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CONTENTS.

Table with 3 columns: Article Title, Page, and Page. Includes sections like Pumice Stone in Idaho, Use of Zinc Dust, Steel Making in the South, etc.

A new branch of mining industry about to be undertaken in this country is the production of pumice stone, of which deposits have been discovered in Miller County, Idaho, and in Western Nebraska. This substance which is used extensively as an abrasive, is at present mined only in the Island of Lipari in the Mediterranean, the production and preparation of its product for market being fully described in Volume V. of The Mineral Industry.

The use of zinc dust, or zinc grey, is steadily increasing through new applications, and sellers in Europe, where the principal market is, are often unable to meet promptly the demand. One of the newest uses for the substance is in the manufacture of zinc ethyl, for which it has been found to answer better than the zinc shavings formerly employed.

The despatch in another column noting the successful start of the first basic open-hearth steel furnace of the Birmingham Rolling Mill Company, at Birmingham, Ala., marks an epoch in the Southern iron trade. While some attempts have heretofore been made to manufacture steel in the South, the present is the first which promises success, because it is conducted on principles which are well understood, and follows known and accepted methods and not empirical processes, as the previous attempts have done.

An interesting feat in separating tin and wolfram ore was accomplished by the Wetherill magnetic concentrator, the operation of which on New Jersey franklinite ore is described in this and our last issue. The ore upon which the experiments were made was from Spain, and consisted of cassiterite contaminated by wolframite. Wolfram in tin ore is, of course, a very objectionable element, and ordinarily its elimination involves a tedious and unsatisfactory process.

Considering the speculative nature of many electric power transmission schemes, it is rather remarkable that commercial success has been achieved by nearly all. The engineering success of the installation while an essential, is not the ultimate object in which the investor is interested. As pointed out in Dr. Bell's recent book on the subject of electric transmission, the vital questions are whether the power, electrically transmitted from a waterfall, or from a steam plant favorably situated as regards fuel supply, can profitably compete with power locally generated, and whether, if such is the case, the need of power is sufficient to afford a market for the product at any price.

There has been, and is, a tendency, probably confined, for the most part, to that interesting class, the "promoters," to rush into electric transmission schemes, utterly regardless of the answer to the above questions, and it is therefore creditable to the shrewdness of our investing class that so few, if any, commercial failures in these plants are to be noted. An exchange states that the Folsom transmission plant in California is in financial difficulties, but with this one exception, all the California plants of this description have proved good paying investments.

The situation with regard to the Western coal miners' strike continues practically unchanged, although there have been some local variations in the news from the disturbed districts. There is no trouble whatever in the regions supplying the seaboard market, the only change noted

there being in the diversion of coal shipments from the Pocahontas and Kanawha regions in West Virginia. Both are now sending nearly all their output westward, but the difference is little felt for the present, as stocks at tidewater are large. West Virginia continues to hold the key to the situation, and as long as the miners in that State remain at work the prospects of success for the strikers are slight. So far the West Virginia men, with a very few exceptions, have resisted all the persuasion which has been exercised to induce them to join their brethren in Pennsylvania and Ohio, and there seems to be little prospect that they will go out; especially as the operators have generally given them some increase in wages. The Connellsville coke district is also steadily at work. Outside of West Virginia there is hardly any coal mining going on from Pittsburg to the Mississippi, with the exception of a small district in Southern Illinois.

So far the strike has been very quietly conducted and few instances of violence or attempts to interfere with property at the mines have been noted. Some efforts have been made to unite the coal operators in an agreement, so that definite offers of terms can be made to the strikers, but without much success so far.

#### Sectionalized Machinery.

In the light of modern engineering achievements it is safe to say that there is no mine situated in so inaccessible a place that it cannot be worked if it is rich enough. It is a greater evidence of our engineering skill, however, that many mines which are not especially rich can be operated profitably in remote places whither a wagon cannot be driven. We have perhaps the most remarkable instances of this kind in Mexico, where the cordillera has a precipitousness that is nowhere approached in the United States, where there are few railways besides the main north and south lines, and wagon-roads are scarce. When, therefore, one comes across a stamp mill loudly pounding away at the bottom of a *baranca* in the heart of the Sierra Madre, or a smelting furnace belching its black smoke, one may well be lost in astonishment at their being there at all. That they are there is due chiefly to the ingenuity of mining machinery makers in dividing their apparatus in such a way that no part of it will weigh more than a mule can carry. This is a branch of work in which American machine works have excelled, and their experience in it is now so complete that the engineer can safely entrust to them his orders for almost any kind of apparatus.

The maximum load that the Mexican mule can carry in the Sierra Madre is 350 lbs., and this requires a specially picked mule. The ordinary mule load is only 300 lbs. It is necessary, therefore, that there shall be no piece of machinery weighing more than 350 lbs., and those of that weight should be few in number. The most experienced machinery makers are generally able to keep within these limits. Such apparatus as boilers and water-jacket furnaces are shipped, of course, in nested plates, which have to be set up and riveted on the ground.

A no less important requirement than the weight of a piece is its length, since a mule cannot safely make the sharp turns of a narrow mountain trail with anything longer than 9 ft. on its back. This restriction, which obviously applies to lumber as well, often increases very much the difficulty of mill construction, since there are numerous mining camps in Mexico where every stick of timber that is used must be brought in by mule-back, or on the shoulders of men.

#### The New Tariff Bill.

The new tariff bill has now received what is presumably its final form in conference committee, and in that shape has passed the House of Representatives. The conference report has not yet been accepted by the Senate, but there seems to be every probability that the bill will pass that body also in a few days. As the bill now stands, changes of much importance were made in the metal schedules from those fixed by the Senate.

The lead section is, in some points, a compromise between the two Houses. Lead-bearing ores are to pay 1½ cents per pound on the lead contained. The provisions for sampling and assaying and for smelting in bond are not changed. On lead in pigs bars and other forms and base bullion the duty is fixed at 2¼ cents per pound; and the intention to make base bullion pay on the entire weight is apparent, no provision being made for deducting weight of precious metals and impurities contained. Lead in sheets, pipes or other manufactured forms will pay 2½ cents.

Copper remains on the free list; except that on manufactured forms, such as sheets, pipe and wire, 2½ cents a pound is levied, and 2 cents on sheathing or yellow metal.

Zinc in blocks or pigs will pay 1½ cents per pound; in sheets, 2 cents; old metal and scrap, 1 cent per pound.

The Senate abandoned its amendment on nickel, and the tax on this metal remains 6 cents per pound as in the present law, instead of 8 cents

as proposed. The proposed duty on nickel in ores or matte is dropped altogether. This will suit the refiners very well, as it leaves the present situation unchanged.

Aluminum and aluminum alloys are to pay 8 cents per pound if in the form of bars or ingots; this is increased to 13 cents when the metal has been manufactured into sheets, tubes or other shapes. Quicksilver remains at 7 cents per pound.

Mica, where unmanufactured or rough-trimmed, is dutiable at 6 cents per pound and 20 per cent. *ad valorem*; when trimmed or manufactured the duty is 12 cents per pound and 20 per cent. *ad valorem*. Monazite sand and thorite are to pay 6 cents per pound.

The conference has done away with the proposed duty of \$1 per ton on manganese ore, which will continue on the free list. This was one of the minor points on which the House conferees insisted. It may be noted here that we are now exporting a good deal of ferro-manganese which is made chiefly from imported ores.

There are two omnibus provisions, one putting a duty of 45 per cent. *ad valorem* on all articles or wares of metal, not otherwise provided for in the act; the other is the provision, to which we have heretofore called attention, for a duty of 20 per cent. *ad valorem* on "metallic mineral substances" and metals unwrought, which are not otherwise provided for.

#### The Klondike Placers.

The chief object of interest in the mining world at the present time are the new Klondike placers of Alaska. That these are phenomenally rich there is no doubt whatever since the stories of their great value are supported by the arrival of large amounts of gold dust and nuggets in the United States. But so far the accounts of the discoveries are somewhat vague. They have been made along the Klondike River, which is a tributary of the Yukon, in Canadian territory, though not far from the American frontier. Order is preserved in the region by a detachment of the Canadian mounted police, but otherwise the mining is carried on as if on American soil. Mails are obtained from Circle City, which is nearby, whither the United States Post-Office makes a dispatch once a month, and supplies are sent in from Juneau, or up the Yukon River. There being no Canadian customs offices in the region these have thus far gone in duty-free, but there is already an outcry in British Columbia against this, and doubtless ere long collectors of customs will be stationed there. Most of the miners on the ground are Americans, and probably all the gold thus far extracted has been brought to the United States.

The climate of the Yukon country is wild and severe. The winter is long, and the time when work can be carried on to advantage is correspondingly short. The snow-fall is said to be comparatively light; but the cold is great, temperatures of 68 degrees to 70 degrees below zero Fahrenheit being registered. During the brief summer the weather is sultry and the myriads of mosquitoes are a pest. After September 15th the Juneau route is impassable on account of the fierce storms which set in at that time and make the crossing of Chilkoot Pass very hazardous.

The new diggings are very difficult of access. At present there are two routes thither, one from St. Michael's, near the mouth of the Yukon River, and the other from Juneau. From St. Michael's there are light-draft steamboats which ascend the Yukon River to Dawson City, a distance of 1,700 miles, the entire journey from Seattle occupying 30 to 40 days, the fare costing \$180. This is the easier route. The other is from Juneau, partly by river and partly by foot, a distance of 650 miles to the Klondike. This route is exceedingly rough. The rivers are rapid and rocky, and over the portages everything must be packed on their backs by the travelers themselves, or by Indian carriers, if they can be secured. No food is produced in the country, and the immigrant is obliged to carry a huge supply with him, because the climate of the country is such that egress from it is possible only in the summer, and even with plenty of money it is not easy to buy there all that is needed. The Alaska Commercial Company, which sends steamboats from St. Michael's up the Yukon River, declares its inability to transport to the region an adequate supply of goods for next winter if there is such a rush thither as there promises to be. If this happens there will surely be much suffering and loss of life. Under these circumstances it is a matter for congratulation that only a comparatively small number of persons can find transportation thither before the present season closes.

Our advice to gold-seekers is to consider well the difficulties to be encountered before setting out, and we address this especially to persons in the Eastern and Central States, who have had no experience in rough countries, and therefore can have little idea of the hardships which must be borne in Alaska. To those who are going from the Pacific Slope we suggest that they take a reserve supply of food in the compressed form that the army has experimented with so successfully and provide themselves with plenty of clothing and blankets. But above all, no one should start for the Klondike

who is not amply provided with money. It is hardly necessary for us to call attention to the historical experience of these rich gold discoveries that where there are a few who make fortunes there are many more who lose all they have, and often their lives. And there are bound to be disappointments in Alaska just as there were in California, Colorado and Dakota.

## NEW PUBLICATIONS.

CYANIDE PROCESSES. By E. B. Wilson. New York, John Wiley & Sons. Pages 116; price \$1.50.

There is need of a good treatise on the cyanide process, but this little book of Mr. Wilson's does not supply it. It is simply a re-offering of previously published information, with little of practical value. There is some looseness of statement in it, and much that displays unfamiliarity with the process as it is commercially carried out. It is not so good as certain other books on the subject, much as they leave to be desired.

REPORT OF THE MINES DEPARTMENT OF THE SOUTH AFRICAN REPUBLIC; WITH THE REPORT OF THE STATE MINING ENGINEER. 1896. Pretoria, S. A. R.; State Printing Office. Pages 60; with maps and tables.

This report would be of interest in any event from its official statements of facts in relation to the third gold-producing country in the world. It is further of interest because it is an excellent piece of work, and might almost be called an encyclopedia of information with regard to the Transvaal gold-fields. Mr. Schmitz-Dumont has done his work thoroughly, and is evidently determined to make his department an efficient one. The tables contain a great variety of information supplied by the companies themselves and by the district inspectors. The reports show how entirely mining in the Transvaal is deep mining carried on by companies with large capital. There are practically no placers and no individual mining. No mines are worked in a small way.

The actual amount of work done in 1896 showed an increase over 1895, but the number of claims and *mijnpachts* decreased, chiefly because a number of claims which had been taken up some time before and held for speculative purposes have lately been abandoned. In 1896 the working mines of the Transvaal were in the hands of 200 companies, an increase of 30 over the preceding year. There were 79 mines which produced gold, and of these only 23 are recorded as paying dividends. There were 45 coal mines worked also.

The proportion of accidents in the mines was large when compared with other countries. In all there were 648 accidents, in which 389 persons were killed and 489 wounded. The proportion was 4.95 killed and 11.24 hurt for each 1,000 men employed. The number of men employed in the gold-fields in 1896 averaged 9,375 whites and 64,012 negroes, while 443 whites and 5,645 negroes found work in the coal mines.

Of the total output of gold 68% was obtained from the mill and 32% from tailings and concentrates worked chiefly by lixiviation or wet processes. These proportions compare with 69% and 31% in 1895, showing a gradual change, which is partly due to the increase in pyritic ores with greater depth in the mines, and in part also to the improvements in the cyanide process and in chlorination.

An appendix contains five special papers: One on the Geology of the Transvaal, by Mr. Schmitz-Dumont; one on the Deep-level Mines of the Witwatersrand, by Mr. Francke; one on the Cost of Machinery, by Mr. Schweder; one on the Geology of the Klerksdorp Field, by Mr. Kubab, and one on the Lydenburg Field by Mr. J. G. Bousquet.

## BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review on another page of the Journal.

*The Annual Report of the Inspector of Mines of the State of Kentucky for the Year 1896.* C. J. Norwood, Chief Inspector. Louisville, Ky.; State Printers. Pages, 241.

*A Glossary of Mining Terms.* Compiled by Capt. C. C. Lowbridge. London, England; Published by *The Mining Journal*, 1897. Pages, 98; illustrated. Price, in New York, 90c.

*Anuario Estadístico de la Republica Mexicana 1895.* A cargo del Dr. Antonio Penafiel. City of Mexico, Mexico, State Printing Office. Pages; 841; with diagrams and tables.

*Iowa Geological Survey: Volume VI., 1896, Report on Lead, Zinc Artesian Wells, etc.* Samuel Calvin, State Geologist. Des Moines, Ia.; Published for the Survey. Pages, 487; illustrated.

*Illinois Society of Engineers and Surveyors: Twelfth Annual Report.* Peoria, Ill.; Published for the Society by the Nixon Printing Company. Pages 156; illustrated. Price, 50 cents.

*Jahrbuch der Elektrochemie. Berichte über die Fortschritte des Jahres 1896.* Im wissenschaftlichen Theile bearbeitet von Dr. W. Nernst. Im technischen Theile bearbeitet von Dr. W. Borchers. III. Jahrgang. Halle a. S., Germany; Wilhelm Knapp. Pages, 359; illustrated.

Preventing Fires on Coal Ships.—There has been of late years a very large increase in the size and depth of ships carrying coal, says the *London Iron and Coal Trade Review*, and statistics show that ships whose cargoes have heated are generally particularly large and deep, and have been loaded in very hot weather. Numerous plans have been patented for extinguishing fires on board coal-laden vessels, and a novel, if a somewhat impracticable one has just been suggested by M. Kraus, who proposes to prevent the absorption of oxygen by the coal by placing in each coal ship cylinders of liquid carbonic acid gas. These cylinders contain about 0.05 cu. m. of liquid gas, which, when it is liberated as a gas, occupies a space 500 times greater. M. Kraus estimates that a ship carrying 1,500 tons of coal would require 40 cylinders of gas, the expense of which he says will be offset by the saving in the insurance.

## CORRESPONDENCE.

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

The Waverly Mine, British Columbia.

Sir: In your issue of June 12th, your London correspondent, I notice, referred to the Waverly Mine, Limited. On June 3d last I visited the Waverly claim, and as there seems to be some doubt about the size and value of the proposition I will note down what I saw during my hurried examination. The claim is located about on a level with the divide at the head waters of the North Fork of the Illicilliwaet River, but on the Downie Creek watershed. The distance from the Canadian Pacific Railway is about 25 miles; grade for a railroad about 80 ft. per mile.

A stratum of gray limestone about 40 ft. thick traverses the country for miles in talcose slate, all laying at a considerable dip from the perpendicular. On the Waverly claim this whole strata of limestone is displaced by an ore body of that size, and at the surface a 6-ft. and a 10-ft. body of smelting ore are exposed at the foot and hanging wall.

There is over 20 ft. of silicious ore between these and very uniformly mineralized. The smelting ore carries copper, galena and antimony apparently, all decomposed and friable, and carloads could be shoveled out; the silicious ore will have to be blasted. Last winter a tunnel was run in, cutting this ore body 100 ft. lower down, a little obliquely, and there the ore bodies are better defined and the ore just the same as on the surface. The tunnel continued for 70 ft. through ore and about 12 ft. further into the country rock; a drift was run for 50 ft. on the footwall streak of smelting ore and held a nearly uniform width all the way. The work has been done with a view to large operations. Good trails and commodious quarters have been provided; in short, there is nothing small about the property.

Moscow, Idaho, July 15, 1897.

OTTO ABELING.

Mineral Wealth in Arkansas.

Sir: During the past six months I have made a somewhat extensive examination and prospect of the eruptive and mountainous region in Polk County, Ark., on the line of the Kansas City, Pittsburg & Gulf Railroad and respectfully ask space in your valued paper to inform all who may be interested in the results, and bring this region to a more extended notice than it has heretofore enjoyed. For some years past prospecting has been done here in a very unintelligent and primitive form, but for manganese ore only, a coarse grade of phosphuretted ore being found in limited quantity on the surface, and of so poor quality as to be worthless. All effort has until of late stopped short of any attempt to discover the more precious ores that are here in abundance.

The face of the country is thickly set with small hills or mountains from 1,000 to 2,500 ft. in height, whose precipitous and rocky sides are covered by a heavy growth of oak and pine timber. Through all these elevations, usually in longitudinal direction, are found veins of white or rose quartz, nearly vertical, massive, and in width from 6 to 30 ft. or more, all containing gold and silver in a finely divided form, there being but little coarse or shot gold in the rock, thus presenting ore bodies of great extent and easy access.

The discovery having been of recent date no mining has as yet been done, though in a few camps the work is being pushed as rapidly as possible, as greater depth shows better ore. The surface prospect shows a body of low-grade ore.

The rock is easily worked and crushed and in tunneling the steep hill-sides afford an opportunity to obtain a depth of hundreds of feet at a small cost, and, with the advent of machinery, abundance of water power, proximity to railroads, etc., this should soon to be an active, bustling mining camp.

Besides gold and silver there are also found here in paying quantities lead, antimony, zinc and copper, all awaiting the influence of capital to develop. A very recent and accidental discovery, it is claimed, shows platinum.

TOPEKA, Kan., July 16, 1897.

J. F. TODD.

An Electrolytic Condenser.—Before the last meeting of the Paris Academy of Sciences M. Ch. Pollak contributed some particulars of a new electrolytic condenser of large capacity and on an electrolytic current rectifier. By passing first an alternating current and then a continuous current between aluminum electrodes in an alkaline solution, the author finds the plates become coated with an extremely thin crystalline deposit of oxide, which is practically non-conducting. A condenser is thus obtained in which the oxide film acts as the dielectric, and the extreme thinness of this film is the cause of its very high capacity.

Mining in North Wales.—In his excellent annual report for the North Wales district, Prof. C. Le Neve Foster points out that the most notable facts in the comparison between 1896 and the previous year are a great decrease in the production of gold ore, and a decided increase in the output of slate and the ores of lead and zinc. The revival in zinc mining is not confined to one part of the district, for old abandoned mines are now being reopened in Cardiganshire, Carnarvonshire and Flintshire. An increase in the production of clay is recorded, due, however, to the inclusion of some large workings near Ruabon, formerly classed as quarries, but now brought under the Metalliferous Mines Act, owing to a certain amount of underground work being carried on. The comparison of the number of accidents appears unfavorable, for the number of non-fatal accidents reported in 1896 was double that of the previous year. In the district there were 11 separate fatal accidents, causing 13 deaths, and 159 non-fatal accidents, causing injuries to 162 persons. Falls of ground are not responsible for so large a proportion of the sufferers as in previous years, and the comparative immunity from shaft accidents is somewhat extraordinary; for, although there were two deaths, no minor casualties were recorded,

#### THE LAKE SUPERIOR MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

A description of the opening of the meeting and the visit to the copper mining country was given in these columns last week. After an enjoyable trip through the mines, which was followed by a reception at the Onigaming Club, on Tuesday night the members took a special train to Duluth, where a local committee, consisting of the leading citizens of Duluth and of the managers of the iron mines, met them. After a brief stay the train proceeded to the docks of the Minnesota Iron Company at Two Harbors, where the great ore docks were inspected and a visit was made to the shops and store. In the afternoon the Vermilion range mines were reached, a large number of the party going underground at one of the mines. The projected visit to the Chandler, Pioneer and Zenith mines at Ely was abandoned for lack of time. In the evening the engineers gathered to hold a session at Tower, which was opened by an address of welcome by Judge Cotton, of Duluth, the response being made by Oliver Williams, of Catasauqua, Pa. The first paper read was that of D. H. Bacon, of the Minnesota Iron Company, on "The Development of Lake Superior Iron Ores," in which he referred to the fact that during the late fifties the ore product of Lake Superior was handled over a mule tram road to Marquette. Now the Duluth, South Shore & Atlantic, the Chicago & Northwestern, Wisconsin Central, Duluth, Superior & Western, Duluth, Missabe & Northern, Duluth & Iron Range and the Lake Superior & Ishpeming railroads serve the shippers. Up to nearly 1870 a 700-ton ship was an enormous craft, the loading of which required two days, the unloading being seldom accomplished in that time. Now the cargoes reach 5,000 tons, the loading requiring less than 3 hours and the unloading 10 hours. In 1871 the largest ore barge carried 1,050 tons and made 12 trips per season. The annual shipments have grown from a few thousand to 10,000,000 tons and the ability of the mines to produce is not taxed. Lake freights are one-eighth of early prices and rail freights one-quarter.

Mr. Bacon's paper was followed by one on "The Mining Methods on the Mesabi Range," by C. E. Bailey, of Virginia, Minn. The meeting was closed with a paper by E. J. Longyear, of Hibbing, Minn., on "Exploration on the Mesabi Range."

Thursday morning the train proceeded to the Mesabi Range, the points of interest being the Biwabik, Canton, Duluth and Cincinnati mines. Later on the party reached the Fayal mine of the Minnesota Iron Company, where many of the engineers went underground to inspect the methods of working. Thence the party proceeded to the Adams group of mines of the Consolidated Iron Mining Company. Leaving Eveleth, a short stop was made at the Auburn mine, and then the Norman, Commodore, Ohio, Lone Jack and Oliver mines were visited. The last mine inspected was the Mountain Iron.

From this point the party returned to Duluth, where the ore docks, the shipyards and other points of interest were visited. In the evening a reception was given the visitors by citizens of Duluth. At noon the next day many of the members started for home on the steamer *Northwest*. About 30 members joined in the trip to the Black Hills, which was the conclusion of the meeting.

#### THE HAND AUGER AND DRILL IN PROSPECTING WORK.

By Charles Catlett.

In this paper, read before the American Institute of Mining Engineers, Mr. Catlett says that, having had occasion during the past year to do a large amount of prospecting work, he had found the use of a hand-auger and drill of immense value, and in his practice it has largely superseded, and always preceded, the other forms of investigation. The information desired was thus acquired at one-fifth what it would have cost by any other method. As no device of this kind is on the market, he was compelled to make them with such additions and modifications as experience showed to be necessary. The result may be summed up in the following description of a set of the tools:

1. An auger-bit of steel or Swede iron, with a steel point, twisted into a spiral, with an ultimate diameter of 2 in. and an ultimate thickness of blade of not less than  $\frac{1}{4}$  in. The point is found more effective when split. The length of the auger proper was gradually increased until about 13 in. was reached as the apparent maximum which could be used effectively. The 13-in. auger contains four turns. This was welded to the end of 18 in. of 1-in. wrought iron pipe, on which screws were cut for connection.

2. One foot of  $\frac{1}{2}$ -in. octagonal steel, with a 2-in. cutting face, which is likewise welded on to 18 in. of pipe, cut for connections.

3. Ten feet of  $\frac{1}{2}$ -in. iron rod, threaded at either end for connection with 1-in. pipe. When connected with one of the drill bits this becomes a jumper for starting holes through hard material. It is also used when desired to give additional weight to the drill in going through rock below the surface.

4. Sections of 1-in. pipe and connections.

5. An iron handle, with a total length of 2 ft., arranged with a central eye for sliding up and down the pipe and with a set screw for fastening it at any point.

6. A sand pump, consisting of 1 or 2 ft. of 1-in. pipe, with a simple leather valve and a cord for raising and lowering it.

7. Two pairs of pipe-tongs or two monkey-wrenches, with attachments for turning them into pipe tongs.

8. Sundries: 25 ft. of tape, oil can, flat file, cheap spring balance, water bucket, etc.

The auger is used by two men, who, standing on opposite sides, turn it by means of the handle. The handle is also useful in giving a good purchase for starting the auger from the bottom of the hole in opposition to the air-pressure, which is considerable. Enough water is continually used to just soften the material. Usually the auger brings up a small portion, which is dry and unaffected. Every few minutes, as the auger becomes full, it is lifted out, scraped off and replaced. The handle is moved up and tightened by means of the set-screw as the auger goes down. At every slight change of the material the depth and the character of the material are recorded.

When hard material is encountered the auger-bit is screwed off and

the drill-bit screwed on, thus forming a churn-drill, which may be used for passing through the hard material, the auger being replaced when softer material is reached. The churn-drill is used by lifting it and letting it fall, turning it slightly each time. Its weight makes it cut quite rapidly. When the drill is used the muck is either worked stiff enough to admit of its being withdrawn with the auger, or it is extracted by means of the sand-pump or a hickory swab. In either case the material is washed and a sample is obtained of the stratum through which the drill is cutting. After washing all the material from one stratum the washed material is mixed and a sample is put into a bottle and labeled. In passing through wash-ore (iron ore consisting of small particles mixed in clay or other material that can be separated by washing) the material is brought up by the auger, put into a vessel with a perforated bottom (an empty tomato-can, having holes punched in the bottom and provided with a wire-handle, does very well) weighed by means of the spring balance, washed and weighed again, and thus an approximate idea is obtained of the proportion of ore in the material, while a sample is secured for analysis.

As the mere recollection of the contents of the several holes cannot be safely depended upon, it is very important that an accurate record should be kept. To secure this is one of the difficulties encountered with ordinary foremen, though they are generally found to recognize accurately very slight changes of material. My foremen were provided with small vest-pocket notebooks, and were soon trained to write down everything and to trust nothing to memory. The holes were located as far as possible with reference to some natural object or to some other hole so located, and the distance therefrom was in all cases measured, not guessed at, the compass-direction being recorded. Every hole was marked with a substantial peg bearing its number and location. In designating the holes upon the record care was taken to avoid all causes of confusion. Separate properties, or great natural divisions on large properties, were designated by letters, minor divisions by numbers.

Of course the best work with such tools is done on soft material, but it is entirely practicable to go through hard material (a few feet of quartzite or flint, and many feet of ore being often encountered in a single hole), and the ability of this simple contrivance to go through interbedded layers of hard and soft substances makes it very efficient. The cost per foot increases considerably with depths exceeding 50 ft., but at the greatest depth attained (some 80 ft.) neither its capacity nor the limit of its economical use as compared with other methods was reached.

Up to 25 ft. two men can operate it; from 25 ft. to 35 ft. three men are necessary; from that to 50 ft. a rough frame, 15 ft. to 20 ft. high (costing something over \$1), for the third man to stand on, is required. The frame can be moved from point to point. Above 50 ft. it is generally necessary to take off one or two of the top joints each time the auger or drill is lifted.

In addition to the economy of operation, which means either a saving of money for the same amount of information, or the expenditure of the same amount of money and the acquisition of more information, there are other marked advantages in the use of such tools. The land is not injured for other purposes. Badly located holes (and there are always such) do not remain as conspicuous blots on the property. The holes can be located at points where it would be exceedingly inconvenient to put shafts. They can stand an amount of water which would add very greatly to the cost of shaft-work.

#### THE SULPHUR SITUATION IN SICILY.

Consul Charles M. Caughy writes to the Department of State from Messina that it is doubtful whether the Anglo-Sicilian Sulphur Trust will succeed in maintaining prices. The trust is now buying from producers their sulphur at prices which make the cost about \$15.80 per ton on board at the shipping ports.

The exports of sulphur from Sicily in 1896 were 44,000 tons in excess of 1895, of which 31,000 tons were exported from January to July. This increase is to be attributed to the exceedingly low prices which prevailed toward the close of 1895 and the beginning of 1896, at which figures the working of a majority of the mines was unprofitable. The increase of 13,000 tons in the last six months of 1896 is undoubtedly due to the sudden advance in prices, which induced customers to lay in heavy stocks in anticipation of a further rise. These stocks, however, cost them relatively low prices. Although prices steadily declined during the years 1891-1896, the production, as estimated by the bureau, frequently increased and never decreased. Stocks show a constant increase. These facts unquestionably prove that the cost of production has diminished, cheaper transportation has been gained by the construction of roads and railways, and improvements have been made in mining and smelting.

The Italian parliament abolished the export duty of \$2.06 per ton with the object of favoring exports, since this duty increased the cost to the foreign consumer. The artificial advance which the sulphur trust wishes to establish is in opposition to all the above facts. It is stated that the production in 1896 shows an increase estimated at about 385,000 tons. There were shipped in 1896 44,000 tons more than in 1895, but nevertheless the visible stock in the ports at Sicily on December 31st, 1896, was only 18,000 tons less than on the same date in 1895. The difference of 26,000 tons must therefore come from an increase of production, which, in part at least, belongs to 1896, as some of this quantity may be sulphur stored in the mines in 1895 and not shipped promptly.

An X-Ray Society.—A Röntgen Society has been formed, with Prof. S. P. Thompson as the president, says London *Engineering*. The intention of the founders is that the society shall occupy a position between those devoted purely to medicine, to physics or to photography. Some of the members will study the sources of the Röntgen rays, others the applications; some the induction coils, others the tubes and the various forms and adaptations of the apparatus used in the production of the rays. Röntgen photography has been found serviceable in so many branches of scientific investigation that the society appeals to a large constituency for support. It should be the means of increasing the efficiency and application of the rays, and should also be of assistance to surgeons and others who have entered the new field of work without previous training in physics.

## PETER RITTER VON TUNNER.

## THE RUSSIAN PETROLEUM TRADE.

Peter von Tunner, who died in Leoben, Styria, June 8th, well deserved the name of the father of the modern iron industry in Europe, which has been given him. He was born at Turrach in Styria in 1809, and at an early age was apprenticed to the iron trade, which was then carried on in Styria in the ancient ways which had been followed almost from time immemorial. He learned his business thoroughly, but was not satisfied, for he saw very soon where improvements could be made and where new methods must be adopted. He continued to work and study for years, and found time and means to visit Hungary, Germany, Sweden, England, France, Belgium—in short, all the countries where the iron industry was active.

In 1840 he established at Vordernburg, in Styria, the school at whose head he remained for many years. It speedily acquired reputation and attracted scholars, and in 1849 it was removed to Leoben; and to that place many of the greatest metallurgists have gone for their early instructions. In 1840 the metallurgy of iron was just beginning to be studied, and Peter von Tunner's work was begun when Germany had done little or nothing; France and Belgium had their industries still to build up; England was still working on the old rule-of-thumb methods, and in this country the foundations of the iron industry were just being laid. The Leoben school, which was later raised to the rank of *Bergakademie*, was a center from which iron men everywhere drew information on the science of metallurgy; and to its head is due the solution of many of the problems which troubled the earlier workers in the field.

At the great Exposition at Paris in 1855 he was put at the head of the jury charged with the awards in Mining and Metallurgy. From that time on he was one of the foremost of the groups of jurors in these sections at all the leading exhibitions until that of Chicago in 1893, which his infirm health and great age prevented him from attending. The late Professor Sterry Hunt has put on record how, at the Exhibition of 1855, Tunner endeared himself to all his fellow jurors by "his assiduity, his earnestness, his simplicity, and his profound knowledge of the principles and details of his profession."

Among his best-known works may be named his *Treatise on Roll Turning for the Manufacture of Iron*, which has been translated into English by J. B. Pearse, and his works on *Russland's Montan-Industrie*, written in connection with the St. Petersburg Industrial Exhibition of 1870. He wrote also *Das Eisenindustrie in Steiermark und Kärnten; die Zukunft der Oesterreichischen Eisenhüttenwesens*, and other works, including notes on iron manufacture in England and in the United States. He was a voluminous writer on other metallurgical subjects. He did not limit himself to a survey of the special metallurgical conditions of his own district or country, but had the whole world for his field of observation.

His earlier writings are largely referred to by Percy in his well-known work on *The Metallurgy of Iron and Steel*. Some of his later writings are to be found in the *Proceedings of the Iron and Steel Institute*, including a valuable paper read at the Vienna meeting of the Institute in 1882, on the use of brown coal in the blast furnace.

In 1867 he retired from the more active work of the Leoben school, but still retained a connection with it. The value of his work was seen at home, and the Austrian government raised him to the rank of "ritter" and bestowed other distinctions upon him. His services to metallurgy were also recognized abroad. He received honorary membership in the three leading scientific bodies representing that profession—the Verein Deutscher Eisenhüttenleute of Germany, the American Institute of Mining Engineers in the United States and the Iron and Steel Institute in Great Britain. On the occasion of the joint meeting of these three bodies at Pittsburg in 1890 a resolution was adopted and cabled congratulating him on the attainment of the jubilee of the Leoben Academy.

