

THE ENGINEERING AND MINING JOURNAL



Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LIV. AUG. 20. No. 8.

RICHARD P. BOWWELL O.E., M.E., Editor. ROSSITER W. RAYMOND, Ph.D., M.E. Special Contributor. SOPHIA BRAEUNLIQH, Business Manager THE SCIENTIFIO PUBLISHING CO., Publishers.

SUBSCRIPTION PRICE:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada. \$4 per annum; \$2.25 for six months; all other countries in the Postal Union, \$7. Monthly Export Edition, all countries, \$2.50 gold value per annum. REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIO PUBLISHING CO. All payments must be made in advance.

THE SCIENTIFIO PUBLISHING COMPANY.

OFFICERS: R. P. BOWWELL, Pres. & Gen'l Mang. SOPHIA BRAEUNLIQH, Sec'y & Treas. P.O. Box 1833. 27 Park Place, New York. Cable Address: "Rothwell, New York." Use A. B. C. Code, Fourth Edition

CONTENTS.

Table listing articles and their page numbers, including 'Lost—Three Silver Bars', 'The Palmarejo Mine, Mexico', 'Labor and Business', etc.

* Illustrated.

Table listing regional and market information under headings like 'MINING NEWS', 'FOREIGN', 'MINING STOCK', 'MARKETS', 'COAL', 'METALS', 'IRON', 'CHEMICALS AND MINERALS', 'CURRENT PRICES', 'RARER METALS', 'ADVT. INDEX'.

"Lost, stolen or strayed, three bars of Comstock bullion numbered 4,197, 4,198 and 4,199, valued at \$11,357.01."

This announcement, strange not in the fact that three or three hundred bars of Comstock bullion have been "misdirected," "stolen or strayed," but that the facts should get in the papers, and the bars remain unclaimed, is now attracting much attention in San Francisco. See our mining news columns.

It does not often happen that an article gets into type in these pages without careful "reading," but we greatly regret to say that this "accident" occurred in the ENGINEERING AND MINING JOURNAL of August 6th, in the abstract of the Tombstone Mill and Mining Company's report. At the last moment this rough proof was substituted for another article, and it appeared with numerous incredible errors of orthography and typography. Fortunately the figures in the abstract as printed are correct, but lest the other errors should be credited to the management of the company, we take this opportunity to state that the report should have been stated to be an "abstract of the official report," and the errors are those of our P. D. or "the office cat" and are no way chargeable to the officers of the Tombstone company.

THE PALMAREJO MINE, MEXICO.

We are scarcely surprised that our remarks in these pages on July 16th concerning the Palmarejo Mine Company should have created some alarm among its stockholders, and that our statements are by some denounced as "deliberate misrepresentations." We thank our esteemed contemporary, the London Financial Times, for the confidence which induced it in referring to these accusations, to say: "We may at once acquit the ENGINEERING AND MINING JOURNAL of any such sinister design. Its mining reports are, as a rule, remarkable for their veracity and impartiality."

We need scarcely assure both our contemporary and the English stockholders that the ENGINEERING AND MINING JOURNAL has no interested motive whatever in this matter beyond that of seeing mining investments profitable. Neither is it influenced by any one who is opposed to the company. It is, of course, possible that any paper, however careful, may be misled sometimes into making unfounded statements. And in this instance our informant was in error—not through malice, however—in stating the length of the Palmarejo railroad, which should have been given at 12 miles, not 30. Possibly the cost, which should have built 30 miles of road, may have been the source of this error.

With regard to the average value of the ore, some entirely reliable experts who are familiar with the mine have estimated it as below \$20 a ton, and everyone knows that even a reliable expert's sampling is more often above than below the results obtained when the ore is actually treated. Perhaps the indisputable fact that the purchase of the mine at less than \$300,000, or about one-third what the English paid for it, was declined by American investors, who had it examined and were ready to pay for it had it been considered a paying property, should be counted good evidence of the quality of the ore. Everyone admits that there is a large quantity of ore in the mine, though it is also said that the mine has been bottomed.

Our information is to the effect that the ore is of very irregular grade; that it can be sorted up to \$30, or possibly \$40 a ton, but as it must be treated, economically and on a large scale, it will not average \$20, and some experts say but little over \$15 a ton. The general reputation of the mine with competent local experts is that it will not pay even under an economical administration, and the English administration is not so characterized.

In recent years the English have shown a wonderful improvement in the character of their management of foreign mines. They are making more use of skillful, educated mining engineers, and they employ men of much higher character than those who were a very byword some years ago. As a consequence, English investments in this country are made in a more prudent manner and are succeeding much better than of old, a fact that it gives us the greatest possible pleasure to testify to. The ENGINEERING AND MINING JOURNAL seeks to enforce the exercise of prudence in making investments in mines, and skill and honesty in managing them, so that the industry may become more profitable and its development be stimulated.

In this instance we greatly fear our English cousins will find our information—except as to the length and grade of their road—is correct, and that the Palmarejo enterprise is not nearly what it has been represented in the rose colored reports of the promoters.

LABOR AND BUSINESS.

The numerous recent and present labor disturbances present innumerable questions worthy of discussion. Some of these, relating to peculiar circumstances of each conflict, have a temporary and local interest only. Others are of wider and deeper importance, such as the questions, What are, in fact, at the present time, and under the present social system, the wrongs and the rights of wage-earners? Is injustice or hardship inflicted upon them? If so, where, how, and to what extent? Such evils having

been proved and measured, are they inherent in the wages system, and must that system be radically changed to remedy them? Or can they be cured without such a revolution, by the efforts of "organized labor," for instance? And, in the latter case, what should be the limits of such efforts, or of any other attempts at reform, if they are to bring any lasting benefit to society?

On all these, and on many similar questions, much more is said by theorists and outside students than by business men, who have no time to take "comprehensive" views, and do not even feel competent to discuss such views on the grand scale. Speaking as one of the latter, I feel justified, however, in saying that I am prevented from accepting with confidence the generalizations of most social doctors by the discovery that, in those parts of the subject with which experience has made me acquainted, they are ignorant of the facts. While I cannot disprove, I am naturally led to distrust their assertions as to other things of which I know nothing personally. And the impression made upon me by much perusal of learned treatises, economic, philosophic and philanthropic, is that the authors, as a rule, do not comprehend the existence, still less the nature, of the actual conditions and problems of business.

Believing, as I do though not beyond the possibility of conviction to the contrary, that, in the lines of business familiar to me, the wages system, with strict freedom of modification as may be agreed upon between each employer and his own employes is the only one yet devised which can be made acceptable to both parties; that there is no social exigency justifying the State in forcing upon them another system, against the will of both; that the evils now alleged are largely imaginary, and still more largely misstated, mismeasured and misunderstood; that the real hardships of wage-earners arise from causes and require remedies quite apart from those which are currently assumed to be involved in the problem; that no proposed change which destroys individual liberty, individual ambition, and fair competition, or which ignorantly opposes the irresistible social forces, can possibly be a benefit on the whole; and that no such change can be even conceived as universally applicable, short of complete socialism—which is, as yet, scarcely a serious issue in this country—believing these things, I wish at this time, not to argue any one of them, but to call attention to a feature of the actual situation which must be taken into account, whatever be the theories of the observer, yet has been singularly overlooked by most critics and reformers.

Even in the columns of the New York Sun, where "labor" questions have been discussed with brilliant force and fearlessness, I find, over the name of "MATTHEW MARSHALL," which I have learned to accept as a guaranty of clear perception and sane judgment in commercial matters, the prophecy that the existing organization of "labor" will be still further consolidated and extended; that it will necessitate a corresponding union on the part of capital; and that the adjustment of labor disputes will be the results of negotiation or war between the opposing interests represented by these two forces the mutual hostility of which may be more or less mitigated by increased intelligence and kindly feeling on both sides.

This view assumes that there is a simple issue between hostile interests, capital wishing to pay as little, and labor to receive as much, of the proceeds of business as possible. On the other hand, there are those who occasionally declare that the true interests of capital and labor are identical—a platitude which means little or nothing. In the same sense, the true interests of buyer and seller in a given transaction may be called identical; yet each of them may justifiably consider his own advantage in a free bargain, and, if that advantage be not served, decline the bargain altogether. It is the supreme, true interest of all citizens that life, liberty and property shall be protected, that contracts shall be enforced, and that no man shall, in the pursuit of his own advantage, trench upon the equal rights of another, by fraud or violence. Beyond this, the dictates of self-interest are the indispensable motives of business. Actions of charity may be duties; but even if motives of a generous character modify business transactions, it is important to know, as a basis of action, just what is sacrificed for such reasons. We are therefore justified in inquiring what are the relative interests of employer and employed in a given establishment.

Instead of involving one defined issue only, these interests are threefold:

1. It is the common interest of both parties and of all other parties in the same line, that the prosperity of that business shall be main aimed. For instance, it is the common interest of operators and miners that anthracite shall have a regular and profitable market. The antagonism of immediate interests here is not between capital and labor, but between the consuming public and both.

2. It is the common interest of employer and employed in a given establishment that it shall be able to compete successfully with other establishments in the same line, and earn the maximum profit permitted by natural and commercial conditions. For certainly neither party will be benefited by the destruction of the business from which both expect gain. Here, again, the antagonism is not between capital and labor, but be-

tween both, as connected with one enterprise, and both, as represented in competing concerns.

3. Finally, after the two common interests above named have been secured as far as practicable, there arises the issue between labor and capital, which, to so many, seems to be the only one involved—namely, the question of the division of profits. It may be fairly said that, to business managers, this is the least troublesome of the three, except so far as its exclusive consideration interferes with the settlement of the other two.

Now, what is the relation of "organized labor" to these three issues?

1. It is clear that labor organizations representing many diverse trades, and ordering strikes and boycotts on questions of etiquette, "recognition" and "sympathy," without any pretense or pretext in the condition of a given trade, cannot possibly represent the special interests of that trade.

2. It is equally clear that labor unions, like the Amalgamated Association, representing the employees in many competing concerns, cannot properly consider the interests of a single concern, as opposed to those of its competitors. I do not mean merely that such organizations in fact now fail to do this; but that they could never do it. For the first requisite to such a function would be the full knowledge of the conditions of the business concerned; and no employer could afford to give all the private details of his business to a body representing his competitors as well as himself.

3. As to the third issue, it is clear, that a labor organization not competent to consider the other two, while it may exert, wisely or unwisely, great power, is liable in many ways to do permanent harm, ultimately diminishing the profits of business and the wages of workmen, through its blind endeavors to counteract the operation of irresistible forces.

According to my experience, employers generally prefer to deal with organized labor. But if labor is to be so organized that the individual employer can make no terms with it, on which he can rely, then such dealing becomes impossible. The notion of "MATTHEW MARSHALL," that capital will organize as widely and as firmly as labor, I conceive to be a delusion. Capital cannot possibly combine in that way, beyond the limits of a particular industry; and even within those limits, the combination is always unstable and partial, and, being necessarily made at the cost of the individual enterprises most highly favored, naturally and commercially, is sure to be ultimately broken by them. In short, employers know that combinations which protect only the interest of a whole trade against the public have an element of weakness in the fact that they do not leave fair play to the several interests of competitors in that trade—on the whole, compel the stronger to carry the weaker. It can be shown, think, that even in the extreme case of the consolidation by purchase of many establishments under one ownership, nothing is gained, in the long run, as to the three issues I have named, except so far as concentrated management may be more effective and economical. But that argument is too extended for this occasion. Suffice it then to say, that I believe the form of antagonism which "MATTHEW MARSHALL" expects will not be the outcome of the "labor" conflict, because it would not form, even temporarily, a practicable *modus vivendi*. Any practicable scheme must recognize the three interests I have named, and provide for them. If it does not business cannot go on under it. I believe employers generally feel this; I believe that workmen will learn it; and I do not think we need to apply any new theories of justice or social policy to bring about a more stable condition in their relations. But of this another time.

R. W. R.

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. All letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

The Tuscarora Mines, Nevada.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: It is a common comment in the columns of the JOURNAL that the management of the Tuscarora mining companies is notoriously bad. I believe that I voice the opinion of "outside" stockholders in saying, that I am disgusted with results obtained by these companies and that there exists an entire lack of confidence in their managers and directors, in New York and in San Francisco.

Instead of our contributing assessments to these people, why not combine and contribute toward employing an expert accountant, etc., to compel them to show up the books, push an investigation into the whole management for an exhaustive accounting.

The mines are steadily producing large quantities of more than ordinarily rich ore; the profits therefrom must certainly go to enrich these people and enable them to live in luxury, as not a cent is distributed to stockholders. A thorough examination of accounts from mine to office by an expert is necessary in order to get the cold, unromantic assistance of figures, ignoring all excuse and procrastinations of the directors. Their full intent is to manage the properties carefully for themselves.

Yours very truly,
THOMAS F. CHUCK, a stockholder.

BUFFALO, N. Y., Aug. 16, 1892.

Shall We Rename Aluminum?

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The paper read by Mr. Oberlin Smith at the Washington meeting of the American Institute of Mining Engineers and the admission at intervals since of numerous letters to your columns on the subject of a short name for aluminum induce me to suggest one which may meet the want.

The word I would offer in all humility is "almin," containing all the essential parts of the present name and easily utilized for chemical nomenclature by the usual additions—um, a, ic or ous. Thus we shall have alminum, almina, sodium alminate and alminous clay; while the name alum can be retained for its old purpose.

The present term for the metal is certainly as yet "uncrystallized"—for whereas in the United States men call it "aluminum," and in Great Britain and the continent of Europe "aluminium" is in greater favor, though both call its oxide "alumina."

The suggestion of "Mem. A. I. M. E.," in your issue of July 2d. to call it "allit," does not seem to evoke enthusiasm from "Chemist," in your issue of July 23d; and without attempting to criticise a word, of the process of building up which I am ignorant, I doubt very much whether it will "take on." The same will probably be said of my suggestion; but, as I said before, I make it in all humility, and am quite content with the "status quo ante."

CHAS. G. CRESSWELL.

LONDON, Aug. 3.

Black Copper and Blister Copper.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In the issue of the ENGINEERING AND MINING JOURNAL of the 6th inst., I read with much interest the "Practical Notes on the Electrolytic Refining of Copper," by F. B. Badt. In these he speaks repeatedly of treating "black copper" by the electrolytic process, while he surely means "blister copper." As I have met a number of metallurgists, to whom the difference between these two terms is anything but clear, and it seems desirable not to get technical terms mixed, I think it would be desirable to have the ENGINEERING AND MINING JOURNAL clear up things. This is the excuse for this letter.

Black copper (translated from the German, *schwarz kupfer*) shows in the break a dark appearance; hence the name, and may contain from 75% to 92% copper. It contains, besides other impurities such as iron, lead, etc., always several per cent. sulphur; it is produced in a blast furnace, together with matte of 52 to 65% copper (German, *dunnstein* or *lech*). The English copper smelting in Wales does not produce "black copper," unless one would call the "bottoms" produced in the "best selected" method by that name. I understand that repeated attempts of refining "black copper" electrolytically, made some years ago, resulted in failure, as the electrolytic copper produced usually carried from 0.8 to 2.5% sulphur.

Blister Copper shows, when broken, a true copper color. It carries from 97 to 98.5% copper and is practically free from sulphur, and it is this metal that is now nearly exclusively used as anodes in electrolytic refining. Blister copper can be made by oxidizing matte (or black copper) in a reverberatory furnace or by the Bessemer process, for the latter process I obtained in a U. S. patent in 1865 or 1866.

A. RAHT.

PUEBLO, Colo., August 10, 1892.

Mining in Colombia, S. A.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In my last I promised to give a short description of the Bocaneme and El Cristo mines, in which American capital has been invested. In this letter I must, however, confine myself to El Cristo, and reserve for a future occasion a description of Bocaneme.

In the time of the Spaniards, records and traditions point to the Cristo as being one of the richest mines in the Santana district, but from the War of Independence up to 1882 it seems to have been lost sight of, its very locality being unknown. In that year (1882) some old workings were located and denounced as the Cristo mine, though it is very probable that the group formerly known under this name comprised extensions to the north on the run of the veins, which are not included in the property owned by the present Cristo Company. Great oversight and carelessness were apparently shown by the management when they commenced operations in not securing such extensions, inasmuch that at the time they could have been secured for a mere song.

Some primitive work was carried on by the native proprietors in a desultory manner until 1885, when the Revolution, which established the present government in power, broke out, and when the principal proprietor—a refugee General—found his way to New York and negotiated the sale of the property with Mr. Asbury Harpending for a quarter of a million dollars. This deal was effected without any examination having previously been made by a qualified expert, and the price given by Harpending, under the circumstances, for a property that had nothing but tradition to recommend it, was absurd, to use Mr. J. C. Randolph's term. Harpending's operations in the stock will be fresh in the memories of your readers. Shortly after the termination of the revolution in 1886 active operations were commenced under the direction of one Skyrme, an old Comstock miner who showed great energy and put in a lot of work. A shaft was commenced, and a lot of machinery from the Ingersoll Co. erected. The latter comprised a Pelton wheel, air compressor, hoist and Cameron pumps. The site for the shaft is not a good one, as it is on the northern boundary of the property.

The veins have a strike from north to south and dip to the west; consequently, the exploring work done by the shaft is as much to the benefit of the adjoining properties to the north as it is to the benefit of the Cristo Company. It should be repeated that in neglecting to secure these adjoining properties before commencing the shaft great carelessness was shown by Harpending's managers, if there was not an ulterior object in view—which is more than probable. The shaft has been carried down about 300 ft., and drifts extended from same. Some good sections of mineral, it is said, have been blocked out, which, judging from samples, is of high grade. A few small lots of mineral have been shipped to the states, but, practically, work has been suspended during the last two years, and the shaft has caved in badly. Manager Stewart has stuck to the place with a fidelity deserving of better things, for oftentimes he has had to rely on his own resources to pay and maintain his small staff of men. A Mr.

Blakely, Harpending's power of attorney, arrived in Honda on the 17th ult., and it was rumored that he had brought credit wherewith to put the mine in full work again, but this has been controverted by his actions since.

The Tolima Company has produced 70,000 oz. of silver for the month. North Tolima 5,000 oz. silver and 40 oz. gold. The works at the latter have been almost stopped owing to a difference between Manager Green and the Santana authorities, added perhaps to the low price of silver.

An order has been passed by the authorities to suspend operations at Malpass, Orita, and other mines dumping into the Guali River, owing to non-compliance with terms of contract for a supply of potable water for the town of Honda. If carried into effect this order will practically suspend for the time being all hydraulic mining in the department of Tolima. Mr. Alfred E. Oakes, the only man who has been really successful in this class of mining here, took his departure a few months ago. He probably satisfied himself that the beginning of the end was on him.

Dr. F. Pereira Gamba has been commissioned by the government to visit the principal mining camps with a view to making a representative collection of mineral samples for the Chicago World's Fair. The work could not be in better hands. Exchange on New York 102-104 premium.

HONDA, July 1st, 1892.

COLOMBIA.

The Relations Between Employers and Workmen—I.

EDITOR ENGINEERING AND MINING JOURNAL:

In all ages, the world over, there has been raging some conflict, which seemed irrepressible to the actual combatants, between one party whose rights were or are not recognized or are over-ridden, and another whose privileges are being infringed. In our wisdom we tabulate some rights as being inalienable and as the common property of universal humanity, others as being but temporary and of doubtful validity. The very terms, rights and privileges, are used sometimes as synonymous, and sometimes as contradictory; the same thing is claimed by one as a right which is resented by another as an infringement of his rights. Thus it happens that the mere assertion of a right in the domain of sociology and politics must be maintained by a force of argument, and generally if the issue be important and affects injuriously vested interests, that is, men's pockets, it is finally settled by recourse to force of arms.

What are admitted to be rights in one age are first questioned and then sometimes universally abrogated in the next; while many a right, which when originally proposed was regarded as an impracticable hallucination of a philanthropic fanatic, has won its way to universal acceptance.

We talk glibly of the rights of labor and the rights of property. The workman claims the right of steady employment; the master the right to manage his own business in his own way. The workman claims the right to prevent a non-union man working, and trade combination claims the right to coerce a refractory rival into the combination by running down prices to a ruinous figure. The assertion of a right in many cases is evidently a mere excuse to veil a selfish purpose. So satisfied with this is the public that it has become wary and hypercritical as to the existence of any inalienable right, except the right of universal self-defense and the temporary rights which are imposed by legislative enactment and which of course are rights only until repealed.

We do not wish to be understood as expressing or advocating universal skepticism, but it is incumbent always to look impartially, especially at the vexed questions which grow out of the relations of capital and labor, to analyze one's conceptions and to define one's terms, and take nothing for granted. Of this we may be sure, that what is thought to be of the greatest good for the greatest number is likely to be, sooner or later, legalized as a right. The greatest number is now the large army of the working classes, who most illogically apply to themselves the mediaeval title of Knights, with the suffix of labor—most illogically, unless they intend thereby to imply that when they become the privileged class of the twentieth century, they intend to lord it over their vassals, the employers, as autocratically as did the knights of yore over their dependents.

Looking at the question fairly, we must recognize the fact that the right of uniting to enforce their claims has been secured by law to the working classes; that these legal rights have, on the whole, benefited the skilled workman, or those of the laboring classes who have been able to combine; that they have secured a higher scale of wages than would otherwise have been paid; that some of the unions have been so wisely led that their organizations have given stability to the trades or occupations which they practiced; that in many cases the reverse has been the case, and that strikes have been inaugurated unwisely and without good cause, thus hampering trade and inflicting great suffering on the strikers; and that intolerable tyranny has been practiced by workmen over one another, and by workmen over their employers and the public. It is impossible to balance the benefits conferred as against the injuries inflicted, even on the unions themselves. But the balance is, in the judgment of most, favorable to the union, and the working classes are, by a very large majority, satisfied that in their case union is strength. That being so, as Lowell advises us, "there is no good arguing about the inevitable. The only argument favorable with the east wind is to put on your overcoat." If trade unions are believed by the workmen to be for their good, trade unions will remain, and no oath or affidavit extracted from a workman that he has forsworn his union will restrain him from secretly joining it. The only effect of this coercion is to convert him into a conspirator.

If, therefore, the employer cannot be free from the trammels of the union, and be at liberty to conduct his own business in his own way, without let or hindrance, his wisest policy is to use what influence he can to induce his men to place over the union men of intelligence and integrity. If labor organizations were thus officered, the men through such trusted officials might be brought to view their master's position more dispassionately than they do, and the masters would be less arbitrary and selfish than they as a rule are, for the arguments, and better still the influence of their best workmen (men often their equal in intelligence and sometimes in education) coming into personal touch and debate with them, would convince them that the contest is one not to be settled only by the law of supply and demand. Mutual sympathy secured by a candid and sincere exposition and discussion of each other's trials, would be more effective than any amount of compulsory arbitration.

D.

NEW YORK, August 18th.

THE EL CALLAO MINE, VENEZUELA.

Written for the Engineering and Mining Journal by Barry Searle.

The greater portion of Venezuela that lies south of the Orinoco River is of Plutonic or metamorphic origin, principally composed of granite, syenite and gneiss, with many belts and dykes of diorite, in which quartz ledges abound, nearly all carrying more or less free gold and a very small percentage of sulphurets. Of this wide territory, which embraces an area of some 50,000 sq. miles, the mineral resources are practically unknown, excepting in a small mining camp at the head of the Yuruari River, in the old Yuruari Territory (now State of Bolivar, annexed in 1891), where since 1866 gold mining has been carried on systematically. These workings represent the entire gold mining industry of Venezuela up to the present time, they having produced over \$42,000,000, more than one half of which came from the famous El Callao mine. This mine has been worked continuously since 1866, when two Spaniards while hunting upon the right bank of the Yuruari River discovered the outcrop. Soon a small company was formed, composed of 10 shares, and an effort made to work the vein in a crude way. This succeeded for a short time, but reaching a point where machinery was indispensable, the shares became depressed, and were sold for a song, one being exchanged for a demijohn of rum. Soon Senor Luccioni and other prominent men in Venezuela became interested, and got control, when the usual process of reconstruction, in introducing machinery, etc., was carried out. The first five stamps being put up in 1871, in time to crush 315 tons of rock, which yielded 6.25 oz. per ton.

To the end of 1874 they had milled 9,632 tons, yielding 4.38 oz. per ton. Up to this time the mine did not pay expenses of working and improvements made, but in 1875 an additional 15 stamps were started, and in the year 11,859 tons of rock, yielding 2.63 oz. a ton, were crushed. Out of this were paid 20 dividends upon the capital stock of 32,200 shares, amounting to \$128,800; from this time it has prospered as few gold mines have. The stock was put upon the London Stock Exchange, and many fortunes were made by the lucky ones that got in on "the ground floor," as shares went to nearly four times their par value, and paid dividends up to the end of 1886 amounting to \$9,138,360; in 1886 alone paying \$2,202,480 on 2-3 the gross yield. This was its greatest achievement as a dividend producer, which, evidently, to this time had been the foremost consideration, as they had practically exhausted the rich pay shoot, having followed it from the surface downward, carrying about 600 ft. on the strike of lode, which was here N. W., and S. E., and dipping to the S. W., on an angle of about 35 deg. There was mined an area of 54,025 sq. metres, producing 309,786 tons of quartz, yielding 1,092,055 35-100 oz. of gold (Eng. standard, .916 2-3) an average of 3.52 oz. per ton.

In 1885 connection had been made with a vertical shaft (No. 6), which cut the lode at a vertical depth of 207 metres, and at a very promising point, showing an 8 to 10-ft. vein carrying heavy gold. This gave much encouragement, but with all the past success and future promise, the mine beyond this shaft disappointed all concerned, for the vein, instead of continuing downwards as anticipated, suddenly took an upward course on an angle of about 10 deg. This, together with the fact that the vein was very much contracted, and of a much lower grade than on the east side, prepared the management for what was to follow, and stimulated them to vigorous efforts in the endeavor to continue the output of gold and the distribution of dividends.

They pursued a liberal system of exploration in the hope of developing equally rich rock as they had mined, but in this they were never successful; however, in 1887 they succeeded in paying \$296,240 in dividends on 1.1-oz. rock, having reduced the expenses per ton from \$40 in 1883 to \$13.84 in 1887. This saving was partly through the improvements in machinery, and partly in the more economical management. Since 1887 the mine has been striving hard to pay expenses, and for three years succeeded in paying \$231,840 on 0.9-oz. rock.

Explorations had been pushed in every direction, which for the four years ending with 1890 had cost over one half million dollars, and represented over 3 1-2 miles of drifting, cross-cutting and sinking. The No. 6 vertical shaft had been sunk 110 metres below the main filon (making a total depth of 340 metres), and explorations from this shaft were carried in every direction without developing any pay rock. The drifting on the main filon exposed only low-grade rock on a pinched vein of fair average, but had demonstrated that the lode was of a basin shape. The outlook in the history of this mine was never so dark: there was not sufficient pay rock in sight to keep the 60-stamp mill running, and it became necessary to discontinue the exploration work in the bottom of the mine, and practically on the main filon. All expenses were reduced as much as possible, and the greatest economy and energy exercised throughout the year of 1891, bringing the cost per ton to \$10, running on 0.6-oz. rock. This is considered by all those who know the difficulties to contend with, as excellent results, and justly gives the Supt., Mr. Geo. E. Webber, Jr., great credit for the successful manner in which he has handled the mine at such a critical time. What the future may bring forth in this mine remains to be seen. The gold is unevenly distributed in the lode, which is very pockety, always opening out, most opportunely, into rich rock, in some condemned portion of the mine.

