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NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. Articles written by Mr. RAYMOND will be signed thus *

Business communications for the Western Department should be addressed to the Western Office at Denver, Colo.

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ERRATA.

See article on the Lowe Gas, on page 344—19 lines from bottom of second column—for "18·48 candles" read 13 48 candles.

On page 345—in article on the Gold Mines of Fauquier County, Va., in speaking of the Ellis mine, it was stated that the vein is developed for a length of "300 feet;" it should read 3,000 feet. It is also stated that a Frue Vanner is to be used. We are informed that the machine is a modification of the Frue, and is known as the Rogers & Healey Vanner.

THE UNSCIENTIFIC FEATURES OF THE INSTITUTE EXCURSIONS.

If anybody ever doubted that J. F. LEWIS, of Amenia, was a prince of good fellows, and at the same time the neatest, quietest, completest organizer that ever arranged, and carried smoothly through, a complicated series of excursions, certainly no one doubts it now. The hearty cheers with which Mr. LEWIS's name was repeatedly received by the enthusiastic members for whose comfort and entertainment he had so admirably provided, bore witness to one universal conviction on *that* head. If our friend desired (as we feel sure he does not desire) any other reward for his energetic and skillful labors than the hearty appreciation of his fellow-members, he might reflect with secret satisfaction that more than one observer of his extraordinary executive ability had privately "made a note" of him as a man to be relied upon.

The question asked by many members, when the place of meeting was announced, "Why do we go to Amenia?" was thoroughly answered by the excursions, which proved that the region chosen possessed two advantages in a high degree. It is full of attractions to mining engineers, metallurgists, geologists, and lovers of nature; and, on the other hand, it furnished to the Institute a field hitherto entirely untrodden. To many of the members individually, even, it was unknown before.

Even Mr. LEWIS, however, could scarcely have accomplished, at so short a notice, the arrangements for such a week of pleasure and profit, but for the cordial support which he received from the proprietors of mines, furnaces, railroads, and other enterprises. The resolution of thanks adopted by the Institute proves, by its length and warmth, the extent of the obligations thus incurred. A large share of credit should be given to Mr. A. L. HOLLEY, whose numerous relationships of blood and friendship in the region visited afforded a delightful basis of social intercourse. For everybody loves HOLLEY, and is ready to patronize with HOLLEY's friends—a general principle which, on this occasion, worked both ways, so that it would be difficult to say whether the Institute welcomed, or *was* welcomed. The affection for our ex-president, which was *universal* among the friends of his boyhood and the colleagues of his manhood, became *vice*-versal between the two classes. A vile pun, no doubt, but a fact!

To Gov. HOLLEY, in particular (whom we would call venerable, but that the phrase involves an unjust insinuation of age towards one who appeared as young as anybody), a special debt of gratitude is owed. Gov. HOLLEY's felicitous address, already given in our columns, was capped with a delightful reception at his hospitable mansion—and, O you fellows who missed that evening and the Saturday following, how will you ever know what you missed? Our feeble words may give you pain (We hope they will); but they cannot give you perfect knowledge. For it was then and there, and thereafter, that the ladies sailed in and took command of the fleet. Not unblest were we already in this respect. Some of the members, following the Wilkesbarre precedent, had brought their wives; and if called upon to entertain a great many attentive gentlemen at once be, as it is said to be, the high ambition of the fairer sex, certainly these ladies must have been satisfied. But they were too few in number to control all things completely. Their example will doubtless spread, however, and future meetings will enable every gallant member to be gracefully attentive to some other member's wife.

It may be imagined that an Institute thus tantalized with a mere taste of ladies' society received with ardor the charming surprise furnished by Gov. HOLLEY's reception, where the fair daughters of the land outshone in a moment all its other manifold attractions. We would not call names, since that might cause blushes; but there are several young engineers whom we might ask, if we would: "How is it that you, who devoted but fifteen minutes to an ore bed and ten to a blast furnace, found it necessary to spend a full hour in the study of a young lady?"

To a disinterested baldheaded observer, the farewells at Gov. HOLLEY's front door partook of the Byronic "if for ever" tone; for who could tell, in the present condition of the iron business, whether he would again visit these delightful places and meet once more the bewitching acquaintance of the evening? But the ladies, moved by divinest pity, and undeterred by lowering skies, turned out in mass for the early train; and all Saturday was but a sweet continuation of the dream of the night before. It is not often given to a man who has dreamed blissfully, and waked, to begin again just where he left off!

Fortunately for our readers, as we reach the point at which our pen refuses to do further injustice to the subject, we become possessor of a letter which treats it from an unexpected standpoint. Who wrote it, to whom it was written, and how we got hold of it, are secrets which we will never, never reveal. But every member of the Institute will feel sure (and will be therein as near the truth as any other) that it was written by the very person to whom, as he flatters himself, his assiduous attentions were not altogether disagreeable. To bury the secret completely, we remove date and signature. The following is the letter, exactly as we find it, with these slight exceptions:

"I do assure you, my dear, you made the *greatest mistake* in going off to Boston last week just because a lot of mining engineers were coming. They are not at all what you think. On the *contrary*—but I will tell you all about it.

"You see it was several days before we got a sight of them, although we kept hearing about them on every side of us, as if they had been an epidemic or an 'area' of weather. One day they broke out at Sharon and Wassaic; and of course (for they are human if they *are* mining engineers) they went to see the condensed milk factory, and made themselves sick by taking concentrated custard, or something of that kind. Another day we heard of them at Irondale and Copake, nosing round among the charcoal heaps and pig iron piles, and then starting off in wagons for Bashbish and Boston Corners, and climbing up to the top of Mount Everett. And after every escape of that kind, they would get together and solemnly read a lot of papers! By the time they came into our neighborhood, we were all *dying* of curiosity to see them. Even —— and —— and ——, who are Vassar graduates, you know, condescended to be interested, 'in a purely scientific way,' they said. 'Yes,' said I, 'you want to study the genus *Homo*, species *mining engineer;* that is what *you* want!' *Science* indeed!

"Well, my dear, it drizzled handsomely on Friday; but those creatures never seemed to mind it. Over at Ore Hill what did the entire company do but pile into ox-carts and go trundling and racing down in the rain and mud to the bottom of the Chatfield pit! On the road from the station, they say that Gov. HOLLEY drove a fast-trotting ox-team, that passed everything; and the Institute cheered him all along the line. We caught a glimpse of them at noon, marching up to the Miller House to dinner; and I was agreeably surprised to observe, in spite of overcoats and umbrellas, and trousers rolled up at the ankles, that they were mostly young and good-looking, and that some of them were *remarkably distingue*.

"But in the evening that *dear* Governor gave a reception; and we all went. What do you think? Two or three gentlemen apiece, the whole evening; and *so* attentive at the supper-table! As for conversation, it just flowed like the Housatonic—and not so deep, either, that we couldn't wade in with the rest. To be sure, if two of them happened together *without a lady*, they would fall a-talking *shop*, and look as if they liked it; but you should have seen, my dear, how quick and glad they were to drop it, if *one of us* looked that way.

"I will confess *to you* that I rather *wasted my opportunities* at first. How was a person to know any better? They all looked so young and behaved so prettily! I talked *my very best* with one for half an hour, and found out afterwards that he was *hopelessly engaged!* Another one, after making himself *most agreeable*, showed me the picture of his wife and four children! But there were plenty of them without any such drawbacks.

"I went home with my head in a whirl; but I think I may say that one gentleman of the party had produced *an impression* more *distinct* than the rest. Now you needn't *laugh;* such things *do happen*. But this would not have *amounted* to anything, but for that lovely excursion next day. We all went along, and where we went I couldn't tell. After visiting the Falls (where I was *most gallantly* escorted around the rocks, which, by the way, he says are micaceous limestone) I scarcely looked out of the car window until we got to Richmond. Once I did ask the gentleman with whom I was talking, where we were; and the audacious creature said that for *his* part, *he* was in Paradise!

"O my dear, I'm in such trouble! I have forgotton his name, there were so many of them, you know; and I don't like to advertise for him. I might describe him by his history; but I am afraid I have got even that a little mixed; it *does* seem too much for *one* man, and he so young! If I have it right, he was educated at Freiberg, Clausthal, Leoben, Berlin, Paris, London, Columbia College, and the Massachusetts Institute of Technology, and several other celebrated schools, after which he traveled all over the world, in the employ of foreign governments. Then he invented the Bessemer process, or something of that kind, made geological surveys of several States and Territories, called public attention to the waste of anthracite coal, got the International Prize for solving the question, *What is Steel?*—determined the consumption of heat in the blast furnace, bought a mine (which he says was easy), sold a mine (which he says was hard), accepted (or declined, I forget which) a position as Professor in a leading institution, and now he is engaged in an important research, which he is going to present in a *very long* paper at the next meeting of the Institute. I hope he will send me a copy, so that I can recall his name. Really, my dear, if I only knew which of them it was, I think *something might come of it!* Don't breathe *a word* of all this to anybody, but be prepared when you return to hear a good deal more, and to give me your *sympathy* and *advice*."

It is very evident from this letter that the fair writer is tenderly affected to-

wards the whole of the Institute; and our theory of the case is, that nearly every one of the members in turn has laid his homage at her shrine. She would have been hard hearted indeed to resist such a corporate wooing. When it is further considered that all the members were similarly devoted to every other one of the bright eyed band which graced that memorable Saturday, the inextricable confusion of sentiment which has resulted passes the power of analysis. One advantage, at least, this state of things presents. Even the married veterans of the Institute may, under such circumstances, join without impropriety (or danger of domestic dissatisfaction) in the toast which was received with so much enthusiasm at the bounteous table of the Richmond and Pomeroy Iron Companies—*To the Ladies of Berkshire and the Housatonic Valley!* *

THROUGH MONTANA.—No. 2.

Staff Correspondence of the Engineering and Mining Journal.

Helena, the capital of Montana, and its chief commercial center, lies at the mouth of Last Chance Gulch, a short stream which heads directly on the Continental divide, and after debouching from the mountains at Helena, winds through a broad park-like valley, uniting therein with Prickly Pear River.

The city is beautifully located, commanding a fine view to the eastward, and sheltered on the west by the limestone and foot-hills of the main range of the Sierra Madre, which, in Northern Montana, is quite narrow and seldom attains an altitude of over 10,000 feet. There is consequently easy communication between the east and west side of the divide, and it is an easy matter to keep well built roads open, even through the most rigorous winters. Helena, being the nearest town to the head of navigation on the Missouri, and having secured through the energy of its merchants the trade of the Territory, is likely to hold its commanding position even after Montana is reached by the Northern Pacific Railroad, which some have thought would throw the commercial center into one of the minor towns farther south, and nearer the head of the Missouri.

Since the flush days of 1864 and 1865 but little has been heard of Montana as a mining country. The districts which were made accessible by the Union and Central Pacific railroads have naturally attracted more attention and drawn to their development much capital. Yet this land on our northern border is scarcely inferior in mineral resources to any other locality in the West. The absence of rapid communication with the rest of the world is a serious obstacle to contend with, and must be remedied before rapid advance will be secured.

In journeying across the Territory from north to south, one notices a predominance of the older sedimentary rocks, mainly Silurian and Jurassic. Except directly at the center of upheavals, where the Azoic rocks are covered over by later formations, and as the Sierra Madre itself is in Montana a comparatively narrow range, and its spurs even less broad, the crystalline sedimentary rocks, generally highly metamorphosed, are encountered far up on the flanks of each divide, and in places completely covering the crest. These circumstances give a key to the general mineralogical character of the country. Veins lying wholly in granite, and having all the characteristics of true fissures, are not as abundant as in Colorado or California. Contact veins, having quartzite for one wall, are much more frequent; and the extensive erosion of the earlier metamorphosed sedimentary formations has produced, as is found to be the case elsewhere on the flanks of the Rocky Mountain chain, very extensive auriferous gravel deposits. It was these latter which drew attention first to the country, and consequently first merit attention.

Grasshopper Creek, one of the extreme head tributaries of the Missouri, was the scene of the first great gold excitement in Montana. The stream heads in Bald Mountain, a rather prominent offshoot from the main range. The first prospectors entered this gulch in the fall of 1862, and found gold in such quantities that before the close of the year $600,000 in dust had been taken out. The cañon is a broad, fine one, about sixteen miles in length from head to mouth, and contains the precious metal not only in its bed, but in the banks, bars, and dry tributaries. In the following year the first ditch was built. Its length was fifteen miles, and water was brought in it from the upper Beaverhead Valley. The population by that time had increased to 1,500 souls, but the discovery of Alder Gulch, in July, 1863, drew away most of the Bannack miners, whose claims were so located that the natural water of the creek was not sufficient for their workings, for the ditch just mentioned proved to be so expensive a luxury to the camp (its water was sold at seventy-five cents and one dollar per inch) that few could afford to use it. Nevertheless, about half a million in dust was washed from Grasshopper Creek in the summer of 1863, but as the season closed and general opinion seemed to indicate that the mines had been exhausted, the gulch was well nigh abandoned in the tremendous stampede to Virginia City. During the three years following, and while new and wonderful discoveries were being made in other parts of Montana, Bannack District was at a standstill, but in 1867 it began to revive. The Bannack Mining Company, founded upon a consolidation of a large number of smaller claims, began operations, and the Horse Prairie Creek Ditch, 30 miles in length, was completed. The latter enterprise brought an abundance of water on hitherto unapproachable ground, and better systems of mining with improved hydraulic machinery having been introduced, the bullion yield from Grasshopper Creek began once more to assume importance. From that day the fortunes of the gulch advanced. Attention was directed once more to the quartz veins which, as early as the winter of 1862 and 1863, had been found on the slopes of Bald Mountain at the head of the gulch. A rude wooden stamp mill had been built, and for a time run successfully on quartz from these mines in the summer of 1863, and in August, 1864, the first steam mill was in operation, but, as usual, these first adventures were in the main unprofitable and were quickly abandoned.

By 1870 the mining industry at Bannack had reached a firm foundation. About $400,000 annually was being taken out from the placers and quartz veins. In the former not much, if any, gain has been made in later years, though the available gravel deposits of the gulch are by no means exhausted. Quartz mining has, however, advanced steadily, and in 1872 the silver mines of the vicinity became of some note. The town of Argenta, a few miles away, on Rattlesnake Hill, grew to be as large nearly as Bannack, and became somewhat of a silver mining center, which position it holds to-day, though the older town being the county seat, is still the larger of the two. From the date of the discovery of gold in Grasshopper Creek up to the close of 1876, the yield of gold has been between four and five million dollars. There are now about twelve large companies operating at various points in the cañon, and the area of ground still untouched, or which may be reworked with profit, is very large. But no return to the flush times which characterized the first two years of the history of the town can be expected. A quarter of a million annually will be taken from Grasshopper Creek for many years to come, and meanwhile the quartz interests of the vicinity will be likely to advance to a commanding position.

ALDER GULCH—A TRUE "EL DORADO."

In the spring of 1863, a party of five miners from Bannack took the trail for the Yellowstone and Big Horn country, which for some time had been supposed to be rich in gold. Shortly after crossing the Madison on their way eastward, they encountered Indians, and were driven back across the spur west of the Madison, into the Valley of the Stinking Water. Following down this stream towards its junction with the Jefferson, they camped over night at the mouth of a narrow gorge coming in from the east. As usual, they prospected its bed, and to their intense gratification found exceedingly rich prospects. Stimulated by success, they pushed explorations next morning still further, and before the day was over had satisfied themselves that the new creek was richer than any yet found in the Territory. This was Alder Gulch, which proved the most productive mountain gorge for its length that has probably ever been found in any part of the world, and whose history, if it could be written, would present, perhaps, the wildest scenes of dissipation and lawlessness that could be found.

