vomiting after the administration of the antidote, while an equal endeavor must be made to cause the patient to swallow more of the antidote between the intervals of vomiting, if the administration be not already and completely made. As soon as the stomach has been satisfactorily emptied and washed and the stomach tube withdrawn, steps should be taken to bring about artificial respiration, should the patient appear to be in a state of collapse and his breathing have ceased to be noticeable. The application of smelling salts or ammonia to the nostrils may itself induce breathing again, but if this be not immediately successful the patient should be

ning over two drums, one at the forward end, the other half way back in the firebox. A mechanical movement exerted upon the drums carries the endless chain bars of the grate towards the center of the furnace, the coal being fed automatically, in as large or small quantities as desired, at the front. The gases from the furnace coal are carried over the bed of incandescent fuel and are thus consumed. From the rear end of the chain grate, the partially consumed coal is dumped on an inclined sliding grate, which oscillates from right to left. The same mechanical movement which operates the moving grate, oscillates the inclined grate, and the coal passes from

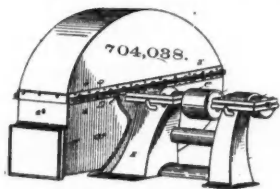


N. J. A connected apparatus for concentrating iron ore, comprising a set of pulverizing-rolls by which the material is finely pulverized, a screen to which the finely-pulverized material is fed, a magnetic separator for separating the magnetic from the non-magnetic particles of the screenings of said screen, a drier to which the magnetic particles are fed and by which they are dried, a fine screen to which the dried magnetic particles are fed, a second set of pulverizing-rolls for pulverizing the tailings of the fine screen, and means for returning the repulverized material to said fine screen.

704,011. APPARATUS FOR SEPARATING NAPHTHA FROM OIL.—Eugene R. Edson, Cleveland, Ohio. Apparatus comprising a percolator; an oil-storage tank or reservoir; a valved pipe arranged to conduct oil from the percolator to the said reservoir; a pump; a valved pipe arranged to conduct oil from the said reservoir and connected with the receiving end of the pump; an evaporator comprising a vaporizing chamber; a pipe-line extending from the discharging end of the pump into the aforesaid vaporizing chamber; a condenser having an oil-outlet; a pipe or flue connecting the vaporizing chamber with the chamber of the condenser; a suction creating device for drawing air and vapor from the vaporizing chamber into the condenser, and a valved pipe line connecting the vaporizing chamber at the bottom with the chamber of the aforesaid reservoir.

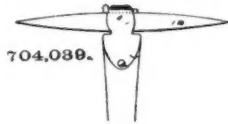
704,036. PROCESS OF SEPARATING ALKALI-METAL SULPHATES FROM MIXED SOLUTIONS.—Carl Hoepfner, Frankfurt-on-the-Main, Germany; Henry Orth, Jr., administrator of said Hoepfner, deceased. A method of separating alkaline sulphates from mixed solutions, which consists in rapidly cooling the same by allowing them to flow into a cold solution of a suitable chloride, thereby preventing the formation of double salts.

704,038. FAN-CASE FOR BLAST FANS.—John T. Hope, Kansas City, Mo.—A fan-case comprising a lower sectional part and a shaft extending through one side thereof and an upper sectional part of said case separable transversely to the case upon a line above the plane of said shaft, angle-



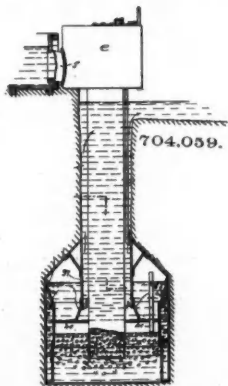
plates upon the sides of said case through which said shaft extends and near the line of separation of said upper and lower sectional parts one of which angle-plates extends from one end of said case to the other and suitable fastening devices for said angle-plates.

704,039. COAL PICK.—Ferdinand Horn, Coshocton, Ohio. A coal-pick comprising a helve-socket provided with an eye having its lower wall reduced in width to present a shoulder, a pick having a recess to engage the shoulder, and a solid key firmly bearing against the pick and the walls of the eye and



constituting a non-yielding surface which will operate to prevent vibration of the pick, in the eye, under impact, one end of the key being provided with a stop and the other end with laterally-projecting members disposed exteriorly of the eye and operating positively to hold the key against accidental separation therefrom.

704,059. HYDRAULIC AIR-COMPRESSOR. William J. Linton, Woodstock, Canada, assignor to the Taylor Hydraulic Air Compressing Company, Limited, Montreal, Canada, a corporation of Canada. In a hydraulic air-compressor, a pair of subchambers located one above the other, a



vertical water-conduit communicating at its lower end with the lower subchamber; a water-passage leading from said lower to said upper subchambers; a water-conduit leading from the upper subchamber to the overflow of the compressor; an air-pipe leading from the lower to the upper sub-

chambers and an air-pipe leading from the upper subchamber to the point of consumption.

704,136. EXPANDING REAMER FOR OIL OR ARTESIAN WELLS.—Jonas P. Smith, Peru, Ind., assignor of one-half to James A. Beverly, Omaha, Neb. The combination of a reamer-body having a slot or opening therein, a pair of cutter-jaws pivoted together at their upper ends and so mounted in said slot or opening as to move up and down therein, a block connecting the central part of the sides of the body together in the lower portion of said slot or opening bearings on the jaws adapted to contact with said block when the jaws are raised in said slot, and means for retaining the jaws in a normally upraised position.

704,241. SEPARATOR.—Fred Cutler, Bradfordton, Ill. The combination of a board, endless chains running over the board, cross-slats attached to the chain in contact with the board, other cross-slats pivotally connected with the chains out of contact with the board, straw-carrying fingers extending rearward from the pivoted slats, a side board having a sinuous groove extending lengthwise thereof and guide-fingers for the pivoted slats engaging the groove.

704,250. WELL-RIG.—Edwin A. Hardison, Santa Paula, Cal., assignor of one-half to Joseph L. Oliva, Santa Paula, Cal. A well-rig, comprising a band-wheel provided on one side with a beveled friction-seat; a loose tug-pulley mounted to slide on the axle of the band-wheel and beveled to fit the friction-seat of the band-wheel; means for sliding the loose tug-pulley into and out of the seat in the band-wheel; an extra bull-wheel and shaft mounted on the side of the derrick opposite the main bull-wheel, said shaft being provided with two spools, one of which is fixed to the shaft and the other of which is journaled to rotate on the shaft; a latch or clutch for fixing the loose spool to the shaft; an extra bull-rope around the loose tug-pulley and the extra bull-wheel; and means for tightening and loosening the extra bull-rope.

704,158. WATER ATTACHMENTS FOR POWER-DRILLS.—Frederick L. Whitehead, Butte, Mont. In combination with a power-drill, a power-fluid-supply pipe, of a cylinder, a pipe connecting the fluid-supply pipe to the top of said cylinder, a water-supply to the cylinder and a pipe for conducting the water to the drill-hole.

704,285. COMPOUND FOR USE IN REDUCING METAL SHEETS IN PACKS.—Thomas V. Allis, Bridgeport, Conn., assignor by mesne assignments to the International Tin Plate Corporation, a corporation of New Jersey. A compound for coating the contact-surfaces of metal plates in packs to prevent adhesion or cohesion of the plates in the operation of heating and reducing same to sheets, consisting of a refractory material combined with water and an adhesive substance.

704,286. FURNACE FOR PROGRESSIVE METAL-HEATING.—Thomas V. Allis, Bridgeport, Conn., assignor, by mesne assignments, to the International Tin Plate Corporation, a corporation of New Jersey. A multisection heating-furnace having offset chambers located one in advance of another in a substantially horizontal plane, the forward end of each chamber overlapping the rear end of the preceding chamber, passages connecting said overlapping chambers, and means intermediate the ends of the heating-chambers for heating each chamber.

704,287. METHOD OF PRODUCING METAL SHEETS.—Thomas V. Allis, Bridgeport, Conn., assignor by mesne assignments to the International Tin Plate Corporation, a corporation of New Jersey. An improvement which consists in rolling a plurality of initial plates of an established uniform thickness and of predetermined different widths, cutting sections transversely therefrom of a length required in the width of the next succeeding or secondary plates, and cross-rolling said sections into succeeding or secondary plates of uniform thickness, the width and thickness of the initial plates determining the length and thickness of said secondary plates.

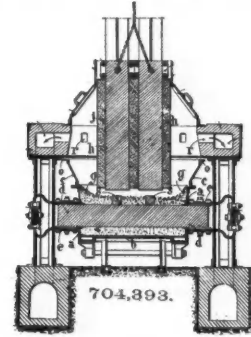
704,316. MACHINE FOR DRAWING TUBES.—Josef Gieshoidt, Dusseldorf, Germany. In a tube-drawing machine, the combination of a conical hollow axially-movable outer mandrel, with an inner mandrel axially movable within the outer mandrel, a series of conical drawing-rolls, and separate means for radially adjusting each end of the rolls.

704,367. PROCESS OF MAKING WHITE ANTIMONY OXIDE. Arthur S. Plews, London, England. A process for producing merchantable white oxide of antimony direct from the ore by exposing the said ore at a bright red heat to make a smokeless current of gases, and periodically changing said gases from a reducing to an oxidizing atmosphere and back again until the antimony is volatilized, condensing the fumes in the presence of aqueous vapor and collecting the condensed products.

704,372. GOLD-SAVING MACHINE.—Charles Ramos, Vancouver, Canada. In a machine having a stout open framework adapted to receive a series of baffles and screens; a rectangular frame surmounting such, and sustained on pivots at its ends; a grizzly having three raised sides, and resting by means of curved rockers on the pivoted frame; and means whereby such grizzly may be rocked and tilted in cross motion.

704,393. MANUFACTURE OF IRON, MANGANESE, AND ALLOYS OF THESE METALS BY AID OF ELECTRICITY.—Albert Simon, Bordeaux, France. A process

of manufacturing iron, manganese and the alloys of such metals, consisting in adding to the materials to be treated carbon, and an electrolyte consisting of fluoride of calcium, in sufficient quantity, to dissolve the material and then subjecting the mass to the action of a continuous electric cur-



rent to cause the electrolytic decomposition and the keeping of the material in a fluid condition.

704,409. ORE-TESTING TABLET.—Henry E. Way, Custer, S. D., assignor of one-half to Harry B. Griffith, Custer, S. D. A composition tablet for testing ores comprising a fuel and a decomposable compound containing oxygen for burning the fuel, said oxygen-furnishing compound being in proportion sufficient to burn the fuel to produce a reducing heat, and also to furnish nascent reducing agents.

704,412. APPARATUS FOR MAKING SULPHUROUS ACID.—William Wenzel, Appleton, Wis. The combination with a tank, of a sulphur-burner communicating with said tank, an angular ejector one leg of which is horizontally disposed and the other leg of which is vertically disposed, the ends of the legs being open, means for passing a stream of liquid through the open end of the vertical leg, and a suction-pipe connected with said tank and inserted into the vertical leg of the ejector, the lower end of the suction-pipe being situated below the horizontal leg of the ejector and being of less external diameter than the internal diameter of the vertical leg of said ejector and the latter being arranged to deliver the water away from said tank.

704,435. SPOOL FOR SAND-REELS, ETC.—Kenton Chickering, Oil City, Pa. The combination with a sand-reel spool having suitable heads, one of said heads provided with a clamp-guide, of clamps movable on said guide to and from the axis of the spool, a means for adjusting said clamps along said guide to and from the axis of the spool, and means for binding said clamps on the guide after adjustment thereon.

704,465. BLASTING-CARTRIDGE.—Wassily Kirsanov, Moscow, Russia.—A blasting-cartridge closed by a cylinder with hemispherical bottom formed by a number of tongues the adjacent edges of which cover each other reciprocally, forming at the center a star-shaped opening which is automatically closed as soon as the pressure is applied.

GREAT BRITAIN.

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

Week Ending June 12, 1902.

- 10,859 of 1901. GENERATING HEAT BY ALUMINUM.—H. Goldschmidt, Essen, Germany. Improvements in the process for using aluminum for generating heat for welding iron and steel.
- 12,291 of 1901. CARBURIZING IRON.—F. J. C. Jones, Leamington. Adding carbon to iron by exposing the iron when molten to an atmosphere of hydrocarbons.
- 14,486 of 1901. ELECTRIC FURNACE FOR STEEL.—Societe Electrometallurgique Francaise, Iseres, France. An electro-metallurgical furnace for producing wrought iron and steel direct from the ores.
- 14,643 of 1901. ELECTRIC FURNACE.—Societe Electrometallurgique Francaise, Iseres, France. An electro-metallurgical furnace arranged to tip and oscillate.
- 14,822 of 1901. ELECTROLYSIS OF SALT.—J. G. A. Rhodin, Manchester. Improvement in the inventor's process for electrolyzing salt.
- 1,007 of 1902. GYRATORY CRUSHER.—E. E. Hanna, Chicago, U. S. A. Improvements in gyratory ore crushers.
- 5,718 of 1902. CATHODE.—P. La Cour, Jutland, Denmark. Improved mercury cathodes for electrolyzing salt.
- 7,660 of 1902. ELECTRIC FURNACE.—The Electric Furnace Company, New York, U. S. A. An electric furnace designed for producing steel direct from ores.
- 8,082 of 1902. DUST COLLECTOR.—G. P. Herrick, New York, U. S. A. Improved dust chamber to prevent the escape of dust with gases from blast furnaces.
- 8,774 of 1902. SLUICE-BOX.—The Rose Gold Reclamation Company, San Francisco, Cal., U. S. A. Improved sluice boxes with floating aprons of textile materials for catching gold from pulp.

## PERSONAL.

Mr. Samuel Newhouse sailed from New York City for England on July 23.

Col. George W. E. Dorsey has returned to Salt Lake, Utah, from the East.

Mr. Richard Eames, Jr., of Salisbury, N. C., will be at Morrystown, Ariz., until July 30.

Mr. V. G. Hills has returned from Santa Maria del Oro, Durango, Mex., to Cripple Creek, Colo.

Mr. B. Gilpin, who is heavily interested in the Prieta Mine, spent a few days last week in Parral, Mex.

Mr. M. F. Perry, general manager of the Prietas Reduction Company, Sonora, Mex., is in Virginia, Nev.

Mr. E. M. Rogers, manager of the Guggenheim Exploration Company, of New York City, is in Parral, Mex.

Mr. A. P. Griffiths has been appointed general manager of the Palmarejo & Mexican Gold-Felds Company of Mexico.

Mr. Jacob E. Bamberger, general manager of the Daly-West Mine, has arrived in Salt Lake, Utah, from New York City.

Mr. E. J. Schmitz, mining engineer, has opened an office in the Washington Building, No. 1 Broadway, New York City.

Mr. A. H. Tarbet, of Salt Lake, Utah, has returned from a trip to Butte, Mont., where he inspected his various interests.

Mr. James A. Pollock, manager of the Tetro Mine, Tintic, Utah, has returned from his month's visit at his old home in Missouri.

Mr. Edward Blanckensee, of the firm of Wendler & Blanckensee, Parral, Mex., left the early part of last week for Birmingham, England.

Mr. F. Husted, who is heavily interested in the Guanacevi District, is in Parral, Mex., on business connected with his properties.

Mr. Bruce M. Myers, of Central City, Colo., has returned from a business visit to the smelters at Lead and Rapid City, So. Dak.

Mr. S. E. Gill, secretary and treasurer of the Hidalgo Mining Company, is visiting the works of the same company at Parral, Mex.

Mr. Richard Codman, who is interested in the Butler Mine, in Gilpin County, Colo., is making a business trip to New York City.

Mr. Albert Ladd Colby, metallurgical engineer of the Bethlehem Steel Company, sailed on July 29 for Europe on business for the company.

Mr. Edward H. Cox, of Springfield, Ill., who has been spending 3 weeks in Ohio in the interests of his employers, has returned to Springfield.

Mr. S. E. Gill, president of the Parral & Durango Railroad, and secretary of the Hidalgo Mining Company, is in Parral, Mex., from Pittsburg, Pa.

Mr. J. Eddy, representing Prof. J. Dunraven Young, of Chicago, Ill., has been examining bituminous coal properties near Cornell, Ill., for Chicago men.

Mr. H. H. Nicholson, mining engineer, of Denver, Colo., recently returned there from a professional trip to Summit County, but left for Mexico at once.

Mr. J. S. Jones, of Chicago, Ill., president of the Jones & Adams Company, and of the Miller Creek Coal Company, has been spending a couple of months in Ohio.

Mr. John Heimrich, of the Consolidated Mercur Mine, has been in Salt Lake, Utah, from his home in Seattle, Wash., to inquire into his mining interests in Utah and Nevada.

Prof. J. Dunraven Young, mining engineer and chemist, of Chicago, Ill., has been examining and reporting on copper properties in Vernon County, Wis., for La Crosse parties.

Mr. P. McFarlane, of the manufacturing firm of McFarlane & Company, of Denver, Central City and Black Hawk, made a business visit to Telluride, Colo., during the past week.

Mr. E. J. Burt, who succeeds Mr. H. A. Fitch as manager of the Salt Lake Branch of the American Bridge Company, was contracting agent for the company at St. Louis, Mo.

Prof. R. H. Richards, of Boston, Mass., is making a study of the concentrating mills in the disseminated lead district of Missouri in company with Prof. H. A. Wheeler, of St. Louis, Mo.

Mr. G. A. Burr, superintendent and engineer of mines of the Hidalgo Mining Company, has tendered his resignation in order to devote his attention to general engineering practice.

Mr. Walter Kennedy, of Pittsburg, Pa., has formally transferred to the La Follette Coal, Iron and Railway Company, of La Follette, Tenn., the large blast furnace he recently completed.

Mr. George Dern, manager of the Consolidated Mercur mines and mills at Mercur, Utah, has re-

turned from the East, where he attended the annual meeting at Jersey City, N. J.

Mr. T. J. Greenway, formerly manager of the Broken Hill South Mining Company, and the Broken Hill Block 14 Company, has been appointed manager of the mines of the New Chillagoe Company, Australia.

Mr. Peter Eyermaun, chief engineer of the Benrather Maschinenfabrik Actien Gesellschaft, near Dusseldorf, Germany, is now in the United States with a view of purchasing machinery, etc., for the German plant.

Mr. W. S. Bell has resigned his position as superintendent of the Juarez Company, and has accepted a position with the Mining and Financial Trust Syndicate of London, Eng. He leaves the City of Juarez, Mexico, for London this week.

Mr. Charles Swan, of Danville, Ill., Commissioner of the Danville District Coal Operators' Association, has accepted the position of mine manager for the Jones & Adams Mine No. 2 and assumed charge on July 21. His successor as commissioner has not been named.

Mr. Walther Hiby, of 109 Victoria street, London, S. W., who has been visiting the mining regions of Western Pennsylvania, Colorado, Lake Superior, and Montana, for the past 2 months, studying American methods, sailed from New York City on his return to England July 22.

Mr. George E. Gunn is now purchasing agent of the American Smelting and Refining Company at Salt Lake, Utah, under the new manager, Mr. Chas. W. Whiteley, who is expected to arrive from Helena, Mont., before August 1. Mr. Frank M. Smith, who has been in Salt Lake for some time as assistant to Manager Jones, has been transferred to the smelter at Helena.

Mr. Chauncey Newton, of Congo, O., general superintendent of the Congo Coal Mining Company, at Congo, and of the Modoc Coal Company, at Modoc, O., has been appointed general manager of both companies with headquarters at Columbus, O. The Modoc Company is a new concern sinking a shaft at Modoc, Athens County, near Jacksonville. The Toledo & Ohio Central Railway is laying a track to the mine.

Mr. H. A. Fitch, of Salt Lake, Utah, until recently manager of the local branch of the American Bridge Company, has accepted the management of the Minneapolis Steel and Machinery Company, of Minneapolis, Minn. The company is building a new factory for the making of structural steel, Corliss engines and general machinery, it being the intention, ultimately, to engage in the manufacture of mining and milling machinery.

Governor Smith, of Maryland, has appointed these delegates to the International Mining Congress at Butte, Mont.: Lloyd Lowndes, Cumberland; Frank Ehlen, Baltimore; J. P. Carroll, Midland; William Bullock Clark, Baltimore; John B. Sisson, Baltimore; Jesse Tyson, Baltimore; John Milholland, Cumberland; C. K. Lord, Baltimore; Alexander Shaw, Baltimore; W. G. Cassell, Baltimore; J. L. Murrill, Baltimore; August Hoen, Baltimore; B. F. Star, Baltimore; John Waters, Baltimore; J. McClenahan, Port Deposit; Augustus J. Ryan, Baltimore; C. F. Coffin, Mul Kirk; R. K. Wood, Sparrows Point; T. J. Mehan, Baltimore.

Governor Yates of Illinois has appointed the following delegates to the International Mining Congress at Butte, Mont.: H. N. Taylor, L. P. Priestedt, T. A. Lemon, Robert Mather, William Brown, P. H. Donnelly, Chicago; George N. Black, Stuart Broun, William D. Ryan, David Ross, Frank Godley, James Morris, Springfield; Robert Fairbairn, John E. Williams, Streator; E. T. Bent, Oglesby; George Strebel, Virden; George C. Simpson, Mount Olive; James L. Frazier, Peoria; Michael Kelly, W. R. Jewell, Ruben Russell, Danville; R. C. Davis, Rushville; Thomas J. Armstrong, Marion; James Thompson, Centerville; Clarence Parker, Chicago.