I do not look for any great reduction in the cost per ton unless the mining interests are consolidated, which must eventually be done; none of the companies are now making any money for their shareholders, and I believe all will favor a proposition now under consideration, i. e., to consolidate under one management a number of the best properties, build a narrow-gauge railroad to carry all the rock to El Callao, when a 200 or 300-stamp mill can reduce it at a much less cost than can ever be done in small mills. There are over 300 stamps now in the district, of which 160 are Fraser & Chalmers, and could be utilized. Ten miles of railroad will connect nine of the most important mines, namely, El Callao, Callao Bis, El Chile, Venezuelan Austin, Perce, El Tigre, Hauser, La Melon, and the old Panama.

Venezuelan Austin failed to pay in 1891 with a 40-stamp (F. & C.) mill. The following table shows the production of the El Callao mine since the present owners obtained possession. The increased production and profits from 1882 to 1886 were due undoubtedly to the united energy and ability of Mr. Hamilton Smith, Jr., consulting engineer, and Mr. H. L. Perkins, general manager of the company, who not only systematized the work, but rendered low-grade ore profitable by erecting improved machinery.

Year.	Tons of quartz crushed.	Gold produced, oz.	No. of oz. per ton.	Value of gold produced.	No. of div.	Value of dividends.
1871...	315	3,219'60	6'5	\$55,726	.....	.....
1872 ..	2,360	8,826'57	3 83	142,463	.....	.....
1873 ...	3,054	12,508'00	4'03	212,767	.....	.....
1874....	3,963	17,187'68	4'33	308,918	.....	.....
1875....	11,869	31,278'83	2'63	609,728	5	\$128,800
1876....	12,419	42,542'05	3'42	834,851	11	341,280
1877....	11,685	45,168'58	4'12	955,636	7	334,880
1878....	9,673	49,688'88	5'13	978,503	7	251,840
1879....	11,894	40,308'54	3'38	779,425	6	186,760
1880....	18,624	54,013'71	2'90	1,040,144	11	996,240
1881....	24,978	72,254'62	2'89	1,394,643	12	361,640
1882....	22,405	105,396'08	4'70	2,030,116	12	991,760
1883....	24,750	134,362'68	5'42	2,588,357	12	1,207,100
1884....	20,936	177,055'16	5'72	3,415,238	12	1,532,000
1885....	47,223	114,454'67	2'42	2,192,728	12	914,480
1886....	73,738	181,040'20	2'45	3,441,035	12	2,202,480
1887 ..	66,167	73,863'71	1'11	1,421,400	12	296,240
1888 ..	54,152	52,598'73	0'87	1,008,056	2	25,760
1889 ..	57,301	52,971'35	0'91	1,028,920	7	103,040
1890 ..	53,066	49,429'95	'93	956,820	1	103,040
1891....	58,949	34,787'87	0 59	666,697	.....	.....
Total.	599,427	1,355,715'96		\$26,076,716	141	\$9,666,440

The average yield per ton was 2.261 oz., and average total cost per ton of ore treated, \$27.37.

MINERAL INDUSTRIES OF VERMONT.

Prepared for the Engineering and Mining Journal by Geo. W. Perry, State Geologist.

From the annual report, which will not be published for some time, the following statistics are taken, showing the business of 1891:

Marble.—Forty-seven concerns reported a capital of \$7,394,525; 3,317 men employed; wages and salaries, \$1,162,756.71; an output of 1,207,051 cu. ft., valued at \$2,545,726.52.

Granite.—One hundred and three concerns report a capacity of \$1,876,400; 3,693 men employed; wages and salaries, \$1,479,506; an output of 1,087,490 cu. ft., valued at \$1,966,812.

Slate.—Thirty-nine concerns report a capital of \$884,000; 1,323 men employed; wages and salaries, \$157,515.42; an output of 182,789 squares of roofing slate and 1,544,848 square feet of mill stock, valued at \$842,378.

Brick.—Fifteen concerns report a capital of \$89,800; 259 men employed; wages and salaries, \$41,470; an output of \$13,930,000, valued at \$79,075.70.

Lime.—Ten concerns report a capital of \$208,200; 218 men employed; wages and salaries, \$3,600; an output of 34,031 tons, valued at \$245,805.

Copper.—Four concerns report a capital of \$1,100,100; 208 men employed; wages and salaries, \$74,788.64; an output of 1,159,624 lbs.; valued at \$70,000.

Yellow Ochre.—Five concerns report a capital of \$83,500; 82 men employed; wages and salaries, \$23,675; an output of 8,330 tons, valued at \$40,306.

Kaolin.—Two concerns report a capital of \$40,241; 62 men employed; wages and salaries, \$10,871.81; an output of 2,662 tons, valued at \$22,500.

Building Stone.—Four concerns report a capital of \$40,000; 9 men employed; wages and salaries, \$13,210; an output of 243,500 cu. ft., valued at \$19,820.

Scythe Stone.—Two concerns report a capital of \$21,000; 22 men employed; wages and salaries, \$8,000; an output of 4,400 gross, valued at \$10,600.

Soap Stone.—Two concerns report a capital of \$85,000; 60 men employed; wages and salaries, \$29,500; an output of 22,000 tons, valued at \$51,000.

Talc.—Two concerns report a capital of \$7,000; 25 men employed; wages and salaries, \$4,500; an output of 400 tons, valued at \$2,000.

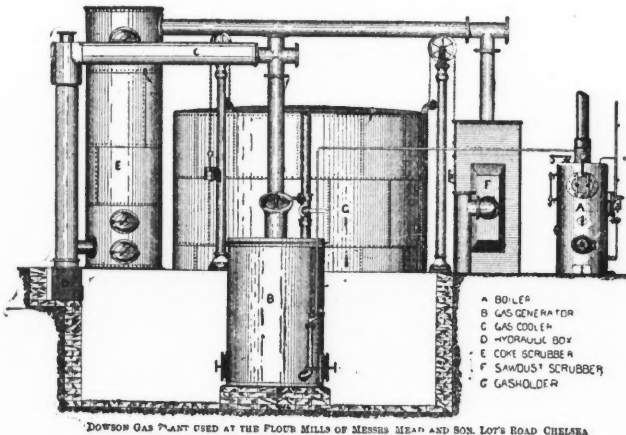
Stone Ware.—Three concerns report a capital of \$50,600; 30 men employed; wages and salaries, \$12,000; an output valued at \$41,160.

Total.—Three hundred and thirty-eight concerns report a capital of \$11,780,466; 9,391 men; \$3,420,148.58 wages; an output valued at \$5,807,476.12.

Miners' Wages in Hungary.—The daily wage of a regular hand at the Hungarian mines is only 32 cents to 40 cents, and of a temporary hand 28 cents. Boys are paid from 12 cents to 24 cents a day, and women from 12 cents to 20 cents. In the coal mines the wages are rather higher; men are paid from 48 cents to 60 cents a day, boys 20 cents to 28 cents, and women 18 cents to 20 cents. The wages in the iron mines are lower than those in coal mines, because the iron mines are all situated in populous districts where living is cheap. In all small mines tools and blasting materials are given free to the men, but in large mines the men have to pay the cost price of the blasting materials and lights. The low rate of wages is astounding to the American mind, but when the cost of living is taken into account the lot of the Hungarian miners is by no means so bad as appears at first sight. For instance, a very comfortable house can be obtained for \$2 a month. Three rooms, such as could be obtained in a tenement house here at \$8 to \$10 a month cost 60 cents a month there, and an attic can be obtained there at 2 cents a month. Wood and coal can be had on easy terms and in many cases gratuitously. Food and supplies are exceedingly cheap, and many mine owners sell their hands food at next to cost price. In many of the State mines a deduction from the wages of $\frac{1}{2}$ is made for a music fund. All Hungarians are natural musicians, and Hungary is the home of true and unaffected music.

DOWSON WATER GAS FOR GAS ENGINES.

Some ten years ago Mr. J. Emerson Dowson, of London, England, first described his method of making water gas. Since that time the process has been greatly developed and improved, until at the present time its efficiency is unrivaled. The process differs from most of the other water-gas processes in that air and steam are introduced into the incandescent fuel at the same time, instead of alternately. After the charge of coke or anthracite has been ignited, the jet of steam is forced in, together with just sufficient air to maintain the heat of the charge. The resulting gas is, of course, of lower thermal value than pure water gas, owing to the admixture of nitrogen; in fact, the calorific power of 100 litres is only 143,213 thermal units, compared with 569,264 thermal units, the calorific value of 16 c. p. illuminating coal gas. However, in most water-gas plants the "producer" gas is of comparatively little value, so that the average efficiency of the Dowson plant is quite as great as that of the others. On account of the less cost and greater ease of manufacture of Dowson gas, an installation of gas plant and gas engines shows a greater economy than the gas engine driven by coal gas, and leaves the steam installation a long way behind. We believe that some writers have proved on paper by a clumsy manipulation of thermal units and such like scientific terms that Dowson gas is not so economical as coal and steam in a boiler and steam engine, and they would, of course, be right if they could utilize all the heat of combustion of coal in the boiler furnace. The only way of properly comparing various systems of turning fuel into work is to consider three practical questions: (1) The amount of fuel burnt per horsepower per hour; (2) The first cost of the installation and of repairs and renewals; and (3) The cost of labor employed in attending to the installation. As regards the second and third of these three points, the steam and gas installations appear to be on the same level according to the reports of users who have had experience in both. As regards the first, the consumption of coal is far lower in the gas plant than in the steam. In some cases it is less than 1 lb. of coal per I. H. P. hour, as compared with 4 lbs. in the best stationary steam plant burning the same sort of fuel as is used in the gas plant. It is hardly economical to set up a Dowson gas plant for less



DOWSON GAS PLANT USED AT THE FLOUR MILLS OF MESSRS MEAD AND SON, LOT'S ROAD CHELSEA

DOWSON GAS PRODUCING PLANT.

than 40 H. P., but from that figure onward its efficiency is sufficient to warrant its general adoption for mill work. Gas engines of 100 H. P. are quite common now, and twin cylinder engines of 300 H. P. are being adopted largely. In a mill of large capacity, batteries of gas engines are employed, and each engine drives part of the mill independently of the rest of the mill, except in case of an accident to one engine, when power can be borrowed from the remainder. It will thus be seen that there is no limit to the application of gas engines.

The most recent important installation put down by Mr. Dowson is one at Mead & Son's, Chelsea Flour Mills, London. Crossley Brothers supplied a twin-cylinder "Otto" gas engine, whose maximum I. H. P. is 174, and Mr. Dowson supplied the gas producer. The engine is of the well known type, and does not require description, but here-with we give an elevation of the gas producer plant.

The steam supplied by the small boiler A enters the bottom of the producer B through an injector, which also draws in the necessary air. The fuel is charged through the hopper in the top of the generator, and is put in often enough to keep the level of the fuel up to about 3/4 of the height of the generator. A plug can be removed from the top of the generator in order to judge of the quality of the gas produced. The gas is first sent through the cooler C and then through the hydraulic trap D, coke scrubber E, and sawdust scrubber F, in order to purify it from constituents that would clog up the gas engine. On passing through the small holder G, its pressure is regulated and then it goes direct to the engine.

The engine at Mead & Son's was tested recently under ordinary working conditions in order to ascertain the exact figures for the consumption of fuel. The engine was not working to its full capacity—174 I. H. P., so that the speed and number of ignitions were less than the maximum. The results of the trial were given as follows: Maximum possible I. H. P., 174; maximum number of revolutions and explosions per minute, 160; diameter of the two cylinders, 17 in.; length of stroke, 2 ft.; duration of trial, 8 hours.

On the trial the engine showed average revolutions per minute, 155.7; average explosions per minute, 109.4; mean pressure in cylinders, lbs. per sq. in., 78.9; I. H. P., 118.7; mean pressure per sq. in. of steam in boiler, 48 lbs.; anthracite used in producer during trial, 669

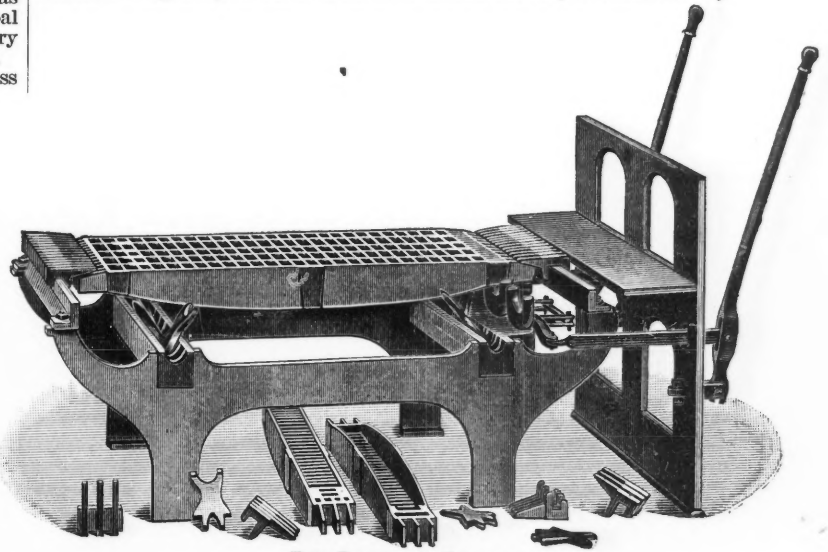
lbs.; coke used in boiler, both in getting up steam and during trial, 150 lbs.; total fuel (anthracite and coke) consumed per I. H. P. hour, .883 lbs.; gas consumed per I. H. P. hour, 63 cu. ft.; fuel (anthracite and coke) per 1,000 cu. ft. of gas, 12 lbs.; water used in cooling the gas engine cylinders, 5.03 gallons per I. H. P. hour; water used in boiler, .08 gallons per I. H. P. hour; water used in cleaning gas, .11 gallons per I. H. P. hour; coal gas used in heating ignition tubes of engine, 4 1-2 cu. ft. per hour.

These figures give the total expenditure in materials during the trial, and are quite representative of ordinary work. If anthracite is too dear or scarce, gas coke can be used instead, but in no installation yet put down for coke has the consumption been so low as in this case of anthracite. On an average the consumption of coke per I. H. P. per hour is 1.2 lbs., as against an average of .9 lbs. of anthracite. Many other installations of this type of plant have been put down, and they uniformly give this high efficiency when large, though when of less capacity than 80 H. P., the consumption of fuel is slightly greater. The figures serve to show the great economy of the gas engine.

THE JERNBERG SHAKING AND ROCKING GRATE.

This grate is manufactured by L. W. Jernberg, of Cleveland, O., and has two distinct movements, viz., horizontal and lateral. The stilt chairs, or supports, are so arranged that when the shaking levers are moved one end of the bar is raised 1/2 in., while the other falls a corresponding distance. The shaking mechanism consists of a series of compound bellcranks and levers.

The movement of the bar can be changed from the reciprocating and rocking motion to the former only, by changing the stilts from an angular position to a vertical position, making them parallel. The grates may be applied in any boiler furnace, as they are made in sizes to suit different widths or length of fireboxes. A burnt or broken bar may be removed very



THE JERNBERG GRATE.

readily and without drawing the fire entirely. A marked advantage gained by the use of the shaking grate is that the grate may be cleaned without opening the furnace and exposing the crown sheet of the boiler to a rush of cold air. Culm or buckwheat may be used for fuel.

Prevention of Condensation in Steam Cylinders.—The system adopted by Professor Thurston, of the Cornell University, of lining the interior of steam cylinders with non-conducting material to prevent thermal loss between steam and metal of the cylinder is well known. Experiments have recently been made by M. Bandsept, of Brussels, says *Industries*, with a view of obtaining a more efficacious method of forming the lining of the cylinder. By this system steam at a higher pressure than that usually employed is first passed into the cylinder. Then by means of special injectors the insulating material—which is either of a refractory or vitreous nature—in a powdered state is forced in and projected on the walls of the cylinder. It attaches itself thereto, and is said to penetrate the metal to a depth of 1/16 mm. The surfaces are afterward easily turned up in a lathe.

The Large Shipment of Gold from San Francisco to Washington.—The largest shipment of gold coin probably ever made was the recent transfer of \$20,000,000 from the subtreasury in San Francisco to Washington via New York. It was hauled by the railroads under their regular mail contracts, and came through as registered mail. The Assistant Treasurer at San Francisco had 500 boxes made especially for the shipment at a cost of \$1,000. Then there were the personal expenses of fifty-one men who went to San Francisco and guarded the treasure on its way East. These were the principal expenditures. The laborers at the mint at San Francisco were pressed into service to pack and load the money, the regular employees of the railway mail service guarded it, the arms which the guards carried were taken from the arsenal, and the mail wagons of the Post-Office Department were used to carry the boxes to and from the cars. The estimated cost is placed at \$3,500.

The lowest bid the Treasury Department could obtain from an express company for hauling the money was \$3 per \$1,000, or \$60,000. This, of course, would have included the risk of loss in transit by accident or theft. The Wells, Fargo & Co., which controls all the territory west of the Missouri, made this rate.

THE ORE DEPOSITS OF NEWMAN HILL, NEAR RICO, COLO.*

Rico, the county seat of Dolores County, is situated on the east fork of the Dolores River, about 12 miles from its source in the San Miguel Mountains. The general course of the River is southwesterly, through a deep cañon extending from the head or the stream to its junction with the west fork.

The Ore Deposits.—The mineral deposits which on Newman Hill have proven of the greatest economic importance, occur (1) in a series of almost vertical fissures, more or less parallel, having a strike from a few degrees to as much as 45 degrees east of north, and a dip varying but a few degrees from the perpendicular, either to the north of west or south of east (2) in another series of fissures which have a strike of 30 to 50 degrees north of west, and a varying dip of from 30 to 45 degrees north of east, crossing the nearly vertical fissures at almost all angles; and (3) along the contact plane between the "contact-limestone" and the overlying shale.

The vertical fissures having proven the most prolific and richest in ore, are locally called "vertical pay-veins," while those of the second system, which intersect the first, are termed "cross-veins;" these latter are uniformly characterized by ore-bodies lesser in extent and lower in grade than those in the former.

The "vertical-pay-veins," as well as the "cross-veins" are fault-fissures, the vertical displacement of the walls in the former ranging from a few inches to a maximum of 6 ft., and in the latter a trifle over 25 ft. These fissures vary in width from a few inches to several feet. They possess all the characteristics usually ascribed to so-called "true fissure veins," slickensides and selvages often occurring; where, however, the veins pass through the sandstone strata, these peculiarities do not appear, the mineral or vein-filling being usually closely adherent to the walls, or frozen to them. The banded or comb-structure of the ore in the veins is a marked feature. In Fig. 2 I have illustrated a typical case.

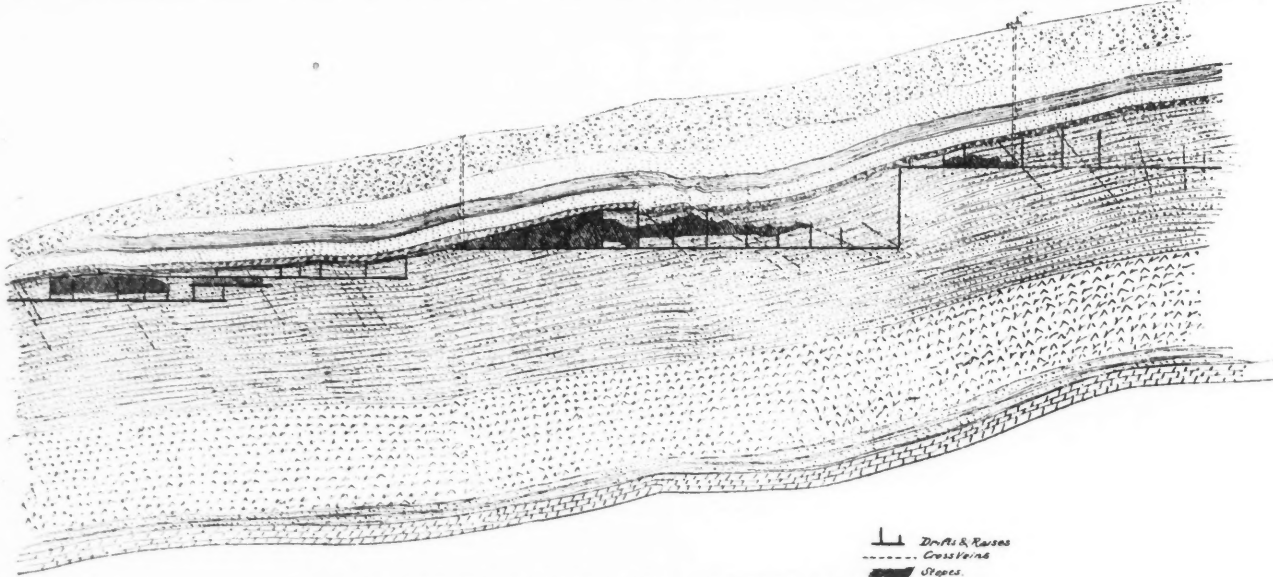
In longitudinal extent the fissures show great strength, the "vertical-

immediately over those points where strong and well-defined veins are being worked below. The faulting which caused the original fissures doubtless extends through the formations overlying the "contact limestones," but such fault-crevices are tight and barren.

It has been observed in following the "Hiawatha" vein, that it will occasionally narrow down, and finally pinch out; where this occurs, however, a cross-cut to the east or west, driven for a short distance, has always disclosed a parallel vein beginning at the point where the original disappeared. Such breaks are characteristic of the "Hiawatha" vein, and where they occur the horizontal ore pipe on the contact exhibits the same features. The close relation existing between the contact ore pipes and the underlying veins is, furthermore, shown by the fact that where the veins narrow, the horizontal ore pipe is also contracted; and where the veins widen, the overlying pipe is correspondingly enlarged.

The physical characteristics of the "cross-veins," of which over 25 have been disclosed in drifting along the "vertical-pay-veins," do not materially differ from those described as pertaining to the first system. They vary considerably, however, in their strike, which is from north to N. 60° west; and also in their dip, which is from 30 to 50° north of east. In the southern position of Newman Hill, in the "Jumbo," "New Discovery" and "Swansea" group of mines, several "cross-veins" have been opened that show a strike almost north-and-south, and a dip of 45° to the east. The "cross-veins" are, on the whole, perhaps narrower than the "vertical-pay-veins," being not often more than a mere seam, and attaining a maximum width of not more than three feet. The vertical displacement of the walls varies from a few inches to rarely over five feet. In one of the recently opened "cross-veins" in the "Enterprise" workings, this displacement, however, exceeds 25 ft.—the greatest thus far observed.

The veins of the system as they enter the shale underlying the "contact-limestone," also separate into smaller veins, although the ramifications are less numerous than is the case with the "vertical-pay-veins." The



THE ORE DEPOSITS OF NEWMAN HILL—SECTION ON ENTERPRISE VEIN.

pay-veins" which have been subjected to the greatest development have, in some cases, been followed for a near distance of 4,000 ft.

Thus far, about one dozen "vertical pay-veins" have been opened on Newman Hill; a number of these have, however, proven of little economic importance, the mineral deposits in them, while often of high grade, being on the whole so slight as to make their exploits turn commercially unprofitable, others again seemingly disappear entirely, or unite with the larger and stronger veins as they extend to the northeast.

Altogether, some five veins, owing to their mineral production, have proven of great importance, namely, the "Swansea," "Enterprise," "Hiawatha," "Jumbo" and "Eureka." Some confusion is apt to be caused on account of the names of the mining claims being applied also to the "vertical-pay-veins" which they cover, as the same fissure at times extends from one claim to another. The heavy development work which, however, has been done on all of the foregoing claims serves to establish the identity of the respective veins which they embrace.

The lowest workings on these veins are 200 ft. below the "contact-limestone," as shown in fig. 4, which represents a section along the "Enterprise" vein. The veins show great strength and regularity until the black shale, lying below the "contact-limestone," is reached. In passing through this band they split into numerous small seams, ranging in width from one-sixteenth to rarely over one inch. These veinlets irregularly traverse the black shale and the following thin layer of limestone—which is occasionally replaced with ore to a limited extent—until the superincumbent drab-colored argillaceous shale is reached. The maximum ore deposition, as already stated, has taken place along the contact plane, the horizontal ore bodies taking the form of a pipe. These horizontal ore bodies vary in width from 2 to 30 ft., and in thickness from a few inches to a maximum of 2 ft., following in longitudinal extent the course of the veins with which they are connected. The pipes lie directly over the vertical fissures. It is rarely the case that the pipes are found so regular in outline as depicted in the sketch, the regularity seeming to have been affected by disturbing movements, subsequent to the ore deposition.

The fissures do not, apparently, extend beyond the "contact-limestone," for drifts and tunnels, which have been run in the overlying shales and sandstones, have failed to disclose any sign of vein-structure or ore, even

ore-pipes, which in this case again form along the contact-plane, do not, however, cover the underlying veins, as is the case in the vertical fissures, but invariably make to one side of them. This I have illustrated in Fig. 6.

The horizontal ore-bodies connected with the "cross-veins" vary in width from 20 to 40 feet, and in thickness from a few inches to a maximum of three feet. They follow continuously, although on one side, as has been noted, the veins with which they are associated.

Faults.—The juncture of the "cross-veins" with the "vertical-pay-veins" is uniformly characterized by a disturbance of the latter, the former continuing along their course without much deviation from their average individual strike. The irregularities so produced in the "vertical-pay-veins" manifest themselves (1) in absolute faults, the break in the vein being sharp and usually to the southeast. The throw in such instances varies from a few inches to as much as 15 feet; (2) in a deviation of the vein from its normal course to one parallel with the intersecting "cross-vein." Such parallelism extends over distances from 15 to 80 feet, although in one observed instance it measures over 200 feet before the original strike of the vein is resumed; (3) in a bend of the "vertical-pay-vein" as it approaches an intersecting "cross-vein," a reverse curve taking place at the departure. In instances of this nature, the "vertical-pay-vein" usually cuts across the intersecting "cross-vein" on a diagonal line.

Figs. 7, 8 and 9 will illustrate some of the more marked irregularities occurring in the "vertical-pay-veins" within the territory studied by me, and I may say that when such disturbances are noted in the lower workings, the ore-pipes at the contact show similar features.

Fig. 7 shows the "Enterprise" together with a parallel one called "Vein No. 1," the distance separating them being about 180 feet. Where these veins are intersected by the "cross-vein," they merge into it, and pursue their course within the "cross-vein" walls for a distance of about 80 feet before departing from the intersecting fissure. They then continue in a trend parallel to the original course of the veins before the intersection. In all cases of this kind, the "vertical-pay-veins" are easily distinguished from the "cross-veins," the veins being separated, and each system marked by its characteristic matrix. The "vertical-pay-veins" show signs of disturbance as they enter and depart from the "cross-veins," a disintegration into seams and stringers taking place. Such disintegration, however, does not obtain for any great distance from the cross-fissure.

Sketch No. 8 illustrates the occurrence of a fault in the "Enterprise" vein, and the deflection of the "Hiawatha" vein by the same cross-fissure. The break in the "Enterprise" vein is seen to be sharp, while the "Hiawatha" vein is not faulted, but makes along the "cross-vein" for nearly 100 feet before emerging from its walls and resuming the original course.

In Fig. 9 I have shown the intersection of a "cross-vein" with the "Jumbo" vein, an instance of the third class of disturbances. The "Jumbo" vein as it approaches and departs from the cross-fissure is considerably disintegrated, the numerous seams and stringers striking diagonally through the "cross-vein."