The Fairweather party (the discoverers) immediately located and staked out the richest ground they could find, and began washing, meeting with unprecedented success. For a time the discovery was kept a secret, but ultimately provisions had to be bought, and the trip made to Bannack for these resulted in the publication of the news. Instantly there was a tremendous rush to Alder. The gulch was invaded by thousands of the wildest and most untamed of the pioneers of those days. Prospecting disclosed the fact that it was rich from end to end, from the base of Old Baldy at its head far down into the valley of the Stinking Water. Every foot of ground was taken up, and much was claimed twice and three times, a circumstance which instantly necessitated a large graveyard and a coroner. With hardly an exception every claim in the cañon became almost immediately highly profitable. In twelve months a population of 15,000 had congregated there, and five miniature cities had sprung to life. During the summer of 1863 over six million dollars in dust, a yield almost incredible, had been taken from the bed of the creek, and in the spring of the following year the population had increased through emigration from all parts of the United States, both East and West, to nearly 20,000. Many claims yielded to their owners $100,000, and several doubled that amount. It can be easily imagined how wild must have been the days on that rugged stream, where fortunes were so plentiful, and where every attraction which the senses could call for were placed within reach of the miners so suddenly raised to affluence. The flush times at Washoe were child's play to these Alder Gulch days.

Of the five settlements strung along the narrow 17 miles of the gulch, Virginia, being the most centrally located, was the most prominent, and is to-day the only one inhabited. It is pleasantly located on the east bank of the creek, and for a number of years was the capital of the Territory. During the four years succeeding its discovery this cañon yielded the enormous amount of $35,000,000.

The geology of Alder Gulch is interesting in the extreme. At its head stands a ragged granite mountain, so steep that the soil finds but scanty foot hold on its slopes. It is cut and seamed in every direction with gold veins, whose outcrop may be distinctly traced by the eye for long distances. Following down the cañon the formation gradually passes into gneiss, and from that into quartzites, slates, and finally the more recent and unaltered sedimentary rocks. The gneiss, like the granite of "Old Baldy," is full of large and strong gold veins, which cross the gulch diagonally from side to side. Through these highly auriferous formations the waters of Alder Creek have been cutting their way for ages, and the frosts of winter have been at work on the steep slopes of the upper gulch, hurling down huge fragments of quartz for the stream below to grind to powder. Thus, a process of disintegration and concentration has gone on through the centuries, resulting finally in a vast deposition of the precious metal to an extent far beyond any precedent.

Of course the fame of Alder declined in time. Confederate, Last Chance, Blackfoot, Ophir, and other new discoveries drew away thousands. Its best days ended with 1867, and when the first attempts at quartz mining proved, through mismanagement and incompetency, to be abortive, the towns in the valley shrank rapidly in size. With this decrease of population came an era of law and order, and Virginia City, losing the palm to Helena, became the town we find it to-day, a moderately lively mountain camp of three or four thousand inhabitants, depending for its daily support on the crumbs of former days, vainly striving to sustain the dignity of the past, and anxiously awaiting for the capitalists who will have the means to collect the hundreds and thousands of small and now valueless (if worked separately) claims into a few large properties, and to bring in the much needed supply of water from the Madison or the head of the Stinking Water.

The thirty odd millions of dust which have come from this famous gulch may be considered as barely a quarter of what was in its bed at first. The opportunity for successful adventures in working the abandoned claims is very great, and has already been seized upon to some extent. Numerous attempts have been made also to work the gold veins so abundant in the gulch, and a moderate amount of success has been attained. The revival of active production in Alder is now only a question of a few years. The enormous figures of the early day will hardly be repeated, but as a mining district, presenting favorable and attractive inducements for capital, it is hardly to be surpassed. The great veins whose debris lined the bottom of the cañon with gold in the past contain still many times more than they have given up, and only wait to be worked in an intelligent manner, to begin pouring out once more their treasures.

The Fairweather party, who discovered the gulch, realized immensely from their claims, and threw away their gold in all forms of excess and dissipation, as was customary among the pioneers. William Fairweather, the leader of the party, a character in our national history, not unlike Comstock, the discoverer of the famous mines in Nevada, died, like the latter, in abject poverty, with few friends, and with scarce a shelter over his head. In both cases the discoverer was forgotten or lost in the fame of his discovery.

BICHEROUX'S GAS FURNACE SYSTEM.*

For several months past the Ougree Iron Company Limited, near Liege, have used Bicheroux's system applied to puddling furnaces. They have obtained such results that we thought it useful to communicate them without delay to our society. The apparatus consists of three distinct parts, as follows: (*a*) A gas producer, where only a small quantity of air is admitted through the grate for the production of carbonic oxide. (*b*) A mixing chamber, where this gas and air is collected by the natural draught, and where the combustion of the gas begins. (*c*) A furnace, or laboratory, where the combustion is nearly completed, and where the different reactions in the puddling takes place. The dimensions

* A paper read before the Liege Society of Engineers, by M. Raze, General Manager of Ougree Iron Company.—From the *Revue Universelle des Mines, etc.*

of each of these three parts vary with the composition of the different coals, and the system can be applied to all kinds of coal, even to such which, from being small and slaty, are not suitable for ordinary puddling. The gases and the air necessary for their combustion, being brought together at different temperatures, and having to be drawn into the mixing and combustion chamber by the same chimney, it is easily understood that the dimensions of their conduits must vary with each kind of coal, and the manner of bringing them together is not unimportant. Before the air arrives at the intermediate chamber, we let it circulate beneath the bottom of the furnace, and in the sides of the chamber itself, in such a way that we add to the advantage of heating the air, that of cooling such parts of the furnace which cannot be heated without injury. The gases which leave the furnace not completely burnt are utilized for the heating of the boilers as in ordinary furnaces. The management of the fire being so easy, we have, whilst diminishing the waste, increased the usual dimensions of the furnaces, and we have applied two working doors at opposite sides. The dimensions to be given the furnaces may vary considerably, according to the weight of the charges. All the results obtained in our works have been charges of 400 kil. (8 cwt.), and with dimensions of the producer suited to the Six-Bonniers coal, of which the gas content does not exceed 20 per cent. This arrangement allows of expediting the stirring and all the subsequent puddling operations. The advantages of this system consist: (1.) In the remarkable economy in fuel as regards the quantity as well as the quality. (2.) In the economy resulting from the diminution of waste, and consequently in the improvement of the quality of the products obtained. (3.) In the diminution of the costs of repairs. (4.) In the much smaller wear and tear of bars; and lastly, (5.) In the improvement of the conditions of the puddling. Taking up successively the advantages here enumerated, we will summarily show their importance.

1st.—Economy in Coal.—The puddling of ordinary white Ougree iron, which required with our ordinary furnaces 900 to 1,000 kil. (18 to 20 cwt.), is now done with less than 600 kil. (12 cwt.) per ton of puddled bars produced. The puddling of fine-grained iron, which required 1,300 or 1,500 kil. (26 or 30 cwt.) is now done with 800 kil. (16 cwt.). Such is the advantage with regard to the quantity of coal. As to the quality this gas-furnace system presents also a very marked advantage, as it does not require large coal (charbon roulant). The working is just as regular with small coal, even when screened through meshes of 20 millimeters (¾ in.). As to the composition of the coal, the quantity of the volatile matter is of course of great influence; we work with "Six-Bonniers" coal, containing little gas (18 to 20 per cent.), which gives us, however, good results. We have used with like success nearly all the coals of the Seraing basin, viz. Ougree, Cockerill, Esperance, Gosson, La Hayes, and Kessales. All have given us the same results as to the quantity; the consumption alone of coal per ton of iron has varied according as the proportion of rock being greater or less.

2d.—Economy in Waste and Improvement in Quality.—These two advantages result naturally from the almost complete non-admission of cool air, be it through the furnace door or through the grate; the latter being always covered by a pretty thick layer of fuel. The economy in waste amounts to 3 or 4 per cent., that is to say, with 100 kil. of puddled bars, the loss in the furnace is only 9 or 10 kil. instead of 13 or 15 kil., as we have had regularly heretofore. We think we shall diminish this waste considerably when experience shall have settled the best shape of certain parts of the furnace.

3d.—Diminution of the Cost of Repairs.—The two doors allowing an easy access to all the parts of the hearth, the fettling can be properly kept in order. Moreover, as the coal never comes in contact with the bridges, these resist much longer than those of the old furnaces. We work several weeks without making any repairs there.

4th.—Less Wear and Tear of Firebars.—The low temperature with which we work in the fireplace, and the quantity of clinkers which we can leave there without interfering with the working of the furnace, allow us to keep the grate always dark. The bars do not alter in the least. After five months' work, bars 40 or 45 millimeters square (1½ or 1¾ in.) have still retained their sharp edges.

5th.—Improvements of the Conditions of the Puddling.—With a uniform price per 100 kil. (2 cwt.) for all the furnaces the workmen working on gas furnaces can earn 25 to 30 per cent. more than those working in ordinary furnaces.

As general considerations with reference to the working of these furnaces, we add: That the room required for this furnace is smaller than for two small adjoined ordinary furnaces, the make of which does not exceed that of one gas furnace. That many castings of the old furnaces, amongst others, the doors with their frames, may be used in new furnaces. That the workmen quickly learn to work, for we have sent out nobody to start furnaces, in works where this system has been adopted. That the number of master puddlers of an ironworks may be reduced by about one-half for the same production. That the number of tools to be taken care of diminishes in the same proportion. That the cost of building does not amount to 2.000 francs per furnace. That we modify nothing in the habits of the puddler. That the production of steam is the same as that of two ordinary puddling furnaces. That the gases are completely burnt at their arrival in the chimney, for since the adoption of the gas furnaces in our works, one of the collective chimneys, which was formerly heated to an extent that we had to raise the refractory lining, keeps now nearly perfectly cold. That the system is the best adapted for the utilization of the most irregular coal. That it leaves each ironworks free to make the bottom in scrap or cinder, to cool the bridges by water or otherwise—in short, not to modify in these two respects anything in the custom of the ironworks, and in the habits always so deeply seated in workmen. We may add that the cleaning of the grate is less distressing than in ordinary furnaces, the cleansings not lasting so long, and their number being very much reduced, for the grates are only cleaned after two charges, and then only one-half of the grate. In conclusion, we think we ought to refer once more to the generation of steam, which, in our opinion, possesses a very great importance. In fact, we should attribute little merit to a system of a puddling furnace, in which the principal economy of coal should cause a diminution in the production of steam. Now, all the experience gained at our works has proved to us that a gas furnace gives us a quantity of steam equal to that produced by two ordinary furnaces, experience which is actually confirmed on a large scale, as all our furnaces have been transformed, and as the general working of the ironworks with regard to steam has not been altered. We believe, finally, that the saving of coal results from the following three causes: (1.) The nearly complete absence of cinders (half-burnt coals). (2.) The complete non-admission of noxious cold air. (3.) Complete utilization, under the boiler, of gases not burnt.—*Colliery Guardian.*

SALE OF THE MILWAUKEE IRON WORKS—MILWAUKEE, WIS., NOV. 9.—Judge Dyer to-day signed an order for the sale of the works of this company, in Bayview, on petition of creditors. The total indebtedness is $520,000. The sale is to take place some time next month.

THE LOSS OF MERCURY AT IDRIA BY VOLATILIZATION.*

By E. Teubner.

In order to determine the losses of mercury in the smelting processes at Idria, and their probable causes, a systematic series of examinations has been undertaken of the intermediate and volatile products, such as soot, condensed water, smoke, etc., in addition to the ordinary assays of the fuel and residues of the operation, The present investigation deals particularly with the smoke from the different furnaces, which, after passing through a series of condenser tubes cooled by water, and through numerous chambers and flues, is discharged by a chimney 45.5 feet high, through a flue 292 yards long, which is provided with a fire for maintaining the draft.

The small amount of mercury which escapes with the smoke is not present as vapor, but is mechanically mixed, in a finely divided state, with the fixed constituents of the smoke as soot; as no condensation of metallic mercury was effected when 10 to 14 cubic feet of smoke were drawn by an aspirator through a tube loosely filled with cotton wool, and through a flask containing a solution of iodide of potassium. A glass tube, gilded externally, and cooled by water, showed no alteration when suspended in the chimney for twenty-four hours. The proportion of mercury in the soot varies very considerably (from 1 to 47 per cent.), and exists partly as metal, partly as a basic sulphate, and partly as sulphide, the proportion of each being also subject to great variation, as seen in the following analyses of samples taken at four different times:

	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Metallic mercury	3·12	14·59	0·92	0·17
Sulphate of mercury	7·32	3·06	6·10	12·69
Sulphide of mercury	27·33	1·83	3.40	9·80
	37·77	19 48	10·42	22·66

In order to determine the daily loss of mercury two large aspirators were used, and in three experiments about 1,150 cubic feet of the escaping smoke were drawn through a filter of cotton wool contained in a tube of about 1·5 inch bore, which, with the entangled deposit, was afterwards dissolved in aqua regia, the mercury being separated by sulphureted hydrogen, and ultimately estimated as metallic mercury by Eschka's method of amalgamation on a weighed gold plate. From the results so obtained, when compared with the total quantity of gases passing through the chimney, the average loss of mercury was computed to be 686 grams daily, or only 0.007 per cent. on the production, which is about 20 cwt. daily.

The gaseous products were found by analysis to have the following composition in volumes per cent.:

Sulphureted hydrogen	0·004			
Sulphurous anhydride	0·050			
Carbonic acid	5·636			
Carbonic oxide	1·740			
Oxygen	15·400	Corresponding to	Air	73·33
Nitrogen	77·170		Nitrogen	19·24

The amount of sulphureted hydrogen given off daily is 208 cubic feet, or 20 lbs., and of sulphurous anhydride 25,950 cubic feet, or 462 lbs. in weight, which quantities, together with the small quantity of mercury accompanying it, are not sufficient to do much harm, either to animal or vegetable life, especially as a large proportion of the latter is in the form of sulphide of mercury, which is practically without action from its insolubility.

CORRESPONDENCE.

THE TELEPHONE FOR MINES.

A correspondent writes us as follows:

"I notice you advocate Bell's telephone for mines. I have tried the instrument you lately described, and my experience is that the receiver of a message must be in absolute quiet, no talking, or, in fact, any noise to distract attention going on in the receiving room.

It seems to me that, as at present issued, the instrument could not be used at the pit bottom where the cries of the drivers, the clang of the cage, and the clash of chains resound so loudly. Besides, without a battery and electric bell, how is attention to be called? If the instrument can only be adapted to convey hoarse shouts loud enough to strongly vibrate ordinary drums, its value would undoubtedly be great, and I think it would be of interest to the mining community to know if larger telephones can be operated alone by the voice and made applicable to the conditions existing at a pit bottom.

WIRE ROPE TRAMWAY OF THE JUNIATA SAND COMPANY.