The following delegates have been appointed to the International Mining Congress from Pennsylvania: Peter Quinn and Llewellyn Price, Wilkes-Barre; Thomas Harris, Lattimer; David Davis, Avoca; S. R. Morgan, Wilkes-Barre; T. D. Nichols, Scranton; Stephen Charles, Hazleton; D. J. Reese, Plymouth; William Jeffreys, Hazleton; B. F. Meyers, Harrisburg; James Hall, Du Bois; Richard George, Wilbourn; Alexander Stewart, Anita; James Hamilton, Floanora; John Bell, Soldier; Andrew Beveridge, De Lancey; Lemuel Smith, Export; Charles E. Porter, Bagdaley; H. D. Jernan, Adamsburg; John Clark, Irwin; James H. Spence, Bernice; James C. Johnson and Thomas James, Phillipsburg; Wallace Bischoff, Robertsdale; C. F. Heckler, Quakertown; Edward F. Blewitt, Scranton; James Starford, Morrisdale; John Reed, Du Bois.

Governor T. T. Geer has appointed these delegates from Oregon to the International Mining Congress: Clark Taber, Portland; Frank Bailee, Baker City; J. H. Robbins, Sumpter; Richard Wilson, Portland; Albert Geiser, Baker City; J. W. Virtue, Leland;

W. T. Grayson, Portland; W. B. Dennis, Black Butte; Elmer Cleaver, Prairie City; Emil Melzer, Sumpter; C. E. Stevenson, Robinsonville; M. F. Eggleston, Ashland; Joseph A. Wright, Sparta; F. V. Drake, Portland; Angus McQueen, Portland; E. J. Godfrey, Granite; J. H. Clark, Portland; Walter McKay, Portland; John Lewis, Leland; J. O. Booth, Grant's Pass; R. J. Jennings, Cottage Grove; Zoeth Houser, Prairie City; Claude Basche, Sumpter; W. A. Thatcher, Sumpter; J. H. Pomeroy, John Day, F. C. Sharkey, Blue River; Henry Ankeny, Jacksonville, and O. M. Rosendale, Portland.

Mr. Frank Klepetko has resigned as general manager of the Boston & Montana mines in Butte and the smelters in Anaconda and Great Falls, Mont., and on or about August 1 will go to New York City, where he will take the position of consulting engineer in the great copper mining and smelting enterprises which James B. Haggin and others have launched at Cerro de Pasco, Peru. He will make New York his home, but will make frequent trips between that city and Peru. Mr. Klepetko graduated from the Columbia School of Mines in 1880, and shortly afterwards entered the employ of the Bigelow properties in Michigan. He remained there 10 years and then went to Montana to take charge of the new smelter of the Boston & Montana Company in Great Falls. About 2 years ago he was made general manager of all the mines and smelters of the Amalgamated, including the Anaconda plant in Anaconda, and made Butte his headquarters. It is said that Mr. Klepetko has contemplated the change for some time. Besides looking after the property of Mr. Haggin he will also act as consulting engineer for other persons or corporations desiring his services.

## OBITUARY.

W. J. Evans, superintendent of machinery for the Amalgamated smelters, who furnished plans for the new Washoe concentrator, was shot and killed at Butler on July 19, by John McGeary, a former employee of the smelter. McGeary is the inventor of a concentrator improvement, and had sought to have the company try it. When he importuned Evans to give the invention a trial he was referred to the superintendent, and, as Evans turned from him, he fired two shots, from which Evans died a few hours later. Mr. Evans was formerly superintendent of the Atlantic Mill, at Houghton, Mich. He went to Montana from Houghton 7 years ago. He invented the Evans slime tables which are still in use.

Mr. Evans, who was 62 years old, had lived in Anaconda for 2 years and had been employed previously at the smelters at Great Falls. He was generally liked and respected in Anaconda and had the reputation of never having spoken a cross word. His murderer is thought to be mentally unbalanced.

Dr. J. H. Tucker, until recently superintendent of the Germania Smelter at Murray, Utah, died at his home in Salt Lake, July 11, after 2 weeks' illness from intestinal troubles. Dr. Tucker had been a prominent figure in Utah mining for 6 years, and was well known to the mining and smelter men of Utah. Fifteen years ago he came into the West from Philadelphia, where he was prominently identified in the sugar industry. He located in Denver, Colo., where he lived for 6 years, and was engaged in the smelting business. He then moved to California and resided in that State for 3 years, engaged in a similar business. Six years later he came to Utah and has made that State his home continuously since, acting as superintendent of the Germania Smelter and living at Murray. He resigned the position of superintendent a month ago. Three weeks ago he became suddenly and violently ill and had gradually declined in spite of all efforts of the physicians. He was 52 years of age, and was unmarried. No relatives survive him in the West.

## INDUSTRIAL NOTES.

Elsasser & Co., it is said, are to erect extensive metallurgical works at Wadley Station on the Mexican National Railway, in San Luis Potosi, Mex.

Reduction works are to be constructed by James A. Kilton, at Matehuala, San Luis Potosi, Mex. The works, it is reported, will be capable of handling all classes of ores and metals.

The Bradley Pulverizer Company, of Boston, Mass., manufacturers of the Griffin mill, states that this mill has acquired such favor among makers of Portland cement that 15,000,000 bbls. of cement are ground by Griffin mills yearly.

The McFeeley-Wheeler Fire Brick Company, of Pittsburg, has about completed improvements to its plant at Latrobe, Pa., which will double its former capacity. The entire plant will have an output of 15,000 high-grade fire-brick daily.

The Philadelphia Pneumatic Tool Company, of Philadelphia, Pa., has made arrangements for opening a branch establishment at Johannesburg, South

Africa, under the management of General Samuel Pearson, late of the Boer forces.

Jones & Laughlins, Pittsburg, Pa., are continually making additions to their electrical equipment and have just recently ordered from the Westinghouse Electric and Manufacturing Company, an 800 kw., direct current generator, 2 150 kw. motor-driven 2-phase alternators, and 2 125-light motor-driven arc generators.

The Magnesia Covering Company, of Pittsburg, Pa., has been awarded the contract to cover all the surface pipe in the extension to the National Steel Company's plant, at New Castle, Pa. The company was also awarded the contract for magnesia covering to be used on the Isabella furnace of the American Steel Hoop Company, at Etna.

The Denver, Colo., office of Fairbanks, Morse & Co., recently sold the equipment for a 150-ton concentrating plant to include Blake rock breaker, Sturtevant crushers and rolls and 8 Standard concentrating tables to the Hensen Creek Lead Mines Company at Lake City, Colo., of which Mr. Newitt is manager. This plant is to be electrically operated by the mining company's power plant.

The Standard Steel Car Company, of Pittsburg, Pa., is equipping its new plant for electric driving throughout. A recent purchase from the Westinghouse Electric and Manufacturing Company, comprises 2 375 kw. alternating current generators; one 400-kw. direct current generator, and a 300-kw. rotary converter for use as a connecting link between the two. This company has also purchased about 50 induction motors which will be used largely for direct connection to machine tools.

The Phillips Mill and Mine Supply Company, of Pittsburg, Pa., has purchased property adjoining its plant, upon which it will build a large addition to increase by 25 per cent. its output of mill and mine supplies. The company recently completed a large extension but this is now inadequate. John Phillips, president of the company, has purchased a large plot of ground in Monongahela City, adjoining the plant of the Monongahela Foundry and Forge Company, comprising about 10 acres, to provide for the future needs of the company.

The Reese-Hammond Fire Brick Company, of Bolivar, Pa., with works at Bolivar, Fairmount, and Curwensville, has secured the contract for the large new blast furnace and 4 hot blast stoves, being erected by Julian Kennedy, for the Rochester & Pittsburg Coal and Iron Company, at Dubois, Pa. The Reese-Hammond Company recently furnished the brick for a blast furnace for one of the United States Steel Corporation's plants, and within 4 months has secured orders for 6 blast furnaces and 8 Kennedy hot-blast stoves. The company was also awarded the contract recently by the Union Steel Company for brick for the new open hearth plant at Donora, Pa., amounting to about 7,000,000 high-grade fire brick from the Curwensville works in Clearfield County. The company is increasing the capacity of the Curwensville works to 75,000 high-grade fire-brick per day, building several miles of mine railway and making other improvements. The company has almost completed the new No. 1 works at Bolivar, which replaces the old one destroyed by fire in March. The new plant, with a brick structure 60 by 312 ft., 2 stories high, will have a capacity of 30,000 brick per day. It is to be used for the manufacture of high-grade refractories exclusively. The total capacity of the 7 plants owned by the company, including all classes of high-grade refractories and other fire clay products, reaches 285,000 brick per day.

TRADE CATALOGUES.

No. 35 of the series of its "Record of Recent Construction" issued by the Baldwin Locomotive Works, of Philadelphia, Pa., is given to a description of the company's rear truck locomotives. The pamphlet describes the "Atlantic," "Prairie" and "Mikado" types of locomotives made by the company, and gives a brief description of the Rushton radial swing truck used under the fire-box.

E. Keeler Company, of Williamsport, Pa., manufacturing boilers, tanks, steel trucks and riveted steel pipe, issues a 36-page pamphlet, giving specifications of the different boilers the company is prepared to furnish. The company makes high pressure tubular boilers, open and water bottomed portable boilers, marine vertical and horizontal boilers and the Keeler water tube boiler for which many good points are claimed.

A pamphlet containing some excellent half-tone cuts and having a unique cover is entitled "Motor Driven Tools," and is sent out for free distribution by the Crocker-Wheeler Company, of Ampere, N. J. It contains illustrations in lieu of descriptive matter and tables of data, and is intended to illustrate a few of the applications of the electric motor in the distribution of power about machine shops and industrial plants.

The W. S. Tyler Company, of Cleveland, O., manu-

facturer of Tyler double crimp brass, copper, bronze, iron and steel wire cloth and screens for all purposes, issues a beautifully gotten up booklet of 86 pages, describing its wares. The booklet contains tables showing the different gauges of wire, price lists of wire cloth and screens, and in addition has some remarkably fine illustrations of ornamental iron work executed by the company. The company manufactures for mine use particularly, heavy wire screens, revolving screens, phosphor bronze wire cloth for stamp batteries, trommels and jig screens and an extra fine brass cloth for testing chemicals, ores, etc.

The air compressors manufactured by the Herron & Bury Manufacturing Company, of Erie, Pa., which are described in circulars sent out by the company, include steam actuated compressors of the straight line type, recommended for general mining, tunnelling and quarrying work, and for isolated installations where hard and continuous service with but little attention is required; also center crank belt driven compressors. In both types the air cylinders and heads are completely water-jacketed, except at the valve seats. The valves are of the poppet type, of forged open-hearth steel, and are arranged radially in the barrel of the cylinder. The company also makes vertical and horizontal air receivers.

Machinery for making brick, tiles, sewer pipe and other clay wares is described in a 64-page pamphlet published by Jonathan Creager's Son Company, of Cincinnati, O. The company states that it has had more than 15 years of continuous experience in the working of clays in all parts of the world, and is particularly prepared to test all clay specimens that may be sent it to determine their good qualities and the best way to develop them. These tests are made promptly and without charge, but all costs for carriage must be prepaid. The pamphlet briefly mentions the different systems of brick making, and then describes the company's "Grand-Automatic" machine, especially constructed to temper and mold very stiff clay, and to develop perfectly the corners and edges of brick. The machine require from 6 to 10-h. p. for its operation, and has made runs of 5,000 brick per hour. The company also manufactures pug-mills, disintegrators, drying racks, barrels, clay cars, grinding pans, dry pressers, tile-cutting machine, molds, kilns, etc. Users of the company's machinery are found in nearly every State in the Union.

Green's improved patent fuel economizer for steam boilers is described in a 92-page pamphlet sent out by the Green Fuel Economizer Company, of Matteawan, N. Y., sole maker in the United States. The pamphlet gives a large amount of detailed information about the construction and advantages of the device mentioned, and in addition contains some excellent tables showing the properties of saturated steam, proper dimensions for chimneys, multiples for finding the equivalent rate of evaporation of water, etc. The Green economizer consists in the main of a stack of tubes arranged vertically in the flue leading from the boiler to the chimney, and is designed to utilize the waste heat in the gases from the furnace by absorbing the low temperature heat of the gases in heating the feed-water that is pumped through the economizer before going to the boiler. The advantages claimed are a saving of from 10 to 20 per cent in fuel; economical heating of the feed water to high temperatures; a large volume of water always in reserve at the evaporative point ready for delivery to the boilers; a prolongation of the life of boilers by the high temperature of the feed water, and a considerable reduction of the amount of sediment going to the boilers, as much is deposited in the economizer where it can easily be blown off.

The pamphlet gives the results of 4 careful tests at different plants, the results being neatly tabulated. Numerous testimonial letters from users are given, and the list of users includes some of the largest industrial concerns in this country and Canada.

GENERAL MINING NEWS.

**Indianapolis Convention of United Mine Workers.**—The delegates from the local lodges met at Indianapolis, Ind., on July 17 to consider methods of helping the striking anthracite miners. At the opening session President Mitchell made an address in opposition to a general sympathetic strike of bituminous miners, pointing out that a sympathetic strike would alienate public sympathy and urging that agreements made with operators be kept. There was no strong opposition to Mr. Mitchell and the convention took up the question of rendering pecuniary assistance. After debating for several sessions the delegates voted to adopt the plan advocated by Mr. Mitchell and the convention adjourned on July 19 after issuing a long address to the public. The plans adopted for raising a general strike fund contain these clauses:

That the National Treasurer be authorized and directed to immediately appropriate \$50,000 from the

funds of the national treasury and place it at the disposal of the officers of Districts Nos. 1, 7 and 9 (these are the anthracite districts).

That all districts, sub-districts, and local unions be appealed to to donate from the surplus in their treasuries as large amounts as they can afford.

That an assessment of 10 per cent. be levied on the gross earnings of all members of local unions in Districts 6, 8, 12, 19, 23, and 25, and an assessment of \$1 per week upon all members of local unions in Districts 2, 5, 11, 13, 14, 15, 16, 20, and 21. The members of districts now on strike which may resume work before the assessment has been removed shall be assessed either 10 per cent. of their gross earnings or \$1 per week, whichever their district may decide from the time work is resumed.

An assessment of 25 per cent. will be levied upon the wages, salary, or percentage received from the organization of all National, district, and subdistrict officers and organizers.

The assessment shall begin with the 16th of July, 1902.

All contributions made from the National office to the anthracite region will be divided pro rata to each anthracite district in accordance with the number of miners and mine laborers in each of them, as shown by the most recent coal reports.

The following amendment, submitted by President Nichols, of Anthracite District No. 1, was included:

That each local union in the regions that are at work select a committee which shall secure work for as many of the men on strike as possible and in the locality where the local union is situated, the locals to inform secretaries of the strike districts the number of men needed, the kind of work, wages, and arrangements for transportation, that the same proposition be submitted to all local unions in the American Federation of Labor.

**Pipe Line Reports.**—There was a general decrease in both the Pennsylvania and Buckeye pipe line stocks during June, says the Oil City *Derrick*, of nearly 10,000 bbls. a day, which is very close to the record for May. The June runs of Pennsylvania oil suffered a decline of over 3,000 bbls., while the shipments declined nearly 20,000 bbls. a day. At the same time the Buckeye runs made a gain of about 200 and the Buckeye shipments increased over 11,000 bbls. a day. The decrease in the net stocks of both sections aggregated about 290,000 bbls.

The June shipments of Pennsylvania oil averaged 90,283 bbls., or 19,719 bbls. less than the average for May. The Pennsylvania runs averaged 84,315 bbls. a day, which was 3,201 bbls. a day below the average for May.

The June runs of the Buckeye & Indiana Oil Company averaged 55,324 bbls., which was 180 bbls. above the average for May and the heaviest of the current year. These figures have not been exceeded since June 5 years ago. For June a year ago the Lima runs were 52,147 bbls. a day. The June shipments of Lima oil were 64,351 bbls. a day, or 11,082 bbls. above the May average. These are the largest on record since the closing months of 1898. The shipments for June 1901 were 51,783 bbls. a day.

The total runs of the Pennsylvania and Trenton rock oil fields averaged 139,639 and the shipments 154,634 bbls. a day in June.

The net stocks of Pennsylvania oil decreased 190,889 bbls. in June and the Buckeye stocks declined 98,052 bbls., making a total decrease of 288,941 bbls. for the month. This is at the rate of 9,631 bbls. a day. The Pennsylvania stocks were 7,108,844 bbls. on June 30, the smallest on record for the past 6 years. Adding the net stocks of the Buckeye and other lines handling Lima oil makes a total of 25,450,516 bbls. in iron tanks at the close of June.

The stocks of Pennsylvania and Lima oils at the close of June were the smallest on record since July, 1900.

**Rates for Mineral Land Surveys.**—The estimated cost of platting and other office work in connection with the surveying of mineral claims will be computed as below: The new charges became effective July 1. The rates are made by the General Land Office:

For lode claim.....	\$30
For placer claim.....	35
For millsite.....	30
For millsite, included in one survey with a lode claim.....	20
For each lode claim within and included in the survey of a placer claim.....	20
For several lode locations included in one survey, the first location named.....	30
All other locations included, each.....	25
For several placer locations included in one survey, the first location named.....	35
All other locations included, each.....	30
For affidavit of \$500 expenditure of improvements, after approval of survey.....	5

Should an amended order issue, an additional deposit will be required.

ARIZONA.

MOHAVE COUNTY.

(From Our Special Correspondent.)

**Gold Roads.**—This group of mines, in San Francisco District, is reported sold to a French syndicate.

**Homestake.**—This mine, 4 miles west of Kingman, is said to have opened a blanket vein of free milling gold ore. The company will erect a mill.

**Keystone.**—This mine, at Mineral Park, was lately purchased by a company from James Uncapher. Men are at work.

**Nighthawk.**—This mine, at Cerbut, is being worked by the Clark Brothers under lease.

**Rough Rider.**—Work has started on this mine, at Payne Springs, which shows 2 ft. of low grade ore. The ore will go to the new smelter at Chloride.

**Tintic.**—This old gold mine, at Chloride, belonging to the Philadelphia & Arizona Mining Company, is to start work.

**Tom Dick.**—This gold mine, at Union Pass, is shipping ore to the Halsey Sampling Works at Kingman.

**Vulcan Smelter.**—This new plant, at Chloride, is running on ore from the Pinkham Mine.

## CALIFORNIA.

### AMADOR COUNTY.

(From Our Special Correspondent.)

**Bunker Hill.**—In this mine at Amador City, C. R. Downs, superintendent, a vein of good milling ore has been found on the 800 level. The new compressor now being installed will be operated by electricity.

**Empire.**—A. J. Crain and others have 4 Huntington mills working over the dump pile of this old mine at Plymouth. It is intended to have 4 more mills.

**Dooley.**—This mine near Ione has crushed rock which paid an average of \$20 per ton. Small rich seams are followed, the richest ore being pounded up in a hand mortar and the rest milled.

**Lincoln.**—At this mine at Sutter Creek, E. C. Voorhies, manager, cross-cutting has begun. The station at the 1,950-ft. level is completed.

### BUTTE COUNTY.

(From Our Special Correspondent.)

**Inskip District.**—While there are a few gold claims worked at this place, lack of capital has kept the camp back. Just at present the mines at Inskip are coming more into notice.

### CALAVERAS COUNTY.

(From Our Special Correspondent.)

**Angels Mining Company.**—The 20-stamp mill of this mine at Angels, J. V. Coleman, of San Francisco, owner, has started with electricity for power.

**Easzy Bird.**—This mine near Mokelumne Hill is worked by the Emma Mining Company. Five men are at work.

**Esmeralda.**—This group near San Andreas is being developed under S. W. Payne. He has had hauled in a light engine and boiler and has purchased a compressor and drills.

**Guifra.**—At this mine at Mokelumne Hill 6 men are at work. The mill will not start until stoping begins.

**Gwin Mine Development Company.**—This company at Gwinmine, F. F. Thomas manager, is adding 20 stamps to the present 80 stamps. A steel gallows frame 100 ft. high is to be put up for the new hoisting plant. The 80 stamps running crush between 13,000 and 14,000 tons of ore monthly.

**Last Chance.**—This mine at Angels has been sold by the estate of the late Geo. C. Tryon to E. Bamberger and C. A. Molson of Salt Lake, Utah. A large force will be put on and the mine thoroughly developed. This is an extension of the famous Cross ledge.

**Lightner.**—This company, at Angels, Alex Chalmers, superintendent, has started suit against the Utica Mining Company, alleging trespass on grounds below the 500 ft. level. Damages are asked to the amount of \$120,000. It is stated that the mine has cleared itself of debt.

**Linderaa.**—This mine near the Easzy Bird, at Mokelumne Hill, is being opened for prospecting.

**Lloyd.**—This mine at San Andreas, which has been idle for years, has been bonded to the Southern Pacific Oil and Development Company of 50 Devonshire street, Boston, Mass. The mine is on the great blue gravel channel running through this county from the Stanislaus River to the Mokelumne. The title has recently been cleared after years of litigation and Mr. Ames, representing the new owners, is sinking 2 shafts from which drifts will be run.

### EL DORADO COUNTY.

(From Our Special Correspondent.)

**Union.**—From this group of mines at El Dorado good ore is taken. The shaft is unwatered down to the 900 level.

### KERN COUNTY.

(From Our Special Correspondent.)

Randsburg is to be supplied shortly with electric power for the mills and mines.

**Bakersfield Smelter.**—Work has started on a smelter at Bakersfield by a recently organized company. There will also be facilities for cyaniding ores.

