

ENGINEERING and MINING JOURNAL.

Vol. XXVII., No. 16.

RICHARD P. ROTHWELL, C.E., M.E., } Editors.
 ROSSITER W. RAYMOND, Ph.D., }
 WILLIAM H. WAHL, Ph.D., Department of Progress in Science and the Arts.

NOTE.—Communications relative to the editorial management should be addressed to RICHARD P. ROTHWELL, P.O. Box 4404, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P.O. Box 1465, New York. Articles written by Mr. RAYMOND will be signed thus *.

SUBSCRIPTION PRICE, including postage, for the United States and Canada, \$4 per annum; \$2.25 for six months; all other countries, including postage, \$5.00 = 20s. = 25 francs = 20 marks. All payments must be made in advance.

REMITTANCES should always be made by Post-Office Orders or Bank Drafts on New York, made payable to THE SCIENTIFIC PUBLISHING COMPANY.

THE SCIENTIFIC PUBLISHING CO., PUBLISHERS,
 27 Park Place, New York.

CONTENTS.

EDITORIALS :	PAGE.		PAGE.
American Institute of Mining Engineers.....	273	New Railroad Mileage.....	279
American Society of Civil Engineers.....	273	Inland Sea Project in Idaho.....	279
The Bessemer Medal to Peter Cooper.....	273	Submarine Work in New York Harbor.....	279
Bessemerizing Sulphurets.....	273	Exposition Building at Cincinnati.....	279
New Publications.....	274	New York International Exhibition.....	279
Personals.....	274	Madeira & Mamore Railroad.....	279
Notes on Zinc Smelting.....	275	Miscellaneous Engineering Notes.....	280
The Gold Mining District of Dahlonega, Ga.....	275	NOTES :	
Honesty in Mining.....	276	New Coal-Shipping Apparatus.....	274
Georgia Mines.....	276	Railway Extension in Idaho.....	280
Wyoming Valley Coal-Mining Notes.....	276	Improvement in Bunsen's Battery.....	280
Individual Mining—Our "Specials".....	277	Fire-Damp Explosion in Belgium.....	280
Home in the Mountains.....	277	Cost of the Saint-Gothard Tunnel.....	280
On the Combustion of Different Kinds of Fuel.....	277	Dephosphorizing Cast-Iron.....	280
Colorado Law Relating to Location and Representation of Placer Mining Claims.....	277	Convention of Iron and Steel Manufacturers.....	280
Flint Creek (Mont.) Mining District.....	278	The Twenty-six Million Suit.....	280
Labor Notes.....	278	Alleged Discovery of Anthracite in New Brunswick.....	280
PROGRESS IN SCIENCE AND THE ARTS :		Chanoit Filter.....	280
Some Novel Astronomical Notions.....	278	Metallic Chromium.....	280
Medals to Americans.....	278	Glasses Melted with Alkali Alone.....	280
Refracting Telescope in Russia.....	278	Petroleum Notes.....	280
Current Scientific Literature.....	278	GENERAL MINING NEWS :	
The Druggists' Advertiser.....	278	ARIZONA.....	281
Electric Light Notes.....	278	California.....	281
Freshly-Painted Rooms.....	278	Colorado.....	281
New Kind of Telegraph Cable.....	278	Dakota.....	282
Weather Service in the United Kingdom.....	279	Nevada.....	282
Colonization of New Guinea.....	279	New Mexico.....	282
The Bennett Polar Expedition.....	279	Utah.....	282
The German Aluminium Industry.....	279	PROPOSALS.....	283
Combination of Iron and Steel.....	279	THE COAL TRADE REVIEW.....	283
Coal in the Black Hills.....	279	IRON MARKET REVIEW.....	284
Rock-Salt from "Petit Anse".....	279	STATISTICS OF COAL PRODUCTION.....	283
Celluloid.....	279	FREIGHTS.....	284
The Borate of Potassium and Sodium.....	279	METALS.....	285
Morrison's Furnace Improvements.....	279	BULLION MARKET.....	285
Tunneling the Detroit River.....	279	FINANCIAL :	
The New French Atlantic Cable.....	279	The Coal Stocks.....	286
Canadian Canal Project.....	279	Miscellaneous Stocks and Quotations.....	286
		Gas Stocks.....	289
		Gold and Silver Stocks.....	286
		Copper Stocks.....	288

AMERICAN INSTITUTE OF MINING ENGINEERS.

The next meeting of the Institute will be held in Pittsburg, beginning Tuesday, May 13th, at three o'clock P.M.

Due notice will be given of the programme of the meeting as arranged by the local committee.

Members and associates are requested to give early notice to the Secretary of their intention to read papers at the meeting.

It is expected that the excursions will be of an attractive character, and that there will be a large attendance of ladies.

THOMAS M. DROWN, Secretary.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

The Eleventh Annual Convention will be held at Cleveland, Ohio, beginning June 17th, 1879.

Details of programme will be issued to members in a short time.

JOHN BOGART, Secretary.

THE BESSEMER MEDAL TO PETER COOPER.

PETER COOPER has received from Dr. C. W. SIEMENS, President of the British Iron and Steel Institute, a letter announcing that the Council of the Institute have unanimously resolved to confer upon him the Bessemer gold medal of 1879, in recognition of his prolonged and eminent services in the promotion of metallurgical science. The medal will be conferred at the annual meeting of the Institute in May. Mr. COOPER will not be present; but Mr. BELL or Mr. SNEELUS, it is understood, will represent him.

This honor, so well deserved and so cordially bestowed, is proof that our British brethren admire enterprise and public spirit, and generously recognize them even in their rivals. For Mr. COOPER's long and active career has been characteristically devoted to the encouragement of inventions and improvements calculated to extend that American industry

which is now inaugurating so sharp a competition with Great Britain in many a market hitherto her undisputed realm. But men of all nations and all parties may well unite in esteem and reverence for the useful public career and the admirable personal virtues of PETER COOPER. *

BESSEMERIZING SULPHURETS.

We have received a copy of the paper read by Mr. JOHN HOLLWAY before the London Society of Arts, on the 12th of February, concerning "A New Application of Rapid Oxidation, by which Sulphides are Utilized for Fuel." The principal experiments of Mr. HOLLWAY were performed in a Bessemer converter (though this is not the form of apparatus which he recommends), and consisted in blowing cold air through molten pyrites, to which silica (sand) was added during the operation, in order to protect the siliceous lining, otherwise liable to be rapidly destroyed by the reaction of the oxide of iron formed. The theory of the process is, that the whole of the oxygen of the blast is utilized in the combustion of the iron and part of the sulphur, creating a temperature in which about half the sulphur is directly volatilized in a free state, about 20 per cent is oxidized to sulphurous acid, and the remainder is carried (when the heat is not overblown, and an excess of sulphide of iron is present) into a regulus, or highly concentrated matte, containing also copper, silver, gold, nickel, and other metals less oxidizable than iron. The oxide of iron formed by the combustion of the pyrites is converted by the addition of silica into a slag which floats upon the regulus.

The theoretical advantage of this process is two-fold, consisting, first, in the economy of fuel and labor effected by a rapid oxidation of the bath, in lieu of a slow oxidation at low temperatures, with extraneous fuel; and, secondly, in the diminished production, under this method, of noxious roasting-gases. It is recommended primarily for use in Spain, where three companies alone are raising annually from 1,500,000 to 2,000,000 tons of pyrites, of which about 600,000 tons are shipped annually to England, and about 1,000,000 tons are burned at the mines, to the great destruction of surrounding vegetation.

The experiments do not yet by any means demonstrate the practicability of the process. They show, what might easily have been foretold, that an elevated temperature can be obtained and maintained by burning iron; but as to the cardinal points of the expulsion of sublimated sulphur unoxidized, and the clean separation of regulus from slag, they are not decisive, because the nature of the apparatus employed did not permit conclusive tests. The escape of sulphur was inferred from the sulphur-flame at the mouth of the converter; while the separation of the regulus is admitted to have been unsatisfactory, because the agitation produced by the blast, which enters the Bessemer converter through the bottom, did not allow the fluid materials to settle quietly. Mr. HOLLWAY says it is probable that the form of furnace eventually adopted will be a modification of the ordinary blast-furnace, fitted with a tuyere hearth.

"Under such circumstances, the blowing would be continuous, the hot charge coming down to a fusion zone, the height of which over the tuyeres would be determined by the amount of air blown in and the frequency with which the blown products are withdrawn, varying likewise with the composition of the charge. The products would be withdrawn by tapping, as with a common blast-furnace, the regulus being run off from a reservoir below the tuyeres, where it would collect, and being thus unacted upon and undisturbed by the blast, rich regulus, or even metallic copper, could be produced."

The great practical difficulties in executing this plan, and the questionable economy of it, if it should turn out to require expensive plant, and to replace, after all, only one or two of the preliminary roastings of the ordinary process, will appear at once to every copper metallurgist. Mr. HOLLWAY is still far from having shown that his scheme is a good one.

On this point we beg to refer our English friends to a few German authorities. The ease with which patents can be obtained in England, almost without any preliminary examination on the part of the public officers, seems to encourage the inventors of that country to keep themselves ignorant of what has been done elsewhere. In the United States, it is otherwise. It behooves an American inventor to know every thing that has been publicly described with relation to his invention. We venture to say, therefore, that no American inventor would claim to have originated what Mr. HOLLWAY claims, and, at any rate, that no American technical society could discuss at length such a claim, without somebody producing the following, and perhaps still other, fatal precedents.

1. In the *Oest. Zeitschrift*, No. 50, 1868, the process of JOSSA and LALETTIN is described. It consists in melting copper ores in a reverberatory to a matte, and "bessemerizing" this by conducting air through it under pressure. The *Berggeist* of the same year, and the *Berg- und hüttenm. Zeitung* of 1871, p. 7, also refer to this process.

2. In the *Oest. Zeitschrift*, No. 35, 1871; and the *Berg- u. h. Zeitung*, 1872, p. 114, will be found RITTINGER'S proposal, to blow air into melted copper sulphide, quartz being thrown upon the bath to form a slag with the resulting oxide of iron.

3. *Dingler's Polytechnic Journal*, vol. cxcix., p. 221, describes the plan of TESSIÉ DU MOTAY, for smelting the ore in an apparatus consisting

of two shaft-furnaces with a communicating channel, and blowing air through the fluid mass, to obtain a rich copper regulus.

So far as we are aware, neither of these processes has ever been practically successful on a commercial scale. But Mr. HOLLWAY'S differs from them only in his intention to supply from oxidation, in a continuous operation, the heat for fusing the ore. In other words, he adds one more difficulty to those which they encountered, and gives himself thereby an additional chance of failure, without removing any of the chances of failure to which other "bessemerizers" of pyrites have been exposed. *

NEW PUBLICATIONS.

SECOND GEOLOGICAL SURVEY OF PENNSYLVANIA. *Report of Progress in Bradford and Tioga Counties.* 1. *Limits of the Catskill and Chemung Formations*, by ANDREW SHERWOOD; 2. *Description of the Barclay, Blossburg, Fall Brook, etc., Coal Fields*, by FRANKLIN PLATT; 3. *The Coking of Bituminous Coal*, by JOHN FULTON. Illustrated with two colored geological county maps, three page-plates, and thirty-five cuts. Harrisburg, 1878.

The first part of this volume contains a general account of the geology of the two counties mentioned, together with descriptions of the different anticlinals and synclinals, forming an explanation and commentary for the colored maps of Mr. SHERWOOD, whose field-notes, which furnish the basis for the text, have been freely edited and expanded by Prof. LESLEY himself. The rocks comprised within this area are the Chemung, with its fossiliferous iron ores, the lower (Old Red) and upper (White) Catskill, the red shale, Pottsville conglomerate, and lower productive coal measures. The valleys are anticlinal, and present the Devonian (Chemung and Catskill) formation; the mountains, which traverse both counties in long, low, flat, parallel ranges, set *en échelon*, so that each projects further to the East than its left-hand neighbor on the North, are piles of later strata, preserved in synclinal troughs, and constitute the monumental remains of a vast erosion. Along their summits are found the fragmentary coal-fields, grouped in the Barclay, Blossburg and Gaines basins, of which Mr. PLATT gives, in the second part of the report, a detailed and interesting account, embracing sections, analyses, and commercial statistics. The geological structure of the region is so simple, and these reports make it so easily understood, that it is difficult to understand how it could have failed to be recognized, even in advance of a systematic survey. But the ignorance of the average adventurer, and the great value of such enlightenment as a geological survey bestows, are strikingly illustrated by the case of the "Arienio" shaft, sunk near Charleston, in Tioga County, in the Chemung strata, at a cost of ten to twenty thousand dollars, in the expectation of finding anthracite coal. The account on page 59 of this volume, narrates that the excitement about this *ignis fatuus* was kept up for months and years. Repeatedly picnics were announced, and orators provided, to celebrate the opening of the coal; but, of course, it always happened at such times that the shaft still lacked a few inches of the necessary depth. We venture to predict that the publication of such reports as the Pennsylvania survey is now issuing, and their accessibility in separate volumes at low price to every citizen, will put an end to such follies. Before risking ten thousand dollars on a hole in the ground, even a fool would be likely to spend one dollar for the opinion of experts, expressed in language which he can understand. At worst, he could not go far in such an enterprise before the nearest country editor, after "cramming" on the appropriate volume, would learnedly and lucidly expose the delusion.

Mr. FULTON'S contribution to this report is in the nature of a supplement to the essay on Methods of Coking, which he furnished two years ago to Volume L. He now discusses, with the aid of later collections of facts, the important question, Which is the best oven for the manufacture of coke as a blast-furnace fuel? It is hardly possible to do justice to his reasoning in a mere summary; but we must briefly outline it, commending the whole of his paper to the careful study of all who are interested in the subject.

Besides freedom from impurities, the best coke for furnace fuel should possess the largest cell structure with the hardest cell-walls, the former quality being important to secure rapid combustion, while the latter is essential for the endurance of transportation and for burden-bearing capacity. For use together with anthracite a denser coke is admissible. These requirements influence the choice of coal for coking. The dry coking coals, containing less than say 20 per cent of volatile matter, and producing a dense structure, are not recommended for blast-furnace coke.

After laying down and explaining these propositions, Mr. FULTON considers the three typical families of coke-ovens, the Baker or Beehive, the Coppée, Belgian or François, and the Appolt. The shape of the chamber in each is shown to have a direct influence on the physical character of the product. To use our author's excellent illustration, the section of the Beehive may be represented by a brick laid flat, that of the Belgian by a brick set on its edge, and that of the Appolt by a brick on end. In the Beehive we have a shallow charge, minimum pressure in coking, and consequently maximum cellularity of coke. The Belgian, with increased depth of charge, involves increased pressure and produces increased density, while the Appolt presents in these respects a maximum. In coking in the primitive pits or mounds, says Mr. FULTON, a very full cellular

structure is developed—fully equal to the Beehive in this respect. But the operation of this system is less regular and more expensive than that of ovens. Hence it is not strongly recommended.

Setting aside the Appolt oven, as planned for peculiar cases, not embraced in this investigation, Mr. FULTON proceeds to compare the Beehive and the Belgian. The advantages of the Beehive are, that it produces coke of the best physical structure, of uniform quality, in the driest condition (being watered out in the oven), and separated into small pieces in rabbling it out. Moreover, the operation is simple, and first cost and repairs are moderate. The Belgian, on the other hand, produces a uniform quality of coke, and is the most economical of all systems in operation and in repairs. But it requires more skill; its coke must be quenched outside, making a damp fuel; its cost is large; and, above all, it yields, from ordinary coking coals, a coke too dense for the best blast-furnace practice. It is therefore especially adapted to the family of coals demanding pressure in coking, to prevent too inflated a physical structure, and to the peculiar cases of coals containing a minimum of volatile matter and requiring washing. Regarding the two systems in the aspect of absolute economy, including interest on capital, repairs, etc., but without reference to the value of the product for special uses, the Belgian shows a superior economy of 12 cents per ton of coke, the figures being as follows, according to Mr. FULTON:

Per ton of coke.	Beehive.	Belgian.
Interest at 10 per cent on cost.....	\$.051½	\$0.16
Repairs.....	0.02½	0.01½
Coal, at \$1 per ton.....	1.60	1.42
Labor.....	0.27	0.23½
Total.....	\$1.95	\$1.83

For the reasons given, Mr. FULTON prefers the Beehive in the manufacture of blast-furnace fuel, and cites in support of this view the authority and the practice of Mr. I. LOWTHIAN BELL. He points out that improvements are still to be expected, but that the characteristics of this type should be preserved, particularly its shallow charge and the quenching of the coal in the oven. *

PERSONALS.

Our Readers are invited to send us Items for this Column.

E. GYBON SPILSBURY, Mining Engineer, of Philadelphia, expects to visit Colorado professionally before the close of the present month.

Dr. T. STERRY HUNT, who has recovered from his recent severe illness, presided on the 17th inst. at a meeting, in this city, of the American Chemical Society, of which he has been elected President.

CHARLES F. SHOENER is changing one of his furnaces near Bethlehem, Pa., on to Bessemer iron, and expects shortly to blow in his other furnace on the same product. The ore used is from Cornwall, Pa.

Our Managing Editor, RICHARD P. ROTHWELL, M.E., leaves this city for Utah in a few days. His address will, for a short time, be Walker House, Salt Lake City; but parties desiring his professional services can obtain information at this office, and be put in communication with him by telegraph at any time.

Prof. GEORGE W. MAYNARD, Mining Engineer, who has been in Europe for several years, has returned to this country, and may go to Colorado with the view of opening up some mining property in which he and some friends are interested. Professor MAYNARD has gained a vast amount of experience in European mining and metallurgy during his long residence there, and returns to this country at a most opportune moment, when mining is again attracting a large share of attention.

The Leadville News Letter and Mining Report is the name of a neatly-printed little periodical, of the size of a full letter-sheet, which is to be issued monthly, or "as often as new features occur." As new features promise to occur in a lively manner at Leadville during the coming season, it is not impossible that the *News Letter* may grow into a daily. The first page is headed with an effective view of the new city, under which the page is left blank for the convenience of letter-writers, who are expected to use this paper in correspondence. The recipient of such a letter will have three pages of paragraphs and advertisements conveying much useful and interesting information, added *gratis* to the communication specially addressed to him. The idea is good, and cleverly executed. Mr. F. B. GODDARD is the publisher. *

NEW COAL-SHIPPING APPARATUS.—We understand that Mr. Graham Smith, C. E., of 6 Westminster Chambers, London, S. W., has just patented a coal-shipping apparatus by means of which 1500 tons of coal may be shipped in a day, simply with the aid of two horses and drivers and a boy to manipulate the machine. It consists of a rising and falling platform, on which is placed a turn-table, so that it is no consequence in what position the truck is run upon it or which end the truck tips. If a hopper wagon, a central chute is so arranged that it may be at once discharged. The wagon which requires tipping is carried on a balanced cage hung on two centers, so that little power is expended in this operation. The whole arrangement is a triumph of mind over matter, and we hope soon to see these machines at work in the States, as they appear to dispense with all sorting of the wagons and the intricate arrangements of points, sidings, and turn-tables which are usually required for this purpose.

NOTES ON ZINC SMELTING.

Written for the Engineering and Mining Journal by F. A. Thum.

If we look through any hand-book of metallurgy, we find, as a rule, zinc treated in a few pages, in striking contrast to iron, copper, lead, silver, etc., which all receive disproportionate attention. We hear and read of smelting methods like the English crucible system, or that of the Carinthian upright tubes, which were never carried on to any extent, and were given up forty or fifty years ago; and, strange as it appears in our days of most persevering inquiry through all branches of natural science, we stand before one of our most useful metals, ranking, by its applicability and cheapness, next to iron, and the extraction and manufacture of which form the basis of national wealth of whole countries, without being more than meagerly informed about many of its properties.

Of the few scientific contributions of value on the nature of zinc, we, in fact, owe a good part to America, though the infancy of her zinc industry might justify her in looking for all such information to Europe. On the whole, we may say that most of our knowledge on the nature of zinc is due to practical men and to their observations and occasional experiments made in smelting and manufacturing works; but without regard to the discredit in which experimenting justly appears to shareholders of industrial enterprises, and without regard to the want of time and of the necessary implements for following scientific schemes under the pressure of business, we also find, among practical men, the notion prevailing that scientific theory in general is of little or no use for a financial success. Superficially looked at, there is, of course, really little to say against the simplicity of the zinc-smelting process still carried out on the same principle by which Henkel, Lawson, or Swab (1721-1738) first succeeded in producing the metal on a large scale. They distilled it by means of refractory clay retorts, as we do at present; but this very fact involves the weak point of our industry as well as the secrets of its relative success. If we consider the low price of the metal and its enormous production, chiefly concentrated in two small districts of Europe, we may well feel astonished at the results achieved, with such a primitive process, and, at the same time, comprehend that only by a long experience, and a minute adaptation of the details of the process to the respective natural resources, it became possible. Success, in fact, depends upon hundreds of apparently trifling conditions, which we have necessarily to submit to, as long as no better process exists.