TO THE EDITOR: SIR—I herewith send you a few notes on the wire tramway I have just completed for the Juniata Sand Company, of Lewistown, Pa., and which may be of interest to you. The Juniata Sand Company own and work an immense deposit of pure white sand, in the mountains five miles west of Lewistown. This sand is in great demand for the flint glass manufacturers of Pittsburg and the West, and is considered equally as good as the celebrated crystal sand of Berkshire, Mass. Formerly, the product of these mines had to be hauled to Lewistown over a terribly rough road, which, in the fall and spring of the year, became practicably impassable. To overcome this difficulty, I have just erected for them one of Hodgeson's patent tramways, one and a half mile long, connecting their mine with the Pennsylvania Railroad at Granville Station. The mine lies sixty-five meters above the level of the railroad, and the tramway had to be constructed across the canal and the Juniata River, which latter, on the line of the tramway, is a little over 277 meters in width. This necessitated the erection of a center pier to support the rope on such a span, and, owing to the great amount of ice, this pier had to be constructed of mason work to the height of 8·30 meters, surmounted by a trestle 7·70 meters high, making a total height of 16 meters. On the whole line there are 53 trestles, over which the rope is carried, the general distance between supports being 50 meters, the two river spans being 138·50 meters. The rope was manufactured by Messrs. Roebling, of Trenton, N. J. It is 18·75 mm. diameter, of the best English cast steel. It was made in one length, and weighed a little over eight tons. The buckets, of which there are a hundred, are made of galvanized iron, and carry about 50 kilos of sand, the total weight of the loaded buckets and hangers being 85 kilos. The motive power is supplied by a small 10 horse-power engine at the mine, the steam being drawn from the mine boilers. The wire travels at the rate of three miles an hour, the capacity at that speed being 60 tons a day. The cost of this tramway, inclusive of stone pier and motive power, has been $5,334 per mile.

E. GYBBON SPILSBURY.

*Abstract of paper in the *Oesterreichische Zeit. f. Berg. und Huttenwesen*, from the Minutes and Proceedings of the Institution of Civil Engineers, of London, edited by James Forrest, Secretary.]

THE VALLEY OF THE COLORADO RIVER, AND ITS GEOLOGY.—XVI.*

LATERAL CANONS.

Many other streams, heading to the north and south, are tributaries of the Colorado, and have cañons which are lateral to the Grand Cañon. The Kanab heads away to the north at the foot of the Pink Cliffs, and runs south into the Grand Cañon, passing through a series of gorges. Where it cuts through the successive lines of cliffs, it presents another series of terrace cañons, in many respects like the series on Green River; but the lower cañon of the Kanab, which comes down to the Colorado River, is carved through the harder limestones and sandstones of carboniferous age, and its general characteristics are the same as those of Marble Cañon.

The Little Colorado, heading away off to the southeast, enters the Grand Cañon by a profound gorge of its own.

From the south, the most important stream is Coanini Creek, which heads near the San Francisco Mountain, and rapidly finds its way into great depths.

Besides these streams, the plateaus are cut by the Rio Virgin, in its upper course, which empties into the Colorado below the Grand Cañon, and by the Paria, which heads in the Pink Cliffs, and enters the Colorado at the head of Marble Cañon.

All these streams, and many others of lesser importance, have cut gorges of their own; and they all have wet-weather affluents, which run into deep canoñs. It is a cañon land.

THE CANONS CARVED BY RUNNING WATERS.

I have stated, and assumed from time to time in the above discussion, that these cañons have been cut by running waters. Prof. Newberry, who first studied this region, in his report on the geology of the country which he visited, says: "Having this question constantly in mind, and examining, with all possible care, the structures of the great cañons which we entered, I everywhere found evidence of the exclusive action of water in their formation. The opposite sides of the deepest chasm showed perfect correspondence of stratification, conforming to the general dip, and nowhere displacement; and the bottom-rock, so often dry and bare, was, perhaps, deeply eroded, but continuous, from side to side, a portion of the yet undivided series lying below."

Prof. Newberry saw the great cañon region which I have described only on its southern border, but where the cañon features are developed on the grandest scale. My own observations overlap his, and extend to the north many hundreds of miles; and during the last six years I have explored many thousands of miles of cañons, and everywhere the facts observed confirm Prof. Newberry's conclusions, as stated above.

Though the entire region has been folded and faulted on a grand scale, these displacements have never determined the course of the streams. The cañons are seen to cut across them, either directly or obliquely, here and there, and in a few instances I have observed cañons to follow the course of faults for a short distance. They have also been observed to run back and forth across a fault; but such instances are surprisingly rare. In all the cañons where the streams are not so large as to cover the bottom, the continuity of the strata below has been apparent; and in the cañons traversed by the larger streams the beds on either side have found at the same altitude; and if it is supposed that these water-ways were determined by fissures, then such fissures were made without displacement, and does not extend to the depths now reached by the streams. If it is possible to conceive of such fissures, they must have been quite narrow; in fact, the whole supposition is evidently absurd. All the facts concerning the relation of the water-ways of this region to the mountains, hills, cañons, and cliffs, lead to the inevitable conclusion that the system of drainage was determined antecedent to the faulting and folding and erosion which are observed, and antecedent also to the formation of the eruptive beds and cones.

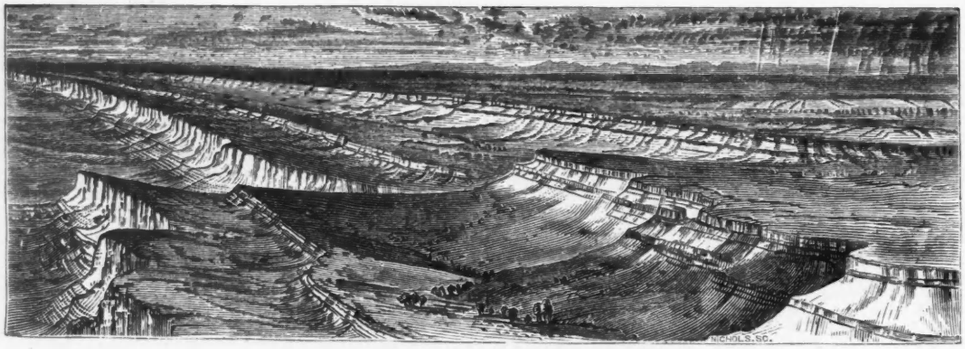


FIG. 37.—BIRD'S-EYE VIEW OF CLIFFS OF EROSION THROWN FORWARD BY A FAULT.

THE U-IN-KA-RET MOUNTAINS.

The plateaus are yet modified in another way. Eruptive mountains, beds of black basalt, and volcanic cones, are found here and there, and scoria and ashes are scattered over the land. There are three great irregular mountains standing on the bench between the To-ro'-Weap Fault and the Hurricane Ledge Fault. These great, complex masses of rock, or irregular mountains, are called by the Indians *U-in-ka'-rets* (Pine Mountains).

Lieutenant Whipple, on the first of January, 1854, while making a reconnoissance for a railroad route to the Pacific Ocean, camped at a spring about 30 miles to the southwest of the San Francisco Mountain, to which he gave the name of "New Year's Spring." From this elevated position on the plateau he looked north, and over the chasm, in the distance, 200 miles away, he saw these mountains. Perhaps he discovered but a single peak, but on the map of the country over which the reconnoissance was made, he has indicated these peaks, and called them "High Mountains." Probably he intended this as a provisional name only.

In the winter of 1857-58, when Lieutenant Ives explored the Lower Colorado, he reached, with a boat, a point on the river about ten miles below the Rio Virgen, and about 80 miles below the Grand Cañon. Being unable to proceed farther in his boat, a land expedition was organized, and he explored the plateaus to the south, descending to the mouth of the Diamond Creek, as I have mentioned. His first view of the cañon, and the great plateau through which it is carved, was obtained April 3, 1858, and is thus described: "At the end of ten miles the ridge of the swell was obtained, and a splendid panorama burst suddenly into view. In the foreground were low table hills, intersected by numberless ravines; beyond these a lofty line of bluffs marked the edge of an immense cañon; a wide gap was directly ahead, and through it were beheld, to the extreme limit of vision, vast plateaus, towering one above the other thousands of feet in the air, the long, horizontal bands broken, at intervals, by wide and profound abysses, and extending a hundred miles to the north, till the deep azure blue faded into a light cerulean tint, that blended with the dome of the heavens. The famous Big Cañon was before us, and for a long time we paused in wondering delight, surveying the stupendous formation through which the Colorado and its tributaries break their way."

On the 12th of April he obtained another good view across the country to the north, and, in his account of the day's journey, he makes this remark: "On the north side of the Colorado appeared a short range of mountains, close to the cañon, which had been previously hidden by the intervening plateaus."

On the map of the country embraced in this reconnoissance, a group of mountains are indicated, and called by him "North Side Mountains," a name doubtless intended by him as provisional. They are the same as those mentioned by Lieutenant Whipple, and the same as we have described as standing on the bench between the To-ro-weap Cliffs and the Hurricane Ledge. The Indian name U-in-ka'-rets has been adopted by the people who live in sight of the highest peaks, and so I have adopted the name which will doubtless live among those who use it daily.

The most northern of these mountain masses I have called Mount Trumbull, the next Mount Logan, and the one standing nearest to the Grand Cañon Mount Emma.

The great mountain masses themselves are covered with volcanic cones, and groups of volcanic cones are scattered over the benches. Let us see how these mountains are formed.

We have seen that the Uinta Mountains were not thrust up as peaks, but were carved from a vast, rounded block left by a retiring sea, or uplifted from the depths of the ocean, and its present forms are due to erosion. But these are volcanic cones. Have they then been built up as mountains? We shall see. The beds of sedimentary rocks, on which these mountains stand, run under the Vermilion Cliffs, to the north, and the beds seen in the Vermilion Cliffs at one time extended far away to the south over this country, and beyond the Grand Cañon. Shales, sandstones, and limestones several thousand feet in thickness, have been washed away from the summit of all these benches south of the cliffs.

When this denudation commenced, there were no faults and no benches, and streams ran down from the north, heading in the Mar-ka'-gunt and Panus-a'-gunt Plateaus, and found their way into the Colorado, and probably there were valleys along their courses. Other streams had their sources far away to the south, and came down into the Colorado, and it is probable that they also ran through valleys. Then these displacements began; they were not formed suddenly, the rocks were not flung down during some great convulsion, but settled slowly, so that this change in the contour of the surface had no effect on the course of the streams. Thus the downfall of the beds was not faster than the wearing away of the channels, for the displacement by faults and folds has not determined nor modified the direction of the principal streams. As the rocks fell, molten lava was thrust up, not suddenly, nor all at once, but from time to time—now here, now there—pouring out a sheet of molten rock in one eruption, and again in another, and this commenced away back in that time before the shales and sandstones seen in the Vermilion Cliffs had been carried away from the benches and plateaus to the south. Doubtless these first floods of lava found their way into valleys—valleys in that elder time—and covered great beds of these sandstones and shales. When the lavas cooled, the rocks which they formed were much harder than the sandstones by which they were underlaid, and the beds which formed the surface of the country elsewhere; and as the degradation of this region by rains and rivers continued, the surrounding country was carried away, and the sandstones and shales, protected by the harder beds of basalt, remained; and now mountains stand in such places, doubtless marking the sites of ancient valleys. So the uncovered sandstones wasted away, and the lava capped beds remained, leaving at first low tables, covered with sheets of basalt. Still, from time to time, new beds of lava are poured out—not over the old beds, usually, but on their borders, increasing their protected area; and, as the surrounding sandstones were still further carried away, still, *pari passu*, with erosion came floods of lava, and thus the mountains which remain have a strangely complex constitution. We may call them eruptive mountains, for, had no eruption occurred, no mountains would have been left, all the sandstones would have been carried away. But yet the great mass of the material, of which the mountains are made, is not eruptive matter; the mountains are great beds of sandstone and shale, covered with blankets of basalt, and, in a general way, the older beds of lava have the higher position on the mountains.

Since these vermilion beds were stripped from the adjacent country, the few showers of this arid region condense chiefly about the summit of the mountains, and the waters, gathered into streams, and running down into the lower region, have cut deep gulches through the sheets of basalt, in many places revealing the structure of the mountains themselves. The last puff in these eruptive vents tossed high into the air scoria and ashes; the lighter materials were carried away by the winds, the heavier fragments fell, and thus cinder-cones were piled up; and in many of these cinder-cones the outlines of the craters are still preserved.

The beds of lava are of various ages. The first were poured out in that ancient time before the sandstones had been carried away. From time to time new beds were formed, and the latest beds have been poured out in a time so recent, that the very waves of the congealed floods are still preserved, and there is no reason to suppose that this action is completed. In time another vent may be opened, and another river of red hot rock gush from the earth. Nor are all the cones of late origin; each outflow of molten matter seems to have ended in

* Extracts from Report of Major J. W. Powell on *The Exploration of the Colorado River of the West*, Washington, 1875.

the formation of a cone. In the older beds the cones have been washed away but their sites are marked by scattered cinders. In the very latest cones the craters are still preserved, and their cinders are angular fragments of slag, that show that many storms have not fallen upon them since they broke in cooling.

So, even these eruptive mountains were hewn from the rock, and only the cinder cones, scattered here and there, small in comparison to the great mountain masses, were piled up in their present forms.

It is probable that the cones have coves which extend to great depths, and perhaps connect the sheets of basalt above with masses of like material below, and thus the more enduring and protecting beds to which these mountains owe their preservation are anchored to the heart of the earth.

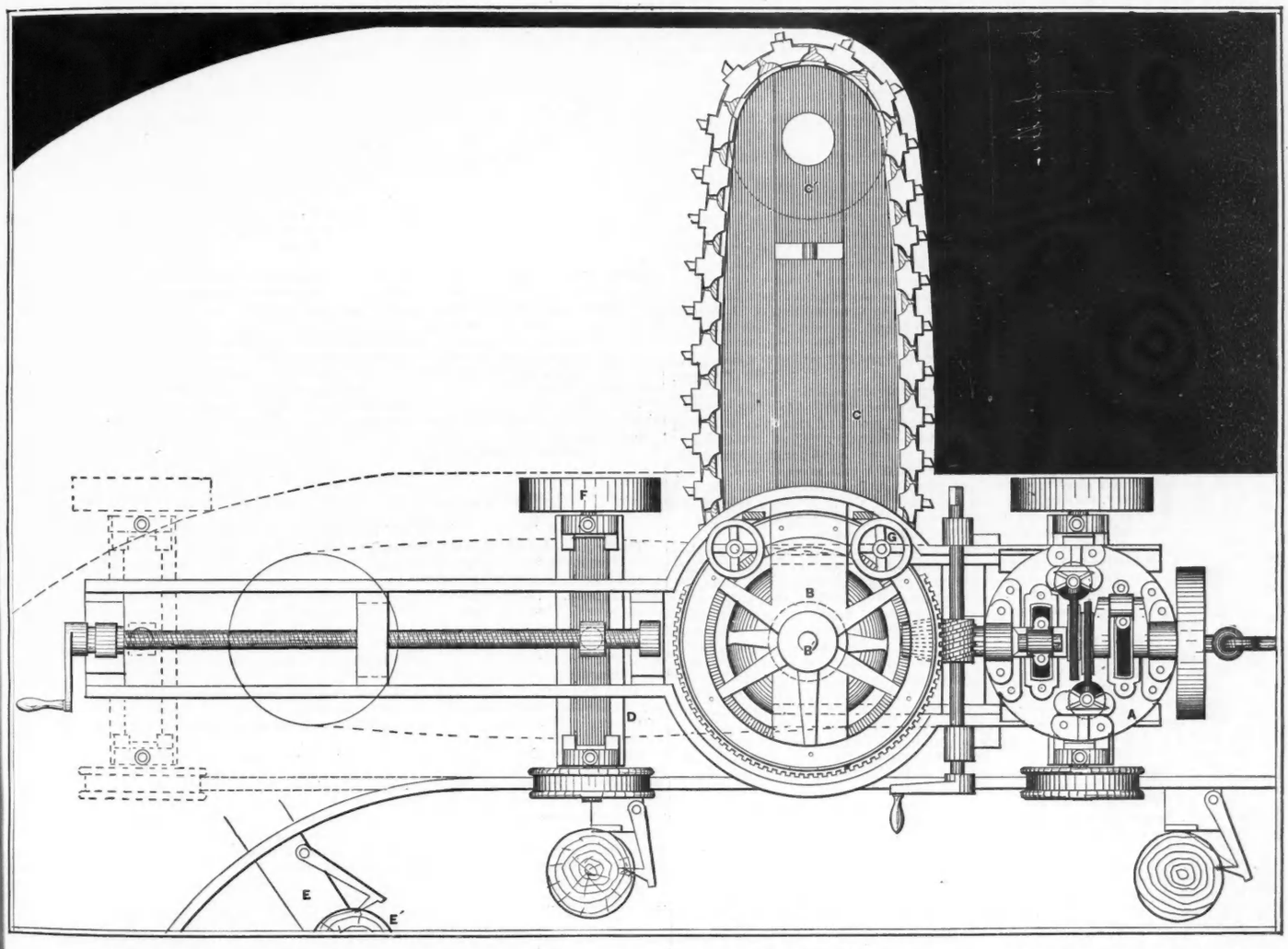
THE MONITOR COAL CUTTING MACHINE.