**Butte Lode.**—This mine at Randsburg has cleaned up \$36,194 for the first 6 months of the year.

**Gold Peak.**—This mine at Amalie has 12 men at work, mainly on development.

**Randopak Mining Company.**—This company owns 8 claims near Randsburg and has begun development.

**Ratcliffe.**—This mine at Ballarat is keeping a 20-stamp mill and cyanide plant busy. Fifty men are at work.

**Yellow Aster.**—At this famous mine at Randsburg, John Singleton, manager, a new pump is installed and the mine force is to be increased.

### LASSEN COUNTY.

(From Our Special Correspondent.)

**Gold Ore Discovery.**—Shearer, Razer and Murphy have found some rich quartz at Granite Creek near Amandee. Rich ore was found in small quantities near this place years ago, but the exact locality was not determined.

### MARIPOSA COUNTY.

(From Our Special Correspondent.)

**Black Prince.**—This mine at Solomon Gulch is showing up well. Some of the ore is high grade.

**Rogers-Peck.**—This group of mines near Hornitos has been bonded to Colorado men who will develop the property.

**Stockton Creek.**—From this mine, leased from the Mariposa Commercial and Mining Company, Mount Bullion, Rowland Brothers and Tremlin & Bertken are taking out good ore from a narrow vein.

### MONTEREY COUNTY.

(From Our Special Correspondent.)

**Alder Creek.**—R. Simmes has taken some fine specimens from his claim near Mansfield.

**Los Burros District.**—In this district about Mansfield a mill has been erected for working rock from the mines on Ajax Hill. Another mill is to be put up for the Grizzly Mine which has been bonded by a company. A number of new mining locations are being recorded.

**Ralston.**—This company at Mansfield has men at work on the north fork of Willow Creek where the company has 35 locations. The rest of the men are working on Spruce Creek.

### NEVADA COUNTY.

(From Our Special Correspondent.)

**Coc.**—This mine, Grass Valley, now under bond, has been unwatered.

**Ironclad.**—On the arrival of a pump, Geo. Hay will unwater this mine at Rough and Ready.

**Meadow Lake District.**—The Crystal Lake Company in this district has rebuilt the mill blown down last fall and is crushing ore. Clark & Cook, of the Century Mine, are to build a saw mill to get out timber for a new quartz mill.

**South Yuba Water Company.**—Ex-Senator Felton, W. C. Ralston, W. S. Graham and J. H. Batchner have been examining the ditch, with a view to purchase in the interest of an Eastern company. The company's water rights and interests are extensive. The price is said to be about \$5,000,000.

### PLACER COUNTY.

(From Our Special Correspondent.)

**Alameda.**—The owners of this mine near Westville, W. D. Pinkston, superintendent, are installing a 20-stamp mill.

**Lost Emigrant.**—The owners of this mine, near Summit, have bought a small mill which will soon be ready.

**Tadpole.**—At this mine at Secret House 200 ft. of the main tunnel are completed.

### PLUMAS COUNTY.

(From Our Special Correspondent.)

**Cataract.**—This company, C. L. Adams, superintendent, has purchased the Indian Bar Mine embracing 60 acres on the North Fork of Feather River below the mouth of Yellow Creek. A ditch is completed for 5,000 ft. and 2,000 ft. remain to be finished. An elevator is to be used.

**Feather River Consolidated Company.**—This company, owning a large deposit of cemented gravel near Shoo Fly, as well as a quartz property near by, has ordered a 300-ton crushing plant from the Krogh Manufacturing Company, of San Francisco. The company is composed of Chicago, Ill., men.

### SACRAMENTO COUNTY.

(From Our Special Correspondent.)

**Ashburton Mining Company.**—At Fair Oakes a very large dredger is working on gravel from 25 to 30 ft. deep. The machine cost \$60,000. R. E. Cranston is manager. Boston men own the plant. Twenty men are employed.

### SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

**Silver Wave.**—On this mine near Danby, the tunnel is now in 650 ft. The mill is working on some high grade ore.

**Vulcania.**—A contract has been let by this company near Danby, for a 100 ft. shaft and 100 ft. of drifting.

### SAN DIEGO COUNTY.

**California King Gold Mines Company.**—Deputy Sheriff Campbell, of New York, has received an attachment for \$36,518 against this company from J. Adriance Bush, in favor of Hewlett Bush, on an assigned claim from the Colorado Iron Works Company for balance due for machinery for a mill near Yuma, Ariz. The attachment was granted on the ground that it is an Arizona corporation.

(From Our Special Correspondent.)

**Bullion Bar Dredging Company.**—This company controlling by lease the properties and dredger of the Advance Gold Dredging Company at Potholes 14 miles above Yuma is to start the dredge in the river for a test. The dredge has been idle owing to litigation among the owners.

**Schaffer Salt Works.**—These old works near the head of San Diego Bay have been purchased by the Western Salt Company, G. E. Babcock, president, and a new refining plant has been put in. Increased facilities are being provided.

### SHASTA COUNTY.

(From Our Special Correspondent.)

**Electric Iron and Steel Company.**—This company has bought 209 mining claims on Pit River from Esterle, Hall, Smyth and Bruson.

**Heintz Dredge.**—This dredging plant near Redding is to be operated by electric power.

**McCloud River Electric Company.**—A very large electrical power plant is being installed on the McCloud River by this company, of Redding. Contracts are being let for a dam, a 12-mile canal, and a power house. The machinery has been obtained and awaits the erection of buildings. A number of mines will use the power.

### SIERRA COUNTY.

(From Our Special Correspondent.)

**Swansea.**—Work on this mine near Allegheny has been under way many years mainly in a bedrock tunnel. Gravel has now been found and a good body opened. The mine is under bond to Joseph Brock, Henry Budd and others. Both below and above the mine good results have attended work.

### SISKIYOU COUNTY.

(From Our Special Correspondent.)

**Flagg Group.**—W. N. Wilbur has perfected title to his property in the Humburg District and will push development. A concentrating plant will be added to the small mill.

**Siskiyou Mining and Development Association.**—This concern has instructed L. J. Caldwell to push development on the mine 8 miles from Yreka and if explorations are satisfactory machinery will be bought.

**Yellow Rose of Teas.**—A tunnel is to be started at once by Geo. L. Carr, the owner.

### SONOMA COUNTY.

(From Our Special Correspondent.)

**Eureka.**—Winfield S. Davis, of San Francisco, has bought from E. Philbrook and wife these quicksilver claims at Pine Flat.

### TUOLUMNE COUNTY.

(From Our Special Correspondent.)

**Bell.**—On this mine at Tutletown, W. J. Rule has a well defined vein.

**Confidence Mining Company.**—This property at Confidence has a cyanide plant about ready to handle 100 tons of tailings daily. A new air compressor and a 70-h.p. boiler have been put in. Over 100 men are now employed.

**Contention.**—This mine near Columbia has been bonded to L. M. Howe, of San Francisco.

**Dutch.**—In this mine at Quartz, the ore shoot has been cut on the 1,200 ft. and in the south drift is 14 ft. wide.

**Jumper.**—This mine at Stent, P. Geo. Gow, manager, has started up again after being closed a short time on account of fire.

**Keltz.**—This mine, at Sonora, is running 10 stamps continuously.

**Lady Washington.**—This mine at Carters has been bonded to W. H. Martin, of San Francisco.

**Laura.**—This mine near Carters will shortly start up under management of its new Boston owners.

**Lost Fox.**—Some of the buildings of this mine were burned recently by forest fires.

**Mount Jefferson Mining Company.**—Jas. M. Meighan has secured a 3 years' option on this mine at

Groveland, and will start the mill shortly and erect a cyanide plant. He may add 20 stamps to the mill.

**Neale.**—This mine, formerly the Sugarman, at Sonora, owned by J. H. Neale and worked by A. D. Herold, R. Watson and Chas. Smith, is again yielding. A \$5,000 pocket was taken out recently.

**Nonpareil.**—At this mine at Groveland the machinery is being put in as rapidly as possible. A. P. Dron is in charge.

**Prince.**—Lime rock is being shipped to San Francisco from this property. If the result is satisfactory works will be established near Sonora.

**Table Mountain Gravel.**—A number of tunnels have been run into Table Mountain near Columbia during the past 50 years mainly on spurs of the main gravel channel. In one section reaching from Mormon Creek to the Stanislaus River rich gravel has been found in places. On Fonda Hill at Doyles ranch where a shaft was started years ago, R. E. Stanford, representing New York men, has erected a hoist and pump and is sinking in hopes of finding the main channel.

**White Oak.**—Axel Johnson, D. L. Oneto and T. D. McLennan have bonded this mine at Soulsbyville from Wm. McGinn and will sink the shaft to 150 ft.

## COLORADO.

### BOULDER COUNTY.

**Boulder Oil Wells.**—Additional casing for the Boulder Basin well has been delivered. Dr. T. E. Inglis has begun drilling on the Central oil well, in the center of the oil belt, a few hundred feet south of the Crawford. Lee A. Reynolds is sinking for the McKenzie Oil Company. The Hygiene well, on J. A. Webber's farm, about 8 miles north of Boulder, is reported to have struck oil. Drilling at the Maxwell well has ceased. The gas has been shut off. The quantity of gas the well would furnish a day has not been ascertained. The Eagle is down about 1,600 ft., with as yet no oil in sight.

**Great Western Exploration and Reduction Company.**—This company has been mining tungsten ores at Nederland. Last year the Railroad reduction mill at Boulder was leased and a trial run was made on 30 tons, concentrating 5 in 1, and leaving a concentrate, which was then quoted at the market price of \$180 per ton. A small quantity of the concentrates was exported to Germany, but the remainder in the mill is waiting for a market.

**Magnolia Mining and Tunneling Company.**—This company was recently organized in Colorado Springs. The company is to work the Graphic, Graphic Extension, the Golden Eagle and the Golden Scepter claims, near Magnolia. The company is organized with a capitalization of \$1,500,000, divided into 1,500,000 shares of \$1 each. The large treasury reserve of 1,000,000 shares has been set aside for future use.

### CHAFFEE COUNTY.

**Vivandiere.**—This mine, the most important in Turret District, was owned by the Turret City Gold Mining and Milling Company, the stockholders being principally Chicago, Ill., men. There is a good plant of machinery and the mine is developed to 500 ft. Considerable good ore has been shipped from the 500-ft. level, and there are ore bodies now blocked out. The Salida Smelter is buying the ore. The Twin City Development Company, that has been for several months making developments in the Turret District, working chiefly on the Gertie property, has now bought the mine for a reported price of \$70,000 cash. The new ownership will continue ore shipments regularly from the stopes already established.

### CLEAR CREEK COUNTY.

**Burns-Moore Mining and Tunnel Company.**—The following officers and directors have been elected: Dr. W. C. Abbott, of Chicago, Ill., president; C. F. Cabene vice-president; J. M. Shaller, of Cincinnati, O., secretary, treasurer and manager. The company controls claims owned up Chicago Creek and extending to Cascade and Ute creeks, adjoining the Lamartine Mine. A pipe-line on Chicago Creek supplies water for 2 water wheels, under 90-ft. head. An air compressor and dynamo were installed some time ago, and within the past few weeks a Root blower.

(From Our Special Correspondent.)

**Marshall-Russell Tunnel.**—The air compressor at the tunnel at Empire proved a failure with water power, and it has been necessary to put in another. W. C. Marshall, of Empire, is manager.

**Mendota.**—The mill at Silver Plume has been remodeled to handle the low-grade lead ores opened. Power is to be supplied from the United Power electric plant.

**Stanley Consolidated Mining and Milling Company.**—The Consolidated Stanley property, consisting of mines at Idaho Springs and the Salisbury Mining and Milling Company's mill, adjoining, have been consolidated into one company, with a capital of \$2,500,000. The new directors are James P. King, president; A. D. Bullis, vice president; W. L. Bush, secretary; G. L.

Torrey, treasurer, and H. A. Reidel. The company has set aside 500,000 shares as treasury stock for raising funds for a 100-ton concentrating mill, the present mill not being able to handle over 25 tons per day. The company has a shaft down 900 ft. with almost 5 miles of levels.

**United Light and Power Company.**—A special meeting has been called for August 12 to consider mortgaging the plant at \$100,000 to retire about \$40,000 of the present issue of bonds, purchase additional machinery and provide for further extensions. Fred P. Dewey, of Georgetown, is manager, although 51 per cent of the stock is owned by the Cascade Electric Company. Hanchett & Himrod, of Idaho Springs, are owners.

**Waldorf Mining and Milling Company.**—This company has acquired 18 claims from O. E. Clark in the Argentine District, 6 miles west of Georgetown, where E. J. Wilcox has been doing much development work and made several strikes in the past year. The district prior to the advent of Mr. Wilcox had received little attention. Now both gold and silver are being opened, with some lead and copper. It is the intention to install a power plant and run wires from Georgetown.

### GILPIN COUNTY.

(From Our Special Correspondent.)

**Mining Deeds and Transfers.**—James N. Bradley to the Blue Ribbon Mining, Milling, Prospecting and Leasing Company, one-half interest in Blue Ribbon lode, Vermilion District; J. H. Kemp to W. A. Uren, the Calhoun lode, Russell District; A. F. Willinsky to C. W. Baldwin, real estate in Black Hawk and the Bryan lode, Enterprise District.

**Cashier Gold Mining and Reduction Company.**—Shipments are being increased and developments are kept ahead of production. June shipments of smelting ores were 96 tons, averaging over \$100 per ton. The properties are shipping daily 25 tons, of which half goes to the local mills and half to the Carpenter Smelter at Golden. One car of iron shipped by leasers returned \$197 per ton. The Meeker shaft is being cleaned out and retimbered. The company will buy machinery to sink 1,000 ft., and will work the entire group of claims from that shaft. About 70 men are employed, under the superintendency of B. L. Campbell, of Central City.

**Federal.**—Denver and local parties have a lease and bond on this property, in Russell District, adjoining such well-known properties as the Old Town and Pewabic groups. They are sinking a new shaft and are preparing to install machinery at once. R. Hughes, of Russell Gulch, is manager.

**Gregory Second.**—Leasers in this property, owned by the Gregory-Buell Consolidated Company, have opened a streak of ore in the 400-ft. level which gives assay values of 59.7 oz. gold and 26.3 oz. silver per ton. Some ores are being shipped by leasers.

**Hidee Gold Mining Company.**—St. Joseph, Mo., parties are interested in the Hidee group in Lake District, and are putting up a new shaft building 18 by 45 ft., and have ordered a 12-h. p. gasoline hoist of the Weber make. The shaft is down 210 ft. and will go 200 ft. deeper. A. T. Richardson, of Central City, is in charge.

**Ingalls Gold Mining Company.**—The Ingalls Mine is making monthly shipments of about 50 tons to the Golden Smelter, and is this week making a 50-ton shipment to the Newton Mill at Idaho Springs for concentration purposes. The Benzie Investment Company, of Denver, is interested with E. Drake, Central City, as manager.

**Nimrod.**—A local pool has taken a lease and bond and is going to put up machinery and commence development. The shaft is down 400 ft., and the property is credited with a good production.

**Russell Gulch Mining and Development Company.**—Arrangements are being made for sinking an additional 100 ft., or 270 ft. in all. In drifting a good-sized ore body has been opened, the same vein as the O. Town. A 50-ton lot is being shipped to Idaho Springs, and the company have had values of from 2 to 18 oz. gold per ton. The company has secured an option on the Rocky Mountain Terror Mine, which adjoins the Robert Fulton group. G. K. Kimball, Jr., of Idaho Springs, is manager.

### GUNNISON COUNTY.

**Akron Mining Company.**—Daniel Tobin, of Leadville, has leased the Tomichi concentrator of 50 tons capacity, owned by this company and the plant is running almost to full capacity. The principal mines which furnish the ore are the Eureka and Erie.

**Crystal River Land and Development Company.**—This company continues to develop its marble quarries in the northwestern part of the county.

**Forest Hill Consolidated Mining Company.**—This company has done extensive development. The main shaft is down nearly 400 ft. The mine is equipped with a good plant of machinery and work is progressing nicely. The company has also a concentrating

mill in operation 2 miles from the mine. This mill treats about 20 tons daily, and turns out a good concentrate.

**Tomichi Valley Smelter.**—This plant is turning out fine bullion daily. The plant is one of the most complete west of Pueblo, and has successfully handled the district's ore. The Southwestern Smelting Company also has a plant in Whitepine which may resume operations soon. This plant has a capacity of 50 tons daily.

### LAKE COUNTY.—LEADVILLE.

(From Our Special Correspondent.)

There has been a slight falling off in shipments, due to the placing of heavier machinery at several properties, but it will be more than made up when the New Monarch Company resumes shipments.

**Amity.**—At 175 ft. a drift has cut an entirely new vein of 2 ft. of siliceous ore, averaging \$100. Some assays show as high as 6 oz. gold and 1,000 oz. silver.

**Cleveland.**—Dr. Crook, the owner, is arranging to resume work.

**Corona.**—The new machinery is in place and sinking has resumed from 150 feet.

**Diamond Mining Company.**—This company is running a drift at over 1,000 ft. after the Resurrection Shoot. The water recently encountered is successfully handled.

**Evalyn Mining Company.**—The shaft is over 1,000 ft. deep. Prospecting is going on at 3 levels.

**Fortune Mining Company.**—The owners are figuring on a resumption.

**Fryer Hill Mines Company.**—The water has been lowered over 90 ft. A number of men are at work preparing to attack the old ore bodies of the upper levels.

**Gold Bug Mining Company.**—Eastern people, represented by W. P. Dewey, own this big acreage in Lincoln Gulch. Arrangements are under way for resuming work.

**Ibex Mining Company.**—Shipments average about 300 tons daily. Most of this tonnage is low-grade material, which the smelters included in their new contract. A large amount of development and prospecting is going on.

**Iron Silver Mining Company.**—The company is shipping 250 tons daily from its Moyer workings. It has sold the old Moyer dump to the New Jersey Zinc Company, which will ship the stuff to the Canon City plant. There are 15,000 tons in the dump.

**Last Chance.**—The new lessees, headed by Terrance Conners, have done much prospecting and are taking out some good bunches of lead ore. The property lies east of the El Paso.

**Midas Mining Company.**—At the annual meeting S. D. Nicholson was elected president and general manager; L. A. Reynolds, vice president; J. Rodman, secretary and treasurer. These men and C. L. Hill and Frank Smith are the board of directors. The company is shipping over 5,000 tons a month of good grade iron and has been for 3 years, but the body shows no sign of exhaustion. No work has been done below the first contact.

**New Monarch Mining Company.**—At the annual meeting this week J. C. Kortz was elected president, H. C. Reddington vice president, J. M. Thomas treasurer, G. A. Steinbrenner secretary, and T. Goodwin general manager. The company has large bodies of ore opened in its Monarch, Lida and Little Winnie shafts on the gold belt, and is completing the smelter at Salida to handle its ore. Shipments of 200 tons daily are to start next week.

**Ohio Mining Company.**—A new shaft is being sunk. Some rich streaks were encountered in the old workings.

**President.**—Hanifen & Reynolds have secured a long-time lease and are putting in machinery. The largest low-grade siliceous ore-body on the gold belt has been opened but could not be handled on account of a \$9 treatment charge, as the ore only averages \$10. The new lessees have secured a better rate.

**Sealey.**—The lessees are shipping fair-grade iron. The recent find of rich lead carbonates proved to be only a streak and has entirely disappeared.

**Star of the West Group.**—A drift is being run from the lower level to tap a known ore body found in the old workings. C. H. F. Meyer is at the head of the proposition.

**Stormy Petrel Mining Company.**—This company has 200 acres of ground in the Horseshoe section. After an expenditure of over \$250,000 the property was closed 12 years ago by litigation. This has been settled and the company reorganized. James Shinn, of Leadville, is the manager. A new shaft will be sunk to develop a fine oxidized lead ore.

### OURAY COUNTY.

**Barstow.**—This mine, commonly known as the Bob Tail Mine, is shipping ore. The output is principally lead carbonate, carrying copper. The greater portion

goes to the Durango Smelter, while a portion is only sent as far as Silverton.

**Hudson.**—This mine has been making preparations to ship its winter output of ore. The property is one of the holdings of the Blue Bell Mining Company of New York City, and has been worked all winter. In addition to breaking down ore, the shaft is 400 ft. deep. About 25 men have been steadily at work. The Hudson is not an old mine, though lying in an old district.

**Silver Lodge Mining Company.**—This company has already started improvements. The mine has been worked about 7 years, but not on a large scale. Work is under way on a new 200-ton stamp mill nearly a mile and a half from the mine, at Chattanooga. Connecting the mine and mill will be an aerial tramway. The old mill was located at the mine and a considerable distance from the Silverton & Red Mountain Railroad. The site of the new mill is much lower, and a short spur will be run from the main track to the mill. The shaft house, destroyed at the same time with the mill, is to be rebuilt. New office buildings and storehouse are also being erected.

#### SAN JUAN COUNTY.

**Gold King.**—This mine at Silverton claims to have made a rich strike. A pay streak over 3 ft. wide is reported to carry from 50 to 1,000 oz. of gold. In addition to the rich streak, the management claims to have from 10 to 12 ft. of high-grade gold ore. The vein was cut at a depth of 1,100 ft. The tunnel was in 2,500 ft. when the present strike was made.

#### SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

**Big Six Group.**—These claims, owned by P. P. Steinwandel, I. Kling and H. E. Herbert, have been leased to W. C. Fulton, of Ouray, under a bond for \$40,000, to run a year. The group consists of 5 claims, between the Japan and Tomboy veins, in Savage Basin. Work will start about August 1. The ore is free milling, and the veins average 4 ft. wide.