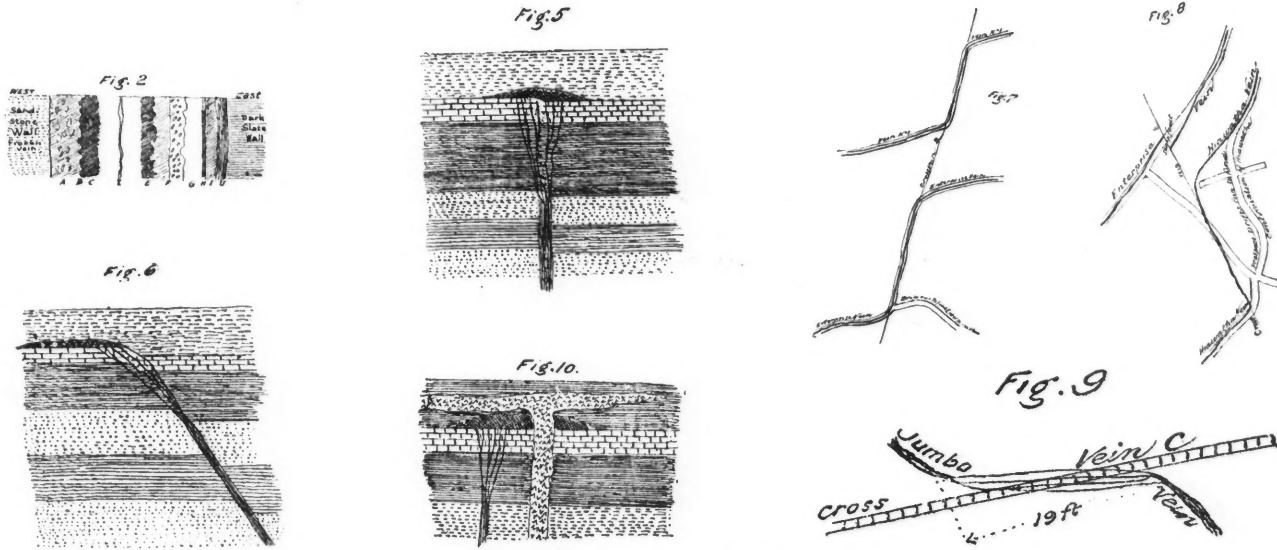
A consideration of these irregularities naturally suggests a speculation concerning the relative age of the two vein systems. In this connection I must confess that from the complexity of the problem I have not been able to arrive at positive conclusions. Reasoning from the occurrence of the sharp faults in the "vertical-pay-veins"—the disconnection being absolute—and the unbroken trend of the "cross-veins," the inference would be drawn that the latter are, relatively, the younger. Whatever mistrust arises from such a deduction is occasioned by the observed deviation of the "vertical-pay-veins" from their normal course for considerable distances to a parallelism with the intersecting "cross-veins" within the walls of the latter.

On the assumption, however, that all of the "vertical-pay-veins" when disturbed by intersecting "cross-veins" were originally faulted, and that the faulting fissure in some instances—prescribed by local influences—furnished a connecting channel for the mineral solutions circulating in the faulted vein, these phenomena are susceptible of reasonable interpretation. I am, at least, strongly inclined to favor this view.

Disturbing Influences.—In none of the openings in any of the mines have eruptive rocks been encountered, with the exception of the tongue-like intrusion in which the "Skeptical Shaft" has been sunk, and which

immediately below the black shale, is rarely found with the ore in the "contact" zone; in fact, its presence there is considered somewhat of a curiosity. The silver contents of these horizontal ore bodies range from 300 to 800 ounces and the gold from two to nine ounces per ton, the deposits being remarkably uniform in value throughout their whole extent. In the "cross-veins," the matrix consists of white quartz inclosing a large proportion of more or less altered country rock. I account for this phenomenon on the theory that the dip of these veins being quite flat, a greater fracturing of the shales and sandstones forming the hanging wall was effected, the seams thus produced permitting the mineral solutions to freely circulate around and finally inclose the loosened pieces of wall rock as the mineral deposition progressed. Rhodochrosite, which is a prominent feature of the gangue of the "vertical-pay-veins," is totally absent in the "cross-veins." The metallic minerals associated with the quartz are found in very small quantities. The gold and silver contents of these veins are very small indeed, average samples rarely showing a combined value of \$12 per ton. Contrary to the experience met within the "vertical-pay-veins," there is no improvement in values as the "contact" is approached. At the "contact," however, a radical change often occurs. Many of the horizontal ore-bodies associated with the "cross-veins" are extremely rich in gold and silver. The ore is a white quartz carrying from 20 to 40 per cent. of galena, sphalerite, pyrite and chalcocopyrite, associated with the same mineral minerals found in the "vertical-pay-veins" and the "contact" ore-deposits connected with them. The ore mined and shipped in large quantities from the horizontal ore bodies associated with the "cross veins" has shown silver contents ranging from 200 to 500 oz. silver, and from 2 to 9 oz. of gold per ton.

A peculiar feature which has been observed in connection with the horizontal ore bodies of the cross-section veins is that in working along their longitudinal extent their richness is subject to great variation; a body



ORE DEPOSITS OF NEWMAN HILL.

is at least 100 ft. below the lowest levels in the "Enterprise" and adjoining mines; and a small porphyry dike, from four to five feet in width, which is very much decomposed. This dike seems to be of comparatively recent origin. It stands almost perpendicular, and is nearly parallel in its course to the "Eureka" vein, from which it is removed only a few feet. On reaching the "contact," the dike cuts through the horizontal ore body connected with the "Eureka" vein, and then spreads out in the soft shale immediately over the ore, as shown in Fig. 10. This intrusion aptly illustrates the disturbing influences to which the mass of the mountain was subjected since the deposition of the ore.

Mineral Characteristics of the Veins.—It has been stated that the deepest workings on the veins in the territory under consideration are 200 ft. below the "contact limestone." At this depth, on the "vertical-pay-veins," the vein-filling is a glassy, white quartz. The quartz contains numerous vugs, some of which are of considerable size. These cavities are usually lined with handsome quartz crystals. The metallic minerals are not plentiful, and consist of pyrite (in cubes) associated with some chalcocopyrite. Raising on the vein, the quartz becomes less glassy, fewer vugs are found, and rhodochrosite appears. The pyrite is more abundant and becomes finer grained and sphalerite, galena and massive tetrahedrite appear. Continuing upward toward the "contact," the proportion of metallic minerals steadily increases, and with such increase the gold and silver contents become, in a marked degree, greater. The principal argentiferous minerals which are associated with the sphalerite and galena are argentite, polybasite and stephanite. Irregular nuggets, and even sheets of these, are often found in the vein cavities. Occasionally, pyrrargyrite and proustite, as well as native silver, make their appearance. As the black shale underlying the "contact-limestone" is reached, and the vein disintegrates into veinlets, a still larger proportion of the metallic minerals abounds. The veinlets are so narrow, as a rule, that they are not mined. Not infrequently, however, is the "contact-limestone" replaced with ore to such an extent to permit of its extraction to a good profit. When the "contact" zone is entered, the ore-deposits attain their maximum development. Here the ore is nearly a solid mass of pyrite, galena, sphalerite and tetrahedrite, carrying its maximum contents of silver and gold—the silver minerals being of the nature described. The silica contents of the ore reach their minimum, being at times less than 10 per cent. Rhodochrosite, which forms a large percentage of the gangue of the vein,

may yield rich ore for a long distance, and then become gradually impoverished, or the reverse may occur, without any apparent cause for the change.

Other Deposits.—It has been explained that no evidences of vein structures have as yet been found beyond the argillaceous shale overlying the "contact-limestone." A number of fissure veins are reported to have been found in the cliffs on the slope of Dolores Mountain, immediately above the summit of Newman Hill. These veins have not come under my personal observation, but are said to have the same strike and dip as the "cross-veins" in Newman Hill. Accepting this statement as correct, it would demonstrate that the faulting, which resulted in the formation of the veins of Newman Hill, also extended through the superincumbent strata of the main mountain. In explanation of the limitation of the mineral deposits to an area not extending upward beyond the "contact" zone, it may not unreasonably be assumed that after the production of the fault-fissures, subsequent movements in the mountain mass closed the fissures extending through the soft argillaceous shale overlying the "contact-limestone," thus preventing the circulation of the mineral solutions beyond the plane of contact. If such were the case, it is probable that the mineral solutions were retarded in their flow along this plane, the final result being the maximum deposition of ore in the "contact" zone, with the attendant increased richness of the ore. Assuming these premises, the conclusion must naturally follow that the vein-filling of the fissures found in the higher cliffs of Dolores Mountain owes its origin to other sources than produced the deposits of Newman Hill. It may be said that the mineral deposits of the veins in the cliffs of Dolores Mountain are essentially different in character from the ores in the Newman Hill fissures, those of the former being essentially a galena, with low silver contents.

If the question is asked, what correlation, if any, there exists between the deposits of Newman Hill—those of the main lacolite and its spurs, which are essentially pyriticiferous, and those of the other prominent mineral zones of the Rico district, consisting in the main of carbonate of lead and oxidized iron ores—I must answer that lack of time forbade the attempt on my part of any such extended investigation. To establish such correlation, or to differentiate the various periods of mineral deposition, will be a work of great magnitude, involving detailed geological research; but it is, nevertheless, one which ought to be undertaken, and which is fully warranted by the economic importance of the region.

THE BUILDING OF A CHINESE RAILWAY

An amusing account of the Chinese methods of directing the construction of railways is given in a paper prepared for the Institution of Civil Engineers by Mr. Henry Cripps Matheson. He was consulting engineer to the Formosan Government Railway built during the years 1887-91. The managers and all the officials with authority were Chinese, as there is a great prejudice against "barbarians" in Formosa and the rest of the Chinese possessions, but it was impossible to get on without English consulting engineers. As the engineers, however, had no control over the work they labored under considerable disadvantages.

For a long time no plans were made, as the Governor of Formosa considered it sufficient to have a longitudinal section upon which the center heights of the embankments and cuttings were written. The petty officers in charge of the gangs of soldier-laborers were careless about working to the engineers' center line, and indeed used the pegs largely for firewood. The land owners through which the line was to run objected to their fields being cut in two, and the Chinese officers re-located the line in order to please them and thus introduced an unconscionable number of sharp curves.

A long delay was occasioned by the curious methods adopted for making a cutting through a low hill of soft ground. This ground was covered with tea plantations, which absorbed water like a sponge. It could easily have been tunneled, but the Governor would not hear of this and ordered a cutting 60 ft. deep to be made and embankments for the line on each side of the hill to bring the line up high enough. The greater part of the excavated material consisted of clay which softened when the rain fell on it and then fell gradually down into the cutting again. Also the Chinese manager did not realize the fact that so deep a cutting would require considerable width at the top on account of the slope of the sides and so the early spoil was thrown upon ground from which it had afterward to be carried away. Thus it resulted that as fast as the spoil was taken out more stuff fell into the cutting, while the upper part became a quagmire. Finally the cutting was abandoned and the line diverted round the hill. At another point the Governor accepted the urgent suggestion of the engineer to build a tunnel 286 yards long instead of making an open cutting 200 ft. deep. The approaches to the tunnel at each end were of course open cuttings. The foreign engineers were only allowed to mark out the required direction of the line and to state the depth of the cutting at each peg. The strata passed through in the excavation for the open cuttings were shales, sandstone and clays of various degrees of hardness and permeability; but although the total rainfall in that district is usually over 130 inches per annum, no precautions were taken to prevent the surface drainage from finding its way into the cutting. The consequence was that before the location of the tunnel was reached, a huge mass of rock and earth slid bodily into the

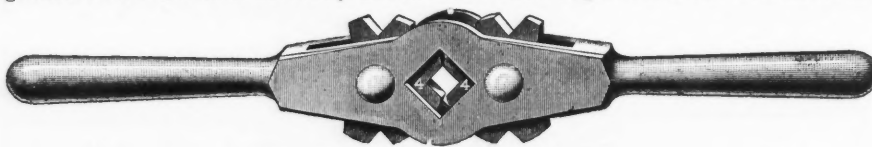
IMPROVED ADJUSTABLE TAP WRENCH.

This tool is designed for all sizes of taps. The tool differs from the ordinary wrench, as two highly tempered steel disks are used for jaws. These disks have rectangular notches on the edges. Each disk has an equal number of corresponding notches, each numbered. By bringing two corresponding numbers together a square hole is formed, into which the squared shank of the tap fits.

Small friction washers placed on either side of the disk hold the disks in place. The adaptability of this tool will be readily appreciated, and the advantage over the sliding jaw wrench, operated by a screw, will be obvious. The tool is made very substantially, and, with its simplicity of construction, it retains all the strength of the other styles. It is made in three sizes, 10, 14 and 18 in. It is being sold by Church & Sleight, of New York.

THE MANCHESTER SHIP CANAL

Engineers who are advocating a ship canal from Philadelphia to New York should study the misfortunes of the Manchester Ship Canal in England. It was estimated that this canal would only cost a matter of £9,000,000, including the purchase of the land, but the eventual expenditure will be more nearly £17,000,000 than the first sum named. The line of the canal, only 35 miles long, runs through the most favorable country; there are no hills to be encountered and the material excavated is either alluvial deposit or new red and Permian sandstone. In addition to this the course followed in many places coincides with the channel of the Mersey River. When the work was started five years ago the contract for the construction was let to the famous contractor, Mr. T. A. Walker, for 5½ million pounds sterling. Unfortunately, Mr. Walker died before half of the undertaking was finished and the canal company took the matter into their own hands. Since that time things have gone badly and additional time and capital had to be asked for. Finally, when the market reputation of the canal became zero, the corporation of the City of Manchester stepped in and loaned another £3,000,000, at the same time becoming practically the controllers of the scheme. A few months ago the additional capital showed signs of giving out and the committee of the corporation were asked to bring in an estimate for the remainder of the work. This week the English papers contain a report of this committee. They state that one and a half million pounds sterling will still be required, even though all unnecessary works are shelved for the present, so that in all probability quite another £3,000,000 will have to be found before the canal is in proper working order. The secret of this gradually increasing estimated cost of the undertaking lies in the fact that engineers and promoters were afraid to give a true and accurate estimate at first, as its magnitude



IMPROVED ADJUSTABLE TAP WRENCH.

excavation at the northern end, and shortly afterward a similar mishap occurred at the southern end. The Chinese officials then wanted to give up the tunnel idea and make an open cutting right through. The Governor, however, adhered to the tunnel, and ordered that work should be recommenced in a slightly different locality. This time, however, the manager fixed the level of the heading at the northern end, 14 ft. too high and a good deal of trouble was thus caused when the two ends of the tunnel met. When the soldier-laborers had advanced only a short distance into the heading at the southern end, the roof fell in and left the excavation open to the sky. They then attempted to remove the fallen material without timbering the sides of the excavation; and as they deposited the earth which they removed close to the edge of the excavation the rain soon brought all the earth down again into the hole. The manager objected to wooden props as they would be too expensive, and so he persevered with the removal of the fallen material. Other similar hindrances to economical design were met with by the engineers, but somehow or other the line was completed and is being used freely by the inhabitants, both for passenger and freight traffic.

Trinitrophenol Explosives.—Magnier, de Lom de Berge and Viellard have invented a process for the manufacture of trinitrophenols, or the trinitro compounds of the homologues of phenols, thereby obtaining certain explosives which can be used for war purposes or wherever a safe explosive is needed. The heavy coal oil is treated with the same weight of sulphuric acid of 60° B. at a temperature not exceeding 120° to 125°. The sulpho compounds so obtained are treated in water with a nitrate, care being taken that there is 15 times as much water as sulpho compound; three parts of the nitrate to one of oil is sufficient. Three parts of sulphuric acid of 55° B. is added, little by little, the mixture left to stand 24 hours, then heated moderately until a portion of the solution immediately crystallizes when placed on a cold surface. When this point has been reached the solution is allowed to cool. Nitric acid can be used instead of nitrate. To obtain an explosive proper for coal mines containing fire-damp, 100 parts of trinitrophenol are mixed with 20 parts of carbonate of ammonia in a small quantity of water. The mixture is slightly heated in order to drive off the carbonic acid, then allowed to cool. A cake is obtained which is washed with cold water, then dried. Of this cake, 28 parts are added to 72 parts of nitrate of ammonia; the mixture is pulverized wet, put in cartridges and then dried. The cartridges, strongly compressed, are merged in a solution of fulminate dissolved in ethyl acetate. A stronger explosive is obtained by treating the trinitrophenol with carbonate of soda dissolved in as little water as possible and heated to 45°; the salt which is formed is washed and dried, then mixed with saltpeter in the proportions of 40° sulpho compound and 60° saltpeter, crushed, granulated and dried. It can be employed either in powder or in grains.

would have frightened investors away. It is really remarkable how expensive the construction of a large canal is. At first sight it is impossible for the layman to imagine that such a piece of work should be anything else but cheap, for really there is nothing in it but removing earth and building walls.

It will be a long time before the shareholders in this concern will see their money back, or even a vestige of dividend on it. Not only is there this serious financial burden on the canal, but since its inception three sources of competition have sprung up to handicap its success. The canal was originally designed to bring raw cotton up from the Mersey estuary to Manchester, and to ship back the finished export goods, and thus to get rid of the high railroad rates for transportation between Liverpool and Manchester. In early days cotton spinning was carried on almost exclusively in Manchester, but of late years the industry has migrated to the surrounding districts in South East Lancashire; so that, although the raw cotton may be brought by water up to Manchester, it will still have to be taken by railroad to the mills in the surrounding towns. Then again, the railroads from Liverpool have a large number of new tubular frame steel freight cars ready for the opening of the canal, and they intend to reduce the freight rate on these trains to such a point as to enable them to compete with the low canal rates. The third drawback is not local, but consists in the growing competition of the United States as a consumer of raw cotton. This country is gradually taking away the foreign English trade in cotton goods, and as we become more expert in the art of manufacturing finished goods, we shall probably make all our own goods and capture the foreign trade of the world and England then will supply only its own self.

The Financial Situation in India.—The depreciation of silver in India continues to excite grave alarm. Numerous petitions have been sent to London requesting the government to make such a change as will place Indian currency on a gold basis, or to agree with other nations upon some effective system of bi-metallic currency. It is asserted by the petitioners that the government of India in paying its debts and interest in gold while receiving its taxes in silver, has already lost \$200,000,000 and that the present loss is at the rate of \$25,000,000 a year. Added to this is the complaint that those who receive stated salaries and who are compelled to purchase a part of their supplies in England, and to educate their children there, have suffered a contraction in the value of their salaries owing to the decrease in the value of exchange. India enjoys the free silver coinage that so many of our people are crying for. These are its fruits. Branches of the Currency Association of Calcutta are being formed in all the principal cities of India. To add to the general distress rumors are flying about that the Indian banks are in a shaky condition and shares of these banks have been declining for some time; and it is stated that there must be some liquidations unless there is an improvement in the value of silver,

THE AUTOMATIC BAND FRICTION HOIST.

The hoisting engine which we herewith illustrate is built by the Morris County Machine and Iron Co., Dover, N. J. It is a double engine, substantially built upon one bed, and is of better workmanship than is usually found in this class of machinery. The links, pins, rods, etc., are of steel and nicely fitted. It has balanced valves and link reverse gear of the best type.

The cut shows the drum provided with a band friction and brake of novel construction, and will easily hold any load within the capacity of the particular machine. By an auxiliary friction clutch the machine itself is made to do the work of locking the band friction. The load is started without shock and may be slowed down at any point. The same design of hoist is made also with double drum for balance cage work, the drums placed side by side or in tandem. They are also made without the friction and in several sizes.

THE EFFECT OF SMALL ADMIXTURES OF ARSENIC AND ANTIMONY ON THE PHYSICAL PROPERTIES OF COPPER.

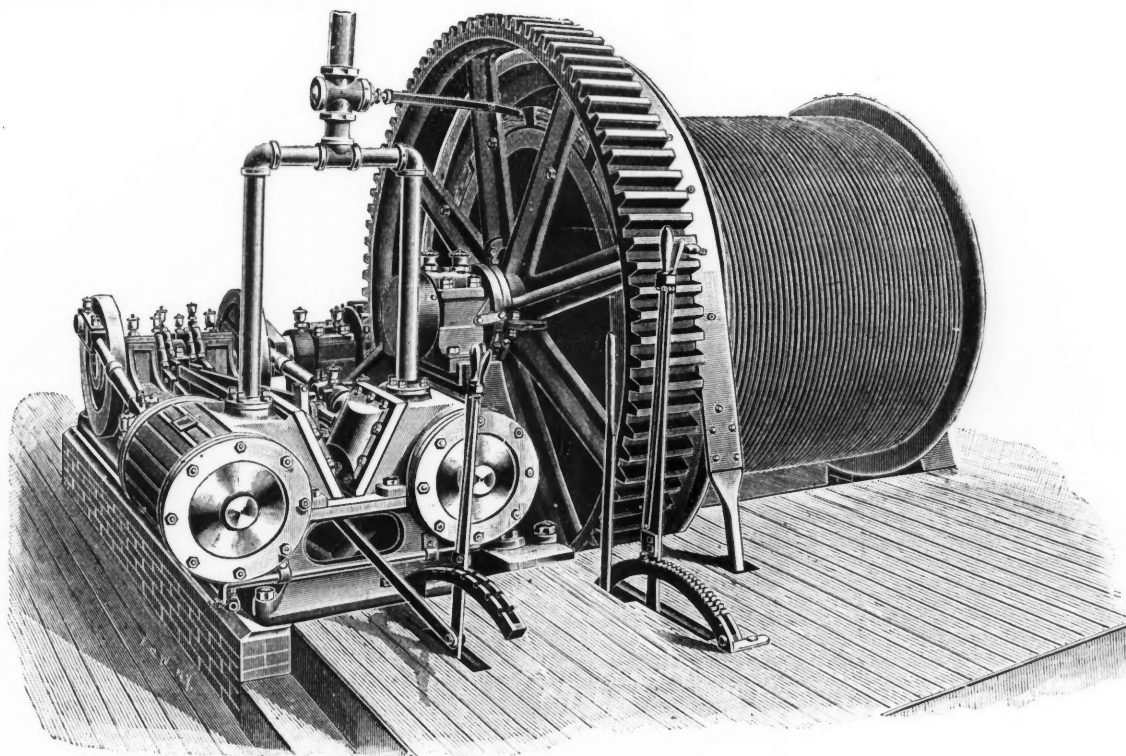
The influence of minute quantities of impurity on the chemical and physical properties of metals has long been recognized as being of great importance, though the practical difficulties in obtaining a specimen of absolutely pure metal with which to compare the commercial article has prevented the prosecution of extended research in this direction. When Professor Roberts-Austen was deputed by the English Institution of Mechanical Engineers to conduct an inquiry into the effects of small admixtures of metals on the physical properties of iron and steel, he com-

An idea of the tenuity of the wire may be best gathered from the fact that one mile of it would weigh about $\frac{1}{4}$ oz.

Experiments were also conducted with samples containing 0.26 and 0.53% antimony; these gave just as good results as those containing arsenic. The tensile strength of the pure copper from which the alloys had been prepared was 22.02 tons per sq. in., an unusually high figure; but high as it is, it was increased by the addition of the percentages of arsenic and antimony. Thus the wire with 0.22% of arsenic had a tensile strength of 26.47 tons, that with 0.35% gave 32.52 tons, and the alloy containing 0.81% broke at 31.11 tons. The two samples containing antimony yielded even higher results, their ultimate tensile strength being 33.09 and 34.92 tons per sq. in. respectively.

The results of these experiments apparently contradict the usual idea that arsenic must not be present in appreciable quantities in copper; but until further experiments are conducted on copper that has other impurities in it as well as arsenic we must refrain from expressing an opinion. These experiments only deal with copper wire and not with plates and tubes, nor is the question of temperature taken into account. Then again nothing but tensile strengths is treated of here; no other physical property is mentioned. Thus it will be seen that only a small portion of the complicated question of the effect of small admixtures of impurities on the properties of copper has been investigated; but none the less the results, as an appreciable addition to our knowledge of the subject, are of considerable interest and importance.

Mannesmann's Process for Adding to the Resistance of Aluminum.—An account of a process invented by Reinhardt Mannesmann for increas-



THE AUTOMATIC BAND FRICTION HOIST.

menced his experiments on gold, as that metal is of all the most easy to prepare pure. When he presented his first communication to the Institution on his experiments with gold, many practical men of the society and some editors of the English technical press stated that the results of his investigation were, in the language of one of them, "not worth a rush," as the actions of gold had nothing to do with those of iron and steel. Practical men are usually in too great a hurry to get at facts, and quite forget that "science moves but slowly, slowly creeping on from point to point." We preface these remarks to a short account which we intend to give of Professor Hampe's experiments on the effect of small admixtures of arsenic and antimony on chemically pure copper, for fear our readers should think the experiments useless on account of their, at present, small range of practical application.

In preparing his pure copper Professor Hampe electrolyzed a carefully purified solution of copper sulphate, and heated the resulting copper with copper oxide in a stream of carbonic acid to eliminate any sulphur that might be derived from any entangled traces of copper sulphate, and finally reduced the copper oxide in a stream of hydrogen. The process is satisfactory save for the final reduction in hydrogen, as copper is known to occlude that gas under such circumstances. The only other impurity was a trace of antimony, which clings persistently to copper even when its electrolysis is conducted with the utmost care. The copper purified in this fashion was then alloyed with approximately known quantities of the impurities whose action was to be determined and the exact composition of the resultant metal was afterward ascertained by analysis. Mechanical tests were made on the samples thus prepared, and some remarkable results obtained. The first three samples contained 0.22%, 0.35% and 0.81% of arsenic respectively, together with faint traces of unavoidable antimony, iron and manganese. The first and second were successfully drawn down to a wire of .085 mm., that is, about 0.0012 of an inch in diameter, without an annealing of the metal between the drawings being necessary, while the third with .81% of arsenic was almost equally soft and ductile.

ing the resistance of aluminum to atmospheric, chemical or mechanical influences is given in the *Moniteur Scientifique*. The inventor says that the addition of a little tungsten to pure aluminum or its alloys communicates a remarkable resistance to the action of cold or hot water, salt water and other re-agents. When the proportion of tungsten is sufficient, the alloys formed offer among other physical properties great resistance to traction and tension. The proportion of tungsten can be varied within extremely wide limits, according to the composition and the nature of the alloy, and according to the usage for which it is destined. The tungsten can be added, alloyed with other metals; still the most advantageous way consists in adding the tungsten before the aluminum is melted.

Koepf's Electrolytic Process for Obtaining Antimony.—According to the *Moniteur Scientifique*, Koepf, of Rheingau, Austria, has invented the following process for obtaining antimony from its ores. It consists in treating sulphide of antimony with certain salts of oxide of iron alone or in connection with haloid salts in an apparatus from which the antimony is deposited electrolytically. The trisulphide of antimony is decomposed in contact with ferric salts, sulphur is liberated, and the ferric oxide passes to the state of ferrous oxide, and at the same time antimonious oxide passes into solution. The reaction is rapid, and is complete when it takes place in the presence of free hydrochloric acid, or, better, in the presence of a haloid salt, such as common salt. The following reaction is explanatory: $2Fe_2Cl_6 + Sb_2S_3 = 2Fe_2Cl_4 + Sb_2Cl_4 + S_3$. The antimonial solution freed from the sulphur by filtration is submitted to electrolytic action, and the antimony is precipitated at the negative pole, the iron being oxidized at the positive pole, giving a solution of ferric chloride which can be used for the treatment of fresh quantities of sulphides of antimony. The anode and cathode are composed of lead plate. The bath is heated to about 50° and maintained in constant movement. In order to obtain a compact deposit of antimony, it is necessary to employ a current of 40 amperes or thereabouts for each square metre of surface of the cathode.