The accompanying engraving represents a plan view of one construction of what is known as the "Monitor Coal Cutter," under the patents of Horace F. Brown. This machine was designed and built especially for the Fall Brook Coal Company's mines at Antrim, Tioga County, Pa., where it is now in successful operation. It is especially adapted to that class of mines where the undercut must be made directly on the bottom, or within a few inches of it. Among other difficulties in the way of coal cutting by machinery is the varied formations in different coal measures, and so great is this variation that it has been found impracticable to meet all cases with one construction of machine.

The first machines under these patents were built for the block coal regions in Indiana, and worked in the mines of Niblack, Zimmerman & Alexander, at Brazil, Clay County, Indiana. In the upper vein the mining was made about one foot above the bottom, while in the lower vein the best results were obtained by mining one foot from the top, or at a height of 2 feet 6 inches to 3 feet 6 inches. In the Fall Brook mines at Antrim, and in all the surrounding coal measures embracing the "Blossburg" regions, it is necessary to make the undercut directly on the bottom. Nearly all the mining in this country is done by means of driving up narrow ranges and leaving alternate pillars to support the roof, and any machinery to mine successfully must be so constructed that it can be readily removed from one range to another, and in fact portability and adaptation to the mines are features of as paramount importance as the cutting machine itself.

In the machine under consideration all these requirements are combined. A shows the inner and supporting part of the cutter arm; this is joined to the frame D by means of a pivot hinge that holds the arm horizontally, but allows it to be raised or depressed on either edge, by means of which the cutter can be made to lead up or down in the coal, to follow the irregularities of the bottom, to avoid interlaminated strata of rocks, etc. The arm can also be raised or lowered without otherwise changing its relative position to the machine. B is the outer portion of the cutter arm, and is grooved to A in such a manner that it can be thrown out or in to lengthen or shorten the arm as required. Attached to B is the wheel C, that acts as a carrying wheel for the chain E at the outer extremity of the arm; at the other end of the arm, and attached to the shaft L, is a similar wheel that acts as a driver for the cutter chain. F is a double cylinder vertical trunk engine, 8 inch bore and 7 inch stroke. The whole is attached to the framework J. This, in turn, is supported by the wheels G, H, etc. The wheels are all plain flanged wheels, as shown by G. While working, the machine requires but one rail of the common T iron, nine pounds per yard. The forward wheel is kept on the rail by means of the second flange G', which is slipped on and held by means of thumb screws. The other two wheels are rimmed into the broad flanges H, made in two or more sections, which run directly on the bottom. When in shape for moving, the wheels G H are drawn to the end of the flange J by the screw K, and the cutter arm swung under the frame J by means of the screw shaft D', which engages the teeth of the segmental gear attached to the frame D.

The machine is fed forward by means of a power windlass, operated by air. The windlass consists of an upright drum, driven by a small rotary engine, so geared that it will wind slowly enough for the lightest feed or fast enough to pull the machine up the grade from the gangway very rapidly. The feed can be varied instantly by the throttle valve to suit the varying strata that are being cut, and from the fact that in many places in the same breast one yard can be cut in half the time with the same power that it would require to cut the next yard.



The capacity of the machine, of course, varies greatly with the nature of the material cut. The following table will show what the machine is doing daily in what is about the average hardness of splint coal:

Weight of machine	3,800 lb.	Pressure used per square inch	25 lbs.
Depth of cut (extreme)	4 ft.	Cut along face (av.) per hour	20 yards.
" " (average)	3 ft. 6 in.	Space between props and coal	42 inches.
Thickness cut out	2 ft. 6 in.	Gauge of track	29 inches.

Exceptional work, 15 yards in 20 minutes; 30 yards in 55 minutes; 5 yards in 4⅓ minutes.

THE NOVA SCOTIA COAL TRADE.—The returns of the coal trade for the nine months ending Sept. 30 give a pretty fair idea of the year's business—the shipments in the last three months of the year being comparatively small. We now have the returns for 1877 up to Sept. 30, and are glad to find that, though they are still far below what they should be to make the mining interest prosperous, they exhibit a considerable improvement upon the returns of the corresponding period in 1876. The total sales during the nine months of this year were 484,493 tons—an excess of 29,848 tons over the sales of the same period last year. The principal mining counties participated in this improvement in the following proportions: Cumberland, 7,105 tons; Pictou, 4,497 tons; Cape Breton, 21,468 tons. Other counties showed a diminished trade, there being a falling of 3,222 tons in the sales, thus bringing the total increase in the Province down to 2,9848 tons.

COPPER BY ELECTRICITY.*

By N. S. Keith, of New York City.

Some time ago a firm, engaged largely in the manufacture of copper sulphate applied to me for information as to the practicability of obtaining the copper from their mother liquors by means of electricity; having reference, more especially, to obtaining the electric current from some magneto-electric or dynamo-electric machine.

The mother liquors were the result of several solutions of commercial scrap copper, containing impurities, the quantity of which in the liquors had increased by the operations until too large to allow the formation of pure, or even merchantable, copper sulphate. There were silver, nickel, tin, zinc, antimony, and iron sulphates in solution, besides enough copper sulphate to represent 4½ per cent. of the total weight of solution as metallic copper.

The question was, "Can we obtain this copper in a cheap, practicable and expeditious way by the agency of electricity?"

They had tried experiments so far as to determine to their own satisfaction the previously known fact that the copper could be deposited by electricity; requiring, however, to do so, three cells of a gravity battery, say an electromotive force of three volts. A less electromotive force would not accomplish it.

Knowing then this fact, it was necessary to employ a machine to produce electricity of at least *that* electromotive force, and of a size to offer a small resistance to the electric current generated, and depositing vessels large enough to accommodate the amount of liquor, and large enough electrodes to make the resistance low; so that the combined resistances of machine, conductors, electrodes and liquors were low enough to allow sufficient current to flow, all in obedience to Ohm's law, which is formulated thus:

$$\frac{\text{Electromotive force}}{\text{Resistance}} = \text{Current.}$$

Another fact: Electrotypers carry on their art of depositing copper electrically by the use of batteries having say ½ a volt electromotive force. Why, then, is it necessary to use 3 volts—nearly six times as much, to deposit copper in this case?

Electrotypers use a copper anode which is dissolved, and by its solution as much force is set free in the electric circuit as is absorbed by the deposition of a like amount of copper on the cathode. So, as no force is set up against the electric force, the weakest battery is capable of depositing some copper. The practical point with the electrotyper is a speed of deposit which gives him a coherent, reguline shell of copper in the shortest possible time, with the least expenditure of force. As that force for his use exists in zinc and acid, or in the mechanical motion applied to a dynamo-electric machine, he uses one or the other, according to the extent of his information or the condition of his pocket. Undoubtedly for him, the machine will give him equal current for less than one-tenth of the cost by use of zinc and sulphuric acid. The consumption of an electric equivalent, 65 grains of zinc, in a single Smee cell, will give a deposit in a copper-depositing cell, with soluble anode, of an equivalent, 63.5 grains of copper. If we substitute an insoluble anode, to completely deposit the copper we must place six Smee cells in series in order to have an electromotive force at our command of three volts; consequently we will use 65 grains of zinc in each cell, or 390 grains in all, to get a deposit of 63.5 grains of copper. Thus 325 grains of zinc are used in decomposing water and setting free oxygen as gas at the insoluble anode—so much energy lost so far as the practical result is concerned. Other cells, having greater electromotive force, like Daniell's, Grove's, Bunsen's, and the gravity battery, may be used with less waste of zinc. A single cell of the gravity battery employed would give a deposit of copper to the electrotyper by the expenditure of equivalent of zinc for equivalent of copper.

The electromotive force of a battery cell is the remainder after subtracting the force of the negative element from the force of the positive element. Thus in a Daniell cell the force of the union of 32·6 grains of zinc with SO_4, is 10,503 foot pounds; from that take the force of the union of equivalent copper with SO_4, 5,878 foot pounds, and we have 4,625 foot pounds, available force of a Daniell cell. Against that we have no force set up in the electrotyper's cell, since as much force is given by the solution of copper as is absorbed by its reduction.

In an arrangement for the complete deposition of copper from its sulphate solution, we have a counter electromotive force equal to the difference between the forces of copper cathode and a platinum or carbon anode, and the force absorbed by the deposited copper at the cathode and the liberated oxygen at anode.

After these facts were considered, the question of choice of anode arose. If we used a copper one we might go on indefinitely depositing copper without exhausting the solution, or liquor; if we used an anode of a metal electro-positive to copper, like zinc or iron, as soon as it was immersed in the solution it was immediately covered with a fine powder of metallic copper in the well-known way. So we might as well use those metals directly without the electricity. If we used copper matte for an anode, we would still be taking copper into the liquor as well as iron, etc. Now for the insoluble anodes—elements electro-negative to copper. Lead is cheap, but it soon covers with a thin film of soluble lead sulphate, which offers a great resistance to the passage of the current. Carbon plates, made by causing coal gas graphite to cohere, conduct the current well, but under the action of the strong electromotive force, and the oxygen, and SO_4, they rapidly disintegrate. Platinum seems to be the only resource. But platinum is expensive, and unless roughened by an electro-deposit of more platinum on its surface, offers great resistance, by reason of the retention of oxygen upon its smooth surface.

As it was desirable to deposit three pounds of copper per hour, to do so by means of a galvanic battery it was necessary to use three pounds of zinc in each of three cells, or nine pounds in all, for each three pounds of copper produced. This was an expense of $1.12½ per three pounds of copper, besides sulphuric acid and labor and waste, amounting to nearly as much more; rolled zinc suitable for batteries costing 12½ cents per pound. This makes rather expensive copper; say 60 cents per pound.

The expense by dynamo-electric machine was figured as follows:

> Force, or energy, of 9 lb. zinc, and equivalent of H_2SO_4, less force of equal amount of copper, is 9,105,469 foot pounds per hour, or about 4·6 horse power.

This is the amount of available force necessary under the conditions. A very few, if any, dynamo-electric machines utilize more than 50 per centum of the force in foot pounds applied to them; double that number of foot pounds of force must therefore be applied, or 18,210,938 foot pounds per hour, equal to 9·2 horse power. This with coal, attendance, etc., from an ordinary steam engine would cost 42 cents per hour for 3 lb. copper, or 14 cents per pound; coal costing $8 per ton in the locality.

We did not deem it advisable to place two or more depositing cells in series, since not only the resistance increased with each addition, but also the counter electromotive force, so that would necessitate a change in the construction of the machine, so as to increase its electromotive force.

While canvassing the merits and demerits of iron as a soluble anode for the purpose, I tried a plan for the use of iron in reducing the copper, which has proven very successful. After a short consideration the question arose, Why use a current of electricity when iron alone is sufficient to reduce copper from the solution? If I apply the current with an iron anode, copper will still be reduced upon it by local action, and I will have the same fine powdery deposit, the same formation of soluble basic salts of iron mixing with the copper deposit, and the expense for producing the electric current. As these objectionable results seemed to arise from the direct contact and association of the iron, copper, and copper solution, as well as the iron solution already present and synthetically formed, I decided to try to separate them, and did so by placing iron in a less than saturated solution of sulphate of iron (free from copper), contained in an ordinary porous cell, such as is used in various galvanic batteries. This porous cell and contents I placed in a larger vessel containing some of the copper liquor and a sheet of metallic copper. I connected the iron and copper, external to the solutions, by means of a clamp, and the work commenced. In 36 hours the liquor was completely freed from copper, which was deposited upon the copper sheet as a beautiful velvet-like coat, pure, reguline, and coherent.

No formation of basic salt of iron; no copper powder; none of the defects of the ordinary precipitation of copper by means of iron. The expenditure of iron was but the equivalent for the copper deposited, namely, 56 of iron for 63·5 of copper. All the attendance requisite was for the occasional removal of some of the nearly saturated solution of iron from the porous cell, filling the space made with water.

There was then procured ten of the largest porous cells obtainable, ready made, and set up in series, that is, the iron of one connected with the copper of the next vessel, and so on through all, forming a ring or closed circuit. The result was the same, all the copper deposited in 36 hours. Eighteen large porous cells have been made, measuring 12 inches in diameter and 32 inches long, and large sized oil barrels will be used for the vessels to contain the copper liquor. A modification of this arrangement calculated for the continuous treatment of cupriferous solutions places the vessels so that the solution may run from one to another through as many as may be needed to complete the deposition of copper. A low percentage of copper increases the speed of exhaustion. Scrap iron may be placed loosely in the porous vessel, and may be added from time to time to take the place of that which has been dissolved. It is necessary to remove portions of the solution of iron as it approaches saturation, in case it be desirable to save that material, and fill again with water, or part can be displaced by water, allowing it to overflow into the outer vessel. Speed of operation, as regards quantity, may be gained by increase of size and number of vessels. The copper sheets may be removed for sale whenever they become heavy enough, or whenever it is necessary for the company to declare a dividend.

In this way any concern, whether producing a gallon of copper solution, or thousands of gallons daily, may produce fine, merchantable copper by inexpensive apparatus at, say one cent per pound, more or less, as scrap iron may be worth more or less than $20 per ton.

* A paper read before the American Institute of Mining Engineers at the Amenia meeting, October, 1877.

RESULTS OF ANALYSES OF BLAST FURNACE GASES.*

By Charles A. Colton, E. M., of New York City.

The results of a series of analyses extending over a period of three weeks at the Cedar Point Iron Company's furnace, Port Henry, N. Y., are given in tables I. and II. This furnace uses a very pure magnetite and Lehigh and Lackawanna anthracite. The flue leading the gas from the "down-comer" to the boilers was tapped by a ¾-inch gas pipe, which carried the gas to the Orsat apparatus. The pressure of the gas not always being sufficient, owing to the small amount made, to force it into the apparatus, I omitted taking samples several days, and, with the exception of the last three days of the campaign, made the analyses whenever an opportunity offered. I find the Orsat apparatus, as described by Prof. Egleston, to work very well, with one exception. The CO is not absorbed as readily in the ammonia-copper solution as he states in his description of the apparatus, as many as 50, and sometimes 60, passes being necessary to absorb all the CO.

The power of absorbing rapidly increases as the solution is used, and this would indicate that the more oxygen it contains the quicker will it do the work. Probably the addition of a small amount of some oxidizing agent would remedy this.