**Double Eagle Mining Company.**—The members of the company are Kansas City, Mo., men, who control 5 claims in Bridal Veil Basin. The veins are from 6 in. to 3 ft. wide. The ore on 4 of the claims is a gold telluride, while on the Black Diamond it is petzite. Samples have shown \$70 per ton. There are about 300 ft. of development work. Men will soon be busy under J. H. Litchfield, Telluride, manager.

**Keystone Placer.**—Work has been suspended by the collapse of 408 ft. of the main pipe line, which supplies the hydraulic giants. New pipe was ordered, and operations are resumed. The actual time lost was 9½ days; 425 ft. of 26-in. steel pipe were riveted, loaded on the cars in Denver, shipped to Telluride, and put in place in that time. C. M. Coleman, Telluride, is manager.

**Peck Cyanide Company.**—The 3-placer claims have been sold to the Tomboy, Smuggler-Union, Liberty Bell, Japan and the Revenue Tunnel mines companies for \$42,829. The Peck Company still retains the 2 plants, and can treat the tailings on the placers for 2 years, but has shut down.

#### TELLER COUNTY—CRIPPLE CREEK.

**Granite.**—The final payment of \$200,000 has been made on this mine, near Victor. The purchasers are Messrs. Tutt, Penrose and MacNeill, officers of the United States Reduction Company. The following officers have been elected: Charles L. Tutt, president; Charles M. MacNeill, secretary and treasurer; Spencer Penrose, vice-president; Clarence Hamlin and William P. Dunham, of Denver, directors. The property consists of the Granite and the Baby Mine claims, containing a fraction over 10 acres on Battle Mountain. The bulk of the present operations are on the lower 3 levels. The daily output averages 45 tons.

(From Our Special Correspondent.)

**El Paso Gold Mining Company.**—A new hoist, one of the largest in the district, is going up, and other surface improvements are being made. The property is shipping considerable ore, but this will be increased on the installation of the new machinery. It is the largest mine on Beacon Hill. William Bainbridge is in charge.

**Elkton Consolidated Gold Mining Company.**—One representative of each of the 3 factions that were trying to get control was elected. The directors are as follows: George Bernard, M. F. Stark, S. S. Bernard, E. P. Shove, E. M. De La Vergne, Sherwood Aldrich and Dr. J. W. Graham. W. S. Jackson and Richard Clough were replaced by E. P. Shove and Dr. Graham. George Bernard was chosen president. E. M. De La Vergne, vice-president, and E. P. Shove, secretary and treasurer. Mr. De La Vergne was also appointed general manager. The president's report shows that production has been greatly hindered by water and inadequate pumping facilities. Two new pumps have been ordered with a capacity of 3,000 gals. per minute from a depth of 1,000 ft. This, with the pumps already in place, will make the pumping capacity 4,000 gals. per minute, and this

will probably be sufficient for some time. The report states that the showing in the 7th and 8th levels is very good, especially in the 8th. During the year the mine has netted about \$82,000, which, considering the water trouble, is quite good. The report is optimistic in regard to the future, and Mr. Bernard thinks that with the installation of new pumps, the delivery of which has been greatly delayed, the mine can be worked at a substantial monthly profit. The total shipment for the year was 23,361 tons of the average value of \$36.26 per ton. Last year the average value was \$60.33 per ton, but in 1900 \$30.89 per ton. One reason for the decrease in the value during the past year was that a large amount of the richer ore was not available, while much development was done. The report of Mr. Mudd, the engineer employed to investigate the water situation, says that while the question was serious the proposed addition to the pumping capacity will be sufficient for some time. On the whole the situation at this property is not so bad as it might be, but the expense of handling the water will be great.

**Sunshine-Sedan Case.** The evidence is all in. The suit involves the question of extralateral rights. A number of prominent mining men have testified, and several well known lawyers have been employed. The property is situated on Galena Hill, in the north end of the district.

#### IDAHO.

##### OWYHEE COUNTY.

**Poorman.**—A vein recently encountered at 1,100 ft. from the surface and 600 ft. beneath the old workings is a foot wide. It is a white quartz, with streaks of free gold.

**Tibo-Bluebird Company.**—Work on the properties in Pixley Basin, about 25 miles from Silver City, will begin at once. The company is controlled by Boise men, and is capitalized at \$500,000. The development is as follows: Upper tunnel, length 160 ft.; drift on stringer, 50 ft.; drift on ledge, 125 ft.; lower tunnel, length, 260 ft.; drift on ledge, 80 ft.; upraise from upper tunnel for ventilation, 50 ft.

#### ILLINOIS.

##### VERMILLION COUNTY.

(From Our Special Correspondent.)

**Catlin Coal Company.**—The mine at Catlin has been absorbed by the Jones & Adams Company, and is now known as Jones & Adams Mine No. 2. These two mines have for a few years been under the same management, though they were separate corporations. The officers of the Jones & Adams Company are J. S. Jones, president; H. C. Adams, vice-president, and D. W. Heath, secretary and treasurer, all of Chicago.

#### INDIANA.

##### CLAY COUNTY.

(From Our Special Correspondent.)

**Block Coal Production.**—Never in the history of the block coal-fields has there been such a production at this season of the year as now. This is said to be due to the strict enforcement of the Interstate Commerce act, which has checked West Virginia coal shipments to Chicago and to the suspension of West Virginia shipments by the strike. The mines of Indiana are getting markets for block coal that they lost several years ago in the Northwest, and the miners have all they can do.

##### GREEN COUNTY.

(From Our Special Correspondent.)

**Island Coal Company.**—The miners at mines No. 1, 2 and 3 are on a strike. The mine inspector stopped 2 entries on account of bad air, throwing 10 men out of work, and the miners refuse to work until the men are provided for. The company has refused to meet the mine committee until the miners resume work according to the last annual agreement. All other mines in the Linton District are running full-handed.

**West Linton Coal Company.**—This company has been incorporated with a capital stock of \$12,000. W. W. Robertson heads the board of directors, and the head office will be in Linton.

#### MICHIGAN.

##### COPPER—HOUGHTON COUNTY.

(From Our Special Correspondent.)

**Atlantic.**—Repairs to the foundation of No. 4 head at the stamp mill are nearly completed, and stamping will be resumed next week. The delay will cause a reduction in the month's production.

**Baltic.**—This company is constructing a new stone engine house, 48 by 50 ft., at No. 4 shaft. The contract for a hoisting engine for the shaft has been awarded to the Nordberg Manufacturing Company, of Milwaukee, Wis. The hoist will be capable of lifting 6-ton loads from a depth of 6,000 ft.

**Champion.**—This company's engineers have surveyed ground for a dam south of E shaft to supply water for boilers, etc. It will have a capacity for 12,000-

000 gal. in the wet season, with an average depth of about 20 ft. It will be on ground 500 ft. higher than the compressor house, and will feed water to the latter through pipes.

##### COPPER—ONTONAGON COUNTY.

(From Our Special Correspondent.)

**Adventure.**—Work at the stamp mill is advanced, and the management expects the first 2 heads to go into commission before September 1. The third head will be ready by October 1. Capt. Thomas Trevarrow, formerly in charge of the underground operations, has resigned.

**Mass.**—This company is constructing 6-ton skips at the blacksmith shops for B shaft. Work on the spur track from the Copper Range Railroad to C shaft is nearly completed. President Lamb, of Boston, is at the mine.

**Michigan.**—Twenty-five tons of mass and barrel copper were recently shipped to the smelters on Portage Lake. The metal was secured in the course of regular development work.

**Victoria.**—At this mine No. 2 shaft has reached the 17th level. Preparations are being made to open a new shaft west of No. 2 by sinking and at the same time raising from the various levels. Work will start within a few days.

#### MISSOURI.

##### JASPER COUNTY.

(From Our Special Correspondent.)

**Joplin Ore Market.**—The zinc and lead ore market continues to boom. The top price of zinc ore remained unchanged, but the lower grades advanced in many instances. The lead-ore market advanced on a few very large lots, but materially in some cases. Two or three of the smelters dropped out of the market, but those remaining were very anxious to secure ore.

The output continues large and the week was a very active one in mining circles. The highest price paid for zinc ore was \$42 per ton upon a straight bid, but several lots were sold upon an assay basis aggregating \$40 per ton for 60 per cent ore. Lead ore's top price was \$24 per 1,000 lbs., except where the premiums were added, and the demand is very good.

Following is the turn-in by camps of the Joplin District for the week ending July 19:

Joplin .....	3,212,960	389,650	\$70,394
Galena Empire.....	11,057,410	168,370	22,862
Carterville-Webb City.....	1,592,310	459,860	38,106
Duenweg .....	921,410	112,180	19,714
Aurora .....	675,430	31,740	10,765
Spurgeon .....	308,130	10,220	3,943
Prosperity .....	226,540	37,940	5,214
Cave Springs .....	160,180	8,780	3,415
Central City .....	43,760	14,930	1,080
Oronogo .....	216,350	2,550	3,834
Neck City .....	182,500	.....	3,650
Carthage .....	109,020	.....	2,180
Zincite .....	223,390	.....	4,468
Granby .....	247,000	58,000	4,050
Carl Junction .....	366,790	.....	7,336
Fortuna .....	92,090	.....	1,750
Total .....	9,645,450	1,294,220	\$202,761
Total 29 weeks.....	301,439,130	35,546,420	\$5,151,857
Zinc value, week, \$171,959; lead, \$30,802; zinc value, 29 weeks, \$4,377,153; lead, \$773,714.			

##### ST. FRANCOIS COUNTY.

(From Our Special Correspondent.)

**Catherine.**—The Catherine Mine, at Fredericktown, has been closed down by President Cantwell on account of labor troubles. The local miners refuse to allow the bringing in of Hungarians to do the heavy work.

**St. Joe.**—The smelting works of the St. Joe Lead Company, at Herculanum, are being enlarged by the erection of 4 new roasting furnaces.

#### MONTANA.

##### GALLATIN COUNTY.

**Bozeman Corundum Company.**—This company has been organized to prospect the Blankenship lands, where promising discoveries have been made on the surface. A shaft is being sunk on the most promising of these outcrops. This company is largely comprised of Bozeman men. A crew of 3 men is sinking the shaft.

**Montana Corundum Company.**—This company, organized last year, has its mill well under way. The foundations for the mill and machinery are completed and carpenters are framing and raising the building. The company expects to have the mill running by August 31. About 30 men are employed. In the mine development work has gone on steadily, and stopes have been opened. At places the development work shows the vein wider than the maximum in the shaft. A cross-cut run from the mill-site tunnel has cut the vein 2,000 ft. west of and 700 ft. vertically below section 23 shaft. The vein here, though small, carries corundum and shows the same characteristics as at the shaft.

##### LEWIS & CLARKE COUNTY.

**East Helena Smelter.**—A second blast furnace has blown in and altogether about 250 men are on the pay-

roll. For the present, no other furnaces will be started up. It is announced that W. A. Price, who has been for years connected with the East Helena works, will accompany Manager Charles W. Whitley to Salt Lake, Utah, where he will take the place of Frank M. Smith as assistant manager. Mr. Smith will go to Helena to take a position under the new manager, Eugene B. Braden. Ore is coming in regularly, and the bins are gradually filling.

**Montana Mining Company.**—At the Drumlummon Mine at Marysville the total output for June was: Gold, 1,740 oz.; and silver, 11,360 oz., obtained from 2,300 tons of ore crushed by the 40-stamp mill, and from 13,489 tons of tailings from the dams. The estimated realizable value of the produce of crushing is \$10,400, and of tailings, \$29,900, making the total receipts \$40,300. The treatment of 13,489 tons of tailings cost \$13,900. The estimated profit for the month is \$8,000.

SILVER BOW COUNTY.

**Minnie Healey.**—The Montana Supreme Court on July 21, granted the injunction applied for by Miles Finlen, or his successor in interest, the Amalgamated Copper Company, to prevent F. A. Heinze from operating the Minnie Healey Mine in Butte, pending the determination of the appeal from Judge Harney's decision in the case. The injunction becomes effective upon the Amalgamated Company furnishing bonds in the sum of \$300,000. Application was made for an injunction on May 20, when attorneys for the Amalgamated asked the court to exercise its appellate jurisdiction and stop Heinze from working the mine until the appeal from Harney's decision could be heard. Counsel for Heinze resisted the injunction and the argument upon the matter was exhaustive. The court in a unanimous decision prepared by Chief Justice Brantley, says that to permit mining to go on at the present rate would destroy the substance of the property to such an extent that if the Amalgamated should prevail when the appeal is decided upon its merits the property might be entirely exhausted and the victory so gained would be one in name only. The appeal from Harney's decision has not been set for hearing, and unless advanced upon the calendar it will not be heard by the court inside of 2 years. Heinze has applied for a stay of the injunction.

NEVADA.

ELKO COUNTY.

**Montana Mining Company, Limited.**—This company has installed a cyanide plant at the Lucky Girl Mine, near Edgemont.

LYON COUNTY.

**Gold Canyon Tunnel Extension Company.**—This company, organized some months ago, is closing contracts with the mine owners of Silver City by Franklin Leonard, Jr., to secure drainage of their mines. The terms are: A royalty averaging 10 per cent of the production, to be paid the tunnel company when the tunnel reaches a point within 500 ft. of any of the mines or mining claims, or when the mines are drained within 2,000 ft. All waste rock may be transported through the tunnel at a cost of 10c. per ton per mile, but mine owners having shafts may hoist their ore and waste if more convenient. All ore or waste excavated in running the tunnel will belong to the tunnel company. The tunnel company has the option to mill ores at the rate of \$2.50 per ton for concentration and \$3 per ton for crushing and cyaniding. All parties owning mills are excepted. In case mine owners do not work their claims for a period of 4 months, the Gold Canyon Company may operate for the account of the owner, paying to the owner 50 per cent of the proceeds. Wherever ore is found in any mine the owner has the right to take possession immediately and work the mine, paying the agreed royalty and the actual disbursements incurred by the tunnel company for development work in that mine. The Comstock Tunnel Company offers to do its work at cost.

WASHOE COUNTY.

**Desert King.**—John Sparks is now in control of this group at Wedekind City, having purchased the Bell hoisting works. Ore is being hoisted from the long idle shaft. Between 40 and 50 men are employed.

**Wedekind-Bell.**—This case has been settled out of court. It had attracted much attention. Bell laid claim to part of the Reno Star Mine by virtue of a United States desert land patent. The District Court of Washoe County decided that Wedekind had the right to follow a vein which he discovered on its dip beneath the Bell patent. Before Bell was prohibited by an injunction he had mined and sold about \$80,000 worth of ore. John Sparks, who bought the Reno Star Mine, with others, bought whatever adverse title Bell had to the property.

NEW MEXICO.

GRANT COUNTY.

**Atlantic.**—A large body of carbonate ore has been struck on the Atlantic property and the owners will

erect a steam hoisting plant on the Blue Bird Mine from which good ore has already been taken.

**Lena Mining Company.**—This company, owner of the Misers' Chest Mine, as suspended operations and closed the mill, owing to a difference among the directors.

**Michigan-New Mexico Copper Company.**—This company is working a new force of men on its properties at Lordsburg.

**North American Mining Company.**—Shafts are being sunk to a depth of 400 and 500 ft. under the supervision of D. W. Briel, of Shamokin, Pa. T. A. Lister, of Williamsport, Pa., is president and manager of the company. The property consists of 6 claims carrying copper, gold and silver.

**Wilson Milling and Mining Company.**—Scarcity of water has caused the closing of the mill at Volcano. As soon as the rainy season sets in operations will be resumed.

NEW YORK.

JEFFERSON COUNTY.

**Old Sterling Company.**—This company is opening the Ward, White, New Dixon, Old Dixon and Old Sterling mines, near Antwerp, formerly owned by the Jefferson Iron Company. Manager W. J. Jameson recently installed the new machinery at the New Dixon, including 2 100-h. p. boilers, a hoist, an air compressor and an electric light plant. The mine and buildings are lit by electricity. Air drills supplant the old hand drills in the mine. A crusher has been installed and the ore will be crushed before shipment. The New Dixon and Old Sterling mines are in operation, and the work of opening the other three mines is being pushed forward. The Old Sterling is the largest of the group. In addition to the 2 50-h. p. boilers now in operation there, there will be placed 4 100-h. p. boilers. The rest of the equipment will be about the same as has been supplied at the New Dixon, with the exception of a steam pump with a capacity of 1,000 gal. per minute.

At the two mines now in operation, about 300 miners will be employed. The ore is shipped to points in Pennsylvania and Canada.

OHIO.

PERRY COUNTY.

(From Our Special Correspondent.)

**National Fuel Company.**—Smith Comley, of Columbus, president, has just added a 100-kw. generator to the electric plant at the mine at Briar Hill, and expects soon to open another mine about ½ mile south. Both will be on the Columbus, Sandusky & Hocking Railway.

OREGON.

**Portland Coal and Yamhill Development Company.**—This company has elected the following officers: Clifford N. Terrell, president; Joseph E. Worth, vice-president; John T. Bodwell, secretary; Charles Whitmer, treasurer; William Steadman, general manager. A report from the manager showed that considerable development work had been done and that there were good prospects that a spur would be built by the Southern Pacific Railway to the mine. The stockholders are mostly Portland men.

JOSEPHINE COUNTY.

**Big Yank Mining and Milling Company.**—L. Y. Keady, of Portland, has a bond on this company's property, in the Galice District. The company, owing to dissension among the stockholders, was not able to carry on development work to any extent.

**Golden Drift Mining Company.**—This company's property, 3 miles east of Grant's Pass, includes the Dry Diggings placer and about 600 acres of placer and timber land. The company is building a crib dam across Rogue River that will be fully 250 ft. long and about 20 ft. high, requiring 1,000,000 ft. of timber. The company has a saw mill busy getting out timber for the dam and flumes. C. W. Ament is manager.

**Granite Hill.**—This mine has started up with its Wilfley concentrators. Mr. Mangum is manager and part owner. The property consists of 500 acres of mineral land, 240 acres of which is placer and the balance quartz. It is located on Louse Creek 8 1-2 miles from Grant's Pass.

LANE COUNTY.

**Indian Girl.**—This quartz mine on Ash Creek about 9 miles west of Hornbrook, on the Klamath River, owned and operated by A. M. Williams, has a crew of men doing development. A 2-stamp mill for prospecting purposes has been installed.

**Nash.**—This placer mine, on Coffee Creek, is being worked night and day, with plenty of water. There are good prospects.

**Treasure.**—Charles H. Park, who owns this claim in the Blue River District, says he is to erect a 20-stamp mill. For several months men have been at work tunneling in the mine.

SOUTH DAKOTA.

CUSTER COUNTY.

(From Our Special Correspondent.)

**Black Hills Porcelain Clay and Marble Company.**—Mica is being loaded at Custer for shipment to Columbus, O. A new ledge of lithographing stone has been opened.

**Grand Junction.**—It is reported that Eastern men are about to purchase this mine and start work.

**North Star Mining Company.**—The new stamp mill is running. Power is furnished by a 100-h. p. boiler and 12 by 30 Corliss engine. There are 10 stamps, with room for 20. Ore is blocked out to a depth of 300 ft.

**Saginaw Mining Company.**—A contract has been let to sink 500 ft. The ledge has been explored to that depth by a diamond drill. The company has purchased an air compressor and drills. S. B. Miller, formerly of Colorado, is superintendent at Custer.

**Sunbeam Mining Company.**—An air compressor and drills have been ordered, and the shaft is to be continued to 1,000 ft. At 150 ft. the ore carries some free gold and is from 12 to 14 ft. wide. There are a steam hoist and saw-mill on the ground. Henry Mittenacht, of Baltimore, Md., is president; J. N. Wright, of Custer, vice president; W. H. Chambers, of Hill City, secretary, and James S. Forsythe, of Hill City, treasurer. The principal office is at Custer.

**Willow Creek Mining Company.**—Work has been resumed on the property, near Custer. A shaft is being sunk on a vein of free-milling ore.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

**Clara Belle.**—The quartz mill is running steadily and good clean-ups are made. The ore in the new shaft is reported as rich as ever.

**Deer Lick Mining Company.**—At the annual meeting at Spearfish, J. W. Huff was elected president; G. W. Nash, vice president, and E. F. Roberts, secretary, treasurer and manager.

**Golden Crest Mining Company.**—A cyanide plant of 100 tons capacity is to be built at the mine near the head of Two-Bit Gulch. Ore is being stored on the dump.

**Hidden Treasure Mining Company.**—S. T. Cochran, of Lincoln, Neb., is president; Banks Stewart, of Deadwood, vice president; Dr. G. M. Smith, of Lincoln, secretary, and Nathan Hart, of Lead, treasurer. The company has been recently organized to work 240 acres of ground a mile west of Lead.

**Imperial Mining Company.**—The cyanide plant in Deadwood is running half time and handling 100 tons of ore daily. The company will soon begin shipping ore from the Eagle Chief group at Crown Hill, the Elkhorn Railroad having recently put in a spur.

**Jupiter Mining Company.**—This company has been formed by the purchasers of the Gustin Mine, in Blacktail Gulch. At a stockholders meeting at Colorado Springs, Colo., Frank T. Sanders, of Colorado Springs, was elected president; Kirk G. Phillips, Deadwood, vice president; John H. Wattson, Colorado Springs, treasurer, and Burt Rogers, Deadwood, secretary. H. A. Wattson, of Colorado Springs, is a director. The company is preparing to build a 100-ton cyanide plant. The company is incorporated under the laws of Wyoming and capitalized at \$2,000,000.