The zinc industry, as one of the concomitants of our modern civilization, has steadily grown, in the last 50 or 60 years, to about 150,000 tons annual metal production; but it may be regarded as quite in its infancy. At least 75 per cent of this production is still confined to North Germany and Belgium, the countries in which it originally sprang up in its present form, and the easily-gained advantages through a long period of monopoly made them more or less indifferent to improvement. Competition, in fact, up to the present day exists only between Silesia and Belgium, and hence we may explain the perceptible want of progress in their smelting processes during 30 or 40 years. It is easy to understand that in zinc-smelting especially, where, on account of its primitive character, so much depends upon the energy, steadiness, and intelligence of the workmen, it is always cheapest to have first-class men. A man who produces 10 cwts. of zinc more per week than another under similar conditions is worth at least double to his employer. The same is true in the management and in the erection of new works. It is clear that these should be left only to experienced men, thoroughly acquainted with the advantages and faults of both smelting systems, with the influence upon the process of the nature of coal, ore, clay, etc., and last, not least, with the history of the zinc-smelting methods down to their latest improvements. In no branch of metallurgy do we meet with more useless repetitions of experiments than in that of zinc, not only in furnace-construction, but, what is far more frequent and injurious, the shape and composition of the clay-retorts. It is quite a common thing, even now, to meet with retorts far too wide to be properly heated through without danger to them and extra difficulty to the fireman. In order to increase their stability in the heat, they are made too thick, or of a form like the muffles used in Silesia, up to 10 or 15 years ago, where the part most exposed to the heat has only two thirds or one half the capacity of the front part. It is a fact that the shape, and especially the width, of the retorts, and their thickness in clay, represent the result of a long and costly experience made in Belgium and Silesia, and alterations in that direction should always be avoided as much as possible in introducing the process into other countries. The now pretty generally adopted dimensions of retorts are based upon the qualities of a first-class fire-clay, and calculated for the possible exhaustion of the charge within 24 hours for the Silesian and 12 hours for the Belgian work. The width for both retorts is 6½ inches inside; but even if the quality of the clay would allow an increase of this width, their charge can not be exhausted in proper time with the common mode of firing; and to use wide Belgian retorts for 24 hours' work, as we frequently see done in England, is surely also a mistake. In the first place, the gain in capacity of the tubular Belgian retorts, by increasing their diameter, is comparatively small, while the difficulty of the exhaustion of their charges quickly rises with such increase, the more so if they are also made thicker in clay than the proper-sized ones; and this is mostly found necessary in order to prevent them from bending and from being quickly pierced through by corrosive slag. The action in both cases is much more destructive for the Belgian retort (wholly suspended over the fire) when charged only once instead of twice in 24 hours. Equally objectionable experiments are made with the clay composition of the retorts. It is an old but ever-returning trick to mix, from reasons of mistaken economy or for other objects, good and bad clay together. If the latter does not stand the necessary heat by itself, it is always a mistake to mix it with another, proved as good. For zinc retorts one ought to use only first-class quality, and all experience has proved in the end that, in spite of costliness of the clay, such is the most economical. The better the clay is, the thinner the retorts may be made, and the more perfect will be the exhaustion of their charges.

Even without dropping the distillation system, the possibility for at least reducing the present waste of 20 or 25 per cent of zinc during the process appears not beyond reach. The very imperfect modes of con-

densation, and the general neglect of the detrimental action of sulphur in the charge, will undoubtedly yield points of amelioration. Curiously enough, we find that, in iron smelting, coal is frequently first washed; but in the reduction of zinc ores, though it might be done in most cases with equal financial advantage, such a thing is nowhere heard of yet.

For some time to come, Belgium and Silesia will probably serve as examples for the newer zinc industry of other countries. They possess a great advantage in their experienced population, part of which for half a century has been brought up in the zinc works; yet even there, good workmen are comparatively better paid than in England and other countries. Great improvements have been made in late years, and whoever saw the smoky zinc works in Silesia about 10 or 12 years ago will be surprised to see them now entirely rebuilt and most favorably changed through the whole country. The former small furnaces, without chimneys, are generally replaced by gas furnaces, with as much as 6 tons of daily charge against 14 to 16 cwt. in the old ones. The enlargement of the furnaces forms one of the predominating features through all later phases of perfection of the process, as the easiest mode of arriving at a reduction of the necessary labor and fuel.

If M represents the cost per ton of ore, W the cost of its treatment per ton, A its analytical percentage, L the loss of zinc during the treatment (both expressed in fractions of which 100 is the denominator), and Z the market price of zinc per ton; c = carriage per ton of zinc to the market, and p = the profit per ton of zinc; then the cost of zinc will have to be

$$Z - (c + p) = \frac{(M + W) 100}{A - L}$$

If the value of ore is constant, as is generally the case in places newly opened to zinc industry, then it may at times be advantageous to balance the two elements of cost, W and $A - L$. That is to say, one may work heavier charges or employ larger furnaces, with a view to a greater produce and a reduction of the working expenses, in spite of a comparatively greater loss of zinc, or *vice versa*. In places like the old producing countries, where ore is in constant demand and valued according to the price of zinc, the scope for an advantageous progress in that direction is very limited. As a rule, the loss in treatment should be kept as low as possible, namely, close to or not above one fifth of the analytical percentage, and, if then in regularly established works, the cost of treatment per ton of ore is constant,

$$M = \frac{0.8 A [Z - (c + p)] - W}{100}$$

will represent the value per ton of ore at the works.

On the other hand, the net yield in per cent is—

$$A - L = \frac{(M + W) 100}{Z - (c + p)}$$

as soon as it covers the cost of treatment per ton of ore, namely, at

$$\frac{100 W}{[Z - (c + p)] 0.8} \text{ per cent,}$$

every further unit of zinc in the ore will be worth

$$\frac{[Z - (c + p)] 0.8}{100} \text{ in money.}$$

Any saving in the cost of treatment per ton of ore may of course be added directly to the value of the latter, as, inversely, cheaper ores will allow an equal increase of the working expenses in order to arrive at the same cost per ton of zinc.

If we look at the loss in smelting as generally ¼ of the contents of the ore free from sulphur, and if the price of ore is regulated by the price of zinc, there remain only the working expenses as the element subject to variation. The ore markets of Belgium and England count conventionally at 75 francs, or £3 per ton; in reality, however, they are less. If x = saving in the working expenses,

$$W = \frac{100 x}{[Z - (c + p)] 0.8} \text{ per cent in the ore.}$$

In Silesia the cost W rarely exceeds £1, or 25 francs (on raw ore), which enables the works to smelt with only 12 per cent yield in zinc, and this simply proves that their cost for ore and treatment together, at the metal price of say £20 per ton, must be below

$$M + W = \frac{20 \times 12}{100} = £2.88, \text{ per ton of ore.}$$

This working cost includes all expenses connected with works except ore. It is chiefly made up of labor, coal, clay, iron, and other items, as well as the fixed expenses, such as rent, taxes, sinking fund, and salaries. There exist some limits, beyond which smelting will always be impracticable, and they are the narrower the greater is the competition at the ore market; on an average " W " should not exceed 15 per cent of the value of zinc at the works.

(TO BE CONTINUED.)

THE GOLD MINING DISTRICT OF DAHLONEGA, GA.

We have received the following letter from the President of the Etowah and Battle Branch Hydraulic Hose Mining Co., of Georgia, dated Philadelphia, Pa., April 15th, 1879:

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your valuable paper of the 12th of this month (page 258), in an article by Mr. J. B. Mackintosh, entitled "The Gold Mining District of Dahlonega, Ga.," and in an explanatory map thereto, Mr. Mackintosh commits an error, which, as it has been and will be used to the disadvantage of the public, allow me to correct.

One of the principal ditches in this district, draining the waters of Mill, Lilly's, and Fletcher's Creeks, is claimed in the article and on the map as the property of the Dahlonega Gold Mining Company, whereas it never has been their property, but has been and is the property of the company I represent. It has been built by my company, under a special act of the Legislature of the State of Georgia, dated December 13th, 1859, conferring on us the right of eminent domain and the charter for our company.

By right of courtesy the Dahlonega Company has been our tenant for this ditch; but they were notified by our company on April 7th

that on May 7th our company will require all the water the ditch furnishes.

The acquisition of an outstanding paper title to a part of this ditch, which represents a notorious blackmailing scheme, and which had been offered to us by the contriver for a mere song, because, as he stated, Northern capitalists would sooner buy up such a claim than go into litigation in the South, has enabled the Dahlonega Company to claim this ditch in their pamphlet of February 20th.

My company is prepared to defend its title and rights without making the public pay the fiddlers.

Respectfully, ARNOLD DAVIDSON, President.

HONESTY IN MINING.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Allow me, as a miner, having the legitimate mining interests of the country at heart, to heartily thank you for the interest and care taken by the ENGINEERING AND MINING JOURNAL to protect the capitalists of the country from the many bogus mining schemes offered for their investment. Referring to your notice of the prospectus of the "Tower Mountain Mining Company," of San Juan County, in your issue of the 22d March, I made, last summer, a somewhat careful examination of the "mining prospects" on Tower Mountain, and found a number of "prospect-holes," some of them in veins of low-grade mineral, and others in veins carrying small streaks of a fair grade; but all the mining was daylight mining; and while I would consider it a fair field for prospecting, I saw nothing, and believe there is nothing there that, with present development, warrants the organizing of a mining company with a large working capital and expensive outfit for working.

It will be a bright day in the history of Colorado mining interests when flaming prospectuses, with "wild statements of rich assays and probable profits," cease to be issued on prospect-holes with no appreciable value. It is for the interest of the State and the country at large that no properties but those offering at least reasonable promise of fair returns for capital legitimately invested and honestly and intelligently managed should be offered in the marts of capital as investments for and incentives to mining enterprise.

LEADVILLE, COLO., March 28, 1879.

GEORGIA MINES.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I have seen nothing in the public prints from this mining region, and think it may possibly interest your readers to know what we are doing here. We had some mining in a desultory way in ante-bellum times; but the war smothered the business in its infancy, and it is only recently that we have commenced again to make any developments.

Our oldest mine is the Columbia, formerly in Columbia, now McDuffie County. This mine was worked for four years by a Mr. Griffin, with very fine results. The ore, which is hard quartz, was hauled two or three miles, and crushed by very crude machinery, which was propelled by water-power, and the net results of four years' work were \$53,000. It was then sold to a company and worked until the war commenced, after which the owners were ruined, and the mine has not been worked since for want of capital.

The Magruder mine, in Lincoln County, was worked for a short time, previous to the war, and has been recently reopened with very flattering developments, showing two or three gold-bearing veins of sandstone, and probably the finest galena and native copper that can be found in the South. The owners have not put up any machinery except a hoisting and pumping-engine, but it is reported that they will soon have a good stamp-mill at work.

The Sale mine, at Goshen, in Lincoln County, was partially opened before the war, and is now being worked by a company, under a lease which expires October, 1880. The new company has taken out about \$16,000 from this mine in a little more than twelve months, with flumes and a Chili mill. The whole hill is full of gold, and should be washed down, but the lessees have not the means to work it on this plan.

The Ward mine is near the Sale mine, having been but recently discovered. The owners have a four-stamp mill of the old style, and it is said that the results are satisfactory. The ore is a soft sandstone, easily mined, and yielding readily to the stamps.

The Booker mine, on Fishing Creek, in Wilkes County, has been lately discovered, but from present developments it promises well. A shaft has been sunk on the vein to a depth of about 25 feet, exposing a vein which pans out well. No machinery has been erected, as the owners are farmers who are busy with their crops, and can spare no time to work at the mine until summer.

Next and last comes the Kendall mine in Wilkes County, near the Booker mine. The Kendall has a shaft 45 feet in depth, and a splendid sandstone vein exposed all the way down. Only two tons of this ore have been carefully tested, which yielded \$14.40 per ton. The owners have a five-stamp mill (stamps one hundred pounds each), which has been at work for several weeks with good results. The vein is well defined, and ranges in thickness from two to three and a half feet, with an outcrop that can be traced for several hundred yards.

Another mine which I had nearly forgotten to mention is the Parks mine, in McDuffie County. This property is worked by Col. J. Belknap Smith, by water-power, and the ore hauled about three miles. Colonel Smith has worked his mine steadily in this way for ten or twelve years, and has realized handsome profits.

All the mines above named have plenty of water near by, and some are so situated that they might be worked by water-power. Our people know but little of practical mining, and have not the means to work mines on such a scale as to secure the largest profits; and this leads me to say that we need capital here to open up and develop these interests, and that persons who have money to invest in mines can find good mining property in this section, at very reasonable prices.

We have exceptional facilities here for working mines, which will commend themselves to those of your readers who understand the business. Washington is a pleasant town, with good schools, fine society, and good church facilities. It is the terminus of a branch of the Georgia Railroad, and has a daily mail and a telegraph. The mines are situated from ten to

twenty miles from this place, all in communities that are thickly settled.

Another advantage which we have here is in the climate. The weather never becomes too cold to work, and such a thing as sunstroke has hardly ever been known. But our greatest advantage lies in the cheapness of labor. Common laborers, windlass hands, wood-cutters, teamsters, etc., can be hired in any number at from eight to ten dollars per month; and the negroes, hired at these prices, make very fair miners, with proper superintendence. Regular miners can be hired at from \$1.25 to \$1.50 per day. We have a splendid mining region here, which is yet in its virgin state, and all that we need is capital, experience, and careful prospecting.

WASHINGTON, GA., April 8, 1879.

C. E. SMITH.

WYOMING VALLEY COAL-MINING NOTES.

Special Correspondence of the Engineering and Mining Journal.

PROSPECTS OF A SCARCITY OF LABOR AND HIGHER PRICES.

Permit me to give your readers signs of improvement in the anthracite coal trade, judging from what transpires in our Wyoming coal-field—notwithstanding that coal is being sold cheaper in New York City than in most of the larger towns in the center of the coal-fields. There is more time being made by the employes in each colliery than for some years past. There are many collieries starting up that have been idle, some for one, others for two years; and some new mines about getting into operation. Another important matter is the first symptoms of the absence of an over-supply of labor, of which so much has been said and written. We are likely to witness a change in that direction very soon, which will bring its natural consequences. To substantiate these statements, I will mention some collieries started of late.

The Dodson Colliery, located in the Plymouth borough, formerly operated by the L. & W. C. Co., but suspended several years ago, has been put into operation by the Messrs. Shonk & Son, and called the Plymouth Coal Company (Limited). They are working in the Lance seam just opened by them, being cut through within 40 or 50 feet of the surface in the shaft. They also work in the lower seam worked there formerly, and which was generally known as the Bennett or lower bed of the Baltimore; but this is now supposed to have been an error, and it is said that the seam is an overlying one, and that the Baltimore bed is still beneath them, and that the seam usually called the Cooper is really what is known on the Wilkes-Barre side as the Hillman seam. To prove or disprove this new nomenclature, the company has commenced to drill down from the foot of the shaft, which will tell the tale without a doubt. If this theory is proven correct, it will add much to the value of coal lands in and around Plymouth.

The Lance Colliery, operated by Charles Parrish & Co., having been idle about a year, has again been started up.

The Midvale Colliery, better known as the Maffet Colliery, operated by the L. V. C. Co., after an idleness of over two years, resumed operations the other day.

The Hartford Colliery, operated by Charles Parrish & Co., was also started this month, after having been idle about fifteen months. It is rumored that a new slope is to be sunk at this colliery from the surface on the Baltimore seam, west of the present workings, to work coal lying to the dip of the old slope, from which tunnels will be driven to the other seams under and over them, making this one of the most productive collieries of the company.

The Diamond Colliery, operated by Charles Parrish & Co., which caved in about two years ago, causing a stoppage there and at the No. 3 Hollenback slope, is about to be put into operation again, having already started gangways and the extension of the slope for another lift. This colliery, including the No. 3 slope, was considered one of the best collieries of the company before the cave, as it has a very fine breaker possessing all the modern improvements for handling and preparing the coal.

The Hollenback new shaft, 500 feet deep, sunk to the coal several years ago, is about to be put to use. A large bull pumping-engine has recently been put up there, and the work of pumping the water has been commenced. The gangways have been let out on contract. This shaft is expected to open out a fine field of workable coal, being well into the center of the coal basin.

Elmwold shaft, formerly operated by the Elmwood Coal Company, but now by Dickson, Albrigt & Co., has been started; first, to test the seam which had been worked to a limited extent only in the shaft and proved very unsatisfactory. They are now sinking a trial or test slope down the dip of the seam; this is down at present some two or three hundred feet. The pitch of the seam is increasing; they were compelled to put in a pair of stationary engines at the head of this slope, underground. The knowing ones say that the seam worked there is the same as is being worked in the Hutchinson and several other mines immediately west of them, and it is known as the Bennett or lower bed of the Baltimore seam. Should this slope prove good coal within a reasonable distance, the colliery will undoubtedly yet become a valuable one.

The Elmwood drifts, formerly a part of the Elmwood colliery, are no longer so considered, as the land-owners are building a coal-breaker of their own to have the coal of their Ross and Red Ash seams prepared separately. Hon. Thomas Waddel, an experienced coal operator from Pittston, it is stated, has leased the drift workings.

Another colliery, opened out for local sales by Mr. Owen Hughes, has been purchased by Messrs. M. B. Williams and G. H. & F. B. Parrish. It is located on the line of the Susquehanna RR., southeast of the old Hollenback No. 2 slope. This mine is hardly ready, but will be so shortly, and the firm is called the Red Ash Coal Company (Limited).

Most of the mines in the Wyoming region are at work, and making more time than they have for some years past, except the Boston Colliery of the D. L. & W., and the Forty-Fort Collieries, formerly operated by J. H. Swoyer, but lately operated a short time by his partner, Mr. Roberts. It is true that we have a few of those collieries suspended several years ago still idle; but you can see from what is reported above, that the list is changing.

The exodus of the over-plus of labor from the coal regions has at last begun to be felt here. In two or three of our mines, they have hardly sufficient hands, and in one instance an operator has advertised for miners. I

don't know whether this was a little premature or not. Should the coal magnates once get a fair price for their coal, things would look better. It will not be a very long time before a great change takes place in prices of both coal and labor, unless I am greatly mistaken in the signs.

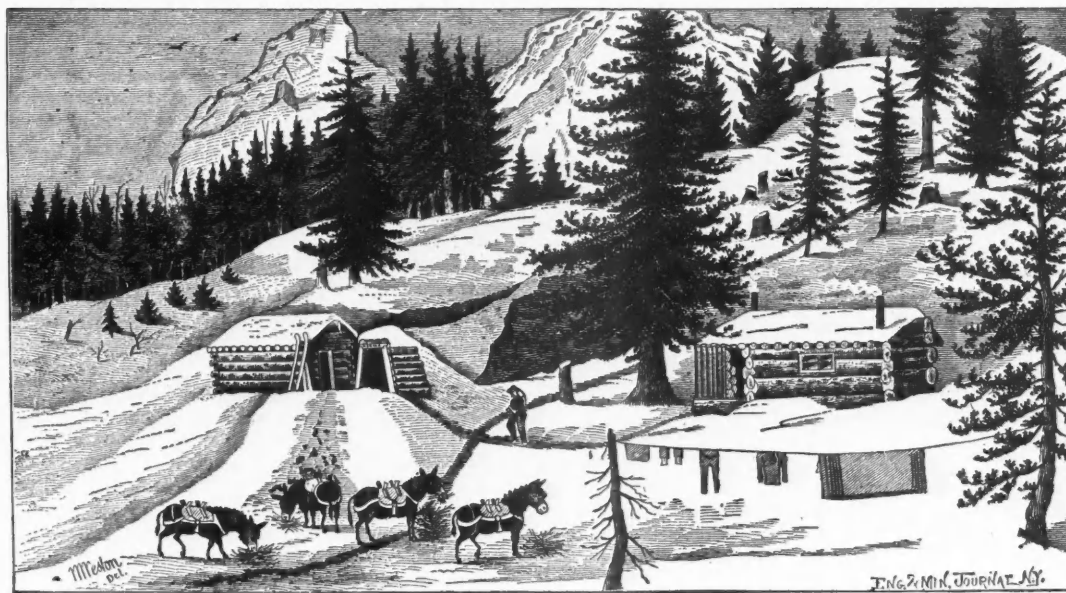
SQUIB.

INDIVIDUAL MINING—OUR "SPECIAL'S" HOME IN THE MOUNTAINS.

This sketch represents the cabin and mine of two men in Imogene Basin, in the Sneffels District of the San Juan silver mines. Having prospected and found a claim, they have put up a comfortable log cabin and ore-house; and are spending their winter in drifting on the vein and developing their property. The sketch was made in November; and, although a great deal of snow had fallen, the trail from Ouray was still passable for animals, and the four burros have just got up with the last load of "grub." A comfortable cooking-stove stands in one corner of the cabin, and from the roof of the addition or shed may be seen protruding the pipe of the assay furnace where they test the ores as they come from the vein. Leaning against the ore-house may be seen the Norwegian snow-shoes, which are used in that region. A good supply of books, drawing materials, etc., not forgetting the ENGINEERING AND MINING JOURNAL, for the evening, and eight hours a day solid work in the tunnel, and plenty of warm bedding and good food, make a winter pass very pleasantly and rapidly. Two men with a few hundred dollars and plenty of grit, in a new country like the San Juan, may acquire a valuable mining property in that way.

of combustion in the path of the air may have been, there could be only one gas drawn into the sample tube, and that would be carbonic oxide mixed with nitrogen. Even if we assume that the product of combustion in the furnace is carbonic anhydride alone (which is not true), this would be completely reduced to carbonic oxide by passing through the hot coal.