THE DETERMINATION OF ZINC IN ORES.

The Colorado Scientific Society some time ago appointed a committee to inquire into the relative merits of the various processes for the determination of zinc in ores, invented and employed by Western Chemists. This committee accordingly carried out a series of tests with the methods of seven chemists, viz.: Von Schulz & Low, of Denver; Mr. L. W. W. Jones, of the Pueblo Smelting and Refining Co., Pueblo, Colo.; Mr. E. N. Hawkins, of the Holden Smelting and Refining Co., Leadville, Colo.; Mr. F. C. Knight, of the Boston and Colorado Smelting Co., Argo, Colo.; Mr. Mann Page, of the Omaha and Grant Smelting Co., Denver, Colo.; Mr. F. Menzel, of the San Juan Smelting and Mining Co., Durango, Colo.; and Dr. H. C. Hahn, of the Colorado Smelting Co., Pueblo, Colo.

The tests were all conducted by Mr. L. G. Eakins, one of the staff of assistants to Mr. F. W. Clarke, chief chemist to the U. S. Geological Survey. Mr. Eakins also analyzed each ore chemically in order to compare the accuracy of the various process with an exact standard. The ores treated were from five different and distinct mines in Colorado, and they were chosen on account of their difficulty of analysis. They consisted chiefly of mixtures of galenite, pyrite and sphalerite, accompanied by greater or less percentages of manganese in the form of rhodochrosite, associated with a quartzose gangue.

The results of the tests are given in the following table.

Analyst.	Percentage of Zinc.				
	No. 1	No. 2	No. 3	No. 4	No. 5
Standard (Eakins).....	14.64	24.11	10.71	6.31	16.09
Von Schulz & Low.....	15.31	24.34	10.76	6.42	16.14
Jones.....	15.39	24.53	10.83	6.58	16.46
Hawkins.....	15.63	24.23	11.88	8.74	15.86
Knight.....	15.08	23.80	10.69	6.85	15.91
Page.....	14.62	22.00	10.50	6.30	15.37
Menzel.....	—	21.62	11.07	6.89	16.08
Hahn.....	14.30	23.03	8.89	5.44	13.22

From this table it will be seen that Von Schulz & Low's method gives the nearest figures to the chemical analysis. Nos. 1 and 2 give rather high figures, but in these samples Mr. Eakins detected the presence of cadmium, though unfortunately he did not estimate it quantitatively; so that this discrepancy in Von Schulz & Low's figures is thus accounted for. Dr. Hahn's method has the advantage of giving the figures for manganese and zinc from one solution, but his figures for zinc are uniformly too low. If this difficulty could be obviated the method would be highly commendable. Mr. Menzel's method is open to objection on account of the repeated use of sulphuretted hydrogen. Mr. Jones's method is practically the same as Von Schulz & Low's; and those of Messrs. Page, Hawkins and Knight give very fair results. We shall give some account of Von Schulz & Low's and Dr. Hahn's methods.

Von Schulz & Low's Method.—Prepare a solution of ferrocyanide of potassium by dissolving 44 grms. of the pure salt in distilled water and diluting to 1 litre. Then prepare a standard solution as follows: Dissolve 200 mgrms. of pure oxide of zinc in 10 cc. of pure, strong hydrochloric acid. Add 7 grms. of chemically pure chloride of ammonium (free from copper) and about 100 cc. of boiling water. Titrate the clear liquid with the ferrocyanide solution until a drop tested on a porcelain plate with a drop of a strong aqueous solution of acetate of uranium shows a brown tinge. About 16 cc. of ferrocyanide solution is required. When the brown tinge is obtained, see if any of the previous tests subsequently develop a similar color, and, if so, correct the burette reading accordingly. Usually the correction for two previous drops has to be made. One cubic cm. of this standardized solution equals about 0.01 grms. of zinc.

In the test take exactly 1 gramme of ore and treat it in a 3½-inch casserole with 25 cc. of a saturated solution of chlorate of potash in nitric acid. Do not cover the casserole at first, but warm gently until any violent action is over and greenish vapors have ceased to come off. Then cover with a watch glass, and boil rapidly to complete dryness, but avoid overheating and baking. A drop of nitric acid adhering to the cover does no harm. Cool sufficiently and add 7 grammes of chloride of ammonium, 15 cc. of strong ammonia water and 25 cc. of hot water. Cover and boil for one minute, and then, with a rubber-tipped glass rod, see that all solid matter on the cover, sides and bottom of the casserole is either dissolved or disintegrated. Filter into a beaker and wash several times with hot chloride of ammonium solution (10 grammes to the litre). A blue colored filtrate indicates the presence of copper. In that case add 25 cc. of strong, pure hydrochloric acid, and about 40 grammes of granulated test lead. Stir the lead about in the beaker until the liquid has become perfectly colorless, and continue the stirring for a short time, to make sure that the copper is all precipitated. The solution, which should still be quite hot, is now ready for filtration. In the absence of copper the lead is omitted, and only the acid added.

About one-third of the solution is now set aside, and the main portion is titrated rapidly with the ferrocyanide until the end-point is passed, using the uranium indicator as in the standardization. The greater part of the reserved portion is now added and the titration continued with more caution until the end point is again passed. Then add the remainder of the reserved portion and finish the titration carefully, ordinarily by additions of two drops of ferrocyanide at a time. Make corrections for the final reading of the burette as in the standardization. In this process cadmium behaves like zinc, and must be separated if necessary by some other method.

Dr. Hahn's Method.—Place one-half a gramme of ore in a porcelain casserole and treat it with 3 cc. dilute sulphuric acid (1 acid to 2 water), 2 cc. concentrated nitric acid and 6 cc. concentrated hydrochloric acid. Heat the solution to dryness or until fumes of sulphuric acid appear. Then remove the casserole from the hot plate and allow it to cool. Add 20 cc. of water and heat the solution to boiling for about one minute. Transfer the contents of the casserole to an 8-oz. beaker and nearly neutralize by adding a saturated solution of carbonate of soda. Add to the solution an excess of basic carbonate of lead suspended in water, until after vigorous stirring the precipitated hydroxide of iron settles quickly to the bottom leaving the liquid clear. The solution is then heated to boiling without previous filtration and the manganese determined with a standardized solution of permanganate of potash (4.86 grammes to 1 litre water). After each addition of the permanganate the solution should be briskly stirred, as it facilitates the settling of the precipitate. If the solution appears yellow or turbid

continue the stirring until it is clear. When the rose tint appears, indicating the complete precipitation of the manganese, add a few grammes of chloride of ammonium and 5 cc. of ammonia water, and filter the solution without previous heating. Wash the precipitate with water containing about 1/15th of its bulk of strong ammonia water. Add to the filtrate 12½ cc. of hydrochloric acid. If copper is present remove it by means of granulated lead, after which determine the zinc by titrating with a standard solution of ferrocyanide of potassium and by using a uranium salt as an indicator.

THE PRODUCTION OF BESSEMER STEEL INGOTS AND RAILS DURING THE FIRST SIX MONTHS OF 1892.

The American Iron and Steel Association have published the statistics of the production of Bessemer steel ingots and Bessemer steel rails during the first half of the present year. These statistics are given in the following tables:

States—Ingots.	First half 1891. Net tons.	Second half 1891. Net tons.	Total 1891. Net tons.	First half 1892. Net tons.
Pennsylvania.....	1,097,653	1,196,477	2,294,130	1,764,724
Illinois.....	237,845	440,785	678,631	489,515
Ohio.....	159,974	213,732	373,706	225,660
Other States.....	163,624	187,616	290,610	226,700
Total.....	1,599,096	2,038,611	3,637,107	2,305,599
Clapp-Griffiths only.....	33,789	39,417	73,236	41,411

States—Rails.	First half 1891. Net tons.	Second half 1891. Net tons.	Total 1891. Net tons.	First half 1892. Net tons.
Pennsylvania.....	439,902	506,252	946,154	530,900
Illinois.....	139,492	256,894	396,386	269,836
Other States.....	535	23,184	23,719	64,392
Total.....	579,929	786,330	1,366,259	865,128

In the figures for ingots are included the production of ingots by the Clapp-Griffiths works and the very small production of steel by the Robert-Bessemer works. We also add to the table a statement of the ingots produced by the Clapp-Griffiths works alone. In the rail table we do not include a few tons of Bessemer steel rails which were rolled in iron rolling mills from purchased blooms.

It will be seen from these tables that the increase in the production of Bessemer steel ingots in the first half of 1892 as compared with the second half of 1891 was over 13%, while the increase in the production of Bessemer steel rails in the same period was over 10%.

Important Mining Decision.—The commissioner of the general land office having decided that where publication of entry had been omitted that the claim was invalid, an appeal was made. To this the commissioner decided that the appeal could not be from his order, because it was merely interlocutory. Upon this, appeal was made to the Secretary of the Interior asking that all the papers be certified to him. The Secretary has decided that the commissioner's decision was not interlocutory, as it denied a substantial right and that the case was appealable.

To Drain the Zuyder Zee.—The commercial and technical societies of Holland have petitioned the government to advance the work upon the draining of the Zuyder Zee as fast as possible. The estimated cost of the work is \$76,000,000. It requires the erection of a dike 26 ft. high and 25 miles long, and involves the removal and reconstruction of the coast defenses. The plan to drain the Zuyder Zee is not new. It was proposed by Engineer Van Diggelen in 1849, before the great work of draining the Haarlem Zee was completed. It was then rejected as impracticable, but it was again proposed in 1865 and plans for the work made by Mr. Beyerinck, who had conducted the drainage of the Haarlem Zee. The result was satisfactory and the plans seemed practicable. In 1873 the Minister of the Interior appointed a committee of experts to examine into the feasibility of the plan. This committee declared it not only possible but desirable. In 1875 the Dutch Chamber voted the equivalent of \$47,000,000 for the work, but nothing was then done. A solid, broad foundation has now been laid, extending from the north point of North Holland across to the Island of Wieringen, and thence straight across the Zee to the nearest point of the opposite coast of Friesland, a distance of 18 miles only. It has been found that as the work advances the sea itself assists by depositing large quantities of sand and silt at every tide, on both the outside and inside of the dam, which is being gradually, simultaneously, raised along its whole length. When the project of draining the Zee took shape 40 years ago, the first idea was to join by dams the great islands of the Texel, Vlieland, Terschelling and Ameland to each other and to the mainland at each end. The total length of dams required for this would have been only the same as that from Wieringen to the Friesland coast, and it would have reclaimed from the sea about half as much again as the present plan; but the tide going in and out through these openings four times daily, with tremendous strength and in enormous volume, could not be coped with. It had hollowed out deep channels between the islands, from which it was considered vain to attempt to dislodge it. It is well established by history that the Zuyder Zee was once dry land and that the sea broke over it about 1282. The water in many places is shallow, only 4 ft. and 5 ft. deep. It is practically an inland sea, which at one time covered an area of 12,000 square miles, but about 400 square miles of this have been reclaimed, and the work projected anticipates reclaiming the remainder. The drainage of the Harlem Sea, begun in 1839 and completed in 1853, reclaimed about 70 square miles, and this now sustains over 7,000 persons.

THE STRATTON STEAM DRYER.

Various devices exist which claim to cause the separating of water from steam. Among these is the Stratton Separator, manufactured by the company of that name in New York. The principle of construction and the operation of this separator are extremely simple, as shown in accompanying sectional view, Fig. 1. The separator is applied on the steam pipe between the engine and boiler, or between the high and low pressure cylinders or compound engines, on long lines of pipe, or in any place where dry steam is regained and condensation takes place, and it acts by rotating the steam current, centrifugal force throwing the water out to the periphery.

Steam is admitted to the separator through a pipe at the top; it rotates downward around a central pipe, which extends downward through half the length of the separator and passes thence upward through the central pipe and out through the pipe connection opposite the inlet pipe. The particles of water constantly run down the sides of the shell and are received in a receptacle at the bottom. The water chamber is provided with a glass gauge. A recent improvement in providing the walls of the water chamber with wings, as shown in the cut, Fig. 2, has been made. This tends to stop the whirling motion of the water and allows it to settle quietly to the bottom of the receiver. The water collected in the receiver is carried to the feed water pipe through a connection. The separator is made in sizes for use on steam pipe from 1 in. to 15 in. diameter. They vary in weight from 35 lbs., the smallest, to 5,300 lbs., the largest.

MOORE'S ANTI-FRICTION DIFFERENTIAL BLOCK.

A conspicuous feature in this block is that the hand and lift chain is separate and independent. The lift chain, therefore, it is claimed, has such a slow movement as to avoid wear both on the links of the chain and pockets of the gear or sheave, which follows when the chain serves as hand chain and lift chain combined. The leverage is attained by means of a gear and pinion movement. The durability of the block, it is claimed, is much greater than those in which the construction is such that the worn shaft is constantly subjected to an end thrust. The teeth in the pinion and annulars are of the same pitch and so carefully made that no wedg-

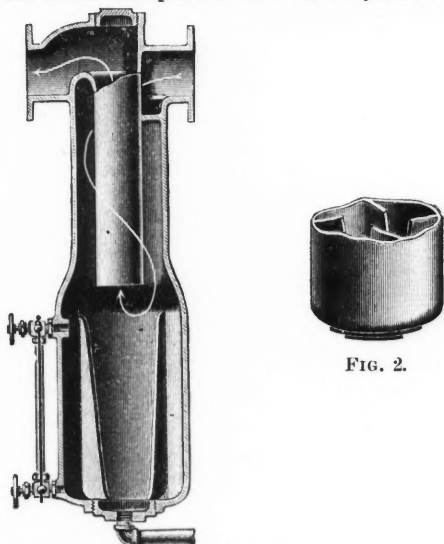


FIG. 1.—THE STRATTON STEAM DRYER.

ing or grinding can occur. The pinion gear is placed on the spindle eccentrics to the other gears. The gears are separated from the pinion by anti-friction rollers.

The pinion is double, or rather, two are used in one block. By reference to the illustration, showing the gearing, the letter *F* represents the fulcrum, which is an imaginary point between the pitch lines of the small and large pinion. The annular or internal gears engage with the two pinions at the points *B* and *C* on the line shown in Fig. 2. This mark represents a lever; this lever operates on the annulars at the points *B* and *C*, and since the lift chain hangs at a point directly or diametrically opposite to this point, the pinions are pulling directly opposite to the chain. Turning the eccentric pinion slightly, the lower part to the right, the fulcrum remaining stationary, the point *F* of the lever moves to the right and the point *B*, of the lever moves in the same direction, but, the point *C*, being on the other side of the fulcrum, moves in the opposite direction; hence, the two points *B* and *C* stand for the teeth of the gear pinion and annular gear. It is claimed by the manufacturers that one man can lift to the full capacity of the block, and the block being differential it is, of necessity, self-sustaining at any point. The blocks are in four sizes: one, two, three and five tons; and sell at \$30, \$50, \$70 and \$125 respectively; the weight of the block varies from 75 lbs. to 353 lbs.

ULLMANN'S SAFETY CONTACT-BREAKER.

The interrupter here shown has been especially designed for use in mines, powder factories and other places where the danger of an explosion or fire which might follow the spark always produced when an electric current is broken has hitherto prevented their use. The construction of Ullmann's device is extremely simple. The rubber tube *t*, containing the wires, is held by a porcelain sheave *B*. The other end of the tube terminates in a rubber bowl *P*, to which is attached the ring *C*, which permits it to be hung to the hook *A*. The interior construction is shown by Fig. 2.

The two free ends of the conducting wires *a* and *b* passing through *t* are soldered to two copper stems *c*, which penetrates into the rubber bowl *P* containing mercury. The two copper stems are carefully in-

sulated by the rubber tubes *n n*. The tube *t* and joints are further protected by the rubber tube *T* attached to the base of the bowl. When the bowl is attached to the hook as in Fig. 1, the mercury surrounds the ends of the coppers and connection is made, but if the tube be allowed to fall down, the mercury falls to the upper part of the bowl and the connection is broken.

Readmann's Electric Manufacture of Phosphorus.—The following account of the process invented by Drs. Readmann and Parker, for obtaining phosphorus in an electrically heated furnace is taken from the *Electrotechnische Zeitschrift* through the *Chemiker Zeitung*. The furnace is made of refractory materials in a rectangular trough-shape 1.5 metres long, 0.5 metres wide and 0.9 metres deep, a cast-iron tube being built in each side through which pass the carbon electrodes. The electrodes are compound, consisting of a bundle of 9 thin carbons, 1.2 metres long and 63 mm. thick, and can be moved forward as consumed by a screw. In reducing the metaphosphates, peat is used instead of fine coal. The crude material is introduced through a funnel which prevents the loss of heat ores or escape of phosphorus vapor. The vapor of the phosphorus is conducted to copper condensers. The phosphorus produced by this method is so pure that little or no refining is required and in consequence the profits are large.

The Development of New South Wales.—The recent visit of Sir George Dibbs to England had for its chief object the securing of British capital for the development of the iron and coal industries of New South Wales. Some very alluring offers have been made on behalf of the New South Wales Government to influential men in England with a view of securing their co-operation in the development of the coal-mining industry in the colony. These offers will doubtless be very carefully considered, and their acceptance will depend not so much, perhaps, on the facilities which this particular industry offers for profitable investment as upon the conditions surrounding the labor problem in the principal coal-mining districts of New South Wales. The coal miners, by their unions, are

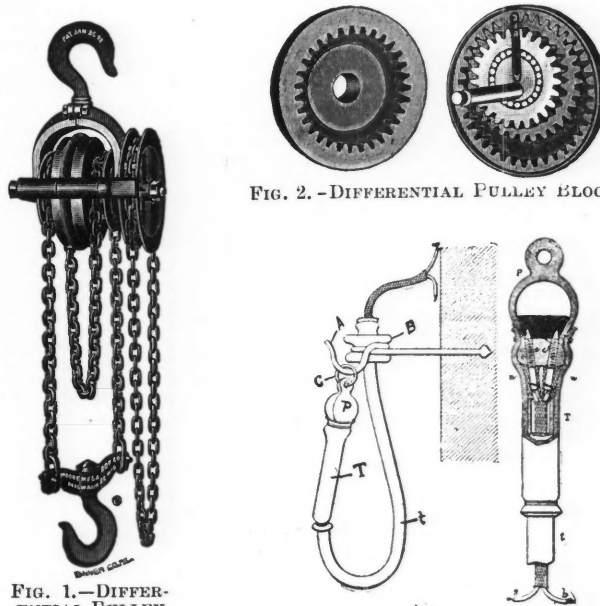


FIG. 2.—DIFFERENTIAL PULLEY BLOCK.

FIG. 1.—DIFFERENTIAL PULLEY BLOCK.

ULLMANN SAFETY CONTACT-BREAKER.

all powerful in this colony; and as they have been able to maintain their wages at a very high level—4s. 2d. per ton being, it is understood, the price for hewing the standard seam in the Newcastle district—any such enterprise as appears now to be contemplated by the Government will have to be entered upon with great caution if it is to be financially successful. The late Mr. C. S. Wilkinson, the Government geologist, estimated that in an area of a little over 3,300 sq. miles there lie, at a workable depth, 14,370,000,000 tons of coal. With a view also of utilizing the great deposits of iron ore which exist in the colony, the Sydney Government have decided to call for tenders for 175,000 tons of steel rails, all of which will have to be manufactured from material obtained within the colony. It is hoped by this means to induce some of the great English ironmasters to establish the manufacture of steel and iron in New South Wales.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

- The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office: TUESDAY, AUGUST 16TH, 1892.
- 480,701. Pump for Oil Wells. George Allen, Franklin, Pa.
 - 480,761. Stone and Ore Crushing Machine. Edgar H. Booth, San Francisco, Cal., Assignor to the Risdon Iron and Locomotive Works of California.
 - 480,860. Ore Concentrator. Philip R. Stanhope, Dumont, Colo., and Frank Wood, Brooklyn, N. Y.
 - 480,923. Process of Recovering Tin from Tin Plate. Manuel R. Garcia, London, Eng.
 - 480,935. Brick Kiln. James W. Penfield, Willoughby, O.
 - 480,936. Process of Treating Base Bullion Amalgam. Bernard Moebius, New York, N. Y.
 - 481,004, 481,005, 481,006, 481,007. Apparatus for Corroding Lead. George D. Coleman, Chicago, Ill.
 - 481,012. Fuse Ignitor. William J. C. Doyle, Aspen, Colo., Assignor to T. motby Buckley, same place.
 - 481,031. Art of Amalgamating Silver Ore. Alexis Janin, San Francisco, Cal.
 - 481,093. Apparatus for Elevating and Conveying Water. Valentine Boatwright, Adel, Iowa.
 - 481,101. Ore Concentrator. William H. Bowers, Denver, Colo., Assignor to the Colorado Iron Works, same place.
 - 481,106. Conveyor. Eckley B. Cox, Drifton, Pa.
 - 481,144. Air Compressor. Arthur H. Hutchinson, Kansas City, Mo., Assignor to Laura N. Hutchinson, same place.

PERSONALS.

Mr. W. S. Ward, of Denver, Colo., has been elected chief of the mineral department of the Colorado World's Fair Commission.

Dr. Elwyn Waller, professor of analytical chemistry at the Columbia School of Mines, is now on a professional visit to Salt Lake City.

Homer S. King, formerly one of the best known stockbrokers in San Francisco, Cal., has been appointed manager of the banking department of Wells, Fargo & Co.

Mr. Courtney de Kalb, mining engineer, of this city, is about to depart for Nicaragua to examine placer gold mines on the Principula River. He expects to be absent several months.

Mr. E. W. Rice, Jr., for several years past general superintendent of the Thomson-Houston factories, has recently been appointed director of the engineering and experimental department of the General Electric Company.

The following resignations have been asked and accepted by the Director of the Geological Survey: Samuel H. Scudder, of Massachusetts, paleontologist; Carl Barus, of Connecticut, physicist; Thomas M. Chartard, of Maryland, chemist; James H. Blake, of Massachusetts, assistant paleontologist; Frank H. Knowlton, of Vermont, assistant paleontologist; Henry N. Stokes, of New Jersey, and Edward A. Schneider, of California, assistant chemists; Charles S. Prosser, of New York, Gilbert D. Harris, of New York, Thomas A. Bostwick, of Connecticut, and Adam Hermann, of Connecticut, assistant paleontologists. These resignations were made necessary by the reduction of the appropriation made for the Geological Survey by the Sundry Civil bill passed at the last session of Congress.

Mr. John J. Valentine, who was for ten years vice-president and general manager of Wells, Fargo & Co., has been elected president of that company to succeed Mr. Lloyd Tevis, resigned. Mr. Valentine was born at Bowling Green, Ky., in 1840. He began his business career in 1854 in the office of Younglove Bros., agents for Carter, Thomas & Co.'s stage and express lines at Bowling Green, and has been in the express business about 38 years. Not very long after entering the service of the above-named firm he became identified with the Adams Express, and continued in the service of that company until 1861, when he resigned and went to California. After filling a number of positions in the service of Wells, Fargo & Co.'s Express he was appointed superintendent of their Pacific division. In 1869 he was appointed general superintendent, with headquarters at New York City. He returned to San Francisco when the general office was transferred to that city in 1870. In 1882 he was elected a director and vice-president of the company, and subsequently was also made general manager. Mr. Valentine has an extensive acquaintance with mining men, particularly in the West.

OBITUARY.

John H. Tilton, one of the earliest locators of the Comstock lode mines, and the earliest settler in Storey County, Nev., died at Virginia City, Nev., on the 12th inst. He was a native of New England and was aged 76 years.

Jabez Bostwick, formerly of the Standard Oil Company, died suddenly at Orienta Point, near Mamaroneck, N. Y., on the 16th inst. He was at one time treasurer of the Standard Oil Company, but of late years had been prominently identified with railroads.

Colonel Henry Clay Nutt, formerly president of the Atlantic & Pacific Railroad, died at Brookline, Mass., August 11th, aged 59. Colonel Nutt was widely known and had a career of prominence in the railroad world. He was born at Montpelier, Vt., June 28th, 1833.

Benjamin G. Clarke, of this city, who for years was a recognized authority in the East on everything connected with the iron and steel industry, and was one of the largest iron and steel men in the country, died in Antwerp, Belgium, on the 12th inst. Mr. Clarke was president of the Thomas Iron Company and vice-president, manager and chairman of the Lackawanna Iron and Steel Company. Mr. Clarke was born in Easton, Pa., about 72 years ago, and early in life began his business career in the iron and steel trade. He was one of the founders of the Thomas Iron Company at Hokendauqua, Pa., one of the largest pig iron companies in the country. Mr. Clarke did not confine his whole attention to the Thomas Iron Company and the Lackawanna Iron and Steel Company, but was also a director of and had a large interest in the Lackawanna Iron and Coal Company, the Delaware, Lackawanna & Western Railroad Company of New Jersey; the Tilly Foster Iron Company, the Hudson River Ore and Iron Company, the New Jersey Zinc and Iron Company, and eight or ten other pipe, iron or steel companies. He was also president of the New Jersey Zinc and Iron Company. One of the peculiarities of Mr. Clarke's business methods, and one to which he undoubtedly owed much of his success in the management of the Thomas Iron Company, was his habit of making all his sales at his main office. At the beginning of the year he would state his figure for pig and would sign contracts for hundreds of thou-

sands of tons. Should the price advance during the year he would hold to his contract, but, on the contrary, should the price decline he would protect his customers and sell them at the market price, regardless of the higher terms of the contract. This brought him much business, increased his customers' confidence and his own profits.

SOCIETIES.

We hear that the Seismological Society of Japan is about to be dissolved owing to lack of interest and support. We do not wonder at this, for earthquakes are inconvenient and expensive things to study. This society was really Prof. John Milne, and as this gentleman is about to issue a seismological journal his usefulness will not be entirely lost to the world. In fact the majority of people would prefer to study the results of his researches when on paper than to join his society and thus make themselves liable to the practical participation in earthquakes.

INDUSTRIAL NOTES.

Governor Brown, of Kentucky, has vetoed the bill recently passed by the legislature, which provided for the continuance of the State Geological Survey.

The Tudor Iron Company, of East St. Louis, Ill., has signed the Amalgamated scale. Work, which has been stopped two months, will be resumed at once.

According to the U. S. Bureau of Statistics, 8,255,691 lbs. of tin andterne plate were manufactured in this country during the quarter ending June 30th, 1892.

The Lake Erie Iron Company at Cleveland, O., has refused to sign the Amalgamated scale, but offers to sign a contract embodying the rate of wages demanded.

The American Iron Works of Jones & Loughlin, in Pittsburg, Pa., were started on the 17th inst. after a shut down of some weeks. The works give employment to 4,200 men.

A Pittsburg, Pa., dispatch says that Jones & Loughlin are among the firms which have not yet signed the Amalgamated scale, and that a strike of their 3,500 employees is threatened.

The Rand Drill Company has opened a Western branch at 1327 and 1328 Monadnock Building, Chicago, Ill. Col. James F. Lewis, general manager of the company, is at present in charge.