**Spearfish Mining and Reduction Company.**—For the last 30 days the mill has been treating an average of 260 tons daily, and the average yield is given as \$5.20 per ton. A cyanide process is used, and the company is working at a minimum expense.

**Sunday.**—C. B. Harris, of Galena, has started shipments to the various cyanide plants in Deadwood. The ore is of uniform grade and yields a fair profit.

**Wasp No. 2 Mining Company.**—Clean-ups are made every 15 days at the cyanide plant on Yellow Creek, yielding from \$6,000 to \$8,000.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

**Castle Creek Mining Company.**—Air drills have been installed and the main tunnel is being pushed. A 10-stamp mill is to be built this summer. R. C. Clark is superintendent, at Mystic.

**Cumberland Mining Company.**—New machinery has been installed at the J. R. Mine and sinking resumed. J. C. Croker is in charge.

**Fairview.**—Shipments are to be made to the National Smelter at Rapid City. J. T. Harrington and Harry Gregg, owners, have been taking out ore several weeks.

**Golden Slipper.**—The Empire State Mining Company is taking out ore at 300 ft., and good clean-ups are made with a 5-stamp mill.

**Red Canyon Stucco Company.**—This is a new corporation, organized to work the gypsum beds of the

Black Hills. Its property consists of 220 acres in the southern Hills, and a manufacturing plant is to be erected.

**Tigerville District.**—William Hendricks has discovered a vein of telluride gold ore on the Enterprise group.

#### UTAH.

(From Our Special Correspondent.)

**Ore and Bullion Settlements.**—The banks report the settlements for the week closing July 19 as follows: American Bullion \$100,800, gold lead, silver and copper ores, \$166,900; gold bars, \$2,200.

#### JUAB COUNTY.

(From Our Special Correspondent.)

**Tintic Shipments.**—For the week ending July 19 the following shipments are reported: Pearson, 1 car ore; Bullion Beck, 6 cars ore; South Swansea, 3; Dragon Iron Mine, 7; Gemini, 5 cars; Mammoth, 7 cars; Carisa, 7 cars; Yankee Consolidated, 6; Uncle Sam, 4; May Day, 1 car concentrates; Eagle & Blue Bell, 3 cars ore; Grand Central, 12.

**Bullion Beck vs. Eurcka Hill and Gemini.**—The dispute over ore bodies extracted from the territories of the Bullion Beck is before Referee Parley L. Williams, who after hearing evidence will report to the court at Nephi.

#### SALT LAKE CITY.

(From Our Special Correspondent.)

**Alta Shipments.**—This camp reports with 1 car ore from the Cabin and 1 from the Grizzly during week closing July 19.

**Bingham Shipments.**—The following shipments have arrived at the samplers in Salt Lake during the week ending July 19, Bingham Consolidated, 1 car ore; Stovey, 6 cars ore; Ben Butler, 4 cars ore; Saratoga, 1 car ore.

**Bingham Consolidated Copper and Gold Company.**—The shipments east for the week ending July 19 were 3 cars copper bullion approximating 180,000 lbs.

**Utah Consolidated.**—Three cars of copper bullion aggregating 180,000 lbs. are reported sent east to refineries for the week ending July 19.

#### SUMMIT COUNTY.

(From Our Special Correspondent.)

**Park City Shipments.**—During the week ending July 19 the following consignments were shipped from the several mines: Anchor, 429,600 lbs. ore; Daly-West, 2,176,710 lbs. ore; Ontario, 1,073,900 lbs. ore; Silver King, 1,650,750 lbs. ore.

**California.**—This company has resumed work since reorganization and expects to have some results of benefit to creditors.

#### TOOELE COUNTY.

(From Our Special Correspondent.)

**Fish Springs Shipments.**—The Utah sent in 2 cars of ore for the week closing July 19.

**Stockton Shipments.**—The Ophir-Hill reports 43 cars of lead-silver concentrates during the week ending July 19.

#### VIRGINIA.

##### BEDFORD COUNTY.

**American Asbestos Company.**—This company, with a capital stock of \$1,000,000, has been organized at Terre Haute, Ind., to mine asbestos near Thurman and spin the yarn in a factory to be erected at Bedford City. The officers of the company are William C. Doak, president; Alvin M. Higgin, vice-president; Gustave A. Conzman, secretary and treasurer. Directors, Adolph Herz, G. A. Conzman, Carl Stahl, Camille A. Urban, W. C. Doak and Alvin M. Higgins.

#### WASHINGTON.

##### FERRY COUNTY.

(From Our Special Correspondent.)

It is believed that work will be resumed in all of the producing mines, including the Republic.

**Black Tail.**—A small force is stopping ore near the cropping.

**California.**—At present 13 men are employed underground and 9 on top. There is room for 100 men in the mine. Teams are hauling ore to the company's bin on the Washington & Great Northern Railroad, and within a week 300 tons will be sent to the Hall Mines' Smelter, at Nelson, B. C. Four stopes are being worked—2 on the first and 2 on the second level. On the latter the ore carries good values in gold, silver, copper and lead. The working force will soon be increased to about 50 men. The new ore bin and assorting house are conveniently arranged. The mine shaft is down 400 ft., with 4 main levels. The vein runs northeasterly and southwesterly. On No. 1 level a northeast drift follows pay ore 270 ft. On No. 2 level the northeast drift follows the vein 485 ft.

**Gold Ledge.**—The tunnel is in about 1,100 ft. and is expected to strike the ledge within the next 100 ft.

**Long Pine.**—Five men are employed, ore is being loaded to be shipped to the Granby Smelter at Grand

Forks, B. C. This will be ground and used to line a converter on account of the values contained.

**Republic Consolidated Gold Mining Company.**—At an adjourned meeting at Spokane, Wash., July 11, Patrick Clark, W. M. Ridpath, A. L. Kempland, Huber Rasher and James Bresnahan, of Spokane, and Robert Jaffray, of Toronto, Ont., and 3 others, Eastern Canadians, were elected directors. Mr. Jaffray, who has been elected vice-president, is succeeded by Mr. Clark as president, who assumes the management with a majority of the directorate in harmony with him. At the meeting the issue of \$300,000 first mortgage bonds, to lift the indebtedness and provide funds for further exploitation, was ratified. Geo. A. Lanskill, of Republic, was elected secretary and Mr. Kempland, of Spokane, assistant secretary. It is understood that \$75,000 of the bonds, for reopening the mine, have been subscribed for, and work in the mine will be resumed before August 10.

**Republic & Kettle River Railway.**—The replacement of the bridge at Nelson, Wash., at the crossing of Kettle River, is about completed. Ballasting the line is nearly finished. Tracks have yet to be laid from the Republic city limits to the mines.

**San Poil.**—Work is resumed, 7 men are stopping ore. A new ore bin has been built on the Republic & Kettle Falls Railroad. A trestle will connect with another ore bin on the Washington & Great Northern Railway.

**Silver Dollar.**—Brick for setting the boiler are on the ground and timbers for the gallow frame. As soon as the machinery is installed sinking will be resumed.

**Washington & Great Northern Railway.**—The track has been laid clear to Republic. Passengers and freight are brought in on construction trains. The road is ballasted as far as Curlew, 20 miles from Republic. Track is laid on the switchback to the Republic Mill. The tracklaying on the main line to the mines will be finished in 10 days.

## FOREIGN MINING NEWS.

### AFRICA.

#### TRANSVAAL.

We have received returns from the following companies on the Witwatersrand for the month of June. The returns reported are all in ounces of fine gold:

Mine.	Stamps.	Tons Ore.	Oz. Gold.	Oz. Per Ton.	Profit.
Crown Deep.....	65	9,000	3,802	0.43	£5,300
Crown Reef.....		9,707	7,523	0.77	20,001
Durban-Roodepoort Deep 40		5,645	987	0.17	*1,100
Ferreira Deep.....	35	5,222	4,580	0.88	11,500
Goldenhuis Deep.....	130	16,800	7,596	0.45	15,400
Goldenhuis Estate.....	60	8,659	4,555	0.53	10,580
Glen Deep.....	30	5,200	2,022	0.39	1,300
Jumpers Deep.....	60	9,143	4,154	0.46	4,600
Langlaagte Deep.....	70	10,830	4,195	0.39	4,000
Neurse Deep.....	55	7,290	2,336	0.32	800
Rose Deep.....	75	10,200	4,071	0.40	5,000

\*Loss.

Nearly all these companies show increases over the returns for May.

**Robinson Gold Mining Company.**—This company's detailed statement for the month of May shows 176 feet of development work done. The rock hoisted was 10,700 tons, of which 2,788 tons were sorted out as waste and 7,912 tons sent to mill. The mill statement shows 60 stamps running and 7,912 tons crushed. The cyanide plant treated 5,702 tons of tailings, while the concentrates were treated in the chlorination plant. The slimes plant was not in operation, the slimes being stored for future treatment. The total yield in fine gold was, from mill, 5,238 oz.; cyanide plant, 1,528 oz.; chlorination works, 751 oz.; total, 7,517 oz., an average of 0.95 oz. per ton milled. The gross receipts were £32,579; profit, £20,018. The average yield per ton milled, reduced to United States currency, was \$19.76. The costs were: Mining, \$3.86; milling, \$1.29; cyanide and chlorination, \$1.27; general, \$1.20; total, \$7.62, leaving a profit of \$12.14 per ton. Development work is included in mining.

### ASIA.

#### INDIA—MYSORE.

**Kolar Gold-field.**—The gold output for June shows some improvement, though it is still limited by the scarcity of water. The total for the month was 37,466 oz. crude, being 3,363 oz. less than in June, 1901. For the 6 months ending June 30 the total was 227,128 oz. crude, against 252,297 oz. in the first half of 1901; a decrease of 25,169 oz., or 9.9 per cent. The total this year was equal to 227,067 oz. fine gold, or \$4,682,125.

#### CANADA.

##### BRITISH COLUMBIA—SOUTHEAST KOOTENAI DISTRICT.

**St. Eugene.**—Some 20 men are at work at this mine near Moyie. The large shaft is down about 130 ft., and the lower levels are below the water level of the lake. Drifts have been run in different directions from the shaft. The new boilers for the compressor and concentrating plant are installed.

**Star.**—J. Y. Kesler is manager of the Star group of mines 18 miles northeast of Fort Steel. The group is owned by the Bull River Mining and Milling Com-

pany, of Spokane, Wash., and is situated at the head of Quartz Creek, a tributary of Bull River. The group consists of 11 claims. Considerable development has been done and the company is to put in machinery.

#### ONTARIO—MANITOU DISTRICT.

(From Our Special Correspondent.)

**Grace.**—Mr. Carter, president of this mine, Eagle Lake, reports having discovered a very rich lode 19 ft. wide.

#### ONTARIO—SEINE RIVER DISTRICT.

(From Our Special Correspondent.)

**Alice A.**—Col. Hillyer has returned from England, where he has been successful in forming a company to open up this mine, a large low-grade lode, and is in Duluth, Minn., making arrangements to erect a 100-stamp mill.

**Grant Gold Mining Company.**—This Buffalo, N. Y., corporation has been formed to operate claims H. W. 74, 75 and 105 at Moser Bay. Most of those interested are stockholders in the Big Master Mine.

**Indian Joe.**—This mine at Clity Bay is being developed.

**Wendigo.**—Ferd Pfau has resumed operations at this mine, near Rat Portage. The shaft is pumped out and vigorous development work will start.

### MEXICO.

#### CHIHUAHUA.

**Palmillo.**—It is said that Pedro Alvarado, of Parral, is defendant in a suit involving the gutting of this phenomenally rich mine by Dr. Dillon Brown, an American, and Eduardo Primero, Alvarado's former bookkeeper. The suit is based on a lease for 2 years which Alvarado gave Primero on his Palmillo Viejo Mine, Primera afterward selling the lease to Brown. When Alvarado learned that Brown was preparing to sink a shaft to the great ore bodies and to gut the mine before the expiration of 2 years, he canceled the lease on the ground that Primero had no authority to transfer it.

(From Our Special Correspondent.)

**Alfarena.**—This mine is developing a large body of ore 200 ft. from surface on the south side of Alfarena shaft, a part of the mine supposed to have been worked out.

**Las Guijas.**—This mine, belonging to the Hidalgo Mining Company, located on Palmillo Hill, has developed 6½ ft. of 40-oz. silver ore in the south drift No. 2.

**La Morena.**—This shaft, on Veta Colorado, is being sunk to the 92d level.

**La Presena.**—In this property of the Hidalgo Mining Company hoisting has been suspended to enable re-timbering of a 100-ft. section of the main shaft. Development continues as usual.

**Parral Mines, Limited.**—A clean up in the mill on the Union property gave \$25,000 on 800 tons of ore treated. S. Cragoe is manager of the property.

**Refugio.**—The new 150-ton lixiviation plant owned by Angel Garcia at Parral is making its trial run in charge of Fernando Sustenic.

**Vizcaina.**—This mine, on La Veta Colorado, is developing pay ore 10 ft. thick on the south side of the shaft, originally sunk to ventilate the Alfarena Mine, which it adjoins to the north. From 600 to 900 tons of ore per month are hoisted.

#### COAHUILA.

**Jimulco.**—This silver mine, recently sold to a company organized in San Antonio, Texas, is reported in bonanza. A car load of ore daily is shipped to the Monterey Smelter.

#### GUANAJUATO.

**Guanajuato Mining Company.**—This company issues a circular to stockholders which says 30 stamps have been at work since the second week of June, and the work of increasing milling facilities and development the mines are progressing satisfactorily. In May 1,500 tons of ore running in value about \$20 (Mexican) per ton were mined at a cost of about \$2 (gold) per ton and milled at \$2.08 (gold) per ton, with an extraction of 82 per cent, while between 10 and 11 tons of shipping ore were taken from the Sirena Mine in the same time, which netted \$500 (Mexican) per ton. A demonstrating cyanide plant of 10 tons daily capacity is completed. The new 60-stamp mill is proceeding rapidly, delays in delivery of machinery alone preventing completion. It should be ready in a few months.

#### OAXACA.

(From Our Special Correspondent.)

**La Natividad.**—Manuel M. Mimiaga, owner of this mine near Ocotlan, is receiving several car loads of machinery from the United States, which he is preparing to install. The plant will include a 100-h.p. Union Iron Works stationary return tubular boiler, an Ingersoll-Sergeant straight line, class A air compressor of 10 drills, a Lidgerwood double cylinder and double drum mining hoist, pumps, etc.



MICHOACAN.

*Dona Louisa.*—At this mine, worked by the Dona Louisa Copper and Gold Mining Company, a rich strike is reported of ore carrying gold valued in gold beside copper and silver. A tunnel is being driven to cut the vertical shaft.

*Santa Emilia Copper Company.*—At the Santa Emilia Mine an additional force of men is erecting machinery, pumps, ventilating blowers, air compressors, hoists, shops and tool houses.

ZACATECAS.

Two American miners, A. H. Norwood and John Erikson, it is stated, have obtained from the government a concession to establish metallurgical works and smelters between the cities of Sombrerete and Chalchihuites. The concessionaires own several mines in the District of Sombrerete and will treat ores of other mines.

MINING STOCKS.

(Complete quotations will be found on pages 134 and 135.)

New York. July 24.

A decidedly better feeling prevails in copper shares as a result of improved metal trade conditions and the news on Amalgamated litigation in Montana. Prices have strengthened and sales have been larger than last week.

Amalgamated sold on Monday as low as \$64½, but on Tuesday jumped 4 points to \$67½ on sales of over 30,000 shares. On Wednesday the price receded to \$66½, and sales fell off. Anaconda rose from 103 (\$25.75) to 107 per cent (\$26.75), but later weakened to 106 (\$26.50) per cent. On curb business was mostly done in a few favorites. Greene Consolidated of Mexico fluctuated between \$27@28.25, British Columbia sold at \$7, Tennessee at \$17@17½, and White Knob of Idaho at \$19¼@20. A little was also done in United, of Montana, and quotations fluctuated between \$34¼@35, based on the business transacted on the Boston Exchange, where the stock is listed. Efforts to introduce Continental Zinc shares on curb were made, and sales are reported at \$19. This company has property in Missouri, is capitalized at \$550,000 in 22,000 shares at \$25 par value, and recently paid its first dividend of 40c. per share, or \$8.800.

The gold and silver stocks are quiet. Standard Consolidated, of California, changed hands at \$3.50@3.75. There were also a few sales of Colorado stocks at prices that show little change.

The Comstock section shows more room trading, outsiders caring little to enter the market while there are prospects of another lot of assessments. Consolidated California & Virginia went at \$1.35, Ophir at \$1.40, and Mexican at 59@60c.

There was an auction sale of 5,000 shares Silver Queen Mining and Smelting Company, par \$100, at \$205 for lot.

Boston. July 23.

(From Our Special Correspondent.)

An impetus was given the copper share market Tuesday which resulted in materially higher prices, and quite an active market is on. Whether this state of affairs is due to a very bullish circular issued by Mr. Thomas W. Lawson on copper is a mooted question. However, there is a much better sentiment, and in some circles a very optimistic feeling prevails. In others the present movement is looked upon as another flash in the pan. It is hoped, though, that the copper share market has moved out of the lethargy that has prevailed so long. The past two days has seen a fairly broad and active market, but it is a question if a great deal of the trading is not artificial. Coppers that are not being boosted show little life. The technical position of the share market could certainly not be better.

Trade conditions are said to have improved, and leading copper dealers are all quoted in a very bullish manner on the situation. The Calumet & Hecla is said to have been out of the market for some time. The injunction against Heinze preventing work at the Minnie Healey Mine is said to be a signal victory for the Amalgamated people. If this proves the case, it will be the first one that has favored the Standard Oil interests in Montana. Notwithstanding this close down the United Copper people claim that there will be no reduction in the output, as there are enough ore reserves in the Cora and Rarus mines to keep the smelters operating fully. Trades in United Copper are very scarce on the Boston board.

Activity has been largely in Copper Range, United States, Centennial, Mohawk, Trinity and United States Coal and Oil. Copper Range jumped up \$2.75 Tuesday to \$58, and touched \$59.12½ to-day. It has sold at \$54 during the week. United States Mining has advanced \$2.50 to \$22. Centennial rose from \$18.37½ to \$20.25, Mohawk from \$42 to \$45.50, and Trinity from \$12 to \$12.75. United States Coal and Oil started up from \$16.75 to \$17.62½, and closed strong to-night. A good deal of new buying was reported of the latter.

The buying of United States Mining has been ag-

gressive. The management of these two properties is practically the same. Bingham showed sympathetic strength, stiffening \$2.37½ to \$34.75. This company has commenced to ship copper to New Jersey for refining purposes. Isle Royale has made a \$2 advance to \$15. The management is aiming to increase the product. Osceola touched \$62, and is increasing its stamping facilities. Parrot rose \$3.25 to \$30, Utah \$2 to \$21.50, Atlantic \$3 to \$31, and Mass is firm at \$18.25@18.75.

Although no particular advance has been recorded in Dominion Iron and Coal, there is said to be a steady absorption of the stock without any attempt to mark the price up. One per cent was bid to-day to call Amalgamated Copper at \$72 for 30 days. Offers to buy calls of late above the market have brought no response. There has been a steady selling of Guanajuato down to \$3.

Old Dominion remains close to \$19.50. The pamphlet report to stockholders was issued to-night. It includes reports from Duncan McVichie, Superintendent Hoar and from the directors. A change in the method of smelting is recommended, and between \$250,000 and \$300,000 will be spent to improve the condition of the plant. The directors believe that this expense can be borne from the mine without incurring any floating debt, issuing bonds or selling treasury stock. April 2, 1902, the floating debt was \$359,178, carrying 5 per cent. This has been reduced to \$75,783, July 1, by sales of copper. Last year's production is being maintained at a reduction in cost of 10½c. The management expects to reduce the cost to 8c. per lb.

Colorado Springs. July 18.

(From Our Special Correspondent.)

The market was dominated this week by Elkton to the exclusion of every other interest. These shares after gradually losing in value for the past three months, made another fall during the week and landed at 30 to-day, the lowest point touched by this stock in 4 years. The annual meeting was held July 14, but developed nothing more than the slate of officers arranged for two weeks ago, when the compromise of the factional fight in the board of directors was compromised; but it proved only to be a short lived truce, for the fight is on again with the consequent disastrous result to the stock. Determined efforts have been made to break the price in order to force the selling of the collateral of the largest individual holder in the company. The battle is still on this week and no one can foretell the issue. On the condition of the mine the shares look cheap but with the attending circumstances in the way of the internal fight on the board of managers Elkton looks like a safe proposition to let alone.

Several attempts were made this week to break El Paso, which is closely allied with Elkton, but nothing was effected. The stock sold July 12 at 51@51½c., and was at its weakest to-day, selling at 49@50c. This stock is in strong hands and there is not much livelihood that any raids will accomplish much.

Portland broke from \$1.75 on July 15 to \$1.62 to-day, in anticipation of litigation over the Sloan filter patent to be commenced in the Federal court for this State next week.

San Francisco. July 19.

(From Our Special Correspondent.)

Business has been rather dull. Transactions have been light and prices weaker, except for a few stocks. Consolidated California & Virginia was quoted at \$1.35; Ophir, \$1.25; Caledonia, 85c.; Mexican, 54c.; Overman, 21c.; Potosi, 16@18c.; Justice, 10@11c.; Chollar, 6@7c.