The late Professor was a man of the most charming manners, and his amiability of character made him troops of friends, not only among his old students—who are to be found in all iron-making countries—but wherever his stately courtesy, invariable readiness to impart information and unusual resources of knowledge were known and appreciated. A man of great industry, strong and original mind, he was among the first to open up the road which Wedding, Ledebur, Arnold, Bell, Howe, Sauveur, Elbers and many others are following with so much success.



PETER RITTER VON TUNNER.

In a recent report to the Department of State Consul James M. Chambers at Batum says that in the Baku oil district the steadily increasing depth of the wells has greatly increased their cost. In parts of the oldest territory (Balakhani), paying wells are still struck at from 500 to 700 ft., and as much drilling has recently been done in this old territory, the average depth of wells completed is not so great as it would be without such shallow wells. In Sabunchi the oil is not found much under 1,100 to 1,400 ft., while in Romani and Bibi-Eibat, the wells are now over 1,400 ft., one good well in the former territory being 1,743 ft., which is now flowing over 12,000 bbls. per day. Of course, the cost of wells varies according to their depth, but statistics from an average well at Sabunchi will give a fair idea of the average cost of wells.

The well referred to is 1,185 ft. deep; however, owing to the formation being devoid of rocks and wholly sandy, it is necessary to pipe the hole as fast as drilled, and as much difficulty is found in getting pipe in the hole, wells are commenced with very large holes, varying according to the depth it is expected to drill. For wells which are expected to be over 1,000 ft. the hole at the start is usually 26 in. in diameter, and is finished with from 14 to 16 in. pipe, according to the success met with in drilling. The pipe used is not the cast-iron or lap-welded pipe used in the United States, but is made of  $\frac{3}{8}$  to  $\frac{1}{2}$ -in. iron and riveted, the joints being about 4 ft. each clear of the coupling, which is riveted on the pipe. The well was started with 26-in. pipe, of which 175 ft. were used; then came 313 ft. of 24-in., 455 ft. of 22-in., 735 ft. of 20-in., 1,025 ft. of 18-in., and the well was finished with 1,148 ft. of 16-in. pipe. The total cost of the well was about 35,320 rubles, equivalent to about \$18,619. But this is not the whole cost of a well ready to pump or flow, as it generally takes the work of weeks, and sometimes months, to get the well cleaned out after drilling is finished, as they usually contain much sand and often mud and water, so that it is safe to estimate the average cost of wells in the Baku territories at \$20,000 each.

The average daily production of wells in December was about 225 bbls., and the present price of crude is about 34c. per barrel. The statistician for the Producers' Association estimates the cost of pumping at 1 copeck per pood, which is about 4c. per barrel, and which is probably too high.

Notwithstanding the fact that the production from flowing wells in 1896 was about 3,000,000 bbls. less than in 1895, there were two new large flowing wells last year, both at Bibi-Eibat, which is about 10 miles south of the Balakhani-Sabunchi-Romani territory. The first of these wells commenced flowing on January 30 and continued for 36 days, in which period it produced more than 3,000,000 bbls. of oil, while the second commenced flowing in June and produced even more oil than the first.

The prosperous state of the Baku trade has greatly en-

couraged prospecting for new territory, and more "wildcatting," as it is called in the United States, is now being done than ever before in the history of the trade, with, however, anything but satisfactory results. Near Poota, a station on the Baku-Batum Railway, about 12 to 15 miles south of Baku, a well has been drilled to the depth of 861 ft. without finding sufficient oil to pay, and at Hindar-Sindi, about 35 miles north of Baku, on the shore of the Caspian Sea, two wells have reached the depths of 784 and 973 ft. respectively, with the same result as at Poota. These wells were located upon surface indications and the existence of oil at shallow depths, which was discovered by trial drillings by hand. Still further north, close to the Caspian and about 20 miles south of Petrovsk, a well is said to be producing about 25 barrels per day from 240 ft. At Supsa, a station on the Baku-Batum Railway about 35 miles north of Batum, a Belgian company commenced drilling several months ago, the inducement being the usual surface indications, and at last accounts the well was over 400 ft. deep, with considerable gas, but no oil. At Koodakoo, on the Kuban River, about 30 to 40 miles east of Novorossisk, a Baku company has drilled six or eight wells in the last two years without getting anything to pay it for its outlay.

The railway disaster of last year can be credited with the determination to construct a pipe line from Michailova to Batum (a distance of about 145 miles and covering the most difficult part of the Baku-Batum line) for refined oil. The intention is to bring the oil from Baku to Michailova (about 415 miles) in tank cars, as at present, and deliver it from Michailova to Batum by pipe, the pipe to be 8 in. in diameter.

This will greatly increase the transportation capacity of the railroad, it is thought, and prove sufficiently profitable and advantageous to induce the railroad to continue the pipe line on to Baku in the near future. It is expected that this Michailova-Batum pipe line will be completed by October this year, but as the pipe, or about 120 miles of it, is to be made by a mill which has been brought from the United States and is now being erected at Mariopol, on the Sea of Azov, it is quite safe to predict that the line will play no important part in the trade in 1897.

The Grosni Field, situated about eight miles from the railway station of Grosni, on the Vladikavkas Railroad, about 80 miles west of the Caspian Sea port of Petrovak, was opened by the striking of a well which started flowing at the rate of probably 100,000 barrels per day in November, 1893, and great things were expected of it and preparations commenced for taking care of a large production; but the field seems to have had disappointing results, as on January 31st there were only 12 wells producing about 7,500 bbls. per day, seven wells in process of drilling, two wells being drilled deeper, and eight new derricks. There are five pipe lines from the wells to the Grosni railway station and two refineries at the station. One of these refineries is a tolerably large one and was constructed by a Belgian company, which bought the best territory at Grosni; but this refinery has only turned out one cargo of refined, which was shipped to Antwerp some months ago, and has done nothing since, while the second refinery belongs to the Vladikavkas Railroad and has not yet commenced working.

It is possible that it has been found that the Grosni oil is not good enough to compete with Baku crude in refining, as it is said that Grosni crude yields only from 15 to 18% of illuminating oil and then leaves a residuum too heavy to compete with Baku residuum as fuel. It is also possible that the Grosni producers find it more profitable to sell their crude for fuel than for refining, as during the winter months Grosni's vicinity to the home markets gives it a great advantage over Baku.

#### THE WITWATERSBAND GOLD-FIELD AND ITS WORKING—V.\*

##### MILLING PRACTICE AND COSTS.

WRITTEN FOR THE ENGINEERING AND MINING JOURNAL BY W. Y. CAMPBELL.

The first five stamps ran on these fields in 1887. At the end of 1890 there were 1,800 stamps at work for that year, but their average work in the year was only 160 days of 24 hours. At the close of 1896 there were 4,831 stamps erected on these fields, but during 1896 only an average of 2,953 worked with a work-period per stamp of 310 days. A portion of the 4,831 stamps are old and light, and in course of substitution by heavier mills.

The "Deep Levels," or second main reef series of mines, are all developing under ground, and preparing and erecting surface equipments, including mills, proportional to their mine development, now well in hand. The estimate of stamps on the two rows of parallel mines, outcrop and deep-level, in 1900 is 10,586, working full time. This 1900 estimate is, of course, largely dependent on political and industrial reform. With present impossible conditions, only the richer shoots can—without serious loss—be milled; but with decent government, and, therefore, cheap conditions of working, the estimate for 1900 would be conservative. Given economic conditions of working, a normal working cost of \$3.60 per ton, inclusive of cyaniding, the mill limit in these extensive auriferous conglomerates, is purely one of the maximum mining powers.

A governing factor, that is as yet latent, is that of "shall we closely sort the ore and mill close, or shall we crush quantity?" It is all a question of profits, but its decision will affect the future milling power by 20%. Estimates are based on present mining and milling practice. Finer feeding into mortar boxes is also a coming factor. The current mills are built by either Frank Taylor's Foundry, at Sandycroft, near Chester, England, or by Fraser & Chalmers, of Chicago and Erith, England. These firms practically share the supply between them, other makers being nowhere. Within a few years the local foundries will begin competing, as the suitable iron ores of the country with fluxes and fuel abundant, will not be dormant forever with sea and land freights in favor of manufacture on the spot.

The average sized mill of 1896 was 60 stamps. The usual vogue of five stamps per battery is invariable. The stamps vary from 750 lbs. to 1,250 lbs., the average being about 1,000 lbs., and the new orders are all for heavy mills. The drop is 6 to 7 in., chiefly the latter, and the speed 90 per minute. Wire screening is used generally on the mortar boxes and varies from 600 to 900 holes per square inch. Present tendency is rather toward 600 or less, securing big tonnage and depending on leaching to bring up the catch. If high sorting is resorted to, it will affect the mesh size, of course. In the early days 1,200 and 1,400 mesh were common, and 750-lb. stamps, but all that is becoming scrap heap now. Amalgamation in boxes is generally mildly resorted to. Plate area per five heads is 4 ft. 8 in. broad by 12 ft. long, say 56 sq. ft., and the fall is 1 in. in 12 in. The sands go then in most cases direct to the settling dams on their way to the leaching vats. Some mills use blanket strakes or vanners, but unless the ore going with the mill is well above 10 dwts. in tenor, intermediate processes do not seem to pay. The total concentrates locally won in 1896 are returned at 0.5% out of the total gold production.

Some mines sort out ore on surface, the bulk do not yet; those who do, sort out from 10% to 20% of the total sent up from mine. The chief cost per ton is in bringing the ore to surface; once it is there, and if of 1½ dwt., it is worth crushing in view of the cost of and yield in milling. No set rule is established or accepted. The country or wall rock varies in the different mines in kind and in percentage to the ore, and the ore bodies vary in size and quality, so that each mine must work out its own proposition as shrewdly as it can, and the matter is having very close attention at many of the mines. Where, as in many cases, the ore is oxidized and friable, sorting is, of course, impossible, and all that can be done is to stope carefully. Crushers are still set too coarse, the average cube of the ore for the mills being between 2 in. and 3 in., instead of 1 in.; here again, however, each mine has its local conditions. The usual up-to-date equipment of ore-crushing plant, large reserve bins, gravitation

\* No. 1 of this series appeared in the *Engineering and Mining Journal* for June 19th, page 631; No. II., June 26th, page 659; No. III., July 10th, page 36; No. IV., July 17th, page 67.

deliverers, Challenge feeders, etc., are found in the outfit of most local mills. The average costs of milling, from the time the ore comes to daylight till it leaves the mill for the leaching works as sands, is 84c.; some of the older mills, or indifferently managed, run higher. A typical 80 stamp mill, doing a duty of 4½ tons per stamp per day, will run a schedule of costs as follows, running say 92% of full time per month:

MILLING COST PER TON.	
European labor.....	Cents. 26 50
Native labor.....	11 50
Water.....	1 90
Stores.....	13 68
Fuel.....	16 42
General.....	12 00
Total cost per ton.....	82 10

There are mills which claim to work at 60c. per ton, but the figure is impossible just yet and indicates merely bad accounts.

The ton is by agreement of the Chamber of Mines the short ton, or 2,000 lbs., but a close scrutiny of the varying practice on the Rand leads me to state that the "ton" varies from 1,500 lbs. to 2,000 lbs., and that the average Rand ton is about 1,750 lbs. Exact figures are, therefore, unobtainable until the companies put in weigh-bridges in their tram tracks. For some time few of the mills have been able to run full time, a serious matter. The vagaries of shifting and inefficient native labor in the stopes is constantly hanging up stamps for hours or days, and this tells up in the year's run and in the year's profits and costs.

The catch on plates varies with the ability of the mill manager; in the well run mills, with freest ores, 65% of the fire assay value of the ore is caught on the plates; in those less well run, or with more refractory ores, 45% to 50% is caught; the reef average is probably 55%. In retorting amalgam 1.5% is missing, say 1.25% retained by the mercury, and, therefore, not lost, and 0.25% lost in unavoidable ways. In smelting a further 0.25% is locked in the slags, though part of that is recovered, as the slags go to the mortar boxes. The amalgam runs from 25 to 41% of gold; doubtless the Rand average is about 35%. The smelted gold contains about 9% of silver in the Western mines, and 11% in the Eastern. The average of the bullion from the plates shipped is '880 to '890 fine. That from concentrates is, on an average, '990 fine. Cyanide bullion averages '720 fine.

One great advance yet to be fully compassed in local milling is the skilled installation and use of ore-crushing appliances before passing the battery feeders. No rock should enter mortar box much over ½-in. cube; the present average is 2 in. The cost of plant to secure this is small, while the duty of the mill is increased 20% at least; maintenance is less, while attrition, and therefore slimes, are reduced to a minimum. The policy means higher duty and less cost. Such a policy might entail modifications of current practice in weight of stamps, height of drop, and of discharge, doubtless, but for Rand ores there is probably room for 20% improvement in milling methods. The expenditure of \$10,000 at most on a 100-stamp heavy mill should secure the above gains. Millwrights must compass two things, better duty in quantity and quality of ore in comminution, than at present; and likewise mill managers must compass full running time. There is room for big improvement locally on both these important points.

Finally a word on the supply of water for milling purposes locally. Dry crushing is spasmodically heard of, but is never a commercial success, and we must still view the wet process as obtaining. The water used is merely seasonal rainfall, caught in reservoirs in the shallow undulations of the plateau. These means are adequate in wet seasons, but quite inadequate in dry seasons. One of two things or both must be compassed: To bring in water from a river, the Vaal for instance, 40 miles from the mines and 1,000 ft. below them, or from some other river; or to establish large catchment and storage dams for the annual rainfall; that is to put a lot of the shallow valleys north and south of the reef ridge line practically under pent-water. This would help materially, despite the enormous evaporation at this altitude, 6,000 ft. Something must be done to obviate the otherwise certain recurrence of silent mills and paralyzed operations, merely for want of water, in a country where the rainfall averages about 30 in. per annum, and where the mines are on top of the highest water-shed with no river of moment nearer than 40 miles.

The rainfall of 1896-97 has been of a showery nature, telling fairly in the rain gauges, but not in storage in the soil. Unless heavy—three or four days continuous—rain comes before the season ends, say the first of April, 1897, water scarcity is sure to come before the year ends.

#### ELECTRO-DEPOSITION AND RECOVERY OF GOLD.

By E. Andreoli.

In this paper, read before the Society of Chemical Industry in London, Mr. Andreoli says that the electro-deposition of gold from its cyanide solution does not appear to be an operation which presents any great difficulty, and to the uninitiated it comes to the same thing as electro-plating. There is, however, a great difference between treating concentrated cyanide of potassium solutions carefully prepared and containing a large proportion of gold, the strength of which is kept up by a gold anode, at an electro-plating works, and electrolytically treating 100 to 150 tons of a very weak solution of cyanide containing a very small proportion of gold. In the former case one has to coat metallic articles with a layer of gold of a certain thickness; in the latter, one has to practically exhaust the solution while it is passing through the tanks.

The treatment of 100 tons of solution per day of 24 hours represents a circulation of more than 4,166 liters per hour, or almost 70 l. per minute. A mode of circulation must be adopted which allows a constant and perfect contact of the electrolyte with the plates. Then the arrangement of the plates in the tanks must be such that they are not too far apart, and that the electro-motive force must be as low as possible, and therefore ensure economy of working.

Now, assuming that ore has an electrolyte which is a good electrical conductor, that the electro-motive force is not too high, and that the best system for arranging the electrodes in the vats and for circulating the liquid between them at a rapid rate has been adopted, what material

is to be used for the construction of the anodes? All the metals, without exception, dissolve at the positive pole in a cyanide of potassium solution; the best carbon will soon be attacked and disintegrated. Iron is, of all the metals, the only one which resists somewhat when acting as an anode in a cyanide of potassium solution; still it dissolves. Complicated reactions take place, and the electrolyte is contaminated with all sorts of impurities.

It has been the writer's good fortune to find an anode which is neither carbon nor metal, and which cannot be destroyed under the corrosive action taking place at the positive pole in a cyanide electrolyte, and which does not decompose or spoil the solution. He says, however, that it is not a discovery resulting from his researches and studies; it is simply the result of chance. He was making experiments on secondary electrolysis, when he noticed that, having put in the central compartment of a tank containing a gold and potassium cyanide solution, a piece of perforated lead close to the negative partition of the compartment, the lead, which in this case acted as an anode, had become brown. He soon ascertained that the plate was covered with a strongly adherent coating of peroxide of lead. There is, therefore, no other merit attached to this discovery except the observation of the formation of peroxide of lead on a lead plate in the course of experiments on the deposition of gold, which were very satisfactory on a laboratory scale, but could not practically be carried out in the gold districts where the use of porous partitions is an impossibility.

Then commenced a long series of tests which all proved the excellence, the solidity and the insolubility of these anodes when properly made, and electrolytic vats were started, each containing 30 large anodes. These plates were formed according to the Planté method, which means that they require a very long treatment; but at present it is best to use a solution of plumbate of soda, in which they are rapidly coated with peroxide of lead, then withdrawn, washed, and placed in a strong cyanide of potassium solution, where, under a heavy current, they become hard and have a good crystalline appearance. The first thing done with these anodes was to use them to deposit gold on zinc plates. It was better and more rapid than the usual deposition on zinc shavings, but not at all good; besides, there was a great drawback to this electro-deposition, where each anode had to be placed between two cathodes. It can be realized how long it must take to disconnect, say, only 1,000 cathodes, and then to replace them by another 1,000 plates, and this is still worse if one has to withdraw the anodes and put in fresh ones. What then if the plates have

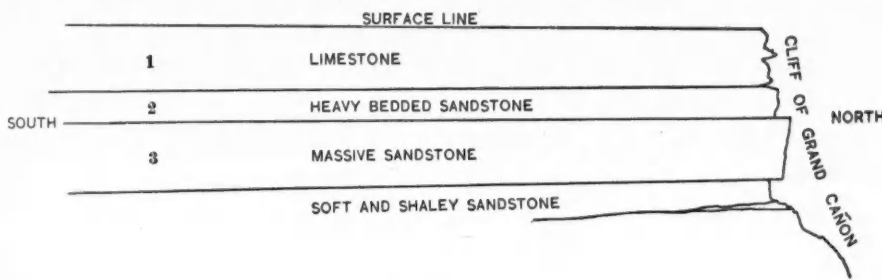


FIG. 1.

GRAND CANYON COPPER DEPOSIT, ARIZONA.

AN ARIZONA COPPER DEPOSIT.

Written for the Engineering and Mining Journal by John F. Blandy.

It was my good fortune to make an examination lately of a unique deposit of copper ores on the Colorado Plateau near the rim of the Grand Canyon. It is about 50 or 60 miles nearly due north of Williams, a town on the Atlantic & Pacific Railroad. The copper ores occur in limestone and are an excellent example for the ascension theorists. The limestone formation (generally considered as the carboniferous) is about 300 ft. thick and lies nearly horizontal, having an ascent toward the north of about 100 ft. per mile. It is underlaid by heavy banded dark gray sandstone of less than 100 ft. depth, under which are several hundred feet of massive white sandstone. An excellent section of these strata can be seen in the cliffs of the Grand Canyon and some thousand feet more of strata down to the granite. In this description it is not necessary to refer to anything below the white sandstone.

The limestone is thinly bedded; I saw none thicker than 6 ft. Some of the strata are clear limestone and in others you have all the gradations from silicious limestone to calcareous sandstone. Fig. 1 herewith is an approximate section of the rock at the face of the canyon cliff.

In the cliff of the white sandstone, which is perpendicular, can be seen a monster ledge of sulphides of copper and iron. Two short tunnels have been driven into it. It has no walls, so the sand-rock at each side of the original fissure has been replaced by ores and gives the appearance of a vein 300 to 400 ft. wide. At first one might consider this only stain, but the heavy blocks of solid ore which have fallen prove to the contrary and that it is ore, though in patches rather silicious. A sampling at the face of the upper tunnel gave 5% of copper, and selected pieces at both tunnels gave 60% and 48.5% copper.

On account of the thin bedded nature of the limestone and consequent tendency to easy lateral displacement, the fissure did not go directly through this formation, but the course of the vein across the limestone is traceable by the deposit of oxides and carbonates of copper for many miles. The surface beds have been much impregnated by the ores, and the lower and stronger beds have had the joints and interstices filled with ores. Many pits and trenches have been sunk on the line of this deposit and shipments of 40% to 50% ores have been made. No greater depth than 30 ft. has yet been reached, but in each case the quality of ore has increased in quantity and value.

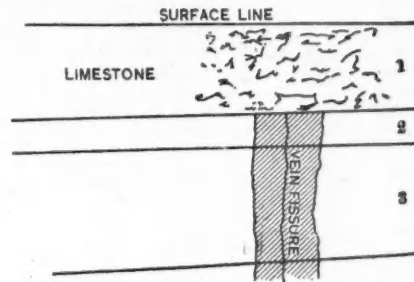


FIG. 2.

to be framed? To this must be added that if the anodes are soluble, the liquid is spoiled and the tanks have to be cleaned. With the insoluble peroxide anodes the gold cyanide solution is as clear after as it was before treatment.

The real problem of the electrolysis of a large volume of gold cyanide solution is to have as few plates as possible and a large surface on which to deposit the gold. For this purpose the writer constructed a tank with two grooves cut in the bottom, which were filled with mercury. Cathodes were amalgamated perforated copper plates, standing in the mercury in the grooves, doing away with terminals and connecting bars. These cathodes were thus all in contact with the mercury, which was itself, by means of a copper strip, connected to the negative pole of the dynamo. Each plate could thus be withdrawn and replaced without the slightest trouble. There were in the tank about 50 perforated cathodes, forming an enormous active surface, and, instead of 51 anodes, only 5 to 6 peroxide of lead plates. The mercurial surface with which the gold solution had to be in constant, intimate and perfect contact, under the action of the electric current, was enormous, but the quantity of mercury in each tank was very small, and the absorption of the gold by the amalgamated plate, which formed a sort of electric filter, was practically complete. Four of these tanks were capable of doing the work of eight ordinary tanks. This was a great advance, but the objection was raised that nobody in mining districts would care much for adopting such a process, which involved too much trouble in distilling the mercury and cleaning the plates in order to recover the gold amalgamated with it.

M. Andreoli firmly believed, however, in this method, which allowed the operator to rapidly and very efficiently exhaust the solution in a comparatively very small installation. To find something else and something better which would suit the wants of mine managers, he commenced to deposit the gold on iron plates, which take gold much more readily than lead. Gold adheres better to iron and steel than to any other metal; to recover the gold from the cathodes, they are dipped for about one minute in a bath of molten lead or bismuth kept at a proper temperature. An alloy is instantaneously formed which becomes richer and richer in gold, and which can easily and economically be cupelled, with the result that the bullion is absolutely pure.

**Hungarian Magnesite.**—Magnesite is mined at Minsan, near the Tolsvar railway station by the "Ungarische Fabrik-Actiengesellschaft für Magnesit Producte" of Budapest. At present it is producing only crude rock, but intends presently to prepare calcined mineral, magnesia hydrate, magnesite brick and chloride of magnesium.

Fig. 2 gives my idea of the nature of the deposit. This impregnation and depositing has taken place in the limestone for a width varying from 50 to 300 ft. Here and there some sulphides are met with. I cannot think of any other explanation of this deposit than that the ascending ore-bearing waters have deposited the ores in the cavities of the limestone at the same time changing them to oxides and carbonates. Also, the limestone has been changed to gypsum, samples of which are often met with, but the bulk of this material has been carried to neighboring gulches, and can now be seen there in beds. In places along the line of the deposit the surface beds seem to be tilted as if an upheaval had taken place, but I rather interpret this to mean that caverns have been formed below and allowed pieces of the surface rocks to fall in. No doubt this deposit in the limestone will continue down to the sandstone floor where the fissure vein will be easily found, and work continued on in the sulphide ores. It is not to be supposed that an equal distribution has taken place along the strike of the lode, as the ascending waters could be easily more abundant at one point than another. Furthermore, there is some difference in the character of the ore, some being somewhat more silicious than others—probably due to the condition of the enclosing limestone bed in which it is found. The carbonates and oxides predominate with a varying amount of iron oxide. Should the ore be found with a short supply of iron for fluxing it can be easily obtained in the near neighborhood from deposits of brown hematite. Altogether I consider the deposit to be one of great economic value.

**Spontaneous Combustion in Coal Cargoes.**—The Commission appointed by the government of New South Wales to enquire into the causes of the firing of coal cargoes has just presented its report to Parliament, says the London *Iron and Coal Trades Review*. It will be remembered that an English Commission which enquired into this question in 1876 found a relation between the size of coal shipments and their liability to combustion, and also condemned the ventilating of coal cargoes except from the surface. The New South Wales report does not bring forth any particularly new facts. It finds that ships carrying coal cargoes are peculiarly liable to both spontaneous heating of the coal cargo and to shifting in the coal cargo. The cause of this spontaneous heating is to be sought in the absorption of oxygen by coal, this absorption increasing with the initial temperature of the coal, the fineness of its state of division, the depth of the cargo, the length and mean temperature of the voyage. The cause of the shifting of cargo is to be sought in imperfect and insufficient trimming and the absence of shifting-boards. These facts are, of course, well known.

THE MINE HILL ORE DEPOSITS IN NEW JERSEY AND THE WETHERILL CONCENTRATING PLANT.

Written for the Engineering and Mining Journal by J. P. Wetherill.

(Continued from page 66.)

At the present time the mill at Franklin is operated under the Wetherill system, the practice now followed being described below. A general view of the mill was given in the preceding number, and the engravings herewith show the details of the plant. The Wetherill concentrator was described and illustrated in the *Engineering and Mining Journal* for June 13th, 1896, page 564.

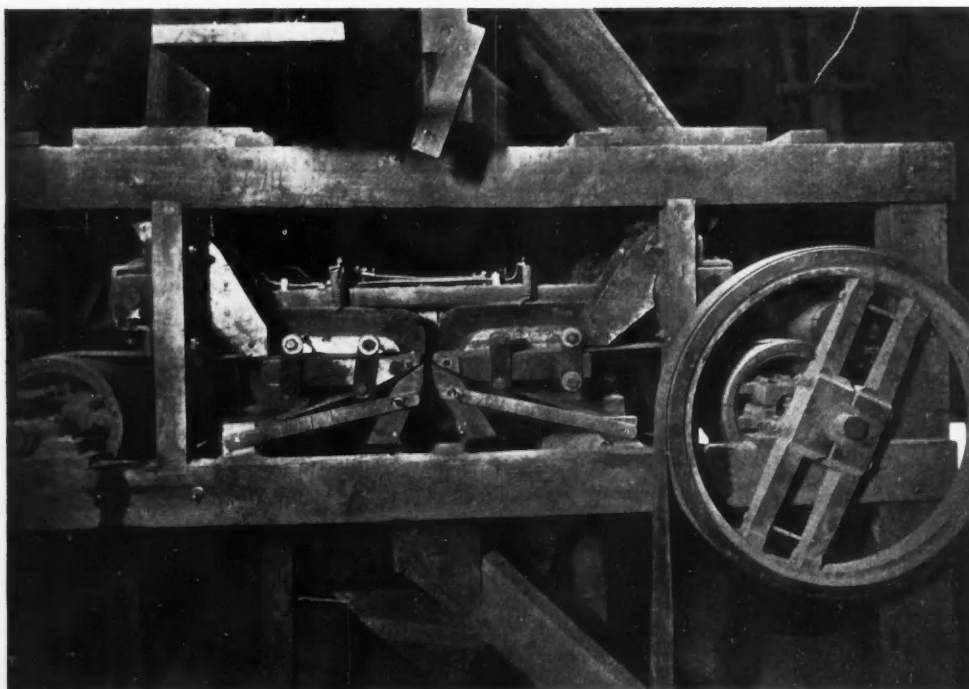
The ore is raised from the mine in 2-ton cars to the upper landing of the head-frame, where the cars are transferred to the ore bins on automatic tapping cars, operated by a small air winze. The ore is dumped over grizzlies having bars 1½ in. apart, which separate it into coarse and fine, each of which enter into separate bins. A double plane having a scale where all the ore is weighed before putting into the house leads from the storage bins to the concentration plant. On the track 1 coarse ore is raised, and on the track 2 the fine ore is taken to the mill. The coarse ore is dropped upon the storage floor 3, where it is fed by hand into a Blake crusher 4, thence on a stationary slotted screen 5, having holes 1 in. in width. Below this screen is a 36-in. rubber picking

conveyor 25 into six wooden storage tanks 26. These tanks serve the purpose of allowing an hour or two repairs either to the crushing part of the house or the separating part, and are supposed to be kept about one-half full. Immediately beneath each tank is located a double magnetic separator of the Wetherill parallel type 27, by means of which a portion of the franklinite contained in the ore is separated and passed to the conveyor belt 28 which leads to the center of the house and thence by elevator to the conveyor 30, which terminates at a sufficiently high elevation to allow the ore to descend by gravity to the franklinite loading bins 31.

The non-magnetic materials from the separators 27 are passed by means of the conveyor belts 32 to the cross-conveyor belts 33, one on each side of the house, and by the latter to the two elevators 34, by means of which it is raised to two sets, of four each, of sizing screens, one set on each side of the house. The upper of these, 35, is 16 mesh; the second, 36, is 24 mesh; the third, 37, is 30 mesh, and the fourth, 38, is 50 mesh. The overs from the screen 35 pass to the two tanks 39; the throughs pass to screen 36.

The overs from screen 36 pass to the tanks 40, and the throughs pass to the screen 37. The overs from screen 37 pass to the tanks 41, and the throughs pass to the screen 38. The overs from the screens 38 pass to the tanks 42, and the throughs from the screen 38 to the tanks 43.

The small tanks are provided for further storage to allow the adjustment of the machines or the replacement of belts or overcoming of any cause of delay. Tank 39 leads to three finishing magnets 24, of the



WETHERILL CONCENTRATOR AT FRANKLIN, N. J.

belt 6, both the fine and the coarse ore being carried on this. The former, dropping on the belt first, acts as a cushion to the latter and protects the belt against wear. In case it may be found advisable, the fine ore can be carried on a conveyor belt below the picking belt and delivered directly into the crusher 8. The clean rock is here picked out and goes, through shutes to a storage bin 7, from which it is dropped into a car and taken to the rock dump. The ore falls from the picking belt into a duplex Blake crusher, 8, and the crushed material from this goes to two revolving screens covered with ¼-in. mesh steel wire screens 9. The overs from this drop into the slow speed rolls 10, the throughs from which go to the elevator 11, where they join the throughs from screens 9. The elevator 11 delivers into the Edison dryer 12.

The fines from the first grizzly at the shaft head are taken to the mill on track 2 and are dumped on the stationary screen 13, covered with slotted steel plates, the openings of which are ¼ in. wide. The overs from this go directly to the picking belt 6, the throughs are carried by the conveyor belt 14 to the top of the Edison dryer 12, where they join the material carried by the elevator 11.

This dryer consists of a cast-iron stack 3 ft. sq., 24 ft. high, made of cast-iron plates outside, which is filled with removable cast-iron slats 6 in. wide inclined at an angle of 45°. These slats dip alternately to the right and left, causing the ore to drop slowly from one to the other, thereby exposing each particle thoroughly to the ascending hot gases of combustion from a coal fire in a grate outside of the building. The ore leaves the dryer through a shute, 15, which carries it to four screens 16, covered with 8-mesh steel wire netting. The coarse material going over the screens drops into two high-speed rolls 17, the throughs from which join the throughs from screen 16 and are carried by the elevator 18 to four No. 10 mesh screens 19. The overs from this screen go through a revolving screen, 20, covered with 1-in. wire netting, in order to remove pieces of wood and other unbreakable material which would otherwise in time clog up the finer screens.

The throughs from 20 drop into a single pair of high-speed rolls, 21, the throughs from which are carried by the elevator 22 to two 10-mesh screens 23, the overs of which go back to the rolls 21 and the throughs of which drop on the conveying belts 24, where they are joined by the throughs from the screens 19 and are distributed by means of the cross-

Wetherill horizontal belt type, the magnetic portions separated by each machine passing to the conveyor 45, thence to the franklinite conveyor 28, and by means of the elevator 24 and conveyor 30, to the franklinite loading bins 31.