When the furnace was working in its normal condition, I had no occasion for using the filter, the amount of fume being so small as not to cause any inconvenience. The gas burned with the flame peculiar to CO, and contained just enough solid particles to give it a slight reddish tinge.

TABLE I.

1877.	Amount absorbed in each five passes.											Total number passes.	CO^2	M.
August 6	7·0	5·0	4·0	3·0	2·0	2·0	2·0	1·0	0·5	0·5	1·0	55	7·0	·393
" 7	10·5	6·5	4·0	2·5	2·0	1·0	1·0	0·5	0·5	0·5	...	50	7·0	·379
" 7	11 0	6·5	4·0	2·5	1·5	1·0	0·5	0·5	0·5	0·5	...	50	6·5	·359
" 8	10 0	6·0	4·0	3·0	2·0	1·0	0·5	0·5	0·5	0·5	...	50	7·0	·393
" 8	10·5	6·5	4·0	2·5	1·5	1 0	0·5	0·5	0·5	0·5	..	50	7·5	·421
" 9	12·0	7·0	4·0	2·5	1·5	1·0	0·5	0·5	0·5	0·5	...	50	7·0	·367
" 9	14·0	7·0	3·5	2·0	1·0	1·0	0·5	....	....	....	...	35	7·5	·379
" 10	11·5	7·0	3·5	2·5	2·0	1·0	1·0	0·5	0·5	....	...	45	6·0	·346
" 11	12 0	6·5	4·0	3·0	1·5	1·0	0·5	0·5	0·5	....	...	45	7·0	·373
" 11	13·5	6·5	3·5	2·0	1·0	1·0	0·5	0·5	....	....	...	40	7·0	·413
" 13	10·0	6·5	4·5	3·5	2·0	1·5	0·5	0·5	0·5	0·5	...	55	7·0	·360
" 13	13 0	6·5	4·0	1·5	1·5	1·0	0·5	0·5	....	....	...	40	7·0	·388
" 15	14 0	6·5	4·0	2·0	1·5	0·5	0·5	0·5	....	....	...	40	6·5	·346
" 16	14·5	7·0	4·0	2·0	1 0	1 0	0·5	0·5	0·5	....	...	45	6·5	·379
" 20	10 0	6·5	5·0	3·0	2·0	1·5	1·0	1·0	0·5	0·5	...	50	7·5	·380
" 22	14·0	7·0	4·0	2·0	1·5	1·0	1.0	0·5	....	....	...	40	6·0	·299
" 22	13·5	7·0	4·0	2·0	1·5	1·0	0·5	0·5	0·5	....	...	45	6·0	·304
" 24	15·0	7·5	3·5	2·0	1·5	1 0	0·5	0·5	....	....	...	40	7·0	·349
" 24	15·5	7·0	3·5	2·0	0·5	0 ·	0·5	0 5	....	....	...	40	7·0	·366

In Table I. the results are given from Aug. 6 to Aug. 24.

Aug. 8, the ratio of $\frac{CO^2}{CO}$ = 0·421, the highest at any time during this period.

* A paper read before the Institute of Mining Engineers at the Amenia meeting, October 1877.

This for an anthracite furnace smelting magnetite is a good showing for the useful effect of the fuel.

The general average for this period was 0·313.

The furnace having been in blast for some time, so that the lining was badly worn, interruptions causing stoppage occurred from time to time, thus causing a great loss in the useful effect of the fuel.

As will be seen by referring to the table, August 22, the ratio went down as low as 0·299. At that time the tapping notch was lost, and before a new one was obtained tappings were made every hour for five hours. In Table II. the results of the analyses are given as made during "blowing out."

TABLE II.

1877.		Amount absorbed in each five passes.										Total number passes.	CO_2	M.
August 25..	10.20 A.M.	17·0	5·5	3·5	2·0	1·0	0·5	0·5	0·5	....	...	40	7·0	·360
" 25..	10.40 "	18·0	5·5	3·0	1·5	1·0	0·5	0·5	....	....	...	35	7·0	·366
" 25	4.00 P.M.	15·0	7·0	3·5	2·0	1·0	1·0	0·5	0·5	....	...	40	8·0	·412
" 25..	4.20 "	16·0	6·5	3·5	1·5	1·0	1·0	....	....	....	....	30	8·5	·453
" 25..	10.05 "	17·0	6·5	3·0	1·5	1·0	0·5	0·5	....	....	....	35	8·5	·445
" 25..	10.30 "	16·5	6·5	3·5	1·5	0·5	0·5	0·5	....	....	....	35	8·5	·453
" 26.	5.00 A.M.	18·5	6·5	3·0	1·5	0·5	0·5	0·5	0·5	....	...	40	8·5	·424
" 26..	5.25 "	18·0	7·0	2·5	1·5	1·0	0·5	0·5	....	....	....	35	8·5	·431
" 26..	9.40 "	16·0	7·0	3·5	1·5	1·5	0·5	0·5	....	....	....	35	9·0	·464
" 26..	10.00 "	17·0	7·0	3·0	2·0	1·0	0·5	0·5	....	....	....	35	9·0	·456
" 26..	4.00 P.M.	11·5	6·5	4·0	2·5	1·5	1·5	0·5	0·5	0·5	0·5	50	8·0	·426
" 26..	4.20 "	13·0	7·0	4·0	2·5	1·5	1·0	0·5	0·5	0·5	....	45	7·0	·360
" 26..	10.05 "	18·5	8·0	3·5	2·0	1·0	0·5	0·5	....	....	....	35	3·5	·161
" 26.	10.35 "	18·0	8·0	3·5	1·0	1·0	0·5	0·5	....	....	....	35	3·5	·169
" 27..	4.00 A.M.	19·0	6·5	2·5	1·5	0·5	0·5	0·5	....	....	....	35	2·0	·101
" 27..	4.20 "	19·0	7·5	3·5	1·5	1·0	0·5	....	....	....	....	30	1·0	·047
" 27..	9.45 "	17·0	6·5	3·0	2·0	0·5	1·0	....	....	....	...	30	0·5	·026
" 27..	10.05 "	18·5	6·5	4·0	0·5	2·0	0·5	0·5	....	....	....	35	0·5	·024
" 27..	4.00 P.M.	9·0	7·5	4·5	3·0	2·0	1·5	1·0	0·5	0·5	0·5	55	0·5	·025
" 27..	4.30 "	12·5	8·0	4·5	3·0	2·0	1·0	1·0	0·5	....	....	40	0·5	·024
" 27..	9.40 "	17·0	8·0	4·5	2·0	1·5	0·5	0·5	0·5	....	....	40	0·5	·022
" 27..	10.10 "	16·75	12·25	2·0	1·5	0·5	0·5	....	....	....	....	30	0·25	·011
" 28..	4.20 A.M.	17·5	8·0	4·0	2·0	1·0	0·5	0·5	....	....	....	35	0·5	·023
" 28..	4.40 "	17·5	8·0	4·0	2·0	1·0	0·5	0·5	....	....	....	35	0·5	·023
" 28..	9.30 "	16·5	8·0	4·0	2·5	1·5	0·5	0·5	....	....	....	35	....	....
" 28..	10.30 "	14·5	8·0	4·5	2·5	1·0	1·0	0·5	0·5	....	....	40	....	....
" 28..	2.00 P.M.	13·0	7·5	3·5	2·5	1·5	0·5	0·5	....	....	....	35	....	....
" 28..	2.30 "	13·5	7·5	3·5	2·5	1·0	0·5	0·5	....	....	....	35	....	....
" 2 ..	3.00 "	Stopped blowing.												

August 25, the last charge of ore was put in at 8.30 A.M. At 9 o'clock the first charge of limestone was put on, consisting of two gross tons; 54 charges of limestone were added, making in all 108 gross tons, the last "round" being charged at 5.30 A.M., August 26.

As will be seen from the table two analyses were made every six hours during the three days and a half required for "blowing out."

After the ore was taken off and only limestone charged, the ratio increased until August 26, 9·40 A.M., about 25 hours after the last charge of ore was put in, when it reached its maximum, and from that time the temperature began to rise, thus partially decomposing the CO_2 of the limestone into CO, and causing the ratio to decrease, the greatest change within any one period being from 4.20 P.M., to 10.05 P.M., August 26, when the ratio fell from 0·360 to 0·161.

At this time the fume became so dense as to nearly close the capillary tubes in the apparatus, and it was necessary to filter the gas.

The gas burned feebly, and instead of a good solid flame, it was divided into a number of tongues of flame, which burned with very little heat, so that the hand could be held in it without inconvenience.

At 2 A.M., August 27, the gas was so dirty that it refused to burn, and it became necessary to start the fires under the boilers to make steam. At 4 P.M., August 27, the gas again burned with considerable heat, and at 9.40 P.M. the furnace was working very hot. The analysis taken at 10.10 P.M. shows a great change in 30 minutes. This is probably owing to the large "run" of slag made just previous to taking the sample.

At 4.20 A.M., August 28, scarcely any change was noticed, the analyses showing the gas to have nearly the same composition as the night before. The furnace was still working very hot, so that the inlet pipe to one of the Whitwell stoves was at a dull red heat.

At 9.30 A.M. I failed to get any indication of CO_2, and it became evident that the furnace had but a short lease of life.

The last analysis was made at 2.30 P.M. At 3 P.M. a tapping was made, but so small an amount of iron flowed out, and from the analysis of the gas, it was evident the work was done.

On examining the interior no fuel was found above the tuyeres, nothing but the calcined limestone, which extended about 18 feet above them. As I had no pyrometer at hand, I was unable to determine the temperatures of the escaping gases at any time.

For the opportunity afforded me for making these analyses, and other work connected with the furnace, I am indebted to Mr. T. F. Witherbee, the Superintendent of the Cedar Point Iron Co.

LECTURES ON MINING.—No. LVI.

By Prof. W. W. Smyth, M. A., F. R. S., Royal School of Mines, London.

ORE DRESSING OPERATIONS.

Inasmuch as a very small proportion only of the minerals raised to surface are in a proper state for transferring to commercial hands, it becomes necessarily a part of the duty of the miner, on the locality of the mine, usually to transform the crude products which are brought to surface into a state in which they can conveniently be sold. In different classes of minerals this will require to be done to very different degrees; while in some cases the mere picking out of a small quantity of impurity may suffice; in others the operation involves a whole series of processes, many of the most ingenious kind, conducted by means of a large group of machinery, and necessitating so much expense and power that, in some cases, it constitutes a large proportion of the total value of the mineral when thus prepared. As a rule, it will fall to the manager of the mine to adopt such processes as he considers most convenient for the purpose, though a special class of workmen may be engaged in the work. In metalliferous mines the term "dressing" is commonly applied to these operations; in the northern districts the term "washing," though it involves a great deal more than mere washing; in France the term "mechanical preparation" is applied; while in Germany the technical term *Aufbereitung* is used.

The amount of dressing required varies very much according to several circumstances. First, there is the consideration of the intrinsic value of the minerals. In ordinary times it is very unusual to get at the place of shipment more than 10s. per ton for iron ores, while they are very bad times in which you cannot get £50 per ton for tin ore, and sometimes it goes up to £90; for lead ore £12 to £13 is an average price, or, if it contains a little silver, it may be as much as £25. This will be sufficient to show how it is that in some cases you can work very small veins, or deposits, where the mineral is disseminated through a large quantity of foreign matter, while in others you must have a rich and pure ore if you would succeed. For instance, it would be of no use to attempt to work iron ores which required a great deal of dressing, no matter how good the quality. With coal, again, if a seam of moderate thickness contain a parting of more than a few inches in thickness, the getting asunder of this from the coal may materially interfere so much with the value of the seam as to render it a question whether it is worth working. And this is one reason, amongst others, why you need to exercise very great caution in dealing with the question of working a fresh district of coal. Or, to take another instance, the lecturer had in his mind one or two cases of iron mines where a specimen sent to a chemist's laboratory would obtain an excellent report, which would look very well in a prospectus, but where this good ore was so mixed up with quartzose material that it quite altered the view of the case. Take, again, the case of roofing slate, at the present time the most profitable of all the mineral productions of England. Those who are conversant with the districts in which slate quarries are worked are aware that enormous sums are lost in attempting to open quarries, since you may find the rock fissile, and may open the quarry to a certain extent, but on coming to dress the slate you find that, for every ton of slate you can manufacture, you have such an enormous number of tons of waste rock to deal with, that the value of the first is quite overpowered by the second. This number varies in different cases; there are some quarries in which they get along very well if they can get one ton of salable slate for twenty tons of rock. But in the average better slate quarries they only have ten to fourteen tons of rock, and occasionally, where you have the top ground wholly removed and the quarry opened out, you may, under good circumstances, get one ton of slate for every three tons of waste. Among the metallic minerals the case of copper ores is rather peculiar. Some years ago, very great attention was paid to the dressing of copper ore, and great pains were taken to remove, even to minuteness, the iron pyrites, arsenical pyrites, and other impurities; and, owing to the similarity in specific gravity, great expense was incurred, and in some cases this dressing was carried too far. But in the common, or Swansea, method of smelting copper, the presence of these impurities is no matter, so that now the ores are dressed to a very small amount only, and the smelters are willing to buy them when dressed up to from 5 to 6 per cent. at the outside. There is a gain in two ways in parting with the ore in this condition, if the smelters will give a good price: in the first place you are spared a considerable amount of trouble, anxiety and expense, and in the second you do not suffer from the loss which inevitably accompanies the treatment of these ores by dressing. This loss is especially great in such minerals as melaconite, or black oxide of copper, which is in so fine a powder that even a shower of rain will wash it away; and, again, in those minerals which are malleable, and readily beaten out into thin plates, these being more readily floated away by water. In a colonial ore, or ore which has to be carried great distances, of course the dressing to this small amount will not be sufficient; then it will be necessary to pick out the finest pieces from the ore, and leave the rest. Very different is the case with tin; here the smelting process requires that it should be dressed up to about 75 per cent., and the operations by which this is done are expensive and elaborate. In some of the best tin mines of central and western Cornwall the crude material, or tinstuff, as it comes to the surface, may contain 2 per cent., but these are rich mines; there are a great number where the proportion is much less, and where 1 per cent. would be thought a capital ore; and there are cases where you find that fourteen pounds out of one ton of crude material is sufficient to pay. The ore of ordinary lead—that is, without silver—would not admit of being profitably worked if interspersed through a quantity of hard material from which it was difficult to get the ore out, because the galena is required by the smelter dressed up to at least 70 per cent. If a moderate proportion of silver be present it may pay, if there is only 1 ton of metal to 24 or 25 tons of stuff, or even, in exceptional cases, if the proportion be only 1 per cent. In the case of the precious metals, silver and gold, very much smaller percentage can be worked. With respect to gold, where there is any approach to as much as one ounce to the ton, there will be no excuse whatever for not making it pay well. In the great mines of St. John del Rey, where the ore has to be raised from very considerable depths, and to pass through a very elaborate series of processes, the ore may be said to contain more than one ounce to the ton, but sometimes considerably less, and it was worked for some time with only half an ounce to the ton. In some of the districts of East Europe, Schemnitz, Austrian Alps, etc., where water power is very favorable, it is commonly the case that a proportion of two ounces of gold to fifty tons is dressed. But the most wonderful case the lecturer had met with was one he saw himself in the valley of Zell, near Innsbruck, in the Tyrol, where they were working 2 to 2½ ounces to fifty tons, and where they even dressed some slaty material which carried only one ounce to fifty tons.