The sworn reports of the mining companies, as filed this week, show cash on hand July 1 as given, with June expenses paid, unless otherwise stated: Alpha Consolidated, \$507; Alta, \$12, with liabilities of \$2,400; Andes, \$275, with liabilities of \$280; Belcher, \$2,751, with liabilities of \$6,793; Best & Belcher, \$336, with bills payable of \$15,000; Bullion, \$910; Caledonia, \$74, with June expenses unpaid; Confidence, \$116, with June expenses unpaid; Consolidated California & Virginia, \$31,776, with a carload of concentrates to arrive; Consolidated Imperial, \$1,439; Challenge Consolidated, \$2,455; Gould & Curry, \$2,250, with bills receivable of \$15,000, and liabilities of \$13,511; Justice, \$1,531, with liabilities of \$5,836; Overman, \$6,558, with June expenses unpaid; Potosi, \$248, with indebtedness of \$1,000; Sierra Nevada, \$6,584; Silver Hill, \$15,300; Savage, \$1,540; Standard Consolidated, \$112,671, with June expenses and June clean-up to be accounted for; Syndicate, \$3,849; Union Consolidated, \$800; Utah Consolidated, \$610, with indebtedness of \$1,000. The following companies report indebtedness and no cash on July 1: Chollar, \$1,032; Crown Point, \$395; Mexican, \$1,555; Ophir, \$276; Segregated Belcher, \$7.

The following companies had assessments in course of collection on July 1: Andes, Best & Belcher, Caledonia, Chollar, Crown Point, Challenge Consolidated, Gould & Curry, Mexican, Potosi, Sierra Nevada and Union Consolidated; eleven in all.

The annual meeting of the San Francisco Stock and Exchange Board was held July 14, and the old

officers were re-elected, as follows: A. B. Ruggles, president; William Edwards, vice-president; O. Walker, chairman; F. W. Hadley, secretary; George T. Marye, Jr., treasurer.

Business on the Oil Exchange has been very dull. Buyers have not been prominent; in fact, there was only an occasional spurt. Home Oil was quoted at \$3.15; Monte Cristo, \$1.25@1.30; Occidental, 15@16c.; Clairmont, 15c. Other stocks were hardly noticed.

London. July 12.

(From Our Special Correspondent.)

A period of stagnation has arrived in the mining market. The amount of business done in the South African section is very small, and prices are giving way all round. The leading houses do not seem to be giving any support to their specialties. The principal people in the market appear to be occupied with other matters. There are still a great number of coronation visitors from the colonies, both official and unofficial in town, and the opportunity is being taken by city men to consult with them on general trade relations and politics, so that the details of the mining market are being left to themselves. It is not likely that we shall have any great activity in the market this summer. In fact, it is difficult to imagine where any boom can come from.

The Tomboy Gold Mines Company, Limited, Telluride, Colo., which was placed on the London market by the Exploration Company, is now getting into a very good financial position. The original mine has not continued as well as it started, but through Mr. Heron's sagacity the company has been saved by the acquisition of other neighboring properties, particularly the Argentine and Cincinnati. These properties have turned out excellently, and were obtained at a comparatively low price. It has been found possible, therefore, to pay for them and for a new 60-stamp mill out of profits instead of by the issue of new capital. This is fortunate, as the raising of new capital for however good a mine is not the easiest thing in the world to do just at present. The company was formed in the middle of 1899 with a capital of £300,000. Dividends at the rate of 5 per cent have been paid half-yearly, and in December last an extra 5 per cent was distributed. Another dividend at the rate of 5 per cent has now been announced, so that the total distribution to date is £105,000. In addition to this some £50,000 has been spent on the purchase and equipment of the new properties, and it is expected that the half-year now commencing will provide £35,000 to complete the purchase and installation of plant. The new properties are in excellent condition, and shareholders should receive increased dividends shortly.

The report of the De La Mar Company, owning the mine of that name in Idaho, for the 12 months ended March 31, shows that profit is still being made. As will be remembered, the company was reconstructed a year ago with a much reduced capital, as the mine was nearing exhaustion. Since then the ore in reserve has been treated, and some new bodies have been met with, so that a profit has been made of nearly £30,000. Efforts have been made to acquire a new property, but so far nothing has been decided on.

COAL TRADE REVIEW.

New York. July 25.

ANTHRACITE.

There is no indication of the strike ending as yet. The miners are encouraged to hold out by the labor leaders, who are dwelling on the large sums for relief that will be raised by the bituminous miners and by other labor organizations. These glittering promises may hold the men in line for a couple of weeks longer, but their utter hollowness is shown by the statement of one of the district presidents to the effect that needy miners will receive supplies, not cash. The distribution of relief under such a plan should be very lucrative for somebody, and may lead to discussions that will hasten the collapse of the strike. The operators still hold to their policy of waiting for the men to tire of idleness, and evidently do not intend to force matters and precipitate rioting and bloodshed. This policy, though, condemned by uninformed writers in the daily press, is under the present political conditions in Pennsylvania perhaps the wisest that has been suggested. Every additional week of idleness shows the miners how little confidence is to be placed in the men who precipitated the strike. More washeries are busy and the total tonnage of steam sizes produced must be considerable. A few small collieries are likely to resume work next week.

Trade at all points continues very light, but the weather is warm and the public apparently is not worrying much about next winter's coal supply, in spite of sensational newspapers at New York and elsewhere telling people that the operators are prolonging the strike with the sole object of advancing prices and that the operators have made millions of dollars already from the high retail prices that prevail.

At the head of the lakes dealers are clearing up their docks, and supplies are limited to certain grades

and sizes. In Chicago territory business continues very dull. Supplies on the docks are getting low and little or no coal is allowed to go to outside points. Local demand is light and dealers are not looking for buyers. Prices are unchanged from the regular schedule. Along the lower lakes little coal is changing hands. Agents of the producing companies continue to sell at the regular list prices. Along the Atlantic seaboard supplies continue to diminish. At points beyond Cape Cod there are still good-sized blocks of coal in the hands of conservative firms, but retail buying on account of high prices is light. At New York retailers are making the most of the situation, and retail prices have been advanced to \$8 per ton for prepared sizes. Large lots continue to change hands at \$7@8\$, though as high as \$10 is reported paid in particular cases. At Philadelphia the market continues quiet. What supplies are left are held by dealers, who do not care to sell to other than regular customers and in small lots. The Reading Railroad has released the anthracite which had been consigned when the strike occurred. The Lehigh Valley took such action some weeks ago.

#### BITUMINOUS.

In the Atlantic seaboard soft coal trade there is considerable speculation as to a possible connection between the course of speculative prices, and the variations in car supply at the mines and in time of transportation to tidewater shown by the railroads. Some people contend that the hand of the railroads in affecting the speculative prices of coal is particularly apparent just now; that full or curtailed car supply and quick or slow transportation given are quickly followed by falls or rises in speculative prices, in that there is a close relationship between railroad conditions and speculative prices. At the same time the people who make such assertions do not say that the conditions influencing prices are brought about by the railroads for a purpose.

Speculative prices during the week have varied around \$3 for Clearfield grades f. o. b. New York Harbor shipping ports. They have here a little, but not much, below this figure, and in the last two or three days have advanced 10 or 15c.

The striking miners in Virginia and West Virginia are still returning to work in bunches. It is understood that in the New River field the miners occupying company houses were to be evicted on July 24, indicating that the operators are preparing to follow the plans of those in the Pocahontas field and get men at work before long.

The general demand for coal from consumers having contracts is not as strong as it was, no doubt because of lower speculative prices. It is thought, also, that producers have a very large proportion of their contracts well in hand. In the far East trade is strong and consignees are calling for all the coal their contracts entitle them to. Along Long Island Sound business is heavy, and the usual overdemand in that territory is still noted. At New York Harbor points the trade is pretty well supplied, and consumers who have been educated to giving long notifications of their needs get coal on time. All-rail trade shows a fall from the extreme demands of last week, and producers who held coal then are now offering it at reduced figures. Some railroads have sold some of the surplus stock they had accumulated in fear of a general strike.

Car supply at the mines has fallen to about 75 or 85 per cent of the demands. Transportation from the mines to tidewater is slower than it was by several days. In the coastwise vessel market vessels are plentiful, orders are scarce and freight rates are weak. We quote current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, 55@60c.; Boston, Salem and Portland, 65@70c.; Wareham, Portsmouth and Bath, 70c.; Lynn and Newburyport, 80@85c.; Bath, Gardiner and Bangor, 70@75c. Rates from the further lower ports are 5@10c. above these figures.

#### Note of the Week.

**Western Maryland Railroad.**—The Fuller syndicate paid the city of Baltimore \$8,651,370 for the city's interest in this railroad, and the holdings were formally transferred. The syndicate also deposited \$500,000, in accordance with the provision requiring \$3,000,000 guarantee that the new owners will construct tidewater terminals. The new board of directors is as follows: W. S. Pierce, George J. Gould, John W. Gates, Henry B. Henson, Lawrence Greer, Edwin Gould, W. H. McIntire, of New York City; F. S. Landstreet, S. Davies Warfield, John M. Hood, George R. Gaither, Thomas J. Shryock and Charles W. Slagle. It is stated that later places will be made on the board for E. L. Fuller, Myron T. Herrick and Alvin Krech, the managers of the Fuller syndicate. Winslow S. Pierce has been elected president of the new board, and F. S. Landstreet vice-president. Mr. Landstreet will continue to act for the time being as general manager.

**Birmingham.** July 21.

(From Our Special Correspondent.)

There are still some local troubles at several places, and more than 2,500 men are idle. None of

the mines at Blocton, in Bibb County, have resumed operation, though it is understood that this week will see two of the mines there getting out coal. At Belle Ellen, operated by the Bessemer Land and Improvement Company, 700 men are idle. The company signed the wage scale, and is willing to abide by it, but there are some local differences in regard to rock in the mines, and the men are not willing to go to work until these differences are definitely settled. There is no work at Aldrich. The Montevallo Coal and Transportation Company, operating the Aldrich mines, claims that it cannot afford to pay the new wage scale of the miners, and has therefore abandoned the mines for the time being. There has been no work this month at Piper, Gurnee and two or three other places in the Bibb and Shelby County fields.

The coke production in this State is none too large. The statement is made, but cannot be verified, that the Tennessee Coal, Iron and Railroad Company has cleaned out the coke ovens at Blocton, in Bibb County, for good, and will abandon that place as a coke-producing center. Coke is bringing a very healthy price.

**Chicago.** July 22.

(From Our Special Correspondent.)

From a condition of eager, almost scrambling buying last week, the market for bituminous coal has turned to almost stagnation. This change was brought about by the Indianapolis convention's refusal to order a strike at the bituminous mines. Everybody in the trade now feels assured of a plentiful supply. The large supply poured in here during the period of uncertainty is now causing embarrassment to some dealers. Screenings are especially plentiful, and the regular prices of \$1 to \$1.50 have in some instances been cut almost in two to get rid of the stock.

Prices are only slightly changed from last week, today's quotations being: Smokeless Pocahontas, \$3.50 for lump and egg; smokeless nut, \$3.25; smokeless run-of-mine, \$3.10; West Virginia, \$3.15; Youghiogheny, \$3.20; Indiana block, \$2.55; Indiana semi-block, \$2.10; Clinton lump, \$1.90; Indiana lump, \$1.85; Northern Illinois run-of-mine, \$1.70@1.80; Southern Illinois run-of-mine, \$1.90@2. Hocking, \$3.10 for city, and \$2.90 for country; blacksmith's coal (still somewhat scarce), \$3.35.

There is, of course, no business in anthracite except of the smallest kind, from stocks laid in before the strike. Retailers have profited out of the condition of things, having been able to supply so far the normal light demand of the season at increased prices, though buying at no increase themselves. Many dealers believe that the better grades of soft coal will prove so satisfactory to consumers who have heretofore used anthracite as to lessen for a long time to come the demand for anthracite, however soon the strike may be ended.

**Cleveland.** July 23.

(From Our Special Correspondent.)

The week has been a poor one for the lake shippers. To begin with, the supply of coal has been very short. Almost during the entire week the railroads have been holding up the coal for their own use, fearing a strike. The operators in the Hocking and Shawnee valleys gave notice toward the latter part of last week that they would be compelled to suspend shipments to the lakes for 10 days. This kept many of the shippers through the lake ports west of Cleveland waiting for material. The first of this week this order was withdrawn and shipments were resumed. The slack supply of cars for this movement, however, has prevented much coal from reaching the lake ports. It is just now beginning to appear, and the situation for the shippers has been a little easier. All the while the vessel owners have been looking around for cargoes. They did not want to send their boats to the head of the lakes to wait there for ore cargoes and, therefore, waited for coal. This has placed at all of the Lake Erie docks a supply of tonnage that has exceeded the needs of the shippers. Under ordinary circumstances such a state of affairs would have weakened the rates and probably might have brought on a reduction, but the rates have not been touched and remain 30c. to Duluth and 45c. to Milwaukee. The total shipment of the season to this date has been much below the actual needs of the shippers, and it looks very much now as if the fall would see a most extraordinary movement of coal.

**Pittsburg.** July 24.

(From Our Special Correspondent.)

**Coal.**—Various views are expressed here as a result of the special convention of the United Mine Workers held in Indianapolis. Some believe it will be impossible to raise the money desired by the assessment of \$1 a week. President Patrick Dolan, of the Pittsburg District, has issued a statement in which he declares that \$20,000 a week will come from the Pittsburg District miners. There are from 40,000 to 50,000 in this district, but of that number, according to the last report, less than 10,000 are members

of the organization, and fully 2,000 are included in the strikers in the West Penn field. The mines are all in steady operation this week, and the output, it is believed, will be large, as the Monongahela River Consolidated Coal and Coke Company is exerting every effort to load all the empty coal boats and barges. Another rise is here, and a large tonnage was sent down the river to-day. Fully 6,000,000 bush. were sent to Cincinnati and Louisville.

**Connellsville Coke.**—Both production and shipment have greatly increased, and there is not an idle oven in the region this week. Prices are high for all coke that had not been previously contracted for. Sales have been made of furnace coke at \$3.50 a ton, and a still higher price for an urgent shipment has been reported. Some furnace coke is still being sent out at the circular price of \$2.25. The *Courier* in its last issue gives the production in the region for the previous week at 249,510 tons, a gain over the preceding week of 19,850 tons. The shipments for the week aggregated 12,142 cars distributed as follows: To Pittsburg and river tripples, 3,896 cars; to points west of Pittsburg, 5,641 cars; to points east of Connellsville, 2,605 cars. Compared with the shipments of the previous week this was an increase of 568 cars.

**San Francisco.** July 19.

(Special Report of J. W. Harrison.)

During the week there have been the following coal deliveries at this port: Two from British Columbia, 7,835 tons; two from Washington, 4,300 tons; two from Australia, 6,118 tons; total, 18,253 tons. The deliveries this week are 2,000 tons less than last, still it is ample for all immediate necessities. The demand seems to grow gradually lighter, but the prices remain unchanged, as they seem to have reached such a low ebb that it will be next to impossible to name a lower price than is now ruling. It has become, at this time, a duel between coal and oil, where in the fight neither wins. It is a very poor contention where both lose. That is about the present status of the fuel oil market. Oil producers are receiving a price for their output which leaves a very small margin to the good. Coal producers are doing business solely for the pleasure of doing it. There is nothing left but glory for either.

**Prices.**—Our special correspondent reports yard prices to dealers at San Francisco for coast coals as follows: Wellington, \$8 per ton; Southfield Wellington, \$8; Coos Bay, \$5.50. Rocky Mountain descriptions are \$8.45@8.50 per ton of 2,000 lbs., according to brand. Cargo lots of Eastern and foreign coals are quoted per ton: Pennsylvania anthracite, \$14; Cumberland, \$12; Welsh anthracite, \$14; cannel, \$11; Wallsend, \$8.50. Coke is quoted at \$15 per ton in bulk and \$17 in sacks.

**Foreign Coal Trade.** July 24.

There is no special movement in the export coal trade here at present and in fact very little surplus available for export just now. No new charters are reported.

Exports of coal and coke from Great Britain for the six months ending June 30 are reported as below, in long tons:

	1901.	1902.	Changes.
Coal .....	20,094,979	20,049,398	D. 45,581
Coke .....	368,020	285,929	D. 82,091
Briquettes .....	507,198	530,646	I. 23,448
Total .....	20,970,197	20,865,973	I. 104,224

In addition to these exports there were 7,183,787 tons of coal sent abroad for the use of steamers engaged in foreign trade, against 6,424,699 tons in the first half of last year; an increase of 759,088 tons.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of July 11, that the tone of the Welsh coal market is somewhat easier, both for Cardiff and Monmouthshire descriptions. Small coals are also a shade lower. Quotations are: Best Welsh steam coal, \$3.96@4.02; seconds, \$3.84; thirds, \$3.54; dry coals, \$3.48; best Monmouthshire, \$3.36@3.42; seconds, \$3.12; best small steam coal, \$2.10; seconds, \$1.98; other sorts, \$1.74.

The above prices for Cardiff coals are all f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f. o. b. Newport, exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2.5 per cent discount.

The general tone of the freight market is quiet and easy and rates show no quotable change. Some rates reported from Cardiff are: Marseilles, \$1.35; Genoa, \$1.32; Naples, \$1.32; Singapore, \$2.64; Las Palmas, \$1.50; St. Vincent, \$1.74; Rio de Janeiro, \$2.88; Santos, \$3.24; Buenos Aires, \$3.06.

#### IRON TRADE REVIEW.

**New York.** July 24.

But little is to be said of the iron market this week, the news being fully given in our local correspondence below. The chief point in the market has been the demand for foundry iron, some large consum-

ers having undertaken to cover their requirements for next year, while there has been a considerable demand for smaller lots for this year. The situation has been further complicated by the stoppage of some Eastern furnaces on account of the coal strike.

**Birmingham.** July 21.

(From Our Special Correspondent.)

There is an active demand for all the iron that can be sold this year, and sales are now being made for 1903 delivery at a lively rate. The statement is made that the larger manufacturers in this State have arrived at an agreement as to prices for the next 12 months. A meeting has been held in New York and an agreement made there as to the selling price of iron for not only the balance of this year, but for the first 6 months of the coming year. It is given out, semi-officially, that No. 2 foundry iron will bring between \$16.50 and \$17 per ton, the latter price to be asked right along. Just as quickly as it can be done, the furnaces which had fires banked because of the scarcity of coal and coke are being started up again in full blast.

The local consumption is improving again. The rolling mills are once more in operation, having lost something like 10 days through the shortage of the coal supply also.

The following quotations are now given for pig iron: No. 1 foundry, \$17; No. 2 foundry, \$16.50@ \$17; No. 3 foundry, \$16@ \$16.50; No. 4 foundry, \$15@ \$15.50; gray forge, \$14.50@ \$15; No. 1 soft, \$17; No. 2 soft, \$16.50@ \$17. There is no doubt that No. 2 foundry iron has brought as much as \$18 per ton in this district, and some statements have been made that \$20 iron has been sold.

At the steel plant there has been steady operation. The production is nevertheless quite satisfactory. The foundries and machine shops have been more or less disturbed because of labor troubles. The machinists and blacksmiths have been out on a strike for a couple of weeks, making demands which the proprietors claimed they could not grant. There are now prospects that matters will be settled this week.

**Buffalo.** July 23.

(Special Report of Rogers, Brown & Co.)

The past week has shown a decided increase in the booking of orders for delivery during 1903, several of the largest buyers in this territory having entered the market and covered for their requirements during the first half. The hesitancy which has recently been felt by a portion of the trade seems to be disappearing, inquiries are quite general, and a good-sized tonnage for next year has already been contracted. There is no let-up in the demands of consumers for shipments on existing orders, and the majority of furnaces are still very far behind specified rates of delivery, while the long unsettled labor conditions in the coal-fields continue to block production from Pennsylvania furnaces. We quote below on the cash basis, f. o. b. cars Buffalo. These figures are intended to approximate prices paid for iron available during the present year: No. 1 strong foundry coke iron, Lake Superior ore, \$24.25; No. 2, \$23.25; Southern soft No. 1, \$23.50@ \$24.50; No. 2, \$22.50@ \$23.50.

**Chicago.** July 22.

(From Our Special Correspondent.)

Heavy sales and extraordinary activity characterized the local pig-iron market in the week ending to-day. Among the orders reported was one for 50,000 tons, another for 30,000 tons, and a third for 20,000 tons. Many sales have been made for smaller lots. Prices on the largest lots are not revealed, but were considerably under the \$20.15@ \$20.65, at which most sales of Southern No. 2, for delivery in the first half of 1903, continue to be made. Much of the activity of the week has doubtless been due to the clearing of the skies as regards labor troubles at Southern furnaces. Northern continues at \$22 for No. 2, with No. 1 50c. higher and No. 3 50c. lower. For immediate delivery small lots of either Northern or Southern are quickly taken at \$25@ \$26. Lake Superior charcoal, when obtainable, brings \$26. The total sales of pig iron in the Chicago District last week are estimated to have amounted to 150,000 tons, or five to six times the average weekly sale.

Coke is plentiful from the Connellsville District, but scarce from West Virginia ovens. The price is lower than last week, being \$5.25@ \$5.75 for foundry. Trade in coke is very brisk, as a result of the cessation of the scarcity that prevailed prior to the last two or three weeks.

**Cleveland.** July 23.

(From Our Special Correspondent.)