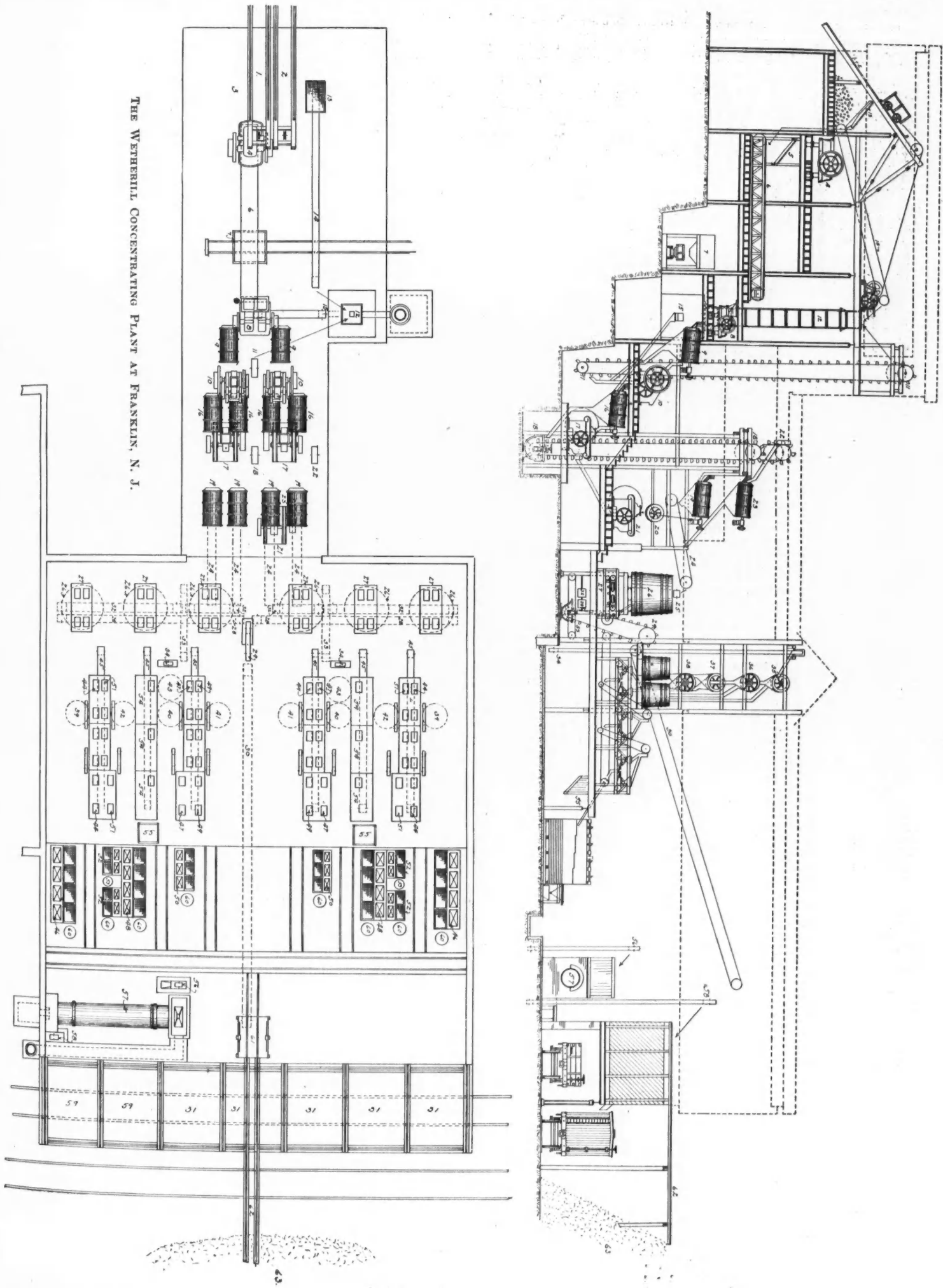
The non-magnetic material, consisting of willemite, calcite and mica goes to the four-screened Hartz jig 46, of the Cooley type. The material from tank 40 passes to the Wetherill magnetic separator of the horizontal belt type 47, the magnetic going back to the franklinite conveyors and the non-magnetic to the four-screened Cooley jig 48. The material from tank 41 passes to the Wetherill separators 49 of the flat magnet type, the magnetic going to the franklinite conveyor and the non-magnetic to the jigs 50. The material from tank 42 passes to the flat belt separators 51, the magnetic going to the franklinite bins and the non-magnetic to the double jigs 52 between which the volume of water is reduced by means of a funnel, 53, in order to prevent too great a flow of water on the last two sieves. The material from tank 43, which is through 50 mesh, passes to the Wetherill up-belt separators 54, the franklinite returning to the franklinite main conveyor and the non-magnetic passing to a hopper on the lower floor 55.

It is found so far that this fine material, after the garnet, tephroite and fowlerite have been removed from it, carries such a small amount of limestone that it may be put directly with the ore, which is done by means of tracks through the building. The ore coming from the jigs is carefully examined and if found sufficiently clean it is loaded on trucks running on tracks adjacent to the jigs and passed by cross-tracks to the elevator 56, which delivers it into a revolving dryer, 57. This dryer consists of a circular shell 40 in. diameter and 25 ft. long. It is finished with inside brackets, that raise the ore as it revolves and allow it to drop through the hot gases of combustion generated in the grate at the discharge end of the dryer. An elevator, 58, carries the dried ore to the spelter ore bin 59. It is dried to prevent its freezing in the bins or in the cars during its shipment in winter time and also to drive off the moisture so that freight or other charges are not paid on it.

The tails from the jigs consisting of mica, limestone and other impurities pass with the water through funnels with iron overflow 60, by means of which the volume of water is separated from the limestone tailings. These are examined, and if found sufficiently free of zinc ore to pass



THE WETHERILL CONCENTRATING PLANT AT FRANKLIN, N. J.



them out of the house, are loaded on trucks, thence to the elevator 61, and so, by means of the track 62, to the tailings bank 63.

The building has an iron skeleton frame covered with corrugated iron. The engine-house and the lower portion of the separating-house are built of brick.

The electrical equipment was installed by the Universal Fire Alarm Company of Philadelphia, and includes two 25-K. W. compound wound multipolar Eddy dynamos, specially designed for 50 volts. The dynamos are belt-connected with friction clutches on main driving shaft. The switchboards are located on a gallery overlooking the dynamos, in plain sight of any one standing at dynamos, and easily accessible from the dynamo floor. They are built of marbleized slate; all switches and instruments are highly polished, all connections and wiring installed in the most approved manner.

The leads from the dynamo are run under the engine-room floor to the dynamo switchboard. This switchboard, a photograph of which is shown herewith, is the connecting link between the dynamos and the distribution system and separator switchboards. It contains the devices for regulating the output of the dynamos, the instruments for measuring the current and the switches by means of which the different dynamos are connected to the various circuits. It is especially designed so that any change in the combination of the dynamos and circuits can be made without the slightest interruption of service.

The separator switchboard was designed and patented by Lewis G. Rowand. It controls 42 separator circuits and is divided into two sides, one for each side of the separator building, so that one or both sides of the separating plant can be operated by simply throwing the main switch for each side separately.

Each separating circuit being provided with special relay, cut-out, switches and rheostat, any desired amount of current can be had on any separator from 1 1/2 amperes to 25 amperes in 1/2-ampere degrees. This is absolutely necessary as found in practice, for as the ore changes in its magnetic attractability it is necessary to change the strength of the magnets. After the desired amount of current is put on any separator the special relay can then be adjusted on that circuit to give notice of any change either above or below the amount desired. The opening of the circuit, changing the rheostat, or close circuiting of the separator magnets, will give immediate notice by ringing a large vibrating bell on the separator floor, and indicating on an annunciator the number of the circuit; also lighting a red lamp on the switchboard. Each circuit is also provided with a special double-throw switch for throwing in the testing ammeter when adjusting the required amount of amperes without breaking the separator circuit.

On the center panel of this board between the separator circuits for each side of the house, are placed the main and local switches for each side of the board, two relays for bell, the indicating annunciator with switches for each indication, testing ammeter and voltmeter, and pilot and resistance lamps for the local circuits. This switchboard after adjustment requires no attention and will give immediate notice and location of any disarrangements of the separators and local circuits. It is simple in adjustment and any one circuit can be adjusted without interfering with any of the others. The separators are wired direct from switchboard, with no switch or cut-outs outside of it. The 42 separator circuits are at this writing taking 525 amperes at 50 volts = 26,250 or 35.18 electrical horse-power.

When the house was first started the ore was dried with an inclined flue dryer. The labor cost of operating this was found to be excessive and the capacity too small. The present Edison dryer, it is expected, will require much less labor and have much greater capacity. At the finished ore dryer it was also found necessary to throw out the flue dryer and substitute another form. A revolving dryer is here used, but it is probable that for this purpose also an Edison dryer will be most economical.

From the following table of costs it will appear that the house takes too much labor and material. This will in part be remedied by the improved dryers, but there is not very great hope of reduction to proper limits until a better system of sizing is adopted than the revolving screens. This is in contemplation and a considerable reduction in cost is anticipated when it shall be in use. The costs given are in cents per ton of 2,240 lbs. of crude ore passed through the house.

COSTS OF RUNNING MILL, FEBRUARY, 1897.

Labor.		Cents.
Loading at storage bins.....	Crushing house.....	11.75
Hoisting into house.....		
Crushing.....		
Drying.....		
Hand picking.....		
Sizing to through.....	Separating and jig house.....	14.77
No. 10 mesh.....		
Separator men.....		
Jig runners.....		
Jig helpers.....	.....	26.83
Drying spelter ore.....		
Chemist, foreman and firemen.....		
Repair men.....	.....	53.32
Engineers and dynamos.....		
Others.....		
Loaders and shipping.....		
Total labor.....		53.32
Coal.....		8.77
Material for general supplier.....	.....	12.45
and repairs.....		
Wire cloth.....		
Oil and grease.....		
Repairs to machinery.....		
Total per ton (2,240 lbs.) of crude ore.....		74.51

The quantity put through in February, 1897, was 4,812 tons.

From 30,311 tons put through the house up to April 1st, 1897, there were produced: Oxide ore, 20,455 tons, or 67.48%; spelter ore, 7,271 tons, or 23.99%; tailings, 2,585 tons, or 8.53%. The following analyses of the product are given:

	Franklinite concentrates.	Zinc ore concentrates.
Iron—Fe.....	29.47	2.20
Manganese—Mn.....	13.57	5.15
Zinc—Zn.....	22.94	48.90

The tailings carried 4.19 Zn for the period above given.

Varying with the quantity of zincite contained in the ore from the mine, the zinc concentrates have gone from 46 1/2% of metallic zinc to 53%. The figure given above is the average of the work so far. Cleaner work in iron and manganese may be obtained by greater experience with the process, but the clear transparent green crystals of willemite contain from 1 1/2% to 3% of manganese and the dull greyish white willemite has been known to carry as high as 8%. The red-brown and darker crystals of willemite carry 1 1/2% to 3% of iron. The mineral itself therefore does not occur in quantity with less than 5% of combined iron and manganese. As the ore is usually made up of several colors or shades of color of willemite, it is not possible that absolutely pure ore can ever be obtained, and while experience may reduce the combined iron and manganese from 7.35% by two or three points, it cannot hope to do better. The ore so obtained has become popular both here and in Europe, because the metal it yields is so free from impurities as to be classed as high grade, commanding a considerable advance in price over other grades. It is probable that in order to supply the demand it will be necessary to erect another separating house in the near future, with double the capacity of the present one.

The frankinite ore will now be used solely for the production of oxide of zinc, and the residuum from that process for the manufacture of spiegeleisen. The ore as formerly sent to this process carried from 30% to 35% of oxide of zinc. The run of the house above recorded sent ore of 28%, and it is expected that better practice will enable 26% ore to be sent and a proportionately greater saving added to the willemite. It has been found that about the same amount of yield can be obtained from a works of a given size with 26% ore without the silicate of zinc in it as can be obtained from a 33% or a 34% ore with the silicate present, because no limestone is required to cause the silicate to yield its zinc, and the same furnace and fuel works a larger volume of ore.

The separation of the willemite also furnishes from the oxide furnaces a residuum higher in iron and manganese and lower in silica, therefore requiring a smaller quantity to produce a ton of spiegeleisen, less limestone and consequently less coal. By thus diminishing the material required, the high phosphorus which was the only objection to spiegel from frankinite ores, has been removed. The analysis of the residuum from which the spiegel is made is: Iron, 36.99; manganese, 15.67; silicon, 16.23; zinc, 4.11; phosphorus, 0.0291. It will be observed that the volume of tailings is very small, only 8%. This is due to the fact that most of the ore used was from development work in the shaft which has not yet begun to work the full width of the vein. It is expected that this material will be considerably increased when the mine is fully developed.

AN UNUSUAL PIECE OF MINING WORK.

Written for the Engineering and Mining Journal by J. T. Donald.

Lac a la Tortue (Turtle Lake), 21 miles from the city of Three Rivers, on the Piles Branch of the Canadian Pacific Railway, is a very curious iron mine, worked by the Canadian Iron Furnace Company, which operates a modern water-jacket furnace at Radnor, 10 miles distant. This lake is a body of water about 4 miles long by 1 1/2 miles in average width, occupying the center of a large area of swampy land. The surrounding land is largely composed of sand formed by the wearing down of the Archaean rocks by glacial action. It is well known that decaying vegetable matter yields acids that dissolve the oxide of iron. Evidences of this solvent action of vegetable acids on iron are frequently seen in pieces of slate. The slate is colored by iron, but frequently white or light-colored spots occur. These are points where a leaf or a fragment of bark has been deposited with the fine mud, in which form the slate was deposited. The leaf or bark has decayed; the vegetable acids thus formed have dissolved the iron oxide to which the color of the slate was due, and of course a white or colorless patch is formed.

In the sandy area around Lac a la Tortue we find the most favorable conditions for the action of vegetable acids on iron oxide. The sandy land produces a rank vegetation, and its decay furnishes abundance of organic acids. These acids are in solution in the drainage waters, which on their way to the lake percolate through the sand. They thus come into contact with the iron oxide in the finely divided materials, dissolve it, and carry it along to the lake. Here a new chemical action comes into play. The solution of iron in vegetable acid (in which the iron is in what the chemist calls the form of a protosalt) is oxidized by the action of the air on the surface of the lake into a persalt, which is insoluble, and appears on the surface in patches that display the peculiar iridescence characteristic of petroleum floating on water. Indeed, not infrequently these films of peroxide of iron are incorrectly attributed to petroleum. These films become heavy by addition of new particles, they sink through the water, and in this manner, in time, a large amount of the iron ore is deposited on the lake bottom. It must not be supposed that the ore is deposited as a fine mud or sediment. On the contrary, in this lake ore, as it is called, we have an excellent illustration of what is known as concretionary action—that is, the tendency of matter when in a fine state of division to aggregate its particles into masses about some central nucleus which may be a fragment of sunken wood, a grain of sand, or indeed a preformed small mass of itself. Precipitated in water, as our lake ore is, it of course has great freedom of movement, and we, therefore, find it in flat concretions, more or less porous and circular in outline; the general appearance amply justifying the term "cake ore," which is locally applied. These concretions vary much in size, some of them being no larger than mustard seeds, others 8 or 10 or more inches in diameter. Frequently the larger cakes are joined together and form masses looking not unlike batches of a certain kind of bun commonly exposed in the shop window of every confectioner, and made by coiling a strip of dough round and round a piece of itself.

The ore is not found over the whole lake bottom; it occurs along the whole margin, and also well out from shore where streams enter the lake, the distance of the ore deposit from shore depending, of course, upon the volume of water carried by the streams and the velocity with which it enters the lake. Certain strips of ore occur at a considerable distance from the shore and in as much as 16 ft. of water. These deep,

water, mid-lake deposits denote probably the courses of former streams which are now non-existent, owing to some change of level. The ore is extracted from this lake-mine by hand and by power: the shallow margins are worked by hand, while from the deeper parts of the lake the ore is raised by means of a steam dredge.

A short time ago the writer was instructed by the proprietors to make an examination of the lake-mine and report the quantity of ore in sight. From the description of the mine already given, it will be seen that the task allotted was a somewhat unusual one. A certain amount of planning and experimenting was necessary before any satisfactory method of getting at the quantity could be determined upon, but finally the following method was adopted, and found to work admirably.

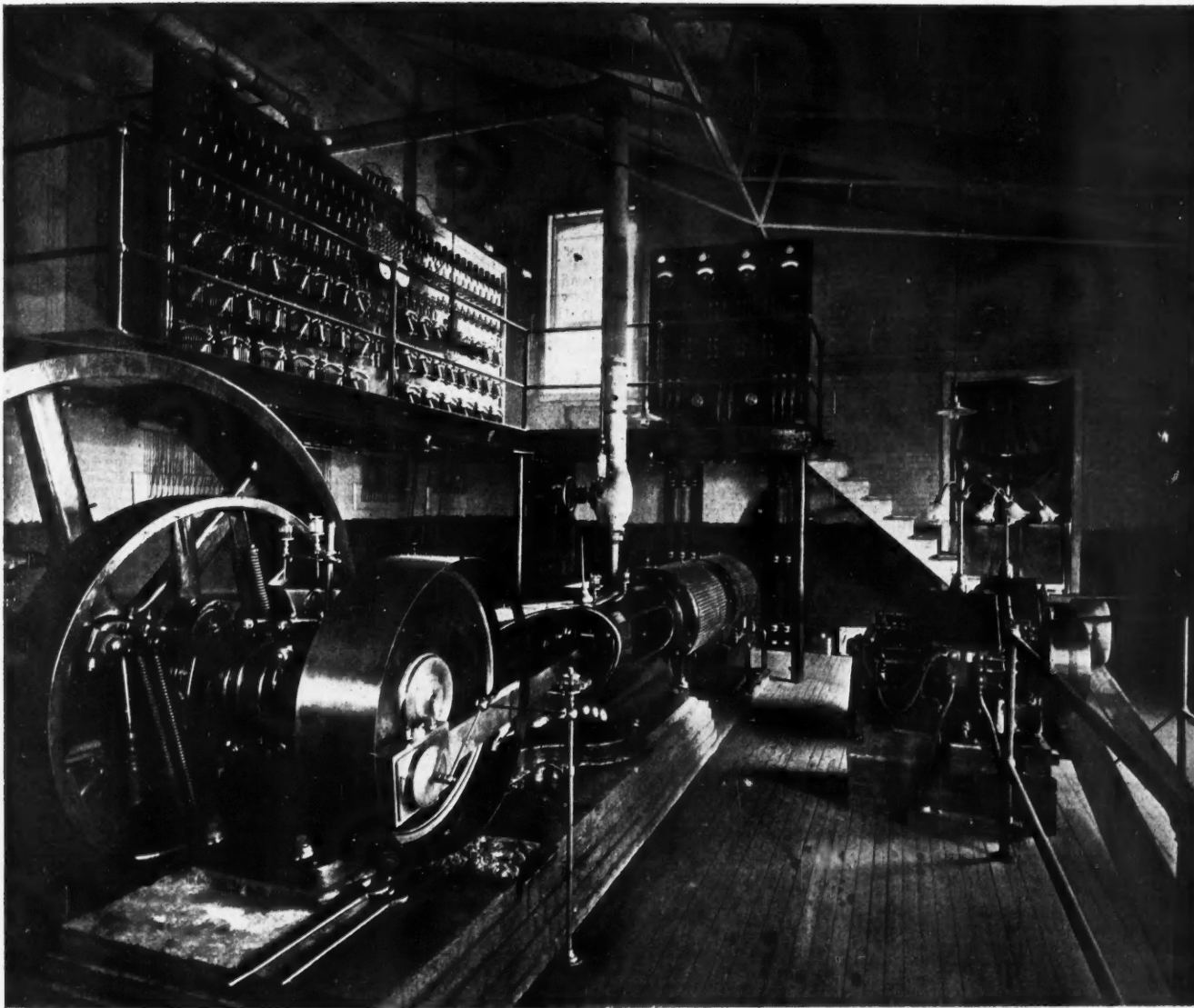
A number of lengths of 1-in. gas pipe were coupled into one length of about 30 ft., and this, resting on the stern of a scow, was pushed down into the water until the end rested on the bottom of the lake. The scow was towed by a tug backward and forward over the whole lake. When an ore deposit was reached, its presence was indicated by the vibratory motion of the long pipe caused by the end slipping from cake to cake of

over, it is found in actual working; if a certain spot be worked out it will in a few years again yield ore in paying quantity.

**British Coal Exports.**—The exports of coal, coke and patent fuel from the United Kingdom during June amounted to 3,082,214 tons, as compared with 3,264,315 tons in June, 1896, and 2,976,871 tons in June, 1895. The coal exports for the first half of the current year reached a total of 17,395,168 tons, compared with 16,594,637 tons in the first half of 1896, and 15,063,126 tons in the first six months of 1895. The average prices per ton work out as follows: 1897, \$2.15; 1896, \$2.14; 1895, \$2.29.

Bunker coal for the use of steamers engaged in the foreign trade was shipped at United Kingdom ports during the half-year to the extent of 4,981,219 tons, as against 4,782,187 tons in the corresponding period of 1896, and 4,502,075 tons in the first half of 1895.

**Steel Works in Russia.**—One of the largest of the recent installations in



SWITCH-BOARD IN WETHERILL CONCENTRATOR POWER-HOUSE, FRANKLIN, N. J.

the ore. When no ore was at hand the end of the pipe slid smoothly along the firm sand, for fortunately nothing coarser than sand is found in the lake except ore cakes. When a deposit of ore had been located and its superficial extent determined as above indicated, the quantity of ore per square foot of each deposit was determined as follows: An iron tube about 2½ ft. in diameter was lowered from the side of the scow into the deposit and worked down until it passed through the ore layer into the sand beneath; then, by means of an implement like a telegraph spoon and by long-handled tongs and grappling irons, all the ore within the area of the tube was brought up to the deck of the scow, where it was examined and weighed. This was done at several points in each deposit, and having already determined the extent of the deposit it was an easy matter to estimate the ore in sight in each.

By this method it is believed that a very reliable estimate of the quantity of ore in the lake was obtained; certain it is that the estimate made by the writer differs materially from those that had been made by other means. It must be added in conclusion that this lake-mine is something like the widow's cruse of oil of which we read in Holy Writ—the supply is being constantly renewed. Vast amounts of iron still exist in the surrounding sands. Vegetable acids are formed from the decay of each year's vegetation, and each year the drainage carries into the lake and deposits there a large amount of iron. This is no mere theory; one can actually see the deposition of the ore along the margin, and, more-

Russia is the Donetz-Jurjev Iron Works, which has so far only manufactured pig iron, its output meeting with a very ready sale. The number of blast furnaces in Southern Russia is, according to the latest statistics, 16, with an aggregate production of 640,000 tons per annum. Nine or ten more blast furnaces will in all probability be in operation in the course of three or four years, which will increase the production by 50%. Although there does not appear to be any apparent lack of ore, investigations are still being carried on so as to insure the supply keeping pace with the consumption. The French capitalists who are starting a large steamer company, with shipbuilding and engineering works in Nokajev, will have a rival in a Belgian company, commencing metallurgic operations on a large scale in the government of Jekaterinoslav, under the style of "Siderurgie Generale du Midi de la Russie." This company has acquired the right of breaking ore on the estate of M. Schtschedrov, at Krivoi-Rog, for a consideration of \$200,000, and its capital is some \$1,600,000. The leading specialty of this company will be cast-iron pipes. A Belgian company has secured a piece of land in the Novomoskovski District, and will go in for the manufacture of wagons, wheels and springs for railway carriages, agricultural implements, etc.; they will produce their own pig iron and steel. Count Schuwalov has secured a concession to form a company under the style of Syswenski Mining Company, for the purpose of exploiting the mineral wealth of Syswenski District, in the Perm government.

## PERSONAL.

MR. CHARLES A. MOLSON was among the visiting mining men at Salt Lake this week.

SIR CHARLES ROSS is at present in the Kootenay country on business connected with his mining interests.

MR. E. A. HARDY has been appointed superintendent of the Santa Ysabel mine, in Tuolumne County, Cal.

PROF. LLEWELLYN J. W. JONES has resigned as professor of chemistry at the State School of Mines, Golden, Colo.

LIEUTENANT-GOVERNOR MACINTOSH, of the Northwest territories, has been on an extended visit to Rossland, B. C.

HONORABLE EDGAR DEWDNEY, Lieutenant-Governor of British Columbia, has recently been visiting the Trail Creek mines.

MR. WARREN B. LIPPINCOTT has received an appointment at the laboratory of the Arkansas Valley Smelter at Leadville, Colo.

MR. W. R. TWOHY, of Colorado, has been inspecting the Comet Mining District, particularly the old Amazon property in Montana.

MR. LESLIE McMURTY, a mining engineer of California, is said to be organizing a company to go into the Yukon for trading purposes.

MR. H. M. KELLER was in Salt Lake the first of the week, meeting friends among Utah mining men attending the semi-centennial Jubilee.

MR. WILLIAM A. CARLYLE, provincial mineralogist of British Columbia, according to the latest accounts was visiting the Trail Creek mines.

DR. J. A. GALLAHER has been appointed State Geologist of Missouri, in place of CHARLES R. KEYES, resigned, and took charge of his office on July 15th.

CAPTAIN JOHN I. GINN, of El Paso, Tex., has accepted the superintendency of the San Jose Mining and Milling Company's mines, at San Jose del Sitio, Mexico.

MR. JOHN C. GRAY, mining engineer, of Oakland, Cal., returned recently from a prolonged visit to New Zealand, where he had been examining some mineral properties.

MR. A. P. OVERTON, of California, and formerly of Arizona, has gone to Alaska. He is an experienced mining man and will represent machinery interests in his trip to the Klondike.

MR. DUNCAN McVICHIE returned to Salt Lake last week from a 10 days' outing in the Deep Creek country. He was so impressed with what he saw that he proposes to return soon.

MR. CHARLES R. KEYES has resigned his position as State Geologist of Missouri, and intends to pass a year abroad. He will start shortly for Russia, to attend the International Geological Congress.

MR. JOHN F. WALLACE, chief engineer of the Illinois Central Railroad has resigned his position, and accepted that of vice-president and general manager of the Matheson Alkali Works, of Providence, R. I.

MR. GEORGE H. WIGHTMAN, general sales agent of the Carnegie Steel Company, has been appointed to the board of managers of this firm, to succeed MR. JOHN G. A. LEISHMAN, who recently sailed for Switzerland.

DR. GEORGE F. BECKER, of the United States Geological Survey, arrived in San Francisco recently intending to examine the northern gold belt in Angel's Camp, Calaveras County. He will remain there for several months.

MR. HERMAN ROEHLING, a member of the Roehling Iron and Steel Works of Voelklingen, Germany, has been in the United States for some weeks, visiting the Lake Superior iron mines and other centers in the mineral industry.

MR. A. GROTHE, mining engineer, who recently returned from New Zealand, has been spending some months inspecting mines in the West, his latest visit being to the Seven Devils District in Idaho. He sails from New York July 24th, on his way to London.

MR. GEORGE GIBBS, mechanical engineer of the Chicago, Milwaukee & St. Paul Railway, has been chosen as consulting engineer for the Westinghouse Electric Company, and the Baldwin Locomotive Works, to fill the place made vacant by the death of MR. D. L. BARNES.

MR. MAX HEBERLEIN, metallurgist of the Boston & Montana Company, Butte, Mont., has resigned and accepted the position of general manager of the Deutsche Metal Gesellschaft in Tasmania. He will superintend the construction of a smelter there, and will fit it up with American machinery.

## OBITUARY.

JOHN HASWELL, who died in Vienna, Austria, recently, was born in 1812, at Lancefield, Scotland. After attending for a time the Andersonian

University in Glasgow, in his 22d year, he entered the employ of the firm of William Fairbairn & Company. Sent out by them to Vienna to erect some steam engines for one of the first railways in Austria, on the completion of the work he was persuaded by the chairman of the company to remain permanently in Vienna. In 1837 he had to lay down the plans and machinery for locomotive repairing works for the Vienna-Gloggnitzer Railway. On the completion of the works he was asked to remain as chief manager. He very soon began to manufacture engines, and it was here that some of the first, if not the first, locomotives were built on the Continent. These workshops very soon got to be, and are still, one of the most considerable locomotive works in Austria or Germany. In those early days Mr. Haswell had to design everything, and also to teach his men. He was nearly half a century at the head of these works, up to the year 1882. Here was set up the very first iron foundry in Vienna. It gives some notion of the difficulties of different kinds that Mr. Haswell was obliged to overcome when it is said that the Government would not permit the use of charcoal in the cupola for fear of injuring the Styrian iron manufacture. The use of coke in the blast furnace was then unknown in Austria, so common gas coke had to be taken. It is stated that chilled iron railway wheels were first cast in Austria in his foundry. It will be by his hydraulic forging press that Mr. Haswell will be longest remembered. Small articles had no doubt before been stamped out by hydraulic pressure, but the heavy hydraulic press exhibited at the London Exhibition in 1862 was the first of the kind seen in England. It encountered much prejudice, and something like 20 years passed before its value was understood. Meanwhile, Haswell's forging press gave his works a preponderating position on the Continent in the manufacture of locomotive wheels and other heavy forgings, and was a source of much profit. Mr. Haswell also showed at the London Exhibition of 1862 some interesting new types of locomotives that excited much attention and controversy at the time. He was also, beyond question, the first inventor of the corrugated furnace. Locomotive boilers fitted with this furnace were in use in 1870 on the Austrian State Railways, of which Mr. Haswell was then chief mechanical engineer. To succeed so thoroughly in a new and foreign country, in such a variety of work, at such an early period, requiring the education of a whole staff, shows a remarkable combination of faculties. The Emperor of Austria made him a member of two of his orders of knighthood; he was also a juror in the Vienna Universal Exhibition of 1873.

## INDUSTRIAL NOTES.

No. 1 blast furnace of the Bellaire (O.) Nail Works is now in operation after several months' idleness.

The Pittsburg Wire Company, of Pittsburg, Pa., has begun the erection of its new nail mill.

The La Belle Iron Works, at Wheeling, W. Va., have resumed operations in their tinplate mills.

No. 4 furnace of the Sloss Iron and Steel Company, at Birmingham, Ala., has been blown in.

The Hamilton Tin Plate Company, it is stated, has begun work on its new tinplate plant, at West Newton, Pa.

Sarah furnace at Ironton, O., has blown out and Hamilton furnace is the only one in Lawrence County, O., now running.

The Virginia (Minn.) Iron Works' new foundry has made its first heat and has run off a lot of special castings successfully.

The Lehigh Zinc Works, of South Bethlehem, Pa., have started the fires in their four furnaces which were blown out a short time ago.

The Illinois Steel Company, of Chicago, Ill., is making preparations to put in blast another one of its furnaces at Milwaukee, Wis.

The North Works, of the Lackawanna Iron and Steel Company, at Scranton, Pa., has resumed operations after being idle for several months.

The National Tube Works Company of McKeesport, Pa., has leased the coal mines of O'Neil & Peterson, at Brunola, Pa., and will start them at once.

The Cleveland (O.) Rolling Mill Company has shut down for want of fuel. The company refused to pay the advanced price, and over 1,200 men are therefore deprived of employment.

The Penn Bridge Company, of Beaver Falls, Pa., has recently received the contract to build a state bridge across the Susquehanna River at Catawissa, Pa. The contract price is \$81,400.

The Punxutawney (Pa.) furnace, in which Rogers, Brown & Company are largely interested, will start up this month, having booked orders, it is said, for the first six weeks' production.

The International Gold and Silver Bullion Corporation, of St. Paul, Minn., recently filed articles of incorporation with the secretary of that State. The capital stock is \$50,000, and the incorporators are S. G. Ginner, John H. Ives and A. P. Swanstrom, all of St. Paul, Minn.

The Williams Manufacturing Company has been organized in Pittsburg, Pa., and has received a charter to make nickel steel. Its plant will be erected at Carnegie, Pa. The officers are: President, Dr. E. G. Husler; secretary and treasurer, W. H. Shinn; manager, W. J. Williams.

At the Haselton mill of the Andrews Bros. Company, and at the plant of the Mahoning Valley Iron Company, Youngstown, O., repairs and improvements are being made, giving the plants greater efficiency when started up again. Stock is being unloaded at the Haselton blast furnace ready for resumption.

The Struthers (O.) Iron and Steel Company, which has operated the old Summers Brothers' plant for two years, is laying the foundations of a galvanizing plant 50x150 ft. which will be in operation in September. In the past two years the company has added a new sheet mill, two scrap furnaces and a set of cold rolls.

The Southern Industries Company, through its president, Mr. H. S. Peck, states that his company contemplates the erection of a small blast furnace at Johnson City, Tenn., to test certain ores, more especially manganese, in the mountains of East Tennessee. However, nothing definite has as yet been decided upon regarding the enterprise.

Receiver McGettigan, of the Premier Steel Company, Indianapolis, Ind., has filed a report with the Circuit Court stating that from August 1st, 1896, until June 28th, 1897, the receipts were \$21,929, and disbursements \$12,485, leaving a balance on hand of \$15,041. He says that the American Steel Company left the property in better condition than it found it.

The Florida Kaolin and Manufacturing Company, of Jacksonville, has been chartered with a capital stock of \$3,000,000, to mine and prepare kaolin in Florida. The officers of the company are Edwin J. Houston, president; A. Arlington Hibbs, vice-president; Howell Lloyd, secretary and treasurer. The subscribers to the charter are Philadelphia capitalists.

The Saratoga Gas, Electric Light and Power Company, of Saratoga, N. Y., is rebuilding and rearranging the gas plant, and has let the contract for the steel work connected with the generator house roof and that over the cold storage building to the Berlin Iron Bridge Company, of East Berlin, Conn. The roofs have steel trusses covered with corrugated iron.

The Tennessee Chemical Company will soon erect a fertilizer factory at Nashville, Tenn. Charter will be applied for at once, the incorporators being T. G. Tinsley, president, and A. D. Ledoux, vice-president and secretary. Site has been secured and a plant for manufacturing kainit, phosphates, guano and all kinds of chemical fertilizers will be erected, capacity per year to be 50,000 tons.

The Pacific Coal Briquette Company, of Norfolk, Va., has been chartered to manufacture coal briquettes, etc. The capital stock is \$50,000, and the officers are: Charles W. Kohlsaat, president; John T. Davis, vice-president; Clarence A. Blanchard, secretary and treasurer. These, with George R. Blanchard, Alfred H. Brown and John M. Sufferies, all of New York, constitute the board of directors.

The Allentown Rolling Mills, of Allentown, Pa., have agreed to lease the Lehigh mill of that plant temporarily, to test a new process for the conversion of iron and steel scrap into material for manufacturing products. The lessee is the Biddell Purchasing Company, of Philadelphia, and the invention of Wm. C. Nelson, of Harrisburg, is to be tested. The mill will soon be ready to start.

The Otis Steel Company, of Cleveland, O., recently received a contract from Dr. R. J. Gatling, of Hartford, Conn., for casting a breech loading steel gun, which he is to furnish to the United States government. The gun will have an 8 in. bore, and will be 23 ft. long, and weigh about 25 tons when completed. The Kirby Manufacturing Company, of Cleveland, O., is building a boring machine to do the work.