The experiments made on gas which was drawn through tubes in holes inserted between the tuyeres do not impress me more favorably. There the tubes were thrust "a little way into the contents of the furnace." That description does not apply to the mode in which gas samples were drawn off for analysis, but to experiments for testing the reducing powers of the gas by submitting pieces of ore to its action. Still it is probably also the mode in which samples were obtained, and the object of this note is to ascertain whether more careful means of sampling the unchanged products of combustion were used. If not, I submit that the analyses which form the basis of all modern reasoning on this subject must be rejected. The rapidity with which red-hot carbon reduces carbonic anhydride, and produces just the gas which experimenters find in their sample tubes, is well known, and methods of sampling which take no precautions to guard against this change can not be accepted. I think the investigators owe it to science to give the world some hint of the means they have used to prevent this action, and to obtain the gas as it is formed. In the case of one of our American furnaces—a small one—the blast has an upward velocity of 20 feet per second at the level of the tuyeres, without considering the increase of volume by its rise in temperature in the furnace, and also allowing it to penetrate instantly to the



ON THE COMBUSTION OF DIFFERENT KINDS OF FUEL.

By Prof. John A. Church, Columbus, Ohio.

I have read with interest the criticism of Mr. I. Lowthian Bell on my paper on the mode of combustion in the blast-furnace hearth. It is true that the question is not simply technical, but is one of scientific importance. The prevailing opinions, which Mr. Bell has expressed with his usual force, rest upon experimental determination of the gases in the hearth. I have never felt that trustworthy results have been obtained in any of the published analyses, and with your permission I would like to state the case, and see if my difficulties are removable by the wide experience of Mr. Bell or other investigators.

The blast-furnace hearth is a cylinder, closed at the bottom, but perforated near the top by a number of openings in which the tuyeres or ends of the air blast-pipes are closely fitted. The air enters at a pressure which usually varies in anthracite practice between 4 and 7 pounds to the square inch. As the discharge is at the top of the furnace, many feet higher, the air must describe a curved path from the point of entrance to the center of the furnace, being acted upon continuously by a horizontal and a vertical force. It is evident that the level of the tuyeres is not the place to obtain the first products of combustion, unless they are drawn through a tuyere in action. Elsewhere the samples would not be taken from the path of the air, which is upward from the tuyere from the instant it enters the hearth.

Mr. Bell and other investigators have analyzed gases drawn from the hearth by means of porcelain tubes introduced through a closed tuyere aperture, or through holes drilled between the tuyeres. It seems to me these analyses are vitiated by the mode of drawing off the gas, and since this criticism applies to the experimental basis of existing views of combustion in confined spaces and with limited supplies of air, I will give a few details to show the scope of my objection.

At the Wear furnace Mr. Bell drew off gas through a tuyere that was closed for the purpose, but air was entering at other tuyeres on each side and 4 feet distant. Certainly this did not represent the product of that active combustion which takes place in the path of the air, but of these products after they had filtered through nearly 4 feet of glowing fuel. What the exact distance was, depends upon the velocity of gas in the crucible of the Wear furnace and the inner diameter of the hearth, but was probably over 3 feet.

The quantity drawn off is not mentioned; but as it was taken for eudiometric analysis, the amount was probably less than 5 liters, and the movement of the gas through this glowing coal to the sample tube must have been extremely slow. Under these circumstances, whatever the product

center, so as to cover the whole area of the crucible. That can not be true, and, on the other hand, the withdrawal of gas from the walls at the tuyere level, while the air is entering with great velocity 4 feet away, can hardly give a fair sample of the unaltered result of immediate combustion.

COLORADO LAW RELATING TO LOCATION AND REPRESENTATION OF PLACER MINING CLAIMS.

Be it enacted by the General Assembly of the State of Colorado:

SEC. 1. The discoverer of a placer claim shall, within thirty days from the date of discovery, record his claim in the office of the recorder of the county in which said claim is situated, by a location certificate, which shall contain: First, the name of the claim, designating it as a placer claim; second, the name of the locator; third, the date of the location; fourth, the number of acres or feet claimed; fifth, a description of the claim, by such reference to natural objects or permanent monuments as shall identify the claim. Before filing such location certificate, the discoverer shall locate his claim: First, by posting upon such claim a plain sign or notice, containing the name of the claim, the name of the locator, the date of discovery, and the number of feet or acres claimed; second, by making the surface boundaries with substantial posts and sunk in the ground, to wit, one at each angle of the claim.

SEC. 2. On each placer claim of 160 acres, or more, heretofore or hereafter located, and until a patent has been issued therefor, not less than \$100 worth of labor shall be performed or improvements made by the first day of August, 1879, and by the first day of August of each year thereafter. On all placer claims, containing less than 160 acres, the expenditure during each year shall be such proportion of \$100 as the number of acres bears to 160. On all placer claims containing less than twenty acres, the expenditure during each year shall not be less than twelve dollars; but when two or more claims lie contiguous, and are owned by the same person, the expenditure hereby required for each claim may be made on any one claim; and upon a failure to comply with these conditions, the claim or claims upon which such failure occurred shall be open to relocation, as if the claim had never been made; provided that the original locators, their heirs, assigns, or legal representatives, have not resumed work upon the claim after failure and before such location; provided, the aforesaid expenditures may be made in building or repairing ditches to conduct water upon such grounds, or in making other mining improvements necessary to the working of such claim. Upon the failure of any one of several co-owners to contribute his share of the expenditures required hereby, the co-owners who have performed the labor, or made the improvements, may, at the

expiration of the year—to wit, the first day of August, 1879—for the locations heretofore made, and one year from the date of locations hereafter made, give such delinquent co-owner personal notice in writing, or, if he be a non-resident of the State, a notice by publication in the newspaper published nearest the claim, for at least once a week for ninety days, and mailing him a copy of such newspaper, if his address be known, and if, at the expiration of ninety days after such notice in writing, or after the first publication of such notice, such delinquent should fail or refuse to contribute his proportion of the expenditure required by this action, his interest in the claim shall become the property of his co-owners who have made the required expenditures.

The following indorsement is made on the bill :

The foregoing act was filed in the office of the Secretary of State by the Governor, March 12th, 1879, without his signature, and became a law under section 11, article 4, of the Constitution of the State of Colorado.

N. H. MELDRUM, Secretary of State.

FLINT CREEK (MONT.) MINING DISTRICT.

The most thoroughly prospected and, in the light of recent discoveries, the most valuable of the many well-known leads of this district is now very generally conceded to be the Algonquin. Discovered at an early day in the history of the camp, the original locators, ignorant of its great value, did no work to develop it other than necessary representation. In 1876 this mine passed into the possession of the present owners, "The Algonquin Company," of Philadelphia, with J. K. Pardee Superintendent. Since that time, work has been steadily prosecuted, and a large amount of money has been judiciously spent in development.

The trend of the mountain range here is nearly north and south. The strike follows the general direction of veins through the hill, being north-east and southwest, its dip being about 29° from the horizontal plane. The mine was first opened by a tunnel run in from the bed of the gulch, tapping the vein 150 feet in. An upraise to the surface was stopped, the vein being found from 4 to 6 feet in width, carrying an abundance of free-milling ore, assaying well. The gangue is white quartz, impregnated with oxide of manganese, showing ruby silver, copper, and close-grained galena. The depth of this shaft or upraise from the surface is 100 feet.

In 1878 sinking was again commenced at a depth of 50 feet below the tunnel level. A cross-cut, 40 feet in barren quartz, disclosed a vein of ore similar to the one in adit level. A level was run each way on the vein, and showed from 7 to 9 feet of vein matter, a very considerable portion being ore. The vein here, in defiance of the course prescribed for it by surface indications, takes an abrupt right-angled turn, running due east and west. Proceeding downward to the 250-foot level (ten feet above the sump), a drift strikes the vein about fifty feet from the shafts. Levels run on the hanging-wall both ways, cross-cutting the lead, exposing a uniform width of 7 feet, with from 3 to 6 feet of high-grade ore, and presenting the characteristics of a true fissure vein, inclosed in metamorphosed limestone formation, with a casing of manganese, carrying thin streaks of clay next to the foot-wall. The hanging-wall is of limestone, which constitutes the country rock of the district. The gangue is white quartz, carrying galena, copper, ruby and native silver.

This is known as a wet mine. All of the timbering is necessarily heavy, requiring close lagging. Large subterranean deposits of water have been occasionally struck; but only in one instance has the mine been flooded, the shaft at that time being filled to a depth of 120 feet. The powerful Knowles pump worked until submerged to a depth of 30 feet. Doors have now been placed in the levels, and the pump so arranged as to be hoisted out of its bed in five minutes' time.

I learn that the Algonquin Company intends erecting reduction works during the coming year. Mr. J. K. Pardee, Superintendent, has just bought a 20-stamp mill. The mill will be erected with White roasting furnaces.

SHARKTOWN.

LABOR NOTES.

The skilled wire-drawers imported from England—twenty-seven in number—have arrived at Johnstown, and been set to work in the wire mill.

The strikes among the miners on the Monongahela River, the Pan Handle Railroad, and in the coke regions of Southwestern Pennsylvania, are now over, and work has been generally resumed.

Under date of London, April 17th, we learn that the employers in the Durham District have asked for military assistance on account of the threatening attitude assumed by the miners.

The President of the Altoona (Pa.) Iron Company has given the following notice to his men: "You are hereby notified that this company will no longer employ any one in good standing in any union, or who joined this year, and hereby discharge all who have so joined; but will receive back some who have been misled, upon their dissolving all connection with and agreeing not to join any other union while in our employment."

A PARTIAL SOLUTION OF THE ENGLISH LABOR TROUBLES.—LONDON, April 15.—A dispatch to the *Times* from Newcastle states that a number of striking miners who are possessed of a little means appear determined to permanently quit the Durham collieries. Immigration agents in Newcastle district are busy sending men to the United States and the colonies. The main tide of the emigration seems to be toward the mining districts of the United States. There is also a considerable migration to British America.

The *Evening Post* says of this: "Emigration agents are reported to be busy at Newcastle, sending men to the United States and the colonies; but the main drift of emigration is admitted to be in the direction of this country. What we have more than once augured as likely to appear on a large scale in the spring is verified by these and many other signs. Crowds of new settlers are flocking into Colorado and Kansas, and the reports from the Northwest are of a like nature. The extraordinary mineral developments of Colorado are evidently destined to give this movement remarkable force and rapidity. Accounts from the neighborhood of Leadville read like the early history of California. If what some

sanguine observers predict should be verified, the yield of precious metals and the consequent excitement and swiftness of growth in Colorado will furnish a parallel to even the amazing record of the Golden State itself. What with political and industrial troubles in Europe and the propitious outlook in almost every direction in the United States, our national prospects in nearly every material sense were never so bright as they are now."

PROGRESS IN SCIENCE AND THE ARTS.

General Science.

Some Novel Astronomical Notions are credited to Professor Peirce, of Cambridge, a distinguished mathematician and late Superintendent of the Coast Survey. He is reported to advocate the belief that our entire solar system is included within a surrounding envelope or shell of meteoric or cometary matter, from which source originate the numberless meteoric bodies that are constantly plunging down upon the sun, and which by their impact furnish the central body of our system with its seemingly endless supply of light and heat. He is also credited with the statement that the discovery (in 1846) of the outer planet, Neptune, which has always been looked upon as a most remarkable verification of a scientific prediction, based upon purely theoretical considerations, was in reality an accident—an incredible accident, but an accident, nevertheless. Professor Peirce makes the point that there were two possible planets that might have given rise to the perturbations of Uranus, and which Leverrier and Adams simultaneously pronounced to be caused by an outer planet, whose position they indicated, and that the observed planet (Neptune) was not the predicted one. He (Peirce) holds that the planet which is responsible for the perturbations referred to has never yet been seen, though astronomers, up to the present time, have believed that it had been found when Neptune happened to have been discovered by the remarkable accident of its having, for once in six centuries, been located just where Adams and Leverrier had predicted the presence of a disturbing body. Perhaps it would be asking too much of Professor Peirce to suggest that he should prove his faith by finding the missing member of our solar system.

Among the Recipients of Honors from the French Academy of Sciences, at the annual public meeting held during the second week in March, and at which the prizes for 1878 were awarded, we observe the names of two distinguished Americans. George H. Corliss received the Moynon prize of 1000 francs in mechanics, for his improvements in the steam-engine; and Prof. Alexander Agassiz, the Serres prize, for his various embryological and other investigations in anatomy and zoölogy.

A Refracting Telescope, of 32 inches aperture, is to be built for the Pulkowa (Russia) Observatory; funds for the purpose having been subscribed.

Current Scientific Literature.—The April number of the *Journal of the Franklin Institute* contains an elaborate theoretical discussion of the limit of efficiency of heat-engines, by Mr. J. F. Klein; reports of the Institute's Committee on Science and the Arts on Norbert Landtsheer's machine for treating flax, hemp, etc., and Ainsworth's automatic safety-switch for railroads; experimental tests of evaporative duty of steam-boilers in the New York Navy-Yard (Isherwood); tests of a Baldwin locomotive (Hill); the Butler Mine fire cut-off (Drinker); the usual interesting items, and the proceedings of the monthly meeting of the Institute for March.

The Publication of the Druggists' Advertiser, we regret to notice, will be discontinued.

Electric Light Notes.—This is how the (London) *Journal of Gas-Lighting* speaks of it: "As we are informed, the ghastly, flickering exhibition of the electric light on the Holborn viaduct is to come to an end. *Sic transit.*" The *English Mechanic*, referring to the same experiment, has the statement that Mr. Haywood's report upon the trials of the Jablochkoff candles at the Holborn viaduct are disappointing. The cost of the electric light for a year would be about £3072, while the cost of gas-light heretofore used is £419. This assertion, however, is followed by the remarkably contradictory one that "Mr. Haywood finds that the 16 lamps give about seven times more light than the 86 gas-lamps; so that, light for light, the electric lamp is not more costly than gas."—The London gas companies, to show their ability to compete with the electric light, have fitted up, at public crossings, Argand burners with reflectors, which arrangement is said to be a vast improvement upon the old plan.—A vibrating needle, actuated by clock-work, and intended as a substitute for Edison's well-known electric pen, is the subject of a recent patent.—If newspaper reports may be credited, Mr. Edison has succeeded in perfecting his electric lighting system to his satisfaction, and purposes at once to make a public display of it.—A French inventor proposes to temper and scatter the electric light by the use of wadding made of glass fiber in place of using clouded glass shades. He claims to reduce the amount of loss by absorption by at least 25 or 50 per cent.—Engravings on copper, steel, and stone, executed by what is known as Bellet's voltaic pencil or electric graver, were exhibited at a late scientific soirée given at Paris.

The Impression that those who Inhabit Rooms Freshly Painted are in danger of lead poisoning has been shown by Dr. Clement Biddle to be quite unfounded. He bases this statement upon the result of the following experiment: He introduced into a close box a number of sheets of paper saturated with white (lead) paint, and upon the bottom of the box placed a shallow dish of pure (distilled) water, previously tested to make sure of its perfect freedom from impurities, and from lead in particular. After an exposure to the atmosphere of the box for three days, the water-dish was removed, acidulated with nitric acid, and treated with sulphureted hydrogen, when not a trace of lead precipitate occurred. Dr. Biddle therefore attributes the colds and other unpleasant consequences experienced by sleeping in freshly-painted apartments to the irritating action of the vapors of turpentine on the lining membrane of the air-passages.

A New Kind of Telegraph Cable, the conductor of which is made of lead, and the insulating envelope of a resinous or sulphurous substance, the whole being inclosed within a leaden tube, is, according to the *London Telegraphic Journal*, being manufactured at Cortaillod, in Switzerland.

The new form of cable, says our authority, is by no means inferior to the cables in use, in respect to pliability, in spite of the slight flexibility of the insulating substance; and the conductor rigorously preserves its central position, notwithstanding any bends that may be made in the cable.

Weather Service in the United Kingdom.—The *English Mechanic* reports that on and after April 1st any person will be able to obtain by telegraph from the Meteorological Office the latest information as to the weather in any portion of the kingdom by payment of one shilling, and the cost of the telegram and reply.

Mining, Metallurgy, and Geography.

A Project for the Colonization of New Guinea.—The *Times'* Roman correspondent reports that Menotti Garibaldi and Achille Fazzari intend to sail for the south coast of New Guinea some time during the coming summer or autumn, with 3000 Italians, there to establish a colony and to found a new city under the name of Italia. The arrangements for the new colony are reported to be complete, and applications to join the party are more numerous than can be granted. Part of the equipment of the emigrants will be a telegraph cable to connect the colony at once with North Australia. It is reported, concerning the *personnel* of the colonists, that men of all ranks and callings (*except lawyers*) are included in the party. We glean the above facts from *Nature*.

The Bennett Polar Expedition.—The *Jeannette* is expected to start from San Francisco on her perilous cruise about the middle of June, under the command of Lieut. George W. De Long, of the Navy, who has been detailed to command her. The crew will be selected with especial care, and the vessel will carry food and fuel sufficient for a three years' cruise. The *Jeannette*, it is reported, will touch first at St. Paul's Island, and at St. Michael's, an Alaskan trading-post, where food, fur clothing, dogs, and sledges will be taken aboard; then at St. Lawrence Bay, on the Siberian coast, whence she will proceed northwesterly in search of the Nordenskjöld party, supposed to be frozen in, several hundred miles from Behring Straits. She will winter, according to arrangements announced, at Kellet Land, whence a dash for the pole is expected to be made, during the following summer. Mr. Bennett, who bears all the expense of the expedition, is reported to be at present in Europe, and to have been making inquiries at Paris as to the most approved methods of constructing and inflating balloons in the Arctic regions. It is, therefore, not impossible that aerial navigation may be pressed into the service of the contemplated expedition.

The German Aluminium Industry, from late accounts, would seem to be quite extensive, and the general impression that France is the headquarters of this manufacture must be pronounced incorrect in view of the fact that there are no less than three concerns in Berlin alone engaged in the production of this metal. The articles into which it is manufactured are chiefly nautical instruments, such as sextants, compasses, etc. The German Navy, it is said, is supplied throughout with aluminium instruments. Of the many reasons which combine to hinder the general use of this metal for many useful purposes for which it appears to be adapted, the difficulty of soldering it is mentioned as being of more serious weight than its cost, which could, even with present processes of manufacture, be materially cheapened, in the event of a great demand.

A Combination of Iron and Steel is made extensively in France, according to the *Revue Industrielle*, by running the two metals separately into a mold, with a plate of thin sheet-iron at the dividing line. In this way, a perfect welding together of the two metals ensues.

Coal in the Black Hills.—The local papers are jubilant over the fact of the successful use of Black Hills coal for the melting of iron at the Grayville foundry. The coal in question is described as of the bituminous variety, taken from the "Red Water" mines, and from a depth of not over 12 feet from the surface. The importance of this new strike for the region in question will be best appreciated from the statement of the *Black Hills Herald*, that heretofore, coal shipped from Chicago cost as much as 8 cents per pound, or \$160 per ton, while that from the new coal region can be delivered at a cost not exceeding 1½ cents per pound, or \$30 per ton. The same authority ventures the opinion that it is only a matter of time when the coal consumers of the Hills will find it necessary that a railroad be built from Central City to these new coal ledges.

A Fine Specimen of Rock-Salt from the island of Petit Anse has been received by the Maryland Academy of Sciences. The deposit from which it came is pronounced to be very extensive, and the quality very pure.

Chemistry, Physics, and Technology.

The Applications of Celluloid is the title of a most instructive article in the *Evening Post* of this city. The writer, who appears to have been at much pains to collect information upon the subject, makes a most surprising exhibit of its novel and useful applications. This remarkable substance (which is a species of solidified collodion, made by dissolving gun-cotton in camphor, with the combined aid of heat and pressure, and the addition of suitable pigments) appears to have been most widely introduced as a substitute for ivory, in which direction it is known to have made serious inroads in the business of the ivory importers and manufacturers. It is, indeed, so close an imitation of ivory that nine persons in ten would be deceived by it. It is claimed, however, to possess greater durability than ivory. Its extreme toughness will permit it to be used very roughly without danger of breaking, while it will neither warp nor discolor with age. On these accounts it is now extensively substituted for ivory in the production of piano and organ keys; billiard-balls, said to be equal in elasticity to those of ivory; combs, backs of brushes and hand-mirrors, and whip, cane, and umbrella handles; harness trimmings, foot-rules, chessmen, knife and fork handles, and other objects too numerous to name, for which ivory has heretofore been employed. The fact that this substance may be molded renders it possible to reproduce the most elaborate carving and ornamentation in the articles named (and others about to be named), and at a fraction of the cost of similar designs in ivory. Hard rubber, on account of its cheapness, holds its own against the inroads of celluloid very well. Celluloid can be made to imitate tortoise-shell

as perfectly as ivory, and has been largely used as a substitute for this popular substance in the production of such articles as combs, card-cases, cigar-cases, match-boxes, napkin-rings, and the like. It can be made with equal facility into an admirable imitation of malachite and amber, while the pink coral, so popular for jewelry, is substituted so perfectly as to defy detection by the eye. It is used for the mouth-pieces of pipes, cigar-holders, and musical instruments; as a substitute for porcelain in the manufacture of dolls' heads; in the place of tortoise-shell, jet, or hard rubber, in the manufacture of the frames of spectacles, eye and opera glasses; for shoe-tips, as a substitute for metal; martingale-rings made of it will resist almost the strength of a horse to break them apart; thimbles are made of it, as well as emery wheels and knife-sharpeners; as a ground for paintings and photographs it is claimed to be superior to ivory; while the latest development is the use of celluloid as a substitute for paper or linen, for shirt bosoms, cuffs, and collars, which, in addition to being wonderfully strong, elastic, and impervious to perspiration, may be cleaned by the simple use of a damp sponge, to be equal to new, and may be worn for months without injury or inconvenience. Taken altogether, the invention of celluloid deserves to rank side by side with that of the vulcanizing of rubber, and its friends assert that its manufacture and applications are still in their infancy.