A Pottstown, Pa., dispatch says that, "owing to the general improvement in the iron market, the steel works at Stowe, near Pottstown, will increase its force of operatives several hundred men and run on double time beginning Aug. 24th."

Some of the policemen in London are now being provided with electric accumulator lamps instead of the old fashioned bull's-eye oil lamp. The new lamps weigh 4 lbs. and will give light for seven hours. So far they have given great satisfaction.

The Susquehanna Iron Company and the Columbia Iron Company, of Lancaster, Pa., started work on the 16th inst., after six weeks' suspension. Puddlers accept a reduction of from \$4 to \$3.65 a ton. About 600 men are employed at the two mills.

Messrs. Pepper & Register, of Philadelphia, have secured the contract to build the Easton, South Easton & Phillipsburg Electric Railway, now consolidated and called the Easton Transit Company, work on which will begin not later than September 10th and to be completed by Thanksgiving Day.

The National Malleable Casting Company, of Chicago, Ill., has purchased ten acres of land for \$75,000, and have commenced the construction of ten buildings which they will occupy with their business at a cost of \$120,000. This company has a capital stock of \$3,000,000. The present works of the company occupy what was once known as the Chicago Malleable Iron Works.

The Penn Iron Works, of Lancaster, Pa., closed June 1st because the company was unwilling to accept the demands of the Amalgamated Association for last year's wages, and it was decided to await the action of the rolling mills at Columbia on the subject. The latter have started up, paying \$3.65 per ton, and the management of the Penn Iron Works have determined to resume operations next week, paying the same scale.

It is stated that the Mexican Government will shortly promulgate a new revenue stamp law. Its principal feature is a reduction of the cost of stamps for business documents, and especially on foreign exchange drafts. It will aid, by lessening the burdens on commercial transactions, and will in all probability increase the revenues of the Government, for the present law requires the use of such expensive stamps that frauds are frequent.

The Hudson River Tunnel Company held a meeting in London Thursday, Aug. 11. Mr. J. Kendall presided. He said that, owing to the default in interest, it was unable to protect the bondholders by electing a trustee. The company was without money. Even its solicitors were unpaid. Mr. Goulding explained the steps that were being taken to reconstitute the company in New York. Engineer Baker

gave a detailed account of the status of the work. He said there remained only 1,684 ft. to complete the tunnel.

The Suffield & Thompsonville Bridge Company, lately organized at Thompsonville, Conn., have called for plans and estimates for a bridge over the Connecticut River 1,060 ft. long. Sixty-nine bids were received from fourteen different bridge companies, and, after careful consideration, acting on the advice of their engineer, Mr. Edw. S. Shaw, of Boston, the company have placed the contract for the bridge with the Berlin Iron Bridge Company, of East Berlin, Conn. It will consist of five spans of 210 ft. each, with a roadway 20 ft. wide in the clear, and will cost \$60,000.

The General Electric Company is about to introduce on the market a new improvement in the armature of the Thomson-Houston alternating dynamo. It consists in building up the core of the armature of laminated plates of wrought iron having dovetailed grooves cut across the periphery. The coils are wound on the core and further secured by wedges. This construction entirely does away with binding wire and avoids all risk of the coils being thrown out by centrifugal force and also adds to the general stability of the construction of the machine. The company proposes to provide all alternating machines hereafter made by the company, with this type of armature.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or supplies of any kind will notify the Engineering and Mining Journal of what he needs, his "Want" will be published in this column, and his address will be furnished to any one desiring to supply him.

Any one wishing to communicate with the parties whose wants are given in this column can obtain their address at this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

Goods Wanted at Home.

2,752. Equipment for the manufacture of electrical specialties. Kentucky.

2,753. Water pipe for 100 coke ovens, coke oven valves, mixed car, 20 and 30 lb. rails, and a 25,000 or 30,000 gallon water tank. West Virginia.

2,754. Sixty tons 16-lb. steel rails. North Carolina.

2,755. An engine lathe 16x12, screw cutting; a drill press back geared to drill to center of 24 in; also stocks and dies for general jobbing shops. Virginia.

2,756. Locomotives, cars 56-lb. steel rails, splice bars, bolts, etc., for 23 miles of railroad. Alabama.

2,757. A handpower punch and shear that will punch and cut 1/2 in. and a pair of rollers 6 in. in diameter and 62 in. between housers. Louisiana.

2,759. A bed lathe, 16-ft. bed and 36-in. swing; also a 24-in. back gear power feed drill press. Mississippi.

2,760. Machinery for mining, hoisting, washing and drying phosphate rock; complete plant, including engines, boilers and pumps. Florida.

2,761. Rolls, screws, figs, etc., for cleaning and separating lead and zinc ores. Tennessee.

2,762. 16 hand dump carts or wagons to dump both sides. Virginia.

2,763. 2 miles 16-lb. rails or a relaying plant. Virginia.

2,764. A 100-H. P. locomotive boiler complete. Virginia.

2,765. A new 10,000-gallon wooden tank. Virginia.

2,766. A 100-H. P. return tubular boiler complete. Virginia.

2,767. Iron roofing and siding. Alabama.

2,768. A 10-ton ice machine. Virginia.

2,769. A second-hand diamond drill. New York.

2,770. A few 36-in. narrow gauge cars with wheels 8-in. face for wooden rails. Alabama.

Goods Wanted Abroad.

2,758. An incubator. West Indies.

GENERAL MINING NEWS.

ALABAMA.

Cherokee County.

(From our Special Correspondent.)

A bauxite bank was recently encountered about 4 miles to the northward of Rock Run, near the Woodward brown ore banks. This is being prospected with a view to shipping in the near future. In a southerly direction from Rock Run are located some of the most extensive deposits of brown ore in this State. The distance from railroad and depressed state of the iron market have been the reasons for

not developing them in the past. The properties at present are in the hands of the original entries in the Government Land Office, who farm the valley portions of the lots, leaving the mountainous and mineral-bearing portions to await the coming of mining companies with capital sufficient to build the necessary railway tracks to connect with the East Tennessee, Virginia & Georgia Railroad at Rock Run, distant from the southernmost banks about $3\frac{1}{2}$ miles and 1 mile from the northernmost. The mineral here is found in a chain of hills shaped as a horse-shoe. Although but very little work has been done, yet in some places a limited amount of ore was mined a few years since and hauled to the Bass Furnace, about 5 miles distant. This was discontinued, however, because of the cost of wagon haul. The Bass Furnace Company reports a portion of the product from these banks as first-class for car-wheel pig iron; but a large proportion of the product is too high in phosphorus for use in any except coke furnaces. Combined with the brown ore in one bank has been discovered and prospected a deposit of bauxite similar in quality to that which has been mined by the Southern Bauxite Company near Dike's ore banks, situated about 10 miles to the northeast. Immediately southwest of these deposits, on the south side of the hill which forms the curve in the horseshoe-shaped chain of hills, are located the banks of the Augusta Mining Company, to which railroad side-tracks and narrow-gauge tram tracks have recently been built to connect this property with the East & West R. R. of Alabama at Rowell's station. The county line between Cherokee and Cleburn counties separate the last named banks from the first mentioned. Inclosed by the horseshoe-shaped range of hills are about six sections of land, of which I judge from personal examination based on surface indications that four sections are covered by these deposits of brown ore. The outcroppings, though, would indicate a regularity and continuity rarely encountered in deposits of brown ore.

ARIZONA.

Mohave County.

The Phoenix "Herald" says of White Hills, the new mining camp: "All veins are parallel, in very regular order, with an intervening horse of porphyry, and paralleled in every case with a hornblende schist. The general course is east and west, dipping to the north. In some veins, as in the Prince Albert, the dip is so great that one may walk down the incline. Others are only slightly out of perpendicular. The surrounding country is more a producer of gold than of silver. Ten miles eastward is Gold Basin, where Robert Patterson, solicitor, and partners own 22 claims. West is the Gold Bug mine, showing up well, and beyond that, considerable mining is going on in Eldorado Canyon. Besides the Schafer properties Robt Patterson and partners have 8 prospects. The Prince Albert, owned by them, has a 62-ft. shaft, the ore showing better than on the surface. Another, the Desert Prospect, was found by sinking through the detritus at the foot of Horn Silver Hill. It is an extension of the Occident which, with the Horn Silver and Orient, comprises a vein, remarkable for size and richness. These are separated from the bulk of the prospects, which are on the Treasure Hill, with Treasure Gulch and the town between. The ore is of different character on Horn Silver Hill, owing to the absence of manganese. Following is an account of the development of the claims:

"Chief of the Hill.—Situated a mile north of the G. A. R., with no intervening float. Largest solid prospect in camp. It has been uncovered 6 ft., and foot wall not yet found. Ore assayed over 2,500 oz. silver and some gold.

"Defiance.—South extension of the Garfield, 36 in. wide, all ledge matter assaying. A small batch of the Kingman sampling works milled over 500 oz.; shaft about 20 ft. deep.

"Garfield.—The vein trends northerly and joins the G. A. R. further up the hill. Croppings can be placed over 2,000 ft. Shaft 15 ft. deep, where pay streak is 14 in. wide.

"G. A. R.—This shows more rich ore than any other prospect here. The vein is over 35 ft. deep on the surface, broken and mixed with foreign matter; shaft 25 ft. Rock running over 1,500 oz. is being sacked for shipment. All ore running less than 70 oz. in this or other claims is left on the dump, as high freight rates to Kingman preclude profit. Occasional streaks 2 or 3 in. wide are found, of pure chloride and horn silver.

"Horn Silver.—Shaft 20 ft. Richest in horn silver in camp. Pay streak 3 ft., vein 4 ft.

"Norma.—Chloriding only at present. Tunnel 25 ft., pay streak 3 ft.

"Occident.—Pay streak 3 ft. wide and width of vein not yet known. Prospect holes not over 10 ft. in depth.

"Owing to the absence of owners and the sale of principal claims, no real developing work has yet been done. Only three windlasses are to be found."

Pinal County.

Reymert.—Owing to a quarrel among its owners, no work is being done at this mine. The ore of this mine contains a great deal of manganese, and it has to be roasted and lixiviated.

Silver King Mining Company.—The following circular letter to the stockholders, signed by the vice-president and by the secretary of the company, has been issued under date of August 5th: "The directors having been compelled to levy another assessment

(No. 8, of 25 cts., delinquent Aug. 27th, 1892), deem it best to advise you of the present condition of our affairs. Since the last annual meeting 24 tons 935 lbs. of ore have been extracted from the old workings and sold to the smelters at Pueblo, Colo., and to the Selby Smelting and Lead Works at Vallejo Junction, Cal., realizing \$6,450.40. To save the cost of transportation on the low grade ores known to be in your mine, it was decided early in the present fiscal year to move 10 stamps from your mill on Queen Creek to the mine, and set up a concentrating plant at the mine, for working these low grade ores. Before this was done an offer was made to the company to move from Queen Creek to the mine, and set up, ready for use, 10 of the company's stamps, without any cost or charges—in consideration of a bill of sale of the other 10 stamps—and this offer was accepted by us. This has been done, and after unlooked-for delays, the mill is now running night and day, and we hope to work nearly 30 tons of ore daily. We were compelled to purchase 8 new vanners and other machinery to make the mill complete, and are now in position to ship and sell concentrates to the smelting companies. Being short of funds, and wishing, if it were possible, to avoid an assessment, very little prospecting work has been done in the mine while these changes were being made. At the present time we are drifting from the Bilk Shaft, on the 700-ft. level, and think we can here find the old ore body again. Meanwhile the low price of silver and small amount of rich ore available for shipment, with the improvements we have made, has led to an indebtedness of about \$5,000. With the proceeds of the present assessment and the sale of concentrates, and judicious work in the mine, it is believed we can again place your property on a paying basis. At the beginning of the present fiscal year we had on hand \$1,170.24 and there were 56,055 shares of the capital stock of the company in its treasury, bought in at previous delinquent sales. By resolution adopted at the special meeting of stockholders on Dec. 10th, 1891, the directors were authorized to sell or distribute any or all of these shares, but so far they have not believed it advisable to do so."

CALIFORNIA.

(From our Special Correspondent.)

Negotiations are said to be pending for the consolidation of the borax companies having works bordering on Death Valley, in Western Nevada, and at Daggett; and also the properties in the State of Washington. The interests involved are estimated at \$2,000,000, and if the trust is formed the price will certainly advance, even if the production is not limited.

Amador County.

Belmont Gold Mine, Sutter Creek.—At this mine a sinking of 130 ft. in the Boss shaft has been completed. A station is being opened on the 200-ft. level preparatory to cross-cutting and drifting on the vein.

South Eureka, South Creek.—The "Amador Record" says: "The north drift is in 75 ft. and the ledge has widened out to 12 ft. The last assay made gave from \$5.30 to \$6.20 a ton.

Humboldt County.

(From our Special Correspondent.)

The oil well at Garberville, being sunk by a syndicate, has reached a depth of 1,600 ft. No flow of oil has been struck, but the presence of oil is evident. The debris brought to the surface is so saturated with it that the fluid can be pressed out with the hand. Another well being sunk in the Mattola section, in the southwestern part of the county, has attained a depth of 800 ft., no oil having been struck, however, in paying quantities.

Mono County.

Bulwer Consolidated Mining Company.—Following is the latest official letter, for the week ending August 7th: "During the week we extracted 166 carloads of ore. Average battery sample, \$34.80 per ton; tailings, \$7.57 per ton. We shipped to the Carson Mint on August 3d bullion valued at \$9,517.22.

Standard Consolidated Mining Company, Bodie.—Mr. Thomas H. Leggett, president and manager of this company, furnishes the following data about the new water power and electric plant, with which it is proposed to run the company's mill: The water power is obtained from Green Creek, in the Sierra Nevadas, on the south edge of Bridgeport Valley. There is 4,500 ft. of ditch of $3 \times 4\frac{1}{2}$ ft. average area, and from the penstock at its extremity the water is to be led through a 22-in., 20-in. and 18-in. W. I. pipe of No. 16, 14 and 12 iron, respectively, on to four 21-in. Pelton wheels, running under 350 ft. of vertical head. The wheel-shaft is to be coupled directly to that of a 120 kilowatt A. C. Westinghouse dynamo that generates the electricity at a potential of 3,500 volts, running at 865 revolutions per minute. The pole line is $12\frac{1}{2}$ miles long, and the wire used is No. 1 B. & S. gauge bare copper, the poles being spaced at 100 feet apart. The motor in the mill will be of 120-horse power, and will run in entire synchronism with the generator twelve and a half miles away. It takes the electricity off the line at a pressure of 3,000 volts, and is brought up to speed by a small dynamo of three to four horse power, which is afterward switched off. The line loss is figured at 15 per cent. The total efficiency can only be estimated, of course, after the plant is in operation. By means of transformers the current will be reduced to 100-volt pressure, and this used to light the mill. The expenses of the company will be decreased, as wood now costs \$10 per cord in Bodie.

Nevada County.

(From our Special Correspondent.)

Champion Mining Company, Nevada City.—The Board of Directors have declared a dividend of 10 cents per share, which was paid this week. The ore in the mine is of good grade, while the cost of extraction, etc., is comparatively small. The ore is free milling, but at times heavily mineralized. The sulphurets run from 4 to 5%, and are valued about \$70 gold; \$10 silver.

COLORADO.

Elko County.

Navajo Mining Company.—The annual meeting of this company was held in San Francisco, Cal., on the 9th inst., with 79,607 shares represented. The following directors were elected: E. Scott, F. A. Berlin, T. J. Shackelford, M. A. Jackson and J. W. Pew. E. Scott was elected president, F. A. Berlin vice-president, J. W. Pew secretary and R. M. Catlin superintendent. The company is in debt \$12,782.77, with \$7,800 due from other companies as an offset.

Gilpin County.

Genuine Mining Company.—This company has opened up a body of mill dirt about 18 in. wide in the west levels and stopes that runs a little over three ounces gold to the cord, as well as a streak 6 to 8 in. wide of smelting ore, worth \$70 a ton. The mill dirt makes 2,500 lbs. of tailings that sell for \$15 a ton.

Rowena Mining Company, Central City.—The main shaft has been retimbered from the 275-ft. to the 400-ft. level. Last week, in driving the 375-ft. level, a streak of fine looking lead ore, one foot wide, was found, together with two feet of mill dirt. Stopping and drifting is going on in the 575, 675 and 735 ft. levels. The milling ore is as good as usual and shows an improvement in the value of the tailings, which are now selling for \$36.75 a ton, a higher price than any sold heretofore. Last month 30 cords of mill dirt and 15 cars of smelting ore were shipped. A new shaft is being sunk and substantially timbered on the Genuine lode. The last ore milled from here brought over three ounces to the cord, and makes 2,500 lbs. of tailings, worth from \$15 to \$20 a ton. Some good copper ore is coming in through the mill dirt in places. The company will sink this shaft at least 100 ft. before drifting.

Lake County.

According to the Denver "Times" good work is doing in the Catalpa-Crescent, while shipments are kept up to 65 tons daily of a fine class of iron ore produced from two distinct bodies of ore, each said to average over 10 ft. in the breast.

Pawnalnas, Leadville.—A good chute of iron ore has been opened up in this group.

Valley Mining Company, Leadville.—This company is taking out about ten tons per day of the fine sand carbonates, while arrangements are going forward to place a new plant of machinery on the property.

(From our Special Correspondent.)

Etna Mining Company.—A large body of high grade chlorides was recently struck in the lime-porphry contact, 170 ft. from the surface. This is the first mineral of paying quality found in that property, although an immense amount of development work has been done there, and the strike has already stimulated prospect work in that vicinity.

La Plata Mining Company.—Affairs at this mine are not at the present time in a very flourishing condition. Most of the lessees have quit work, owing to the fact that the owners have raised the royalty to \$1 per ton instead of 40 cents, as formerly. No action has lately been taken looking to a compromise and the chances are quite strong that a long period of idleness is in store for this property.

Lee Mining Company.—In the Lee south shaft, working under lease, a fine body of rich chlorides has just been encountered in the old and presumably worked out ground.

Robinson Mining Company.—From the Robinson and New York ground an average of 1,750 tons of ore was shipped last month, somewhat over the product of June. This is principally sulphides mined from the lower levels, although including 250 tons of oxides taken from the upper workings.

Venture Mining Company.—The Venture mine on Sugar Loaf is to resume operations after an idleness of many years. New machinery has been substituted for the old plant and everything is being put in first-class shape. The Venture was, some years ago, one of the most important mines in this district and was a regular producer of high grade sulphides.

Ouray County.

The mining camp of Red Mountain was destroyed by fire on the 14th inst. The total loss is estimated at \$275,000, with but little insurance. The fire was started by an incendiary. Considerable damage was done to the surface works of several mines.

Weld County.

Long's Peak Coal Company, Erie.—At this company's mine the shaft is down 120 ft. to a vein of good coal 6 ft. 6 ins. thick. The engine will soon be in place and all will be ready for hoisting as soon as the Union Pacific Railroad has the switch in position.

Northwestern Mining Company, Erie.—This company is reopening the mine formerly operated by the Boulder Valley Mining Company, and which closed down in 1885 on account of labor difficulties. The new company has leased 240 acres of coal land.

The shaft is now down 50 ft., and it is the intention to sink to the second vein of coal, which is 130 ft. below the surface. The former company reserved the first vein. The coal is said to be a good quality. The vein which will be operated is from 6 to 9 ft. thick. The officers of the new company are: Charles E. Quincy, general manager; William H. Nicholson, secretary; A. J. Vivian, treasurer, and P. McKenna, superintendent.

GEORGIA.

Polk County.

(From our Special Correspondent.)

Near Hamlet, in this county, the Cochran Iron Company have just erected a McLanahan & Stone ore washer with a capacity for washing 200 tons daily, the power being furnished by a 35-H. P. engine and the water supply being pumped about half a mile through an 8-in. pipe by a large Knowles pump. The entire plant cost about \$10,000. The ore from this company's banks is reported to analyze on an average 50% metallic iron and about .03 in phosphorus. This washer is one of a few of its kind erected in this section of the south. The following short description will demonstrate what thorough work it ought to do: At the tipple the ore and foreign matter as it comes from the banks is dumped into a 14-ft. revolving sizing drum, one-half of which is pierced with 3-in. holes and the other half 5-in. The lumps which pass through the drum are discharged onto a picking table, thence direct into the ore bin. The matter which passes through the holes of the drum is discharged into the washer box, furnished with two 30-ft. wooden logs; this discharges into an 8-ft. riser bored with 1 1/4-in. holes, which discharges into another sizing screen, which as it revolves, separates the ore and foreign matter into four sizes, and discharges into elevators which carry it to the jig tank furnished with four sets of jigs to correspond with the sizes of the holes in the last sizing screen. From the jig tank the ore and refuse from all four jigs are carried by two elevators to the ore bin and refuse dump.

IDAHO.

Ada County.

(From our Special Correspondent.)

A vein of clear milling ore that runs \$80 per ton has been struck, and for over 100 feet the vein carries a 13 in. streak that runs \$170 to the ton.

Alturas County.

Hailey.—According to a special correspondent of the Anaconda "Standard," a number of silver properties in this district have been bonded and sold. Among others is the Star. The new owners will take charge Sept. 1st. In the bottom of the shaft there is 4 ft. of ore. The leasers are working 44 men and have two months' more time, hence the owners who purchase are to give the leasers \$15,000 cash to quit at once.

Red Elephant Mining Company.—The mine continues to improve. The company's new hoist will be in place Sept. 1st; then the shaft will be continued to a depth of 300 ft. more, giving a vertical depth of 886 ft. The mill is working full time on second-class ore.

Silver King, Sawtooth.—The mill of this company is completed, and the working is reported successful, the concentrates turned out averaging as high as 360 oz. to the ton. There are 3,000 tons of ore on the dump, and 20,000 tons or more estimated unstoped. The mill can now turn out one ton of these high-grade concentrates in 24 hours, and the capacity will probably be brought up to a ton and a half.

Boise County.

Stormy Hill Mine.—This is the south extension of the War Eagle mine, and is opened by a shaft 300 ft. deep, three levels run 200 ft. each way from the shaft. The ore is from 1 to 3 1/2 ft. wide, and the average value is \$35 free-milling gold and silver. Rich silver ore occurs in bunches, and runs as high as \$250 per ton. This mine will be worked from extension of the tunnel to War Eagle. The ore now in sight is estimated at \$150,000.

War Eagle.—The shaft is 800 ft. deep; 8 levels run each way from the shaft. The ore body is from 2 ft. to 12 ft. wide. In the lower or 8th level it averages 8 ft. wide for a distance of 400 ft. south of the shaft and 100 ft. north. The average value of the ore is \$45 per ton, says the Helena "Journal." The ore is free-milling gold ore. The reserves now opened up are estimated at \$300,000. The mine is not being worked at present, and will not until a cross-cut is run from the lower tunnel on the Rolph, which will cut the War Eagle vein near the shaft at a depth of 1,200 ft., when all ore can be taken by tunnel into the Rolph mill.

(From our Special Correspondent.)

News has been received of the destruction by fire of the Lang's smelter at Mineral. This was the only smelter in the Boise Basin Mining region, and its destruction will retard the output of bullion very materially. The loss will reach \$50,000.

Kootenai County.

Old Dominion Mining Company.—The principal work at this mine is now done at tunnel No. 3, says the Spokane "Review." It is in on the contact about 180 ft. and shows up both walls smooth and solid. The vein is 12 ft. wide and is composed of concentrating ore. At the end of this tunnel the work is fine ore and the vein is retaining its width and richness, though the foot wall of lime is losing its distinctiveness and is getting more and more

seamed with small chutes of high grade ores. Tunnel No. 4 is in only 30 ft. It is being run to provide a new chute for ore from the higher levels. Tunnel No. 5 is in nearly 1,000 ft., and although the ledge will not be encountered for nearly 200 ft. yet, the face of the tunnel is highly mineralized.

Owyhee County.

Brooklyn.—An important strike has been reported at this place. The owners of the group of mines, which joins the New York claim of the De Lamar group, on the southeast, after running a tunnel 165 ft., the owners started a cross-cut, in which two veins have been struck at a depth of 60 ft. from the surface, one of which is 6 1/2 ft. in width. Samples taken from the vein show an assay value of \$164 in gold and \$125.30 in silver.

Jones & Ready.—Wyoming parties have an option on these properties, which lie to the northwest of the De Lamar, and thought to be a continuation of the De Lamar ledge. The owners are running a long cross-cut tunnel, through which they expect to cut the ledge within the next 60 days at about 200 ft. from the surface.

Lepley and Howe-Manhattan.—What is known as the Lepley and Howe-Manhattan group of mines, lying just west of the De Lamar, is reported to have been sold in London.

Union.—This is an old galena mine in the South Mountain district, which is now attracting considerable attention on account of the discovery in it of a 6-in. vein of native tellurium, which runs upward of 70 oz. of gold, according to the Anaconda "Standard." This journal says that Capt. Plummer, manager of the De Lamar mine, has visited the new find.

Shoshone County.

Coeur d'Alene.—The Seattle "Mining News" says of the trial of the rebellious strikers: "In the trial of the Coeur d'Alene miners the United States court has decided that the union is a conspiracy, and that any member is liable for the acts of the others. If the Supreme Court of the United States sustains this decision strikes hereafter will be less frequent and less formidable. It will materially change the feature of strikes when the union as an organized body and the individual members can be held responsible for all unlawful acts committed on account of said organization, whether they have been the destruction of property or assaults made upon the person or individuals."

KANSAS.

Cherokee County.

During the week ending Aug. 13th the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 1,730,710; rough ore, pounds sold, 1,490,850; zinc ore, pounds sold, 708,640; lead ore, pounds sold, 327,250. Sales aggregated a total value of \$15,273.

MICHIGAN.

Gold.

Ropes Gold Mining Company.—According to the Ishpeming "Iron Ore" 27 samples taken along the east drift of the 14th level gave very good results, the highest being \$213.23, of which \$161.23 was gold and \$52 silver; the lowest was \$1.41, the average being about \$22.50 per ton. The conditions now met with in the mine are said to be similar to those encountered in the ninth level. Gold is the predominant metal, whereas silver has been for some levels above.

Copper.

Calumet & Hecla Mining Company.—The annual meeting of the stockholders was held at Boston August 17th. The auditor's report was as follows: Statement of assets and liabilities—Assets: Cash at mine office, \$26,486.95; cash at New York office, \$6,910.59; cash at Boston office, copper at 10 cts. and mineral at 5 cts., \$3,042,219.34; notes, bonds and bills receivable at Boston and mine, \$1,118,192.83; total assets, \$4,193,809.71. Liabilities—Drafts in transitu, \$32,938.44; employees' aid fund, \$3,224.30; bills, notes and loans payable at Boston and mine, \$424,098.51; proposed mine equipment, \$310,000; Calumet & Hecla Smelting Works, \$437,500; machinery contracts, \$350,105.56; total liabilities, \$1,557,866.81; balance, \$2,635,942.90. In his report President Agassiz said that during the past fiscal year the company had produced the equivalent of 34,540 tons of refined copper. Prices of copper have varied from 13.55 cts. per lb. to 10 1/2 cts. It is now 12 cts. The large expenditures for construction heretofore planned are drawing to a close, and the end of the fiscal year coming, without demands now unforeseen, will see the construction account greatly reduced. The president stated here that the construction cost always had been charged to cost of copper, also that the work of sinking the Red Jacket shaft will be completed in about two years. This shaft will give at least twice as much output as any of the old shafts. Cost of stamping has been reduced to a minimum, owing to the improvements in handling rock. It was voted to convey the timber lands owned by the company in Luce and Alger counties to the Hall & Munson Company for \$176,000. This sale yields about 5% profit on original cost of the lands to the Calumet & Hecla. The company makes the sale because it has found that prepared timber can be bought as cheaply as it could be produced from the company's timber lands. The company has purchased, under the provisions of a contract made in 1887, the half interest owned by the Detroit & Lake Superior Copper Company, in the Calumet & Hecla Smelting Works at Torch Lake. President

Agassiz said the company's expectations of cheap smelting had been realized at the smelting works erected at Black Rock, Buffalo, on the Niagara River. These works are of a capacity to treat one-half the output of mineral. Messrs. Alexander Agassiz, Quincy A. Shaw, Thomas L. Livermore, F. W. Hunnewell and Thomas L. Chadbourne were elected directors.