**Iron Ore.**—The shipment of iron ore down the lakes continues at a very rapid pace, despite the fact that the boats are more numerous at both the upper and the lower lake ports than the shippers and the docks can take care of. Since the movement of ore is as heavy as at any time this year, if not heavier, the indication is that there is an overplus of boats rather than that the shipment is lagging. The rates of carriage remain unchanged at 75c. from the head of the

lakes; 65c. from Marquette, and 55c. from Escanaba. Very little is heard of ore sales nowadays, but should any be made the market quotation has not changed from \$4.25 for bessemer old range, \$3.25 for non-bessemer old range and bessemer Mesabi, and \$2.75 for non-bessemer Mesabi.

**Pig Iron.**—Consumers of pig iron are surely running on a hand-to-mouth supply. The reports now are that there is not a day's supply of pig iron in this territory, and that if the furnaces were to be closed for any reason the mills and foundries depending upon them would likewise have to close. The coke shortage which is menacing production is therefore a serious cloud on the sky. On this account pig iron is scarce. Foundry grades have been selling as high as \$24@ \$25 a ton at the furnace, and for next year's delivery \$21 is being obtained, with no immediate prospect of a reduction. Bessemer for immediate shipment is about off the market, but what little is obtainable is being sold at \$21@ \$22. Basic iron is hardly to be had at all, but nominal quotations are on a parity with those governing bessemer sales. No second quarter of 1903 sales of either grade have been made of late.

**Finished Material.**—All grades of finished steel are selling heavily for next year's delivery, and the present demand keeps beyond the possibilities of the market to meet it. Adding to that specifications on old contracts are outrunning the abilities of the mills to meet them. Sales of rails have been made in such quantities as to cover the possible output for the coming year. All sales are still on the basis of \$28. Light rails are in extraordinary demand at the present, and the supply is short. Prices have been booming, and \$38 to \$40 is paid on all transactions. The immediate demand for structural steel is greater than the supply, and mills which have any material are getting jobbers prices of 2½c. at the mills. Jobbers are holding to their old prices of 2½@ 3c. The sales into next year have been so heavy that the output for the first half of the year has about been sold up. On these sales the association price of 1.60c. Pittsburg still holds. Plate sales are increasingly heavy, and the report now is that there will be no more material available for first quarter delivery of 1903. Mills have no difficulty in getting 2½c. for plates for immediate delivery, but on future sales the old association price of 1.60c. Pittsburg is used entirely. A few of the bar iron mills have resumed operations, but the market has not been affected since there is no large demand for that material, steel bars being sold almost exclusively. On steel bars the prices are still 1.60c. Pittsburg for bessemer and 1.70c. Pittsburg for open-hearth. The demand for sheets has been light, but prices are still 2.50c. for No. 10 and 3.50c. for No. 27 as a basis.

**Philadelphia.** July 24.

(From Our Special Correspondent.)

**Pig Iron.**—The business in foundry iron has quieted down somewhat during the past few days; at the same time there is considerable anxiety among that class of consumers who have not covered their requirements for the past 60 or 90 days. The larger consumers who buy for distant delivery are less concerned. It is believed here that some of them have received some assurances as to late deliveries, which makes them feel safe. A good deal of correspondence has been going on, some of it with Southern pig iron makers, and some cabling has been done within a day or two, but the actual details are withheld. The substance of the situation to-day is that there is an easier feeling among pig iron buyers, and prices, while not lower, are not as strong as last week. It is understood that considerable Scotch iron is either on its way or will soon be started. Also that some Middlesboro iron will soon come, and it is hinted that it will come at a little less price than past shipments. While there is no fluctuation in prices it may be said that No. 1 foundry can be had at \$24, though some sells higher. No. 2 is \$23@ \$23.50; standard gray forge has settled down to about \$20; basic iron, \$22; Scotch iron, \$23@ \$25.

**Billets.**—The market is easier under the assurance of receipts from abroad, and the disposition of home manufacturers to make concessions. Prices are nominally \$34.50; foreign, \$31.

**Bars.**—Local mills are picking up a good deal of business for prompt delivery. The turn that the strike has taken has stimulated the retail demand. Refined bar, 1.90@ 2c.; steel bars, 2c.

**Scrap.**—There is a disposition shown to shade skelp for future deliveries on large orders, but all small orders are being taken at top prices, and mills have all the work they can do.

**Merchant Steel.**—Agents for merchant steel mills have been among the trade recently, and are showing a disposition to accommodate their old customers. Shafting steel is quite strong and active. Crucible tool steel is selling in large lots.

**Merchant Pipe.**—There is a more active inquiry to-day for merchant pipe in small lots than for several weeks.

**Sheet Iron.**—Sheet iron is quiet, although it is well

known that there is a large amount of business that could be had were it practicable for manufacturers to yield a point or two from the bonus prices that have prevailed so long.

**Plates.**—Everything is sold up, and there are some buyers now negotiating for late fall deliveries a little ahead of time.

**Plates.**—The plate market is made up of business for delivery during the next few weeks. Scarcely a single mill is in a position to accommodate that class of customers. There are three or four very large lots wanted, but it is probable a part of this business will be taken by Western mills. Premium prices are still paid for early deliveries; ¼-in. plate commands 2.10c.; universals, 2c.; flange, 2.20c.; fire-box, 2.30c.; marine, 2.30c.; charcoal plates are selling better than for some time past.

**Structural Material.**—There is a good deal of confusion in regard to quotations and disappointment in regard to deliveries. Stock from store commands its own price. Mill shipments range from 2.75 to 3c. A great deal of new work has appeared within sight in last week.

**Steel Rails.**—Rumors are current that negotiations have been closed for steel rails from abroad, but it is impossible to verify.

**Old Rails.**—Iron quoted as high as \$26; old steel rails, \$21; and there is a market for everything that is to be had.

**Scrap.**—Railroad scrap has been picked up this week at \$24; heavy steel scrap, \$21.50; low phosphorus scrap, 28; machinery cast, \$18; old car wheels, \$21.

**Pittsburg.** July 23.

(From Our Special Correspondent.)

The business in iron and steel so far done for 1903 has shown indication of somewhat lower rates, but in some lines it seems reasonably certain that higher prices will rule. The United States Steel Corporation seems determined to keep prices from going beyond the present level. It is said that sales of foundry iron have been made into next year at less than \$21, Pittsburg, but in the face of the report came the announcement that the Tennessee Coal, Iron and Railroad Company, the largest pig iron producer in the South, had entered the market for deliveries in 1903. The price named for foundry No. 2 is \$17. This is equal to \$21.15 delivered at Pittsburg. Southern iron invariably brings a lower rate in this district than the product of the Valley furnaces. Sales of pig iron this week are nominal, as the furnaces are well sold up for the year. The demand is somewhat better, but iron seems to be scarcer than a week ago. A sale of 30,000 tons of bessemer for delivery throughout the coming year at \$18, Valley furnaces, is reported, but lacks confirmation. Basic iron is now being offered at a trifle less than bessemer, and gray forge is not quite as firm as it was a week or two ago. Foundry iron is selling into the first and second quarter of next year.

All contracts made for next year up to date in rails, steel plates, bars and structural material are at base rates, while for early delivery premiums are paid. There is but little change in the market for finished material. Nearly 1,000,000 tons of steel rails have already been ordered for delivery next year, and there is expected to be a considerable tonnage carried over from this year. The United States Steel Corporation quotes the base price of 1.60c. for plates, but outside mills will not accept business for any delivery at that rate. Some of the plate mills are about sold up to April 1.

The lodges of the Amalgamated Association of Iron, Steel and Tin Workers are now voting on a proposition which, if accepted, will mean a reduction in wages. The American Tin Plate Company at the recent conference announced that it could secure the contract for furnishing the Standard Oil Company with 1,500,000 boxes of tin-plate annually, that are now being received from mills in Wales for export and on which the rebate of 99 per cent of the duty is allowed. It is said that the cut in wages necessary to secure the additional business for the American mills will amount to 25 per cent. President T. J. Shaffer and Secretary John Williams, of the Amalgamated Association, went to Elwood, Ind., where considerable opposition has been raised, to explain to the workmen the benefits that will accrue to the workmen of the country if the proposition is accepted. It now seems certain that the proposition will be accepted.

It was definitely decided this week by the United States Steel Corporation to expend \$10,000,000 on enlargements and improvements on the McKeesport plant of the National Tube Company. There had been a dispute over the price of the property, 25 acres being desired, and several weeks ago it was officially announced that the project had been abandoned so far as the McKeesport site was concerned. The citizens and business men of the town took the matter up and persuaded the owners of the property to reduce the prices asked. The steel combine expressed a readiness to pay \$750,000, and the men

in charge succeeded in having the prices reduced to an amount aggregating \$770,000. The difference in price, \$20,000, was raised at a citizens' meeting on Monday night.

**Pig Iron.**—Bessemer pig iron for the fourth quarter is quoted at \$21@21.50, Valley furnaces, and for earlier delivery is \$22. But few sales are recorded. Basic iron is now offered at about 50c. a ton less than bessemer. Gray forge is not as strong, but is still quoted at \$21, Pittsburg, for any delivery. Foundry No. 2 is still in good demand, and sales have been made for delivery throughout the first half of next year at \$21.50@22, Pittsburg.

**Steel.**—The steel market is quiet, and there is but little buying of either domestic or foreign. A few small sales of bessemer steel billets are noted at \$32@33.50. Sheet bars are quoted at \$31.50 for bessemer and \$33 for open-hearth. Steel plates are still quoted at 1.60@2c., the latter price being for quick shipment. Steel bars are firm, prices ranging from 1.60c. to 1.75c.

**Sheets.**—The sheet market is not in as satisfactory shape as last week. Prices, however, are well maintained, No. 28 gauge black sheets remaining at 3@3.10c. Galvanized sheets are weak. No. 28 gauge is quoted at 4.50c. in car-load lots.

**Ferro-manganese.**—Domestic, 80 per cent, is still out of the market, and English is held at \$53 and German at \$52.

**New York. July 25.**

**Pig Iron.**—Iron for delivery before the end of the year is still harder to get, and commands fancy prices. No. 1X, foundry, \$23@25; No. 2X, \$21@22; No. 2 plain, \$22@24. For Southern iron on dock, New York, No. 1 foundry, \$22.75@23.25; No. 2 \$21.75@22.25; No. 3, \$21.25@21.75. There is practically little or no Southern iron to be had before November, furnaces already making sales into 1903.

**Bar Iron and Steel.**—The market continues firm. We quote on large lots on dock: Refined bars, 1.95@2.05c.; common, 1.85@1.95c.; soft steel bars, 2c. Small lots for prompt delivery are considerably higher.

**Plates.**—Plate is hard to get, and mills are charging customers according to time of delivery. We quote for tidewater delivery in car-loads: Tank, 1/4-in. and heavier, 2.05@2.35c.; flange, 2.10@2.40c.; marine, 2.20@2.60c.; universal, 2@2.25c.

**Steel Rails.**—A very heavy tonnage has already been placed for 1903. Standard sections are still quoted at \$28 f. o. b. mills; light rails \$30@35, according to weight.

**Structural Material.**—Large contracts are being closed, and the market remains very firm. Imports of foreign material, particularly beams, continue. We quote for forward delivery on large lots at tidewater as follows: Beams and channels, 2@2.30c.; tees, 2@2.25c.; angles, 2@2.25c.

**Cartegena, Spain. June 28.**

(Special Report of Barrington & Holt.)

**Iron and Manganiferous Ores.**—Shipments since last report have been one cargo, 2,150 tons, manganiferous ores to Cette; making a total of 169,305 tons to date. Since our last report the movement of ore has been very slack; notwithstanding this the mines are in active production and local prices are firm. The cost of transport from the mines has been increased 10 per cent owing to the demand for donkey. The Subida Iron Ore Company has shipped a cargo of its Subida ore from La Calera for Glasgow.

Quotations for iron ores are per ton, f. o. b. shipping port: Ordinary 50 per cent ore 6s. 6d.@6s. 9d.; special low phosphorus, 7s.@7s. 6d.; special iron ore, 50 per cent iron, 3 per cent manganese, 6 per cent silicon, 8s. 6d.; specular ore, 58 per cent iron, 9s.; magnetic ore, 60 per cent iron, 5 per cent silicon, 11s. 6d. for lumps, 9s. 6d. for smalls. For manganiferous ores quotations are: No. 1, 20 per cent iron and 20 per cent manganese, 14s. 3d.; No. 1 B, 25 iron and 17 manganese, 11s. 3d.; No. 2, 30 iron and 15 manganese, 10s. 3d.; No. 3, 35 iron and 12 manganese, 9s. 6d. All grades of manganiferous ores are rated at 11 per cent silicon and under 0.03 phosphorus.

**Iron Pyrites.**—Quotations for iron pyrites, 40 per cent iron and 43 per cent sulphur, are 11s. per ton, f. o. b. shipping port. Export of pyrites for the second half of June were one cargo, 1,315 tons to Genoa.

**CHEMICALS AND MINERALS.**

**New York. July 24.**

**Heavy Chemicals.**—Quiet in most lines, as large consumers are out of the market. Prices show little change. Domestic chemicals, we quote, per 100 lbs. f. o. b. works, as follows: High-test alkali, in bags, 80@85c. for prompt shipment, and 75@77 1/2c. for forward; caustic soda, high-test, \$1.90@1.95 for early delivery, and \$1.85@1.87 1/2 for futures; bicarb. soda, ordinary, 95c., and extra, \$3; sal soda, 65c.; chlorate of potash crystals, \$8.50, and powdered, \$8.75; bleach-

ing powder, off-test, \$1.35; best grades mostly under contract. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90@92 1/2c.; caustic soda, high-test, \$2.25; sal soda, 67 1/2@70c.; chlorate of potash, \$10.25@10.75; bleaching powder, prime brands, Liverpool, \$1.75; Continental, \$1.60@1.70.

**Acids.**—Free ordering on contracts, especially for sulphuric and muriatic acids.

Exports of copper sulphate from Great Britain in June were 3,650 long tons, making a total of 35,603 tons for the six months this year, as against 33,241 tons in the corresponding period of 1901; showing an increase of 2,362 tons.

Quotations per 100 lbs. are as below, unless otherwise specified, for large lots in carboys or bulk (in tank cars), delivered in New York and vicinity.

Blue Vitriol...	\$4.50@4.62 1/2	Oxalic, com'l...	\$4.60@5.00
Muriatic, 18 deg.	1.50	Sulphuric, 50 deg.,	bulk, ton.....13.50@15.50
Muriatic, 20 deg.	1.62 1/2	Sulphuric, 60 deg.	1.00
Muriatic, 22 deg.	1.75	Sulphuric, 60 deg.,	bulk.....18.00@20.00
Nitric, 36 deg....	4.00	Sulphuric, 66 deg.	1.20
Nitric, 38 deg....	4.25	Sulphuric, 66 deg.,	bulk.....21.00@23.00
Nitric, 40 deg....	4.50		
Nitric, 42 deg....	4.87 1/2		

**Brimstone.**—Little is doing in spot brimstone, as there is hardly anything in store. Ex-steamers cargoes are held at \$23 for best unmixed seconds, while shipments are quoted at \$22@22.25. Best thirds are about \$2 less than seconds.

Imports of brimstone into Great Britain in June were 2,459 tons, making a total for the six months this year of 12,978 tons, as against 9,885 tons in 1901; showing an increase of 3,093 tons this year.

**Pyrites.**—The market is sympathetically quiet, as consumers of sulphur are doing only a moderate business in their manufactures. A cargo of 2,465 tons Spanish iron pyrites arrived at New York for the Pennsylvania Salt Manufacturing Company. Prices are unchanged.

Imports of pyrites into Great Britain in the 6 months ending June 30 amounted to 315,074 tons, as against 344,385 tons in the same period last year. The falling off this year of 29,311 tons in the imports of pyrites indicates a curtailment in the consumption of sulphur equal to 14,069 tons. This is more than the total quantity of brimstone imported this year.

Quotations are f. o. b. Mineral City, Va.; Lump ore, \$5 per ton, and fines 10c. per unit; Charlemont, Mass., lump, \$5, and fines \$4.75. Spanish pyrites 12 1/2@13 1/2c. per unit, New York and other Atlantic ports. Spanish pyrites contain 46 to 51 per cent of sulphur; American, from 42 to 44 per cent.

**Sulphate of Ammonia.**—Sellers are resting on a quiet market. Gas liquor on spot is quoted at \$3.02 1/2 @ \$3.05 per 100 lbs., while shipments are worth \$2.95 @ \$2.97 1/2.

**Nitrate of Soda.**—The market continues quiet, while prices are easier. Spot is offered at \$1.92 1/2 per 100 lbs., August-November at \$1.87 1/2, and December and next year at \$1.82 1/2. These are the lowest prices in many months. The coast market is also weaker, and it looks as though the bottom has been touched. In Europe there is more strength, prices having been advanced 1d. per cwt., as inland dealers and consumers are coming into the market. European shippers on the coast of Chile are also entering the market at present prices, as the time is approaching when the European buying season will open. Ocean freights are quoted at 17s. 6d.@18s. (\$4.20@\$4.32), showing a drop, as compared with last year, of 7s. 6d.@9s. 6d. (\$1.80@\$2.28).

Recent arrivals at New York were the bark *Danae* with 8,544 bags, and the steamer *Borderer*, with 16,085 bags.

Shipments from Chile to be made during the second combination year ending March 31, 1903, have been definitely fixed at 30,500,000 qtls., as was suggested in this column some time ago. In the first year, ended March 31, 1902, the combination exported 31,273,000 qtls., or 773,000 qtls. more than has been fixed for the year 1902-1903. This reduction is due to the falling off in the European consumption during the past season, as a result of continued high prices, principally.

Concerning the Chilean market, Messrs. Jackson Brothers, of Valparaiso, write us under date of June 14 as follows: Very little interest has been shown to operate either on the part of producers or exporters, but the price of 95 per cent has been maintained at 6s. 4.5d. alongside, with some transactions at this figure for June-July deliveries, and at 6s. 5d. alongside for September. For the refined quality a fair demand has been shown for prompt deliveries, the price of 6s. 8d. alongside having been paid with little or no nitrate obtainable before July delivery; a fair business being done at 6s. 7d. alongside for the latter months of the year. The exports for the first 5 months of this year have been 11,573,000 qtls., against 10,704,697 qtls. for the same period in 1901; the production, 11,170,000 qtls., against 10,856,000 qtls., and the consumption 16,802,000 qtls., against 20,424,000 qtls. respectively. We quote 95 per cent June-July 6s. 4d.; August-December, 6s. 4.5d.; and 96 per cent July, 6s. 7.5d.; August-December, 6s. 7d.—all ordinary

terms sellers. The price of 6s. 4d. with an all round freight of 17s. 6d. stands in 7s. 11d. per cwt., net cost and freight, without purchasing commission. Sales for the fortnight have been 353,500 qtls.

**Phosphates.**—Comparatively few new orders are being placed and the quantity is small. In producing centers complaint is heard of a scarcity of labor, but this trouble is usually experienced at this season. In fact, in Tennessee and certain parts of Florida men are becoming more plentiful, so that in the next month or so the labor supply ought to be sufficient. In South Carolina the Ashley River mines are doing materially better. Some rock will shortly go to Europe, but it is not likely that any large business will be done this year, as competition with other phosphates is very keen.

Ocean freights are pretty steady, though not higher than they have been in the past month.

We quote prices below:

Phosphates.	Per ton F. o. b.	or European Ports.	
		Unit.	Long ton.
*Fla. hard rock (78@80%)	\$6.50@7.00	6 1/2@7d.	\$10.27@11.06
*Fla. land pb. (68@73%)	3.00@3.25	4 1/2@5d.	6.05@7.00
*Fla. Peace Riv. (58@63%)	2.25@2.50	4 3/4@5d.	5.70@6.00
†Tenn., (78@82%) export.	3.25@3.50	5 1/2@6d.	8.58@9.30
†Tenn., 78% domestic	3.00		
†Tenn., 75% domestic	2.75@3.00		
†Tenn., 73@74% domestic	2.40		
†Tenn., 70@72% domestic	2.10@2.25		
‡So. Car. land rock	3.25	4 1/2@5d.	5.67@6.30
‡So. Car. river rock	2.75@3.00		
Algerian (63@68%)		5 1/2@6 1/2d.	7.48@8.45
Algerian (58@63%)		5 1/4@6d.	6.30@7.20
Algerian (53@58%)		5 @5 1/4d.	5.50@5.78

\*Fernandina, Brunswick or Savannah.  
†Mt. Pleasant. ‡On vessels, Ashley River.

**Liverpool. July 16.**

(Special Report of Joseph P. Brunner & Co.)

There is no new feature to report as regards the position of heavy chemicals, a moderate trade passing without change in quotations.

Soda ash is in fair demand at spot range for tierces about as follows: Leblanc ash, 48 per cent, £5 15s.@£6; 58 per cent, £6 2s. 6d.@£6 7s. 6d. per ton net cash. Ammonia ash, 48 per cent, £4 5s.@£4 10s.; 58 per cent, £4 10s.@£4 15s. per ton net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in request at generally £3 7s. 6d. per ton, less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export quarters. Caustic soda keeps very firm, and a fair trade is passing at the following quotations: 60 per cent £8 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s., 76 per cent, £10 10s. per ton, net cash.

Bleaching powder is slow of sale, but prices are nominally unchanged, hardwood being quoted at £6 12s. 6d.@£6 15s. per ton net cash, with special quotations for Continental and a few other export quarters.

Chlorate of potash is dull at nominally 3d. per lb. net cash.

Bicarb soda meets with a fair inquiry at £6 15s. per ton, less 2 1/2 per cent for the finest quality in 1-cwt. kegs, with usual allowances for larger packages, also special quotations for a few favored markets.