Among recent signatures to the Amalgamated Association scale are those of the Blairsville (Pa.) Rolling Mill and Tin Plate Company, the Washington (Pa.) Steel and Tin Plate Company, the La Belle Iron Company, Wheeling, W. Va.; American Tin Plate Company, Elwood, Ind.; the Humbert Tin Plate Company, Conneville, Pa.; the Britton Rolling Mill Company, Cleveland, O.; Licking Rolling Mill Company and Mitchell, Tranter & Company, Covington, Ky.

Jones & Laughlins, of Pittsburg, Pa., have signed the finishing scale of the Amalgamated Association, and work will be resumed at once. The scale signed was a compromise, but it is said to be favorable to the workmen. This firm is the first to sign the finishing scale in the country, and it is thought that other firms will soon do likewise. The scale has now been signed for all departments of the extensive plant of this concern, and the entire works will be in operation in a few days, giving employment to 3,500 men.

The Philadelphia Bridge Works, of Cofrode & Saylor (incorporated), located at Pottstown, Pa., were sold July 15th to C. R. Baird & Co., large pig iron dealers in Philadelphia. The sale was made under an order of Court by the Security Company





already begun on both properties, and development work will be vigorously prosecuted. Mr. Parfet has been appointed general manager of the development work.

(From Our Special Correspondent.)

**EL PASO GOLD MINING COMPANY.**—A small shipment of 400 lbs. of ore which brought \$12.50 per pound was recently made from the Simmour & Barbee, lease on the Orizaba claim of this company. Considerable ore has been shipped from this lease as well as from several others on the company's property.

**ENTERPRISE MINING COMPANY.**—This company, during the month of June, shipped 95 tons of about 2-oz. ore. The ore was taken from the Dolly Varden claim. A shaft has been sunk on the Squaw Gulch Claim to the depth of over 300 ft., and drifting is now in progress, 12 men being employed on the property. A shipment of 30 tons of ore was made recently.

**FAVORITE.**—Considerable ore is being shipped from this claim by the owner. The shaft is now 350 ft. deep.

**FREE COINAGE MINING COMPANY.**—Berry & Company have commenced work on a block of ground 300 ft. square on the Bison claim, leased from this company. A small shipment of ore has been made.

**GOLD STANDARD MINING COMPANY.**—Jenkins & Co., who have a lease on the south 360 ft. of the North Star claim of this company, are getting ready to ship a carload of ore to the smelter. This ore was taken from the 90-ft. level. One or two shipments have already been made. The shaft is about 300 ft. deep.

**HALLET & HAMBURG MINING COMPANY.**—This company is shipping about one car of ore per week. Two shifts are being worked, making in all 14 men.

**HULL CITY PLACER.**—The White lease on this property is putting in a new 40-H. P. Vulcan hoister and also a new locomotive boiler. At present about 100 tons per month are being shipped, but the management expect to materially increase this soon. Good ore is being found on the third level. The shaft is 200 feet deep.

**KELTON ORE PURCHASING COMPANY.**—Ground is being broken for a new ore sampler near the town of Goldfields. It is being built by the Kelton Ore Purchasing Company and is to have a capacity of 250 tons per day.

**PIKE'S PEAK.**—Considerable ore is being shipped from this claim, which belongs to the Union Gold Mining Company by the lessees C. J. Moore & Company; also from some sublessees.

**ST. THOMAS.**—Dr. Shaw and others who have a lease on a portion of this claim are putting up a steam hoist. This property is close to the Arqua Townsite and is being actively prospected by lessees.

**VINDICATOR.**—Good ore has recently been found in the west vein on the fourth level. The mine is shipping about 1,000 tons of ore per month. The value averages a little over \$30 per ton. Sinking is progressing in the shaft which is now 365 ft. deep. Development is being pushed in the fourth, fifth and sixth levels. The east vein has a course of about N. 35° W. and the west vein about N. 50° W.

#### GARFIELD COUNTY.

It is reported that a coal company is being organized to operate in this county, and if affairs are successfully consummated 150 men will be employed by fall. Both coking and steam coal will be mined and coke ovens will be built and operated. It is said that experts have reported favorably upon the quality and extent of the coal.

#### GILPIN COUNTY.

**BALTIMORE.**—This mine, owned by White & Company, of Boulder, is about to change hands, parties at Marshall desiring to purchase. There is a shaft down on it 65 ft. which shows a crevice 4 ft. wide of free-milling ore, and considerable free gold among it. This property had quite a good surface pocket, and many tons were shipped to the Baltimore mill in the canyon, giving good results. The new parties are expected to put up machinery if the deal goes through.

**CONLIN.**—Collins & Lute, operating this property in Silver Lake district, shipped a load of smelting ore last week to the State Ore Sampling Works, which run \$83.60 per ton, and they have several more tons on the dump, from which they will make an early shipment.

**ELK PARK MINING AND MILLING COMPANY.**—The Annie H. shaft, operated by this company, is being sunk with three shifts, being now down over 200 ft. and showing about 4 ft. of mineral in the bottom of the shaft. Ore is being taken out of the 190 west level and they are running from 15 to 20 tons per day through the Elk Park concentrators, which is giving satisfactory results.

**JUSTICE GOLD MINING COMPANY.**—The suit of Lester E. Drake et al. vs. the Justice Gold Mining Company, which has been on trial in the District Court at Central City, resulted in a verdict in favor of the defendants. The property is located in Lake gulch, east and south of this city; and the Justice company in developing its property broke into openings made by the owners of the Washington, from which the ore had been extracted. The Justice claim is owned by St. Louis parties. A motion for a new trial was overruled.

**PINE CREEK MINES' PROTECTIVE ASSOCIATION.**—At a regular meeting of this association recently

the following officers were elected to serve during the ensuing year: Charles R. Baer, president; Charles Nuckolls, vice-president; B. B. Wheeler, secretary; Charles McElhaney, treasurer; C. Smith, sergeant-at-arms.

**RED CROSS GOLD MINING COMPANY.**—Sinking operations have been stopped at this company's Manchester mine at a depth of nearly 160 ft., and after the necessary timbering is done in the bottom of the shaft, drifts will be started off east and west at a depth of 155 ft.

**TORONTO.**—Denver parties are behind the operating of this crosscut tunnel in Jennie Lind Gulch, which is in 120 ft. and is being run to cut a group of four claims. One vein has already been cut, and the breast shows a good deal of iron streaks.

#### GUNNISON COUNTY.

**CHARITY & BRISTOL.**—The force of men on these two lodes have been increased.

**CHICAGO.**—A set of buildings, consisting of a boarding bunk, shaft and ore houses, blacksmith and other shops are about completed on this property near Lake Brennan. A hoisting plant will soon be added, and Superintendent McCabe states the mine will be put in shipping order as soon as possible.

**CRYSTAL MOUNTAIN MINING AND DRAINAGE COMPANY.**—Operations will soon be renewed on this property. The tunnel is being cleaned out and coal and supplies are being hauled in.

**HOOSIER MINING COMPANY.**—The mill on this property is being overhauled preparatory to starting up again. A Pelton water-wheel will furnish compressed air.

**MOUNTAIN GEM.**—The steam hoisting plant on this property has been repaired, and work on the lower levels is being pushed as rapidly as the present force will permit.

#### HUERFANO COUNTY.

**SANTA CLARA COAL COMPANY.**—This company has reached a distance of 150 ft. in the slope and has started two entries. The new mine is situated about 1½ miles north of the old Santa Clara mine and near the Pryor ranch. The officers of the company are: W. R. Harp, president; James Bowen, treasurer and secretary; R. T. Lawther, vice-president and general manager.

#### LAKE COUNTY.

**LITTLE JOHNNY MINING COMPANY.**—Judge Hallett, in the United States Circuit Court at Denver, recently overruled the defendant's demurrer to the bill of complaint of L. S. Ballou and Alexis M. Lay, of New York, against John Campion and this company, of Leadville, in which the latter ask for a division of a large amount taken from the mine and a restitution of their interest. The case will come up for trial during the November term of the Court, unless a compromise is effected before that time. It is understood that the plaintiffs will ask the Court to appoint a receiver for the property until the case has been settled.

**UNION LEASING AND MINING COMPANY.**—At the annual meeting of the stockholders of this company, held in Denver July 13th, the following directors were elected for the ensuing year: S. W. Mudd, Robert B. Estey, H. I. Higgins and R. J. Downer, of Leadville, and John E. Price, James H. Crandell and F. L. Bellan, of Denver. At the meeting of the new board, held in Denver on the same date, the following officers were elected: S. W. Mudd, president; Robert B. Estey, vice-president and general manager; H. I. Higgins, secretary and treasurer. The company has some 170 acres of valuable territory under lease in the Fryer Hill District of Leadville.

(From Our Special Correspondent.)

**BIG FOUR MINING COMPANY.**—Mr. L. Z. Farwell, of Springfield, Ill., one of the owners of the Big Four, which property was visited by such a damaging fire early this month, has been in the city for the past week and has made his settlement with the insurance company. The mine will be paid the full \$2,500 insurance, as the loss was triple that sum. Mr. Farwell is having the repairs made in the shaft which burned down about 50 ft. but he informed me to-day that they had not yet decided as to whether to rebuild. Mr. Farwell has communicated with all the directors of the company and will act according to their instructions. The mine is supposed to be a good one, being excellently located on the slope of Johnny Hill. Some very rich ore has been shipped during the past year, but of late, the mine has not been doing so well and the probabilities are that Mr. Farwell did not care to shoulder the responsibility of erecting new buildings and placing new machinery on the ground without first consulting with the other owners.

**BLACK PRINCE.**—From the work being prosecuted at this property by both Mr. J. T. Briggs, the owner, and some lessees, it is believed that the Black Prince is one of the leading gold producers of the camp. The north half of the property is being operated by owner Briggs, while the south half is operated by lessees. Much dead work has been done by Mr. Briggs, and he now has a virtually a new shaft, having retimbered and enlarged the old one from top to bottom. He is shipping from a good body of copper ore carrying gold and silver and located at a depth of 200 ft. On the south half the lessees have a body of silicious ore at a depth of 250 ft. They have been doing dead work for several months, but from now on shipments will be steady

and will be increased just as rapidly as the body opens up.

**DOWNTOWN PROPOSITIONS.**—The Leadville Pumping Association, which is to handle the water of the downtown mines has met with its first delay, and will be set back in its work from two to three weeks. It appears that by some means the order for winches, which are used to raise and lower the pumps, was misunderstood, and now the pumps are all ready for use and the winches are not yet made. They are being built in Denver, but it was necessary to first send East for castings. As a result a wait of several weeks is necessitated. The pumps are all on the ground, and all preparatory work that could be done is about ready. At the Penrose an entire change has been made in the surface plant. New furnaces have been put in and new boilers are on the ground. It is the supposition that the water in this shaft is about 200 ft. from the surface, and it is still rising. At the Coronado the new engine and shaft-house have been completed, and the four big smoke-stacks were raised this week. At the Bon Air and Weldon and the other properties all is being gotten in readiness so that pumping can be started just as soon as the new machinery is in place.

**FLAGSTAFF.**—The lessees on this and the Belgian ground are now working almost entirely on the Flagstaff end of the property. No shipment are being made, but prospecting work with a good force of men is being carried on, and indications are said to be very good.

**GARBUTT.**—This property is developing into something better every day and shipments are steady. The lessees are working on both the lower and upper levels, but the best ore is at present coming from the 400-ft workings, from which shipments are being made steadily of a good grade of gold ore.

**SPOT CASH.**—This property will undoubtedly forge to the front within the next few months. It is excellently located on Breece Hill, and this week a deal was closed whereby Colorado capitalists, headed by John D. Murphy, a veteran mining operator here, have secured a lease on the Spot Cash for a term of three years. Active operations have already been resumed and the shaft, now down 400 ft., is to be sunk from 100 to 200 ft. further and then drifting will ensue to catch the rich Gold Belt ore chute that is known to run through this ground.

**THE STARS.**—The large territory of the Morning Star (consolidated), and the Evening Star Mining companies on Carbonate hill is being actively developed by lessees. The interests of the company here are being looked after by Mr. E. D. Dickerman, and while the company has not done any work for many years its big territory is being thoroughly explored by lessees and large iron bodies are being developed. It is learned that some 14 shafts of the company are being operated by different sets of lessees and shipments of over 3,500 tons a month are being made. Bad air is causing many of the lessees a great deal of trouble of late and connections with the various workings are being made as rapidly as possible. The iron ore mined is being sent to the Valley smelters and shipments will be probably increased in the near future.

**VALLEY.**—From what can be learned there will be a move in connection with this property in the near future. I understand that negotiations are now pending whereby the Valley will arrange to start up at an early day. This property is well located and indications for a steady shipper with development work are very good.

#### SAN JUAN COUNTY.

**SUNNYSIDE EXTENSION MINING AND MILLING COMPANY.**—F. W. Poppo, who is said to represent William Havemeyer, the sugar magnate, of New York, was recently appointed receiver of this company by Judge Le Fevre, upon the application of Rufus P. Lincoln, one of the creditors of the company. Mr. Lincoln applied for the receiver, representing himself and all other creditors of the company similarly situated, and in his bill he sets forth that the Sunnyside Extension Company is the owner of the Sunnyside Extension and Doctor lodes, Doctor mill-site and one-half interest in the Mountain King lode, together with mills and tramways used in the working of the properties, all of which are situated in San Juan County. The complaint recites that the company is indebted to Lincoln to the amount of \$4,441, which amount it is claimed was advanced to the company in the course of business. Mr. Lincoln charges that the debts of the company aggregate \$40,000, of which \$30,000 is secured by deeds of trust upon the property, the remainder being evidenced by notes given by the company. It is also charged that the other creditors of the company have been forced to commence action for the recovery of amounts due them, and that unless the affairs are placed in the hands of a competent person to care for the interests of the stockholders, the present management of the business will result in great loss to the individual owners.

The claims owned by the company were discovered by Rasmus Hansen several years ago and were developed to a considerable extent before being purchased by the present company. It is stated that Mr. Havemeyer advanced a large amount of money for the working of the property, but it is claimed through bad management the affairs have become badly mixed and the creditors are clamoring for

their money. Judge Le Fevre fixed the receiver's bond at \$5,000.

**SILVERTON SMELTER.**—A shortage of pyritic ores has caused this smelter to shut down temporarily.

**SYLVANITE.**—The shaft-house and machinery on this property, which were swept away by snowslides last winter, are being replaced.

(From Our Special Correspondent.)

**BLACK CANYON.**—A body of gray copper ore running 600 oz. silver per ton was recently opened up, but a few days ago a sudden influx of water drove the employees out of the mine and it will be impossible to resume operations on the vein for some time to come.

**COPPER KING.**—Another important strike is chronicled at this property in Whitehead Gulch, consisting of 2 ft. of yellow copper, intermixed with a fine grade of gray copper.

**GOLDEN HORN MINING COMPANY.**—This company recently resumed work on the Grand View, and is now mining several tons daily of gold ore which mills \$25 per ton.

**GOLD KING MINING AND MILLING COMPANY.**—On July 4th the new tramway was completed and started up for active operations. The mine and mill will now be run on full time.

**NORTH STAR.**—This property is now employing a large force of men, and is mining and shipping 30 tons daily of first-class ore. The output is being treated at the Crooke mill.

**ORO GOLD TUNNEL AND RAILWAY COMPANY.**—This project which is intended to form a single exit for all the mines of the Ice Lake district, has been started in earnest, and is now about 20 ft. under cover. Foundations will be commenced in a few days for the machinery which will feed the air drills.

**ROYAL TIGER.**—The large body of lead ore recently struck in this property has proved to be a bonanza, and it has been found necessary to increase the capacity of the ore bins. The boarding house has also been enlarged, and the force has been increased to 25 men. The output is at present 25 tons daily.

**VICTORIA.**—This mine, located in Maggie Gulch, was recently purchased by Alfred & Jennetto. The tunnel is in 285 ft. and has good shipping ore in the breast. A crosscut from the main tunnel has lately encountered a 12-in. streak of fine yellow copper, but the results of the mill run have not yet been made public.

#### SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

**SMUGGLER UNION MINING COMPANY.**—The tunnel being driven on the vein of the Pennsylvania, which, together with two other adjoining claims, belongs to this company, is now in the mountain a distance of about 200 ft. and going ahead several feet a day. The tunnel was commenced only about a month ago and is being driven principally for the purpose of opening up the Pennsylvania lead, which, so far as developed, shows 4 ft. of gold and silver ore running about as high in the two metals as Smuggler-Union ore itself; but after it has been run 3,000 ft. it will intersect the Smuggler-Union lead at an angle of about 15°, 680 ft. below the Bullion tunnel, which is the lowest depth yet attained on this vein, and about 3,000 ft. below the surface. Having the Pennsylvania tunnel for an outlet the ore can be delivered to the surface much nearer the company's 50-stamp mill at Pandora, as the mouth of the Pennsylvania tunnel is much lower down the mountain than that of the Bullion tunnel, the present outlet. It is the most important piece of development work inaugurated in the district this year. The Smuggler-Union 50-stamp mill at Pandora is treating on an average 180 tons of mineral a day, which is yielding 30 to 35 tons of high-grade concentrates. The first-class ore is shipped in its crude state to smelters, the shipments amounting to 12 or 15 carloads per week. A. G. Kirby, who recently secured a lease on the tailings issuing from the mill and constructed a plant just below the mill in which to treat them, now has his works in full operation and is saving from 200 to 250 oz. silver per day, which heretofore have been flowing down the river with the tailings and lost.

**TOM BOY GOLD MINES COMPANY.**—As many men as there is room for are engaged drifting on the Tom Boy vein both ways from the intersection of the mill tunnel crosscut, 2,000 ft. in length, which recently intersected it at a depth of 450 ft. below the lowest of the upper workings, and so far as the lead is opened up it shows 12 ft. of mineral fully as valuable as that in the upper workings, which means that taking the entire matter between walls it averages \$20 in gold per ton. A large duplex compound air compressor having a capacity of driving 15 machine drills will shortly be installed at the mill. After the east drift has been run 600 ft. to a point vertically below the bottom of a shaft sunk from the lower level in the upper workings an upraise will be made to connect the two, which will provide ventilation and drainage for the workings of the properties. The Tom Boy mill is treating from 150 to 175 tons of mineral a day, which is averaging \$20 per ton on the plates and in the concentrates, but the bulk of the values are saved on the plates by amalgamation, only 10 to 15 tons of concentrates being caught per day from the tonnage put through the mill; they are worth from \$60 to \$75 per ton. There are about 300 men on the pay

roll of the company, and every department is working with uninterrupted regularity.

**UNITED STATES & BRITISH COLUMBIA MINING COMPANY.**—The resident agent of this company, J. M. Dikeman, recently leased and bonded the Greenback, Lucky Girl and Liberty Bell mining claims, located on the same lead in Cornet Creek basin, and now has a force of men exploring the vein in three different places. The ore is showing up splendidly at every point, and there is every reason to believe the company will purchase the properties at an early date, they being considered among the largest low-grade gold and silver concentrating propositions in the district, the vein averaging about 12 ft. in width. If a deal is consummated the company will erect a tramway about two miles in length, from the mines to the Allegheny stamp mill on the bank of San Miguel River.

**VALLEY VIEW GOLD MINING COMPANY.**—This company's stamp mill on Marshall Creek, near the Smuggler-Union mines, is now turning out retorts at regular intervals, one shipped out a few days ago weighing 150 oz. The ore is conveyed down from the company's mines over a bucket tramway 2,000 ft. in length, which has a capacity of 60 tons in 10 hours.

#### GEORGIA.

##### LUMPKIN COUNTY.

**KENTUCKY MINING COMPANY.**—This company has been organized at Earlinton, Ky., with a paid-up capital of \$100,000. John B. Atkinson was elected president and treasurer, and James R. Rash, secretary. The directors are: Judge W. W. Murray, of Dahlonega, Ga.; John B. Atkinson, George G. Atkinson and James R. Rash, of Earlinton, and I. Bailey of Madisonville. C. J. Norwood, ex-inspector of mines for the State of Kentucky, is manager for the company, with headquarters at Dahlonega, Lumpkin County, Ga., in which county the gold mines are located, which the company are already developing. Ore has been reached, and the mines are now producing gold.

#### IDAHO.

##### ELMORE COUNTY.

**WILSON.**—This lode is on Cat Creek, near Neal District. The property is developed by a 140-ft. tunnel on the upper ledge and by a drift of 125 ft. on the pay streak in the lower level. The ore contains both gold and silver, assays of which were: highest, \$12.40 in gold and \$15.60 in silver per ton. There is a large body of ore in sight in this claim. The owners say there is enough to keep a 20-stamp mill busy for 6 months.

##### IDAHO COUNTY.

**GOLD BUG MINING COMPANY.**—An 18-in. streak of good ore has been struck in the face of the 700-ft. tunnel on the Gold Bug, at Florence, and the company is now contracting for the sinking of a 100-ft. shaft from the tunnel on that ore chute. The tunnel struck this ore about 125 ft. perpendicularly below the surface. The completion of the new shaft will give a depth of 225 ft. on the Gold Bug. The Banner and Gold Bug mining companies have contracted with Fraser & Chalmers, of Chicago, for a quartz mill to be placed on their properties, with a capacity of 25 tons in 24 hours.

**LITTLE GIANT.**—This mine, owned by Riebold & Schieler, lately crushed 15 tons of rock that averaged \$100 per ton. The mine has been developed to a depth of only about 175 ft., yet has produced upward of \$200,000.

##### OWYHEE COUNTY.

**FLINT.**—Advices are to the effect that the mill has closed down, and prospecting work will be resumed at the mine. A donkey-hoist has been placed over the burnt shaft and the water will be taken out.

**DE LAMAR MINING COMPANY, LIMITED.**—The following is the return for the month of June: Crushed during the month 4,791 tons; bullion produced in the mill, \$14,030; estimated value of ore shipped to smelters, \$110; miscellaneous revenue, \$265; total produce, \$44,705. The total expenses were \$36,430, leaving a profit for the month of May of \$8,275.

**MORNING STAR.**—The works have been closed on this property, and only water is being hoisted. It is understood that the reason for this action is a misunderstanding among the stockholders.

**RATTLER.**—This property and its eastern extension, the B. & B., in the Steele District, near Silver City, are owned by William McCall. The claims are situated at the head of Meadow Creek, in granite formation and have an easterly and westerly course. The Rattler is opened by an adit tunnel 365 ft. in length, a winze 65 ft. deep from this level, and by a shaft. The ledge, it is stated, will average 8 ft. in width, and has produced some very rich ruby silver ore. The last mill run from this property was reduced at the Flint mill and gave high returns. The mine was then owned by A. J. Van Wie. Considerable work was then done upon the claim about two years ago by the Irwin Bros. The present owner has started a crosscut tunnel, new 69 ft. in, which will eventually cut the ledge at a depth of 215 ft., but is in good driving ground, and will tap a parallel ledge 155 ft. south of the Rattler.

##### SHOSHONE COUNTY.

**CONSOLIDATED TIGER & POORMAN MINING COMPANY.**—The annual meeting of the stockholders

of this company for the election of directors for the ensuing year was held recently at the office of the company in Spokane, Wash., and the following directors were chosen: S. S. Glidden, Spokane, Wash.; E. D. Olmsted, Spokane, Wash.; John Noves, Butte, Mont.; H. L. Frank, Butte, Mont.; F. R. Culbertson, Burke, Idaho. A report from the general manager of the company was read and approved. This report is not intended for publication, but is given out to non-resident stockholders in order that they may be informed of the condition of affairs as if they had been present.

The report says: "The rebuilding of our works was not commenced until after the adjustment had been made with the different insurance companies interested in the loss, and in this matter there was considerable delay, our insurance money not being received until the latter part of July. The mine was allowed to fill with water, it being thought at the time that it would be cheaper to pump it out when we got ready to start up than to keep it pumped out during construction. The total cost of pumping the mine out after commencing to pump up to the time the water was out amounted to something over \$40,000. Our construction account for the rebuilding of our plant, which consists of a 400-ton concentrator, ore bins, tramway, boiler-house and boilers, carpenter shop and blacksmith shop, repairs and additions to the Poorman hoist, shows that there has been expended \$101,552.23."

The net liabilities of the company are about \$90,000, but profits over working expenses are now showing from \$15,000 to \$20,000 a month. The mine is said to be looking better than ever, the 1,200-ft. level showing 10 to 12 ft. of ore.

#### KANSAS.

**SMOKY RIVER ZINC MINING COMPANY.**—The annual meeting of this company was recently held in Topeka and a new board of directors was elected. The board of directors is composed entirely of Topeka men, but a large body of stock is held elsewhere. The directors are A. B. Quinton, Walter Oakley, A. M. Barrett, F. Burleigh Johnson, R. G. Martin, G. W. Veale, Jr., F. J. Cloe and D. Shelton. An order was at the same time made to continue work on the shaft and run drifts in the company's mines in both Ellis and Trego counties.

#### MICHIGAN.

##### COPPER.

**KEARSARGE MINING COMPANY.**—This company has declared a dividend of \$1 per share, payable August 10th, to stockholders of record on July 24th. This will require \$40,000, and will make the total amount paid up to date \$160,000. This is the third dividend paid, the company having made one of \$2 per share in January, 1890; and one of \$1 per share in 1895.

##### IRON—MENOMINEE RANGE.

**ARAGON.**—A large force is at work putting the plant at this mine in order to resume mining.

**CHAPIN MINING COMPANY.**—Arrangements are now under way for the erection of another pumping plant at Timber Shaft No. 2. The plant will be erected in the eighth level of the above shaft. A room 18 ft. wide, 13 ft. high and 65 ft. in length is now being prepared for it.

**DUNN IRON MINE.**—Negotiations are in progress for a settlement of the difficulties relating to the royalty on ore taken from this mine. The fee-owner wanted 15c. per ton, but the operators were not willing to pay more than 10c. If a compromise can be made, the mine will be started up.

#### MINNESOTA.

(From Our Special Correspondent.)

The annual meeting of the American Institute of Mining Engineers, held in Duluth last week, was a great success, and was one of the most enjoyable of the series. The visiting engineers took in parts of the Mesabi and Vermilion districts, seeing mines of every distinctive character, after visiting the copper country of the Houghton peninsula. About 25 of the members left Duluth Saturday for the Black Hills country of South Dakota, which most of them had never seen, and will be there this week. Many will return to their homes via Minneapolis and will be entertained there by local members of the Institute and friends. The rest went directly east from Duluth on Saturday by one of the magnificent steamships of the Northern Steamship Company. The entire trip was a revelation and not the least of it was the lake trip, on ships as fast and fine as any of the ocean liners, viewing the gigantic traffic of the inland lakes, the cities there growing and the rapid development of a country but a few years ago a wilderness.

Iron-ore traffic has been resumed in full on the lines running in the Minnesota ranges, and ore is coming to Duluth and Two Harbors faster than ever. Twenty-eight ships loaded at Two Harbors in the last three days of last week, carrying away about 100,000 tons of cargo.

The filing of papers in a suit in Duluth last week gives evidence that the amount of money paid by John D. Rockefeller to one of the Merritt family, Alfred, to settle the cases held by that family against Mr. Rockefeller was \$230,000. The Alfred Merritt claims, though the only ones in which judgment had been given against Mr. Rockefeller, were only about one-fifth of the claims that were to be pushed against him on identical grounds, prior to the settlement.



IRON—MESABI RANGE.

(From Our Special Correspondent.)

**FAYAL IRON COMPANY.**—In its report of the visit of the Institute to the Fayal Mine, one of the Duluth papers, which presumably had its best iron expert on the trip, says that the best recorded work at the Fayal per man per day, including every man on the location under and on ground, was 80 tons of ore hoisted. As there are more than 400 men at the Fayal, mining at this speed would furnish a very nice share of the total production of the Lake district.

**FRANKLIN MINING COMPANY.**—This company has suspended shipping, its stockpiles having been cleaned up. It has sent out about 17,000 tons.

**OHIO MINING COMPANY.**—Water covered the works in this property so deep that only the top of an engine could be seen. This engine had been brought in to cope with the floods and was hardly in position before it was abandoned. The cloud-burst was terrific in that neighborhood.

**OLIVER MINING COMPANY.**—At the Oliver work is going on as fast as ever, the water and mud having been cleaned out of the cuts. Three shovels are now at work in cre, two days and one at night.

**SPARTA IRON COMPANY.**—At this mine the strike of last week was quickly settled as expected, and the men have returned to work. It is not probable, however, that the mine will do much, if any, shipping this year, because of delays of various natures. The cut to be completed at once under the present contract is 350 x 300 ft., giving a magnificent surface for the loading shovels.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

**JOPLIN ORE MARKET.**—The production of zinc and lead ores was fairly active this week. The shipments of zinc ore were increased by 13 cars over the previous week, but those of lead ore showed a decrease of two cars. The top price paid for zinc ore was \$23 per ton, with an average of \$22 at Joplin and \$20.50 at Webb City, Cartersville and Galena. Most of the Oronogo, Carthage and Alba output brought \$22.50 per ton this week. The market opened strong and closed weak, owing to the coal miners' strike in Illinois affecting smelters. Lead ore advanced from \$21.25 to \$22.25 per 1,000 lbs. One lot sold at Joplin and another at Cartersville brought \$22.50 per 1,000 lbs. This price is above the basis of buying on the St. Louis quotations. At the corresponding week last year zinc ore brought only \$20.50 per ton for the best grades and lead ore only \$16 per 1,000 lbs. There is no surplus of zinc ore in the entire district and only about 500,000 lbs. of lead ore are left over.

Following are the sales of lead and zinc ores for the week ending July 17th, 1897: Joplin zinc, 1,050,630 lbs.; lead, 180,120 lbs.; value, \$15,520. Cartersville zinc, 1,021,620 lbs.; lead, 151,810 lbs.; value, \$13,844. Webb City zinc, 598,570 lbs.; lead, 51,650 lbs.; value, \$7,289. Galena, zinc, 2,850,000 lbs.; lead, 457,450 lbs.; value, \$48,137. Aurora zinc, 580,000 lbs.; lead, 20,000 lbs.; value, \$4,225. Carthage zinc, 125,210 lbs.; lead, 1,750 lbs.; value, \$1,384. Alba zinc, 94,000 lbs.; value, \$1,034. Oronogo zinc, 87,790 lbs.; lead, 3,500 lbs.; value, \$995. Stott City zinc, 33,100 lbs.; value, \$364. Belleville zinc, 12,710 lbs.; lead, 10,750 lbs.; value, \$370. District totals last week: Zinc, 6,458,630 lbs.; lead, 877,050 lbs.; value, \$93,168. District totals for 28 weeks: Zinc, 181,606,820 lbs.; lead, 31,193,490 lbs.; value, \$2,306,891.

**CENTER VALLEY COMPANY.**—This company's pumps are working steadily and the water has been reduced to within 3 ft. of the old working levels.

**E. B. & J. M. LEONARD.**—These people are operating the Independence mine on the Leonard land which, three years ago, was known as the Baker Diggings. They have opened up a large face of lead and jack at 80 ft. in hard ground.

**ELEVENTH HOUR COMPANY.**—The output from this company's lease of 40 acres at Cartersville, from June, 1890, to July, 1897, was 132,188,390 lbs. of zinc ore, valued at \$1,399,829, and 11,395,630 lbs. of lead ore, valued at \$214,694. At present it is having trouble with strong water, upon which two 16-in. Cornish pumps are at work.

**THAYER & CHANDLER.**—They own the Cock Robin mine in Chitwood Hollow and have built a large concentrating plant that will handle 100 tons of dirt every 10 hours. They have a large face of lead and zinc ore at 120 ft. in hard ground and from May 9, 1896, they sold 1,079,430 lbs. of zinc ore and \$1,277,430 lbs. of lead ore, for which they received \$32,373. These people bought the mine last November and paid \$10,000 for it and built the plant now on the property.

**TWIN GROVE MINING COMPANY.**—This is a new company opening up a 208-acre tract of land north of Lehigh, in Twin Grove Township. The tract is being prospected with a drill, and in the first hole the company struck a body of zinc ore in open ground. The company is composed of G. T. Cooley, Wm. Watkins and others.

MONTGOMERY COUNTY.

A dispatch from Columbia, Mo., states that M. A. Bibb has discovered gold on the banks of Dry Fork Creek, near New Florence, in this county. Assays of the quartz have been made by Dr. G. A. Broadhead, geologist of the State University, which are said to show gold.

MONTANA.

CASCADE COUNTY.

**UNITED SMELTING AND REFINING COMPANY.**—The annual statement of this company was recently filed with the county clerk. It shows a capital stock of \$1,250,000; assets, \$1,250,000, including ore ore, etc., \$485,000, and real estate, \$500,000; liabilities, \$449,000.

DEER LODGE COUNTY.

**MONTANA MINING COMPANY, LIMITED.**—The directors state that the 50-stamp mill crushed during the month of June 3,320 tons of ore, which contained gold 1,700 oz., and silver 9,480 oz.; the estimated realizable value of the same is \$39,300. The expenditure was as follows: Working expenses on revenue account, \$26,400; outlay on developments, \$6,000; extraneous expenses, \$200; permanent improvements and machinery, \$100; total, \$32,700; leaving an estimated net result of \$6,600 for the month. Mr. Burrell expected to begin the treatment of tailings on July 10th.

FERGUS COUNTY.

**SPOTTED HORSE.**—J. L. Bright and J. S. Martin, of Columbus, O., are at work exploiting this mine near Lewistown. They have in sight a big body of low grade ore and have sent for a diamond drill in order to make further investigations. They are also erecting a cyanide process plant.

JEFFERSON COUNTY.

**BABY HELEN.**—This mine is leased from eastern parties by John Ketch. A depth of 200 ft. has been attained, and the ore shows up well.