Kearsarge Mining Co.—The Kearsarge mine's new rock house is nearly completed, and by the 1st prox. it will be in full operation. The openings underground have been pushed ahead and new bodies of virgin ground, rich in copper, opened up, and the mine is in shape for a long run, says the Torch Lake "Times."

National Copper Mining Company.—The company is exploring on the surface at the foot of the bluff, a short distance north of the present mine. It is said that a well-defined amygdaloid vein with good walls and carrying considerable copper is being opened. A winze has been sinking from the 13th to the 14th level through good vein, and in the process of sinking this 100 ft. has taken out something over 7 tons of copper. But owing to the low price of copper and poor outlook, this good streak attracts but little enthusiasm from the mine officials.

Tamarack Junior Mining Co.—The latest from No. 2 shaft is that the south drift penetrated ground carrying copper, the latter part of last week. The value of the discovery as yet is problematical and can only be ascertained by extending the drift.

Tamarack, Jr., Mining Company.—According to the Calumet "Conglomerate," on the fourth level south, on No. 1 shaft, the drift is in about 465 ft., and the breast is rich. The vein is 7 or 8 ft. wide, carrying copper all through. Several stopes on this level and in the one above are rich. The breast of drift in third level south is very fine also. At No. 2 the company has drifted about 50 ft. each way from the copper cross-cut, and is finding a small seam of heavy copper bearing rock in a 6 or 7 ft. vein. Some of the rock that comes up is very rich and full of heavy sprangly horns of copper, besides much fine copper.

Iron—Gogebic Range.

The report that the mines of the Wisconsin Central Railroad Company, located on the Gogebic range, had suspended operations is untrue, says the Ishpeming "Iron Ore." The mines, with the exception of a small one, the Superior, are all being worked, and with full complements of men.

Duluth, Special, Aug. 11.—Judge Severance has filed a decision in the case of Emil Hartmann vs. Harvey Iron Company, Robert Whitesides and others. This is the case involving one-fourth interest in fee of the Zenith mining property. The Harvey Iron Company settled the case as far as it was concerned, and Emil Hartmann sold his interest to H. M. Bradley, which changed the title of the case to H. M. Bradley vs. Robert Whitesides and others. Defendants claimed title through soldiers' additional scrip, which was assigned to them. Plaintiff held a quit claim from soldiers, and claimed that the power of attorney was void, and that the transfer of the property by the attorney in fact was against public policy. Judge Severance decides in favor of the defendants, which means that the transfer of soldiers' additional scrip was valid. Whitesides and others are declared to be owners of the quarter in fee.

Pickards, Mather & Co.—The River furnace of this company, which turns out about 100 tons of foundry pig per day, will blow out about September 1st.

Iron—Marquette Range.

Claire Iron Company.—Shipments have been gradually increased until now the daily output runs from 600 to 800 tons of ore. This shipment all comes from the open pit. No. 1 shaft, a short distance to the west of the pit, is being pumped out and making ready to add several hundred tons to the daily output of the mine.

Iron—Menominee Range.

Chapin Iron Co.—The Chapin is at present shipping 300 cars or 6,000 tons, of ore to the Escanaba ore docks daily. Orders have been received at the Champion to ship 275,000 tons of ore to Cleveland, and it is thought probable that the operations at the mine may be resumed in a short time. Ferdinand Schlesinger, it is reported, is seeking an option on the Ludington, on a basis of \$100,000 for the mine. The Lumberman's Mining Company are endeavoring to have the Portage Lake Canal Company, owners of the fee of the Ludington, reduce the royalty. The Chapin could doubtless handle the Ludington and Hamilton water in addition to its present work, and if the three properties were under one control the cost of operation would be reduced to the minimum. The present owners of the Ludington bought it on a basis of \$160,000.

Claire Iron Company.—Shipment have been gradually increased until now the daily output runs from 600 to 800 tons of ore.

Hemlock River Iron Company.—About 250 tons are being raised and shipped each day, and the output of the season up to date is 35,000 tons. Nearly all of the mining is done in the second level, though the first level yet furnishes considerable ore. B shaft, which cut through to the second level early in the year, is now on its way to the third level and is about 50 ft. below the second, leaving about 20 ft. to go, when work in the third level will be commenced. The workings of B shaft are independent

of the other parts of the mine, being provided with a separate engine house. A shaft still rests on the second level and has not been started for the third. The air shaft from the diamond drill hole, on the opposite side of the river, is now down to the second level and connection made. It will rest there until the third level's south drifting reaches that point. The working force is held at about 125 men.

Mastodon.—The mine is shipping ore and has been doing so for some time—now loading the fourth cargo. The shipment is yet confined to 15 large cars per day, but arrangements are being made whereby this can be materially increased, says the "Diamond Drill." The bulk of the ore going to market is that being mined at the present time, but little is taken from the stockpile, which contains several thousand tons.

MINNESOTA.

Iron—Mesaba Range Notes.

On the H. W. Oliver lease of the Mesaba Mountain Mine the advance royalty of \$75,000 has been paid. The minimum output fixed by the lease is 400,000 tons a year at a royalty of 65 cts. a ton. At the Mountain Iron the plow used in stripping turns up 62% ore in the second furrow. In spots the ore is found just under the leaves. The ore is not over 4 ft. from the surface over a length of 400 ft. and an unknown width. It is soft blue hematite of excellent quality. At the Bivabik stripping is progressing with a steam shovel. The cost of stripping and moving the dirt several thousand feet with tram cars and horses is 17 cents a yard. It is expected that steam cars will reduce it to 10 cents a yard. The average depth of stripping is 30 ft., with 60 ft. of ore below.

Iron—Vermillion Range.

Chandler Iron Company.—On the 10th inst. 131 cars of iron ore were loaded by the steam shovel, the largest number of cars loaded in any one day since the commencement of the season. The total number of tons loaded was 2,937½.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, August 15th.

The production of ore from the lead and zinc belt for the past two weeks was fully up to the average, notwithstanding the fact that there has been a decline of 50c. per ton in the zinc ore market. Two important deals were closed up and the money paid. The first was the purchase by Mr. N. B. Jaffery, of London, England, of a tract of mining land about two miles north of Joplin for \$10,000. The land is only partially developed, but makes a very good showing of ore. Mr. Jaffery secured the services of J. H. Fisher, M. E., as superintendent, and then left for Tennessee to look at zinc properties. The next deal was the sale of John W. Arnold's one half interest in the now famous Victor mine of Cartersville, located on the Connor land, for \$50,000 cash. E. E. Dwight and others of Toledo, O., were the purchasers; the same parties recently purchased a one-fourth interest in the mine for \$25,000. It cost a fortune to open up and develop the Victor mine, and the discouragements which were met by the old company almost caused the abandonment of the property on several occasions. Mr. J. N. Arnold, who has just sold out his one-half interest, was a conductor on the Mo. Pac. R. R. between Kansas City and Joplin, and all of his salary went into the development of the mine for almost two years before the main body of ore was reached; then it became a famous producer and paid a dividend at the rate of \$1,000 per week. Your correspondent has seen a complete plat of the underground workings, and finds that there is less than an acre of ground developed at the present time. The purchasers have certainly secured a good zinc property. Following are the sales of ore from the different camps for the past two weeks.

Joplin, August 8.—Joplin mines 1,307,420 lbs. zinc ore and 292,220 lead, value \$22,483.15; Webb City mines 334,310 lbs. zinc ore and 87,100 lead, value \$6,002; Cartersville mines, 1,667,680 lbs. zinc ore and 142,900 lead, value \$23,168; Zincite mine, 153,330 lbs. zinc ore, value \$1,970; Oronogo mines, 33,100 lbs. lead ore, value \$851; Carthage mines, 390,140 lbs. zinc ore, value \$4,414; Galena, Kan., mines, 787,300 lbs. zinc ore, and 270,010 lead, value \$14,870; district's total value \$73,768.15; Aurora, Lawrence County, mines, 328,090 lbs. silicate, 187,000 lbs. zinc ore and 528,040 lead, value \$11,900; lead and zinc belts, total value \$85,668.15. Joplin, August 15.—Joplin mines, 1,649,370 lbs. zinc ore and 294,350 lead, value \$36,113.75; Webb City mines, 705,690 lbs. zinc ore and 51,820 lead, value \$9,482.65; Cartersville mines, 1,630,230 lbs. zinc ore and 95,290 lead, value \$22,141.30; Zincite mines, 125,050 lbs. zinc ore and 2,050 lead, value \$1,568.60; Carthage mines, 74,430 lbs. zinc ore, value \$959.75; Oronogo mines, 68,830 lbs. zinc ore and 19,070 lead, value \$1,116.30; Burch Center mines, 40,710 lbs. zinc ore, value \$478.35; Alha mines 40,000 lbs. zinc ore, value \$400; Galena, Kan., mines, 704,000 lbs. zinc ore and 327,250 lead, value \$15,273; district's total value, \$77,543.70. Wentworth, August 15.—This is a new camp, located in the northeast corner of Newton County. I believe zinc ore was first mined here in paying quantities about two years ago in what was known as the Baker mines. The camp is located on a beautiful open prairie at the head water of a branch of Center Creek, and in this respect differs from almost any

other camp in the entire lead and zinc belt, and for this reason mine operators were slow about going into the new camp, as they were not favorably impressed with the surface topography. However a few men kept persistently prospecting and struck the ore deposits at a depth of 30 to 50 ft. Some prospecting was done by drilling at a number of different points, almost all of which proved up good ore deposits. Some good strong companies are now locating in the new camp. As a rule the ore bodies are found disseminated into the chert beds, making what may be termed hard ground. In fact, the formation is very similar to that of Webb City and Cartersville, and should the ore deposits prove to be as continuous, Wentworth will become a large producer. The ore is very clean and of an exceptionally high grade. At the present time the Pierce Mining Company have the only concentrating plant in the camp and are mining steady and producing an average of two car loads of concentrates per week. The Purdy & Jones property recently developed now makes a fine showing, and they are making arrangements for putting in a plant of machinery. The Pittsburg Land and Mining Company are sinking a large development shaft on a drill hole that cut a good body of ore.

MONTANA.

Beaver Head County.

Golden Leaf Mining Company.—The company has moved its 5-stamp mill from Bannack down to Argenta, to work the second grade ore on the Golden Era dump. There is a large quantity of that class of ore on the dump, and the mill will be kept running for an indefinite period, says the Helena "Daily Journal."

Deer Lodge County.

Granite Mountain Mining Co.—The south half of the mill was closed down most of the past week while a general cleaning up of it was in progress, and on Wednesday that portion was put in operation and the north half was closed down. It is not unlikely that all the stamps will be put in permanent motion again in a short time.

Jefferson County.

East Pacific.—This mine, about six miles south of Placer, is owned by Winston Bros., of Minneapolis, and worked under the local management of W. S. Dodge. The development work consists of three tunnels, No. 1, 1,600 ft. long; No. 2, 1,900 ft. long, and No. 3, 1,700 ft. long; two drifts, one 950 ft. and one 1,000 ft.; one winze 70 ft. deep; two shafts, one 400 ft. deep and one 200 ft. deep. They employ about 75 men at present, and have shipped about 8,000 tons of ore from the mine, which netted about \$1,000 per car.

Madison County.

Alder Gulch.—The "Madisonian" says: "This will prove one of the most profitable seasons for placer miners in Alder Gulch that they have had for several years. Since the first flow of water in the spring all the fluming companies have been running with a full force of men until within the past two weeks, and as a result large areas of ground have been stripped to bedrock, which is now being cleaned up as rapidly as possible."

Buffalo.—It is said that the average net yield of this property during the past few weeks has been \$700 per day. Regular shipments of ore which averages 80 oz. in silver to the ton are made to Butte and Omaha. It carries also a considerable amount of lead in the form of carbonate.

Day.—The mill has been repaired and was started up on ore from the Easton mine August 11th.

Royal Mining Company.—All of the machinery for the new 10-stamp mill is now on the ground and is being placed in position as fast as possible. It will be in operation by the 1st of September. The company is developing its property with three tunnels, one 500 ft. above and one 500 ft. below the original location tunnel.

Silver Bow County.

Alice Mining Company.—Work at the Alice properties is in active progress, the Waldemere and Magna Charta supplying their usual amount of ore. The Boston mine, located north of the Poser, was started up by this company some weeks ago and a few men have been developing it. Since then a ledge of quartz 2 ft. wide and assaying on an average 60 oz. in silver was uncovered at the 150-ft. level. The property is looking so favorable that the company will at once begin preparations for the development of the shaft another 100 ft. The shaft on the property is now 150 ft. in depth, says the Butte "Inter-Mountain."

Butte & Boston Mining Company.—This company is again producing matte, and September 15th works will probably start in full. The company shipped five carloads of matte August 5th. Two furnaces are now in blast and the third is expected to start shortly. It is estimated that during the shut down the company was at an expense of \$100 a day for pumping water out of the mines.

Crown Point.—This mine is located about half a mile southwest of the Pandora and is now 70 ft. deep. The shaft is sunk on the ore shoot, which is about 15 in. wide and has an assay value of 150 oz. in silver and \$20 in gold. The owners will sink the shaft 200 ft. deep.

Emma Nevada Mining Company.—The company is extending the levels west of the main shaft. The

100-ft. level will be extended about 30 ft. before the mineral can be extracted. The surface tunnel and 50-ft. level is producing good grade of ore, which is taken to the ore sheds and divided into three classes. The first-class has an assay of 250 oz. in silver and \$20 in gold; second-class, 125 oz. in silver, \$30 in gold; third-class, 20 oz. in silver and \$10 in gold to the ton. The vein on the 50-ft. level has an average width of about 10 in., and is gradually getting larger as the drift is driven under the hill to the west.

Mand S.—Work was started on August 1st by the lessees of this claim. An incline shaft has been sunk 170 ft. on the lead, and over \$11,000 taken therefrom in the last 10 months. The ore is similar to that of the Emma Nevada, the shipments made giving mill returns of over 200 oz. in silver and \$20 in gold per ton.

NEVADA.

Elko County.

Following are the latest official weekly letters from the various Tuscarora mines:

Bello Isle Mining Company.—North line cross-cut 250 ft. level, has been extended 7 ft., cutting into some high grade ore, the width of which has not yet been determined. The upraise from the gangway drift, same level, has been extended 7 ft. No. 1 winze, south drift, same level, extended 4 ft., still in rich ore.

Commonwealth Mining Company.—Joint east line drift extended 15 ft., with slight improvement. Joint west line drift 17 ft. in low grade ore. Third level—South drift from No. 1 raise extended 17 ft., exposing 1 ft. second-class ore. Hoisted 5 cars first-class ore, assay \$175 per ton, and 42 cars second-class, assay \$28 per ton.

Navajo Mining Company.—The stopes above the 350-ft. level continue to yield about the same.

Nevada Queen Mining Company.—North drift from No. 5 chute extended 23 ft. and connected with gangway from No. 1. North drift from No. 6 advanced 15 ft.; joint east line drift 15 ft., and north drift from No. 7, 15 ft., all showing slight improvement. Joint west line drift extended 17 ft. Hoisted and shipped to concentrating plant 207.7 tons of ore, average assay \$24 per ton, and 4 tons first-class, \$265 per ton.

Eureka County.

(From our Special Correspondent.)

Alexandria.—The lessees report that the ore which they followed down from the Lord Byron mine is pinching out. Five out of the nine miners who were employed here have been discharged. On the other hand, it is reported that the Ruby Mining Company, Limited, are considering the purchase of the Alexandria mine and the Excelcior claim, which adjoins it (the latter belonging in part to the Ruby superintendent), but this does not appear probable, in view of the low financial condition of the company.

Diamond Mine.—The output of ore is increasing, and the reports are that the mine is improving, but if the price of silver continues to fall operations at the mine will be suspended.

Eureka Consolidated Mine, Eureka.—Twenty men are employed on day's pay, and a force equal to that number are tributing.

Eureka & Palisade Railroad Company, Eureka.—This company transported over their line during the month of July 2,133 tons of ore as follows: Eureka district, from the Diamond mine, 927 tons; Eureka Consolidated Mine, 195 tons; Richmond Mining Company, 152 tons; Jackson mine, 103 tons; Dead Broke mine, 68 tons; Alexandria mine, 67 tons; Hamburg mine, 52 tons; Idaho mine, 29 tons; Stowell mine, 13 tons; Williamsburgh mine, 12 tons; James Wilson, 11 tons; Bullwhacker mine, 10 tons, and Silver Connor mine, 10 tons; total Eureka district, 1,649 tons. From the Star mine, Union district, 15 tons, and Phillipsburg mine, Diamond district, 34 tons. White Pine district, White Pine County: From Tom Cornell's mine, 95 tons; Paul & Ross, 75 tons; Ross & Siri, 71 tons; Rocko, 66 tons; J. B. Mathewson, 46 tons; Ed. McAllen, 24 tons; Louis Lani, 18 tons, and Bismuth mine, 11 tons; total White Pine district, 406 tons. Nye County: From H. A. Cohen, Morey, 28 tons, and from Reveille 1 ton.

Ruby Mining Company, Limited, Eureka.—There are only two men at work in the Dunderberg tunnel at present. The drill has been hung up for the past week. It is believed here that the company will soon suspend operations entirely. It is reported that the superintendent has given up all hopes of striking ore in the tunnel, a conclusion the miners had arrived at before work was resumed in it.

Storey County—Comstock Lode.

Consolidated New York Mining Company.—At the annual meeting of this company at San Francisco, Cal., on the 6th inst., about 92,000 shares were represented and the old management was re-elected without opposition. The superintendent's report speaks well of the ore developments on the 650-ft. level and says that about 600 tons of ore have been saved therefrom and are now on the dump which will mill from \$20 to \$25 per ton. As there is a likelihood of the Justice mill starting soon, this ore will probably be worked at that mill.

Justice Mining Company.—Following is the latest official weekly letter: "The south raise from the south winze, from No. 2 cross-cut on the 622 level, was advanced 8 ft. during the past week, and is now

up 33 ft. There are 2 ft. of fair grade ore in the top. Have commenced to stope some ore from the north end of the mine on the 822 level, 50 ft. up from the track floor. The pay streak is 18 in. wide and assays about \$25 per ton.

Savage Mining Company.—The latest official weekly letter says: "The usual prospecting and repairing work is being done throughout the mine. The ore stopes on the 950 and 1,100 levels show a better grade of ore."

(From our Special Correspondent.)

The following is the weekly statement of ore extracted from the Comstock mines and milled, the car and battery assays, bullion product, etc.:

Mine.	Tons hoisted.	Car s' sample assay.	Tons milled.	Average bat. assay.	Bullion product for week.	Bullion shipped.
Con., Cal. & Va.	978	23.08	980	19.42	.....	130,024.58
Occidental	175	.....	175	21.40	.....	.....
Overman	.....	.....	.....	.....	.....	.....
Potosi	484	30.30	484	25.30	.....	854½ lbs.
Savage	495	27.12	525	25.03	9,197.00	687 lbs.
Yellow Jacket	.....	.....	.....	.....	.....	.....

¹ Total shipments to July account \$74,047.74.
² Crude Bullion.
³ Cars.

Consolidated California & Virginia Mining Company.—The statement of the ore worked during the fiscal month ending August 6th shows the bullion production to have been the smallest for a long time, and less than half of that produced during the corresponding month of 1891. There were 4,820 tons of ore worked at the Morgan mill, which produced as follows:

Bullion Product.			Y'ld per ton.			Battery Sample assay.		
Gold.	Silver.	Total.	Gold.	Silver.	Total.	Gold.	Silver.	Total.
41,014.33	33,033.41	74,047.74	9.58	7.72	17.30	13.37	10.92	24.29

There having been no dividend declared since August, 1891, it is of interest to note how the bullion output has decreased. The following statement illustrates this:

	July, 1892.	Jan. 6 to Aug. 6, 1893.
Gold	\$41,014	\$345,971
Silver	33,034	549,279
	\$74,048	\$595,250
In 1891	185,010	1,275,397

Rather curiously, as it happened, a letter was received this week from Superintendent Lyman, stating that three bars of bullion had been shipped and credited to the Consolidated California & Virginia Company by mistake. They really were the property of the Comstock Mill and Milling Company, and were valued at \$11,337.01. Query: Is this the Milling Company's profit from the working of the "little joker?" To say the least, it is strange that a mistake of such a nature should be made, and still more strange that the Comstock Milling Company should be owners of bullion.

Hale & Norcross Silver Mining Company.—An assessment of 50 cts. per share has been levied on the stock—another step in the reform programme—and now the street is asking if this is the first of a series. Yesterday the suit of M. W. Fox versus the Hale & Norcross Company came up again before Judge Hebbard upon a motion to retax costs. The cost bill amounted to \$18,279.40, and counsel for defendants objected to almost every item, but particularly to the expenses incurred by searching the mint records at Carson. It was contended that these were merely clerical services by employees of plaintiff's attorney and should not be paid by the losing side to the action. The matter was taken under advisement. H. M. Levy, ex-president of the Hale & Norcross Company, appeared to take an interest in the proceedings, and no doubt inwardly chuckled at the thought of how he had contrived to circumvent the court.

Justice Silver Mining Company.—The work of stoping ore has commenced from the north end of the mine, 822 level, 50 ft. from the track floor. The pay streak is 18 in. wide and assays \$25 per ton.

(From our Special Correspondent.)

It seems as if another scandal in connection with this company was about to be brought to light. On the 5th inst. superintendent of the Consolidated California & Virginia Mining Co. notified Secretary Havens that three bars of bullion (Nos. 4197 to 4199), valued at \$11,337.01 "did not belong to this company, but to the Comstock Mill and Mining Co., it having come to our assay office misdirected. We did not discover the mistake until some time afterward. This bullion, of course, is eliminated from our account." It seemed so marvelous that nearly \$12,000 should go about begging for an owner, and that the claimant that did come forward should be the Com-

stock Mining Co. that some investigations were made by the Mining Stock Association with curious results. The facts developed were brought under the notice of the President of the Consolidated California & Virginia Mine yesterday, and were briefly as follows:

(1) The ore taken from the Consolidated California & Virginia mine is crushed by the mills belonging to the Comstock Milling and Mining Company, which are fully employed in the reduction of the ore of that company. (2) The Comstock Milling and Mining Company, so far as known, neither owns nor controls any ore-producing mines, and therefore have no means of obtaining bullion except from the ore intrusted to them by the Consolidated California & Virginia Company for reduction.

In view of these facts the query was put "Where did the Comstock Milling and Mining Company get their three bars of bullion valued at \$11,337.01?"

White Pine County.

(From our Special Correspondent.)

Keystone Mine and Mill, Ely.—The lessees have been experimenting on the lixiviation of ore from the mine by roasting it under an unusually high degree of heat and then slacking it with water. Two new leaching vats, a 40-H. P. engine and two new boilers have been added to the mill plant. The capacity of the mill is 20 tons a day, but only 8 tons a day are being treated at present. A new pipe of ore has been struck in the mine, which assays about 30 oz. silver per ton. The breast exposes 6 x 10 ft. of ore at a depth of 14 ft. below the surface.

White Pine District.—Reports are very encouraging. The finding of a gold-bearing quartz vein in Cathedral Canyon, below Eberhardt, has given prospectors new hopes. The miners in and about Hamilton are all engaged at work, and the low grade silver ores, which are rich in lead, are finding a ready market in Salt Lake City and California. Reports from the Eberhardt tunnel are encouraging.

NEW MEXICO.

Bernalillo County.

Sandia Mining and Smelting Company.—A few weeks ago Alexander Rogers, Edwin L. Hayes and John S. Thompson sold a three-fourth interest in the Gold Eagle, Virgin Saint, Margaret, Green Tops and Solitaire mines, situated in La Madera district of the Sandia mountains, east of Albuquerque, to New York and New Jersey capitalists for \$225,000. On the 11th inst. the deed was recorded in the Probate Court under the name of the Sandia Mining and Smelting Company. The owners are erecting a large smelter.

Dona Ana County.

Beunett-Stephenson.—The owners of this mine, in the Organ Mountains, near Las Cruces, have decided to put in a large concentrating plant at the mine. Over two miles of pipe have been ordered, which will be laid to conduct a supply of water to the concentrating plant. Within the past three or four years the Bennet-Stephenson property has produced large quantities of ore which have been shipped to smelters, but experiments have proved that it would be more profitable to concentrate the ore before shipping it.

Grant County.

The Silver City correspondent of the New York "Sun" writes as follows: "There has been very little doing in the Silver Creek district during the past month. The Last Chance mill remained idle, and work was suspended on the Maud S. mill about the first of the month. A few men were kept at work on the Confidence, but no ore was reduced in the camp or shipped out. The Maud S. Company has resumed operations, and the new mill will be completed in a few days, but it is not expected that anything will be done in the Last Chance Company mill for two or three months yet. The Confidence Company will build a large mill as soon as the title to the mine can be perfected. The production of gold in Grant County has increased considerably within the past few weeks, and a further increase is looked for, but the total production will fall short of that last year. There is very little doing in copper mines, and silver producers are discouraged. The largest silver producing company in the county will suspend operations about the last of this month, and if it were not for the silver in the lead ores produced here the silver production of the county within 50 miles of Silver City would be small. The ores mined at Cook's Peak contain lead enough to make them pay, and the silver is clear profit, and in some other camps the lead in the ores almost pays the expense of mining, shipping and treatment, and these mines could be worked profitably with silver much lower than it is now."

Cook's Peak Mining Company.—Shipments of ore from this mine are increasing, as there have been several important strikes made during the past month. A great deal of development work has been done in the camp this summer, and the results so far have been very encouraging.

Manhattan Gold Mining and Milling Company.—Another assessment has been levied by this company to carry on the work of driving the Montana tunnel to the main vein on the company's property. This is the third assessment since the reorganization of the company. Work on the tunnel is progressing slowly. The Bremen mill at Silver City, which has

been leased by W. H. Newcomb, will be started up this month. The mill will be run on ore from Chloride Flat and Pinos Altos.

Pacific Gold Mining Company.—The mill at Silver City, which has been idle for several months, has started work again. The mill was closed down on account of lack of water, and the company leased the Mountain Key mill at Pinos Altos, which has been running on ore from the Pacific mine for several weeks. The recent rains have swelled the mountain streams, and an abundance of water is assured for milling purposes for the remainder of the year.

Pyramid Silver Mining and Milling Company, Pyramid.—This company has made a strike in the Viola mine at Pyramid. The ore was encountered at a depth of 200 ft., and the ore body is 4 ft. wide. The ore is native silver and sulphide. The company has expended a very large amount of money in developing the mine. Work was commenced on the property several years ago, but it was not kept up continuously. Legal complications kept the property idle, and it was finally sold under an order of the court a little over four years ago. It was bought in by a representative of the stockholders, and as soon as arrangements could be made work was resumed, and the development which has been carried on so persistently has resulted in this important silver strike.