Sulphate of ammonia is flat, and values continue downward, good gray 24@25 per cent in double bags f. o. b. here being quoted at £12 6s. 3d.@£12 8s. 9d. per ton, less 2 1/2 per cent.

Nitrate of soda is nominally quoted on spot at £8 15s.@£9 per ton, less 2 1/2 per cent for double bags f. o. b. here, but there is not much going on.

**METAL MARKET.**

**New York. July 24.**

**GOLD AND SILVER.**

**Gold and Silver Exports and Imports. At all United States Ports in June and Year.**

Metal	1901.	June.	1902.	1901.	Year.	1902.
Gold:						
Exports....	\$5,344,844		\$393,750	\$29,491,226		\$20,496,504
Imports....	3,280,743		1,414,316	15,927,969		10,613,867
Excess. E.	\$2,064,101		E. \$1,059,566	E. \$13,563,257		E. \$9,882,637
Silver:						
Exports....	\$4,568,905		\$3,250,066	\$28,434,062		\$22,534,624
Imports....	1,934,357		1,802,853	15,135,186		12,351,131
Excess. E.	\$2,634,548		E. \$1,447,213	E. \$13,298,876		E. \$10,183,493

These figures include the exports and imports at all United States ports, and are furnished by the Bureau of Statistics of the Treasury Department.

**Gold and Silver Exports and Imports, New York.**

For the week ending July 24, and for years from January 1, 1902, 1901 and 1900:

Period.	Gold.		Silver.		Total Excess Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week ...	\$2,656,128	\$8,709	\$477,355	\$27,820	E. \$2,966,954
1902.....	19,194,390	1,925,181	14,665,615	760,974	E. 31,773,820
1901.....	25,774,704	1,601,906	18,408,442	2,212,449	E. 40,768,791
1900.....	22,216,574	1,579,158	22,236,390	2,420,695	E. 40,453,111

**Financial Notes of the Week.**

General business continues very good for the season, though the speculative markets are irregular. The shipments of currency from New York to interior points have again been large. About \$2,650,000 gold has been exported this week to France and Germany, and it is reported that more will follow.

The statement of the New York banks, including the 63 banks represented in the Clearing House, for the week ending July 19, gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts	\$797,853,900	\$856,198,500	\$903,327,300
Deposits	882,174,000	939,145,300	940,692,900
Circulation	24,225,700	30,710,100	31,809,600
Specie	171,381,700	177,501,800	173,168,700
Legal tenders	73,243,700	78,313,900	77,713,800
Total reserve	244,625,400	\$255,815,700	\$250,882,500
Legal requirements	220,543,500	234,786,325	235,173,225
Balance surplus	\$24,081,900	\$21,029,375	\$15,709,275

Changes for the week this year were increases of \$32,400 in circulation, \$2,661,500 in specie, \$444,600 in legal tenders, and \$3,482,375 in surplus reserve; decreases of \$3,448,900 in loans and discounts, and \$1,505,100 in deposits.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding date last year:

	1901.		1902.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'n	\$177,501,800	\$173,168,700		
England	187,994,825	190,194,775		
France	488,173,705	\$223,204,120	514,934,400	\$223,842,705
Germany	172,610,000	73,975,000	187,595,000	69,380,000
Spain	70,015,000	84,870,000	70,895,000	77,805,000
Neth'l'd's	31,259,000	28,046,500	24,249,500	33,501,000
Belgium	14,995,000	7,495,000	15,526,665	7,763,335
Italy	75,385,000	9,705,500	80,935,000	10,310,000
Russia	353,170,000	37,885,000	369,345,000	44,115,000

The returns of the Associated Banks of New York are of date July 19, and the others July 17 as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

The silver market in London has been fairly steady this week, due to Continental buying for French mint. The demand for the East continues flat.

The United States Assay Office in New York reports receipts of 67,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to July 10 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.	Changes.
India	£4,227,710	£3,631,445	D. £596,265
China	339,125	63,440	D. 275,685
The Straits	79,976	70,550	D. 9,426
Totals	£4,646,811	£3,765,435	D. £881,376

Arrivals for the week, this year, were £22,000 in bar silver from New York, £6,000 from Chile, and £9,000 from Australia; total, £37,000. Shipments were £25,000 in bar silver to Bombay.

Indian exchange has been a little firmer, and all the Council bills offered in London were taken at an average of 15.93d. per rupee. Indian crop prospects have been much improved, abundant rains being reported. Buying of silver has fallen off, however.

The foreign merchandise trade of Great Britain for the 6 months ending June 30 is reported as follows:

	1901.	1902.	Changes.
Imports	£262,416,790	£262,740,088	I. 323,298
Exports	172,663,024	168,194,416	D. 4,468,608
Excess, imports	£89,753,766	£94,545,672	I. 4,791,906

This shows an increase of £323,298, or 0.1 per cent, in imports; a decrease of £4,468,608, or 2.6 per cent, in exports; and an increase of £4,791,906, or 5.3 per cent, in the balance of imports. The movement of gold and silver for the 6 months is reported as follows:

	1901.	1902.	Changes.
Imports	£12,135,767	£10,624,514	D. £1,511,253
Exports	4,587,193	4,458,695	D. 128,498
Excess	Imp. £7,548,574	I. £6,165,819	D. £1,382,755

Of the silver imported this year £3,569,995, or 80.9 per cent of the total, was from the United States.

Shipments of gold from Australia for the five months to June 1 are reported as follows:

	1901.	1902.	Changes.
Melbourne	£2,070,561	£1,850,113	D. £220,448
Sydney	830,108	641,063	D. 189,045
Fremantle	1,931,000	2,161,762	I. 230,762
Total	£4,831,759	£4,652,938	D. £178,821

Included in the shipments this year were £1,411,443

to India, £1,100,000 to South Africa and £129,176 to China, the balance going to Great Britain.

**Prices of Foreign Coins.**

	Bid.	Asked
Mexican dollars	\$0.41 3/4	\$0.43
Peruvian soles and Chilean pesos	.3894	.42
Victoria sovereigns	4.86	4.88
Twenty francs	3.86	3.88
Twenty marks	4.77	4.85
Spanish 25 pesetas	4.78	4.82

**OTHER METALS.**

**Daily Prices of Metals in New York.**

July	Silver			Copper			Spelter		
	Sterling Exchange	N. Y. Cts.	London Pence.	Lake Cts per lb.	Electrolytic per lb.	London per ton.	Lead cts.	N. Y. cts.	St. L. cts.
18	4.87 3/4	52 3/4	24 1/2	11 3/4 @ 12	11 1/2 @ 11 1/2	53 1/2 @ 29	4.05 @ 4.10	5.25 @ 5.37 1/2	5.05 @ 5.12 1/2
19	4.87 3/4	52 3/4	24 1/2	11 3/4 @ 12	11 1/2 @ 11 1/2	53 1/2 @ 29	4.05 @ 4.10	5.25 @ 5.37 1/2	5.05 @ 5.12 1/2
21	4.87 3/4	53 1/4	24 1/2	11 3/4 @ 12	11 1/2 @ 11 1/2	53 1/2 @ 29	4.05 @ 4.10	5.37 1/2 @ 5.10	5.10 @ 5.10
22	4.87 3/4	53	24 1/2	11 3/4 @ 12	11 1/2 @ 11 1/2	52 3/4 @ 28 3/4	4.05 @ 4.10	5.37 1/2 @ 5.10	5.10 @ 5.10
23	4.87 3/4	52 3/4	24 1/2	11 3/4 @ 12	11 1/2 @ 11 1/2	52 3/4 @ 28 3/4	4.05 @ 4.10	5.37 1/2 @ 5.10	5.10 @ 5.10
24	4.87 3/4	53	24 1/2	11 3/4 @ 12	11 1/2 @ 11 1/2	52 3/4 @ 28 3/4	4.05 @ 4.10	5.37 1/2 @ 5.10	5.10 @ 5.10

London quotations are per long ton, (2,240 lbs.) 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; the price of electrolytic cathodes is usually 0.25c lower than these figures.

**Copper.**—The market displays somewhat more activity, and it appears that some large orders have been placed, both for home consumption and for export. However, the buying has not yet been of sufficient volume to affect prices. Consumption is excellent, and as far as we can learn there are no accumulations to speak of in the hands of either producers or manufacturers. We quote Lake at 11 3/4 @ 12c.; electrolytic in cakes, wirebars and ingots at 11 1/2 @ 11 3/4c., in cathodes at 11 3/4 @ 11 1/2c.; casting copper at 11 1/2c.

The London market for speculative sorts has been dull. It closed last Thursday at £53 1s. 3d. for spot, £53 5s. for three months. During the week a decline set in, and on Thursday the closing quotations are cabled as £52 12s. 6d. for spot, £52 15s. for three months.

Refined and manufactured sorts we quote: English tough, £56 10s. @ £57; best selected, £58 @ £58 10s.; strong sheets, £68; India sheets, £67; yellow metal, 6d.

Exports of copper from New York, Philadelphia and Baltimore in the week ending July 23 are reported by our special correspondents as follows: Great Britain, 823 tons; Germany, 223; Holland, 1,402; France, 100; Italy, 2; Philippines, 7; Brazil, 2; total, 2,559 tons. Imports were 200 tons copper from Great Britain and 512 tons from Mexico; total, 712 tons.

Imports of copper into Great Britain for the six months ending June 30 were as follows, in long tons, the totals being stated in the approximate equivalent of fine copper:

	1901.	1902.	Changes.
Copper ore	45,225	47,717	I. 2,492
Matte and precipitate	41,728	39,833	D. 1,895
Fine copper	31,842	54,148	I. 22,306
Total, fine copper	57,229	78,837	I. 21,608

Of these imports, the United States furnished 379 tons of ore, 9,880 tons of matte and 29,851 tons of fine copper; against 444 tons, 7,303 tons and 9,784 tons, respectively, in the first half of 1901.

**Tin.**—After the activity of the past 30 days, the market has relaxed into dullness. Consumers, however, are not well covered, and as consumption is very heavy, the market is likely to shortly become more active. At the close we quote spot and July at 28 1/2c., August at 28 1/4c.

The London market, which closed last Thursday at £129 for spot, £127 for three months, opened on Monday at £128 5s. for spot, £126 5s. for three months. On Wednesday it declined to £127 10s. for spot, £125 5s. for three months, and closes on Thursday at £127 15s. and £125 5s., respectively.

Imports of tin into Great Britain for the six months ending June 30 are reported as below, in long tons:

	1901.	1902.	Changes.
Straits	11,701	12,813	I. 1,112
Australasia	1,320	1,475	I. 155
Other countries	2,391	1,448	D. 853
Total imports	15,322	15,736	I. 414
Re-exports	10,672	11,148	I. 476
Balance	4,650	4,588	D. 62

The net imports were therefore very nearly the same in both years.

**Lead.**—The market remains unchanged. We quote St. Louis at 3.97 1/2 @ 4.05c., New York at 4.05 @ 4.10c.

The foreign market is slightly lower, Spanish lead being quoted at £11 2s. 6d. @ £11 3s. 9d. English lead 5s. higher.

**St. Louis Lead Market.**—The John Wahl Commis-

sion Company telegraphs us as follows: Lead is unchanged. Sales are still made at 3.97 1/2 @ 4c. for Missouri brands, while argentiferous lead brings 4.05c.

Imports of lead into Great Britain for the six months ending June 30 are reported as below, in long tons:

	1901.	1902.	Changes.
United States	23,505	28,968	I. 5,463
Spain	43,180	49,272	I. 6,092
Australia	33,863	30,964	D. 2,899
Other countries	6,683	7,738	I. 1,055

	1901.	1902.	Changes.
Total imports	107,231	116,942	I. 9,711
Exports	19,939	17,181	D. 2,758
Balance	87,292	99,761	I. 12,469

The lead credited to the United States is chiefly Mexican lead, refined here in bond.

**Spanish Lead Market.**—Messrs. Barrington & Holt write from Cartagena, Spain, under date of June 28, as follows: The price for silver during the week has been 13.25 reales per ounce. The exchange has gone up 3 centimes, making it 34.37 pesetas to £1. Local quotations for pig lead on wharf have been 61.50 reales per quintal, which on above exchange is equivalent to £10 6s. 4d. per ton of 2,240 lbs., or 2.24 cents per lb. Exports of pig lead have been 812,850 kgs. to London; 744,518 kgs. to Marseilles; 240,443 kgs. to Coneron; a total of 1,797,811.

**Spelter.**—The market continues strong and active. Consumption is very large, and, on the other hand, the ore production has diminished, and, in consequence, spelter is rather scarce. We quote 5.10c., St. Louis; 5 3/4c., New York.

The foreign market is a little lower, good ordinaries being quoted at £19, specials 5s. higher.

**St. Louis Spelter Market.**—The John Wahl Commission Company telegraphs us as follows: Spelter is strong and reasonably active. Latest sales here are on a basis of 5.05 @ 5.10c., East St. Louis, for prompt or August delivery.

Imports of spelter or metallic zinc into Great Britain for the six months ending June 30, were 46,758 long tons, against 31,465 tons for the first half of 1901; an increase of 15,293 tons, or 48.5 per cent, this year.

**Spanish Zinc Ore Market.**—Messrs. Barrington & Holt write from Cartagena, Spain, under date of June 28, that the demand for zinc ore has been very active, and competition at the mines very keen. Recently some large parcels of ores have been sold at prices that must leave buyers a certain loss, based on prices of spelter.

**Antimony** is unchanged. We quote Cookson's at 9 3/4c., Hallett's at 8 1/4c., Italian, Hungarian, Japanese and U. S. Star at 8c.

**Nickel.**—The price continues firm at 50 @ 60c. per lb., according to size and terms of order.

**Platinum.**—Consumption continues good. Ingot platinum in large lots brings \$18.50 per oz. in New York.

Platinum ware—crucibles and dishes—best hammered metal from store, is quoted at 74c. per gram.

**Quicksilver.**—The New York price continues \$48 per flask for large orders, with a slightly higher figure for small lots. In San Francisco prices are steady, and the quotation is \$45.50 @ \$46.50 per flask for domestic orders. Special rates—about \$3.50 lower—are made on export business. The London price remains £8 15s. per flask, with the same figure quoted from second hands.

Imports of quicksilver into Great Britain for the six months ending June 30 were 2,368,141 lbs., against 1,988,544 lbs. for the first half of 1901. Re-exports were 943,572 lbs., against 1,139,880 lbs. last year.

**Minor Metals and Alloys.**—Wholesale prices, f. o. b. works, are as follows:

	Per lb.	Per lb.	
Aluminum	Ter lb.		
No. 1, 99% ingots	33 @ 37c.	Ferro-Tungsten (37%)	28c.
No. 2, 90% ingots	31 @ 34c.	Magnesium	\$2.75
Rolled sheets	4c. up	Manganese, pure (N.Y.)	60c.
Alum-bronze	20 @ 23c.	Mangan'e Cop. (20% Mn)	32c.
Nickel-alum	33 @ 39c.	Mangan'e Cop. (30% Mn)	38c.
Bismuth	\$1.50	Molybdenum (Best)	\$1.82
Chromium, pure (N.Y.)	80c.	Phosphorus	50c.
Copper, red oxide	50c.	American	70c.
Ferro-Molyb'dum (50%)	\$1.25	Sodium metal	50c.
Ferro-Titanium (10%)	90c.	Tungsten (Best)	62c.
Ferro-Titanium (20 @ 25%, N. Y.)	55c.		

Variations in price depend chiefly on the size of the order.

**Average Prices of Metals per lb., New York.**

Month.	Tin.		Lead.		Spelter.	
	1902.	1901.	1902.	1901.	1902.	1901.
January	23.54	26.51	4.000	4.350	4.27	4.13
February	24.07	26.08	4.075	4.350	4.15	4.01
March	26.32	26.03	4.075	4.350	4.28	3.91
April	27.77	25.93	4.075	4.350	4.37	3.98
May	29.85	27.12	4.075	4.350	4.47	4.04
June	29.36	28.00	4.075	4.350	4.96	3.99
July	27.85	27.85	4.350	4.350	4.35	3.95
August	26.78	26.78	4.350	4.350	4.35	3.99
September	25.31	25.31	4.350	4.350	4.35	4.08
October	26.62	26.62	4.350	4.350	4.35	4.23
November	26.67	26.67	4.350	4.350	4.35	4.29
December	24.58	24.58	4.153	4.153	4.153	4.31
Year	26.54	26.54	4.334	4.334	4.334	4.08

Average Prices of Copper.

Table with columns: Month, New York (Electrolytic, Lake, London Standard), 1901, 1902. Rows: January to December, Year.

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper.

Average Prices of Silver, per ounce Troy.

Table with columns: Month, London, N.Y., 1901, 1902. Rows: January to December, Year.

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

DIVIDENDS.

Table with columns: Name of Company, Date, Latest Dividend Per Share, Total to Date. Rows: Alaska-Treadwell, Allis-Chalmers, Amalgamated Copper, etc.

\*Monthly. †Quarterly. ‡Semi-annual.

Note.—A complete list of the dividends reported this year will appear in our issue for Aug. 2.

ASSESSMENTS.

Table with columns: Name of Company, Location, Date, Delinq., Sale, Amt. Rows: American, Annandale, Ben Butler, Cal. Gold & Copper, etc.

STOCK QUOTATIONS.

NEW YORK.

Table with columns: Company and Location, par val, July 17, 18, 19, 21, 22, 23. Rows: Alice, Mont., Amalgamated, Anaconda, etc.

Total sales, 132,225 shares. \*Per cent.

Coal, Iron and Industrial Stocks.

Table with columns: Company and Location, par val, July 17, 18, 19, 21, 22, 23. Rows: Am. Agr. Chem., Am. Agr. Chem. pf., etc.

Total sales, 257,550 shares. †Ex-dividend

BOSTON, MASS.\*

Table with columns: Name of Company, par val, Shares listed, July 17, 18, 19, 21, 22, 23. Rows: Adventure Con., Aetna, Amalgamated, etc.

\* Official Quotations Boston Stock Exchange. Holiday. Total sales, 91,380 shares. \*Ex-dividend.

PHILADELPHIA, PA. §

Table with columns: Name and Location of Company, par val, July 17, 18, 19, 21, 22, 23. Rows: Am. Alkali, Am. Cement, Cambria Iron, etc.

§Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia, Pa. Total sales 29,125 shares.

†Ex-privileges.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.\*

Table of stock quotations for Colorado Springs, Colo. listing companies like Acacia, Alamo, Am. Con., Anaconda, etc., with columns for par value, high/low prices, and sales.

\*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 270,567 shares.

Colorado Springs (By Telegraph.)

Table of stock quotations for Colorado Springs via telegraph, listing companies like Acacia, Alamo, Am. Con., etc., with columns for par value, high/low prices, and sales.

MEXICO.

July 11.

Table of stock quotations for Mexico, listing companies like Durango, Guanajuato, Angustias, etc., with columns for shares, last dividend, bid/ask prices, and sales.

ST. LOUIS, MO.\* July 21.

Table of stock quotations for St. Louis, Mo., listing companies like Am.-Nettie, Catherine Lead, Central Coal, etc., with columns for shares, par value, bid/ask prices, and sales.

SPOKANE, WASH.\* July 18.

Table of stock quotations for Spokane, Wash., listing companies like American Boy, Black Tail, Lone Pine-Surp. Con., etc., with columns for shares, par value, high/low prices, and sales.

LONDON.

July 12.

Table of stock quotations for London, listing companies like Anaconda, Copiapo, El Oro, etc., with columns for authorized capital, par value, last dividend, and quotations.

c.-Copper. d.-Diamonds. g.-Gold. l.-Lead. s.-Silver.

PARIS.

July 3.

Table of stock quotations for Paris, listing companies like Acieries de Creusot, Huta-Bank, la Marine, etc., with columns for country, product, capital stock, par value, latest dividend, and prices.

SALT LAKE CITY.\* July 19.

Table of stock quotations for Salt Lake City, listing companies like Ajax, Ben Butler, California, etc., with columns for shares, par value, high/low prices, and sales.

TORONTO, ONT. July 7.

Table of stock quotations for Toronto, Ont., listing companies like Ontario, Olive, British Columbia, etc., with columns for shares, par value, high/low prices, and sales.

\*From our Special Correspondent.

Total sales 80,000 shares. \*Reported by Hunner & Harris.

All mines are in Utah. \*By our Special Correspondent. Total sales, 138,240 shares.

Total sales, 152,367 shares.

CHEMICALS, MINERALS, RARE EARTHS, ETC. CURRENT WHOLESALE PRICES.

(See also Market Reviews.)

Table with multiple columns listing various chemicals and minerals such as Abrasives, Barium, Barytes, Bauxite, Bismuth, Bitumen, Bone Ash, Borax, Bromine, Cadmium, Calcium, Ceresine, Chalk, Chlorine, Chrome Ore, Clay, China, Coal Tar Pitch, Cobalt, Copperas, Copper, Cryolite, Explosives, Feldspar, Flint Pebbles, Fluorspar, Fuller's Earth, Graphite, Gypsum, Infusorial Earth, Iodine, Iron, Kaolin, Lead, Lime, Magnesite, Manganese, Marble, Mercury, Mica, Mineral Wool, Nickel, Oils, Potash, Potassium, Quartz, Salt, Sulphur, and Zinc. Each entry includes a description, measurement unit, and price.

THE RARE EARTHS.

Table listing rare earths including Boron, Calcium, Cerium, Didymium, Erbium, Glucinum, Lanthanum, Lithium, Strontium, Thorium, Uranium, and Zirconium, with their respective measurements and prices.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.