The Borate of Potassium and Sodium, prepared by dissolving in water equal quantities of chloride of potassium, nitrate of sodium, and boric acid, and evaporating to dryness after filtering, is recommended by the *Deutsche Gewerbe-Zeitung* as a powerful and valuable antiseptic agent. The same authority asserts that it has of late been extensively adopted in Germany by butchers, sausage-makers, tanners, and especially in the manufacture of butter and cheese, and for the preservation of fish, oysters, vegetables, beer, and wines. For fuller details, our readers are referred to the journal quoted or to the *Scientific American* of the 12th of April, which has a full abstract.

Engineering, Mechanics, and Miscellaneous.

Morrison's Furnace Improvements, to which we referred editorially some months ago, as an excellent and simple device for promoting combustion, is warmly indorsed in the current issue of the *Bulletin of the Iron and Steel Association*, as being "worthy of even greater praise" than we bestowed upon it. Mr. Swank recommends it earnestly to the attention of Pittsburg manufacturers, with whom combustion without smoke would be a novelty indeed.

The Tunneling of the Detroit River at Grosse Island, the project for which we announced some weeks ago, appears to meet with some opposition, and the *Engineering News* reports that the construction of a bridge to connect with the Canadian shore by way of Belle Island is again being considered to forestall the tunnel project. The *Detroit Free Press* holds that the best, cheapest, and most practical plan ever proposed for crossing the river is that for a bridge to Belle Island and a tunnel thence under the narrow Canadian channel.

The New French Atlantic Cable.—The Poyer-Quertier scheme, which has for some time been talked about, is about to be taken in hand at once. The present intention as announced is to lay a single cable (not two, as originally proposed) from Brest to New York. The English telegraphic journals have all along stoutly opposed the project for more Atlantic cables, urging that the existing companies afforded more than enough facilities for the transaction of all business offered, and that the creation of a new line would only work disaster to the financial interests of both old and new companies.

A Canadian Canal Project.—The Legislature of Ontario some time since appointed a committee to examine the project of a Huron and Ontario ship-canal, which body has just reported in favor of the scheme. The committee thinks that the hydraulic lift-lock will be the principal means of overcoming the engineering difficulties in the way. The estimated cost of the work is \$20,000,000.

The Mileage of New Railroad, reported in the *Railroad Gazette* of April 4th as having been built in the United States during the current year to that date is 298, as against 226 miles for the same period of 1878 and 165 in 1877.

A New Project for the Creation of an Inland Sea has been advanced and advocated by General Fremont, at present Governor of Arizona. The removal of a barrier ridge, he affirms, would admit the waters of the Gulf of California into an ancient basin, and would create a navigable inland sea 200 miles long, 50 miles broad, and 300 feet deep. This piece of engineering, which is very like Roudaire's Algerian inland sea project, noticed in these columns, he claims, would convert what is now a desert region into a commercial highway, and would greatly improve the climate of Southern Arizona and California.

The Submarine Work for the Removal of the Obstructions in New York Harbor has been resumed for the season by General Newton on Diamond Reef. At Flood Rock, in Hell Gate Channel, work has been steadily prosecuted with a small force; and at Hallett's Point, workmen are engaged in removing fragments of the old "crater" left by the great explosion of two years ago.

The Permanent Exposition Building at Cincinnati, for which contracts have just been given out, according to description, will be a substantial and ample building of brick and stone. It is anticipated that it will be so far finished as to be ready for the reception of goods by the 20th of August next, and opened to the public on the 10th of September. The new structure, it is understood, will be used for the holding of annual exhibitions of American manufactures on the general plan of the very successful competitive displays that have been held there for a number of years.

The Project for an International Exhibition to be held in New York appears to be gradually assuming the shape of an organized movement. The year 1883 is now named as the best for the purpose, the dates at first suggested having been considered to be too remote.

Madeira & Mamore Railroad.—The suit for the payment of the \$4,000,000, the fund accruing from the sale of Bolivian bonds, and which is in the custody of the Bank of England, we learn from *Engineering News* was to have been adjudicated during the past week. The *News* af-

firms that the decision, whether adverse or favorable, will not affect the enterprise, the Brazilian government having advanced a sum sufficient to guarantee the completion of the road.

Miscellaneous Engineering Notes.—A grand railroad-building revival in Minnesota is reported, the influx of emigration being unprecedented in the history of that growing State.—A new railway bridge across the St. Lawrence River, opposite Montreal, is proposed.—Captain Brown's latest official survey of the jetty channel at the mouth of the Mississippi, is reported to show "a 25-foot channel through the jetties, with a least width of 400 feet, a 20-foot channel with a least width of 140 feet, and a central channel 27½ feet deep."—A correspondent of the (Philadelphia) *Times*, writing from New Orleans, reports that city to be in an indescribably filthy condition. He notes the utter absence, on the part of the authorities, of any sanitary precautions, and looks forward to the recurrence of pestilence during the coming hot season as a matter of course.

RAILWAY EXTENSION IN IDAHO.—OGDEN, UTAH, April 11.—The Utah & Northern Railway has been completed to Eagle Rock Bridge, Snake River, Idaho, 210 miles north of this point. Regular trains will begin running there April 15th.

IMPROVEMENT IN BUNSEN'S BATTERY.—F. Lefebure says the oxidation of the exterior surface of the zincs contributes nothing to the liberation of electricity, so it may be safely covered with varnish, thus reducing the consumption of zinc by one half.—*Les Mondes*.

A FRIGHTFUL FIRE-DAMP EXPLOSION IN BELGIUM.—BRUSSELS, April 17.—By an explosion of fire-damp in the Agrappe coal-pit, near Mons, Belgium, the wood-work of the shaft caught fire and fell in. There are 240 men in the mine, and there appears to be scarcely any hope of rescuing any of them.

THE COST OF THE ST. GOTHARD TUNNEL LINE.—A dispatch to the *Standard* from Berne says the International Conference of the Swiss, Italian, and German Commissioners has accepted the proposals of the St. Gothard Tunnel Company, according to which 227,000,000 francs will cover the total cost of the line.

EXPERIMENTS RECENTLY UNDERTAKEN TO DEPHOSPHORIZE CAST-IRON.—M. Gruner has ascertained that dephosphorization may be effected in the Bessemer apparatus or the Siemens furnace if the siliceous lining in both is dispensed with and refractory basic materials are used instead.—*Bull. de la Soc. d'Encour.*

CONVENTION OF IRON AND STEEL MANUFACTURERS.—A convention of iron and steel manufacturers and iron-ore producers in the United States, will be held at Pittsburg, on Tuesday, May 6th. The object of the meeting is to "consider the present condition of our iron and steel industries, their wants, and the dangers which threaten them."

THE TWENTY-SIX MILLION DOLLAR SUIT.—In the suit of John H. Burke against J. C. Flood and others, to recover \$26,000,000, which the defendants are alleged to have unlawfully appropriated from the funds of the Consolidated Virginia Mining Company, etc., the court in San Francisco on the 4th inst. overruled the demurrer of the defendants and ordered them to answer in 30 days.

ALLEGED DISCOVERY OF ANTHRACITE IN NEW BRUNSWICK.—The *Monetary Times* of the 11th inst. says: "Near the Bay of Fundy, and some thirty miles from St. John, Mr. Ireland has found what he thinks to be anthracite coal. Coal was discovered in this locality some four years ago, and pronounced by geologists to be bituminous shale. An effort is being made to form a company to make further experiments and work the mine, provided it turn out to be anthracite."

CHANOIT FILTER.—A metallic reservoir is supplied by a pipe entering at the bottom. The water is forced by the pressure of a hydrant, or of a head, upward through the filtering bed, compressing the air before it, and thus becoming thoroughly aerated. The filter can be readily cleaned by opening a discharging cock in the bottom. Faucets for drawing the filtered water, or for conveying it to other rooms, are inserted above the bed.—*La Nature*.

METALLIC CHROMIUM.—A simple method for producing metallic chromium has been described by M. Moissan before the French Academy. He agitates a concentrated solution of chromous chloride in water with sodium amalgam. Several reactions occur, and among them the sodium is eliminated from the amalgam, forming a chloride, while an amalgam of chromium is formed. The amalgam obtained is then boiled in water for an hour or so to remove all the soda, and then decomposed by heating in a stream of hydrogen gas, kept at 350 deg. C. (662 deg. Fahr.), by which the mercury is volatilized, and the chromium is obtained as a black, slightly-coherent metallic powder. The same method will serve to obtain amalgams of manganese, iron, cobalt, and nickel.

GLASSES MELTED WITH ALKALI ALONE.—Dr. P. Ebell.—Sodic and potassic sulphides, or sulphates in presence of reducing agents, on dissolving in glass at the melting-point, impart to it a peculiar tint, varying from yellow to brown, and even to a deep red-brown if in sufficient quantity. In certain conditions, the same coloration is produced by the introduction of free sulphur into glass, melted and kept at a high temperature. This coloration takes place only in glasses where there is sufficient available alkali to give rise to sulphides. To produce the color there must be at least 1 equivalent of base to 2.5 of silica. The base may be lime or baryta, as well as potash or soda. Silicates in igneous flux are solvents for very various bodies, simple or compound. They dissolve free metals, such as gold, copper, silver, and lead; oxides, like chrome, alumina, stannic oxide, magnetic oxide of iron; also salts, such as sulphates, phosphates, aluminofluorides. These bodies are separated out on cooling either in a crystalline or an amorphous state, according to circumstances, and communicate different properties to the glass. The affinity of silica for bases measured by the carbonic acid displaced during fusion is not a constant magnitude, but depends on an action of mass. The quantity of carbonic acid expelled by a given weight of silica is so much the smaller the less alkaline carbonate there is in reaction.

PETROLEUM NOTES.

COMPARATIVE SYNOPSIS OF REPORTS FOR FEBRUARY AND MARCH, 1879 AND 1878.

42 GALLONS = 1 BARREL.	1879.		1878.	
	Feb. 28 days.	March. 31 days.	Feb. 28 days.	March. 31 days.
Stock at wells	Bbls. 250,922	Bbls. 250,922	Bbls. 162,410	Bbls. 162,410
Production for the month	1,197,420	1,476,065	1,094,856	1,208,380
Daily average production	42,765	47,615	39,102	38,980
Iron tank stock	5,541,741	6,043,927	3,713,554	4,180,422
Total stock in the region	5,792,663	6,294,849	3,875,964	4,342,832
Shipments out of the region	702,927	973,879	774,334	741,512
Number of producing wells	10,582	10,682	8,725	8,848
" " drilling wells	323	406	326	379
" " completed	132	238	226	211
Average daily production of new wells in bbls.	17 1-10	21 1-10	13 8-10	14 4-10

By inspecting the above tables, the following facts will appear:

- 1st. That there were more wells drilling at the close of the month than in any corresponding month since 1870.
- 2d. More wells were completed during the month than in any month since November, 1878.
- 3d. The daily average production of the new wells was larger than in any previous month of which we have a record.
- 4th. The number of rigs erected and being erected at the close of the month exceeds that of any previous month.
- 5th. The amount of crude produced in the month was larger than in any previous month since the commencement of the business.
- 6th. The amount of stock in the producing region exceeds the amount ever before held.
- 7th. The shipments out of the region were larger than in any corresponding month in the past.
- 8th. The price of crude at the wells ruled lower than in any corresponding month since 1862.

With these facts plainly in view, the developments apparently are to be pushed with vigor through the coming summer months in the Bradford district.

The daily average production for the month of March, 1879, was 47,615 barrels, against 38,980 barrels for March, 1878, which is an increase of 8635 barrels, or about 22 per cent, to which add 9.4 per cent produced in 1878 more than was needed for the export and home trades, and we have an increase of about 31.4 per cent in production to be provided for.

The exports from the United States from January 1st, 1879, to April 4th, 1879, were about 18 per cent more than was exported in the same time in 1878.

Should the present rate of 22 per cent increase in production be kept up through the year, which it now bids fair to do, and the present rate of 18 per cent increase in exports maintained, we will have at the close of 1879 an overwhelming amount of stock on hand, except new markets shall be found, which will increase the export demands; or new uses, which will increase the home trade.

The stock in the producing regions has been increased during the month, 502,186 barrels, making the total stock at the close of the month 6,294,849 barrels, and is held by pipe companies, tankers, and operators as follows:

Lines.	Stock.
United	5,312,970.80
Equitable, included in Tidewater Pipe Co.	13,800.64
Franklin	2,595.00
Charley Run	2,187.00
Church Run	6,607.60
Cherry Tree Run	8,517.28
P. T. Co., Titusville	191,885.81
P. T. Co., Petrolia, included in United	12,472.19
T. & T. Limited	26,549.68
Octave	11,664.14
T. & Warren, included in United	20,069.12
Fox Farm	307,605.74
Emlenton	127,102.00
Shaffer Run	250,922.00
Tidewater Pipe Co.	
Private Iron Tanks	
Stock at Wells	
Total	6,294,849.00

"The New River Oil Company" has been incorporated in West Virginia for the purpose of searching, boring for, and obtaining petroleum or other mineral oils; boring and purchasing lands for the purpose of developing the same for oil purposes, and to do such other things as may be necessary to fully carry out the purposes for which this corporation is organized. The corporation will have its principal office or place of business at Charleston, Kanawha County, W. Va.—*Stowell's Petroleum Reporter*, April 15th, 1879.

THE MARKET AT PETROLIA, ONT.—The *Advertiser* of April 4th says: "Several meetings have taken place since our last issue, and the *pros* and *cons* have, no doubt, been thoroughly sifted; but up to the hour of going to press, nothing definite has been settled on as to the disposition of the surplus. Our reporter, returning from his trip over the oil district, gives a very gloomy account of the doings of the wells. The producing interests are very quiet indeed, and all idea of making any new ventures seems to have been abandoned for some time, at least till we know what is to become of the accumulated surplus.

"The price of crude can not be quoted, because no one will buy or offer a price. Probably 50c. per barrel would be the outside figure."

THE MARKET IN NEW YORK.—The *Shipping and Commercial List* of the 16th inst. reports the New York market as under:

Crude.—There has taken place no change in the market, which remains quiet and nominal at 5 cents for bulk oil, and 7¼@8¼ for barrel.

Refined.—The market has undergone no change, being still nominal at 9½ cents, with neither buyers nor sellers in any wise anxious; 9½ was at the close bid for prompt delivery; quoted nominal at 9½ here and in Philadelphia and Baltimore.

Naphtha is still quiet and nominal, shipments going forward exclusively from first hands; quoted nominally 7¼@8 cents.

Residuum.—The above remarks apply with equal force to residuum, which is nominal at 6½@7 cents.

Certificates.—The demand continues light, and the business reported on 'Change during the three days is confined to 30,000 bbls. United States at 79½@81½ cents regular. Oil City quiet, 80 cents bid for old; Titusville quiet, 80; Parker's quiet, 80.

LONDON, April 16.—Refined firm, 8¼d., last four months firm, 8½d.

ANTWERP, April 16.—Refined dull, 23f.

EXPORTS OF REFINED, CRUDE, AND NAPHTHA.

	1879. Gals.	1878. Gals.
Since our last.....	2,645,930	
Previously since January 1st.....	45,966,167	43,097,732
From other ports.....	20,111,028	15,755,117
Total.....	68,723,125	58,852,849

A petroleum spring in Pechelbronn, Lower Alsace, has flooded the bitumen mine there to the extent of 1750 cubic meters.

GENERAL MINING NEWS.

ARIZONA.

The Tucson Citizen says: "The recent gold discovery about six miles from Picket's Post, is claimed to be one of the best yet found in Southern Arizona. The ledge is said to be over fifty feet in width, and a seam six feet wide shows free gold in every piece of ore taken from it. The ledge projects above the surface for a distance of over 1000 feet."

In the Mohave district we note that the Moss mine has been sold for \$10,000.

The Mineral Park mill and Keystone mine have been sold to New York capitalists. The mill is at present running on custom ore and turning out considerable bullion.

Experts have been examining the Fairfield mine, with a view to the purchase of the same.

The Silver Belt says:

"In the Globe district, the ledge in the Despreciado mine is ten feet in width and assays from \$80 to \$150 per ton. Other work at various points on the claim shows good ore.

"Work is still progressing in the tunnel running for the Big Indian ledge, which is now in 80 feet.

"There is good ore in sight in the General Allen mine, and can be taken out at any time.

"The El Capitan mine is yielding ore worth from three to four hundred dollars per ton. A shipment is to be made to the Miami mill. Four men are at work.

"The Metamora shaft is over 190 feet deep, over six feet having been made last week. The quartz is still of a promising quality.

"A new discovery, on Eagle Creek, of ore bearing copper and silver. The ledge is reported from ten to twelve feet wide, and assays have been made from it which give from \$200 to \$300 in silver. It is about three miles from the Longfellow copper mine.

"The La Plata mine, in Richmond Basin, is looking splendid. The shaft on the main ledge is down 35 feet, with 3½ feet of ore in width, which will average \$200 per ton. This is on the Mack Morris ledge, and has awakened a new interest in Richmond Basin."

A STRAW OF HOPE FOR ISABELLA STOCKHOLDERS.

The Silver Belt says: "We learn from Mr. Haskin, in charge of the mines, that men have been put to work sinking on the Happy Jack, one of the Isabella group. The shaft is now down 70 feet. The vein matter at that depth shows well, and the indications are that the Happy Jack will prove a mine. Cross-cuts will be run on the vein at the depths of 100 and 200 feet.

"Dr. Spence, who is represented as having a controlling interest in the Isabella and Haskin mining companies, has arrived from the East, accompanied by Major Sisson. They have been investigating the affairs of these companies, with the view of their reconstruction and the proper development of their mines. Arrangements are being made to start the mill running, and attach to it a roasting furnace, which will place it in a position to handle base ores, so much of which abounds in this district. Under the new arrangements, the companies resume operation entirely clear of debt, with a perfect title to all their property. Work will be commenced at once on the Isabella group, and to find ore below grass-roots will be the company's aim."

It will be observed, and particularly by purchasers of stock in the above company, that some of the statements published above do not altogether agree with those publicly proclaimed here last fall.

CALIFORNIA.

THE BODIE DISTRICT.

The Standard of the 5th inst. says:

"The most important development of the week, and to our mind one of the most important which has ever been made in the district, is that which has occurred in the joint cross-cut of the Mono and Bodie mines, from the 400-foot level of the former mine. We have heretofore adverted to the importance of this cross-cut. From the 400-foot station of the Mono a lateral drift was run north 125 feet, to the boundary line of the two mines, from which point cross-cuts were started east and west, for the purpose of thoroughly prospecting the veins which had proved so rich in the Bodie proper. The most southerly point at which work has been done on any level of the Bodie mine is fully 500 feet north of this cross-cut, which, while 400 feet deep in the Mono, is equal to 500 feet in the Bodie, and is really on a lower plane than any mine on Bodie Hill. At a point 65 feet from the north drift, in the east cross-cut, a ledge over ten feet in width was cut, which is believed to be what is known as the Burgess vein in the Bodie, from which, in a distance of 200 feet, hundreds of thousands of dollars have been taken. The ledge is considerably mixed with waste where cut, but portions of it are very rich in gold, and in native and horn-silver, and single pieces of rock show the metals in all these different forms. In most of the rock, silver is the predominating feature. Altogether, the find is of a most surprising and remarkable character, differing essentially from anything before discovered in the camp. The fact that a cross-cut was run in the 260-foot level, in the blue rock, and nothing found, while the present cross-cut is in brown porphyry, establishes the fact, which has always been held by the most observing of our mining men, that the blue rock is a secondary formation, and that to find mines it must be cut through, into the primary brown porphyry, in which the ledges line. We have dwelt thus at length upon the Mono strike because we regard it as of the utmost value to the camp, proving the existence of metal where heretofore all has been conjecture. The work in the other mines is of the most interesting character from one end of the lode to the other. The Black Hawk, Bechtel, Tioga, Summit, South Bulwer, and many others on the north end are now pushing important cross-cuts, while at the south the Richer, University, Booker, Noonday, Red Cloud, Defiance, and others are each and all establishing the claims of their several sections."

It has been decided to open a new level in the Standard mine, as well as to continue sinking the shaft, which is down 780 feet vertically. A station will be cut out at the 700-foot level, and cross-cutting, both east and west, will be begun at once.

The Orange mine has recently been purchased by a New York company, and will be operated by it under the name of the Bradford Mining Company. A large number of miners are prospecting Prospect Mountain.

The Richmond Company is building a new furnace, which will make four in all. The new one, we believe, is to be the largest ever put up in this district.

This company is now producing from 1200 to 1300 tons of ore per week which yields about \$50 per ton, at which rate the yearly output of the company would equal about \$3,000,000.