**BAUM.**—Charles Fahlgren and A. Gillis have taken a lease on this property in Bizzville.

**COLUMBIA.**—At this mine, near Pipe S'one, the new hoist is in place and two shifts of men are at work. A new shaft is to be sunk and the mine developed.

**COONEY-LOCKEY GROUP.**—The tunnel on these claims is in several hundred feet, and a drift has been run 230 ft. A vein of ore on the property has been followed for about 75 ft., which increased gradually from 1/2 in. to 14 in. in thickness. The men are taking out ore for shipment now. The ore is galena, and carries some gold and a trace of copper.

**FLORA.**—The men at this mine are working down 200 ft., and are running a crosscut to intercept the vein. Vaughan & Culver, of Jefferson, and Colonel Ferris, of Bozeman, are interested in this property.

**FREE COINAGE.**—Only prospecting work is being done on the surface of this claim.

**HILLMA.**—This property is bonded by A. H. Johnson, Stubbs & Son and I. N. Winslow, and they have been cross-cutting from the bottom of the 100-ft. shaft to catch the lead.

**JUSTICE.**—This mine adjoins the Silver Wave property. The owners of the Justice, Sharnke & Hoffman have a carload of ore that gives a return of \$21 per ton at smelter, and are developing the property.

**KENNEDY.**—This mine has a new shaft of 125 ft. with ore, and is owned by Thomas Cruse, of Helena.

**RESCUE.**—There is a vein on this property which is said to be gold-bearing, running from 3 to 9 ft. in thickness, and assaying from \$18 to \$40. Two other veins are 4 and 5 ft. thick. The owners, Johnson & Leonard, have lately completed a road and are shipping ore to the East Helena smelter.

MEAGHER COUNTY.

**QUEEN OF THE HILLS.**—Mr. W. G. Conrad says that work will soon be commenced on this property at Neihart. He has several leases now at work on ground belonging to the Queen, and Messrs. Bernier & Ganz, who have been doing some work on a lease, have recently struck a rich chute of ore.

MISSOULA COUNTY.

**CHARCOAL.**—The present bond on this property is for \$30,000, for a period of one year. The property is a high-grade silver smelting proposition, with over 1,000 ft. of shafts, tunnels and crosscuts. Over the principal shaft, which taps a 5-ft. body of ore, there is a hoist in good repair, so that the mine can be worked to advantage.

PARK COUNTY.

**OREGON GROUP.**—A one-half interest in this group of mines in the Natural Bridge District was sold recently to John Smith, of Smith Brothers' Sheep Company, of Livingston. The price paid is said to have been \$17,000, \$7,000 cash and the balance to be paid August 1st. The mines were located and owned by E. E. Fowler and Thomas Howell. The new owners will put in a tram and will at once operate the mines.

SILVER BOW COUNTY.

**GROUND SQUIRREL.**—An action in the district court at Butte has been commenced against James W. Kemper by William V. Lawler and S. V. Kemper to recover a judgment for \$11,250 commission on the sale of this claim. The property lies in the Kemper addition and was sold in 1892 at a price claimed to be \$225,000.

**MICHAEL DEVITT.**—A petition was filed in the District Court at Anaconda recently to amend the interlocutory decree entered in the case of James A. Murray against the Butte & Boston Mining Company. The original action was for a sale and partition of the Michael Devitt mining claim, of which Murray owned one-third, the Butte & Boston one-third and Alex J. Johnston and Charles S. Warren a sixth each. The decree of sale and

partition was entered in 1893 and the sheriff appointed as referee to make the sale. The sale, however, was not made until May 16th last, and prior to that time the Butte & Boston had purchased all interests except the sixth held by Johnston. When the sheriff offered the property, F. A. Heinze, being represented by one Whitmore, bid the property in for \$351,000 and paid \$10,000 down, but has paid nothing since. The decree for the sale made no provision for the payment of the purchase price and the petition filed recently asks that the decree be amended so that the purchaser shall pay the whole of the purchase price within one hour after the sale and if not paid that the sale shall be declared vacant. The petition alleges that Whitmore has refused to pay the balance of \$340,000.

(From Our Special Correspondent.)

**ANACONDA COPPER MINING COMPANY.**—This company is developing its properties in every direction. Shafts are deepened, crosscuts and drifts extended, larger hoists put in, higher head frames erected, larger shaft houses built, while the usual quantity of ore, 5,000 to 6,000 tons, is produced daily. At the Buffalo sinking is in progress below the 800-ft. level. At the Green Mountain a large new engine for sinking is in place on the 1,400 ft. level. About 700 tons of ore is hoisted daily. At the High Ore drifting is in progress to connect with the Mountain Consolidated, about a mile west. At the Mountain Consolidated No. 2 shaft is down to the 1,500 ft. level. A new double cylinder hoist 15 x 36 in. manufactured by the Union Iron Works, of San Francisco is ready to be lowered into the mine, to be placed on the bottom level and used for sinking and development purposes. The new hoisting engine *Aztec*, designed by the company's employees (previously described in the *Engineering and Mining Journal*) has been in continuous operation about six months, hoisting on some occasions 600 tons of ore from a depth of 800 to 1,400 ft. besides waste, timber and men, in eight hours, and could if necessary hoist much more; it is considered an economical steam user, and will hoist a four-deck loaded cage from a depth of 1,200 ft. with less than 50 lbs. steam pressure. At the St. Lawrence a new hoist 30 x 72 in. high pressure double cylinder, manufactured also by the Union Iron Works, is almost completed; the roof of the shaft house is partly taken off preparatory to putting up a higher head frame. The vein on the bottom, 1,300 to 1,400 ft. deep, of the Anaconda, Never Sweat and St. Lawrence, is in places over 100 ft. wide, all ore, with some of it high-grade.

**BOSTON & MONTANA CONSOLIDATED MINING COMPANY.**—It is reported that this company will in a short time start up the Moose mine, one of its silver-gold properties which has been idle for years. Larger machinery will replace the present plant and the mine developed to greater depth. The copper-silver properties are producing the required amount of ore, about 1,200 tons daily, and could, if necessary, increase the quantity.

**BUTTE & BOSTON CONSOLIDATED MINING COMPANY.**—The Blue Jay mine, located in the city, has been shut down, throwing about 40 men out of employ. The mine is so situated that teams are compelled to haul across the sidewalk on East Granite street to get at the ore-chute. Complaint was made to the Street Commissioner concerning the damage done to the sidewalk by hauling over it. This official issued orders prohibiting the hauling, hence the shut-down, which will probably not be of long duration. At the Silver Bow No. 1 and Harrington Placer development work is going steadily. At the East and West Gray Rock a number of men are employed cleaning out and timbering up old workings, opening up ground for stopping, etc.

**MONTANA ORE PURCHASING COMPANY.**—This company is experiencing some difficulty in obtaining sufficient water to operate its concentrator and smelter. In bringing in a water ditch it was necessary to cross some ground owned by the Boston & Montana Company, which is leased to the Northern Pacific Railroad Company and sub-leased by them to the Montana Ore Purchasing Company. The company owning the ground sent out a force of men to cut a ditch in such a manner that it would interfere with the sub-lessees' intended ditch. The latter company then sent out a force of men to fill it up. With difficulty the two forces were kept from violence. Now the dispute is to be settled by the District Court. At the Gtengarry more ore is hoisted than there has been of late. At the Itarus the usual amount is produced. At the Nipper the shaft is down nearly to 400-ft. level. It is intended to sink to the 500 before crosscutting.

**WASHOE COPPER MINING COMPANY.**—At the Estella sinking is in progress below the 600-ft. level, where a connection was made with the drift. Drifting is in progress on the 600, 800 and 1,200-ft. level from the Poulin shaft. Sinking is in progress at the Moonlight, below the 700-ft. level, while on surface a larger hoist is being erected. A higher head-frame and larger shaft-house is also being built.

NEVADA.

ELKO COUNTY.

**CARLSON.**—This property is located in the Mardis District and the principal work done is a tunnel in 135 ft. From this crosscuts have been run, showing up a ledge 30 ft. wide. The entire development work on the property is about 250 ft.

**DEXTER MINING COMPANY.**—At the annual meeting held recently in Tuscarora, Nev., W. H. Dick-

son was elected president; A. C. Ellis, vice-president; H. E. Booth, secretary and treasurer. These, with John G. Gray, E. O. Lee and L. L. Archer, constitute the board of directors. Since February 22d, 1897, the mine has produced gold bullion of the value of \$35,896, cyanides of the value of \$13,142 and tailings that netted the company \$3,006. The superintendent reports that with the aid of a 40-stamp mill the company would be enabled to materially increase its earnings.

**EMPIRE.**—The hoisting plant in this mine, at Gold Creek, was started up recently and operations were begun to open up this gold-bearing lode. On the surface, with a general strike north and south, are three quartz leads in a porphyry dike. A shaft is being sunk on the centre one which is about 18 in. wide. The other two leads are distant about 20 ft. each and dip toward the centre one.

**NAVAJO MINING COMPANY.**—Stamps are once more dropping in the mill after a long idleness. The power is furnished by a Pelton wheel. At present it is being run as a concentrator, on some ore belonging to lessees, after which it will be worked on Nevada Queen and a lot of other gold ore.

#### LANDER COUNTY.

**AUSTIN.**—The new 30-stamp mill at this mine at Austin, has been started up, and besides doing the work of the company it supplies the power for electric lighting in the town.

#### STOREY COUNTY—BRUNSWICK LODGE.

**CHOLLAR MINING COMPANY.**—According to the latest weekly official letter shaft No. 1 has been sunk 10 ft. on the slope during the week, and is now down 980 ft. on the slope, or 129 ft. on the slope below the 600-ft. level; bottom in porphyry. On the 300 level the stopes continue to yield about as usual, and they are understoping in the winze below on a streak of good ore. On the 400 level they are working south on the ninth and twelfth floors in good ore, and from the fifth to the seventh floors north where the grade is fair. On the 500 level No. 2 west crosscut was advanced 18 ft. work the week; total length, 34 ft. It has been run through hard porphyry, but is softer in the face and shows seams of quartz of low grade. The south drift has been run 19 ft. through hard porphyry and quartz, assaying \$5 per ton, and is now cut 448 ft. south of north line. The winze, started 25 ft. north of No. 4 crosscut, is down 34 ft., advanced during the week 10 ft.; bottom in soft porphyry, with a small streak of quartz assaying from \$8 to \$30 per ton. On the 600 level the main south drift has been extended 19 ft. and it is now in 134 ft. south of the Chollar north line; face in hard rock, with the footwall exposed on the west side of the drift. All work was suspended on July 5th in the mine. They extracted and shipped to the Nevada mill 103 tons and 1,000 lbs. of ore, average car sample, \$14.32 gold and 14.99 oz. silver. Wagon samples, gold \$14.01 and 13.61 oz. silver. They shipped to the United States Mint at Carson two bars of bullion of the par value of \$7,715, of which \$3,469 was gold. This was the cleanup for June.

**OCCIDENTAL CONSOLIDATED MINING COMPANY.**—The latest weekly official letter says: 550 level—west crosscut No. 2 started 600 ft. south of No. 1 from the tunnel level, has been extended 8 ft.; total length, 133 ft.; face in hard porphyry. The upraise from crosscut No. 1 has been extended 18 ft.; total height, 243 ft.; top in low-grade ore. The winze started from No. 1 west crosscut has been sunk 10 ft. and is down 135 ft.; bottom in ore assaying about \$5.50 per ton. On the 650 level, main south drift has been extended 22 ft.; total length, 446 ft.; face in low-grade ore.

#### STOREY COUNTY—COMSTOCK LODGE.

**CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.**—The latest weekly official statement of operations in the mine is as follows: 1,000 level—west crosscut No. 1 started from the north drift from the Consolidated Virginia shaft on this level, at a point 200 ft. north from the station, has been advanced 21 ft.; passing through harder porphyry showing clay seams; total length, 431 ft. On the 550 level the double compartment incline upraise No. 1 has been carried up along the footwall 10 ft.; total height 188 ft.; top of opening in porphyry streaked with quartz, assaying \$1 to \$2 per ton. On the 650 level from the ninth floor south drift, at a point 285 feet in from the upraise was carried up 93 ft., during the week advanced 11 ft.; passing through quartz assaying 75c. per ton. From incline upraise No. 1 at a point 60 ft. above the sill floor of this level from near the end of the north drift the upraise has been carried up on the footwall 10 ft.; passing through porphyry and clay with a little quartz lying on the footwall assaying \$1 per ton; length, 89 ft. From No. 2 upraise on the sill floor of this level from the end of the north drift, which had been advanced last week a total distance of 37 ft. we have worked upward 16 ft., passing through quartz assaying \$16.14 per ton. This upraise work shows some narrow streaks of fair grade ore from which we have saved 22 tons, averaging per mine car samples \$39.17 per ton. The total extraction of ore for the week amounted to 22 tons, the average assay value of which, per samples taken from the cars when raised to the surface, was \$37.57.

**SIERRA NEVADA MINING COMPANY.**—The latest weekly official letter says that the north lateral drift, 900 level, has been advanced 10 ft.; total length, 251 ft. north from the Sierra Nevada shaft; face in porphyry and seams of clay. From a point 100 ft.

north from west crosscut No. 2, 900 level, they started a west crosscut No. 3, and advanced the same 10 ft.; face in porphyry. In the Layton tunnel workings east crosscut No. 5 started from the northeast drift at a point 444 ft. north from the tunnel was advanced 30 ft.; face in soft porphyry; total length, 115 ft.

#### NEW JERSEY.

##### PASSAIC COUNTY.

**FEDERAL HILL MINING COMPANY.**—This company has been organized, with its main office at Paterson. The capital stock is placed at \$100,000, with a paid up stock of \$50,000. The sum of \$20,000 will be used to commence business with, \$5,000 of which is available at the present time. The principal stockholders in the company are John W. Griggs, Alfred Gartner, Fred. W. Wentworth, Judson Males, Judge Frank Scott, John L. Conklin and L. Doremus, of Patterson; E. P. Backus, Hudson Poole and J. O. Poole, of Newark. The company intends to work a deposit of mica recently discovered on Federal Hill, between Bloomingdale and Butler, about a mile from the track of the New York, Susquehanna & Western Railroad. The company owns a tract of 20 acres, on which several test-pits about 15 ft. deep have been sunk. The intention is to sink a shaft about 500 ft. and crosscut from this. Mr. J. O. Poole, of Newark, will have charge of the work.

#### NEW MEXICO.

##### GRANT COUNTY.

**TEXAS.**—This mine at Central, is now being operated by the original owners, Messrs. Corn and Givens. The fifth level is now being run and the ore at this depth runs high in silver and averages something over an ounce in gold.

##### POTNAM COUNTY.

**TILLIE FOSTER.**—This iron mine, at Tillie Foster, has closed down, throwing 100 miners out of work.

##### TAOS COUNTY.

**COMSTOCK.**—This mine is situated in Black Horse Canyon, and the shaft is down 50 ft. showing good ore. The property is owned by Wheeler, Glasscock & Seymore.

**MIDNIGHT.**—Work on this property has been suspended temporarily owing to a flood of water.

**ROCK OF AGES.**—This proposition is owned by A. W. Tibbips & Company. There is 52 ft. of drift and 25 ft. of shaft work already completed, and 50 tons of ore is on the dump.

#### NEW YORK.

##### ONONDAGA COUNTY.

A dispatch says that another immense gas well has been developed on the Binning farm, half a mile northeast of Baldwinsville. By actual test the volume of gas flowing from it amounts to over 5,000,000 ft. every 24 hours. The pressure is intense, and must reach 3,000 lbs. to the square inch. The well is down 2,520 ft. It has been sunk into the Trenton rock 200 ft., where the great deposit of natural gas was struck. It is stated that no such deposit has ever before been disclosed in this State, and it is even said by experts that the flow exceeds any discovered in other States. The well is now being piped and packed, in order to save the waste of gas.

#### OREGON.

##### GRANT COUNTY.

**DEXTER.**—Horace Sloan, of Susanville, is reported to have struck a rich vein of ore in this mine. The mine is developed only on a small scale.

##### UNION COUNTY.

**UNION-COMPANION.**—This mine, which has been under development for the last five months, started up the mill July 7th with a full force of men. The concentrates shipped from this property are said to range in value from \$125 to \$300 a ton.

#### PENNSYLVANIA.

##### ANTHRACITE COAL.

**LOCUST SPRING COLLIERY.**—A new pump has been put in place on this property and there are three shifts at work under J. Ludgen of Mt. Carmel who has the contract.

**MT. HOPE COAL COMPANY.**—A charter has been granted to this company, of South Bethlehem, with a capital of \$100,000, and these directors: G. B. Linderman, South Bethlehem; S. D. Kynor, Pottsville; J. D. Bishop and S. D. Luckenbach, Bethlehem, and D. H. Reese, St. Clair.

**PLYMOUTH MOUNTAIN COAL COMPANY.**—This company, of Kingston, Luzerne county, has been incorporated with a capital of \$60,000. The directors are G. Murray Reynolds and Edward Gunter, Wilkes-Barre; R. B. Vaughan, Christian and A. G. Hoyt, Kingston.

##### LACKAWANNA COUNTY.

**DELAWARE & HUDSON.**—Several changes it is said are soon to be made in these collieries. William Bryden, who for some years has been mining boss at the Clinton mine at Vandling, has tendered his resignation to take effect on August 1st. Thomas Jardon, of Carbondale, mining boss at the Powderly colliery on the South Side, is believed to be Mr. Bryden's successor. E. R. Pettesbone has been chosen general inside superintendent of the Delaware & Hudson collieries from Carbondale to Plymouth. He takes the place of Christopher Sherer, who has filled it for over 30 years.

**NEW YORK & SCRANTON COAL COMPANY.**—Two

large boilers have been put in at the Ontario colliery, which will increase the working facilities of the plant.

#### NORTHAMPTON COUNTY.

**CHAPMAN SLATE COMPANY.**—This company resumed slate making with one hoist last week.

**NATIONAL SLATE COMPANY.**—This company has its machinery at the quarry in Danielsville in position and began making slate last week.

#### SOUTH DAKOTA.

##### LAWRENCE COUNTY.

**HIGHLAND CHIEF.**—Councilman Kidd recently completed a new hoist for this mine on Spruce Gulch. The present shaft is down 278 ft., and the new hoist has been put in for the purpose of sinking it still deeper.

#### TENNESSEE.

##### CARTER COUNTY.

It is reported that John N. Adams, representing Philadelphia capitalists, will develop copper, iron pyrites and other mineral lands near Elizabethton.

#### TEXAS.

##### DALLAS COUNTY.

**MENARD OIL AND GAS COMPANY.**—This company, with a capital of \$15,000, has been chartered at Dallas by J. C. Duke and others to do a manufacturing and mining business.

##### EL PASO COUNTY.

**EL PASO COPPER COMPANY.**—This company has been chartered at El Paso, with a capital of \$50,000, to do a mining and smelting business. Millard Paterson and associates are the incorporators.

##### NACOGDOCHES COUNTY.

**TEXAS COAL, COKING AND OIL COMPANY.**—The charter of this company has been filed at Garrison, which permits the mining of coal, the manufacture of oil, etc. The capital stock is \$150,000, and the incorporators are J. H. Kempner, Gus Levy, C. H. Moore and J. Markowitz.

#### UTAH.

##### (From Our Special Correspondent.)

**SEMI-CENTENNIAL JUBILEE.**—Mining, like all other industries of the youngest State, is taking a holiday this week, nearly every resident of moment of the different camps being in Salt Lake participating in the gala jubilee. Fifty years ago Brigham Young and his followers entered Salt Lake Valley and the entire week has been given up to the festivities of the semi-centennial anniversary. Wednesday the parade of progress, from the prairie schooner, or even more primitive conveyance of 1847, down to the Pullman Palace on wheels, formed an interesting panorama, in which the growth of the mining industry was fittingly portrayed. Thursday was county day and in the parade the 27 counties were represented by floats. Park City, or rather Summit County, had the most complete mining pictures, with miniature stamp mills, jigs, concentrating tables and the like in operation. Cripple Creek is the only mining camp from beyond Utah represented by a float, which was emphatically golden in brilliancy. Probably there never were more people in Salt Lake at any one time than during this week—a conservative estimate is 70,000 visitors. The streets and buildings were profusely decorated in red, yellow and green, the jubilee colors; typifying the Indian, the sunflower and the sage brush, the sole inhabitants and products of Utah in 1847.

**SHIPMENTS FROM SALT LAKE.**—During the week ending July 17th, there were shipped East 30 cars, or 1,105,769 lbs. lead-silver bullion; one car, or 46,023 lbs. copper bullion; 41 cars, or 724½ tons lead-silver ore.

##### BEAVER COUNTY.

##### (From Our Special Correspondent.)

**INDIAN CREEK MINING COMPANY.**—A force of 18 men is at present advancing exploration. Two shafts, 68 and 75 ft., are being put down on ore going \$12.50 gold, 15 oz. silver, with occasional stringers of gold high grade. Manager C. W. Miles states that the recent decision of the Utah Supreme Court in the Sheep Rock cases was all in favor of the Indian Creek Company, thus opening the way for the development of this promising ground in the near vicinity. Members of the Indian Creek Company own the control of the Sheep Rock Company, and it is said work will soon be started.

**WASATCH.**—Shaft is 45 ft., the bottom in fair ore. President J. H. Whalon, of Salt Lake, is on the ground and states the property is of brighter promise than he expected to find it. There are some 6 or 8 other tracts in the Beaver Lake District on which development is being advanced. The Galena, True Fissure, Old Jack and Sunrise are liable to be pleasantly heard from before the close of the season.

##### IRON COUNTY.

##### (From Our Special Correspondent.)

**CREOLE.**—As previously stated in the *Journal* there is a bond on two-thirds of this property, held by J. J. Knight, of Provo. Last week his father, Newell Knight, paid \$9,000 cash for one-third, he purchased one-third for \$10,000 on time payments, W. J. McBurney retaining the remaining one-third. Machinery is to be put on, with track and cars and needed buildings erected. Mr. Knight is at Salt Lake attending the Jubilee, and while there will contract for a 10-stamp mill. There is an ample

supply of free-milling gold rock to keep the stamps constantly moving with a good margin of profit. Tunnel is in 150 ft. showing a 4-ft. face of ore. A 50-ft. shaft on vein and a 20-ft. drift from bottom has opened a 6-in. seam of quartz, carrying free gold in goodly quantity, while the entire vein filling is a milling product. There are 75 men prospecting and working other claims in the neighborhood. The distance from rail transportation holds back the district, though when the first mill gets winning values the needed capital will not be long in finding its way in this direction. To-day any one of several excellent prospects can be had at way down figures.

## JUBAB COUNTY.

(From Our Special Correspondent.)

**AJAX.**—For months it has been generally known that there was friction in the Ajax directory. If the reports made public last week are true, this state of affairs is at an end by the retiring of Henry M. Ryan and W. G. Nebeker, who, it is said, have sold their holdings for \$20,000.

**BLACK DRAGON MINING COMPANY.**—Annual meeting held on Tuesday of last week. Officers and directors for current year are: L. L. Terry, president; J. H. Brown, vice-president-treasurer; Dr. E. D. Woodruff, secretary; E. D. Ellis, F. M. Peet, Allan Conkling. Capitalization is \$40,000, divided into 800 shares at \$50. Realty consists of Black Dragon, Rust Dragon and an interest in six adjoining claims. There are over 1,500 ft. of workings on a fissure vein 6 to 14 ft. wide in lime. The property was formerly a producer, though the present company has made but one shipment. Contract to continue main shaft, now 215 ft., to 500 ft. is let and sinking in progress. Ore in this vein carries gold, silver, copper and some lead.

**HUMBURG.**—The lower tunnel is within 30 ft. of where the ore body that proved such a generous producer in the upper workings is looked for. A small seam was cut the other day in the lower tunnel, which is being explored.

**MAMMOTH.**—Last week the mill was once more in full operation, causing an agreeable change around Mammoth Hollow. Another shut-down is not to be looked for this season.

**OPEX.**—A week ago the work of pushing the west drift from bottom of 500 ft. shaft was resumed. The drift is 35 ft. in dolomitic lime and is being driven toward fissure showing at top of the shaft.

**STAR CONSOLIDATED.**—Another mill is to be erected at Robinson. The Star Consolidated Company is to have its own plant immediately west of the Mammoth mill and will receive water from the Cherry Creek pipe line. It is probable that this move was determined on from the satisfactory returns of the Sioux mill on Star second-class ore. The mine has a large supply of milling stuff.

**TINTIC SHIPMENTS.**—For the week ending July 17th: Bullion-Beck, 20 cars; Centennial-Eureka, 3 cars; Eureka Hill, 18 cars concentrates; Gemini, 9 cars; Uncle Sam, 6 cars; Eagle, 1 car; Ajax, 4 cars; Swansea, 3 cars; Buckeye, 2 cars; Dragon Iron, 10 cars of hematite.

## SALT LAKE COUNTY.

(From Our Special Correspondent.)

**FRISCO MINING AND MILLING COMPANY.**—Annual meeting held July 12th, resulting in the selection of the following officers and directors: E. W. Genter, president; George Havercamp, vice-president; George E. Forrester, secretary-treasurer; E. L. Talbot, superintendent; J. L. Thompson. There is a 10 years lease and \$50,000 bond on two patented claims on which there is a well-marked fissure 3 to 4 ft. between walls in lime. Main development consists of three tunnels and above No. 3 considerable ore was mined years ago. This tunnel is 420 ft. northwest to vein, thence 500 ft. southwest on vein and at 200 ft. from the right angle a station is cut for a hoist that is on the ground. There is considerable lead ore showing, that carries 50 to 120 oz. silver, \$1 to \$3 gold. Systematic exploration is being prosecuted.

**HIGHLAND BOY.**—No. 5 tunnel, in 680 ft., for 85 ft. crosses the Mammoth auriferous copper sulphide zone. Dip of vein 35°, and as the tunnel crosses at an angle the ore body is found to be fully 50 ft. thick. This immense pyritic mass is all workable mineral, containing seams 1 to 3 ft. of 15 to 30% copper and \$8 to \$14 gold, while the entire body averages above 5% copper, \$3 gold. The combination pan-cyaniding mill now rapidly nearing completion is not to win values from this mineral but for large bodies of oxidized material exposed in the upper workings. If all moves as favorably as at present the initial test run will be in a month. Beyond any question this is the best and most complete mill ever erected in Bingham.

**WINNAMUCK.**—On Wednesday of last week the first shipment under the new regime, of two cars, was made. A contract has been let to sink from the 300 level, the deepest working. Under the direction of Manager A. H. Borman this is being put in workmanlike trim.

**ZELNORA.**—Bingham has another shipper. The Zelnora, near the top of Clipper Hill, has opened a strong seam of carbonates and galena in a well-marked quartzite-lime contact. There is a tunnel 80 ft. and an incline from the face 175 ft. on the dip of vein 35°. At the bottom an ore body 6 ft. thick is exposed from which the first shipment went forward this week. Ore carries 25 to 70% lead, 30 to 150 oz. silver, \$2 to \$6 gold. A horse-whim was put

on a fortnight ago, and with 6 men 10 tons of mineral a day are brought to the surface. F. F. Frisbee and C. S. Vadner are the fortunate owners.

## TOOELE COUNTY.

(From Our Special Correspondent.)

**FLORENCE GOLD MINING AND MILLING COMPANY.**—Incorporated 17th inst., with 250,000 shares, par \$1. Officers and directors: Fred Crowther, Sr., president; Frederick Hadder, vice-president; J. R. Bowdle, secretary; John A. Williams, treasurer; Fred. Crowther, Jr., Thomas Hadder, Alfred Denny. The realty consists of Florence Bell, Robert E. Lee, Mayflower, Fanny Garfield, Alice and Red Rock lode claims and the White Rock spring claim in the Skull Valley portion of the Mercur region.

**GOLD COIN MINING COMPANY.**—Incorporated Saturday, 17th inst., with 1,600,000 shares, par 50c.; B. T. Lloyd, president; James H. Moyle, vice-president; Richard P. Morris, secretary; William H. Dale, treasurer; the foregoing with David C. Dunbar compose the directorate. Realty consists of Gold Coin, Gold Coin Nos. 1, 2, 3, 4, 5, 6, 7; Border, Border Nos. 1, 2, 3, 4, and Cottonwood Spring claim; 156½ patent acres to the north of Golden Gate and Brickyard. A tunnel 94 ft. is being extended, expecting to strike vein about 300 ft. from mouth.

## KING COUNTY.

**ANNIE.**—This property is owned by F. Henderson. A 70-ft. tunnel and another 75 ft. have been run in a streak of ore, which assays about \$28 to the ton.

**BLACK JACK.**—This group of three claims, on the south slope of Mount St. ridge, was located in 1890 by S. D. Gustin, D. H. Rushing and John W. Guye, and was shortly afterward acquired by the Cascade Gold Mining and Milling Company, which spent about \$6,000 in the attempt to develop it under the direction of Charles Blackburn. The first showing was an outcrop of 6 ft. of magnetic iron, with no walls visible. Tunnel No. 1 was run 68 ft. on the 8-inch stringer, then turned to the left and ran at right angles for 60 ft., crosscutting three other stringers and tapping the 2-ft. stringer. Tunnel No. 2 was then started under the magnetic iron cropping, and was run for 60 ft. on a 4-ft. stringer, then turned to the left and continued for 60 ft., again to the right for 20 ft. Work was suspended in 1891, and, as the company failed to do the assessment work in 1895, the claims were relocated last year as the Copper Bell by Sherry McElroy, F. M. McElroy, Charles Baxter, George Sharick and Joseph Sherk. Last spring Sherry McElroy located eight other claims at right angles to the course of these, five of them being in a string on what he calls the Thelma lode, believing it to be the main ledge. He ran tunnel No. 1 65 ft. further on the stringer, which panned free gold at the surface, but it ran to a vanishing point. He then went deeper and ran another tunnel on a dike impregnated with mineral, and having a 10-in. streak on one wall and 4 in. on another, but both these streaks ran out. From these streaks assays were obtained of \$1.40, \$1.65 and \$2.50 in gold, with a trace of silver. Mr. McElroy, who has just completed this year's assessment work, believes that he will strike the main ledge in unbroken formation by crosscutting about 200 ft. lower.

**CLEVELAND GROUP.**—This group consists of seven claims, owned by the Washington City Gold and Silver Mining Company, at an elevation of 1,500 ft. above the river, and 2½ miles from Salt Lake station. The main ledge is shown by a crosscut to be 25 ft. wide, with 4½ ft. of sulphide ore on the hanging wall and 2½ ft. on the footwall, with several other veins 2 to 6 in. wide. Assays average about \$32 gold, silver and copper from the pay ore.

**GOLDEN STAR.**—This property has been relocated as the Alderby and Corey by W. C. Keith and F. Henderson. The Golden Star Mining Company, which formerly owned it, did a large amount of work, which is being followed up by the new owners. A tunnel runs 270 ft. on the footwall, and from it a crosscut has been run 25 ft. toward the hanging wall, showing several small streaks of iron and copper sulphides and a little zinc blende with galena coming in.

**MILWAUKEE MINING COMPANY.**—Nine claims have been acquired by this company adjoining the Annie. There are several ledges and feeders on the property, upon which some preliminary work is being done. One ledge is about 40 ft. wide, running in a northeast and southwest course and carries 4 to 5 ft. of ore, in which chalcopryite and zinc blende contain most of the value. An assay recently showed 90c. gold, 121 oz. silver and 10.83% per cent. copper in an average sample, a total value of \$90. An open crosscut is being made on this main ledge.

**RED PEAK.**—About six miles up the north side of the Mount St. ridge, Fred Ellis and William Kelly have the Red Peak on a 40-ft. ledge, in which a 70-ft. tunnel shows 6 to 18 in. of copper sulphides on the hanging wall, carrying about \$25 gold, silver and copper, while a streak of iron sulphides, 8 to 24 in. wide, runs along the footwall. The same parties own the Cascade on a stringer, 4 to 6 ft. wide, running into this ledge, and have started a tunnel to follow it in, as they could gain but little depth in the other tunnel. This stringer carries about 6 in. of iron and copper sulphides and galena, assaying \$16 to \$25.

**ROSALIE GROUP.**—This property adjoins the Leona and consists of six claims, five of which are on three ledges and one is a placer on the creek. A tunnel has been driven 25 ft., showing 45 in. of ore

in the face. Of this 30 in. assayed \$3 to \$9 for all values near the surface, carrying fine iron sulphides and copper pyrites in quartz and hornblende. As the tunnel penetrated, the proportion of hornblende decreased and the mineral became more solid, showing antimonial silver, some brittle silver and zinc blende, and assayed 27 oz. silver. The two parallel ledges, 4 and 16 ft. wide, respectively, have been traced 6,000 ft. to the summit of the mountain, and one of them has been opened, showing a good pay streak.

## WASHINGTON.

## OKANOGAN COUNTY.

**RUA GROUP.**—The negotiations which have been pending for some time for the purchase of this group of claims, on Squaw Creek, were consummated, recently and the deal closed. The purchasers are John W. Gates, president of the Illinois Steel Company, of Chicago, and J. A. Drake, treasurer of the Indiana, Illinois & Iowa Railroad. The consideration is said to be a fair one. The deal was made through Charles A. Hallam, of Chicago. An investigation was made of the property by Geo. W. Cook and J. F. Horner, mining men of Leadville, Colo. There are 18 claims in the group and the ground is in a fair state of development, showing a large amount of silicious ore of good grade. Mr. Hallam states that the new owners will prosecute development work and mining ore vigorously and that Mr. Rua has been engaged by the purchasers to take charge of the mine.

## SNOHOMISH COUNTY.

**THOMAS.**—The Golden Cord tunnel in this mine has been extended 57 ft. further by Contractor Robert Hurley.

(From Our Special Correspondent.)