Lincoln County.

South Homestead, White Oaks.—According to the "Old Abe Eagle" developments will be pushed on this mine, and hoisting works will be put up at once over the new shaft, which is now down 100 ft. The owners expect to reach the ore body on which they were working at the time of the disastrous fire, last year, at the depth of 500 ft.

Socorro County.

Peacock.—This mine and mill at Cooney will be started up by Brown & Martin, lessees, as soon as the rest of the machinery can be put in. The mine has never been made to pay, but the lessees are going to try dry concentrators for concentrating the ore, and are confident that they will be able to save a larger percentage of the assay value of the ore than has heretofore been saved in the mill.

OHIO.

Hancock County.

Northwestern Ohio Natural Gas Company.—The failure of natural gas in the section operated by this company has compelled it to put in an immense pumping station at Bairdstown for the purpose of not only forcing the gas through the mains to Toledo, Detroit and other points, but also to increase the flow of gas. The pumps will have a displacement of 13,000,000 cu. ft. of gas in 24 hours, and it is expected they will furnish satisfactory pressure. This pumping station, however, can produce but a small fraction of the energy that was wasted in the early days of natural gas.

PENNSYLVANIA.

Coal.

The coal company at Highland is stripping large bodies of coal that a few years ago was considered impracticable to secure. Already there are several veins stripped. A new stripping has just been started at No. 2, and this one will equal, if not surpass, the other. A great number of men are busily engaged at present removing the clay, and in a short time it will be ready to have the coal removed.

At the Hazleton mines of A. Pardee & Co. 607 cars were recently hoisted, breaking the mine's record.

Proposals have been asked for sinking one of the new shafts on the Delaware, Lackawanna & Western Railroad Company's grounds back of the Gomer farm near the Lehigh & Susquehanna Railroad in Hanover. The contracts asked for are to sink the shaft 700 ft. more or less, and it is thought by some that the shaft will have to be sunk about 900 ft. before it is completed.

Delaware & Hudson Canal Company.—This company is operating quite extensively with a diamond drill at Miner's Mills, on the Miner tract, to prove the coal deposits at that point. The Red Ash seam will be drilled and if of sufficient value will be opened up, although the vein is not operated by the company anywhere in this region except at the Baltimore tunnel No. 3 opening.

Susquehanna Coal Company.—This company has the Priscilla Lee basin, which is on the Glen Lyon tract, about four miles below Nanticoke, very nearly ready for the work of developing its deposits, says the Wilkes Barre "Record." The Red Ash vein is found at a depth of 840 ft. and runs at about 18 ft. thick, the coal being very bright and showy. The veins will be opened in connection with the big Glen Lyon colliery and can be worked economically.

Upper Lehigh Coal Company.—This company is opening out several small veins at its collieries, near Freeland. There are three in all—6, 3½ and 2 ft. in thickness, and the coal is pronounced as being of a superior quality.

SOUTH DAKOTA.

Lawrence County.

Austin Process of Pyritic Smelting.—The Deadwood "Daily Pioneer" says concerning these patents: "The Austin patents for use in Lawrence County

have been sold to parties who propose to build a 175-ton smelter for pyritic smelting."

Deadwood.—The deal which has been pending between the owners of the Tornado, Harmony and Double Standard properties and Samuel Allerton, of Chicago, Harris Franklin and C. W. Carpenter, of this city has been consummated and the money paid, says the Deadwood "Daily Pioneer." The exact amount is not known, but it is said to be between \$200,000 and \$300,000. The purchaser of these properties is virtually the Golden Reward Company, of which the three above-named gentlemen are the directors. The property purchased consists of three full claims at Bald Mountain, and are considered the most valuable properties in that district.

Hawkeye Gold Mining Company.—The machinery for the 40-stamp mill is expected to arrive in a short time. It will include a 130-H. P. Corliss engine, of the latest pattern, manufactured at Milwaukee, Wis. The stamps will be 850 lbs. each, and the mortars will be the same style as now used by the Homestake Company. All machinery is furnished the company by the Colorado Iron Works, of Denver. It is expected that stamps will be dropping by October 1st.

Seabury-Calkins Mining Company.—Ore shipments from this company's properties, at Carbonate, to the D. & D. smelter began August 10th, says the Black Hills "Times." The ore now being shipped resembles the silver ore found in the Iron Hill mine in 1886-7, and it is reported that arrangements have been made to ship from 15 to 20 tons daily.

Two Bears.—This mine was originally known as the Oro Fino and belonged to a company of that name, but all the rights and properties of that company now belong to the Deadwood & Delaware Smelting Company. The Oro Fino shaft has now been unwatered to a depth of 200 ft. Work will soon be commenced at the stamp mill. The Gilpin County tables will be used after the stamps. The concentrates and non-free milling ore will be sent over to the D. & D. smelter at Deadwood.

Wizard Mining Company.—A strike of lead ore is reported to have been made in this company's ground at Carbonate. The reports state that the ledge is extensive.

Pennington County.

It is reported that prospectors on the west side of Terry's Peak have discovered some bodies of dry ore. That portion of the country is overlaid by jasper, and mining men thought that the chances for finding an extension of the refractory ore belt were small. However, the prospectors continued work and lately succeeded in penetrating the jasper, under which some ledges of dry ore were found, carrying about \$35 a ton in gold, it is claimed.

Addie Mining Company.—Work on the mill foundations is nearly finished. The boilers and other machinery is on the ground, and in a short time it is expected that the mill will be ready.

TENNESSEE.

Tennessee Coal, Iron and Railroad Company.—The Stockade at Tracy City, in which the convicts employed by this company were confined, was burned on the 13th inst. by a mob of miners. The property of the company was first removed, and the convicts, 350 in number, were led out under guard and locked up in railroad box cars. The stockade buildings were destroyed and the convicts sent to Nashville, where they were transferred to the penitentiary. On the 15th a number of armed miners went to Inman, a mining camp of the company, captured 282 convicts and 27 guards and sent them by rail to Nashville. There was no conflict at Inman, and none of the company's property was destroyed. An attack on the stockade at Oliver Springs was made on the next day. The mob was repulsed by the guard and lives are said to have been lost on both sides. On the 17th the stockade fell into the hands of the miners. Several companies of militia were sent from Knoxville and Chattanooga for the reinforcement of the guards, and reached there in safety. The troubles reached a crisis on the 18th, the miners making an attack in force upon the camp of State troops at the Coal Creek convict stockade. The wires around Coal Creek were cut early in the day, but it is reported that three assaults were made upon the fort, each of which was repulsed with loss of life on both sides. In one of these attacks several of the miners' leaders were captured, and during a truce, in which overtures were made for the release of three prisoners, Colonel Anderson, the commander of the troops, fell into the hands of the mob. The State militia and small bodies of sheriff's deputies, recruited at Knoxville, Chattanooga and other points, were sent to the scene of the troubles during the day, but there is no definite information as to their whereabouts.

UTAH.

Salt Lake County.

Agnes.—The shaft is now down 60 ft., with 2 ft. of good ore in the bottom of the incline. This mine is located on York Hill, and joins the York mine on the south. It is supposed to be a continuation of the York vein. The owners have taken out 20 tons of ore that assays 70% lead and 29 oz. silver from the incline while sinking.

Argentine.—Operations have been resumed on this

group, located on Copper Hill, and the work on the tunnel is being pushed with two shifts.

Emma Mining Company.—This company has a force of 15 at work, and is making regular shipments. New boilers and a drilling plant has just been put in.

Salt Lake.—According to the Salt Lake "Tribune" Prof. Elwyn Waller, of Columbia College, is now in Salt Lake looking for suitable lead ores to be used in making lead white direct from the ore by a process invented by himself. Prof. Waller is now erecting a plant for this purpose in New York City.

Summit County.

Chalk Creek Mining Company.—The Chalk Creek Mining Company is now operating, says the Salt Lake "Tribune," their mine situated in what is known as Allen's Hollow, on the same coal vein as the Wasatch mine. Recently the company commenced the sinking of a shaft, and it is expected that the vein will be reached in six weeks. It was supposed that this vein would be found at a depth of 280 ft. judging from the old workings on the incline. It is now down 200 ft. and the rock indicates the near approach of coal. A fault in the vein between the outcropping and the present shaft makes it impossible to calculate exactly the depth of the coal.

Ontario Mining Company.—Active preparations are going forward at the mill to place the gas plant to be used in drying and roasting ores. Grading is being done for coal bunkers, and cement floors are being laid. The whole arrangement will probably be completed next month.

Weber County.

La Plata Mining Company.—This mine has a shaft 165 ft. deep on a 30-ft. ledge, the walls being lime on the foot and shale on the hanging. A drift has been run at the 50-ft. level a distance of 110 ft. north, and another 200 ft. to the south. Another drift has been run at the 150-ft. level, 35 ft. north, and one 40 ft. south, with a cross-cut of 10 ft., all showing high grade lead ore. Considerable ore has been mined and shipped from this property, and with the additional facility afforded by the use of an improved hoist and engine there is no doubt that the mine can be worked at a profit. The assays show 5 oz. in silver and 70% lead.

WASHINGTON.

Snohomish County.

Puget Sound Reduction Company, Everett.—This company has located its smelter at the mouth of the Snohomish, near the works of the Steel Barge Company. The company has a paid up capital of \$90,000, and will begin work immediately on the work of erecting one of the largest smelters and reduction works in this part of the country.

WISCONSIN.

Iron.

Ashland.—Shipments of iron ore from this place for the season to Aug. 10 were 1,230,523 tons, of which 623,731 tons were from the Wisconsin Central docks and 604,792 from the Lake Shore docks. From Two Harbors, Minn., to the same date shipments were 595,548 tons; from Two Harbors, Mich., 562,278 tons.

WYOMING.

Albany County.

Anglo-American Oil Company.—The well of this company on Powder Creek is now down 150 ft. and is in shale. Oil is not expected under a depth of 900 ft.

Sheridan County.

Fortunatus Mining Company.—A correspondent of the Rapid City "Daily Republican" says, concerning this company and its district: "The Bucyrus electric amalgamator, which is being put in by the Fortunatus Mining Company for the purpose of working the Bald Mountain placers, arrived at Sheridan Aug. 9th, and is being freighted to the camp, which is located near the summit of the range and about 45 miles from Sheridan. Test work done during the week by this company by means of ordinary sluicing shows the average to be about \$1.25 per cu. yd. A stamp mill will be erected to work the gold-bearing cement."

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

Lucky Jim Mine, Kaslo City.—According to a "special" to the Spokane "Review," this "camp is filled with rumors regarding the failure of the Lucky Jim mines recently bonded for \$40,000 by Dr. Kilbourne, of Seattle. The report has been asserted and denied frequently, but to-day your correspondent met a dozen men who had seen the property, and who stated that the mine was to all appearance dug out, there having been no ore in the bottom of the shaft for several days. Naturally this news has cast considerable gloom over the camp, as naturally enough a fear is expressed that other big surface showings on the Kaslo side may prove to be blowouts too."

GREAT BRITAIN.

The gold mining industry in Wales is not yet dead. The Crown granted a small plot near Gwynfynydd, in Merionethshire, in December last to a gold-prospecting company, with a capital of £500, and during

the six months ending midsummer it is said to have distributed £6,000 as the result of its efforts, being a return of 1,200% upon its investment. The diggers have just struck a vein of auriferous quartz, said to be 4 ft. thick. Specimens have been sent to the assayers in London, and a yield of 12 oz. per ton is declared. On the original Morgan mine a new find of 12-oz. quartz is reported, but whether Mr. Morgan will care to commence work again is a doubtful question. There is no doubt about the existence of gold-bearing quartz in Wales and in some parts of Ireland, but the terms on which the land can be obtained and the royalties claimed by the government on the output are sufficient to cripple the miners' operations.

JAPAN.

Innai Copper Mine.—Advices from Japan say the Innai copper mine in Akitaken, Japan, was inundated on July 14th by a sudden overflow of the River Ginzan. One account states that 60 miners were drowned.

MEXICO.

Chihuahua.

Nuestra Senora de Loreto.—While running a cross-cut in this mine at Candamena to tap the main lode, two other veins carrying rich ore were unexpectedly encountered, it has been stated. A short time ago negotiations were pending for the sale of this property to an English syndicate, but they were not brought to a successful issue. For many years this mine has been offered for sale, but while it contains large quantities of high grade ore the price asked has been too great to close a deal. It is owned by A. Ruyval and others of Chihuahua.

LOWER CALIFORNIA.

(From our Special Correspondent.)

An onyx mine, situated 170 miles south of the line and belonging to the estate of C. Murillo, A. Villavicencio, P. Espinoza and J. L. Clark, has been sold to an Eastern syndicate for \$50,000. The mine is considered one of the most valuable of its kind, and will now be developed on a large scale.

SOUTH AFRICA.

A rather remarkable statement regarding the cost at which gold may be won in Mashonaland has been published at Johannesburg, on the authority of Mr. Borrow, whose name carries considerable weight on such a point. At Hartley, he says, the gold has been worked at a cost of 25s. 6d. per ton of quartz— which means that any yield over 8 dwt. to the ton would leave a profit. Just now the yield averages about 20 dwt.; so that, on Mr. Borrow's basis, gold mining in Mashonaland has already justified itself. But it is hardly possible to believe that mining in such a remote locality should cost only 11s. per ton, explosives 3s. 6d., fuel 2s., carting 1s., and milling 8s. per ton. It is reported, moreover, that the American engineers who recently examined properties in this district came to unfavorable conclusions concerning them, considering them partially, if not entirely, exhausted by previous mining, the present workings in several instances having encountered, at a considerable depth, the tunnels of previous workers.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, August 19th.

Heavy Chemicals.—The past week has been one of quiet trading in the market for heavy chemicals. In no particular has there been any change since our last report. There has been some inquiry for caustic soda for future delivery, but whatever actual business has been done has been of the same jobbing nature as for weeks past. For carbonated soda ash and alkali the demand has been almost entirely for future shipments; some sales for delivery over next fire are reported. Sal soda, both American and foreign, is quiet and the same may be reported of bleaching powder. Our quotations this week are as follows: Caustic soda, 60%, 3-17½@3-20c.; 79%, 2-95@3-12½c.; 74%, 2-97½@3-12½c.; 76%, 3-12½@3-25c.; 77%, 3-12½@3-25c. Carbonated soda ash, 48%, 1-60@1-62½c.; 58%, 1-52½@1-55c. Alkali, 48%, 1-50@1-55c.; 58%, 1-47½@1-52½c. Sal soda, English, 1-07½@1-15c. American, 1-05@1-10c. Bleaching powder, 2-15@2-20c. on the spot, according to quantity.

Acids.—Generally speaking the acid market continues fairly active. There has been an improved demand for a certain acid and some dealers report firmer prices although this does not hold good in Connecticut; prices there continue low. We quote: Acid per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, \$1.50@1.75 according to quality; muriatic, 18° 80c.@1; 20°, 90c.@1.10; 22°, \$1@1.25; nitric, 40°, \$4; 42°, \$4.50@4.75; sulphuric, 85c.@1.10; mixed acids, according to mixture; oxalic, \$7.25@7.75. Blue vitriol is quoted all the way from \$3.25@3.50; alum, lump or ground, \$1.55@1.80. Glycerine for nitro-glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—A fair business has been done in this market. Prices have advanced and we quote this week: On the spot best unmixed seconds, \$24.50 to \$25, best unmixed thirds, \$23.75 to \$24. To arrive, 50c. less.

Fertilizers.—The fertilizing chemical market just now is dull, but strong. An improved demand from

WESTERN SHIPMENTS.

	1892.		1891.
	Week.	Year.	
Pittsburg, Pa.....	23,424	789,399	785,198
Westmoreland, Pa.....	34,568	1,021,547	1,276,171
Monongahela, Pa.....	18,638	380,930	374,171
Total.....	76,630	2,191,866	2,435,540

Grand total 410,737 12,563,622 13,315,290
 PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending August 13th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 86,700 tons; year, 3,342,245 tons; to corresponding date in 1891, 2,368,217 tons.

Anthracite.

The anthracite coal trade is in no means a strong position. The output is in excess of the demand, and consequently the storage plants are crowded to their limiting capacity, and there is also a great deal of coal in cars on the railroads. The collieries are only working three days a week, and the amount of mining is regulated from day to day, so that no more shall be mined than can be accommodated in cars or storage plants. The consumption will be further reduced on account of the railroad strike at Buffalo, for at present it is impossible to ship any coal to the west. The coal agents will meet again on the 25th of this month. It is said that they intend to put up the prices by 25 cents all round. If they consider the present situation, however, as sketched above, they will probably decide to defer any further advances in the price.

The figures for the output during July are given in the tables above. It will be seen that the output was 136,915 tons less than in July, 1891. The stocks of coal on hand at tide water shipping points has also increased by 33,751 tons, but this figure does not by any means reflect the increased accumulation of unsold coal. The total excess of production for the first seven months of the year over the corresponding period of 1891 is now reduced to 1,301,230 tons. Judging by the accumulation of stocks and by the slower demand, we should not be surprised if the production during the last five months of the year does not show an increase over that during the last five months of the previous year.

We hear of many mill owners and manufacturers who are altering their furnaces in order that they shall be able to burn bituminous instead of anthracite. For industrial purposes bituminous coal is always better than anthracite as far as the relation of thermal value to cost goes, and when efficient smoke-preventing hituminous furnaces are introduced, the sole drawback of bituminous will be removed. There are many excellent smokeless bituminous furnaces in Great Britain. It is possible that something similar will be introduced here.

Nothing has been heard of the legal proceedings against the Reading combination during the past week. Rumors, however, have been circulated in Wall street about a decision adverse to Reading's lease of the Jersey Central, and it had the effect of lowering the value of the Reading stock for a time. This was merely a stock-jobbing canard, for there is no likelihood of a decision just yet. When the decision does come it will in all probability be in favor of the Reading lease, and even if it were not there is nothing to prevent a business arrangement and private agreement not to cut rates. As we have said before, the solution of the coal question rests entirely on trade principles and not on State interference. If people do not care to pay the increased price demanded by anthracite coal dealers, let them not pay it but buy something else. Then the anthracite people will make concessions for the regaining of custom.

The strike at Buffalo is having a considerable effect on the Western anthracite trade. The shipments in that direction are stagnating and consequently the coal is thrown more largely on Eastern markets. The Western trade has grown enormously during the last few years, in fact during the 15 or 20 years that it has been a factor in the anthracite trade. To give some idea of its rapid growth we may state that westward shipments by lake from Buffalo in July were 425,785 net tons, as compared with 311,500 net tons in July, 1891, and 244,320 net tons in July, 1890. It would thus be seen that a contraction in Western shipments will have considerable effect on the trade generally. One thing that helped to precipitate the strike at Buffalo was the opening of the new line of the Lehigh Valley. The Reading began last week to operate the through line between Buffalo and Philadelphia without using the Erie tracks. The Lehigh Valley and the Erie are joint owners of the Buffalo Creek, which is the belt line in Buffalo. They opened passenger business last week, and the natural result was the dismissal of a number of switchers. This precipitated the strike. The company will have its way, of course, and the strikers may have to choose between the penitentiary and immigration.

Bituminous.

The bituminous trade is in much the same condition as last week. There is little new business, but contractors are generally taking their usual amount. The shortage of cars is giving a good deal of difficulty, and in consequence there are more orders for shipping at all the ports than can be filled. For a day now and then the block on the Pennsylvania Railroad becomes eased, but the difficulty again becomes as great as ever. There is a plentiful supply of vessels at Philadelphia; in fact, much greater than can be engaged. In consequence freight rates are low. To Sound ports the rate is 60@65c.; to Boston, 60@65c.; to Portsmouth, 65@70c., and to Portland, 60c. At Baltimore vessels are scarce and

rates are 10 cents higher all round. Bituminous dealers are complaining of the low price of the small grades of anthracite, but they think that the remaining stocks of pea and chestnut are so slaty that they will not hold out as long as competitors with bituminous.

NOTES OF THE WEEK.

The friends of the New York & New England Railroad are dilating with some force on the visible benefits of the alliance with the Reading system over the Poughkeepsie Bridge system. If this connection is of so much importance to the New England, and it seems already that it is valuable, the same is true in the results bearing on the Reading. The traffic contract, through which the arrangement was made, is very favorable to the Reading; so if the alliance is proving so good to the New England, it must be equally satisfactory in its returns to the Reading.

The Hocking Valley Coal Company has been offering its shares in England upon the following statements: This company is formed for the purpose of acquiring five freehold coal mining properties in the State of Ohio, U. S. A., consisting of a total of 4,087 acres, with their plant, machinery, buildings, etc., as now existing. The capital is £300,000 in 300,000 shares of £1 each. Connected with one mine, the Poston, is an elevated railroad used for coaling the engines of the Hocking Valley Railroad, with which company there is a favorable contract running for the supply of 150,000 tons of coal per annum. The total estimated quantity of coal on the properties acquired by the company amounts to 62,390,000 tons, of which 46,790,000 tons is estimated to be lump coal. There are already proved three workable seams, of which one is in operation, and it is estimated that there is sufficient coal in this seam alone to maintain the present output for upward of 25 years. General Axline, the present owner of the properties, has made the following affidavit as to past earnings and output: "That the output for the year 1889 amounted to 360,000 tons, and that the net profits of the said properties for the same year amounted to \$161,000; also that the output of the said mines for the year 1890 amounted to 380,000 tons, and the net profits to \$171,000; also that the output of the said mines for the year 1891 amounted to 660,000 tons, and the net profits to \$250,000." The reports state that the mines are capable of a largely increased output, but assuming that the profits do not exceed those of the year 1891, as above stated (£51,546), after paying a dividend of 10% on £300,000 there would be a surplus of £21,546. The purchase price is £290,000, payable in shares or cash, or partly in cash and partly in shares, at the option of the directors, the remaining £10,000 of the share capital being reserved for issue as additional working capital if required. The vendors are prepared to accept at par in payment of the purchase money any shares that may not be subscribed by the public.

Boston.

August 17.

This has been another quiet week in the anthracite coal market. Dealers generally are moving very little coal and consequently their stocks are being reduced but slowly. Prices are very firmly maintained.

We quote f. o. b. prices at New York; stove, \$4.50; egg, \$4.20; free broken, \$3.90; chestnut, \$4.40; Lykens Valley (at Philadelphia), broken, \$4.75; egg, \$5.25; stove, \$5.75; chestnut, \$4.75.

There is nothing new to note in the bituminous coal market. Trade is light and prices easy, but steady. We quote: Clearfield, \$3.10@3.15; George's Creek, \$3.40@3.45 on cars here.

The freight rates are the same as a week ago, but are still easy. We quote: From New York to Boston, 50@—c.; from Philadelphia to Boston, 60@65c.; from Philadelphia to Portland, 65c.; to Bath, 75@80c.; to Providence, 65c.; from Baltimore to Boston, 70@—c.; Newport News to Boston, 70@75c.; Sound Points, 65@70c.

The retail demand for coal is very inactive at present; few seem to want coal, and those who do in small lots. Prices are firmly maintained, however.

We quote: Stove, \$6; nut, \$6; egg, \$5.75; furnace, \$5.50; Franklin, \$7.25; Lehigh egg, \$6; Lehigh furnace, \$6. Wharf prices are 50 cents less than the foregoing.

Buffalo.

August 18.

(From our Special Correspondent.)

Anthracite coal quiet at unchanged quotations. The impression prevails that an advance may be expected September 1st.

Bituminous coal in moderate demand and prices nominally without variation. The strike if continued for any length of time will curtail stocks and coal will be higher.

By the by, the strike of the railroad switchmen here is becoming more and more serious every day; but, as your readers are cognizant of what is going on, comment is unnecessary, except that it may be mentioned that the shipments of coal by lake have fallen off for lack of supply, and nine-tenths of the vessels leaving this port go "light." The tug fishermen have also struck!

Shipbuilding continues very active; about 36,000 gross tonnage is now under way, and will be ready by the spring of 1893. The cost of this tonnage will be over \$2,000,000.

The shipments of coal westward by lake from August 10th to 16th, both days inclusive, were only 59,510 net tons, distributed about as follows:—21,500 to Chicago, 17,705 to Milwaukee, 4,900 to

Duluth, 1,500 to Superior, 3,775 to Toledo, 2,000 to Houghton, 1,000 to Menominee, 2,230 to Racine, 2,500 to Ashland, and 2,100 to Washburn. The rates of freight was 60c. to Chicago, Milwaukee and Menominee; 35c. to Duluth, Ashland, Washburn and Bay City; 50c. to Houghton and Portage; 70c. to Kenosha and Racine; 40c. to Marine City and Saginaw; and 25c. to Toledo. Closing firm.

The coal movement by canal for the second week in August, as follows: Receipts 653 net tons, and shipments 966 net tons.

Chicago.

August 18.

(From our Special Correspondent.)

The trouble at Buffalo if not speedily settled will, before long, seriously affect the fueling docks and all rail shipments of anthracite coal. Direct shipments from mines will also be much impeded by the strike of the men on the Chicago & Erie R. R. and its connections and already a good deal of coal is sidetracked along the divisions of this and other roads. Shippers' agents here state that unless the strikes are quickly adjusted, and a settlement effected before end of month, car coal for through shipment to points west and northwest of Chicago will be almost entirely suspended. The trouble, if at all prolonged, will completely demoralize the hard coal trade, and the consequences be disastrous to the interests of the trade. The presence of the leading officials of the various trunk lines affected gives a more reassuring aspect to the situation.

From outside points in Iowa and Wisconsin there is a better inquiry springing up, but country orders average a very small number of cars; that is to say, dealers who in previous seasons had ordered in lots of 50 to 100 cars are now taking 5 to 10 cars at a time, being evidently afraid to come right into the market and buy as they have done heretofore. Several shippers' agents who have generally enjoyed a good trade at all Missouri River points report an alarming condition of business. Said one: "With coal at \$9.05 per net ton, equal to \$10.14 gross, to which retailers' profit must be added, is it to be wondered at that orders are small, few and far between? Then, again, when it is considered that bituminous coal is abundant, cheap and of good quality, is it at all extraordinary that Western dealers hesitate to place business? Let the gentlemen in the East who control prices pause before they make any further advances. According to an agent of a prominent individual company his principals ask what is the reason that consumption has not increased as rapidly as the growth of the country and the increased wealth of this great Western country?"

The question will not have to seek far for a solution. Many prominent people are already taking out their hard coal stoves and replacing them with new soft coal burners. With some of the dealers retail trade is increasing to some extent, though in a general way it is admitted by most of them that it is slow, very slow, for the season.

Bituminous coal is already beginning to look up, and while the tonnage for the first half of the current month was light there is now a better movement to the country trade. The total for the month will show a fair volume of increase. Some shippers report an increase of 50% in their business for July this year over that of the corresponding month in 1891. Deliveries on railroad contracts continue large, and in one instance we know that a certain terminal road, with branches to lake ports north of here, have requested lake shipments to be completed by October 1st. This is taken as an indication that the road looks either for trouble on the lake or an early close of navigation, as deliveries according to contract should extend to November 15th, or close of navigation. Demand is heaviest for Indiana block, Hocking and cheap Illinois grades, on which there is small margin for profit, and circular prices are shaded. Those on northern Illinois coal are better maintained.

Coke continues in light demand, and little improvement is looked for until foundries and other consumers are more actively employed. Crushed domestic is in fair inquiry.