The Sentinel says of the Phoenix mine:

"The community will be glad to learn that a marked improvement has taken place in the Phoenix mine within the last few days. The ledge has been cut in the drift from the five-hundred-foot level, and looks most encouraging for a magnificent development. Of course sufficient work has not yet been done to accomplish any thing beyond ascertaining the mere fact that there are several feet of good ore in sight."

In the Real del Monte, located in the Esmeralda District, an improvement in the cross-cut from the shaft on the 500-foot level is reported. The stock of the company has advanced to \$7 per share, in consequence.

THE PEMBERTON HYDRAULIC GOLD MINING COMPANY.

The Placer Argus says of this company, whose property is located on the middle fork of the American River:

"The company owns, under a U. S. patent, sixty acres of pay gravel, averaging in depth two hundred and twenty-five feet; a ditch running twelve hundred inches of water per day; a dump of eighteen hundred feet into the middle fork of the American River; a head of water of one hundred and fifty feet; twenty-five hundred feet of sluice, with the necessary piping, etc. The work is so far advanced that the engineer expects to turn on the water within a few days.

"On the 5th inst., the Powell and Sophia gravel mines, located in Todd's Valley, came upon the pay-beds which have long and patiently been sought. The gravel bed ranges from 4 to 6½ feet deep, and pays from \$5 to \$40 per ton."

We are indebted to the Foothill Weekly Tidings for the following notes:

"At Moore's Flat the Blue Banks claim is about ready to begin washing. The Boston is running full blast, working 30 men and paying \$3 per day, the attempt to cut down the wages having been abandoned. The Chinese claims are also running full force.

"The Little York Mining Company is reported as having shut down, in consequence of the injunction granted the farmers by Judge Keyser.

"The Thomas mine, formerly the New England, is turning out considerable good ore, which is said to be paying handsomely.

"The mine known as the Black Lead, near the Rocky Bar, is looking splendidly. A small crushing, made recently, averaged a little over \$75 per ton.

"Assays of the Wyoming ore run as high as \$706 per ton; free gold, \$300; silver, \$17; sulphurets, \$389. The general average of the great bulk of the ore is \$17 per ton free gold, and from \$98 to \$103 concentrated sulphurets. The future prospects of the mine are exceedingly good.

"The Badger Flat claim in Pleasant Valley has been washing since last October. The owners expect to soon commence cleaning up.

"The tunnel of the Planet mine is in over 1660 feet, and encouraging symptoms are apparent.

"A clean-up of 70 loads of rock has just been made at the Omaha mill, of ore from the New York Hill mine, which yielded \$100 per load. Improvement is noted in size of ledge, quality of rock, and general appearance.

"Extensive improvements are going on at the Spenceville copper mine.

"The Deer Creek mine at Mooney is opening up in some splendid gravel. The company expect to have the electric light in operation on the claim soon. If it prove a success, it will be a great saving, as they can use their water all the time.

"The Blue Point Mining Company, having been washing some very rich gravel, no doubt will have a fine clean-up.

"The Empire mine is reported as about to shut down. Within the last few months it has run several hundred dollars behind. A number of the miners have been discharged, and the pumps taken up to No. Six.

"New Rocky Bar is about putting in a larger pump. Water has prevented much headway of late, but the mine looks well.

"The Round Mountain gravel mine has its tunnel in 400 feet, and has pay gravel in large quantity on the dump, ready for washing. They are working about a dozen men, and as the gravel is easily mined, about eighty car-loads per day are taken out.

"The hoisting works and new pump of the Iron Clad mine, Rough and Ready, are expected to be ready to start up in three weeks.

"A Derbec clean-up—the fourteenth, and said to be the most satisfactory yet—has been made.

"The Mammoth quartz ledge, south of Smartsville, is being prospected with good results.

"The Gold Hill Mining Company has determined to resume operations on or before the 1st of May.

"The machinery on the Knight of Malta claim is being put in place as rapidly as possible, and it is expected to start up soon. The first work in order will be the pumping out of the shaft, which is 95 feet in depth.

"The South Yuba Canal Company's ditches are now all in good condition for the first time this season.

"The machinery being put up on the Iron Clad mine, near Rough and Ready, is from the Montana mine at Colfax.

"About 60 tons of ore per week are extracted from the Deadwood mine by the lessees. There are some 350 tons of fine-looking ore on the dump. The mill is running night and day."

COLORADO.

A sale of two properties at Leadville for \$275,000 is reported; particulars not yet given.

The prospects at Galena City, on Oak Creek, near Silver Cliff, are very good, the assays ranging from 25 ounces to 96 ounces silver per ton, and some assays go into the thousands.

A correspondent of the Denver Tribune says that the snow is rapidly disappearing at Ten-Mile. The roads are very bad, and freight rates from Leadville are from 3 to 5 cents per pound. The Chelsea Beach mine has opened a fine body of galena and carbonates at a depth of 45 feet. The ore is said to carry 150 ounces silver. Two or three fine showings of galena are now opened on the mountain side between the Wheel of Fortune mine and the Robinson camp. Some very promising strikes are said to have been made below and opposite Kokomo.

The Boulder News quotes the opinion of Representative Evans on Silver Cliff. He says there are seven or eight paying mines there. He thinks it a good camp, but that there is nothing there to justify a great excitement.

From the Georgetown Miner of April 5th we glean the following relative to mines on Seaton Hill: "Forty sacks of ore, taken out of the Telephone in going to a depth of 15 feet, gave in the mill 8.4 ounces of silver and one ounce of gold per ton. The Kangaroo is down 175 feet. A drift from the 130-foot station has been driven 30 feet west in ore 8 to 8 inches wide, averaging \$140 per ton. The Tropic mine is down 172 feet. Levels have been driven at a depth of 105 and 160 feet. The first level is 300 feet east of the shaft and 150 feet west, and the second level has been driven 150 to 200 feet east and over 100 feet west. The vein is from 4 to 24 inches wide, and carries from 125 to 200 ounces of silver and one ounce of gold." Of the mines in Dry Gulch, the same paper says: "The Nonpareil is being worked by lessees. One party has a shaft down 60 feet, with six-

inch vein at the bottom, giving high assays. Explorations have been started on the Princess lode."

The *Miner* says that the Freeland mine is employing about 50 men. There are nearly 5000 tons of about \$30 ore on the several dumps.

THE DUNDERBERG AND SUB-TREASURE LODES.

We are indebted to the *Georgetown Courier* of the 10th inst. for the following: "Dunderberg mine continues to improve with developments. The ore-vein has increased both in quantity and quality on both sides of the shaft in the lower workings, as the level has been driven east and west. On the tunnel level, which is now 100 feet east of the discovery shaft, a fine body of high-grade ore, averaging about seven inches in thickness, is exposed in the breast and stope. The last run of ore, driven into one class, gave a return of 250 ounces.

"At the Sub-Treasure, work is going forward at sinking the main shaft, it being now about 90 feet deep, but another 40 feet will be sunk before another level is started. These workings show ore of varying quality in all portions of the mine. In the upper workings it has chiefly been a lead ore carrying 60 to 70 ounces in silver, but the shaft shows that the probability is that a higher grade will be encountered in depth, as there is now a vein in the bottom of it composed of galena carrying a large percentage of gray copper, from four to five inches thick. None of it has yet been milled, but assays show that it is of a quality similar to that of the Dunderberg.

"The workings on the Silver Chain property are confined to a drift run east from the Sub-Treasure shaft by the lessees, which is now in about fifty feet. The workings show a vein of solid galena ore carrying considerable gray copper, from ten to eighteen inches thick, that gave at the last run 290 ounces in silver and 40 per cent in lead in the first class, and 70 ounces in silver in the second class. Work at present is confined to the stope, but it will soon be resumed at drifting, it being the intention of the lessees to run ahead and make connection with the Frostburg, they having a lease upon that property also, which will greatly facilitate the working of that mine."

The *Denver Tribune* of April 11th says:

"The mine market has been quite active during the past few days. There have been several important sales, and outside of the real sales of importance there has been no little dickering over mining property which will doubtless bring forth fruit ere long."

It then quotes the sale of the Freeland mine near Idaho, at \$250,000 cash, to California and Nevada parties. Mr. George Roberts, who lately visited Leadville with the view of purchasing there, is said to have conducted the negotiations. Lieutenant-Governor Tabor has made a purchase in San Juan County of a group of mines, which will be put on the market at \$2,000,000.

The Robert E. Lee mine, on Fryer Hill, at Leadville, is said to have made a rich strike.

Ore and bullion are now carried from Leadville to Colorado Springs, the present terminus of the South Park road, for \$16 per ton.

DAKOTA.

THE BLACK HILLS.

We are indebted to the *Herald* of April 6th for the following notes:

"In the Father De Smet, the ore in the lower level is looking much better than that in either of the others, and the quartz now being reduced at the eighty-stamp mill is of a far higher grade than usual. The plans and specifications for the additional forty stamps at the mill have all been completed, and the work will be begun in a short time.

"The Cheyenne mine, under the management of Colonel Frisbie, is being rapidly developed, and the twenty-stamp mill kept constantly running. Ten additional stamps will soon be put in."

The *Pioneer* of April 5th says of this mine:

"The face of the ledge is striped, showing a breast of ore 121 feet wide. This is the width of the ledge. It is as true a fissure-vein as was ever seen, each wall being clearly defined. The east wall is of porphyry and the west of slate. Ore is being stripped from this face, and several teams are engaged in hauling it to the mill, a few hundred yards distant from the mine. Twenty-three men are working, and the mine looks very promising. The main tunnel, 75 feet below the upper workings, is 100 feet into the hill, running parallel with the ledge. A shaft from above, down 70 feet, will probably connect with the tunnel to-day. This shaft has a cross-cut at 32 feet from the surface for 21 feet, all in rich ore. The ore at present is not assorted, and is taken up with some waste; hence it is not a fair average of the value of the ore, but is giving satisfactory returns at the mill. Twenty-eight tons per day is crushed.

"The Durango mine, the first quartz mine patented in the Hills, lately had 100 tons of its ore milled, which gave a return of \$14 per ton. A similar run last fall returned a yield of \$19 per ton. This mine, situated on the hill back of Lead City gives promise of being a very valuable property. It is probably the same vein of ore encountered in the Cheyenne and Hoodlebug mines, as the same wall of porphyry is readily traced on the east side of these mines. The present work is confined to a tunnel, started for the purpose of tapping the old tunnel and drifts to drain the mine. The old tunnel is in 110 feet in ore. At the face of the tunnel a large chamber has been excavated, the sides, top, and bottom showing a solid front of ore. The gold generally is coarse, and in nuggets. A road is now being built from the mine down to Main street, Lead City.

"In the Roderick Dhu mine a very rich strike has been made in the face of the tunnel, showing a body of rich ore, with free gold in many places.

"Twenty men are at work in the Great Eastern mine, mining twenty-five tons of ore per day, at an average value of \$9 per ton.

"At the Fairview mine, located at the head of Hidden Treasure Gulch, a tunnel is being driven which crosses one pay-streak of very rich ore. It is about fifteen feet wide, and pays \$25 per ton. This company has its location in the right direction, and can run a tunnel through the mountain, or quarry out and strip the whole of the surface; for it will all mill \$5 or more from the grass-roots down. The company has another location called the Great Western, which bisects the Fairview, and is parallel with the Aurora and Hidden Treasure mines.

"Sixty-five stamps are at work regularly on ore from the Goldfinch mine, which, along with the Aurora, will be incorporated and stocked under the name of the Aurora Gold Mining Company. The gold is very fine all through the ore, but there seems to be plenty of it and easy to mill.

"At the Homestake mine, every thing is running smoothly. One new feature, novel in its relation to mine working in the hills, is the steam-engine, now *en route*, for the track which is laid from the mine to the mill. Its weight is 10,000 lbs., and will be run on T rails to transport trains of cars freighted with ore. It will be a rather singular procedure to see a steam-engine traversing the various tunnels in the mountain.

"The March clean-up from the Homestake Company's property was nearly \$103,000. About 9000 tons of ore were crushed.

"The Cheyenne *Stm* is jubilant over the discovery of copper near Granite Cañon. Professor Murphy, assayer, has examined specimens of the ore taken out a few feet below the surface, and pronounces it rich. It assays \$60 per ton, and yields 30 per cent of first-class copper."

THE SILVER DEPOSITS OF THE HILLS.

The *Pioneer* says:

"It is now three years since silver ore was discovered in Bear Butte. It is found as a carbonate, a chloride, and a sulphuret. The chloride and the sulphuret prevail. The sulphuret, a sulphuret of lead and silver, on El Refugio Mountain; the chloride, on Horn-Silver Mountain. Both mountains are in close proximity, being divided by a narrow cañon. The El Refugio mines have unfortunately been involved in litigation for two years; hence developments have been estopped.

"Horn-Silver Hill has been largely developed, so much so that the Florence mine is to-day considered very promising.

"Horn-Silver Mountain is about one and one quarter miles in length, east and west, and three quarters of a mile wide. The formation is granite and porphyry, capped with quartzite and limestone. There are a number of silver lodes discovered, the trend of the veins being northeast and southwest. The Florence mine is the great attraction of Bear Butte. It is extensively developed. A tunnel 550 feet in length enters the mountain from the southwest. Rich chloride ore was discovered outcropping through the surface in the form of a 'pipe' or 'chute.' The entry was made on this outcrop, and, for 550 feet, ore has been followed continuously. Never for an hour had the workmen been in ground barren of ore. Occasionally large chambers would be found containing chloride assaying away up in the thousands. Vugs or cavities at intervals extend long distances on either side, and produce much rich ore. At a distance of 450 feet from the face of the tunnel a cross-cut extending through the north wall 25 feet discloses a rich ore-body. In the face of the main tunnel is to be seen a vein of solid ore eight feet in width, four feet of which averages about 50 ounces of silver to the ton. The remaining four feet is exceedingly rich, being a mass of horn-silver."

NEVADA.

THE COMSTOCK.

From the *Gold Hill News* of the 9th inst. we condense the following:

"The development in the Sierra Nevada mine is none the less important because of its want of great effects upon the market.

"In the incline a very rich stringer of ore has been encountered. This rock is largely gold-bearing, but shows some rich sulphurets and what appears to be ruby silver. The pitch of this stringer is greater than that of the incline, and hence has been intersected by it. It is supposed to be a feeder of the main ledge, which has been left to the west by the greater slant of the incline. The work of grading and timbering the drift, 2200 level, connecting the incline and east shaft, is progressing well. There remain some 400 feet to receive attention. The east shaft will be ready to receive its pumps and tanks next week.

The situation in the mines where activity prevails is increasing in interest. Ophir and the C. & C. shaft are sumping preparatory to starting off in new lines on new levels; Consolidated Virginia has completed repairs to its shaft, and has commenced western explorations on the 850 level; Curry is bulkheading for removal; the water mines are waiting, to be sure, but with a hope, a purpose, and a prospect right before them; next south and on to the Yellow Jacket prospecting is eagerly prosecuted; Belcher is cross-cutting and Crown Point is getting ready for it; Overman and Caledonia are taking breath, while the Forman shaft is going to the relief of their lower levels; Alta and Justice are moving confidently and assuredly toward objective points, and there is nothing discouraging anywhere on the Comstock.

"The joint west drift, 2150 level, from the C. & C. shaft of the California mine is in 370 feet. Cross-cut No. 1, west on this level, showed indications of water and has been discontinued till a diamond drill can be sent ahead to test the ground. The C. & C. shaft has reached the 2350 level. The station will not be opened till a sump 40 feet in depth has been made."

THE SUTRO TUNNEL.

The work of preparation for cutting out the sub-drain of the Sutro Tunnel is being prosecuted with all diligence, and recently 100 men were set at work moving the car track to the north side of the tunnel in order to give room for blasting out the drain on the south side. It is expected that by next Monday the track will be thus shifted and a flume put in to carry the water naturally flowing through the tunnel, and thereafter work will be commenced with three shifts of 300 men each. The sub-drain will reach from the south side of the tunnel to the center, and contain two boxes, each 18 by 24 inches in the clear, to be made of three-inch stuff. If one gives out, the other will carry off the water. New timbers will be put in on the south side of the tunnel, 12 feet long, reaching to the bottom of the sub-drain. Cars are being constructed for use in carrying the men to and fro at change of shifts, and for carrying out 1000 tons of *débris* per day.

It is anticipated to have the drain completed by the first of June. Most of the workmen will go in at the mouth of the tunnel; but as the work progresses, a larger proportion will go down through the Savage and Julia shafts.

After the lateral drifts north and south are completed, Mr. Sutro intends making arrangements to commence working the vast areas of low-grade ore known to exist everywhere along the Comstock.

THE EUREKA MINES.

From the *Ruby Hill Mining Report* we take the following:

"The Geddes & Bertrand mine is now worked under a lease. The main shaft is down 320 feet: 20 feet above this point a level was opened and the drift is in 200 feet. The formation encountered is blue quartz, and pockets of rich ore are frequently opened up. On the 75 level the drift is in 50 feet, and a winze driven down near the face has reached a depth of 20 feet. Some fine ore is being extracted from this winze; in fact, it is the best taken out of the mine in many years. A shipment of 22 tons will take place in a few days, which it is thought will average \$250 to the ton. There is some water in the bottom of the shaft.

"In the Silver Gate Consolidated there are four claims. The main incline has reached a depth of 120 feet, with a very pretty ledge in the bottom. The vein, which was followed all the way down, at the widest part was 3 feet, but averages 2 feet in width. There are 30 tons of very fine ore on the dump, assays from which run \$165, \$245, and \$967 per ton.

"The stopes above the intermediate drift in the Hamburg mine show a material improvement during the week, and are yielding ore of extra good quality. West cross-cut, 600 level, advanced 22 feet, a total of 240 feet, with face in iron and stained lime; south drift from west cross-cut gained 11 feet, a total of 155 feet. A seam of good ore about a foot wide was cut; the entire drift is in iron mixed with small bunches of ore. The drift from the 700 level is now in 40 feet, with face in hard lime. All the machinery is in first-class condition, and working well."

The Hidden Treasure shaft is down 140 feet in good ore. The Hodgdon was the first claim located in Secret Cañon and over \$30,000 were taken out within 15 feet of the surface. There are three shafts sunk, one 230, one 170, and the other 75 feet.

The Brick Top, Blue Ruin, Silver King, and Connelly are all looking well, and yielding limited amounts of rich ore.

NEW MEXICO.

A correspondent writing to the *Denver Tribune*, under date of Santa Fé, New Mexico, April 5th, 1879, says:

"The Cerrillos mining excitement continues, and claims are being staked daily. Two camps have been organized and work is being pushed in each, for the purpose of ascertaining the character of ore below the surface. Thus far, depth assays show a rapid increase in richness. Confidence in the permanence of the camps is now established, and propositions are now being discussed for the erection of reduction works at an early day. It is proposed by the business men of Santa Fé to organize a stock company with \$25,000 capital, and put in reduction works immediately. I am told that an excellent quality of fire-clay abounds in the new mineral fields, as well as coal and iron of superior grades."

UTAH.

SILVER REEF.

From the *Miner* of the 9th inst. we condense the following:

"The mining outlook of this district is very encouraging, and with one excep-

tion there is not a company operating in this vicinity that is not making more or less money. The March Bullion product of the Stormont mill, which operates on Stormont and Last Chance ore, was upward of \$50,000. The Christy mill, running on ore extracted from the California, Tecumseh, and Maggie mines, yielded \$90,000, a remarkable feat when it is considered that five stamps do all the crushing. The Barbee mill is in constant operation, and is using up an immense amount of ore, though the supply remains apparently undiminished. The Leeds mill, which is working but five of its ten stamps, is the only mill in the district not running to its full capacity. The mine itself is being actively prospected for richer ore with encouraging results, the ore-body showing signs of decided improvement. The extent of the vein is beyond all question, and if the ore will but improve a few dollars in assay value, the mine would soon resume its place among the first dividend-paying properties of the coast.

"The Buckeye is working a full complement of men who are extracting plenty of good ore. A 'gang' of five chloriders made together nearly five thousand dollars last month."

The Kenner is looking equally well. The incline shaft which dips into the hill at an angle of forty degrees is now down 130 feet, and prospecting is in active progress. Eighty feet from the top, on a four-foot vein of ore assaying from \$200 to \$700, stoping has just commenced, and within a few days a large body of ore will be ready for shipment.

The mining interests in the northern part of the territory are suffering severely from the depreciated price of lead, and capitalists are directing their attention to this section of the country for profitable investments. We offer the best possible inducements; for, aside from the unsurpassed richness of our mines, whose production is exclusively silver, we are entirely independent of lead fluctuations, silver being always marketable and uniform in its value. The prosperity of the Alta, Bingham, and Stockton mines is conditional upon high market prices for lead; and when that metal becomes reduced in value, those camps invariably suffer a relapse. As the ores of this district carry no lead, and as our profits are not eaten up by heavy freights on base bullion, our superior advantages must be obvious to all.

PROPOSALS.

For the benefit of many of our readers, we compile weekly such proposals and solicitations for contracts, etc., as may be of interest. The table indicates the character of proposals wanted, the full name and address of parties soliciting, and the latest date at which they will be received:

Table with 2 columns: Proposal description and Date. Includes items like 'Coal—1200 tons for Camden (N. J.) Water-Works; Henry B. Wilson, Water Department, Camden, N. J.' dated April 21, 1879.