**BELL & CROWN MINING COMPANY.**—Nine men are engaged in development work on this company's properties near Silverton. They have a 12-ft. vein rich in black oxide and native copper.

**FORTY-FIVE.**—This company has let the contract for a Halliday bucket tram over Marble Pass to the Everett & Monte Cristo Railroad, a distance of 13,000 ft. The guaranteed capacity of the tram is 120 tons per day, and it is to be completed and in working order by October 1st. A 3,500-ft. tram from the mine to the upper terminal of the main tram is being constructed. This mine has furnished the company and the general public with a series of surprises since extensive development work was commenced a year ago. The first was a strike of ruby silver; then came gray copper and brittle silver; this was followed last week by the exposure of a streak of quartz rich in free gold.

**INDEPENDENT.**—Air drills and a compressor plant have been ordered for this property. All preliminary arrangements for a concentrator have been perfected. W. T. Nicholson, formerly foreman of the Monte Cristo concentrator, will superintend construction. One side of the plant will be adapted solely to the reduction of independent ore, while the other has been designed for custom work.

**MARTIN CREEK.**—The county commissioners have been petitioned to survey and establish a wagon road about three miles in length from the Everett & Monte Cristo Railroad to the head of Martin Creek. The road will be constructed on a grade that will permit its use for an electric line. It will afford an outlet for a large number of embryonic mines—in fact, it will tap one of the best mining districts in the county. Claim owners along the route will contribute the greater portion of the labor.

**MONTE CRISTO MINING COMPANY.**—Information comes from a reliable source that work upon the big union tunnel at the base of Wilman's Peak to intersect the vein upon which is located the Rockefeller syndicate's Pride-Mystery, the Wilmans Brothers' Golden Cord and the Sidney Mining and Reduction Company's Argonaut mines will soon be commenced. This tunnel will tap the vein about 800 ft. below the present workings at the Mystery and 300 ft. below those at the Argonaut, and will eventually supplant the bucket tram system of transporting ores now in use at the Pride-Mystery and Golden Cord. An appropriation of \$250,000 was made in 1895 for this work, but delays have been caused by opposition of parties interested.

**O. & B.**—The first shipment of the season from this mine at Monte Cristo (a 30-ton carload) was made to the Everett smelter last week. Its value has not been made public. An accident at the mine a day or two later will prevent further shipments for several weeks. A large mass of snow fell upon the bull-wheel and reduced it to scrap iron. A new wheel in sections will have to be packed a portion of the distance from railroad to mine by horses, and the remainder of the distance by men.

**PRIDE-MYSTERY.**—Eight feet of ore, carrying two ounces of gold and a little silver, has been struck in the lower tunnel (No. 3). The raise from this tunnel to the Pride workings is being driven with air drills and will be completed in August, when the force is to be doubled. From 100 to 120 men are now employed, and the daily output of ore averages near three tons to the man.

**SIDNEY MINING AND REDUCTION COMPANY.**—At the Argonaut on the Pride-Mystery lode, Monte Cristo, the crosscut has exposed on the hanging wall a small pay streak sampling \$73 gold, 9 oz. silver and 3% copper. Two shifts are employed in development work.

**VANDALIA.**—After being involved in litigation

and remaining in idleness for several years, this property (the most extensively developed in the Silver Creek District) is about to change ownership. F. H. Brownell, attorney for the Monte Cristo Mining Company, has secured a bond for a syndicate of Seattle and Eastern capitalists. This is a high-grade galena proposition.

## WEST VIRGINIA.

## MINGO COUNTY.

**UNION MINING AND MANUFACTURING COMPANY.**—James Little, James Garson and others have bought the plant and property of this company near Dingess, and are preparing to organize a new company and work the coal mines.

## WYOMING.

## CARBON COUNTY.

A new discovery of gold was made recently by G. H. Allen and E. E. Lufkin on Timber Mountain, east of Saratoga. The lead is said to be 6 ft. wide at the surface, and can be traced to some distance on the top ground. The ore is reddish brown, is a true fissure vein and cuts the country formation:

## FOREIGN MINING NEWS.

## AUSTRALASIA.

## WESTERN AUSTRALIA.

The gold entered for export from the Colony in June amounted to 53,318 oz. For the half-year ending June 30th the total exports were 265,321 oz., against 112,329 oz. for the first half of 1896, and 97,310 oz. for 1895. The increase this year is a notable one.

## CANADA.

## BRITISH COLUMBIA.

(From Our Special Correspondent.)

E. L. Kinman has recorded at Trout Lake City, the discovery of a 4 ft. lead of nickel ore. It was found three miles above Ferguson. An assay from float from the lead went 7% in nickel. The formation is a talco-schist.

**HOMESTAKE CONSOLIDATED GOLD MINES, LIMITED.**—This is a London company recently formed for the purpose of acquiring the Homestake, Copper, Maid of Erin and R. E. Lee, situated within a radius of two miles from Rossland. These properties were until July 12th more or less owned by three separate companies, but virtually under one management. At the meeting of the old Homestake Company, held in Rossland, July 12th, Mr. M. G. Johnson, the president, occupied the chair, and said that the properties could be developed together more economically and to better advantage than separately, requiring only one office, staff and general manager. The new company has a nominal capital of \$800,000. The holders of shares in the old companies will receive a new fully-paid £1 share in the new company for every 40 shares of old stock.

The new company, it is stated, is to put up £25,000 for working capital, the money to be expended in further developing the properties. The names of the promoters and the amount of stock already subscribed have not yet been given out.

## BRITISH COLUMBIA—AINSWORTH DISTRICT.

**ELLEN & TWIN.**—Development work is being pushed forward, and the Ellen ledge shows over 6 feet, of which 18 to 22 in. is nice ore. The Twin is in under its first shoot of ore, showing about 22 in. of clean shipping ore. Camps are being built to accommodate a larger force of men.

**GOODERHAM.**—These properties are being managed by T. M. Gibson. The Black Diamond, Little Donald and Little Phil are making regular shipments which net about 104 oz. of silver and 50 to 6% lead. The Mamie and the Lady of the Lake have machinery working now, are taking out ore and will soon commence shipments.

**HIGHLANDER.**—The property is putting in a wire tramway and the mill will do custom work besides carrying their own ore. A flume is being built on Cedar Creek to carry the water down to the concentrator, at the mouth of the creek, for treating the ores.

**ILLINOIS.**—This property had ore for 70 ft. in the tunnel, and since striking the cross lead has from 18 in. to 2½ ft. of clear ore, besides several feet of concentrating ore. The property is being surveyed preparatory to starting a tunnel, which will give an additional depth of 80 ft.

**KING SOLOMON MINING COMPANY.**—This company, of which Dr. Wingate is in charge, has its wagon road completed and has commenced work in its mine.

## ONTARIO.

**PRINCESS MINING COMPANY.**—The case against this company entered for the assize court at Rat Portage by Wm. James and James Gordon had a hearing recently before Judge Robinson and judgment was reserved. The plaintiffs claim payment for a shaft 60 ft. in depth at \$22.50 per foot. That was the original contract, but a mistake occurred in the location of the place to begin work, and it was abandoned at a depth of 30 ft. The plaintiffs claim payment in particular for the 30 ft. of worked ore and damages for the balance of the contract. The defendant company disputed this payment on the ground that the plaintiffs assumed responsibility for the location of the shaft and knew that they were not working on the Princess property as called for by the contract.

## COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 23.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending July 16th, 1897, compared with the corresponding period last year:

	1897.		1896.
	Week.	Year.	
Pennsylvania Railroad.....	69,765	1,737,509	1,913,956

PRODUCTION OF BITUMINOUS COAL in tons of 2,600 lbs., for week ending July 16th, and for years from January 1st, 1897 and 1896:

	1897.		1896.
	Week.	Year.	
Shipped East and North:			
Allegheny, Pa.....	55,646	1,263,894	1,284,740
Barclay, Pa.....	765	25,022	31,055
Beech Creek, Pa.....	70,596	1,949,996	1,648,705
Broad Top, Pa.....	12,369	232,117	240,162
Clearfield, Pa.....	9,587	2,426,893	2,743,873
Cumberland, Md.....	\$23,616	1,920,318	1,861,655
Kanawha, W. Va.....	\$85,998	1,704,691	1,869,313
Phila. & Erie.....	726	163,854	38,738
Pocahontas Flat Top.....	182,175	1,290,207	2,083,645
Totals.....	474,358	10,976,812	11,785,886

	1897.		1896.
	Week.	Year.	
Shipped West:			
Monongahela, Pa.....	13,701	730,671	564,532
Pittsburg, Pa.....	56,067	976,523	1,090,754
Westmoreland, Pa.....	79,378	1,073,017	1,089,971
Totals.....	149,146	2,780,211	2,736,257

Grand totals..... 623,504 13,757,023 14,524,143

Production of coke on line of Pennsylvania Railroad for the week ending July 16th, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 81,589 tons; year, 2,385,583; to corresponding date in 1896, 2,435,600 tons.

† For two weeks ending June 26th. ‡ For week ending July 10th. \* For week ending July 14th.

## Anthracite.

Fortunately for the hard-coal trade matters are again looking up encouragingly. All those who have any connection with it are in unison in saying that the appearance of Mr. J. P. Morgan among them will certainly be very advantageous to the coal-operating and carrying interests. It is expected that Mr. Morgan will accomplish what McLeod tried to do, namely, place the market on a stable basis and make profits for the companies. It is true that McLeod had quite an influence during his presence in the trade, but there is every reason to believe that Mr. Morgan will be of more weight, as he has the capital and experience in handling combinations and like organizations. So far he controls the Philadelphia & Reading, which has an allotment of 20-50% of the total production of coal; the Lehigh Valley, with an allotment of 15-65%, and the Erie, with 4%. While he does not control the Delaware, Lackawanna & Western, with 13-35%, and the Delaware & Hudson, with 9-60%, he has interests and is closely affiliated with parties owning the chief interests in those companies. This makes a total of 63-10%, more than half the output of all the leading operators, which he can control. Mr. Morgan also has an interest in the Central of New Jersey, which has an allotment of 11-70%, which brings the total controlled by him or his allies up to 74-80%. Now that the New York, Susquehanna & Western has again offered its property to the Delaware & Hudson, it is believed that the negotiations will be completed and the whole come under Mr. Morgan's rule. This would make the total allotment to his credit 78% and only leaves the Pennsylvania Railroad with 11-40%, the New York, Ontario & Western with 3-10% and the property of Cox & Company 3-50%. The trade anticipates the time when the anthracite business will practically have passed into his control and what will happen after that is a matter of conjecture.

The story that the New York, Susquehanna & Western has put in a bid for the Delaware & Hudson contract for hauling its coal, amounting to about \$1,000,000, which has been heretofore let to the Erie, still remains to be substantiated. Parties connected with the Erie inform us that the whole contract could not be awarded on January next to the Susquehanna & Western, as that company's lines run only to tidewater, and it could not take west-bound coal which the Erie now handles and will continue to carry. Besides the Delaware & Hudson people ship a considerable share of their coal on the canal to Rondout, N. Y., and have their own lines to Albany, Vermont and Canada. Of course, should the Delaware & Hudson Company take any part of this contract away from the Erie people, it would be a loss. Nothing definite, however, has as yet been given out by either of the companies interested.

To return to the trade proper. The statistics of production for the month of June show that there were 2,920,000 tons of coal mined, which is a decrease of 334,496 tons from the corresponding period in 1896, and 857,644 tons less than for June, 1895. There was also a decrease of 2,798,654 tons in the total shipments for the six months ending June, 1897, from the preceding year. Buying of coal from January to June has not been as active as last year, owing to the depression of business generally, which curtailed the demand from the industrial centers. It has been said that July will show a production of 3,000,000 tons, and it may be less, as the companies are adhering rather strenuously to their allotments. What is considered a strong condition for the maintenance of prices is that the

companies are not furnishing middlemen with very large amounts of coal, so that they cannot cut under the market quotation to any extent. On the other hand, the companies are making few sales at the new circular prices, and those deliveries which are going forward are principally on contracts made at the old schedule. Immediate business is therefore rather quiet.

For some time past the smaller sizes of anthracite have been selling in a fair way, and it is expected that by fall this line will have made quite an advance. The present strike in the bituminous coal regions has helped to increase sales, but prices for steam sizes are still very low, and one shipper remarked that he will take anything that is offered for pea and buckwheat.

Shipments to the West are said to be small, but should the soft-coal strike continue an increase in these is looked for.

A fear is entertained by some that should the hard-coal market expand the sales-agents will make further increases in the schedule of prices. Such an action would not, however, be conservative, as it would only open the way for a demoralization of prices by the jobbing fraternity.

The new circular gives the prices of anthracite coal as follows: Broken, \$4; egg and chestnut, \$4.25; stove, \$4.50 per ton f. o. b. New York.

## Bituminous.

The soft-coal trade along the Atlantic seaboard is very little changed from last week, the chief trouble continuing to be the excessive shortage of vessel tonnage at the shipping ports. One of the immediate causes of this is the fog and contrary winds which have prevailed for some little time past. The shippers of the various kinds of coal are much worked up over this embarrassing situation and are therefore seeking in every direction for any available tonnage that may arrive at their port. The feeling is that the vessels must arrive some time, but the delays in their appearance reduce the carrying capacity of the coastwise tonnage in the shipping season. These shortages generally occur once or twice during the season and are not altogether an injury to trade, as they indicate to consumers that they must not run too close with their supplies of coal on hand. Furthermore, producers are accumulating orders upon which deliveries are hard to be made.

Prices have not varied very much from the commencement of the season, though at times there has been some weakness, but this situation was removed later when its cause became known and so the prices again resumed their steadiness. We quote generally: \$1.75@1.85 per ton, f. o. b. Baltimore; \$1.75@1.80, f. o. b. Newport News and Norfolk; \$1.60@1.90, f. o. b. Philadelphia; \$2@2.65, alongside, New York Harbor.

Trade from the far East is fairly active, and the consumers are pushing for deliveries on orders from this district which have been hanging up for lack of vessel transportation. Sound ports are urgent in their demand for coal at the present time, and New York Harbor trade is good. All-rail trade keeps on in the regular way, it being independent of the vessel business.

Regarding the strike news as it affects the Atlantic seaboard, there have been some efforts made by the agitators in Virginia and Pennsylvania on the districts supplying this trade, but these have proved unsuccessful, and the feeling is that any further attempts in this direction will be defeated.

Transportation from mines to tide, considering the amount of coal on the way at shipping ports, is fairly good. The car supply is governed entirely by the dispatch given them by the individual shippers who ask for cars. The coastwise vessel market is bare of boats, and the freight market is strong, while orders are plentiful.

We quote current rates of freight from Philadelphia: To Boston and Salem, 60@65c.; Providence, New Bedford and the Sound, 55c.; Portland, 60c.; Portsmouth, 65@70c.; Wareham, 75c.; Lynn, 70@75c.; Newburyport, 75c.; Bath, 60@65c.; Gardiner, 60c. and towage; Bangor, 65@70c. Five and 10c. above these rates are asked to the further lower ports.

## Buffalo.

July 22.

(From Our Special Correspondent.)

The shipments of coal westward by lake from Buffalo for the week ending July 17th aggregated only 43,585 net tons, distributed as follows: 12,620 tons to Chicago, 6,400 tons to Milwaukee, 5,100 tons to Duluth, 5,810 tons to Toledo, 1,825 tons to Racine, 10,900 tons to Superior, 1,800 tons to Green Bay, 2,050 tons to Gladstone, 600 tons to Portage, 250 tons to Oscoda, 330 tons to Sand Beach and 1,100 tons to Amherstberg. The rates of freight were unchanged, as follows: 2c. to Chicago, Milwaukee, Duluth, Toledo, Portage, Superior and Gladstone; 25c. to Racine, Sand Beach, Port Huron, Oscoda and Green Bay.

## Pittsburg.

July 22.

(From Our Special Correspondent.)

**Coal.**—Comparatively few persons have any idea of the importance of the bituminous coal industry of the United States; since 1893 it has led in point of market value the nominal products of the country. The great coal strike is still in progress; the reports are so conflicting that in most instances the truth is not obtainable. There are a large number of miners at work at various points who are perfectly satisfied with the wages; there seems to be little doubt that they will be allowed to remain, though the strikers are preparing to force them out, and will surely try to do so. At Altoona, Pa., the Cambria coal operators

refuse to ship coal into strike territory. The aggregate output is enormous. A month ago the Pennsylvania Railroad had many thousand cars lying idle on sidings, now there are none and more are wanted. At Fairmont, W. Va., July 19th, 1,300 men went out; 800 Monongah men struck and all the mines are idle.

At Cincinnati a careful estimate shows that there are 316 barges, coal flats, boats and floats, besides cost at the elevators; this makes in the hands of the river operators 6,941,000 bu.

The latest about the strike shows that both sides claim a victory; operators say the strike is lost. The West Virginia miners refuse to join the strike. Debs is dissatisfied with the situation, and says so, admitting that the miners' organization was in bad shape financially, and that without money the fight would soon be over. The efforts made to bring out the coke workers in the Connellsville District so far has failed. The end may come at any time.

**Connellsville Coke.**—The coal strike so far has had no particular effect upon the coke trade; but there is no telling what may take place in the future. The strikers threaten to force the coke workers out either peaceably or otherwise. There was quite a spurt in the region, 466 ovens being blown in, which will increase the production for the week about 2,000 tons. The demands for coke from all points are very encouraging, those from Pittsburg and Western points being well up to the average.

Summary for the week shows 11,275 ovens in blast, with 7,693 idle. The production of the region for the week, estimated upon the ovens drawn, amounted to 105,356 tons, being a decrease compared with the preceding week of 5,008 tons. The Southwest furnace and several other plants will make six days this week, likely increasing production to a much higher point than 10 weeks ago. In the running order of the ovens in blast last week 9,978 ovens made five days, 666 ovens made four days, and 50 ovens, the Smet-Solvay plant, seven days; an average of 4.98 days. The shipments were: To Pittsburg, 2,555 cars; to points West, 2,066 cars; sent East, 1,196 cars; total, 5,817 cars. Furnace coke is quoted at \$1.50; crushed, \$2.50 per ton.

**Cleveland.** July 21.

(From Our Special Correspondent.)

If there is a famine of steam coal in Cleveland it will not make its appearance for at least two months, according to authorities on the coal situation. The statement was made to-day by a representative of M. A. Hanna & Company that there was enough coal in the city to supply all the manufacturing plants for two weeks, and arrangements had been made to keep up the present supply. During the past week the Cleveland & Pittsburg, the Wheeling & Lake Erie and the Cleveland, Lorain & Wheeling Railroads have been bringing coal to the city and at the present time there are hundreds of cars standing on side tracks. President Chisholm, of the Cleveland Rolling Mill Company, told your correspondent to-day that he expected to start many of the departments of the mill next Monday, as he had made arrangements for a supply of coal. The original intention had been to start up last Monday, but on account of the unsettled condition of affairs in the coal districts the resumption was deferred one week.

**Shanghai, China.** June 18.

(Special Report of Wheelock & Co.)

**Coal.**—Judging from the long list of arrivals or might think that Japan coal was plentiful, and consequently cheap in this market, but such is by no means the case, the greater part of the total being for the use of consumers, in fulfillment of annual contracts, and coal of any kind continues to command very advanced prices. Small quantities of Cardiff coal constitute the only business doing in this kind. The Australian Wollongong market seems to have revived slightly. Stocks are gradually diminishing and transactions among natives show handsome profits to holders.

We quote prices as follows: Cardiff, 13 taels per ton; American anthracite, 9 taels per ton; Sydney Wollongong, 8 taels per ton. Japan coal is 5.75 taels for Takasima lump, 5 taels for Namazuta lump, 5.75 taels for Miiké lump, and 5.75@6 taels per ton, with an upper tendency, for other sorts.

**Kerosene Oil.**—During the period under review the market for American has undergone an entire change, owing to the arrival of three cargoes which have replenished stocks, and from 1.67 taels, our last quotation, after a slight rise to 1.70 taels, the price suddenly fell to 1.60 taels, and a further decline makes our present quotations 1.55 taels, at which price transactions have taken place. Natives seem disinclined to operate, even at this low figure, fearing a further fall. Importers are now asking 1.60 taels, less 2%, for September, October, November loading, at which price a fair quantity has been sold. Russian Batoum has likewise experienced a fall, in sympathy with Devoe's, stocks being more than sufficient to meet the small delivery which always exists at this time of the year. An arrival is noted of 137,410 cases. Langkat has declined to 1.40 taels. Stocks are 100,000 cases American, 250,000 cases Russian and 86,000 cases Langkat. Quotations are as follows per case: American Devoe's, 1.57½ taels; Comet, 1.52 taels; Russian Batoum, 1.48 taels; Russian Batoum, bulk, 1.45 taels; Langkat, 1.42½ taels.

**IRON MARKET REVIEW.**

**NEW YORK, Friday Evening, July 23, 1897.**

**Pig Iron Production and Furnaces in Blast.**

Fuel used.	Week ending				From	
	July 24, 1896.		July 23, 1897.		Jan., '96.	Jan., '97
	F'ces.	Tons.	F'ces.	Tons.	Tons.	Tons.
Anthracite.	39	24,100	23	12,750	766,640	488,136
Coke.....	130	155,950	107	150,353	1,690,312	1,289,364
Charcoal....	23	6,600	15	3,253	159,326	139,226
<b>Totals</b>	<b>192</b>	<b>186,650</b>	<b>145</b>	<b>166,356</b>	<b>5,616,178</b>	<b>4,916,766</b>

In one sense we have a waiting market this week. It is waiting for future developments, and iron-men are chiefly occupied in discussing how far the general business situation—the good crop returns and the high prices of grain—will affect their business next winter. The present prospect is that the farmers will have more money than they have seen for several years past, and that the railroads will have a better business. These are very important factors in the situation and may help to make at least one season of good business. For permanent prosperity no careful observer looks until our currency question is settled and our financial policy put on a stable foundation and taken out of politics.

Meantime the iron market is unmistakably dull, and the talk of small sales and slow trade is heard everywhere. The purchasers of foundry iron seem to have all the stock they need for the present, and the steelmakers have Bessemer pig enough to keep them going. There is a little demand for basic pig, but not enough to offset the lack of orders for other irons. In finished material there is not very much doing, structural and bridge shapes showing up the best, but that is not very good.

Under all the circumstances, it is not surprising that prices continue very low, with little prospect of early improvement.

The armor-plate question has gone back to just where it stood before. The House of Representatives was willing to allow the makers \$400 or even \$450 per ton, but the Senate amended the bill by making \$300 the limit, and the House gave way. The two concerns owning plants for making these plates will not bid at that price, and it looks as if the whole question would go over to the next session of Congress.

The trade is still uneasy about labor troubles. There are several small strikes on hand and everyone is afraid that big ones will follow. The situation in the coal regions is closely watched, not only because of its direct effect on the iron trade in various places, but also because it presents an example for the ironworkers, who may undertake a general movement, should this one of the miners be successful.

The organs of the British iron trade are complaining that, while pig iron, steel billets and other products are in active demand and the volume of business is large, prices continue very low. This is ascribed to American competition and the fact that large imports of pig iron and steel have been made to England itself and sold there. In addition to this, American concerns have taken foreign and colonial orders which were formerly considered British property exclusively. The force of American competition is being admitted, and its effect in keeping down prices is a matter of serious consideration. It is no longer held to be temporary or of slight importance.

**NOTES OF THE WEEK.**

The American Iron and Steel Association has received from the manufacturers complete statistics of the production of all kinds of pig iron in the United States in the first half of 1897. The total production of pig iron in the United States in the first half of 1897 was 4,403,476 gross tons, against 4,976,230 tons in the first half of 1896 and 3,646,891 tons in the second half of 1896. As compared with the first half of 1896 there was a decrease in the first half of 1897 of 572,769 tons, but as compared with the second half of 1896 there was an increase of 756,585 tons. The production of Bessemer pig iron in the first half of 1897 was 2,495,978 gross tons, against 2,793,672 tons in the first half of 1896 and 1,861,283 tons in the second half. Of the total increase of 756,585 tons of all kinds of pig iron in the first half of 1897 over the last half of 1896, 634,695 tons, or almost six-sevenths, was of Bessemer quality. The production of spiegeleisen and ferro-manganese in the first half of 1897 was 80,622 gross tons, against 83,010 tons in the first half of 1896 and 48,930 tons in the second half. The production of basic pig iron in the first half of 1897, by States, was 281,610 tons, as compared with 144,716 tons in the second half of 1896, and 191,687 tons in the first half.

**New York.** July 23.

Actual buying in the local iron market has been rather small this week. There is some business for structural material men, while a few bridges are also to be built. The Grand Central Depot contract has now been let by the Union Bridge Company, and the material, about 2,000 tons, will be furnished by a Pittsburg mill. On Saturday last the Westchester County Board of Supervisors of White Plains, N. Y., let a contract to the Champion Iron Company of Kenton, O., for remodeling the county jail; the price was \$50,029. There were several other bids

for the work, which ranged from \$52,000 to \$100,000.

In cast-iron pipe we note that the Warren Foundry and Machine Company has received the contract for 4,000 tons from the Kingston (N. Y.) water works. Contract for a standpipe 36 x 105 ft. was recently awarded by the town of Flushing, L. I., to the New Jersey Iron and Steel Company, of Trenton, at \$11,892. Other bids ranged from \$12,950 to \$16,178. With regard to that Brooklyn contract, manufacturers of pipe here inform us that their checks have been returned, and the name of the successful bidder is not generally known. However, it is believed that the Addyston Company, of Cincinnati, O., received the contract, as it was the lowest bidder, at \$18.43 per ton.

Export business has lessened in activity from last week. Nails are still being shipped from this port in fair quantities. Hardware continues to move in the usual way. A small lot of mining machinery was sent to Mexico, while the Central and South American States have taken considerable electrical material. A moderate lot of hoops has been ordered for Manchester, Moscow, Russia, and Rotterdam, Holland, will receive some of our iron pipe, while St. Petersburg gets 161 casks of ferro-manganese. Most of the ferro-manganese that goes forward now is being exported, by the Carnegie Steel Company. Steel tinplate bars, valued at \$15,300, were shipped to Cardiff on Saturday last. There have been no exports of pig iron from this port within the last week, and that which is being sent to the other side goes direct from Southern ports.

**Pig Iron.**—The numerous small orders that have been received by sales-agents for a short time past have helped to fill up the books of the furnacemen so that some of them are sold ahead. This situation has made several of them a little stiff as regards prices, but it is doubtful whether they will let a good-sized order slip through their hands. The Northern furnaces—the majority of them—are apparently willing to accept any orders they may be offered them at lower prices than those given as the market quotations. Southern iron is understood to be holding its own as regards prices, but sales are not very numerous to local buyers. For export, however, business is better.

Our market quotations as given below are unchanged: Northern No. 1 X Foundry, \$12@ \$12.50; No. 2 X Foundry, \$10.50@ \$11.25; No. 2 plain, \$10.25@ \$11; gray forge, \$9.75@ \$10.25; Southern No. 1 Foundry, \$10.50@ \$10.75; No. 2 Foundry, \$10@ \$10.25; No. 1 soft, \$10.75@ \$11; 2 soft, \$10.25 @ \$10.50; gray forge, \$9.50@ \$9.75; Basic, \$10.50@ \$10.75. All prices are for tidewater delivery.

**Cast-Iron Pipe.**—Manufacturers report business dull in this region, and only one really large contract was closed this week, to which we refer above. Prices are very weak.

**Spiegeleisen and Ferro-Manganese.**—Local trade continues quiet. Quotations are: Spiegeleisen, 20%, \$19@ \$19.50; ferro-manganese, 80% foreign, \$46, delivered at buyer's mill.

**Steel Billets and Rods.**—The local market continues very quiet. Quotations are \$16.25@ \$16.50 for billets at tidewater and \$20, nominal, for rods at mill.

**Merchant Iron and Steel.**—Business continues rather inactive, and prices continue easy. Quotations are: Common bar, 1@ 1.05c.; refined, 1.10@ 1.15c.; soft steel bars, 1.00@ 1.10c.; steel hoops, 1.25@ 1.35c.; steel axles, 1.50@ 1.60c.; tire steel, 1.05@ 1.10c.; spring steel, 1.40c.; base; links and pins, 1.50@ 1.60c.; cotton ties, 60c. per bbl. at mill.

**Plates.**—Buying generally continues only in a small way. We quote for universal mill plates 1.10@ 1.15c. For steel plates prices are: Tank, 1.10@ 1.15c.; boiler shell, 1.20@ 1.30c.; flange, 1.35@ 1.40c.; firebox, 1.60@ 1.75c., and 2.25@ 2.50c. for locomotive firebox, according to quality. Charcoal iron plates are 2.25c. for shell, 2.75 for best flange and 3.25 for firebox. Rivets are 2.25@ 2.50c. for iron and 1.75@ 1.85c. for steel. Prices are for tidewater delivery in large quantities.

**Structural Iron and Steel.**—Although some orders were taken, the market is quiet. We quote for angles, 1.10@ 1.15c.; tees, 1.35@ 1.50c.; channels, 1.15@ 1.25c. The price of beams, New York delivery, is 1.15c. for ordinary sizes, 1.20c. for 20-in., and 1.25c. for 24-in., carload lots.

**Steel Rails and Rail Fastenings.**—Market continues quiet, but inquiries are more numerous for small quantities of rails. Quotations are \$19@ \$20 per ton for standard sections and \$23 for girder rails. Lighter rails are figured on by a reliable concern as follows: 12-lb. rails, \$26 per ton at mill; 16-lb., \$24. 20-lb., 25-lb. and 30-lb., \$22 per ton.

For rail fastenings tidewater quotations are: Angle bars, 1.05@ 1.10c.; spikes, 1.45@ 1.50c.; bolts, 1.75@ 1.85c.; square nuts, 1.80@ 1.85c.; hexagon nuts, 1.90@ 1.95c.

**Wrought-Iron Pipe.**—Business is slightly better locally, and export trade continues good. Discounts are as follows: For plain pipe, out of store: 1½ in. and over, 67, 10, 10, 10 and 10%; 1¼ in. and under 50, 10, 10, 10 and 10%. Galvanized pipe, 1½ in. and over, 55, 10, 10, 10 and 10%; 1¼ in. and under, 50, 10, 10, 10 and 10%. For fair-sized orders these discounts are made with an additional 5% for less than carload lots. For carload lots this additional discount is 7½% to 10%.

**Nails.**—Business has been curtailed somewhat owing to the shut-down of most of the mills. General buying is rather small, and prices remain unchanged. Quotations are for wire nails, \$1.40 for carload lots on dock, and \$1.50@ \$1.60 for smaller

quantities, from store. Cut nails are \$1.30 for car-load lots, and \$1.40 for less quantities.

Old Material.—Better business is reported than last week, but prices for some kinds of scrap have been a little unsteady. Export demand is good. In wrought scrap (No. 1) we note a shipment by vessel of about 175 tons from yard, said to be at \$9.75 per ton. The usual number of carload orders at from \$10@10.5) per ton delivered f. o. b. cars, New York are being received. Railroad scrap shows a fair demand with dealings at \$11@12 per ton, delivered at mill. A sale of 500 tons of tees is noted delivered at a Sound port at about \$10.25 per ton delivered at New York. This purchase was made for export. Quotations for all sections are \$9@10.50 per ton delivered at New York.

Iron rails for export are quoted at \$12.25@12.50 per ton delivered to steamer at New York. For domestic consumption there is noted a sale of about 350 tons of light section at \$11 delivered at mill. Other quotations are: Old wrought pipe and tubes, \$7.50@8 delivered at New York; machinery cast, \$9@10 per ton; burnt iron, \$5.50@6.50; cast borings, \$6.50@7; car wheels, \$9@10; wrought turnings, \$8@8.50, delivered at buyer's works.

Birmingham, Ala.

[BY TELEGRAPH.]

BIRMINGHAM, ALA., July 23.—No. 1 basic open-hearth furnace of the Birmingham Rolling Mill Company completed its first heat at 6:27 p. m. last evening. Everything is going well, and no fault is to be found with the working of the furnace or the appearance of the steel.

Buffalo. July 21.

(Special Report of Rogers, Brown & Co.)

There has been during the past week quite a noticeable increase in the requests for immediate shipment of foundry iron on existing contracts. We have noticed a better feeling among foundries in general. Some running on special lines of work are quite busy; others depending upon car contracts are running rather light. Taken as a whole, however, the foundries in this vicinity can be considered fairly active. Several good-sized orders have been entered by local furnaces for both foundry and malleable iron, but there has been very little, if any, improvement in prices. We quote below on the cash basis f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$10.75; No. 2 strong foundry coke iron, Lake Superior ore, \$10.50; Ohio strong softener No. 1, \$10.75; Ohio strong softener No. 2, \$10.50; Jackson County silvery No. 1, \$14; Southern soft No. 1, \$10.75; Southern soft No. 2, \$10.50; Niagara malleable, \$11.

Cleveland. July 21.

(From Our Special Correspondent.)

Iron Ore.—Very few sales of any kind of ore were made during the past week. Many of the furnacemen seem to have supplied their immediate wants, and those who have so far failed to do so are not inclined to make purchases at present, as they are not quite certain of the future of the iron market. Liberal shipments from the upper lakes have been interfered with by washouts on railroads connecting the mines with the docks. There is a scarcity of dock room also, one of the results of the coal strike. Taken all together, the ore market and its outlook have not improved during the past week, but it is confidently expected that as soon as the coal strike is settled there will be a resumption of business. There is no change in the freight rates, 50c. from Lake Superior ports and 40c. from Escanaba. Following are the quotations: Specular and magnetic ores, Bessemer quality, \$3@3.75; specular and magnetic ores, non-Bessemer quality, \$2.5@2.75; hematites ores, Bessemer quality, \$2.50@3; hematite ores, non-Bessemer quality, \$2@2.50.