We may look first at one or two cases of the dressing of non-metallic substances, and in the first place that of coal. Shale from the roof will be very apt to come down along with the coal, especially where there is very strong adhesion, and it is perhaps somewhat excusable if the collier now and then shovels some of this in his wagon by mistake, by reason of the imperfect light of his Davy. This, however, cannot be allowed to go beyond a certain limit; if it does, then the agent ought to see that the wagon at the surface is rejected, and does not count. Where these partings have very much of the external appearance of coal, so as to cause great trouble by falling down with the coal, it becomes a question whether it is not advisable to work the seam in two parts. Formerly it was the plan to send away the small and large coal together; but at an early period, in dealing with the tender coals of the North, it was found necessary to screen them, and now this is almost universally the case, but is carried out to greater extent in some districts than in others. In the North of England the coals are separated into various sizes, known as dust, peas, nuts, while all above is kept together under the name of round coal; in the West of England the term lime coal is often used for the smaller sizes, from the kind being used in lime kilns. The separation is effected by having a screen placed at an inclination of 18 inches to the yard, or about 26°, and the screen consists of a framework with iron bars parallel to one another. The space between the bars varies—sometimes it is ⅜ inch, in others ½ inch, ⅝ inch, or in Scotland (where the screen seems to be of somewhat newer date) 1 inch, 1¼ inch; this, however, depends on local circumstances, in some districts the small will be useful for coking, in others it will be almost valueless. The bars usually have parallel sides, sometimes they are made conical, so that pieces of coal may not be so readily fixed. In Scotland the screening is sometimes done with a shovel, made somewhat like a gridiron, while the coal is being loaded. The wagons are run along the rails to the screen, and then, either by a door to the wagon or by

a tipping apparatus, the coal is thrown on to the screen. In France, Germany and Belgium the coals are divided into a great many sizes. All this separation of the coal is, of course, quite apart from the divisions which nature has often made for us, so that, for instance, one seam, or one particular part of a seam, is useful for steel and iron manufacture, another for domestic purposes, etc.; these will be kept separate from the commencement. In nearly every case the screens are rectangular, to from ten to sixteen feet long; but some twenty-five years ago, in Lancashire, an inclined cylindrical rotating screen was introduced. For tender coals this would be likely to knock them about too much; nevertheless, the method was largely employed in Lancashire, but very few of them are now left, probably because experience has shown that, while there is an economy of labor, there is a loss in other respects.

We may next briefly refer to the preparation of kaolin, or china-clay, which is a product of the decomposition of granite, and which, in its preparation for commerce, has to be separated from the other constituents, quartz and mica. If this occurs on a hillside, stopes will be cut in the hill, and a stream of water will be made to flow over the face of the stope. The water, aided by a little work with a broad pick, breaks down the clay, and carries forward the kaolin and the mica, but very soon drops the quartz, or gravel. This gravel is partly thrown away, partly used for the floor of the evaporating pans to be referred to. The great point is to do as much work as possible with water, and so save manual labor. The water then passes into a number of small pits, where it is brought almost to stagnation, and as it passes slowly along backwards and forwards, it deposits the mica, and is then taken into the collecting pit. From this it is allowed to run into a number of evaporating pans, where it is left slowly to evaporate, leaving behind a deposit of pure white kaolin, free from silica and mica. When the sediment in these pits has accumulated to a depth of eight or ten inches, it is dug out before it hardens, and is then the china-clay of commerce. For the purpose of expelling a great deal of the water, it is placed under sheds in the dry season, or in later years it has been dried artificially by means of heated pipes. The selling price is only from £1 to £2 2s. per ton; yet, under favorable circumstances, plenty of water, etc.. they can manufacture at such a rate as to be very profitable.

Coming next to metallic minerals, the first point to notice is that it is very important that there should be in the mine itself, if possible, some arrangement or division. In many cases the only division made is that between ore and attle. This is useful so far as it goes, because you have to recollect that, if mere stone is sent to the surface, it costs money in raising; while, if it be left in the mine, it may prove very useful, and perhaps invaluable, for filling up. It is, however, very often desirable to go further, if the men have sufficiently good light about them, and to separate those parts which are very good for those which are middling and those which are poor; this is at present little attended to, except where the precious metals occur. The plats, containing several divisions, which were described in a previous lecture as at use at Przibram, come into play very usefully when this separation is effected. Some of the ore which comes up will be of small size—"shaft smalls" (German, *Bergklein*)—and this will usually be separated by passing over some kind of a riddle. Others will be in large lumps, and these require to be examined, after washing, etc., to remove the dirt with which they may be covered. In some cases, in the North of England, instead of having a small dressing-floor connected with each pit, the ore from the different pits is accumulated at one central establishment and there dressed, and there is much to be said in favor of this plan. But in this country we have none of those exceedingly large dressing establishments which have been put up in several foreign countries, there being several cases where £30,000 to £60,000 have been expended on these establishments abroad. A remarkable case of this kind is described in one or two recent numbers of *Engineering* (February, 1876), by Mr. Jefferson—one recently put up at Clausthal, originally intended to dress 55,000 tons per year, but which, just before the outbreak of the war, was required to dress three times the amount. The tubs or wagons containing the mineral are usually run on rails over a kind of large hopper, usually of masonry, and the ore allowed to fall into the hopper, where it is carried by a stream of water down the sloping floor on to a grate, through which smaller sizes and the water fall, and are ready to be carried on to the next operation.

The grate is usually two or three feet square, with bars one inch thick and one inch asunder; a man assists the descent of the ore, and, as the larger lumps pass out, they are washed by a pipe arranged for the purpose, and carried away to be examined, and afterwards made up into three or four different kinds. The number of these will vary very much, according to the custom of the district, as to whether the ore coming from the different sets is dressed separately, or is worked together at the expense of the mine. In cases where the ore is very dirty, like the argillaceous beds, for example, the gold from the pipe-clay of Australia, it may be necessary to subject it to a considerable amount of washing. Perhaps no system has been more successful than Mr. Rittinger's drum, which is conical, and made to revolve on a horizontal axis, so that the ore which is placed in at one end travels down to the other. In so doing, however, it is sorted, all but the larger falling through the bar into the outer case; that which falls through is taken up by a revolving arrangement and delivered on to an inclined plane. From this plane the ore slides down into a second drum, in which the finer falls through in one portion, a little coarser at another, while a still coarser portion does not pass through at all. Thus the machine sorts the whole into four distinct portions, according to their fineness.—*London Mining Journal.*

MINING INTERESTS IN ALABAMA.

By P. H. Mell, Jr., C.E. and M.E.

The region of Alabama especially devoted to the precious metals is bounded on the north and north-west by a line drawn from Cedar Town, Ga., to Waxahachie, on the Coosa River; on the west and south-west by a line from the last-named place to Wetumpka, and on the south from Wetumpka to Columbus, Ga., thus covering an area of about seven hundred square miles. This formation is the continuation and termination of the metamorphic slates passing through North Carolina and Georgia. The whole extent of country is considerably broken and undulating, the valleys, as a general thing, being rich and productive. Vast stretches of forests in their natural and primitive condition cover most of the lands. Such as pines, various kinds of oaks, hickories, walnuts, poplars, maples, etc., abound of superior quality for manufacturing into lumber, both for building and mining purposes. Water courses run in every imaginable direction across this section, supplying, in any amount of power, this necessary auxiliary to the miner. The roads, as a general thing, are in fair condition.

Up to the present, gold, silver, and copper are the only metals that have been worked out in paying quantities from this formation. But it is to be hoped that the day is soon approaching when enterprise and capital will continue to furnish means for utilizing the sulphur of the pyrites, the plates of mica, building stones, talc, galena, magnetic iron ore, limonite, feldspar, etc., that are now lying dormant.

Gold, it is supposed, was first discovered in Alabama by a company of Spaniards, who landed at Pensacola, Florida, in the sixteenth century, and made a prospecting tour through Alabama. The foundation for this supposition is the fact that throughout the metamorphic region, and especially the northwestern portions, quite a large number of holes and excavations have been made at various points, that give unmistakable evidence of their antiquity by large oak trees, with trunks from three te four feet in diameter, growing out of the piles of earth and slate thrown from these holes. Whether all this work was performed for the purpose of obtaining gold or other mineral is a problem yet to be solved.

The earliest positive assurance that we have of gold being taken from this State was in the year 1833. This was at the Rippito mines in the neighborhood of the Coosa River. From that time till the commencement of the war between the States gold mining excitement increased and lulled alternately. A great amount of work was performed and thousands of dollars' worth of gold was extracted. Water, however, seemed to be an enemy they could not overcome, for as soon as water level was reached, the works were abandoned and new shafts and tunnels opened. There are a great many such places to be seen at the present day made upon the rich veins and gold deposits. With a little judicious management, and with the aid of the present mining machinery, these places can be reclaimed, and will, no doubt, handsomely repay the necessary outlay of capital.

I have been spending my time for the past few months in visiting some of the localities at which gold has been worked, and is now being worked, in Alabama. A cursory description of two of these mines I give in this paper.

THE HARRAL GOLD MINE.

This mine is located in township 20, section 34, range 6, east, in Clay county. It was first discovered in 1846 by Mr. Harral, the owner of the land. He was standing in the door of his dwelling, just immediately after a heavy fall of rain, and noticed a few particles of gold in the sand under the eaves of his house, stirred up by the water as it fell from the roof. He was thus induced to search for the source of this gold, and eventually found the vein. Being a poor man he was unable to work it, and the property was sold to a company, who opened and worked the mine two or three years, and, from all accounts, quite profitably. From some misunderstanding among the members of the company, the property was placed in litigation and work was suspended. Before the suspension of operations, however, the company had succeeded in erecting a mill of four stamps, run by water-power, and had driven into the side of the hill, through which the vein ran, a tunnel one hundred and twenty-five feet in length, and opened a bluff on the side of the hill, exposing the vein for thirty feet in depth.

In 1854, Prof. Tuomey, the State Geologist, visiting the mines and speaking of it in flattering terms, parties purchased the property for the purpose of re-opening, but for some unknown reasons work was never commenced. There are some efforts now being made, by the present owners, C. H. George & Co., to open and place the mine in a first-class and profitable condition. They have sunk a shaft, cutting the vein at one hundred feet below the surface, and have commenced to erect the necessary machinery.

The lode consists of a large number of small quartz and slate veins that gradually approach each other as they dip into the earth. The width at the outcross is 25 feet, while at one hundred feet below it is contracted to the width of 15 feet. The vein passes through a hill about 200 feet in height and a mile in length. The inclosing schist is thoroughly decomposed, and but little water is met with until the level of the valley is reached. The ore consists of ferruginous quartz and slate. The country rock is talcose, chloritic, and mica slates. Some silver is associated with the gold. The gold is 0·90 degree in fineness in the upper portion; but as depth is attained the amount of silver seems to increase. My impression is that the introduction of suitable machines, to save the silver, will be a desideratum.

The pyrite found in the vein is more or less auriferous. Heretofore, however, the sulphurets have been cast aside as worthless. The present management, I trust, will investigate this matter, and, if necessary, treat the sulphurets for gold.

A large mass of the ore is exposed at present, and will require but little work to cut down and handle. The gold is mostly fine-grained, and but rarely visible to the naked eye. The mine to the depth opened will produce ore that will average $10 to the ton. From three analyses of this ore, made by myself, I obtained the following results: Near the surface the yield was $7 per ton; 20 feet below, $17 per ton; while in the neighborhood of 100 feet below the surface, the yield was $27 per ton, thus furnishing proof that the mine, at least to the depth tested, was steadily improving.

GOLDVILLE MINES.

A considerable amount of work has been done around this village, both along the streams in the loose auriferous gravel and in the veins. Work has been suspended now for a number of years. The veins were discovered in 1844, and worked out as far as water level. The greatest depth reached was 80 feet.

The richest claim in the section is known as the "Log Pit Vein." This property is now owned by J. D. Williford, H. L. Hull, and T. K. Wynne, and consists of 320 acres. The lode passes through the length of a ridge, so that a considerable depth can be reached before water will materially interfere.

This was called "Log Pit," from the fact that, at the point where gold was first discovered on the vein, the outcrop resembled an old decayed log so much as to be so considered by prospectors, until one of a more inquiring mind than his predecessors tapped the supposed log, and breaking off a piece noticed the gold glittering on the freshly-broken surface.

The property lies in Coosa County, about seven miles from Goldville, in township 24, range 23. There are two veins, one 18 inches, and the other 12 inches in thickness, that approach each other, the first striking at an angle of 45° N. E., and the other 20° N. E., and each dip at 60° to the S. E. The inclosing rock is talcose slate, thoroughly decomposed. The ore is a friable, porous, ferruginous quartz, and yields $36 per ton. The gold is 0·90 in fineness. The associated minerals are pyrites, more or less impregnated with gold, magnetic iron, sand, native sulphur, garnets, silver, etc. When the mine closed down, 18 or 20 years ago, $30,000 worth of gold had been extracted. The present company contemplates re-opening at an early day.

Parties wishing to visit the above mines should either get off at Talladega, on the Selma, Rome and Dalton Railroad, or at Goodwater, on the Savannah & Memphis Railroad. Private conveyance must be used from these points. The Harvard mine is distant from the above mines about 18 miles, while the Goldville mines are fully 40 miles from the first, and 25 miles from the latter place.

MINING NEWS.

Staff Correspondence of the Engineering and Mining Journal.

IDAHO AND MONTANA.

Silver City Avalanche.—Prospecting continues in the lower levels of the Empire, with no results of importance as yet. The upper stopes are yielding steadily.

The chances for the reopening of the Poorman appear to be excellent. The new superintendent left San Francisco for Owyhee on the 6th of November.

The Golden Chariot shaft has reached its 1500-foot station, and cross-cutting for the ledge has begun.

Butte Miner—The Monroe Mill, at Dewey Flat, has been closed down in consequence of difficulty with the miners. The *Miner* states that the management was unusually bad, and lays the blame of the entire trouble to the fact that the mill was put under the charge of a relative of an Eastern stockholder who knew nothing of the business, and consequently made a failure.

The repairs required on the Dexter Mill were finished on the 25th, and it is now running as smoothly as ever. The Lexington mine, which supplies this mill, is being supplied with a new and a more powerful engine, and will be once more producing in a few days.

For the week ending Oct. 27, the Hecla works, at Glendale, yielded 55 tons of loose bullion.

The pay streak has at last been struck after four years labor, in Quartz Creek, Missoula County.

Helena Herald.—A 53-ounce nugget, worth $1,050, was taken out of Nelson Gulch lately.

During the quarter ending Sept. 21, the Helena U. S. Assay Office melted bullion to the value of $245,000.

The Smelting furnaces of the Montana Company were started up on Oct. 29.

ARIZONA AND NEW MEXICO.

The Almoner G. & S. M. Co., with a capital of $10,000,000, has been organized, to operate in Pima County mines. The Silver King concentrating mill is now running with four Frue belts. They are turning out over a ton a day of ore, with over $1,500 per ton. The mine keeps shipping to San Francisco regularly, the latest shipment being 11 tons, worth $16,500, being wholly of concentrates.

The Gila Consolidated Mining Company of San Francisco are bringing the necessary hydraulic machinery into Arizona for their extensive enterprise, and expect to have the ground under water next spring. Indian labor, to some extent, is to be used—a new departure. The discovery of these placers was made in 1858, and within a few months one thousand men were at work at Gila City, all doing well. The mines prospered for four years or more, and then were abandoned for richer ground by a majority of the miners. The present company has succeeded in consolidating a large number of smaller claims, and finds that its ground is of excellent quality for operations on a large scale. The ground will average, itis thought, five cents to the pan. It is on record that one of the early miners on the Gila took out $35,000 in five days' work.

The Signal Company's claim on the McCracken lode is producing sixty tons daily, more than supplying the mill.