Table of proposals and contracts. Includes 'Illuminating Floor-Tiling for U. S. Custom House and Post-Office, Chicago; John Fraser, Acting Supervising Architect, Treasury Department, Washington, D. C.' dated April 21, 1879.

Contract awarded.—Col. J. N. Macomb, Colonel of Engineers, U.S.A., has awarded the contract for removing 8800 cubic yards of sand and clay from the mouth of Salem Creek to the American Dredging Company, at 40 and 63 cents per cubic yard.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative statement for the week ending April 12th and years from January 1st:

Table showing coal production statistics for 1879 and 1878, categorized by region (Wyoming, Lehigh, Schuylkill, Sullivan) and total production. Columns include Tons of 2240 lbs., Week, and Year.

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

The increase of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania railroads, amounts to 61,243 tons, as compared with the corresponding period in 1878.

Belvidere Delaware Railroad Report for week ending April 12th:

Table showing coal shipment statistics for Belvidere Delaware Railroad for the week ending April 12th, 1879, compared with 1878.

Perth Amboy Business: Received for the week 20,628 tons; Shipped for the week 26,078 tons; On hand April 12th 148,592 tons.

The Production of Bituminous Coal for the week ending April 12th was as follows:

Table showing bituminous coal production for the week ending April 12th, categorized by region (Cumberland, Barclay, Broad Top, Clearfield, Snow Shoe, Tyrone) and total production.

Table showing coal production statistics for Allegheny Region, Pa., and West Penn. R. R. for the week ending March 14th.

Table showing the production of coke for the week ending March 14th, categorized by region (West Penn. R. R., Southwest Penn. R. R., Penn. & Westmoreland, Pittsburg, Penn. R. R., Allegheny Region).

THE COAL TRADE REVIEW.

NEW YORK, Friday Evening, April 18, 1879.

Anthracite.

Many dealers and consumers realize that at present prices coal is very cheap and is a good speculation, and are putting in stocks. From this cause there has been a liberal business, but not of sufficient proportions to strengthen prices. In fact, coal is being sold even lower than the average prices of the last Delaware & Hudson Canal Co.'s auction sale. Broken coal has been sold as low as \$2 per ton, f. o. b. There is no question that the prevailing prices entail a great loss; and as the companies have been steadily losing money for years, some of them must go into bankruptcy unless a change takes place very soon.

There has been a great deal of talk about a new combination during the past week. On Wall street you are gravely informed that "something very important is going on," while in many of the daily papers the eye has met the heading of "A Coal Combination." After diligent search, we have been unable to find even a trace of any thing doing in that direction. The following is a specimen of a press dispatch, it being one in last night's Graphic:

"PHILADELPHIA, April 17.—Charles Hartshorne, Vice-President of the Lehigh Valley Railroad, stated to-day that he thought there was a possibility of a coal combination being formed at a future date, but he could not affirm that any steps were being taken at present to effect that result. Whether the Lehigh Valley road would join any future combination it was impossible for him to say at present."

Nothing seems too wild or incredible to find a place in the daily papers. Suffice it to say, the rumors seem to be all started to help on a Wall-street game.

We publish elsewhere a letter which reviews the labor situation in the Wyoming Region, and sustains our views that there will be a scarcity of labor if a large output is called for.

The reduction of freights on the Lehigh Valley RR. gives the shippers by that route such advantages that they should be making a liberal profit, even at the present low prices of coal. The tolls from the mines

of the Lehigh and Mahanoy regions to Perth Amboy, probably average from \$1 to \$1.10 per ton.

The production of anthracite coal last week was 466,046 tons, as against 405,161 tons the previous week, and 368,346 tons the corresponding week of 1878. The total production from January 1st to April 12th was 5,598,225 tons, as compared with 3,416,331 tons for the like period of last year, showing an increase this year of 2,181,894 tons.

Bituminous.

There has been some business, but mostly at low prices. A contract with an Eastern iron concern for 8000 tons is reported. The prices at which some of the late contracts for Cumberland coal were made must certainly entail a loss on the producers. The very low prices of anthracite coal are very materially reducing the business in bituminous. Many who were using bituminous coal are now using anthracite, while others are waiting to see what will be the normal price of that coal.

Pittsburg.

April 17, 1879.

COAL.—Since the concession to the demand of the workmen a general resumption has taken place in the mines of the Monongahela—3 cents a bushel is the uniform price paid everywhere, except at the Saltsburg colliery belonging to the Messrs. Brown, where but 2 3/4 cts. is given, owing to constant employment and superior dwellings, conveniently situated, provided for the families of the miners. The production is now about 600,000 bushels daily, which will soon accumulate ample quantities ready for shipment on the first flood tide. The rivers have been rather too low the past ten days for coal-boat navigation; but a few small fleets have consequently been dispatched, and these mainly to meet contracts to supply coal for the manufacture of gas. The supereminent quality for this purpose of the Pittsburg coal is widely known—it not only yields bushel for bushel of coke to the coal used in the manufacture, but its product of gas is unsurpassed in quality and quantity. By some it is estimated that the coke product is 11 1/2 the number of bushels of coal; but the lacking 1/2 is usually consumed under the retorts; when other fuel is used and all the coke saved, it fully equals the coal in measured bushels. All the lower markets are fully supplied with West Virginia and Ohio coal, and prices, by the operations of those districts, are held down immovably to the low rates which have prevailed the past two years. By this system the business is carried on with very little profit to repay the incidental trouble, risks, and outlay. But cheap fuel is an inestimable blessing that can not be too widely diffused; and to be contributors to such a beneficent result of unprofitable business struggles, may alleviate in some degree the feeling of sadness usually produced by working for nothing. Prices remain steady under the compulsion of steadfast competition—quotations unchanged:

Table showing coal prices at Pittsburg and Cincinnati. Columns include Wholesale and Retail prices for different grades of coal.

leaves contains 2 4-7 bushels of 80 lbs. each, making about 200 lbs. Nine and two thirds of these barrels weigh a ton, within a small fraction.

COKE.—The strikers that mined the coal for the Connellsville coke manufacture have thought better of it and are returning to work in such numbers that it is confidently believed that all will be in the mines by Monday. No concession has been made to them, and their resumption is under the same wages they have been paid the past three or four years, by which they easily earn from \$1.75 to \$2 a day. The suspension has been productive of no special damage to the trade—consumers having had sufficient stocks on hand to bridge the lost time of manufacture—and it is presumed that the whole 3000 ovens will be ablaze soon enough to meet the demands of consumers, and that the great industry will immediately be in active progress. There having been no change in prices we quote as before—\$1.15 to \$1.30 per ton of 2000 lbs. on board cars at ovens.—American Manufacturer.

New York.

Wholesale Prices of Anthracite Coal Delivered f. o. b. at Tide Water Shipping Ports, per ton of 2240 lbs.

Table with columns for coal types (Lump, Steamer, Grate, Egg, Stove, Chestnut) and prices for various locations like Wyoming Coal, Lackawanna, and Schuylkill Coal.

* Fifty cents per ton additional for delivery in New York, and fifteen cents per ton additional for delivery at Weehawken.

† These prices are given by Whitney, McCreary & Kemmerer.

‡ On coal delivered f. o. b. at shipping wharf at Williamsburg, the current rate of harbor freight will be allowed from above prices.

§ F. o. b. at Weehawken, N. J., less 10 cents per ton commission.

Wholesale Prices of Bituminous Coal.

Table showing Domestic Gas Coals and Foreign Gas Coals with prices per ton of 2240 lbs. for various locations like Westmoreland and Newcastle-on-Tyne.

Retail Prices.

Table showing retail prices for anthracite coal delivered at different locations like Pitston and Lack.

THE IRON MARKET REVIEW.

NEW YORK, Friday Evening, April 18, 1879.

It now appears that Cumberland (England) hematite iron ores are being imported in large quantities into this country, at prices comparing favorably with Spanish ores. English steel rails are imported into this country, in spite of a duty of \$28 per ton; English, Spanish, and African iron ores are coming in in large quantities. Daniel J. Morrell, President of the Iron and Steel Association, has called a meeting of the iron and steel producers. What does it mean?

American Pig.—The past week has been a quiet one, without any sales worthy of particular mention.

We quote No. 1 Foundry iron at \$18@19; No. 2 Foundry, \$17, and Forge, \$15.75@16.50.

Scotch Pig.—We learn of no business of importance in this class of iron, and continue to quote Eglington at \$20; Coltness, \$22; Glengarnock, \$21@21.50.

Messrs. John E. Swan & Brothers, of Glasgow, under date of April 4th, report 90 furnaces in blast, against 91 a year previous. The quantity of iron in Connal & Co.'s stores increased 3325 shares during the week, and amounted to 237,177 tons. The shipments to March 29th amounted to 109,859 tons, an increase of 20,381 tons over those to same date in 1878. The imports of Middlesbrough pig-iron in the same comparison showed a falling off of 10,397 tons. No. 1 iron was quoted as follows: Gartsherrie, 47s. 3d.; Coltness, 50s.; Langloan, 49s.; Summerlee, 45s. 6d.; Carnbroe, 44s. 6d.; Glengarnock, 46s., and Eglington, 42s. 9d. Middlesbrough pig-iron f. o. b. Tees was quoted as follows: No. 1 Foundry, 38s. 3d.; No. 2, 36s. 9d.; No. 3, 34s. 9d.; No. 4, 34s. 3d. and No. 4 Forge, 33s. 9d.

Rails.—We learn of a sale of 500 tons of steel in this market and another of 600 tons of iron. There is a sale of from 5000 to 7000 tons of steel rails reported to have been made in the West. We quote steel rails at mills at \$43@44, and here at \$45@46. Iron rails are quoted at \$36@37 here.

Old Rails.—A sale of 500 tons is reported. We quote at \$21.

Wrought Scrap.—A sale of 500 tons on private terms is reported. We quote at \$24@25.

Our Baltimore correspondent writes, under date of April 14th:

"We have no material change to report in the iron market. The demand continues fair and prices are unchanged."

At Louisville the market is quiet and prices firm at last quotations.

The following, dated April 14th, is from Messrs. Card & Hoffer, of St Louis:

"The market for pig-iron is not active, though holders are firm in their views. A considerable quantity of old rails are being released by the laying of steel, and they have a very material effect upon mill irons, which have been scarce and firm. The general outlook is for good business at about present prices."

We quote as follows, terms cash:

Table listing prices for Charcoal Hot-Blast, Coking and Coal, and Cold Blast for various locations like Missouri, Southern, and Ohio.

Columbus advices, dated 15th inst., are as follows: "The demand for pig-iron the past week has been good. Consumers are buying in small lots, however, seeming willing to take their chances of any further advance being established, and hoping to see a concession from present prices. There are very light stocks of iron at the furnaces, and producers are quite hopeful as to being able to obtain better prices for pig-iron ere long. Prices are unchanged."

Philadelphia. April 17, 1879.

[Specially reported by JUSTICE COX, JR., & Co., Iron Merchants, 333 Walnut street, Philadelphia.]

Pig-Iron.—There is little new to report. The furnaces continue to sell about all the iron they can make at full quoted prices. No. 1 and Gray Forge being the scarcest, while No. 2 is more plentiful. The market can be quoted firm at \$18.50 to \$20 for No. 1, \$16.50 to \$18 for No. 2; \$16 to \$17.50 for Gray Forge, all Philadelphia.

Manufactured Iron.—The demand for bars continues, and full prices are maintained. Mills in this neighborhood have all they can do for some time to come, and only accept the small orders from old customers. Large orders will only be accepted for future delivery. In plate and tank, most mills have about all they can do; but prices rule unnecessarily low, as better prices could be got for the asking, as the demand is large, and consumers must have the iron. In skelp, large orders have been placed the past week, but at such prices that only one or two mills would accept them. We quote: Bars, 1 1/2 to 2c.; Plate and Tank, 2 1/2 to 6c.; Skelp, 1 1/2 to 2 1/2c. @ 2 1/2 lb.

Rails.—The demand for steel rails continues, and full prices are obtained for delivery in the next six months. Consumers are not disposed to place orders at present prices for long future delivery. In iron rails there is a good demand, and full prices can be obtained for standard quality, while rails of poor reputation are quite low. We quote steel \$43 to \$45; iron, \$34 to \$36 all at mills.

Old Rails.—The demand for spot rails continues, and full prices can be obtained for any lots that come to hand. We quote spot rails at \$22@22.50; lots for future delivery, \$21.50@22.

Muck Bars.—Good stock bars are in demand, at \$32 @ \$33, at Philadelphia. We quote, \$31.50@33.

Scrap.—The demand for wrought scrap is good, and full prices can be obtained for spot lots, which are scarce. We quote \$22 to \$24, Philadelphia. Cast scrap is quoted \$12 to \$16, Philadelphia.

FREIGHTS.

Coastwise Freights. Per ton of 2240 lbs.

Representing the latest actual charters to April 18th, 1879.

Table showing freight rates for various ports from Philadelphia and Baltimore, including locations like Baltimore, Bangor, Bath, Me., Boston, Mass., Bridgeport, Conn., Bristol, R. I., Brooklyn, Cambridge, Mass., Cambridgeport, Charleston, Charlestown, Chelsea, Danversport, Derby, East Cambridge, Easton, Md., Fall River, Fortress Monroe, Fredericksburg, Galveston, Georgetown, Gloucester, Hackensack, Hampton, Va., Hartford, Jersey City, Key West, Fla., Lynn, Marblehead, Medford, Middletown, Milton, Nantucket, Newbern, N. C., New Bedford, New Brunswick, New Castle, Del., Newburyport, New Haven, New London, Newport, New York, Newark, Norfolk, Va., Norwich, Norwalk, Conn., Pawtucket, Peekskill, Petersburg, Portland, Portsmouth, Va., Portsmouth, N. H., Providence, Richmond, Va., Rockland, Saco, Sag Harbor, Salem, Mass., Savannah, Somerset, St. John, N. B., Washington, Wilmington, Del.

* 1.30@1.37 1/2. † And discharging and towing. ‡ And discharging. § 3 cents per bridge extra. ¶ Alongside.

Ocean Freights.

Ocean Freights on coal, iron, etc., per ton of 2000 lbs. to and from foreign and domestic ports, for four weeks ending April 17th, 1879, are given below.

Table showing ocean freight rates with columns for Date, From, To, Cargo, and Rate. Includes entries for Mch. 21 Baltimore, 21 Port Johnson, 21 Black Rock, 21 Boothbay, 25 Philadelphia, 25 New York, 28 Callao, 28 Philadelphia, 28 Perth Amboy, 28 Perth Amboy, 28 Philadelphia, 28 Baltimore, 28 Baltimore, 28 Wood's Hole, Apr. 1 South Amboy, 1 Baltimore, 1 Ashley River, 1 Charleston, 1 Portland, 4 Philadelphia, 5 Baltimore, 8 Hoboken, 11 New York, 11 New York, 11 Elizabethport, 11 Norwalk, 11 South Amboy, 11 Boston, 15 South Amboy, 15 South Amboy, 15 Manhattanville.

* Phosphates. † Phosphate rock. ‡ Peruvian guano. § Old rails. ¶ Super-phosphates. ¶ \$1 per ton. ** 42s. 6d. †† \$1 f. o. b. †† \$8@10.

METALS.

NEW YORK, Friday Evening, April 18, 1879.

There has been no large business done in metals this week, although there is a good jobbing demand. Prices have shown but little weakness.

RECEIPTS OF METALS AT NEW YORK FOR THE THIRTEEN WEEKS ENDING APRIL 3D AND YEAR FROM JANUARY 1ST, 1879.

Table with columns for Mar. 13, Mar. 20, Mar. 27, Apr. 3, and Year from Jan. 1. Rows include Copper bbls, Copper boxes, Copper cakes, Lead pigs, Spelter pieces, and Quicksilver flasks.

Copper.—There is the same lack of animation in this article that has characterized it for some months. The business is only in the smallest way, at 15 1/2 @ 16c. The market has an abundance of stock, and is being artificially supported, awaiting large contracts from manufacturers and for export.

From London, under date of April 4th, we have received the following:

"A telegram of Reuter's in this morning's Times, announcing that war had been declared by Bolivia and Peru against Chili, caused quite an excitement in the market, and we note a further rise in bars of about 20s. per ton. Transactions of the day amount to fully 600 tons, from £57 1/2 to £58 1/2, cash; £58 to £58 1/2 for forward metals; both good ordinary and favorite brands selling at the above rates, as values rose so quickly that buyers took any thing they could get at what appeared to be reasonable figures, without stopping to discuss the question of marks. It is impossible to foretell the effect a war would have on the production in Chili, but the general impression appears to be that it would seriously curtail supplies from said quarter. Values close rather nominal, say for ordinary and favorite sorts. £58 @ £58 1/2; best, £58 1/2 @ £59; Wallaroo cake being quoted £64 1/2 @ £65 1/2; Burra, £63 1/2 @ £64 1/2; English rules £61 @ £62 for Tough; £63 @ £65 for Select; £66 @ £67 for India sheets; £67 @ £68 for other sheets."

STATISTICS OF COPPER.

Table with columns for April 1, March 1, February 1, 1879. Rows include Stock, Chili produce shipping and afloat per mail advices, Total, Chili produce chartered for per cable advices received up to date, and Australian produce afloat.

Tin.—Straits in London is quoted at £69 10s.; in Singapore, \$21.70, with exchange at 3s. 8 1/2 d. The shipments from the Straits to the United States were 50 tons by steam, and to Europe 220 tons. There has been no large business done here, although there has been a good jobbing demand. We quote Straits at 14 1/2 c.; L. & F., scarce and firm, at 15c.; Refined nominal at 15c.

Our advices from London, under date of April 4th, are as follows, of tin:

"A shade steadier; a moderate business, 68 1/2 c. cash, closing buyers thus."

TIN STATISTICS. 1879.

Table with columns for February 1, March 1, April 1. Rows include Foreign tin in London, Banca tin in Holland, hands in Company's, Billiton tin in Holland, Total, and Quantity of tin afloat for Europe.

Tin Plates.—Sales of from 2000 to 3000 boxes of coke tins, at \$5.20 @ \$5.25, are reported. There has been a fair jobbing business. We quote, in gold, per box, as follows: Charcoal, bright, 1/2 X, Melyn grade, \$6.25; Allaway grade, \$6.12 1/2; charcoal ternes, Allaway grade, \$5.75; coke, bright, B. V. grade, \$5.30 @ \$5.37 1/2; coke roofing, 14 x 20, \$5.

Messrs. Robert Crooks & Co., of Liverpool, under date of April 3d, say of tin and ternes plates:

"At date, as far as larger operations go, the market is a blank. All the lots that are being placed are either odd sizes or special parcels, for prompt shipment. Prices for coke tins show a break of from 6d. to 8d. off highest, but other sorts are little changed. If buyers hold back a little longer, we will have much lower figures for coke tin. Their power to affect charcoal tin is not so great, as in this description specifications have been pretty freely placed."

Lead.—The business reported has been entirely in a small way, at 3'05 @ 3'10c. For 100-ton lots no bet-

ter than 3c. can be quoted. The Eureka Company does not hold so firm a position as two months ago, yet it still refuses to dispose of its lead at prices which could be secured. Nevertheless the large stocks exist, and buyers know that they must ultimately come upon the market, and they are buying as little as possible. An effort has been made to dispose of a large quantity of lead in England. Although no bid was made for the lot, yet the replies indicated that a great concession would have to be made. Until the surplus is taken from the market, the outlook will be very discouraging.

The shipments of lead from London and Liverpool to China during March amounted to 2005 tons.

The lead production of Utah shows a falling off of 2,791,040 lbs. for the first three months of this year, as compared with the like period of 1878.

Spelter and Zinc.—The business in these is very quiet. Spelter is quoted at 4 1/2 @ 4 3/4 c. We continue to quote sheet zinc at 6 1/4 c.

Antimony is quiet and quoted at 11 1/2 @ 12c., according to brand.

THE BULLION MARKET.

NEW YORK, Friday Evening, April 18, 1879.

The market has been without a single feature of any moment the past week, and with very little variation. The late very active speculation in order for a rise, based on the expectation of a £10,000,000 loan (and which advanced the market the equivalent of 3 cents an ounce), has subsided, disappointing the East India banks and large private houses, on whose account large amounts of silver were purchased, and have now to be carried until an outlet can be found.

DAILY RANGE OF SILVER IN LONDON AND NEW YORK, PER OZ.

Table with columns for DATE, London Pence, N. Y. Cents, DATE, London Pence, N. Y. Cents. Rows for April 12, 13, 14, 15.

* Holiday. † Nominal. ‡ 49 3/4 @ 49 1/2.

BULLION SHIPMENTS.

We give below a statement showing the latest bullion shipments in addition to those announced in our issue of April 12th:

Table with columns for DATE, Name, Amount. Rows include April 2d Martin White, 3d Paradise Valley, 5th California, 5th Hillside, 7th Ophir, 3d Con. Virginia, 2d Northern Belle, 4th Alexander, 7th Bulwer.

The bullion yield of the following mines for March was as follows:

Table with columns for Mine Name, Amount. Rows include Raymond & Ely, Star, California, Grand Prize, Independence, Con. Virginia.