Pig Iron.—Little has been done in either Bessemer or foundry irons during the week, and the market as a whole is quiet. The prices, however, remain firm at the figures which have prevailed for several weeks. They are: Lake Superior charcoal, \$13.25; Bessemer, \$9.75@10; No. 1 foundry, \$10.25@10.50; No. 2, \$9.75@10; No. 1 Ohio Scotch, \$10.40; No. 2, \$9.90; gray forge, \$8.50@8.75.

Philadelphia. July 23

(From Our Special Correspondent.)

Pig Iron.—The market is weak and dull. Large transactions have been attempted by some makers for cash, but parties who are accustomed to buy in a large way find good reasons for not closing at this time. More or less iron is selling all the time. Buyers are looking around, more to keep posted than to buy. There are rumors of large transactions and there is a talk of big work coming along, but the actual facts are not particularly encouraging. Consumers are indifferent, and when told that the tariff law will boom iron they smile. Quotations are No. 1 X foundry \$11.75@12.50; No. 2, \$10.75@11.25; forge, \$10@10.50; basic iron is held at \$10.50 and low phosphorus at \$14.50.

Steel Billets.—Billets are likely to sell well soon. Some parties have booked work calling for billets, but they have some time to go and come on and will not hurry deliveries. Quotations are \$16.25.

Merchant Bars.—The only business in a wholesale way heard of has been done at such a low price that it appears as if a break in prices had occurred. Refined bars are 1'05@1'10c.

Sheets.—The mills are gathering up midsummer business, and the stores are selling from stock in

hand with more promptness. On the whole the situation is better. Some iron has been shipped abroad and the prospects are for larger shipments in the near future.

Pipes and Tubes.—Work is picking up in these lines and business now promises to be of larger volume, though not to the extent of hardening prices.

Merchant Steel.—The retail movement is steady and, for July, satisfactory. Carriage and wagon material goes quite quickly.

Plates.—The rush of manufacturers for business, big and little, has a demoralizing effect on prices; even small orders taken this week were at shaded prices. There is no evidence of firmness, and will not be until there is a decided increase in requirements. Tank is 1'5c.; universal, 1'20c.; flange, 1'30c.; firebox, 1'50@2'25c.

Structural Material.—The new business this week has been of unimportant quantities: Angles are 1'5c.; beams, 1'25@1'40c.

Steel Rails.—Quiet; no large sales.

Old Rails.—Small sales of iron at \$10@11.

Scrap.—A moderate business is being done.

Pittsburg. July 22.

(From Our Special Correspondent.)

Business continues dull in most departments. With few exceptions dealers appear indifferent and seem to be waiting to see how the scale question will be decided, as well as the coal strike. Industries of most kinds are undoubtedly in a very bad shape all around. The iron and steel question appears to attract but little attention at the present time. In fact the same unsatisfactory condition which has prevailed for some time past still continues; many of the iron brokers have turned their attention to buying and selling coal, and report says they are doing well. Iron production shows a slight falling off, but not sufficient to have any effect on prices; there is too much pig iron on the market and too many furnaces in blast to meet the consumptive demand. The demand is of a hand-to-mouth character, consumers generally refusing to buy beyond their immediate wants; prices are so low that they can hardly afford to be lower, but the indisposition of buyers to stock up at the figures now quoted, and the attempt to reduce wages, together with the low prices now ruling for ores, are not very encouraging to those who have been hoping for better business. In the local pig iron market there is little change to note as compared with the condition of a week ago, except that prices are so various that it seems hardly possible to quote them with any degree of definiteness, as so much depends upon the quantity, quality and time of delivery and the anxiety of the seller to secure the order. The weakness in prices is more manifest in the medium qualities of material, the standard brands not being much affected. Until there is an expansion of the demand to meet the rate of production prices can hardly show any movement upward.

For steel rails the market is quiet; rail mills are running on old contracts; very little new business offered; prices nominal. The Carnegie Company will soon commence on a 40,000-ton contract for the Baltimore & Ohio. For wire nails the demand was restricted to limited amounts; prices nominal, \$1.27@1.30.

Wrought iron and steel pipe makers report an increased inquiry; sales are below expectations. Sheet bars are in good demand at unchanged prices. Old rails were more inquired for; prices irregular.

The iron trade continues to move along slowly. Sales are confined to limited amounts for present wants; prices of last week would answer on the occasion with slight alterations. Bessemer sales have been made at Pittsburg at \$9.40@9.60; Valley Bessemer, \$8.90@9. Billets have sold at Pittsburg at \$14.10@14.40. Skelp iron advanced; grooved is \$1.10. Skelp steel is higher; sheared, \$1.05; grooved, 92½c. For sheet bars demand is good. Steel wire rods advanced. Ferro-manganese sells at \$45.50.

Table with multiple columns listing prices for COKE, SMELTED, LAKE AND NATIVE ORE, BLOOMS, BILLETS, SLABS, SHEET BARS, SKELP IRON, SKELP STEEL, STEEL WIRE RODS, FERRO-MANGANESE, OLD RAILS AND SCRAP.

METAL MARKET.

NEW YORK, Friday Evening, July 23, 1897. Gold and Silver.

Prices of Silver per Ounce Troy.

Table showing prices of silver per ounce troy for July, with columns for St. Ex., London Pence, N. Y. Cts., and Value of sil. in \$.

Silver showed considerable firmness and even strength at 27½d., until July contracts were closed; then, under a combination of circumstances—the withdrawal of the Eastern banks as buyers for large amounts, and the absence of continental orders on the one side and the more free offerings of holders for a rise, and producers on the other side—prices gave way, and the market closes with a moderate business at 27¼d.

The United States Assay Office in New York reports the total receipts of silver at 87,000 oz. for the week.

Average Monthly Prices of Silver

In New York and London, per ounce Troy, from January 1st, 1897, and for the years 1896 and 1895.

Table showing average monthly prices of silver in New York and London for 1897, 1896, and 1895, with columns for Month, London Pence, New York Cents, and London Pence, New York Cents.

The New York prices are always per fine ounce, or ounce of pure silver; the London quotation is per standard ounce, or for metal 925 fine.

Gold and Silver Exports and Imports

At all United States ports, June, 1897, and years from January 1st, 1897 and 1896:

Table showing gold and silver exports and imports at all United States ports for June 1897 and years from January 1st, 1897 and 1896.

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York

For the week ending July 23d, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

Table showing gold and silver exports and imports in New York for the week ending July 23d, 1897, and for years from January 1st, 1897, 1896, 1895, 1894.

Of the gold exported for the week \$800,000 went to France, and the balance to London; the silver went chiefly to London. The gold and silver imported came principally from Central and South America.

FINANCIAL NOTES OF THE WEEK.

The main event of the week has been the agreement of the Conference Committee on the tariff bill and the passage of the amended bill by the House of Representatives without debate. The Senate is still talking over it, but with every apparent probability of passing it also in a few days. The bill is not a very good bill—everyone is agreed on that point; but it is something to have it passed and matters settled so that business can be adjusted to the new duties, with some degree of certainty as to the future.

Imports and withdrawals of merchandise from bond have been very large in anticipation of the enactment of the new tariff. The receipts for customs, especially in New York, have been extraordinary this week, and the Treasury will be able to make a very good showing for the first month



order. The London price is about on a parity with New York, allowing for the duty of 6c. per lb.

Platinum.—Prices are firm at \$14@15 per oz. New York. The London quotation is 55s. @ 56s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotations, the prices given being respectively for orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 54c., 55c. and 56c. per gram. Wire and foil are 52c., 53c. and 54c. per gram.

Quicksilver.—The New York quotation remains unchanged at \$40 per flask. The London price is £7 5s. per flask, with £7 4s. quoted from second hands.

Quicksilver receipts at San Francisco in June were 1,349 flasks. For the half-year ending June 30th they were 7,309 flasks, a decrease of 9,396 flasks from 1896, chiefly due to larger direct shipments from the mines. Exports for the first six months of the year were as follows: Mexico, 1,874; Central America, 720; British Columbia 33; New Zealand, 20; total, 2,647 flasks, against 8,539 flasks in 1896. Last year the shipments included 2,500 flasks to New York and 3,000 flasks to Hongkong. Overland shipments for first five months were 5,326 flasks. No returns for June.

The Minor Metals.—Quotations are given below or New York delivery:

Table with 4 columns: Metal, Quantity, Price 1, Price 2. Includes Aluminum, Bismuth, Phosphorus, Tungsten, Ingots, Scrap, Rolled sheets, Alum-Nickel.

Variations in price depend chiefly on the size of the order.

Average Monthly Prices of Metals

In New York, for the years 1897 and 1896; in cents per pound.

Table with 5 columns: Month, Copper, Tin, Lead, Spelter. Shows monthly price trends for 1897 and 1896.

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements' see page 120.)

New York. July 23.

Heavy Chemicals.—This market is very quiet, and is in an uncertain condition owing to the tariff discussion. There is no change in prices, however.

We quote: Caustic soda, 60%, \$2.10@2.15; 70@76%, \$1.90@2 per 100 lbs. Alkali, 58%, 60c. for 50-ton lots and over, and 70@80c. for smaller quantities; alkali, 48%, \$1@1.20 for jobbing lots. Carbonated soda ash, 48%, 90@95c. per 100 lbs.; 58%, 75@80c. per 100 lbs. Bleaching powder, prime brands, \$1.75@1.87 1/2; Continental, \$1.55@1.75 per 100 lbs.; Continental F brand, \$1.60@1.65. Bicarb. soda, English, 1.75@2c. per lb.; American, bulk, \$1.50@1.55 per 100 lbs., according to brand. Sal-soda, English, 60@65c. per 100 lbs.; American, 55@60c. (in barrels), and 75@80c. in kegs. Chlorate of potash, 9 1/2c. per lb.

Acids.—Business continues quiet. Quotations per 100 lbs. in New York and vicinity in lots of 50 carboys or over are as follows: Acetic acid, commercial No. 8 (in barrels), \$1.40 @ \$1.50; in carboys, \$1.50@1.65; redistilled, 28% in bbls., \$1.70@1.80; in carboys, \$1.90@2.05. Muratic acid, 18%, 75@85c.; 20%, 85@95c.; 22%, \$1.15@ \$1.25, according to make and quantity. Nitric acid, 36%, \$3.50@4; 40%, \$4@4.50; 42%, \$4.50@5.50. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66%, 85c.@ \$1 in carload lots, 10@15c. higher for small quantities. Chamber acid, 86@86.50 per ton at factory. Blue vitriol, \$4@4.25, according to grade and order.

Brimstone.—Trade in this article is very dull just now. Best unimixed seconds are quoted at \$20 @ \$20.25 while thirds are offered at 65c. less.

Fertilizing Chemicals.—This market shows no change, excepting in prices. Buying generally is rather light.

Sulphate of ammonia, gas liquor, \$2.10 for shipment, and \$2.20 for spot; bone, \$2 @ \$2.05 per 100 lbs. Dried blood, high grade Western, \$1.60@1.65 per unit New York; f. o. b. Chicago, \$1.55@1.60 per unit. Azotine, \$1.65@1.70 basis New York. Concentrated phosphate (30% available phosphoric acid), 57 1/2c. per unit. Acid phosphate, 13%@15%, av. P2O5, 54@65c. per unit at sellers' works in bulk. Dissolved bone black, 17%@18% P2O5, 80c. per unit. Acidulated fish scrap, \$8.50@9, and dried scrap \$17.50@18, f. o. b. fish factory. Tankage, high grade, \$13.50@14 per ton; concentrated, \$1.32 1/2 per unit, f. o. b. Chicago; New York,

\$18.50; low grade, \$16.50@17. Bone tankage, \$19@ \$20; ground bone, \$21@23. Bonemeal, \$19.50@22.50.

Sulphate of Potash: 90%, New York and Boston, \$1.90 1/2; Philadelphia, Baltimore and Norfolk, \$2.01; Southern ports, \$2.03.

Double Manure-Salt: Quotations for 48@49%, less than 2 1/2% chlorate, are 1.01@1.01 1/2c., to arrive, and 1.02@1.03c. on spot; basis of 48%. High grade, 90@ 95% sulphate of potash, 1.96 1/2@2.00 1/2c. to arrive; basis of 93%. In bulk 24@33 1/2, 36 1/2@37 1/2c. per unit O. P.

Muriate of Potash: We quote: New York and Boston, 1.75@1.78c. Philadelphia and Norfolk, 1.76@1.79 1/2c.; Charleston, Savannah, Wilmington and New Orleans, for 80@85% basis of 80%, 1.78 1/2@ 1.81c. in lots of 50 tons and upward.

Kainit.—Invoice weights, as taken at port of shipment, per ton of 2,240 lbs., testing 12 1/4% actual potash, equivalent to 23% sulphate of potash, \$8.80 @ 8.90.

Nitrate of Soda.—Buying continues small, while prices rule low. Quotations are 1.70@1.72 1/2c. for spot, and 1.65@1.67 1/2c. for futures.

NOTES OF THE WEEK.

Cable advices state that a meeting of the leading South American producers of nitrate was held on June 25th at Iquique, Chile, to take steps for a restriction of exports during the present season. These producers, of which there are about 80 of importance, formed a combination two years ago for the purpose of regulating exports. By the arrangement then agreed upon it was decided to limit exports from April 1st, 1896, to March 31st, 1897, to 20,300,000 quintals, and for the year ending March 31st, 1898—the present season—to 23,500,000 quintals. Recently there have been efforts to secure a still further restriction of exports by 10%. This plan was accepted some time ago by several of the mills which are owned by English capital. The last meeting was held in order to see whether the South American producers would also concur. From the cable advices it appears that the plan will be carried through, a considerable number of the producers having agreed to it already, and enough to make a majority being expected to fall into line at an early date. The output of the West Coast forms 98% of the world's production.

The report that a duty of 5c. per ton on crude sulphur has been provided for in the new tariff bill caused one of our prominent importers of brimstone—Mr. Solon J. Vlasto—to raise opposition to it in the interest of his customers. A petition was drawn up which was forwarded to the Conference Committee, and this document contained the signatures of 180 reputable concerns in different industries whose views were in accord with his own. Mr. Vlasto set forth that there was absolutely no reason why Congress should place a tax on an industrial raw material like crude sulphur, which is only sparingly mined in this country, when pyrites, of which we produce quite an amount, is kept on the free list. Furthermore, the United States is the largest consumer of Sicilian sulphur, and official statistics show that during the year 1896 we imported 124,923 tons of this mineral, of which nearly 68,000 tons were consumed by the paper mills during that time. On the other hand, our domestic production amounted to but 3,800 long tons in 1896, according to The Mineral Industry. Japan at one time sent some of its sulphur here, but these imports have ceased, owing to the great distance and the uncertainty of the time of arrival of sailing vessels. For some industries in which Sicilian sulphur is being used pyrites can be substituted, but the arsenical contents of the latter make it objectionable for other important purposes. Mr. Vlasto did not see why the Senate should tax an article like crude sulphur, of which we produce so little, and place pyrites, of which we are capable of producing a considerable amount, on the free list. He contended that as it was the desire of Congress to protect American industries and products, the tax of 5c. per ton on crude sulphur should be eliminated. He also said that in case Congress did impose the duty it would make no difference in the imports of sulphur, as the paper, pulp and sulphite mills, the sulphur refiners and manufacturers of sublimed and refined sulphur have to use crude sulphur, which they think indispensable, as they cannot use pyrites, though the latter could be secured at any price. The petition was successful, and the Conference Committee restored crude sulphur to the free list.

Liverpool. July 13.

(Special Report of Joseph P. Brunner & Co.) In heavy chemicals the position is about unchanged, business being on a moderate scale, while prices, as a rule, are well maintained.

Soda ash is quiet, but prices are well controlled by makers. Quotations vary according to export market, and range for tierces may be called about as follows: Leblanc ash, 48%, £1 5s @ £4 10s. per ton; 58%, £1 10s. @ £4 15s. per ton, net cash; ammonia ash, 48%, £3 7s. 6d. @ £4 per ton; 58%, £3 12s. 6d. @ £4 5s. per ton, net cash. Bags 5s. per ton under price for tierces. Special quotations for American business.

Soda crystals are in fair demand and are quoted at £2 17s. 6d. per ton, less 5% for barrels, and 7s. less for bags, although lower prices quoted for some special export markets. Special terms for American orders.

Caustic soda is moving off and prices are firm. We quote spot range, as to market, about as follows:

60%, £6 3s. 9d. @ £6 5s. per ton; 70%, £7 3s. 9d. @ £7 5s. per ton; 74%, £8 2s. 6d. @ £8 5s. per ton; 76%, £8 15s. @ £9 per ton, net cash.

Bleaching powder is dull, and is nominally quoted at about £6 15s. @ £7 per ton, net cash, for hardwood packages, as to destination.

Chlorate of potash quiet, and although still quoted at 4d. per pound the tone is weaker.

Bicarb. soda is held for the usual price of £6 15s. per ton, less 2 1/2% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

In sulphate of ammonia there is not much going on, but quotations are fairly steady at about £7 16s. 3d. @ £8 per ton, less 2 1/2%, for good gray 24% @ 25% in double bags f. o. b. here, as to quality.

Nitrate of soda is selling in a small way at about £7 17s. 6d. @ £8 per ton, less 2 1/2%, for double bags f. o. b. here, as to quantity and quality.

Carb. ammonia, lump, 3d. per lb.; powdered, 3 1/4d. per lb., less 2 1/2%.

Valparaiso, Chile. June 19.

(Special Report of Jackson Brothers.)

Nitrate of Soda.—During the fortnight the spot price for this article in Hamburg reached 6.50 marks, being the lowest figure ever touched. This fall we attribute to the minimum quantity for exportation last year fixed by the combination being too large, outside of the fact that the production of sulphate of ammonia has increased, whereas the cost of same has gradually decreased to a lower value than nitrate. Again, what has greatly influenced the European market have been the constant consignments made by English companies and the arrival of said cargoes un-sold. Unless the combination decide to reduce the exportation of the minimum quantity of 23,500,000 previously proposed for this nitrate year and consignments are not made on such a large scale, we do not foresee any hopes of a remunerative price being obtained for this article. We quote 95% June and July at 5s. 2d.; August, 5s.; September and December, 5s. 3d., and refined, June and July, 5s. 3d., all sellers. The price of 5s. 2 1/4d., with 18s. 9d. freight, stands in 6s. 8 1/2d. per cwt. net cost and freight without purchasing commission. Sales during the fortnight were 385,000 quintals.

MINING STOCKS.

Complete quotations will be found on pages 116, 117 and 118 of mining stocks listed and dealt in at:

Table with 3 columns: Location, Name, City. Lists mining stocks from Aspen, Baltimore, Boston, Butte, Cleveland, Colo. Springs, Denver, Helena, Los Angeles, New York, Philadelphia, Pittsburgh, Salt Lake, San Francisco, Mexico, Paris, Rosland, Shanghai, Valparaiso.

New York. July 23.

Transactions in mining stocks on the Consolidated Stock and Petroleum Exchange have been very light during the past week, with the exception of Brunswick Consolidated, which still continues in some demand. The Leadville stocks also attracted some attention, with prices firm.

The Comstocks were quiet, with prices ruling steady.

Standard Consolidated records sales this week at an increase of 10c. over ruling figures of last week.

At the Mining Exchange the cheaper Colorado stocks continue in good demand, with particular attention being paid to Annetta and Miami. The Cripple Creek stocks, with the exception of Cannon Ball, remain dull and inactive.

Boston. July 22.

(From Our Special Correspondent.)

The market this week has been a dull and declining one for copper stocks, in marked contrast to the activity and strength of last week. Butte & Boston was heavily dealt in, but at a decline, due in a great measure to a desire to realize profits and to the absence of buying orders. The stock opened at \$24, which was the highest point, and settled down to \$22 1/2, the closing price of to-day, and was weak at that. Boston & Montana opened at \$185 and sold up to \$136 1/2; later, dividend off at \$133, which was the closing price.

Calumet & Hecla declined to \$385, but rallied later and sold at \$395, a gain of \$5 for the week. Tamarack sold at \$132 and went off to \$130. Quincy touched \$120, but declined to \$118 1/2. Osceola sold up to \$37 once during the week, but closed at \$35. Old Dominion declined from \$20 to \$18 1/2. Kearsarge sold at \$19 1/2 and \$19. A dividend of \$1 per share was announced payable August 10th. Franklin declined from \$15 to \$14 on small transactions. Atlantic was heavy and sold off from \$23 to \$21 1/2. Centennial declined to \$7. Wolverine was quite strong and sold up to \$11 1/2, losing 3/4 in the closing sales. Tamarack, Jr., sold at \$17 1/2 and later at \$18. Arnold was steady at \$3 1/2. Allouez sold at 50c.

The gold stocks were generally heavy, especially Gold Coins, which sold off on the unfavorable reports from the mine to \$3 per share, a decline of 1 1/2 per share. Pioneer was also weak and declined to \$5. Merced sold at \$8, and Santa Ysabel at \$15. Boston & Cripple Creek sold at 9c.

Cleveland. July 21.

(From Our Special Correspondent.)

But little activity was manifested on the mining stock market during the last week. Few sales were recorded, and none of them were for large blocks. Except in one instance the same quotations



tions prevail this week as last week. Pittsburg and Lake Angelina has weakened slightly, but if history repeats itself it will advance during the coming week.

**Los Angeles, Cal.** July 17.

(From Our Special Correspondent.)

The past week on the Los Angeles Mining Stock Exchange has been one in which both the bears and the bulls had found opportunities to make a few quick turns, although there has been no special boom. The entire list has been selling well and an improvement may be noted in one or two instances, while the market closes strong with good undertone. Rand Mountain is holding its own splendidly considering the rapid advance which occurred at the close of last week, and is now selling at about the same figure as at the opening on Monday. Magganetta, a new stock, has taken splendidly and advanced  $\frac{1}{2}$ ¢. From 15 to 20 brokers are on the floor every day, and the bidding at times is decidedly spirited. Wedge stock is selling at about the same price it did before last dividend was declared, but has not been so active. News from this property during the past week goes to show that they are more than earning their regular 2¢ monthly dividend. It certainly looks like a bull market, and everybody is buying rather than selling. Pacific Consolidated is the only stock on which the bears have had any active interest, and they have been able to send it down as low as  $\frac{1}{2}$ ¢. The latter part of the week; it, however, closes very strong at  $\frac{1}{2}$ ¢ bid, which is the same as last week. The coming week promises to be quick and exciting, and will probably be ruled by rumors and authentic reports from Randsburg properties; there will, therefore, be plenty of opportunity to make quick turns on either side of the month.

There is considerable talk here of a revival in speculation among the Comstock properties, and one or two of them may be listed on the Los Angeles Exchange. The Listing Committee has at present five companies under consideration.

The mining market in Los Angeles certainly never looked more promising and the situation is improving from day to day. The Exchange quotations are being published regularly in the daily papers. Since the exchange has opened its regular call-board 45 new members have been taken in, which is certainly a good indication. The situation is good and growing better.

**Salt Lake City.** July 17.

(From Our Special Correspondent.)

Another vacation week ends on rather a firm mining share market, with an upward tendency, almost entirely due to local trading. No considerable increase of outside orders is anticipated till August, though the revival of Mercur, particularly Captain De Lamar's large construction operations just launched, cannot fail to prove a tonic to the golds. New companies are being organized, consolidations made, while more exploitation is under way than for many months.

In the open market there was no trading in Ajax, though it is reported the Ryan-Nebeker interest—80,000 to 100,000 shares—changed owners, slightly under ruling quotations, causing a small sensation and much guessing. At approaching annual meeting there will be a reorganization. Bullion-Beck is quiet and firm. But little Centennial-Eureka is offered and prices are unchanged. Chloride Point scored some sales at 25¢; the mine is sending forward about a carload a week of 100 oz. silver ore. Dalton is inactive and quotations remain low. A few lots of Dalton & Lark sold at 10¢. Daly improved on the quotations of last week and sold up to \$4. On Thursday came the announcement of a reduction in wages on August 1st, and the inquiry for the stock was immediately diminished. It is still firmly held. All mine operations at Daly-West are suspended indefinitely, owing to the unfavorable metal prices and the change in smelter rates, which the management asserts amounts to an additional cost of nearly \$5 per ton. The closing down has had but little effect on the stock, as it is closely held.

Galena remains strong, with an upward inclination; it sold to-day at 95¢. Geyser-Marion continues a favorite, while heavy drafts on the stock in sight had no weakening effect. Grand Central is in demand at prices near par value, but is held above. Little Pittsburg is credited with a new strike of silver ore, which, however, does not affect the stock, though there are but few offerings. Mammoth remains unchanged at last week's figures. Mercur is strong and sold at the close just under \$8. Northern Light was in moderate demand at ruling prices.

Ontario was in active demand until Thursday, when the announcement of the proposed cut in miners' wages of 25% had a bad effect on the stock. It is not yet certain what action the miners will take on the matter, they being allowed until July 25th to reach a decision.

Sacramento took a slight spurt toward the close, due to an increased demand with only a limited number of shares in sight. Since the annual meeting of Sunbeam there is considerable inquiry for the shares at higher figures. Swansea, another favorite is quoted much higher, with a pronounced upward tendency. South Swansea is strong and made a small advance in the week. The stock will pay the usual dividend of 5¢.—\$7,500—July 21st.

Utah shows considerable improvement since the annual meeting, and is expected to develop more strength in the near future.

**San Francisco.** July 17.

(From Our Special Correspondent.)

The market opened with some show of activity and prices rather higher, and brokers reported quite an accumulation of buying orders. None of them were very large, however, though they served to put up prices on several stocks. There were reports current of a great improvement in the Sierra Nevada new openings, which rather helped matters. When the first orders were filled, business fell off again and the market was dull enough, with some decline in prices, but not at all marked.

Later the market stiffened and prices improved, being rather strong at the close. Some quotations noted are: Consolidated California & Virginia, \$1.30@1.35; Chollar, 80@84¢; Sierra Nevada, 77@83¢; Ophir, 63@64¢.

A surprise comes on us to-day from the North, in the arrival of a steamer from St. Michael, with a lot of miners from the North, and an amount of gold which report puts anywhere from \$2,000,000 to \$5,000,000. It seems that extremely rich placers have been found on the Yukon; but you have doubtless all the particulars by wire long before this can reach you.

The following mining companies report having had cash on hand July 1st: Alpha Consolidated, \$338; Andes, \$3,368; Alta, \$91; Caledonia, \$1,517; Consolidated California & Virginia, \$786; Chollar, \$2,197; Consolidated New York, \$237; Consolidated Imperial, \$2,814; Challenge Consolidated, \$3,485; Confidence, \$3,938; Crown Point, \$3,267; Exchequer, \$1,308; Gould & Curry, \$12,481; Julia Consolidated, \$670; Justice, \$860; Mexican, \$3,481; Occidental Consolidated, \$81; Ophir, \$799; Overman, \$7,403; Potosi, \$5,277; Savage, \$4,008; Sierra Nevada, \$6,106; Standard Consolidated, \$21,559; Segregated Belcher, \$1,016; Syndicate, \$866; Union Consolidated, \$13,590; Utah Consolidated, \$247.

The Belcher Mining Company reports having an overdraft at bank of \$1,566 with a portion of the June expenses paid. The Best & Belcher Mining Company owes \$5,077, less \$717 cash on hand. The Hale & Norcross Mining Company reports an overdraft of \$2,166 at bank. The Lady Washington Mining Company owes \$1,820, and the Silver King \$74.

The annual meeting of the Associated Stock Brokers of the San Francisco Stock and Exchange Board was held Monday morning. The old directors were re-elected as follows: Geo. T. Marye, Jr., James M. Shotwell, H. L. Van Wyck, A. W. Foster and A. F. Coffin.

The Pennsylvania Mining Company, of Yuba County, has levied an assessment of \$5 per share, delinquent August 11th.

The Champion Mining Company, of Nevada County, has declared a monthly dividend of 25¢ per share, payable July 20. This is the 39th dividend of the Champion.

**London.** July 13.

(From Our Special Correspondent.)

The mining stock market at the present time wears a typical holiday aspect. There is practically no buying on the part of the public, and the professional element is very quiet and indisposed to do anything. The city generally is quieter than usual at this time of the year, and no one seems to be troubling about new business. I have made many inquiries among brokers and promoters to ascertain their opinion as to future business. The general opinion is that very few new mining ventures are being prepared for the public or being arranged privately, and that the present is not a good time for bringing forward new schemes. During the past month or two hardly any new mining companies have been advertised, and the advertising contractors who arrange for the circulation of prospectuses say that the issue of new mining companies is being postponed all round until the end of summer.

As for the South African market very little can be said of its course during the past week or two. Business has been almost entirely at a standstill, and the bulls and bears were both half-hearted and have not troubled the market much. The most interesting event has been the issue of debentures by the Bechuanaland Railway Company, with the object of providing capital to complete railway communication to Bulawayo. This company is an offshoot of the Chartered Company; and this method of raising the necessary capital has been adopted instead of the creation of new capital by the Chartered Company in order that the market generally should not suffer by such an issue. In fact, Chartered and other shares have strengthened through this method of shifting the responsibility of capital.

The output of the Rand for June was 251,529 oz. as compared with 248,395 oz. in May, which was the highest previous record. Five out of the six months of this year has seen an output which was the record for the time being. All the mines show a general improvement, but the largest increases have been at Modderfontein, Kleinfontein, Geldenbuis Deep, and Rodepoort United. Geldenbuis Deep shows a very good profit for the month, £15,000, a much larger profit than ever before. This has had a good effect on all deep level companies.

A remarkable statement was made by one of the London papers the other day to the effect that Dr. Leyds was arranging with German capitalists to buy a controlling interest in the Mozambique Company. This was a very nice tale for a daily paper which emulates the practice which is in favor at many American newspaper offices. But nobody in the city believed it, and the excitement was confined to the general readers. The Mozambique

Company controls the seaboard adjacent to the Transvaal and British South Africa, and by treaty the reversion of the territory belongs to Great Britain. Besides an inspection of the share-list makes it obvious that no German syndicate could purchase a large enough interest to control the company. The publication of this report had not the slightest effect on the stock market.

In other sections of the market stagnation has been the rule, and nothing of interest can be recorded.

**Rossland, B. C.** July 14.

(From Our Special Correspondent.)

The most noticeable feature of the mining business in this camp of late is the rapid and marked increase in the production of ore from the producing mines. The Le Roi has distinguished itself by an output in one week of 1,905 tons, its previous highest output in one week having reached 1,375 tons. This prolific mine up to July 10th is credited with having produced from January 1st of the present year 24,335 tons of ore, all of which has been shipped to smelters. The War Eagle has shipped about one-fourth of this quantity, or 6,145 tons.

The Center Star and the Cliff mines continue to ship small quantities of ore, the quantity so far shipped having respectively reached 257 and 397 tons. The total shipments reached 37,178 tons from January 1st to July 10th. What is especially noticeable, however, is the dullness in what may be called the local stock market. This is very flat with no promise of a renewal until better financial arrangements are made here by the local mining promoters, some of whom are making a more determined and honest effort to reach the investor than that which prevailed in the past. With a marked decline in those questionable methods which were very fashionable a year ago, and with a certain purgative effect which the amended mining law has had on wild-cating, the camp to-day is producing better results than when it was exceedingly busy with the sale of bubbles. The way for legitimate mining enterprise is now clearer than it ever was, and the actual production greater than it was at any previous period.

**MEETINGS.**

Bankers' Gold Mining and Milling Company, annual, at room 204 Ernest & Cranmer Building, Denver, Colo., on August 4th.

Bull Domingo Mining and Leasing Company, monthly, at the Boston Building, in Denver, Colo., on July 29th, at 3 p. m.

Cactus Mining Company, at the office of Marshall & Royle, in Salt Lake City, Utah, on July 31st, at 2 p. m.

Galena Mining Company, special, at room 411 McCormick Block, in Salt Lake City, Utah, on July 28th, at 2 p. m.

**LATE NEWS.**

(From Our Special Correspondent.)

SALT LAKE CITY, UTAH, July 22.—Capt. J. R. De Lamar returned to Salt Lake from his flying trip to De Lamar, Nev., on Tuesday, and departed for New York to-night. While here he signed the final contracts for the furnaces, machinery, etc., for the Golden Gate cyaniding mill. He is to sail for Paris next week. In less than a month, while in the United States, he became obligated for a total mining expenditure which will amount before the end of the year to over \$400,000.

**CRIPPLE CREEK, COLORADO.**

(From Our Special Correspondent.)

The output of the Cripple Creek District during the month of June amounted to 23,225 tons of ore of the total value of \$1,045,000. The dividends paid by the public stock companies during the month were as follows: Anchoria-Leland, \$6,000; Moon-Anchor, \$6,000; Portland, \$30,000; Elkton Consolidated, \$20,000; Isabella, \$11,250; total dividends paid, \$73,250 for the month. This does not include the profits of private companies, firms and individuals working mines.

(From Our Special Correspondent.)

SALT LAKE CITY, UTAH, July 23.—On Wednesday evening there was a mass meeting at Park City of the miners at work in the Ontario and the Daly mines to act on the management's proposition to reduce wages on August 1st. There was a large attendance, nearly all not on the night shift being present. For several days the question had been discussed among the men and it was agreed that a majority vote of the miners and mill men affected by the change would be decisive. The ballot resulted 205 for accepting and 159 in opposition, the married men generally voting "aye." On Thursday it was given out that the executive committee of the Union proposed to have the matter reopened and to have the Western Federation of Miners confer with the management. Should this be done, it would mean the closing down of the properties indefinitely, throwing 600 men out of work. It is believed, however, that the decision of Wednesday's meeting will hold, and that the miners interested will not permit influence from beyond the camp to control their action in the matter.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Anaconda, and others with columns for location, par value, and prices for various dates from July 17 to July 23.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Aetna Con., Allouez, and others with columns for location, par value, and prices for various dates from July 16 to July 22.