Globe District, in Arizona, is at present the most prominent mining camp in the Territory. Most extraordinary reports are made, in the Arizona papers, of the richness of the ore—so extraordinary, however, as to be almost beyond belief. The *Sentinel*, however, reports one definite fact of the shipment of 6,400 pounds from the Stonewall Jackson mine, which is worth $10 per pound.

NEVADA AND CALIFORNIA.

White Pine News.—The furnaces of the King Company are rapidly approaching completion. It is believed from the care and ability displayed so far in the erection and management of the works that they will prove successful.

Particulars of the strike in the Eberhardt and Aurora tunnel are now at hand. It appears that the tunnel has passed through the western edge of a chamber of mineralized spar, twenty feet thick Drifts will immediately be begun on the vein or segregation. It is thought that plenty of $50 ore can be furnished from this new body.

Cherry Creek district is looking well. The Star Company have completed their new hoisting works; two new roasters are being erected, and it is expected that the 20 stamp mill will be in operation by the middle of November. The Star mine is looking finely.

Pioche Record.—The Meadow Valley shaft is being retimbered from top to bottom. The Raymond & Ely continues production from its upper levels, and prospecting below. The recent strikes on the bottom of the mine have not amounted to anything of great importance, though a moderate amount of ore is always coming out.

Winnemucca Silver State.—The mines of Winnemucca Mountain are continuing to look very finely, wide veins are found and good ore. The Ophir is the best developed so far.

The Arizona, one of the standard mines of Nevada, is yielding about $20,000 monthly, and the Rye Patch mine about $25,000.

The suit of Kinney *et al.*, questioning the title of the Consol Va. mine, has been at length decided in favor of the Bonanza.

The Melville Reduction Works at Silverton, which employed Walker's lightning amalgamators, have proved an utter failure.

Georgetown Courier.—During the last week of October the Tooker claim on the Boulder Nest lode produced ore worth $10,000, and the Cornish & Roberts ground about $12,000.

The Flat Iron, an extension of the Free America, has been developed into fair pay.

A rich strike has been made on Leavenworth Mountain, in the Buchannan Tunnel. The vein struck is supposed to be the O. K. Eighteen inches of ore worth over $500 per ton is the amount and value.

The developments on the White Lode progress with vigor, and make a fine showing. This vein is one of the largest on Republican Mountain.

Central Register.—The yield of the Gilpin Company gold mines for the month of October, was as follows.

Mill Retort, gold	$65,390
Boston and Colorado Smelting Works, gold	74.500
" " " " silver	15,000
Sales of ore	8,000
	$162,890

The yield of the Monmouth Kansas for the month, was $11,600.

Silver World.—The Ocean Wave works turned out their first lot of base bullion—ten thousand pounds—on the last day of October, and have been casting about six tons daily since. These works are built and started under the charge of Mr. Wm. West, formerly of Golden. They are supplied with two wasting furnaces and one stack, and have a wasting capacity about fifteen tons. The fuel used in the stack is charcoal. The ore is mainly argentiferous galena, of moderate grade.

The Van Gerson lixiviation works closed down for the winter on October 30, the supply of ore having diminished so as to make such a move necessary. The works began operations on September 1, and during the sixty days' run treated about 400 tons of ore, which yielded on an average $100 per ton, making the shipments $40,000. The bullion ranged from 850 to 925 in fineness. The works will be reopened early in the spring, by which time the company expects to have a large amount of ore on hand from the mines.

Sunshine Courier.—The Frue concentrating machines recently set up at Providence are reported to be working very successfully on the dumps of the John Jay and Last Chance mines.

The Big Blossom lode shaft is down fifty feet, and is making small shipments of very high grade ore, worth nearly $5 per pound. As no large amounts have yet been shipped, it is probable that the rich pay streak is not very wide.

The recent developments at the bottom of the American are favorable to the future of the mine. The new ore body has, however, only been penetrated a short distance, and its extent is therefore wholly unknown.

THE PRODUCTION OF SOLID STEEL CASTINGS.*

By M. Euverte.

The investigations that have led to the manufacture, at Terre-Noire, of steel of all tempers, cast free from blow-holes, were directed in the first instance to the production of projectiles of chilled cast iron, suitable for piercing armor plates. Preliminary experiments showed that the strength of the metal was much increased by fusing it in an open-hearth Siemens furnace, with the addition of between one-half and one-third of its weight of steel scrap, and that this increase in strength, over that of metals not so heated, was most marked in the case of test pieces cast in chills, and from metal that had contained in its original state a considerable proportion of silicon. An addition to the metal of 0·72 per cent. of tungsten further increased its strength. The addition of scrap, in quantity exceeding a certain proportion, which depended on the amount of silicon contained in the pig iron, was found to produce honeycombed castings; and the metal, which had up to that point gained in strength with each addition of scrap, thence rapidly deteriorated.

Chilled projectiles made of this toughened cast iron, which contained from 2 to 2·5 per cent. of carbon, pierced armor plates without injury when fired directly against them; but when fired obliquely, though they penetrated the plates, they were broken by the shock. This mattered little in the case of solid shot, so long as the plates were pierced; but a shell, to be effective, is required to pass through the armor unbroken, and to burst within it; and thus, for the production of hollow projectiles that would be effective against armor when fired obliquely, a similar metal, combining sufficient hardness to resist deformation with greater toughness, was required.

Such a material has been obtained by carrying still further the addition of scrap to the charge of pig-iron in the Siemens furnace, and finally adding to the resulting bath of decarbureted soft iron from 8 to 9 per cent. of silicious pig-iron, containing 4·5 to 5 per cent. of silicon and 3 to 3·3 per cent. of carbon. One-half per cent. of manganese, in the form of ferro-manganese or spiegeleisen, is also added to the bath of pig-iron at the commencement of the operation, and 1 per cent. more before tapping, in order (in addition to the beneficial effect of the manganese itself in alloy with the steel) to diminish the oxidation of the bath, and to render the slag more fluid.

Projectiles cast of metal made in this way are entirely free from blow holes. When required to be hollow, they are in the first instance cast solid, bored out, and then tempered in oil and slightly annealed. Thus treated, a shell of 9·45 inches caliber may be driven without fracture, and with little alteration of form, through an armor plate 8·66 inches thick, when fired normally at it, and through a plate 7·87 inches thick, at an incidence of 20° from the perpendicular.

The effect of annealing and tempering upon such castings is very remarkable. The fracture, which in the steel as cast is highly crystalline, with a large and brilliant grain, becomes much finer, and comparatively gray and dull, like that of hammered metal, and both the strength and the toughness are at the same time greatly increased. Thus, in one instance, the limit of elasticity of a sample of metal, containing rather a high percentage of manganese, was in the cast state 24·57 tons per square inch, with a breaking strength of 32·70 tons per square inch, and an ultimate extension of 0·7 per cent. (on test pieces 0·59 inch diameter and 3·93 inches long); and, by annealing, the limit of elasticity was raised to 27·24 tons, the breaking strength to 57·78 tons, and the ultimate extension to 5·3 per cent.

	Hard Metal for Projectiles C = 0·635 Si = 0·550 Mn = 0·950			Metal of med'm hardness C = 0·425 Si = 0·275 Mn = 0·750			Soft Metal. C = 0·260 Si = 0·260 Mn = 0·410		
	Limit of Elasticity.	Breaking Load.	Elongation.	Limit of Elasticity.	Breaking Load.	Elongation.	Limit of Elasticity.	Breaking Load.	Elongation.
	Tons pr sq. inch	Tons pr sq. inch	Per cent.	Tons pr sq. inch	Tons pr sq. inch	Per cent.	Tons pr sq. inch	Tons pr sq. inch	Per cent.
Test pieces cut from cast ingots	15·04	35·55	2·1	19·81	39·68	5·3	10·92	30·35	13·8
Annealed	18·66	46·35	7·5	23·43	46·28	14·0	12·19	29·52	26·5
Tempered in oil, slightly annealed	27·11	70·796	1·0	24·76	48·76	12·0	19·75	34·92	22·8

The minimum amount of silicon that must be present in steel, in order that it may be cast free from blow holes, appears to be about 0·25 per cent., a proportion that cannot be introduced into it, by adding silicious pig-iron to the bath of decarbureted metal at the end of the open-hearth process, without putting in at the same time too much carbon to admit of making the metal soft; and hence, for the production of the softer qualities of this "dead-melted" steel (*acier sans soufflures*), it is necessary to add, instead of pig iron, 3·5 per cent. of a special alloy containing:

*Abstract of paper in the Memoires de la Société des Ingénieurs civils, 1877, p. 738, from the Minutes and Proceedings of the Institution of Civil Engineers, of London, edited by James Forrest, Secretary.

	Per Cent.
Silicon	8·1
Manganese	14·5
Carbon	1·3

By the use of this alloy, solid steel castings of a mild and tough quality, suitable for the production of cannon and for various purposes of construction, may be obtained as readily as the harder metal fitted for the manufacture of projectiles.

The above table has examples, from a table given in the paper, of the composition and properties of some of the principal qualities that have been made; the test pieces being in each case 15 millimeters (0·59 inch) in diameter by 10 centimeters (3·93 inches) long.

NOTES.

CHESAPEAKE & OHIO CANAL.—On Nov. 12 a heavy land-slide occurred in the east approach to the tunnel near Cumberland, Md., filling up the prism of the canal and breaking the lock gates and flumes. The damage done is heavy and will take, it is thought, at least ten days to repair. It is possible that it may close navigation for the season, especially if cold weather should set in.

THE GEOLOGICAL SURVEY OF CANADA.—This was reorganized a few months ago, and now forms a permanent branch of the Civil Service of Canada, under the title "The Geological and Natural History of Canada." Prof. Selwyn is director, and Mr. Robert Bell assistant director. Mr. Bell has just returned to Montreal from a five months' exploration of the district around Hudson's Bay.

EMBARRASSMENT OF THE BOSTON LEAD CO.—The Boston Lead Co. having become embarrassed, a meeting of creditors was held on the 14th inst., J. H. Chadwick & Co., their selling agents, made a statement showing a large surplus in stock and other property over their liabilities. The company asked for an extension of time, and J. H. Chadwick & Co., who are indorsers for the company to a large amount, propose, if the extension is granted, to guarantee payment in full of principal and interest. The statement was favorably received and a committee chosen to examine the company's affairs.

THE WASHINGTON MONUMENT.—Generals Gilmore and Duane, of the Corps of Engineers, members of the Board to examine the foundation and structure of the Washington monument, concluded last year that the present foundation of the monument was insufficient to bear the weight of the structure when completed. That opinion was based upon certain measurements made by Lieut-nant Daniel Kingman, of the Engineer Corps, who found that the sinking of the shaft was so serious as to endanger its safety if a greater weight was added. It now appears that, through no fault of his, the measurement was made from a wrong bench mark, and that there has been really no such settling as was believed. The Board has now agreed to report that the monument may safely be completed if a certain addition is made to secure the foundation. They report that a strong wall should be built around the foundation from the surface to twelve feet below the present walls, and at least six feet distant at the corners of the structure, and curved or bowed so that the center of the wall on each side shall be at least twelve of fifteen feet from the monument. The space between the wall and the monument they propose to fill in with a strong concrete of rubble and cement, and believe that this will effectually hold the earth directly underneath the shaft, so that it will be firm, and will not slide or sink.

WAGES AND COST OF COAL MINING AT SEATTLE.—The *Pacific Tribune* has the following: "The Seattle Company, last week, reduced the allowance paid its colliers one-third. They were before paid $12 per yard of the breast, and are now paid $8, from which $1.50 or $2 may be deducted for expenses necessary to mining. 'A yard of the breast' would be a term of indefinite meaning to all unacquainted with coal mining, unless explained. In the mine of this company it consists of a slice out of the vein of solid coal three feet thick by eleven feet one way and thirty another—equal to between thirty and forty tons of the mineral. We have often stated, on very excellent authority, that the mine of the Seattle Company is the best on the coast for easy and economical working, and this opportunity is taken advantage of to repeat and sustain the assertion. The common prices for mining coal have been on this coast a dollar, dollar and a quarter, and a dollar and a half a ton for many years, at which the miners would make three, four, and five dollars a day. Here, at $8 a yard, they are getting twenty or twenty-five cents a ton, and yet they make their three dollars a day as well as men elsewhere who are paid four or five times as much. The low prices of coal in San Francisco has necessitated this reduction by the company, with whom it is a question of cheaper coal or shutting down. No description of coal is now being placed on the market that sells as readily at its price as Seattle coal, but in the terrible competition prevailing, it has got to be offered cheap to sell at all. With an improvement in the market, higher prices will undoubtedly have to be paid for the mining of the coal, which, as well as transportation, etc., is down to its lowest notch, and must go up whenever a change is made."

FIRE DAMP EXPLOSION IN THE JERMYN, PA., COLLIERY.—The Jermyn Colliery, located in the Thirteenth Ward of Scranton, was the scene of a thrilling fire-damp disaster on the morning of the 15th inst., by which a number of workmen were fatally injured and others maimed in a most appalling manner. The explosion occurred in one of the chambers of the mine, some sixteen hundred feet from the foot of the shaft, where a gang of workmen were constructing cross walls to direct the course of the air. The volume of the fire-damp coming in contact with their lamps, became ignited and exploded with a terrible roar, tearing all before it, causing the entire mine to shake, and making the firm breaker at the mouth of the shaft tremble like a reed. Two hundred men and boys were in the mine when the accident occurred. Their lights were instantly put out. Huge pillars of coal were torn into fragments. Props were flung about in all directions. Mine cars were crushed to pieces, and men and mules carried several yards distant, or buried alive amidst great boulders of rock and coal. It was a moment of intense terror. As soon as the men in a distant part of the mine recovered from the effects of the shock they ran to the assistance of their comrades, who were lying helpless and dying beneath the heap of debris.

It is rumored that two men are yet in the mine, but its dangerous condition will not allow of any one going down the shaft, which is 200 feet deep. The gas is still blazing fiercely where the accident occurred, and the flames are fed by hundreds of currents rushing from all directions through the crevices of the coal. All the mules are in the mines, and must have perished during the day.

Another terrible explosion must take place to exhaust the accumulation of gas before any one can enter the mine. It is hourly expected, and so intense is the dread of it that old miners will not venture near the mouth of the shaft until it has occurred.

It is but a few weeks ago since a destructive fire, induced by the ignition of fire-damp, raged for several days in this colliery, and the place was only in fair working order when this deadly accident of to-day occurred.

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ASSAYS.

All assays are reported in ounces per ton of 2,000 lb. The ounce of silver is worth about $1. The ounce of gold about $20. Lead and copper are reported in per cent.

202 C.—Silver, 9·3 oz; gold, 1·7 oz.

203 V.—Dump rock.—No 1 Silver, 32·25 oz; gold, ¼ oz.
No 2 " 17·5 oz; " 0·1 oz.
No 3 " 10·0 oz; " trace.
No 4 " 16·0 oz; " trace.

204 J. B.—Silver, trace; gold, none.

205 T. M., Boulder.—Gold, 0·4 oz; silver, 262·6 oz.

206 H., Boulder.—Gold, trace; silver, 10·8 oz.

207 S., Boulder.—Gold, none; silver, 36·25 oz.

208 J. H. S.—Silver—No 1, 282·5 oz; No 2, 107·5 oz; No 3, 5·5 oz; No 4, 12·0 oz.

209 J. M.—Silver, 607·75 oz.

210 T. W. H.—Silver, 19·12 oz; silver, 23·5 oz.

211 D. A. F.—Lead, 49·92 per cent.

212 B. Q.—Silver, 3·5 oz; gold, none. Silver, 62·25 oz; gold, none. Silver, 3·75 oz; gold, none.

213 J. D. L.—Carbonate of lead, Oro City, No 1 silver, 2267·5 oz; gold, 160·1 oz.
" " " No 2 silver, 306·25 oz; " 10·34 oz.