The Government Bullion Purchases.—A dispatch from Washington says that the Treasury Department has not lately purchased as much silver bullion as usual, because the amount of bullion on hand was in excess of the \$5,000,000 limit fixed by the act of February 28th, 1878, providing for the coinage of the standard silver dollar, added to the amount on hand at the passage of the act. The excess had gradually accumulated, and the purchases were made at very favorable rates, but it was deemed best to reduce the amount of coinage to the limit fixed by the laws, which has been done. Hereafter purchases will be made more freely from the silver-producing regions.

The Director of the Mint says the coinage of \$6,000,000 of silver bullion per month, proposed by Representative Buckner's bill, is not only beyond the present capacity of the mints, but largely in excess of the total production of the silver mines of the country, which is estimated at fifty millions annually.

In this connection we note the introduction of a number of bills at Washington designed to regulate our silver coinage. The bill of Judge Kelley, Representative from

Pennsylvania, appears to meet with the greatest favor, and, briefly stated, may be summed up as follows:

"It provides for retiring the trade-dollars and receiving them into standard silver dollars, and for the redemption of subsidiary coins. The bill prohibits the further coinage of the trade-dollar, and provides that for the period of twelve months after its passage trade-dollars shall be a legal tender for all debts and demands owing to the United States, and that when so received the trade-dollars shall be received into standard silver dollars. The second section provides that the Treasury shall redeem with legal-tender notes subsidiary silver coins when presented at the Treasury or any Sub-Treasury in sums of \$5, or any multiple thereof. Numerous complaints are received from the large cities in reference to the business inconveniences resulting from the discrimination against the trade-dollar and the absence of all means for the conversion of subsidiary coins, and it is likely that some such bill as that prepared by Judge Kelley will receive the affirmative action of both Houses."

Germany's Gold Coinage.—BERLIN, April 13.—In the next coinage gold crowns amounting to 50,000,000 marks will be struck.

The Mints of the United States.—Hon. Horatio C. Burchard, Director of Mints, returned on the 15th inst. from an extended tour of inspection of the United States Mints. He states that he found the Mint at New Orleans in excellent condition. The machinery was all new, and every thing presented a neat and pleasing appearance. This mint coined over \$100,000 in silver, during the month of March. There is a good local demand for the silver, the colored people seeking it as a convenient form in which to hoard their savings. Considerable quantities of Mexican dollars and bullion arrived from Mexico, and the Director thinks, when regular channels of trade are established, Mexico will send a great deal of her silver bullion to New Orleans.

The mint at Charlotte, N. C., was doing a small business, but the operations there were very satisfactory. Its maintenance he considers important to the development of the mineral resources of the locality. Mining interests in that state have received a new impetus, and the indications are that the production of gold in North Carolina will be materially increased. Northern capital to a considerable extent is being invested in mining enterprises there.

The yearly expenses of the Carson and San Francisco mints are as under:

Table with columns for Mint Name, Expense Category, Amount. Rows for San Francisco Mint and Carson Mint.

Total for San Francisco Mint: \$87,400.00

Total for Carson Mint: \$146,050.00

The bullion receipts from the Horn-Silver mine, by Warrick & Co., at terminus of Utah Southern Railroad, were for the dates annexed, as below:

Table with columns for DATE, Amount. Rows for April 3, 5, 7, 8.

The shipments were:

Table with columns for DATE, Amount. Rows for April 3, 5, 7, 8.

About 40 car-loads, or 420 tons, are on hand at York awaiting shipment, and an equal quantity is stacked at the Frisco smelter. This makes a total stock of 840 tons awaiting shipment. It is estimated that bullion has a value of \$200 per ton, giving a value to the present stock of \$168,000. All of this company's bullion is refined at the company's refinery at Chicago, the silver produced running 996 to 998 fine. Sample bricks can be seen at the company's office, 90 Broadway.

Table with columns for DATE, Amount. Rows for April 3, 5, 7, 8.

Shipments of base bullion for March, 2,651,381 lbs. two months, 5,810,194 lbs. Total, 8,461,575 lbs. Ore shipments for March reduced to lead, none. Two months, 778,160 lbs. Total shipments of lead for three months, 1879, 9,239,735 lbs. Same time for 1878, 12,030,775 lbs. Decrease in 1879, 2,791,040 lbs.

SALT LAKE ORE AND METAL MARKET.

SALT LAKE CITY, Utah, April 18, 1879. Argentiferous Lead (Base Bullion), \$28 per ton for lead; \$1.12 per ounce for silver; \$20 per ounce for gold. The quotations for silver are based upon the silver in the lead of 80 to 120 ounces per ton of 2000 lbs.

Mr. J. B. Meader, under date of April 12th, 1879, reports the following:

Table with columns for Category, Amount. Rows for Shipments of base bullion for March, two months, Total, Ore shipments for March reduced to lead, none, two months, Total shipments of lead for three months, 1879, Same time for 1878, Decrease in 1879.

COAL STOCKS.

Large table with columns for NAME OF COMPANY, Capital Stock, SHARES (No., Par Val., Last Dividend), Rate per ANNU. (Per cent), Quotations of New York stocks (Apr. 12, 14, 15, 16, 17, 18), SALES. Rows include Consol. Coal, Del. & N. E., D. L. & W. Ry., Lehigh C. & E. R., Lehigh V. R., Maryland Coal, N. J. C. & R., Penn. Coal, Penn. R. R., Ph. & R. R.

GENERAL MINING STOCKS. Dividend Paying Mines.

Table with columns: NAME AND LOCATION OF COMPANY, Feet on Vein, Capital Stock, SHARES (No., Par Val), ASSESSMENTS (Total levied to date, Date and amount per share of last), DIVIDENDS (Total paid to date, Last Dividend, Rate p. An), and HIGHEST AND LOWEST PRICES PER SHARE IN CURRENCY AT WHICH SALES WERE MADE (Apr. 12, Apr. 14, Apr. 15, Apr. 16, Apr. 17, Apr. 18). Rows include companies like Alps, Belcher, Bobtail, etc.

Non-Dividend Mines.

Table with columns: NAME AND LOCATION OF COMPANY, Feet on Vein, Capital Stock, SHARES (No., Par Val), ASSESSMENTS (Total levied to date, Date and amount per share of last), DIVIDENDS (Total paid to date, Last Dividend, Rate p. An), and HIGHEST AND LOWEST PRICES PER SHARE IN CURRENCY AT WHICH SALES WERE MADE (Apr. 12, Apr. 14, Apr. 15, Apr. 16, Apr. 17, Apr. 18). Rows include companies like Allouez, Alpha, Alta, Am. Flag, etc.

Total Assessment levied to date..... \$65,488,613

a. Gold, s. Silver, L. Lead, c. Copper. * Non-Assessable. Total Dividends paid to date..... \$164,126,830

Total Sales for the week..... \$34,206,

stocks, where the investor foolishly argues that but little can be lost, while a great deal may be gained.

A dispatch from the agent to the officers of the Trio Gold and Silver Mining Company, from Central City, received here to-day, says: "Have cut another crevice coming into Trio, two feet wide. Assays over \$100 per ton. Every thing looks very favorable."

The Secretary of the Plumas mine telegraphed today as follows:

"Mill running all right. Lowest level indications are favorable for ledge soon. Shaft developments in the mine are good. Every thing looks well."

Both mills (32 stamps) are running at the Green Mountain mine, California, and the managers expect to pay the first dividend under the new organization in May.

The production of the Homestake mill during 25 days in March was \$60,027.83.

The Black Hills Daily Pioneer of April 12th says of the Deadwood mine: "The surface workings are conducted upon a stupendous scale. Their location embodies two claims, thus giving nearly 400 feet in width for surface work. A breast of ore 300 feet wide by 150 feet high is shown. One hundred and eighty tons per day of this go to the mill without a shovelful being touched by hand." The same paper says of the Homestake: "The mine continues to look well at all points. In the lower level recent developments have disclosed a very rich strike of bonanza ore. The drift started north from the vertical shaft in the 100-foot level has been driven in 22 feet, all in solid ore. An average sample made from the face yesterday returned \$24 per ton."

The Colorado papers announce the arrival in that State of Senator Jones. Report says that he has gone to look at the Little Pittsburg consolidation at Leadville, with the view of identifying himself with the sale of the mine in the East.

REVIEW OF THE SAN FRANCISCO MARKET.

The San Francisco list still continues depressed; a very few exceptions being noted to a decline from the prices ruling a week ago. Assessments appear to be the order of the day, upward of \$600,000 being called on this account by Comstock mines alone, the list being as follows: Sierra Nevada, \$2 per share, amounting to \$290,000; Union Consolidated, \$1.50 per share, equal to \$150,000; Yellow Jacket, \$1 per share, equal to \$120,000; Best & Belcher, \$1, amounting to \$100,800, and Utah, \$2.50, amounting to \$50,000; the whole call aggregating \$620,800, which sum, properly expended, should carry forward an immense amount of developments. They may be levied in part for stock-jobbing purposes, however.

It is significant that these companies should bring these assessments so near together and almost immediately following the general arrangement with the Tunnel Company. It is somewhat suspicious.

Alta has been very steady during the week, and opens to-day at the same price recorded in our last. The joint Alta-Benton winze, which is three-compartment, has nearly reached the 1750 level. In the Benton mine north drift, the 1550 level of the Alta has penetrated the Benton grounds some 900 feet. A strong vein is reported.

Alpha has gradually declined during the business of the week and opens to-day at \$19.

Belcher has been fairly steady during the week. The main incline is 50 feet below the 2660 level. Assays from the cross-cut on the 2360 level average \$10.38 per ton. A cross-cut has also been started on the 2560 level.

Best & Belcher is one dollar lower. The drain tunnel at the Osbiston shaft is in 285 feet. This company has levied an assessment of \$1 per share.

Bullion shows no change, and there is nothing of special importance from the mine.

Belvidere and Black Hawk, Bodie mines, are looking very well. We have no quotations of these stocks, but the prices are well maintained on the San Francisco market.

Caledonia is lower. The works at the mine have been shut down, and raising the debris and sinking the winze below the 1600-foot level are being done through the Overman shaft.

Consolidated Imperial is barely maintained. This company's pumps are running again, and active operations are going forward in all parts of the mine.

Chollar opens at 5%, against 6% a week ago. At

the Combination shaft, the pumps have been stopped and a bulkhead placed at the connection of the Lighting drift, with the shaft of sufficient height to turn the water as it rises into the pipes running from the Hale & Norcross, thus conducting it to the shaft of that mine, where it is pumped to the surface.

Crown Point is steady. Preparations are being made to cross-cut on the 2500 level of this mine, which corresponds to the 2560 level of the Belcher.

The stock of the old bonanzas is well maintained, that of the California Company opening at the best

SAN FRANCISCO MINING STOCK QUOTATIONS.
Daily Range of Prices for the Week.

NAME OF COMPANY	CLOSING QUOTATIONS							Open- ing. April 18.
	April 11.	April 12.	April 14.	April 15.	April 16.	April 17.	April 18.	
Alpha.....	21 1/4	20 1/2	23	21	19 1/4	19 1/4	19	
Alta.....	5 1/8	5	5	5	5	5	5	
Argenta.....								
Bechtel.....								
Belcher.....	6	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	
Belle Isle.....								
Benton.....	10 1/2	15 1/2	16	16	16	15 1/2	15 1/4	
Best & Belcher.....	7 1/2	7 1/2	9	10	9 1/2	9	9	
Black Hawk.....								
Bodie.....	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	
Booker.....								
Bullion.....	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	
Bulwer.....								
Caledonia.....	2 1/4	2	2	2	2	2	1 3/4	
California.....	5 1/2	6	6	6	6	6 1/2	6 1/2	
Chollar.....	6 1/4	6 1/2	6 1/4	6 1/4	6	5 1/2	5 1/2	
Confidence.....			15 1/2	15 1/2	14	14		
Con. Imp.....					1 1/2	1.50	1.45	
Con. Va.....	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	
Crown Plat.....	5 1/2	5	4 1/2					
Endowment.....								
Eureka Con.....	10 1/2	17	10 1/4	10 1/4	16	15 1/2		
Exchequer.....	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	
Goodshaw.....								
Gould & Cur.....	8 1/2	8 1/4	8 1/2	8 1/2	7 1/4	8 1/2	8 1/2	
Grand Prize.....	3 1/4	3 1/2	3 1/4	3	3			
Hale & Nor.....	10 1/2	11 1/2	12	12 1/4	11 1/4	11 1/4	11 1/4	
Hamburg.....								
Homestake.....								
Hussey.....								
Indep'd nee.....								
Jackson.....								
Julia Con.....	3 1/2	4	4	3 1/2	3 1/2	3 1/2	3 1/2	
Justice.....	4	4	4 1/4	4 1/2	4	4 1/2	4 1/2	
Kentuck.....			4 1/2		4 1/2	4 1/2	4 1/2	
Kossuth.....								
Leopard.....								
Leviathan.....								
Manhattan.....								
McClinton.....								
Meadow Val.....								
Mexican.....	31	30	31	31 1/4	30 1/4	31 1/2	32	
Mono.....								
Navajo.....								
North Belle.....	10 1/2	9	8 1/2	8 1/2	8			
Ophir.....	23	22 1/4	24 1/4	24 1/4	2 1/2	25 1/4	26	
Orig. K. Y. S.....								
Overman.....	9 1/2	9 1/4	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	
P. Sheridan.....								
Potosi.....								
Ray & Ely.....	5	5 1/4	5 1/2	4 1/2	4 1/2	4	4	
Richer.....								
Savage.....	10 1/4	10 1/4	10 1/2	10 1/2	9 1/4	10	10	
Scorpion.....								
Seg. Belcher.....							28 1/2	
Sierra Nev.....	43	42 1/2	43 1/4	43 1/4	42 1/2	42	42	
Silver Hill.....			1 1/4	1 1/4	1 1/2		1	
Silver King.....								
Summit.....								
Tioga.....								
Tip Top.....								
Union Con.....	58 1/4	57 1/4	59	59 1/2	57	58	58 1/2	
Utah.....			15	14 1/2	14	14	14 1/2	
Ward.....								
Washoe Con.....								
Wells Fargo.....								
Yel. Jacket.....	16 1/2	15 1/2	16	16	15 1/2	15 1/2	15	

* Assessment \$2. † Assessment \$1. ‡ Assessed \$1. § Assessed \$2.50.

price of the week. The output of these companies continues at about the same satisfactory rate recently noted, and the most active operations are going forward in both mines.

Eureka Consolidated stock closed in San Francisco yesterday at \$15 1/2 per share, a decline of \$2 for the week. The dividend period of this company marked another reduction of \$1 per share in the amount, the March dividend being \$2 per share. It is given out in explanation of this that the necessity of prospecting for new ore-bodies exists, and that the mine is not played out by any means. With the payment of this last dividend this company will have disbursed nearly \$4,000,000 to its stockholders.

Gould & Curry is steady. This company is bulk-heading the 1800 and 1900 levels; when completed, it is proposed to abandon the incline to the floods.

Grand Prize is lower, the upper ore stopes in this mine continue to produce well and active work is being prosecuted on the lower levels. The De Frees mill started up on the 8th inst., with five stamps on chloride ore from this mine.

Hale & Norcross shows considerable improvement.

It is stated that this company and the Savage will not close down till the Suro tunnel is ready to receive their water. To prepare for that event it has been decided to prosecute dead-work that must be done sooner or later. The Julia 2000 level and the cross-cut therefrom keep the pumps busy, as well as the six-inch pipe running into the tunnel. The pipe is too small to carry off all the water.

Hamburg, a Eureka mine, is very sparingly dealt in on the San Francisco market, at about 50c. per share. Recent letters from the mine say that the stopes above the intermediate drift show improvement during the week, and are yielding ore of good quality.

Independence continues its shipments, and an improvement in the mine has been reported. No confirmatory proof of this has been received, however.

Julia is steady. The winze below the 1800 level of this mine is being continued down, and is in quartz of a favorable character.

Justice is lower. Some thirty-five tons of ore are being extracted daily from the recent surface discovery at the south end of the Justice ground. It is not known whether it will pay or not. The appearance of the cross-cuts on the 1300 level of this mine is reported as very favorable.

Kentuck shows an improvement.

Manhattan produced during the month of March 336 tons of ore, yielding \$75,968. The mine continues to look well, and yields satisfactorily.

Mexican and Ophir show decided advances in prices on the quotations ruling in our last. The joint Union winze from the 1600 level of the Mexican mine is making three feet per day toward this upraise, through favorable-looking vein porphyry, which carries some water and requires timbering. The yield of the Ophir mine from the 1900 and 2000 levels remains unchanged; the March product amounted to nearly \$100,000.

Overman is barely maintained. The O. & C. shaft is down 570 feet, and the winze below the 1600 level of the mine is being rapidly sunk.

Raymond & Ely is lower. March product amounted to over \$50,000 from 340 tons of ore. Mine is reported as looking well at all points, with prospects of increased product; there are now about 20 feet of water in the mine.

Savage is fairly maintained; the pumps are holding the water below the 2000 level. The incline is 100 feet on the slope below the 2300 level.

The new bonanzas show some improvement, the Union Consolidated stock advancing \$2 per share. The assessment levied by this latter company is the first call upon stockholders since April 10th—about a year ago—when an assessment of 25 cents per share was levied. It is stated that it is levied for the purpose of placing the company out of debt, with a good surplus in the treasury before consolidation with the North Consolidated Virginia takes place.

In the Sierra Nevada mine, a decided improvement is reported. The management of this company states that no cross-cut will be run on the 2200 level till the 2300 and 2400 levels are ready to be opened up, and then all three levels will be developed together.

ASSESSMENTS, with dates when delinquent: South Belvidere, 10c., May 10th; Red Cloud Con., 30c., May 13th; Tioga, 20c., May 8th; Union Con., \$1.50, May 5th; North Sierra Nevada, 5c., May 7th; Belmont, 30c., May 8th; Panther, 10c., May 7th; Mahoney (Sutter Creek), \$1, May 7th; Oro (Bodie), 5c. per share; South Utah, 10c.; Best & Belcher, \$1; Sierra Nevada, \$2; Utah, \$2.50; Yellow Jacket, \$1.

The Butte Hydraulic Mining Company has reduced its capital stock to \$20,000.

Copper and Silver Stocks.

Reported by WILSON W. FAY & Co., Brokers in Mining and Miscellaneous Stocks, Room 7, Traveller Building, 31 State street.

Boston, Thursday Evening, April 17, 1879.

The market on general stocks has been quite excited during the week, the mining stocks receiving their full share of attention, and principally outside the Board.

There is a great deal of interest manifested in these new stocks being placed on the market, they far superseding the old copper stocks in amount of transactions, and pushing themselves into prominence as speculative and investment stocks.

Calumet & Hecla has declared its dividend of \$5 per share, payable May 15th, and the stock has advanced to 177, and closes steady at that figure.

Copper Falls is quiet at 1 1/2 @ 1 3/4 (ass. paid), and 1 1/2 @ 1 1/2 (ass. unpaid).

Franklin is stronger, at 4 1/2 @ 5, and little stock on the market.

Osecola is still firm, at 1 1/2 @ 1 3/4, and no sales. Pewabic is quiet, at 5/8 @ 3/4.

Quincy is steady, at 1 1/2 @ 1 1/4, and sales at 1 1/4. Ridge is quiet and unchanged.

Duncan has been unusually quiet during the week, there being a small lot sold at 4 1/2, and closing steady at 4 @ 4 1/4.

International is also quiet, at 4 1/2 @ 5. Silver Islet has advanced and sold at 60, and closes firm at 59 @ 59 1/2.

Commonwealth Consolidated is in demand, at from 65 @ 75c., and will probably go higher.

Altar is much stronger, at \$2 bid, and 2 3/4 asked, and very little stock offering.

Malachite is steady, though a trifle weak, at 1 11-16 @ 1 3/4, there being more sellers than buyers.

Sullivan Silver is stronger, the stock that was offering having been taken off the market, and closes \$8 bid and none offered.

There has been a new stock placed upon the market, under the name of the Mass. & New Mexico Mining Company, by some of the most respected men in the city, and is being rapidly placed at \$2 per share.

The Pittsburg & Boston Mining Company, for many years one of the most prominent corporations on the lake, and under whose management the Cliff mine passed through its halcyon days as a producing and dividend-paying industry, has settled up its affairs and declared a dividend amounting to \$1.93 per share.

Pewabic Copper Mining Co.'s Annual Report.—The annual meeting of this company was held on the 26th of March. We condense from the report the following:

"The directors stated that nearly all the ground in the Cliff Pewabic mine is now worked out, and consequently only a short time longer can any product be taken therefrom that will pay the cost of mining, milling, etc.

"We have, therefore, to resort to our Concord mine for a further supply of mining ground, or to the purchase of some adjoining land of other parties, and in either case, a further outlay of capital would be required.

A purchase at a reasonable price might be desirable; but all negotiations in that direction have been unavailing, and our plans must now be made for more extensive operations on the Concord if we wish or intend to keep our mill supplied with ore.

"The mill, for want of ore, has been idle since the close of navigation, but will be started up about the first of April, and run long enough to stamp what ore has accumulated during this time, which will take but a short time to do."

The agent says with reference to operations in the Concord mine:

"We have extended the 5th level north of No. 3 shaft 97 feet; it is now opened from the shaft 222 feet. The ground from time to time was found to contain some very good bunches of copper, but, on the whole, not enough, with the present prices of copper, to pay a profit.