\* Official quotations Boston Stock Exchange. \* Bid and ask quotations. Total sales, 52,596. † Ex-dividend.

BALTIMORE, MD.

Week ending July 22.

Table of stock quotations for Baltimore, Md., listing companies like Atlantic Coal, Big Vein Coal, and others with columns for location, par value, bid, and ask prices.

\* Official quotations Baltimore Stock Exchange.

CLEVELAND, O.

Table of stock quotations for Cleveland, O., listing companies like Aurora, Chandler, and others with columns for par value, bid, and ask prices.

\* From our special correspondent.

ASPEN, COLO.

July 16.

Table of stock quotations for Aspen, Colo., listing companies like Agnes C, Aita Argent, and others with columns for location, capitalization, par value, and quotations.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing companies like Alamo, Anaconda, and others with columns for par value, bid, and ask prices for various dates from July 12 to July 17.

\* Official quotations Colo. Springs Mg. Stock Assoc. Total shares sold, 230,401.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stocks, listing companies like American Coal, Col. C. & I. Dev, and others with columns for location, par value, and prices for various dates from July 13 to July 21.

\* Official quotations. New York Stock Exchange, mining, 7,330 shares; other stocks, 121,788 shares; Consolidated Stock and Petroleum Exchange, mining, 37,230 shares; Mining Exchange, 28,770 shares. Total shares sold, 248,053. \* Bid and ask quotations. † Ex-div.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing companies like Cambria Iron, Choc. & Gt. Cifs, and others with columns for location, par value, bid, and ask prices for various dates from July 13 to July 21.

\* Official quotations Philadelphia Stock Exchange. \* Bid and asked quotations. † Ex-div. Total sales, 8,857.

PITTSBURG, PA.

Week ending July 13.

Table of stock quotations for Pittsburg, Pa., listing companies like Allegheny, Cartborundum, and others with columns for location, par value, bid, and ask prices.

\* Official quotations Pittsburg Stock Exchange.

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing various companies and their stock prices from July 12 to July 17, 1897.

Official quotations Colorado Mining Stock Exchange. \*Bid and ask quotations. Total shares sold, 786,000.

BUTTE, MONT.

Table of stock quotations for Butte, Montana, listing various companies and their stock prices for July 16, 1897.

HELENA, MONT.

Table of stock quotations for Helena, Montana, listing various companies and their stock prices for the week ending July 15, 1897.

\*Special Report of Samuel K. Davis. Total shares sold, 7,000.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, California, listing various companies and their stock prices from July 16 to July 22, 1897.

\*Official telegraphic quotations, San Francisco Stock Exchange.

LOS ANGELES, CAL.

Table of stock quotations for Los Angeles, California, listing various companies and their stock prices from July 12 to July 17, 1897.

\* Official quotations, Los Angeles Mining and Stock Exchange. \* Bid and ask quotations. Total sales, 177,300 shares.

SALT LAKE CITY, UTAH.

Week ending July 17.

Table of stock quotations for Salt Lake City, Utah, listing various companies and their stock prices for the week ending July 17, 1897.

\*From Our Special Correspondent. † Utah companies. ‡ Mines in Tuscumora, Nev. § Mines in Vanderbilt, Cal.

ROSSLAND, BRITISH COLUMBIA.

July 7.

Table of stock quotations for Rossland, British Columbia, listing various companies and their stock prices for July 7, 1897.

\* From Our Special Correspondent.

MEXICO.

Week ending July 14.

Table of stock quotations for Mexico, listing various companies and their stock prices for the week ending July 14, 1897.

NOTE.—In most of the older Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Many newer companies have a nominal par value, usually \$5 or \$100. Prices are in Mexican dollars.

STOCK QUOTATIONS.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Divs. last year, Prices (Op'nng., Closing). Includes companies like Aciéries de Creusot, Anaconda, and various iron and steel producers.

Table with columns: NAME OF COMPANY, Country, Authorized capital, Par value, Last dividend, Date, Quotations (Buyers, Sellers). Includes companies like Alaska-Mexican, Anaconda, and various mining and industrial firms.

\*From our special correspondent.

VALPARAISO, CHILE. June 19

Table with columns: NAME OF COMPANY, Location, Capital paid up, Sh. Val., Last dividend, Bid., Asked, Last sale. Lists companies like Arturo Prat, Caracoles, and Huanajaya.

\* Special Report of Jackson Bros. Values are in Chilean pesos or dollars.

SHANGHAI, CHINA. June 18.

Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Date, Amount, Price. Lists companies like Jeletu Ng. & Trad., Funjong Mg., Ltd., and Raub A'han G. Mg.

\* Special Report of J. P. Bissett & Co. The prices quoted are in Shanghai taels.

DIVIDENDS.

Table with columns: NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1897, Total to date, NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1897, Total to date. Lists companies like Aetna Con. Q, Alaska-Mexican, and various mining firms.

NOTE.—This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the Engineering and Mining Journal will confer a favor on the publishers if they will notify the Journal of any errors or omissions in the above table. \* July dividend paid.

ASSESSMENTS.

Table with columns: NAME OF COMPANY, Location, No., Dlnq, Sals., Am. Lists companies like Alpha Con., Alta, Benton Con., and various mining firms.

\* New assessment.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and Amount of Last. Includes 121 entries for dividend-paying mines and 121 entries for non-dividend-paying mines.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. \* Non-assessable. † 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 \$42,390,000. † Dividends paid since consolidation.

§ Bodie, Bulwer and Mono transferred to Standard Cons., January, 1897. ¶ Dividends have not been paid in several years.

Note.—This table is corrected up to July 1. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

RARE ELEMENTS, CHEMICALS AND MINERALS—CURRENT PRICES.

NOTE.—This table is revised up to July 13th. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.

Table with columns: Chemicals and Minerals, Cust. Meas., Price. Includes sections for Abrasives, Acids, Alcohol, Alum, Aluminum, Ammonia, Ammonium, Antimony, Argols, Arsenic, Asbestos, Asphaltum, Barium, Barytes, Bauxite, Bismuth, Bone Ash, Borax, Bromine, Cadmium, Calcium, Cement, China Clay, Ceresine, Chalk, Chlorine, Chrome Ore, Cobalt, Copper, Explosives, Feldspar, Flint, Fluorspar, Fuller's Earth, Gilsontite, Gold, Gypsum, Iodine, Iron, Kaolin, Lead, Lime, Magnesia, Magnesium, Marble Dust, Mercury, Mica, Mineral Wool, Nickel, Oils, Mineral, Oxide, Potash, Potassium, Pyrites, Quartz, Sal Ammoniac, Saltpeter, Silica, Sodium, Sulphur, Sulphuric Acid, Talc, Tellurium, Tin, Zinc.

Table with columns: Cust. Meas., Price. Includes sections for Cement, China Clay, Ceresine, Chalk, Chlorine, Chrome Ore, Cobalt, Copper, Explosives, Feldspar, Flint, Fluorspar, Fuller's Earth, Gilsontite, Gold, Gypsum, Iodine, Iron, Kaolin, Lead, Lime, Magnesia, Magnesium, Marble Dust, Mercury, Mica, Mineral Wool, Nickel, Oils, Mineral, Oxide, Potash, Potassium, Pyrites, Quartz, Sal Ammoniac, Saltpeter, Silica, Sodium, Sulphur, Sulphuric Acid, Talc, Tellurium, Tin, Zinc.

Table with columns: Cust. Meas., Price. Includes sections for Oils, Mineral, Paints, Sal Ammoniac, Saltpeter, Silica, Sodium, Sulphur, Sulphuric Acid, Talc, Tellurium, Tin, Zinc.

Table with columns: Cust. Meas., Price. Includes sections for Salt, Strontium, Tellurium, Tin, Zinc.

THE RARE ELEMENTS.

Table with columns: Price, Cust. Meas., Price. Lists prices for various rare elements like Argon, Barium, Beryllium, Boron, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Germanium, Glucium, Helium, Indium, Iridium, Lanthanum, Lithium, Molybdenum, Niobium, Osmium, Rhodium, Rubidium, Ruthenium, Selenium, Silicon, Strontium, Tantalum, Thorium, Thulium, Vanadium, Wolfram, Zirconium.

ALPHABETICAL INDEX TO ADVERTISERS.

(-) Indicates every other week or monthly advertisements.

Table with columns A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z. Each column lists advertiser names and their corresponding page numbers.

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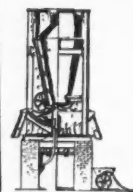
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 General Electric Co.  
 Hunt, C. W., & Co.  
 Porter, H. E., & Co.

**Lubricators.**  
 Detroit Lubricator Co.  
 Lunkenhelmer Co.

**Machinery.**  
**Dealers in Mining, Milling and Other Machinery.**  
 Allen, Edw. P. & Co.  
 American Diamond Rock Drill Co.  
 Bacon, S. C.  
 Bealy, Chas. H. & Co.  
 Billin, Chas. E. & Co.  
 Blake, T. A.  
 Bradley Pulverizer Co.  
 Bullcock, M. U., Mfg. Co.  
 Caldwell, H. W., & Co.  
 Colorado Iron Works.  
 Cuninghame & Co.  
 Denver Eng. Wks. Co.  
 Fairbanks, Morse & Co.  
 Fraser & Chalmers.  
 Gates Iron Works.  
 Gillette-Herzog Mfg. Co.  
 Hamilton, Mfg. Co.  
 Hendrie & Bolthoff Mfg. Co.  
 Ingersoll-Sergeant Drill Co.  
 Jeffrey Mfg. Co.  
 Jessop, W. & Sons, Ltd.  
 King & Andrews Co.  
 Lambert Hoisting Engine Co.  
 Lagerwood Mfg. Co.  
 Krupp, F.  
 McNulty, R.  
 Neekenburg Ir. Wks.  
 Mine & Smelter Supply Co.  
 Montgomery, J. H. Mach. Co.  
 Nelsonville Foundry & Machine Co.  
 New York Diamond Drill Co.  
 Norwalk Iron Wks. Co.  
 Philadelphia Eng. Wks., Ltd.  
 Pollock, Wm. B. & Co.  
 Rand Drill Co.  
 Raymond Bros. Impact Pulv. Co.  
 Roberts Mfg. Co.  
 Rudson Iron Works.  
 Semi-Steel Co.  
 Steman Pty. & M. Co.  
 Snow Steam Pump Co.  
 Stearns-Roger Mfg. Co.  
 Sullivan Mach'y Co.  
 Tod, Wm. & Co.  
 Union Iron Works Co.  
 Vulcan Iron Works.  
 Volmer & Beaton.  
 Webster, Camp & Lane Mach. Co.  
 Westinghouse Elec. Mfg. Co.  
 Williams Mfg. Co.

**Manufacture of Steel.**  
 Taylor Iron & Steel Co.

**Metal Dealers**  
 American Dev. & Mfg. Co.  
 American Metal Co.  
 Am. Zinc-Lead Co.  
 Baker & Co.  
 Bath, Henry & Son.  
 Bealy, Chas. H. & Co.  
 Bridgeport Copper Co.  
 Elliott's Metal Co., Ltd.  
 Garsia Co.  
 James & Shakespeare  
 Johnson, Matthew & Co.  
 Lambert's Wharf Co.  
 Lawson Bros.

**Metallurgical Works and Ore Processors' Processes.**  
 American Dev. & Mfg. Co.  
 Am. Zinc Lead Co.  
 Baker & Co.  
 Baker & Co. & Ref. Co.  
 Baltimore Copper Wks.  
 Bridgeport Copper Co.  
 Canadian Copper Co.  
 Con. Kas. City S. & R. Co.  
 Denver Eng. Wks. Co.  
 Elliott's Metal Co., Ltd.  
 Gates Iron Works.  
 Fairbanks, Morse & Co.  
 Hendrie & Bolthoff Mfg. Co.  
 Hunt, C. W.  
 Nelsonville Foundry & Machine Co.  
 (See Machinery.)

**Mine Cars**  
 Denver Eng. Wks. Co.  
 Fairbanks, Morse & Co.  
 Hendrie & Bolthoff Mfg. Co.  
 Hunt, C. W.  
 Nelsonville Foundry & Machine Co.  
 (See Machinery.)

**Mine, Mill and Smelters' Supplies.**  
 Cuninghame & Co.  
 Denver Eng. Wks. Co.  
 Gates Iron Works.  
 Koessler & Haaslach Chemical Co.  
 (See Machinery.)

**Mining and Lode Companies.**  
 American Dev. & Mfg. Co.  
 Atlantic Mfg. Co.  
 Arizona Copper Co.  
 Copper Queen Con. Mfg. Co.  
 Nickel.  
 Canadian Copper Co.  
 Orford Copper Co.

**Ore Cars.**  
 Gillett & Herzog.

**Ore Crushers.**  
 Brown, Horace F.  
 Cummer, R. & Sons Co.  
 Dunbar, R. & Son.

**Ore Tasting Works**  
 Hunt, F. F.  
 Ledoux & Co.  
 Montana Ore Purchasing Co.

**Packing and Pipe Coverings.**  
 Brandt, Randolph.  
 Jenkins Bros.  
 Robertson, J. L. & Son

**Perforated Metals.**  
 Aitchison, R., Perf. Metal Co.  
 Fraser & Chalmers  
 Harrington & King Perforating Co.

**Peroxide of Sodium.**  
 Roessler & Haaslach Chemical Co.

**Phosphor-Bronze.**  
 Phosphor-bronze Smelting Co.

**Pile Drivers.**  
 Bucyrus Steam Shovel and Dredge Co.  
 Ingersoll-Sergeant Drill Co.

**Pines**  
 Billin, Chas. E. & Co.  
 Fairbanks, Morse & Co.  
 Pollock, Wm. B. & Co.  
 Power Specialty Co.  
 Wycroft, A. & Co.

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 Baker & Co.  
 Johnson, Matthew & Co.

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 Atlantic Dynamite Co.  
 Ingersoll-Sergeant Drill Co.

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 British Columbia Mining Record.  
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 C. & Q. Quincy R. R.  
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 Denver & Rio Grande R. R.  
 Denver, Leadville & Gunnison Ry.  
 Florence & Cripple Creek R. R.  
 Illinois Central R. R.  
 Midland R. R. of Kentucky.  
 Rio Grande Southern R. R.  
 Southern R. R.  
 U. P. D. & G. R. R.

**Railroad Supplies and Equipment.**  
 Hunt, C. W., Co.  
 Porter, H. E., & Co.  
 Robinson & Orr.

**Regulators, Dampers, Heat, Etc.**  
 Eddy Valve Co.  
 Jenkins Bros.

**Rock Drills.** (See Air Compressors.)

**Roasting**  
 Berlin Iron Bridge Co.  
 Franks, Dodge & Co.

**Rubber Ties.**  
 New York Belting & Packing Co., Ltd.

**Scales.**  
 Fairbanks, Morse & Co.

**Screens.**  
 Aitchison, R., Perf. Metal Co.  
 Denver Eng. Wks. Co.  
 Fraser & Chalmers  
 Gates Iron Works.  
 Harrington & King Perforating Co.  
 Link Belt Machinery Co.  
 Ludlow-Saylor Wire Co. (See Machinery)  
 Tyler, W. S., Wire Works Co.

**Second Hand Machinery.**  
 McClure Bros.  
 Robinson & Orr.  
 Robertson, J. L. & Son

**Shoes and Dies.**  
 Chester Steel Cast. Co.  
 Carome Steel Works.  
 Crescent Steel Co.

**Shovels (Steam).**  
 Bucyrus Steam Shovel Co.  
 Marion Steam Shovel Co.

**Smelting and Refining Works.**  
 Balbach, S. & Ref. Co.  
 Baltimore Cop'r Wks.  
 Bridgeport Copper Co.  
 Con. Kas. City S. & R. Co.  
 Elliott's Metal Co., Ltd.  
 Gillette-Herzog Mfg. Co.  
 Smelting Co.  
 Sprocket Wheels.  
 Detroit Sprocket Chain Co.  
 See Belts, Castings, Rolls, Drill Steel  
 Bethlehem Iron Co.  
 Chester Steel Cast. Co.  
 Cronmum steel works.  
 Crescent Steel Co.  
 Jessop Wm. & Son Ltd.  
 (See Metal Dealers.)

**Sulphur Apparatus.**  
 White, Edward F.

**Tanks.**  
 Billin, Chas. E. & Co.  
 Denver Eng. Wks. Co.  
 Fairbanks, Morse & Co.  
 Gates Iron Works.  
 Williams Mfg. Co.

**Telegraph Wires and Cables**  
 Okonite Co., Ltd.

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 Bealy, Chas. H. & Co.  
 Pratt & Whitney Co.

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 Williams Bros.

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 New York Belting and Packing Co., Ltd

**Turbine Water-Wheels**  
 American Impulse Wheel Co.  
 Leffel, Jas., & Co.  
 Pelton Water Wheel Co.  
 Stillwell-Bierce & Smith Valle Co

**Wires**  
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 Fairbanks, Morse & Co.  
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 Sullivan Mach'y Co. | Williams Bros.

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 Lambert's Wharfage Co.

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 Aitchison, R., Perf. Metal Co.  
 Harrington & King Perforating Co.  
 Tyler, W. S., Wire Works Co.

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 Fairbanks, Morse & Co.

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 Rope Co.  
 California Wire Wks.  
 Cooper Hewitt & Co.  
 Hunt, C. W., Co.

**Wire Rope Tramway.**  
 Brown Hoist & Conv. Mach. Co.  
 Phelps, Dodge & Co.  
 R. B. J. A. Sons & O  
 Ropeway Syndicat Ltd  
 Trenton Iron Co.  
 Tod, Wm., & Co.  
 Valves Iron Works

POSITIONS VACANT

Free Advertising.

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them, and in attending to the correspondence of applicants, are incurred in the interest and for the exclusive benefit of subscribers to the ENGINEERING AND MINING JOURNAL.

Applicants should inclose the necessary postage to insure the forwarding of their letters.

1532 WANTED—A GOOD SMELTER AND Refiner who knows how to handle tin and lead drosses and other refuse metal, making of Brazine Spelter and Babbitts; competent, practical men only need apply. Address SMELTER, ENGINEERING AND MINING JOURNAL. June 12.

1533 WANTED—COMPETENT MAN FOR position in neighborhood of New York, experienced in running a steam electric plant. Address ELECTRIC, ENGINEERING AND MINING JOURNAL. June 12.

1534 WANTED — AN EXPERIENCED Placer Mining Foreman; one who is capable of taking full charge of a placer mine and is able to put in such improvements as will be required: building dams for holding water in reservoir, digging ditches, and putting in pipe and giant. Must also be familiar with under-currents. Must come with best recommendations as to ability and honesty. State experience and salary expected. Mines are located in Oregon. Address PLACER FOREMAN, ENGINEERING AND MINING JOURNAL.

1535 WANTED—MILL SUPERINTENDENT for Peru; must fully understand the amalgamation of silver ores by the latest processes. House rent and table board furnished free. State experience, salary desired and references. Address PERU, ENGINEERING AND MINING JOURNAL.

1536 WANTED — AN ASSAYER AND Chemist for the City of Mexico; preferably one having had experience in Western smelter practice. Salary \$150 Mexican currency per month. Address, stating age, experience and references, PUENTE, ENGINEERING AND MINING JOURNAL.

1537 WANTED — MINING ENGINEER for State of Durango, Mexico. Must be competent to assume full charge of mining operations, erect plant, conduct development and prospect work, assays, etc. Must speak Spanish and be thoroughly reliable. Address, with full particulars as to experience, ability and salary desired, DURANGO, ENGINEERING AND MINING JOURNAL.

1538 WANTED—A MINING ENGINEER experienced in silver mining and graduate of a technical school, to go to Peru; must have best references as to competency and reliability, and good knowledge of Spanish language. Address, stating salary expected, etc. LIMA, ENGINEERING AND MINING JOURNAL.

1539 WANTED.—A FIRST-CLASS SURVEYOR; also a chemist and assayer for a large mill and cyaniding plant. State qualifications, recommendations and salary expected. Address C., ENGINEERING AND MINING JOURNAL.

1540 WANTED—COMPETENT ASSAYER and Refiner for Jewelry Factory at Seat le, Washington. One who is ready to go without delay for good pay. Address SEATTLE, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

Advertisements for SITUATIONS WANTED will be charged only 10 cents a line.

A MAN, 27 YEARS OLD, WITH TECHNICAL education, previously assistant chemist at a large smelter and now with a consulting engineer, desires a position in the fall with a milling, smelting or refining company. Good references. Address C. D., ENGINEERING AND MINING JOURNAL. No. 18,940, Aug. 14.

ELECTRICIAN, WHO HAS HAD GOOD practice with electric mining and electric haulage machinery, first-class repair man on electric machinery, with practical and theoretical education, wants to change his position. Good steam engineer and mechanic; industrious workman. Best references from present employers. Address J. M. S., ENGINEERING AND MINING JOURNAL. No. 18,951, July 31.

WANTED BY MINING ENGINEER POSITION as superintendent of mine or mill; fully competent to take charge of iron, silver and gold mine, and understands steam and electric mining machinery; has had similar position, and is familiar with handling men; fine recommendations. Address No. 3a, ENGINEERING AND MINING JOURNAL. No. 18,959, Aug. 14.

POSITION WANTED BY A MECHANICAL and Chemical Engineer, graduate of University and thoroughly experienced; perfectly familiar with electrolysis; have experimented extensively on electrolytic treatment of ores. Address J. W., ENGINEERING AND MINING JOURNAL. No. 18,958, July 31.

POSITION WANTED BY MINING ENGINEER and metallurgist; also good chemist; 20 years' experience; good references; will go to any country. Address ENGINEER, ENGINEERING AND MINING JOURNAL. No. 18,952, Aug. 7.

A MINING ENGINEER 26 YEARS OF AGE, now under engagement with well-known mining company, desires change; has been continuously employed for past five years in every capacity; thorough assayer and chemist. Address MINING, ENGINEERING AND MINING JOURNAL. No. 18,950, Aug. 14.

A PRACTICAL MINING MAN DESIRES engagement as manager; 20 years' experience in Central and South America. Able to open out and develop new properties, design, construct and run mills, etc., and manage any class of labor; speaks Spanish; city references. Address O. Y., ENGINEERING AND MINING JOURNAL. No. 18,953, July 31.

SUPERINTENDENT.—POSITION AS MINE Superintendent wanted by an experienced man now under engagement with well-known mining company; first-class mechanic; understands all details of mining from the sinking of shafts to the development of same. Specialties: reduction of costs and increase in production of output. Address PRACTICAL, ENGINEERING AND MINING JOURNAL. No. 18,942, Aug. 7.

SOUTH AMERICA OR MEXICO—AN ASSAYER and chemist who is familiar with heavy electric and steam machinery desires a position. Speaks Spanish; can give good recommendations. Address L. E. W., ENGINEERING AND MINING JOURNAL. No. 18,955, Aug. 7.

A PRACTICAL MILL-MAN DESIRES engagement; fully understands amalgamation and concentration of ores; thorough knowledge of machinery; best of references. Address ANACONDA, ENGINEERING AND MINING JOURNAL. No. 18,956, July 31.

POSITION WANTED BY YOUNG MAN who has had five years' experience in the principal determination of the constituents of ores with some metallurgical and mining observations; references. Address D. C., ENGINEERING AND MINING JOURNAL. No. 18,957, July 31.

WANTED — POSITION BY COMPETENT Assayer with practical experience; excellent references. Address "EDNA," ENGINEERING AND MINING JOURNAL. No. 18,921, July 31.

CONTRACTS OPEN.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., July 27, 1897.—Sealed proposals will be received at this office until 2 o'clock P. M. on the 31st day of August, 1897, and opened immediately thereafter, for furnishing all the labor and materials required for trench excavation, concrete foundations, iron work and brick arches of terrace, and stone and brick work of basement, area and terrace walls for the U. S. Mint Building at Philadelphia, Pa., in accordance with drawings and specification, copies of which may be had at this office or the office of the Superintendent of the Mint at Philadelphia, Pa. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the government to do so. All proposals received after the time stated for opening will be returned to the bidders. C. E. KEMPEL, Acting Supervising Architect. Orig.

WATER-WORKS.—Sealed bids will be received at the office of the Secretary of the Committee on Improvement of the Water-Works of the city of New-Bern, Tenn., until 2 o'clock p. m., on Monday the 23d day of August, 1897, to furnish the necessary material, etc., and to erect and install the following: 1,300 ft. (approx.) of 8-in. cast-iron water pipe; 1,300 ft. (approx.) of 6-in. cast-iron water pipe; 7,200 ft. (approx.) of 4-in. cast-iron water pipe; 2 1/2 tons of nub and spigot special castings; half ton of flanged special castings; two 8-in. gates; two 6-in. gates; eight 4-in. gates; 12 gate cocks; 22 fire hydrants; one 8-in. tubular well; one 65,000-gal steel tank, and 50-ft. steel tower. All in accordance with the plans and specifications on file in my office. Each bid must be accompanied with a certified check for \$250. The Committee reserves the right to reject any and all bids.

ELECTRIC LIGHTING.—Sealed proposals will be received at the office of the town clerk until 1 o'clock p. m., August 12th, 1897, for lighting the town of Lebanon, O., by electricity. Liberal franchise will be granted. Proposals to be for a term of five years or more, with price of purchase of plant on completion and at stated times thereafter. Each bidder to furnish his own plans and specifications and each bid must be accompanied by a certified check for \$1,000. The council reserves the right to reject any and all bids.

PIPE SEWERS.—Sealed proposals will be received at the Engineer's Office, Whiting Lane, West Hartford, Conn., until Wednesday, August 4th, 1897, at 12 o'clock noon, for the construction of a pipe sewer system. The work will consist of about 12,000 lin. ft. of pipe ranging from 10 to 24 in. Bids must be made upon blanks furnished by the engineer, accompanied by a certified check in the sum of \$1,000 made payable to the Town Treasurer. Plans and specifications are on file and can be seen at the office of the engineer.

The right is reserved to reject any and all bids not deemed to be for the interest of the said town.

HYDRAULIC CEMENT.—U. S. Engineer's Office, Mobile, Ala.—Sealed proposals for furnishing hydraulic cement at McGraw's Shoals Landing, Tombigbee River, Ala., will be received here until 12 m., August 5th, 1897, and then publicly opened. Information furnished on application.

DITCH.—Sealed proposals will be received by the Drainage Commissioners of the city of Moline, Ill., until August 12th, 1897, at 1 o'clock p. m. for the construction of a main ditch and six branches in the Hopkins Drainage District in Kankakee County, State of Illinois. The ditch and branches will be about 15 miles long and constructed by dredge, and will require the removal of approximately 320,000 cu. yds. of earth. Said bids will be opened at the office of B. F. Gray, over Exchange Bank, city of Moline, Ill. Plans and profiles and specifications of the proposed work may be obtained by calling at or addressing the office of J. L. Clark, engineer of the said district of Moline, Illinois. Each bid must be accompanied by a check certified for \$500.

LEVEE CONSTRUCTION.—U. S. Engineer Office, Equitable Building, Memphis, Tenn.—Sealed proposals for Levee Construction in Third District, improving Mississippi River, will be received here until 1:30 p. m., August 11th, 1897, and then publicly opened. Information furnished on application.

HOISTING MACHINERY FOR HEAD GATES.—Proposals will be received by the Water Board until 3 o'clock p. m., August 9th, 1897, for hoisting machinery for head gates for water-works, Bangor, Me. Same are to be made in accordance with plans and specifications of the work, which can be seen at the office of the Water Board or may be obtained of A. B. TOWER, Holyoke, Mass. The right is reserved to reject any or all bids.

STONE BRIDGES.—Sealed proposals will be received by the Board of Selectmen of the town of Killingly, at the office of the Clerk of the Board in Danielson, Conn., until 12 o'clock noon, on August 7th, 1897, for constructing three stone arch bridges. Plans and specifications may be examined at the office of O. W. Bowen, Clerk of the Board of Selectmen. The selectmen reserve the right to reject any or all bids.

THE ENGINEERING AND MINING JOURNAL

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I will give a one-third interest in the property, and in  
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**JOURNAL.**

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ling traction wheels, with 1 yd. dipper. Just over-  
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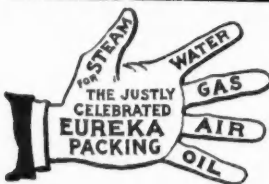
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**MISCELLANEOUS WANTS.**

**SECOND-HAND RAILS.**

If you have any Rails which are in good  
condition to relay—or if only good to be  
used as scrap—write us we buy both  
kinds.

**ROBINSON & ORR,**

**No. 419 Wood Street, Pittsburgh, Pa.**

**DIVIDENDS.**

**SABELLA GOLD MINING COMPANY.**

COLORADO SPRINGS, COLO., June 10, 1897.  
DIVIDEND NO. 11.

A dividend of ONE-HALF CENT PER SHARE  
(\$11,250) has been declared, payable June 25th, 1897, to  
stockholders of record June 15th, 1897.

The stock transfer books will be closed June 15th,  
1897, at 3 o'clock p. m., and will be reopened on the  
morning of June 26th, 1897.

**PERCY HAGERMAN,**  
Vice-President and Treasurer.

**CONTRACTS OPEN.**

*Continued from Page 20.*

**DRAINAGE DITCH.**—Sealed proposals will be  
received by the Commissioners of the Claypool Drain-  
age and Levee District, Grundy County, Ill., until  
2 o'clock p. m. of August 2d, 1897, at the court-house, in  
Morris, Ill., for the construction of a main ditch and  
three lateral ditches, the main ditch being 20,800 ft.  
long, divided for this letting into four sections. Main  
ditch to be 30 to 40 ft. wide on top, 7 to 10 ft. at bottom,  
and 3 to 6 ft. in depth. The three lateral ditches are  
about 15,000 ft. long, 10 to 22 ft. wide on top, 3 to 5 ft.  
wide on bottom, 3 to 5 ft. deep. Plans, profiles and  
dimensions of this work are on file in the county  
clerk's office at Morris, Grundy County, Ill., to which  
all contractors and bidders are referred for more defi-  
nite information. The entire work calls for an excava-  
tion of about 163,000 cu. yds., all work subject to the  
approval of the engineer, E. G. Cryder.

**WATER-WORKS AND ELECTRIC LIGHT**

Plant.—Sealed proposals will be received by the Sec-  
retary of the Board of Improvements of the city of Sil-  
loam Springs, Ark., until 12 o'clock noon on Tuesday, the  
tenth day of August, 1897, for furnishing the necessary  
material, machinery, etc., to erect and install the fol-  
lowing: 1 stone tower, 30 x 50 ft.; with steel tank, 25 x  
30 ft.; 7,000 ft. (approx.) of 12-in. sewer pipe; 18,000 ft.  
(approx.) of 4-in. iron pipe; 5,600 ft. (approx.) of 6-in. iron  
pipe; 3,400 ft. (approx.) of 8-in. iron pipe; 1,000 ft. (ap-  
prox.) of 2½-in. hose; 34 fire plugs. Electric Lights—  
Power house, stone or brick; 1½ H. P. engine; 2 boilers,  
16 ft. x 54 in.; 1 arc and 1 alternating incandescent dy-  
namo; 4 miles (approx.) street wiring; 25 1,200 c. p. arc  
lamps. All in accordance with the plans and specifica-  
tions on file in this office. Each bid must be accom-  
panied by a certified check in the sum of \$250. The  
Board reserves the right to reject any and all bids.

**HOISTING MACHINERY FOR HEAD GATES.**

—Proposals will be received by the Water Board until  
3 o'clock p. m., August 9th, 1897, for hoisting machinery  
for head gates for water-works, Bangor, Maine.  
Same are to be made in accordance with plans and  
specifications of the work, which can be seen at the  
office of the Water Board or may be obtained of A. B.  
TOWER, Holyoke, Mass. The right is reserved to re-  
ject any or all bids.

**MAIN SEWER.**—Bids will be received by the

Secretary of the Board of Control of the City of Cleve-  
land, O., up till noon, August 6th, 1897, for constructing  
the second portion of the Walworth street main sewer.  
The work consists of about 4,400 lin. ft. of sewer, ranging  
from 11 ft. 6 in. to 14 ft. 9 in. in interior diameter. Bids  
must be made upon blanks furnished by the Chief En-  
gineer and accompanied by a certified check in the  
sum of fifteen thousand (\$15,000) dollars upon a solvent  
bank in the city of Cleveland. Plans and specifications  
are on file and can be seen at the office of the Chief  
Engineer.

**STONE.**—U. S. Engineer Office, Boston, Mass.

—Sealed Proposals for cement, sand and stone, for  
Battery at Long Island Head, Mass., will be received  
here until noon of August 9th, 1897, and then publicly  
opened. Information furnished on application.

**BREAKWATER.**—U. S. Engineer's Office, Du-

luth, Minn.—Sealed proposals for building two break-  
water piers, each some 2,700 ft. long, at Lake Superior  
entrance to Portage Lake Ship Canals, Mich., will be  
received here until noon, September 10th, 1897, and then  
publicly opened. Information furnished on applica-  
tion.

**LEVEE**—U. S. Engineer Office, 99 Madison St.,  
Memphis, Tenn.—Sealed proposals for closing crevasses,  
enlarging and repairing levees in Lower St. Francis,  
White River and Upper Yazoo Levee Districts will be  
received here until 12 o'clock noon, August 16, 1897, and  
then publicly opened. Information on application.

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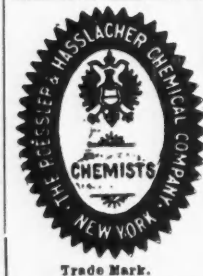
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