Quotations are: \$1.05 furnace; \$5.05 foundry crushed; \$5.40 Connellsville; West Virginia, \$3.90 furnace, \$4.10 foundry; New River foundry, \$1.75; Walston, \$4.65 furnace, \$5 foundry.

Circular prices are at the following rates: Lehigh lump, \$6.50; large egg, \$5.60; small egg, range and chestnut, \$5.85. Retail prices per ton are: Large egg, \$7; small egg, range and chestnut, \$7.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, \$3.15; Hocking Valley, \$3; Youghiogheny, \$3.25; Illinois block, \$1.90@2; Brazil block, \$2.35.

Pittsburg.

August 18.

Coal.—The market since our last has not been a very active one; still, taken as a whole, we see no reason for complaint. A rise of 2½ feet in the Alleghany river gave sufficient water in the Ohio to enable the tow boats that were detained above Cincinnati to reach port. This was just what the coal men wanted. The empties were forwarded to the ports to be loaded to take advantage of the first rise. Pittsburg coal in Cincinnati advanced 50 cents per ton; the advance will likely continue at least until we have a rise in the river which is not looked for before October and possibly later. Within a few days quite a large amount of coal lands have changed owners, including a lease of 5,000 acres in Sewickey township, and nearly every acre in that locality has been leased.

Connellsville Coke.—We have to report a dull and

Strong Softener No. 1, \$15.25; Ohio Strong Softener No. 2, \$14.25; Jackson County Silvery No. 1, \$17.30; Jackson County Silvery No. 2, \$16.80; Lake Superior Charcoal, \$16.50; Tennessee Charcoal, \$17; Southern Soft No. 1, \$14.15; Alabama Car Wheel, \$13; Hanging Rock Charcoal, \$20.50.

Chicago. August 19.
(From our Special Correspondent.)

The settlement of the iron scale between the Amalgamated Association and the Western Iron Masters gives general satisfaction. It is nevertheless true that some manufacturers have refused the scale in its present condition and some of the men refuse to work under the old scale, so that it may yet be some little time before all the mills are in operation. The price for puddling iron remains the same, \$5.50, but in the finishing departments a reduction of 10% has been made. The larger rolling mills in the valleys adjacent to Pittsburg are apparently in no hurry to sign the scale or to start up, and to them it is not satisfactory, but that they will do so does not admit of a doubt, as some of them have already had to buy iron from outside mills to complete August shipments on season's contracts which has cost them 1.70c. rates to Chicago. The six weeks' shut down has been the means of cleaning up the old stocks of finished iron and steel, and in that respect has been of material benefit. Demand for crude iron here is comparatively light for local coke and charcoal, with little hope for improvement in the very near future. Finished iron is in fair demand and a more active movement is anticipated after the mills get started.

Pig Iron.—In a general way transactions are chiefly confined to small quantities, ranging from carloads to several hundred tons of local coke iron. A rather peculiar condition exists in the iron market, and on some of the prices named we know that the grade of iron quoted would not be delivered. In other words, the figures quoted by some sellers often applies to a grade below that which is bought. Thus, a price is quoted on No. 2 foundry, and No. 3 is delivered. A sale of 2,000 tons of Bessemer pig is noted at \$15.50, and there is almost any quantity of business pending an early settlement of the steel scale. Some of the large malleable iron concerns would buy Lake Superior charcoal if they could get future deliveries as cheaply as the spot article is quoted. Southern coke iron is in some little demand, and prices rule low, though some offers made by consumers are often rejected as being unreasonably low. There is a limit below which agents refuse to go. Concessions are the rule and any fair offer is accepted.

Quotations per gross ton f. o. h. Chicago are: Lake Superior charcoal, \$16.55@17.00; Lake Superior coke, No. 1, \$14.50@15; No. 2, \$14@14.25; No. 3, \$13.75@14; Lake Superior Bessemer, \$16.50; Lake Superior Scotch, \$15.50@16; American Scotch, \$16.75@17.75; Southern coke, foundry No. 1, \$14.50; No. 2, \$13.25; No. 3, \$12.50; Southern coke, soft, No. 1, \$13.25; No. 2, \$12.50; Ohio silveries, No. 1, \$17; No. 2, \$16.50; Ohio strong softeners, No. 1, \$17; No. 2, \$16.50; Tennessee charcoal, No. 1, \$17; No. 2, \$16.50; Southern standard car wheel, \$20@21.

Steel Billets and Rods.—Inquiry is light for billets and only fair for rods. Prices are steady at \$24.50 for the former and \$34.50 for the latter.

Structural Iron and Steel.—Figures are now being taken on quite a number of important buildings. Contract prices remain without improvement. Bridge material is in great demand and some shapes are hard to get. Regular quotations, car lots f. o. h. Chicago, are as follows: Angles, \$2@2.25; tees, \$2.50@2.40; universal plates, \$1.95@2; sheared plates, \$1.95@2; beams and channels, \$2.25@2.50.

Plates.—While the demand from store has been large owing to the heavy stocks carried here, all orders have been filled promptly. Demand is good and prices are stiffening. Steel sheets, 10 to 14, \$2.30@2.40; iron sheets, 10 to 14, \$2.20@2.30; tank iron or steel, \$2.10@2.15; shell iron or steel, \$2.75@3; firebox steel, \$4.25@5.50; flange steel, \$2.75@3.00; boiler rivets, \$4.00@4.15; boiler tubes, 2 1/2 in. and smaller, 60%; 7 in. and upward, 70%.

Merchant Steel.—While the season for contracts from implement manufacturers is about over, it is well to note that the tonnage to be consumed by Western makers during the coming season will be greater than ever before. Steel makers who cater to this trade are well pleased with the orders booked. We quote tool steel, \$6.50@6.75 and upward; tire steel, \$2.10@2.20; toe calk, \$2.40@2.50; Bessemer machinery, \$2.10@2.20; Bessemer bars, \$1.75@1.80; open hearth machinery, \$2.40@2.60; open hearth carriage spring, \$2.25@2.30; crucible spring, \$3.75@4.

Galvanized Sheet Iron continues in excellent demand, stocks badly broken and mill shipments slow. Discounts are steady at 70 on mill lots, and 67 1/2 on Juniata, and 67 1/2 and 5% off on charcoal from warehouse.

Black Sheet Iron.—Demand is all that could be desired and still shipments heavy to jobbers. Quotations remain steady at 2'90@2'95c. for No. 27 Common, f. o. h. Chicago. Steel sheets are 10c. higher. Dealers quote 3'10@3'20 from stock, same gauge.

Bar Iron.—Some large consumers who have withheld orders are now being forced into the market, and 1'52 1/2@1'55c. is the best they can do just now for prompt or early delivery, and 1'50 is asked for

September and October delivery from mill, equal to 1'65@1'67 1/2c. Chicago. Demand from warehouse is active at 1'90@1'95c. rates.

Scrap.—Stocks are heavy in dealers' hands and sales light. Quotations are nominal, No. 1 railroad, \$15; No. 1 forge, \$14; No. 1 mill, \$9.50; fish plates, \$17; axles, \$19; horseshoes, \$15.50; pipes and flues, \$7; cast borings, \$6.50; wrought turnings, \$9; axle turnings, \$10.50; machinery castings, \$10; stove plates, \$8.50; mixed steel, \$10.60; coil steel, \$14; leaf steel, \$15; tires, \$14.50.

Old Material.—A sale of 500 tons of iron rails is reported at equal to \$17.75 Chicago. Improvement is expected when mills get started. Old steel rails are held \$12@14, according to length and condition. Old car wheels are very dull at \$14.50@14 75.

Nails.—Steel cut are in good request from mill at \$1.60@1.62 1/2, 30c. average; jobbers quote \$1.75 in less than car lots from stock. Wire nails are in moderate demand at \$1.70 base Chicago and \$1.80 from stock in small lots.

Steel Rails.—While contracts for steel rails placed during the present year have been for smaller amounts than usual it is gratifying to note that the aggregate tonnage of shipments made during the first half of 1892 is in excess of either the first or second half of 1891. Should the same demand continue during the remainder of the year, which seems probable, 1892 will make a good showing as to amount of rails used this year. The fact is we are only just commencing to feel the benefit of the enormous crop of last year. Quotations are steady at \$31, other supplies are quiet at \$1.70 for iron or steel splice bars; spikes, \$2.05@2.15 per 100 lbs.; track bolts, hexagonal nuts, \$2.65; square, \$2.55.

Louisville. August 12.
(Special Report by Hall Brothers & Co.)

The market is still dull, some few inquiries, but fewer sales and at the lowest prices yet heard of. Iron seems to have lost its prominence; some are bold enough to assert their belief that an improvement will shortly show itself, while others see no ground for an early improvement. Stocks continue to increase. A buyer only has to name a figure to buy what iron he wants. It is difficult to believe that iron will drop further; many looked to August to change the iron situation, and it may yet. It will require a persistent buying movement to start an advance in iron. Upon the whole, it is difficult to give any but approximate figures which are about as follows:

Hot Blast Foundry Irons.—Southern coke No. 1, \$13@13.50; Southern coke No. 2, \$12.25@12.50; Southern coke No. 3, \$11.75@12; Southern charcoal No. 1, \$16@17; Southern charcoal No. 2, \$15.00@15.50.

Forge Irons.—Neutral coke, \$11.50@12.00; cold short, \$11.25@11.50; mottled, \$10.75@11.

Car Wheel and Malleable Irons.—Southern (standard brands), \$20@21; Southern (other brands), \$18.50@19.50; Lake Superior, \$19.50@20.50.

Philadelphia. August 18.
(From our Special Correspondent.)

Pig Iron.—The increasing output of Eastern rolling mills and the gradual resumption taking place in Western mills, has imparted an impetus to the demand for forge iron, in which the standard brands are most sought for. Besides this, the decreased output, as shown by recently published statistics, satisfy many that the safe limit of restriction has been reached, and that there are probabilities of a reaction. This condition of things has brought out inquiries for large lots for late delivery, but as yet only a few sales have been definitely made at \$13. As to foundries, there is nothing new to say, and liberal sales of northern are being made at \$15 for No. 1 and \$14 for No. 2.

Muck Bars.—Bars are once more in good demand at an asking price of \$26.50 for best.

Blooms.—Blooms have been very active within a few days, but while there has been no decided advance there are strong indications that July quotations will not hold long.

Merchant Iron.—What amounts to another advance has taken place. Storekeepers are running down their stock at 1.85 to 1.90. Some mill orders are being taken at 1.85, though most of the business in hand is at 1.65 and 1.70.

Nails.—There is continued activity in nails, and storekeepers are selling at 10 cents higher than July quotations.

Sheet Iron.—All the sheet mills are running full time and prices are quietly creeping up, though card rates have not and probably will not be advanced.

Skelp.—A few sales of skelp were made at 1'65@1'85.

Wrought Iron Pipe.—Small orders have been hooked within a few days and more business is expected, but prices are very low indeed.

Plate and Tank.—All the mills are crowded with business at advanced and advancing prices.

Structural Material.—Business is presented faster than accepted. Prices have been advanced all round. Beams, tees and channels are quoted at 2'40. Builders needing small lots are very urgent.

Steel Rails.—Some new business has been booked at \$30.

Old Rails.—More are offered than are wanted. Quotations nominally \$20.

Scrap.—Railroad No. 1 is quite plenty, but brokers are refusing some of the low offers made, expecting better prices later on.

Pittsburg. August 18.
(From our Special Correspondent.)

Raw Iron and Steel.—The market for pig iron may be said to have undergone scarcely any change, notwithstanding the signing of the Amalgamated scale by certain manufacturers. There are parties who still decline to sign unless a reduction is made on certain articles. Those who seem to be aggrieved are still holding meetings, endeavoring to arrange matters satisfactorily; how will be learned later on. The market for pig iron remains about the same, except that owing to further concessions on the part of Southern furnaces prices continue weak and unsettled.

The accumulation of pig iron at certain furnaces, especially forge descriptions, has stimulated the Southern producers to make special efforts to supply the wants of the mills that have gone and will go into operation during the present month. Notwithstanding the low prices quoted, however, buyers show no intention of departing from the usual custom of purchasing only such material as they require for immediate use. Even with the close competition for business, and the lack of firmness on the part of makers, an increase in the demand for finished forms of iron and steel is confidently expected to have a beneficial effect on the market for crude material.

While stocks at the furnaces are large the rate of production is lower than at any previous time during the past two years. The figures for August 1st show a decrease of 68 furnaces in blast and a reduction of 33,947 tons in the weekly production as compared with the showing on January 1st. The present low prices, in connection with the increased consumption, ought to create an entirely new sentiment. Stocks are undoubtedly large and capacity for production vary much in excess of all ordinary requirements, but the extremely low prices now ruling ought to be specially attractive, as the current supply from this time forward is likely to be less than current consumption, unless higher prices act as an inducement for "blowing in" additional furnaces. It is too soon yet to form any very definite opinion in regard to what may be done in the immediate future, but at the same time it may be regarded as absolutely certain that bottom prices have been reached, and that a reaction toward higher prices is only a question of short time.

Since the first of August our city furnaces have sold over 20,000 tons Bessemer for delivery during the next ninety days; this fact confirms the view noted above that bottom prices have been reached, the buyers being among the best informed manufacturers who would certainly not purchase so large an amount for future delivery if they had the remotest idea that prices would be lower. There is certainly no risk in purchasing standard Bessemer pig at \$14, and no persons are better aware of the fact than the parties who have secured their fall supply. The steel rail mills report little new business, the only orders placed being for small lots. The current rates at the works are \$29.00 f. o. h. cars. Structural material in steady demand. Steel beams 2 @ 2 1/4; channels 1 1/2 @ 2; angle 1 1/2, @ 1 1/2.

Coke Smelted Lave and Native Ores.

3,000 Tons Bessemer, City Furnace	\$14.00 cash.
2,000 Tons Bessemer, City Furnace	14.00 cash.
2,000 Tons Bessemer, City Furnace	13.90 cash.
1,500 Tons Grey Forge, City Furnace	12.50 cash.
1,000 Tons Grey Forge	12.50 cash.
1,000 Tons Grey Forge	12.50 cash.
1,000 Tons Grey Forge	12.50 cash.
500 Tons Grey Forge	12.50 cash.
500 Tons Bessemer	14.00 cash.
225 Tons Open Mill	12.15 cash.
200 Tons White and Mottled	12.00 cash.
100 Tons Grey Forge	12.75 cash.
100 Tons No. 1 Foundry	14.75 cash.
100 Tons No. 2 Foundry	13.75 cash.
75 Tons No. 2 Foundry	13.50 cash.

Charcoal

100 Tons Cold Blast	24.00 cash.
100 Tons No. 1 Foundry	20.00 cash.
100 Tons No. 2 Foundry	19.00 cash.
100 Tons No. 3 Foundry	19.00 cash.
50 Tons Cold Blast	5.00 cash.
50 Tons Cold Blast	26.00 cash.
25 Tons Nut Foundry	20.00 cash.

Steel Slabs and Billets.

2,000 Tons Billets and Slabs	23.75 cash.
1,000 Tons Steel Slabs	24.50 cash.
1,000 Tons Billets, spot	25.00 cash.
1,000 Tons Billets, prompt	24.75 cash.
500 Tons Steel Billets, August	24.25 cash.
200 Tons Steel Billets, spot	25.00 cash.
100 Tons Steel Billets, spot	23.15 cash.

Muck Bar.

500 Tons Neutral	25.00 cash.
500 Tons Neutral	24.75 cash.
500 Tons Neutral	25.00 cash.
200 Tons Neutral	25.00 cash.

Sheet Bar.

100 Tons Sheet Bars	30.00 cash.
---------------------	-------------

Ferro-Manganese.

50 Tons 80%, Seaboard, foreign	57.25 cash.
--------------------------------	-------------

Old Iron and Steel Rails.

500 Tons Old Steel Rails	15.50 cash.
600 Tons Old Iron Rails, Youngstown	10.00 cash.
350 Tons Old Iron Rails, Youngstown	19.25 cash.
200 Tons Old Steel Rails	15.25 cash.

Scrap Material.

600 Tons No. 1 R. R. W. Scrap, net	15.00 cash.
500 Tons Open Hearth Steel S. gross	16.15 cash.
450 Tons R. R. W. Scrap, net	14.00 cash.
250 Tons R. R. W. Scrap, net	15.40 cash.
100 Tons Iron Axles, net	22.50 cash.
100 Tons Iron Cast Scrap, gross	19.25 cash.

NEW YORK MINING STOCKS QUOTATIONS. DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, dates from Aug. 13 to Aug. 19, and Sales. It lists various mining companies like Adams, Alice, and Alpha.

*Ex-dividend. †Dealt at in New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 6,120. Non-dividend shares sold, 4,600. Total shares sold, 10,720.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, dates from Aug. 12 to Aug. 18, and Sales. It lists companies like Atlantic, Bodie, and Bonanza Development.

Dividend shares sold, 1,647. Non-dividend shares sold, 2,125. Total shares sold, 3,772.

COAL STOCKS.

Table with columns for Name of Company, dates from Aug. 13 to Aug. 19, and Sales. It lists coal companies like Cambria Iron, Cameron Coal, and Ches. & O. R. R.

Total shares sold, 288,708.

San Francisco Mining Stock Quotations.

Table with columns for Names of Stocks, dates from Aug. 12 to Aug. 18, and Sales. It lists stocks like Alpha, Alta, and American Flag.

DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

Main table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS, DIVIDENDS. It lists 154 companies with their respective financial details.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$42,900,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before the reorganization in 1880. ††† This company acquired the property of the Raymond & Ely Company, which had paid \$3,075,000 in dividends. †††† Previous to this company's acquiring Northern Bell, that mine declared \$2,400,000 in dividends, against \$425,000 in assessments.

STOCK MARKET QUOTATIONS.

Aspen. Aug. 13. The closing quotations were as follows: Agnes C., Argentum Juniata, Aspen Deep Shaft, Aspen Contact, Best Friend, Bimetallie, Bushwacker, Carbonate Chief, Empire Champion, Justice, Little Annie, Mollie Gibson, Nolan Creek, Park, Mamie & Queen, Pontiac, Sheep Mountain S. & M. Co., Staggler, St. Joe & Mineral Farm, Yellow Boy.

Baltimore, Md. Aug. 17. COMPANY. Atlantic Coal, Balt. & N. C., Big Vein Coal, Conrad Hill, Cons. Coal, Diamond Tunnel, George's Creek Coal, Lake Chrome, Maryland & Charlotte, North State, Silver Valley.

Pittsburg, Pa. Prices highest and lowest for the week ending Aug. 18:

COMPANY. Allegheny Gas Co., Bridgewater Gas Co., Chartiers Val. Gas, Columbia Oil Co., Consolidated Gas Co., East End Gas Co., Fisher Oil Co., Forest Oil, Hazlewood Oil Co., Hidaigo Mining Co., La Nora Mining Co., Luster Mining Co., Mansfield C. & C. Co., Nat. Gas Co. of W. Va., N. Y. & Clev. Gas Coal Co., Ohio Valley Gas Co., Pennsylvania Gas Co., People's Nat. Gas Co., People's N. G. & P. Co., Philadelphia Co., Pine Run Gas Co., Pittsburgh Gas Co., Red Cloud Mining Co., Silvertown Mining Co., South Side Gas Co., Sterling Silver Mining Co., Tuna Oil Co., Union Gas Co., Washington Oil Co., Wheeling Gas Co., W. House E. Light, W. House Air Brake Co., W. House Brake Co., Ltd.

Deadwood. August 13.

Bullion, Caledonia, Calumet, Cambrian, Carthage, Cora, Deadwood Terra, De Smet, Double Standard, Elk Mountain, Emmett, Equitable, Florence, Golden Reward, General Merritt, Harmony, Hester A., Homestake, Hermit, Iron Hill, Isadorah, Maggie, Monitor, Rainbow, Retriever, Ross Hannibal, Ruby Bell, Ruby Wilkes, Seabury Calkins, Silver Queen, Spanish R., Stewart, Tornado, Troy.

St. Louis. Aug. 17.

The closing quotations were as follows: Adams, Colo., American & Nettie, Colo., Bi-Metallic, Mont., Central Silver, Elizabeth, Mont., Granite Mountain, Mont., Hope, Leo, Little Albert, Montrose Placer, Colo., Mickey Breen, Pat Murphy, Colo., Silver Age, Silver Bell, Small Hopes, Colo., Yuma, Ariz.

Helena, Mont.

(Special report by SAMUEL K. DAVIS.) Prices highest and lowest for week ending Aug. 13: Bald Butte (Mont.), Benton Group, Mont., Bi-Metallic, Mont., California (Castle), Mont., Champion (Oro Fino), Mont., Combination (Phillipsburg), Mont., Copper Bell (Catact), Mont., Cornucopia, Mont., Cumberland (Castle), Mont., Elizabeth (Phillipsburg), Mont., Florence (Neihart), Mont., Fourth of July, Wash., Glengary (Butte), Mont., Helena & Victor, Mont., Ingersoll, Mont., Iron Mountain (Missoula), Mont., Jersey Blue (Butte), Mont., Lone Pine Consolidated, Mont., Moulton, Mont., Polaris (Beaverhead Co.), Mont., Poorman (Coeur d'Alene), Idaho, Queen of the Hills (Neihart), Southern Cross (Deer Lodge), Mont., Whittach Union & MacIntyre, Yellowstone (Castle), Mont.

Foreign Quotations.

London. August 6. Highest. Lowest. Alaska Treadwell, Amador, Cal., American Belle, Colo., Appalachian, N. C., Can. Phosphate, Can., Colorado, Colo., De Lamar, Idaho, DeJkens Custer, Idaho, Eagle Hawk, Idaho, East Arevado, Idaho, Eberhardt, Nev., Elkhorn, Mont., Emma, Utah., Esmeralda, Nev., Flagstaff, Utah., Golden Feather, Cal., Golden Gate, Cal., Golden Leaf, Mont., Golden River, Cal., Idaho, Jay Hawk, Mont., Josephine, Cal., Kohnmoor, Colo., La Luz, Mex., La Plata, Colo., La Valera, Mex., Maid of Erin, Colo., Mammoth Gold, Ariz., Mount McClellan, Montana, Mont., Mona Lake Gold., New California, Colo., New Consolidated, New Eberhardt, Nev., New Gold Hill, N. C., New Guston, Colo., New Hoover Hill, N. C., New Russell, N. C., New Viola, Idaho, Old Lout, Colo., Parker Gold, N. C., Pittsburg Cons., Nev., Poorman, Idaho, Pumas Eureka, Cal., Richmond Con., Nev., Ruby, Nev., Sam Christian, N. C., Sierra Buttes, Cal., Plumas Eur., Cal., Silver King, United Mexican, Mex., West Argentine, Colo., Yankee Girl, Colo.

Paris. August 4.

East Oregon, Ore., Forest Hill Divide, Cal., Golden River, Cal., Laurium, Greece, Lexington, Mont., Nickel, New Caledonia, Rio Tinto, Spain, Tharsis, Spain, Vieille-Montagne, Belgium.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified. Acid-Acetic, No. 8, pure, 1,040, Hydrobromic, dilute, U. S. P., Hydrofluoric, U. S. P., Alcohol-95%, Ammoniated, Alum-Lump, Alum-Chloride, Amalgamating solution, Sulphate, Ammonia-Sul., Carbonate, Muriate, Aqua Ammonia, Antimony-Oxymur., Regulus, Argois-Red, powdered, Arsenic-White, powdered, Yellow, White at Plymouth, Asbestos-Canadian, Italian, Ashes-Pot, 1st sorts, Pearl, Asphaltum-Prime Cuban, Hard Cuban, Trinidad, Egyptian, Californian, Barium-Carbonate, pure, Chlorate, crystal, Chloride, commercial, Iodide, Sulph., Am. prime white, Sulph., foreign, Carb., lump, f. o. b. L'pool, No. 1, Casks, Runcorn, Bauite, Bichromate of Potash-Scottish, American, Bichromate of Soda, Borax-Refined, San Francisco, Concentrated, Refined, Liverpool, Bromine, Cadmium Iodide, Cadmium Iodide, Chalk, Precipitated, China Clay-English, Domestic, Chrome Yellow, Chrome Iron Ore-Franco, Chromalum-Pure, Commercial, Cobalt-Oxide, Copper-Sulph. English Wks., Vitriol (blue), ordinary, Nitrate, Copperas-Common, Best, 100 lbs., Liverpool, Corundum-Powdered, Flour, Cryolite-Powdered, Emery-Grain, Epsom Salt, Feldspar-Ground, Crude, Fluorspar-Powdered, No. 1, French Chalk, Fuller's Earth-Lump, Glauber's Salt-in bbls., Glass-Ground, Gold-Chloride, pure, crystals, Oxide, 15 gr. c.v., doz., Chloride and sodium, Oxide, 15 gr. c.v., doz., Gypsum-Calcined, Land Plaster, Iodine-Resublimed, Iron-Nitrate, Kaolin-See China Clay, Kieserite, Lead-Red, American, White, American, in oil, White, English, in oil, Acetate, or sugar of, white, Granulated, Nitrate, Lime Acetate-Am. Brown, Litharge-Powdered, English flake, Magnesite-Crude, Kilos, Calcined, ton of 2,240 lbs., Brick, ton of 2,240 lbs., Manganese-Ore, per unit, Oxide, ground, Mercuric Chloride-Corrosive, Sublimated, Powdered.

Marble Dust, Metallic Paint-Brown, Mineral Wool-Ordinary slag, Ordinary rock, Ground, in sheets according to size, 1st quality, Naphtha-Black, Nitre Cake, Ochre-Rochelle, Washed Nat Ox'rd, Lump, Washed Nat Ox'rd, Powder, Golden, Domestic, Oils, Mineral-Cylinder, light filtered, Dark filtered, Extra cold test, Dark steam refined, Phosphorus, Precip., red, white, Plumbago-Ceylon, American, Potassium-Cyanide, Bromide, domestic, Chlorate, English, Chlorate powdered, English, Carbonate, Caustic, Iodide, Nitrate, refined, Bichromate, Yellow Prussiate, Red Prussiate, Pumice Stone-Select lumps, Original cks., Powdered, pure, Pyrites-Non-cupreous, p. units, Quartz-Ground, Hotten Stone, Powdered, Lump, Original cks., Rubbing stone, Sal Ammoniac-lump, in bbls., Salt-Liverpool, ground, Domestic, fine, Common, fine, Turk's Island, Salt Cake-Crude, Soapstone-Ground, Block and slab according to size, Sodium-Prussiate, Phosphate, Stannate, Tungstate, Hyposulphite, Strontium-Nitrate, Sulphur-Roll, Flour, Sylvinit, 23% S.O.P., Tale-Ground French, American No. 1, American No. 2, Terra Alba-French, English, American, No. 1, American, No. 2, Tin-Crystals, in kegs or bbls., feathered or flossed, Muriate, single, Double or strong, 54° B., Oxy. or nitro., Vermilion-Imp. English, Am. quicksilver, bulk, Am. quicksilver, bags, Chinese, Trieste, American, Zinc White-Am. Dry, Antwerp, Red Seal, Paris, Red Seal, Muriate solution, Sulphate crystals, in bbls.

THE RARER METALS.

Aluminium, Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Glucinum, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, Niobium, Palladium, Platinum, Potassium, Rhodium, Ruthenium, Rubidium, Selenium, Sodium, Strontium, Tantalum, Tellurium, Thallium, Titanium, Thorium, Tungsten, Uranium, Vanadium, Yttrium, Zirconium.