"All the ground that would pay to stope has been removed except a small piece in the bottom of the 4th level, which is now being stowed by two men.

"We have rock enough broken in the mine to keep us hoisting ten hours per day for about two months; after which, if there is no money furnished to open up the mine, we shall be compelled to abandon it.

"It is with the utmost regret that I have to state that, for the want of territory in the Pewabic to work in and money to open up the Concord with, our prospects for the future are extremely unfavorable, unless more territory or funds are provided."

The following is a statement of the financial condition of the company on January 1st, 1879:

Table with 2 columns: Item and Amount. Includes Cash on hand (\$5,883.36), Copper on hand (29,927.55), Supplies at mine (10,462.44), Cash at mine (741.19), Total (\$47,014.54).

Table with 2 columns: Item and Amount. Includes Drafts outstanding (\$4,431.11), Bills payable (19,500.00), Liabilities at mine (6,982.19), Total (\$30,893.30).

Table with 2 columns: Item and Amount. Includes Balance assets (\$16,121.24).

Minnesota Copper Mining Company's Annual Report.—We take from the recently published report, covering the operations of this company during the past year, the following:

"The directors say: We have to report, as the result of the business of the company for 1878, a largely-increased production of copper over the previous year, but without much corresponding benefit to the company, in view of the very low price at which copper has been and is now selling.

It is, however, a matter of congratulation that the ground at the disposal of our tributors continues to show undiminished resources, and the present year's working will probably result in as good returns of mineral as the one now under review, provided we are enabled to retain our men, whose earnings are naturally diminished by the very low market price of copper they help to produce."

The product of the mine for the year is given in the following:

The product of the mine, in mineral for the year 1878, was 241,549 lbs. yielding in ingots 175,027 lbs. and in cash \$28,730.22

The estimated product of mineral for November and December, 1878, is 43,453 lbs. of which 11,453 lbs. have been bought of the tributors at a cost of 740.12

COST OF PRODUCTION.

Table with 2 columns: Item and Amount. Includes Balance—mineral at mine, December 31st, 1877 (\$470.90), Wages, amounts paid tributors, surface labor, salaries at mine, powder, wood (19,368.61), Transportation (1,673.52), Insurance (134.18), Commissions (143.47), Smelting (2,070.51), Taxes (1,446.40), Salaries (1,600.00), Office and general expenses (858.45).

Table with 2 columns: Item and Amount. Includes Total (\$27,766.04), Less profits on interest, rents, merchandise, farm, etc. (1,646.43).

Table with 2 columns: Item and Amount. Includes Profit on copper, 1878 (\$26,119.61), Total (\$29,470.34).

Table with 2 columns: Item and Amount. Includes The cost of South Bluff operations was (\$2,903.44).

Gas Stocks.

NEW YORK, Friday Evening, April 18, 1879.

The market is dull but strong, with very few stocks offering. Mutual, N. Y., has declined 3 per cent, as also Manhattan. With these two exceptions the list has advanced slightly.

Electric Lights in the New York Post-Office.—In accordance with an order from the Secretary of the Treasury, preparations are in progress in the basement of the Federal Building to introduce the electric light as a substitute for gas in the Post-Office. An electric light company has for some time been making arrangements for a test of its lights, in the hope that they will prove so satisfactory that they will be adopted for permanent use.

An engine and three electric machines have been placed in the cellar of the building, and three more machines are to be added. It is designed to put five of the lights on the Broadway side of the great room on the ground floor. As yet the tests of the light have been confined to the cellar, where its illuminating power was found to be extraordinary.

The gas bills of the Post-Office each year have, it is said, averaged \$33,000, and it is thought considerable saving will be effected by the adoption of electricity. Some of the officers fear that the innovation will prove injurious to the eye-sight of the employes, even when the intensity of the new light is subdued by globes, which are being manufactured expressly for the purpose.

Men Employed at the Gas Works in Philadelphia.—At the Philadelphia City Gas-Works, on the River Schuylkill, north of Market street, over 600 hands are employed at the present time, and they are nearly all working on full time. When the works are running at their fullest capacity over 700 hands are employed.

At the Point Breeze Gas-Works, 415 men are actively employed night and day, and that number has been engaged since the beginning of last month. When these works are running at their full capacity, over 500 men are kept at work.

The Twenty-fifth Ward Gas-Works are on the Delaware River, north of Venango street. These works are now running at their full capacity and 254 men are kept constantly at work. This is as large a number as has been employed at these works since their erect on.

The Twenty-first Ward Gas Works in Manhattan are now employing 31 hands, which is the full complement of workmen, and they are all making full time.

The Spring Garden Gas-Works, at Twenty-fifth and Calowhill streets, in the Fifteenth Ward, now employ 129 hands, who are making full time.

A dispatch dated London, April 13th, says that gas shares are well sustained.

Legislative Action on the Electric Light.—Mr. Hayes introduced a bill in the New York Legislature on the 16th inst., in relation to electric-light companies, giving them the same authority that is now possessed by gas companies. It allows companies now furnishing gas to use electricity instead, and to erect poles or lay tubes for wires after first gaining the consent of local authorities.

Some of the reporters on the daily papers have been interviewing Mr. Edison on the probable success of his light. Mr. Edison emphatically reaffirms that it is a success, and that he will demonstrate the fact to the world within two months.

Some consideration should certainly be given to Mr. Edison's promises, as he has heretofore fulfilled some of his apparently most wonderful statements.

Reduction in Price of Gas at St. Paul, Minn.—The price of gas, from April 1st, is \$4 per thousand, with the following discounts: \$20 or less, 15 per cent; from \$20 to \$100, 20 per cent; and from \$100 to \$200, 25 per cent. Provided always the bills are paid by the 10th of the ensuing month. No deductions made after the 10th.

The Boston Gas-Light Co. reduced the price of gas on April 1st to \$2 per 1000 ft.

Cleveland, O., is supplied at \$2 per thousand to private consumers, and \$1.25 to the public lights and buildings.

Marshalltown, Ia., has gas-works, but no street lamps. The company offers to put in posts and lamps for \$20 each, and light the lamps for \$25 each per annum.

AUCTION SALES: Metropolitan Gas-Light Co.—75 shares, at \$126 per share; \$2000 scrip bonds, at 101 1/2 per cent.

Harlem Gas-Light Co.—24 shares, at \$42 3/4 per share. Brooklyn Gas-Light Co.—18 shares, at \$140 1/2 per share.

Nassau Gas-Light Co.—110 shares, at 69 per share; \$275 scrip bonds, at 94 per cent.

Manhattan Gas-Light Co.—119 shares, at 188 @ 188 1/2 per share.

The following list of Companies in New York and vicinity is corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad street, New York:

Table with columns: COMPANIES IN NEW YORK AND VICINITY, Capital Stock, Par., Rate per ann., Div. of last, Date of last, Bid., As'd.

CALLON, J.—Lectures on Mining, delivered at the School of Mines, Paris. By J. Callon, Inspector-General of Mines. Translated at the Author's Request by C. Le Neve Foster, D.Sc., and W. Galloway, H. M. Inspector of Mines. In Three Volumes. London and Paris: 1876.

Vol. I, 8vo, cloth, pages 459; and Vol. I, Atlas of Plates, 4to, half bound, 40 plates. The two volumes, \$9.25. Address.

THE SCIENTIFIC PUBLISHING CO., P. O. Box 4404, 27 Park Place, New York.

FINANCIAL.

W. W. HANLY & CO., BANKERS AND BROKERS, 60 Broadway, New York. Buy and sell mining stocks on commission on New York Mining Stock Exchange, and offer superior facilities on San Francisco Exchanges through agency of the Bank of California.

VAN DEVENTER & PATTON, Successors to Ludlow Patton & Co., Bankers and Brokers, NO. 6 WALL STREET, NEW YORK. C. H. VAN DEVENTER, WILLIAM LUDLOW PATTON. Stocks, Bonds, Gold and Government Securities Bought and Sold on Commission. Loans negotiated. Interest allowed on deposits. Dividends and Interest Warrants collected and remitted.

C. T. YERKES, JR., & CO., Bankers and Brokers, 305 CHESTNUT STREET, PHILADELPHIA. Agents for the sale of the stock of the GREEN MOUNTAIN MINING COMPANY OF CALIFORNIA.

THE PLUMAS National Quartz Mining Co. of California. Business and Transfer Agency of Company, 54 Broad Street, N. Y., Room 8. Sole Agents for Sale of Stock. L. P. BAYNE & CO. 54 Broad Street, N. Y., Room 8.

PARKER HANDY, J. S. CRONISE. HANDY & CRONISE, BANKERS, AND DEALERS IN Bullion and Specie, 24 NASSAU ST., NEW YORK.

Dealing exclusively in GOLD AND SILVER BULLION AND COINS of all kinds, we are prepared to guarantee satisfaction to those who may intrust their business to us. We will make special arrangements with BANKERS and others dealing in GOLD DUST or in GOLD OR SILVER BARS, and will pay over to their correspondents here, as we may be directed, advances on Bullion when received or when the proceeds are ascertained.

We refer to: American Exchange Bank, The Third National Bank, Winslow, Lanier & Co., Eugene Kelly & Co., Eugene S. Ballin & Co.

W. H. ASHTON, P. DOYLE. ASHTON & DOYLE, Dealers in Gold and Silver Mines and Valuable MINERAL PROPERTIES, solicit correspondence for sale or purchase. 161 Broadway, New York.

LONE ELM MINING & SMELTING COMPANY. Manufacturers of the M. & S. JOPLIN EXTRA REFINED PIG-LEAD AND PURE OXIDE OF LEAD, JOPLIN, MO. E. R. MOFFET, Pres't. GEORGE A. CASE, Sec'y. BEHR & STEINER, AGENTS, NEW YORK.

\$10 to \$1000 invested in Wall Street Stocks makes fortunes every month. Book sent free explaining every thing. Address BAXTER & CO., Bankers, 17 Wall St., N. Y.

DIVIDENDS. OFFICE OF THE HOMESTAKE MINING COMPANY, No. 31 BROAD STREET, NEW YORK, April 14, 1879. DIVIDEND NO. 4. The regular monthly dividend of THIRTY CENTS per share has been declared for MARCH, payable at the office of the Transfer Agents, WELLS, FARGO & CO., 65 Broadway, on the 25th inst. Transfer-Books close on the 19th inst. H. B. PARSONS, Assistant Secretary.

LEHIGH UNIVERSITY.—TUITION FREE. Civil, Mechanical, and Mining Engineering; Chemistry and Metallurgy; Full Classical Instruction; French and German; English Literature; International and Constitutional Law; Psychology and Christian Evidences. For Registers address The Rev. JOHN M. LEAVITT, D.D., President, Bethlehem, Pa.

CHEYENNE GOLD MINING COMPANY

OF BLACK HILLS, DAKOTA TERRITORY.

MINE LOCATED IN THE GREAT MINERAL BELT NEAR DEADWOOD.

ORGANIZED UNDER THE LAWS OF THE STATE OF NEW YORK.

CAPITAL STOCK, \$1,000,000. PAR VALUE OF SHARES, \$5.

FOREVER UNASSESSABLE.

R. P. CORMACK, President | D. B. CANOL, Vice-President and General Manager,
R. McNAUGHT, Secretary | Deadwood, D. T.

This mine is situated in the heart of the Black Hills, and on the acknowledged richest gold belt on this continent, if not in the world.

The improvements on the mine consist of a shaft 36 feet deep, from which a drift has been run 21 feet, all in paying ore. On a level with the orifice of the shaft a drift has been driven 42 feet, with a northeasterly cross-cut 28 feet 7 inches, from where a back slope was run up to the grass roots, giving a breast of 31 feet 10 inches, and 37 feet wide. Eighty-five feet below the adit a tunnel has been commenced and run 66 feet, and will strike the ore-body at present disclosed at the bottom of the shaft 22 feet lower.

From this work 250 tons of ore have been milled as a test, the lowest being \$8.40, and highest \$25.60. The work thus accomplished shows at the lowest estimate 10,000 tons of ore in sight.

The Directors have set aside 50,000 shares of stock for the purchase of machinery.

ANNOUNCEMENT.—The 20,000 shares offered at \$1 having been all taken, 10,000 shares are now offered at \$1.50 per share until further notice. In this connection the Company begs to announce that it has purchased the Hoodlebug Mine, a property adjoining the Cheyenne, and of great proven value.

We respectfully invite the closest scrutiny and most searching investigation into the merits of this property.

R. P. CORMACK, President.

R. McNAUGHT, Secretary,
Office, 61 Broadway, Room 38, New York.

THE BUELL GOLD MINING CO., OF COLORADO,

To be organized under the laws of the State of New York, with a capital of \$500,000, divided into 100,000 shares of \$5 each, full paid and unassessable. 50,000 shares of said capital will be set aside to provide funds for the further development of the property, of which 40,000 shares are now offered to subscribers at \$1.25 per share.

On a Basis of \$125,000 for the Property, with \$50,000 Cash and 10,000 Shares in the Treasury.

There are 3000 feet on the Leavite, Kip, and Vasa lodes, all covered by United States Patents.

The improvements on the property consist of a 60-stamp mill complete, with an 80 horse-power engine for driving the same; also a 70 horse-power engine for hoisting and pumping, all in first-class condition, and inclosed in substantial stone buildings. The "Buell Mine" has produced nearly a million dollars in bullion, and is well known as one of the best gold mines in the State.

Subscriptions to the stock are received by R. H. RICKARD, No. 30 Pine street, New York.

ADVERTISERS' INDEX.

Clocks:	Seth Thomas, Thomaston, Conn. 1
Coal:	Berwind, White & Co., New York. xi Borda, Eugene (Koh-1 noor Coal), Phila. xi Borden & Lovell, New York. xi Consolidation Coal Co., Baltimore, Md. xi Coke Bros. & Co., New York. xi Cox & Boyce, New York. xi Heissenbuttel & Wells, New York. xi Hoboken Coal Co., Hoboken, N. J. xi Maryland Coal Co., New York. xi New Central Coal Co., New York. xi Philadelphia & Reading Coal & Iron Co. xi Swords, A. S. New York. xi
Coal Lands for Sale:	Henderson & Camp, Wilmington, Ill. vi
Contractors:	Blandy, H. & F., Zanesville, O. ii
Copper Dealers:	Baltimore Copper Co., Baltimore, Md. xii
Crucibles:	Frasse & Co., New York. v
Dividends:	Homestake Mining Co., New York. 289
Educational:	Royal Prussian Mining Academy, Claus- thal, Germany. 1
Emery Wheels:	New York Belting and Packing Co., N. Y. ii
Engineers and Chemists:	Bradt, W. H., Leadville, Colo. ix Hooker, W. A., New York. ix Hunt, Dr. T. Sterry, Montreal, Canada. ix Keyes, W. S., San Francisco, Cal. ix Porter, J. A., Eureka, Nev. ix Randolph, John C., New York. ix Rohrer, Chas. M., Reno, Nev. ix Rothwell, Richard P., New York. ix Stwolinski, F. de, Joplin. ix Wulsten, Carl, Rosita, Col. ix Wilson Bros. & Co., Philadelphia. ix
Engineers' Instruments:	Gurley, W. & L. E., Troy, N. Y. iv Heller & Brightly, Philadelphia. vi Kreuffel & Esser, New York. ix Woolman, G. S., New York. vi
Financial:	Baxter & Co., New York. 289
Fire Brick:	Maurer, Henry, New York. ii Ernst, Otto, South Amboy, N. J. ii
Gas Engines:	Otto's Silent, Philadelphia, Pa. —
Gas Process:	American Gas Fuel and Light Co., N. Y. i
Hoisting Machinery:	Crane Brothers Man'g Co., Chicago, Ill. x Griffith & Wedge, Zanesville, O. iii
Ice Machines:	Pictet Ice Co., New York. viii
Iron Works for Sale:	Bounton Iron Works, New York. ii
Locomotives:	Manchester Locomotive Works, Manches- ter N. H. xii
Machinery:	Blandy, H. & F., Zanesville, O. ii Pratt and Whitney Co., Hartford, Conn. iv
Metal Brokers:	White, Edward P., New York. ii
Mineral Wool:	Elbers, Alexander D., New York. iii
Mining Companies:	Buell Gold Mining Co., New York. viii Cheyenne Gold Mining Co., New York. viii Phumas National G. Mining Co., New York. 289
Mining Milling and Smelting Machinery:	Aitchison, R. & Co., Chicago, Ill. v Blake's Stone Breaker, New Haven, Conn. vi Copeland & Bacon, New York. xii Crane Bros. Mfg. Co., Chicago, Ill. x Fraser, Chalmers & Co., Chicago, Ill. iv Forster-Firmin G. & S. Amalgamating Co., Norristown, Pa. iii Griffith & Wedge, Zanesville, O. iii Morey & Sperry, New York. ii Wanted, a Second-Hand Blake Crusher. vi
Oils:	Leonard & Ellis, New York. v
Perforated Sheet Metals:	Aitchison, R. & Co., Chicago. v
Patents:	Lehman, F. A., Washington, D. C. i
Pig Lead:	Lone Elm Mining and Smelting Co., Jop- lin, Mo. 289
Photography:	Rockwood, George G., New York. i
Proposals:	Wanted, Proposals for New Zealand Steel Rails. vi
Pumps:	Cameron, A. S., New York. iii Clayton Steam Pump Works, Brooklyn, N. Y. i Crane Brothers Manuf'g Co., Chicago. i Deane Steam Pump Works, New York. iii Knowles Steam Pump Works, New York. i Worthington, H. R., New York. iii
Railroads and Transportation:	Colorado Central R.R. ix New York & Philadelphia New Line. ix Pennsylvania R.R. x
Rock Drills:	Am. Diamond Rock Boring Co., N. Y. xii Burling Rock Drill Co., Fitchburg, Mass. xii Ingersoll Rock Drill Co., New York. ii, xii National Drill & Compressor Co., New York. xii Penn. Diamond Drill Co., Pottsville, Pa. xii Rand Drill Co., New York. xii Sampson, Geo. H., Boston, Mass. xii
Roofing:	Hyndman, W. G., & Co., Cincinnati, O. vi Scaife, Wm. B., & Sons, Pittsburg, Pa. vi
Rope and Blocks:	Gilbert, Hubbard & Co., Chicago, Ill. ii
Safes and Seales:	Chicago Scale Co., Chicago, Ill. i Marvin Safe & Scale Co., New York. i
Saws:	Curtis & Co., St. Louis, Mo. vi
Smelting and Refining Works:	Forster-Firmin G. & S. Amalgamating Co., Norristown, Pa. iii Robertson, R. J., New York. ii Stetefeldt Furnace Co., San Francisco, Cal. i
Steam-Engines:	Blandy, H. & F., Zanesville, O. ii
Steam Fire-Engines:	Manchester Locomotive Works, Manches- ter, N. H. xii
Steel Works:	Crescent Steel Works, Pittsburg, Pa. v Park, Bro. & Co., Pittsburg, Pa. v Quincy, J. W., New York. —
Tackle Blocks:	Bagnall & Loud, Boston, Mass. xii
Taps and Dies:	Pratt & Whitney Co., Hartford, Conn. iv
Tramway:	American Wire-Rope Tramway Co., Phila. v
Valves:	Mohawk and Hudson Manufacturing Co., Waterford, N. Y. iii
Watchman's Time Detector:	Buerk, J. E., Boston, Mass. ii
Water Wheels:	Leffell, James, & Co., Springfield, O. iv
Wire Rope:	Chamson, H. & Co., Chicago, Ill. iv Copeland & Bacon, New York. xii Haigh, J. Lloyd, New York. i Hazard Mfg. Co., Wilkes-Barre, Pa. v Hubbard, Gilbert & Co., Chicago. ii Mason, John W. & Co., New York. i Roebing's, J. A., Sons Co., Trenton, N. J. iv

CONTINENTAL BOLT WORKS. B. SHUMWAY, BURGESS & CO.,

WE **O** CHICAGO,
MAKE **L** ILLINOIS,
T U. S. A.
EVERY DESCRIPTION
OF ROD, BOLT, AND BRIDGE-WORK.
ESTIMATES CHEERFULLY GIVE

THE ENGINEERING AND MINING JOURNAL Of New York.

Published Weekly. Splendidly Illustrated.

EDITORS:
RICHARD P. ROTHWELL, Mining and Civil Engineer.
ROSSITER W. RAYMOND, Ph.D., U. S. Commissioner
of Mining Statistics.
THE BEST

MINING AND METALLURGICAL PAPER IN THE WORLD.

Gives every thing new in
MINING, METALLURGY, ENGINEERING, GAS-MAKING,
ELECTRIC LIGHTING, AND IN SCIENCE
GENERALLY.

Combines the practical value of complete trade reports,
prices, etc, with the highest technical and scientific infor-
mation.

SUBSCRIPTION PRICE, including postage: U. S. and
Canada, \$4; Great Britain, 20 s; France and Belgium, 25
francs; Germany, 20 marks; South America, \$6. Remit-
tances should be made in Post-office orders or bank drafts
on New York. Specimen copies sent on receipt of 10c.

No. 27 Park Place, New York.

ICE at \$1.00 per Ton!

PICTET ARTIFICIAL ICE CO. (LT'D)

Room 51, Coal and Iron Exchange—P. O. Box 3083, N. Y.