214 M. O'NIEL.—Silver, 22 oz.

215 J. S. C., Fort Collins.—Gold, 2 oz; silver, 6·5 oz.

216 B., Magnolia.—Gold, 2 oz; silver, 3 oz.

217 T. C. J.—Gold, ¼ oz; silver, 4¼ oz.

218 MARKHAM, Santa Fe.—Gold, 2¼ oz.

219 H. W. B., Cimarron, N. M.—No 1 iron pyrites, gold, 3·31 oz; silver, 12· oz.
No 2 copper " " 12.41 oz; " 68. oz.
No 3 galena, " 694. oz.
No 4 " " 112,22 oz.

220 D. B. J., Georgetown.—Silver, 192½ oz.

221 R. FAWKINS, Leadville, Colo.—Lead, 61 per cent; silver, 934 oz.

222 PETER M. DROWN, Laramie, Wyoming.—
No 1 copper, 38¼ per cent.
No 2 " 36 per cent.
No 3 " 19¼ per cent.; gold, trace.
No 4 " 44.12 per cent.

223 S. B. B., Springdale—Big Blossom Lode: Silver, 129 oz; gold, 3,338·5 oz.

224 BLUE BIRD MINE.—Silver, 320 oz; gold, none.
" 17 " " "

225 P. S. O.—Silver, 6·6 oz; gold, ¾ oz.

226 W. B. R.—Silver, 10·5 oz; gold, 5¼ oz.

227 McC.—Silver, 10 oz.

228 J. B. D.—Silver, 7·25 oz; gold, 3 oz.

229 D. B. M.—Silver, 3·75 oz; gold, ¼ oz.

230 J. H. B.—Silver, 453·60 oz.

231 HENRY MARKS, Deadwood.—The sample is a reddish crystalline slate, showing free gold and a little pyrites; good milling ore.

232 E. R. PERKINS, Santa Fe, N. M.—The sand sent contained minute grains of platinum. This is a discovery of some note if you have really made it in New Mexico. It is the second sample we have received from your Territory containing this metal.

233 F. A. ROBERTS.—No use to assay. Sample is a pure graphite, consisting almost wholly of carbon.

234 T. W. FAIRPLAY.—A fair sample of black mica. The color damages it. The sheets are otherwise unusually good.

235 M. A. LAWLER, Idaho.—It is not ruby silver, but iron; a common mistake.

236 R. E. FORD, Deadwood.—No. 1 gold, 2·6 oz; No. 2 gold, 1·8 oz; No. 3 gold, 0·4 oz.

237 J. W., Central, Colorado.—Gold, 1·6 oz; silver, 11½ oz; Cu, 6½ p. c.

238 H. GORDEN, Bingham, Utah.—Silver, 143 oz; Pb, 36 p. c.

239 D. P., Cowles Lake, Colo.—Silver, 1238 oz.

240 H. M. FURNESS, Cimarron, N. M.—Gold, 1·25 oz; silver, 22 oz.

241 W. B. JAMES, Laramie.—No 1 silver, 18 oz; Cu, 31. No. 2 silver 19·6 oz; Cu, 24 p. c. No 3 silver, 66½ oz; Cu, 23 p. c. No 4 silver, 60¼ oz; Cu, 46 p. c.

242 JOHN DILLINGHAM, Denver.—Silver, 432 oz; Pb, 41 p. c.

243 JUDGE WOODS, Caribou.—No 1 gold, ½ oz; silver, 94 oz; No 2 gold, 1·1 oz; silver, 67¼ oz.

244 L. G. C., Pueblo, Colo.—Silver, 118 oz; Pb, 6·p. c.

245 MCFARLAN, Colorado Springs.—Silver, 11 oz; Pb, 18 p. c.

246 E. E. E., Fairplay, Colo.—Silver, 301 oz.

247 T. WAITE, Cheyenne.—Silver, trace.

248 H. FORRESTER, Boise City, Idaho.—Gold, 0·3 oz; silver, 201 oz.

249 E. E. H., Ward, Colo.—No 1 gold, 2·1 oz; silver, 4 oz; Cu, 6 p. c. No 2 gold, 2·0 oz.; silver, 12½ oz; Cu, 4¼ p. c. No 3 silver, 31 oz; Pb, 16 p. c.

250 A. F. BROOKS, Dahlonega, Ga.—Gold, 0·5 oz; silver, 3 oz.

251 F. H., Slide Mine, Gold Hill.—Gold, 92 oz; silver, 63 oz.

252 A. R. G.—No 1, Congor Lode, silver, 11 oz; Pb., 18. No 2, Empire Lode, silver 109½ oz; Pb, 36. No 3, Castle Lode, silver, 384 oz. No 4, Le Roy Lode, gold, 0.5 oz; silver, 87 oz; Cu, 3 p. c.

253 JAMES MCNASSOR.—Ford Mine, silver, 607¾ oz; Pb, 48 p. c. Rob Roy Mine, silver, 103¾ oz; Pb, 2½ p. c. Musk Ox Mine, silver, 558 oz; Pb, 12·7 p.c. Keystone Mine, gold, 0·9 oz; silver, 53·4; Pb, 29·1 p. c. Mineral Mine, gold, ¼ oz; silver, 22¾ oz; Pb, 53·7 p. c. Musk Ox Mine, silver, 1479·6 oz; Pb, 31·3 p. c.

254 J. S. C., Fort Collins, Colo.—Gold, 2 oz; silver, 6½ oz.

255 B., Magnolia, Colo.—Gold, 2 oz; silver, 3 oz.

256 T. C. J.—Gold, ¼ oz; silver, 4¼ oz.

257 G. W. B.—Gold, trace; silver, 36½ oz.

258 O. C.—Concentrates.—Gold, 1·6 oz; silver, 5·8 oz.

259 McC.—Gold, trace; silver, 14·00 oz.

260 H.R P., Butte, Montana.—Red oxide of copper with particles of copper glance and some copper pyrites. Would probably yield 25 per cent of metal.

261 J.Q., Georgetown.—Pyrargerite.

262 Judge Woods, Caribou.—Thanks for elegant samples of wire and leaf silver.

263 A.B.P., Silverton, Colo.—The sample sent yielded, after crushing and drying the following constituents: Sulphide of lead, 37½ per cent.; sulphide of zinc, 9 per cent.; sulphides of iron, 24½ per cent.; copper, trace; alumina, 11·5 per cent.; silica, 38¼ per cent.; silver, 1½ per cent.

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 Nov. 10, and years from Jan 1st.

Tons of 2,240 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co.	59,596	1,473,836	62,326	1,643,578
D. L. & W. RR. Co.	66,997	1,576,050	65,112	1,585,849
Penn. Coal Co.	29,760	871,167	32,977	921,035
L. V. RR. Co.	29,396	758,136	14,574	812,864
P. & N. Y. RR. Co.	1,632	37,775	873	20,541
C. RR. of N. J.	51,255	1,087,059	40,092	1,141,392
Penn. Canal Co.	9,364	305,981	15,378	377,430
	248,000	6,110,004	231,272	6,502,689
Lehigh Region.				
L. V. RR. Co.	68,045	2,801,419	96,926	2,377,225
C. RR. of N. J.	51,623	1,288,851	32,448	1,190,577
D. H. & W. B. RR.	....	25,987	1,239	37,940
	119,668	4,206,257	130,613	3,605,742
Schuylkill Region.				
P. & R. RR. Co.	127,894	5,837,929	153,738	4,154,424
Shamokin & Lykens Val.	16,849	623,388	26,094	808,867
	144,743	6,461,317	179,832	4,963,291
Sullivan Region.				
Sul. & Erie RR. Co.	607	16,904	396	29,094
Total	513,018	16,794,482	542,113	15 100,316
Increase	....	1,693,666	....	....
Decrease	29,095	....	....	....

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.

Receipts and shipments of coal at Chicago, Ill., for the week ending Nov. 10, and year from January 1:

	Week. Tons.	Year. Tons.
Receipts	36,911	1,433,011
Shipments	4,671	314,336

The Receipts of Coal at Rondout, N.Y., by the Delaware & Hudson Canal for the week ending November 15 were 235 boats, carrying 29,239 tons.

The shipments of coal at Cleveland, Ohio, for the week ending Nov. 12 were as follows: shipped coastwise, 10,348 tons; total for year, 257,550 tons; foreign shipments, 3,230 tons; total for year, 76,834 Total of coastwise and foreign shipments for week, 13,578; for year, 334,384 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania, Railroads amounts to 125,663 tons, as compared with the corresponding period in 1876.

Perth Amboy business:	Tons.
Received for the week	25,594
Shipped for the week	20 432
On hand Nov. 10	115,867

The Exports of Coal from Baltimore for the week ending Nov. 10 were 780 tons, and since January 1st, 25,485 tons as against 22,609 tons for the corresponding period of 1876.

Shipments of coal at Pictou, N.S., for the week ending Nov. 10 and year from January 1:

	Week.	Year
To Canada	850	50,942
" United States	....	20,332
" Other Provinces	1,165	70.768
West Indies	....	1,626
Total tons	2,015	143,608

Receipts of Coal at Boston, for the week ending Nov. 9 and years from Jan. 1.

Tons of 2,240 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
From				
Alexandria and Georgetown	5,568	74,825	....	53,308
Philadelphia	21,522	607,010	14,834	516,795
Baltimore	1,720	137,876	760	132,330
Other places	8,132	223,702	5,534	256,211
Great Britain	5c	11,087	200	5,039
Nova Scotia	435	37,091	261	22,819
Total	37,427	1,091,591	21,589	986,502

Coal Cleared on the Canals of the State of New York from Nov. 1 to Nov. 7 inclusive, and years since the opening of navigation:

Tons of 2,000 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
Anthracite	25,938	864,316	21,516	683,864
Bituminous	4,224	227,755	7,264	271,115
Total amount cleared	30,162	1 092,071	28,780	954,979
Of the above, there was cleared at tidewater ports, viz., New York, Albany, West Troy, and Waterford.	17,886	747,357	16,417	426,194
Cleared at internal ports	12,276	344,714	12,363	528,785

The production of Bituminous Coal for the week ending Nov. 10 was as follows:

Tons of 2,000 lb., except where otherwise designated.

Cumberland Region, Md.	Week, Tons.	Year, Tons.
Tons of 2,240 lb	39,143	1,359,839
Barclay Region, Pa.		
Barclay RR. tons of 2,240 lb	7,917	281,912
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	3,214	118,423
*East Broad Top	1,168	41,897
Clearfield Region, Pa.		
*Snow Shoe	1,216	32,173
*Tyrone and Clearfield	26,970	1,100,890
Allegheny Region, Pa.		
*Pennsylvania RR	3,378	149,936
Pittsburg Region, Pa.		
*West Penn. RR	4,455	149,542
*Southwest Penn. RR	697	31,944
*Penn & Westmoreland gas coal, Pa. RR.	23,705	566,274
*Pennsylvania RR	11,459	308,729

* For the week ending Oct. 28.

The Production of Coke for the week ending Oct. 28.

Tons of 2,000 lb.	Week.	Year.
West Penn. RR	742	48,000
Southwest Penn. RR	13,552	511,503
Penn & Westmoreland Region, Penn. RR.	1,313	53,243
Pittsburg, Penn. RR	1,770	91,397
Total	17,385	704,143

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 16, 1877.

Anthracite.

It has been a long time since the coal trade has had a week attracting so little attention as the one under review. Wholesale prices show no change worthy of notice, while all the producers are fully engaged filling orders that must be attended to previous to the close of navigation. This prevents the great competition that has ruled almost without interruption since the break of the combination. Every day, however, makes it more difficult to secure boats for some of the more distant markets, and by the end of this month all inland points will probably be inaccessible. After that time the markets will be very limited, and competition quite strong. Much, however, will depend upon the position the Reading Company will take in the winter trade—whether it will ship from Amboy, and if so, how much.

Although on every side we hear that "unless the companies enter into some arrangement to limit production, and, of course, to advance prices, they must all be bankrupted,"—and that "a combination of some sort is inevitable;" yet we fail to see the first indication of a practical or practicable move in that direction. We have heard a little talk of efforts to be made to have the miners limit the production, as they did some years ago, if the companies will not. It is bad enough for the stockholders to be at the mercy of the managers, but if turned over to the miners their case would be a quite pitiable one. We do not believe the miners have any desire to restrict their already too short work, they have seen clearly enough that partial work and even high wages only led to too many men and low earnings, and they will not again repeat the disastrous lesson which they are still suffering from.

Owing to severe rains the shipments from the Schuylkill region, in particular, were considerably curtailed during the past week. The shipments over the Lehigh Valley Railroad are decreasing, owing to the refusal of the company to reduce its tolls sufficiently to enable operators on its line to compete with other coals. The result has been that shipments are confined to coal necessary to fill orders for large sizes, and the incidental product of smaller sizes made in obtaining the larger. The total shipments of anthracite coal last week was 513,018 tons, as against 482,214 tons for the previous week, and 542,113 tons for the corresponding week of last year. The total production from January 1 to November 10, was 16,794,482 tons, as against 15,100,816 tons for the like period of 1876, showing an increase of 1,693,666 tons this year. The Lehigh region shows an increase this year of about 600,000 tons, and the Schuylkill 1,500,000, while the Wyoming shows a loss of 400,000 tons.

Although vessels are in large demand, yet freights are easier.

Bituminous.

This branch of the coal trade has attracted as little attention as for weeks past. The business now being secured is confined to cargo lots, the balance going to fill yearly contracts. Shipments of Cumberland coal over the Chesapeak & Ohio Canal have been impeded by a land-side. According to the local press it was thought that light boats could pass again to-day, and loaded ones to-morrow. The reports from some of the mines show that the active season is over with them, and that the output of the whole region must soon show a considerable decrease. The production so far this year is more than 125,000 less than for a like period of 1876. Our Clearfield reports are not up to date, but indicate that this region will continue to show this year as it has for several years past, a very satisfactory increase of business. Prices of all discriptions of bituminous coals are very low, and in many cases show no profits to the mining companies. Freights continue very strong, with no indications of relief during the balance of this season.

New York.

Wholesale Prices of Anthracite Coal f. o. b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Chestnut.	Stove.
Wyoming Coals.						
*Lackawanna at Rondout	2 65	2 65	2 65	2 80	3 05	3 10
†Pittston at Newb'g (A.S Swords)	2 70	2 70	2 70	2 80	2 80	3 00
‡Scranton at Hoboken	....	2 32	2 45	2 50	2 86	2 40
Wyoming at Amboy (L. V. C.Co.)	....	....	2 85	2 85	3 00	2 60
Wilkesbarre at Port Johnston	2 60	2 60	2 70	2 75	2 60	3 00
Kingston at Hoboken	2 50	2 50	2 65	2 70	2 60	3 00
Lehigh Coals.						
Sugar Loaf, at Hobok. & Amb	3 50	..	2 85	2 85	2 60	3 00
Lehigh at Perth Amboy	3 50	....	2 85	2 85	2 60	3 00
Hazleton at Hoboken	3 50	....	2 85	2 85	2 60	3 00
Lehigh Coal Exchange	3 50	....	2 85	2 85	2 60	3 00
Mount Pleasant at Hoboken	3 50	....	2 85	2 85	2 60	3 00
Cross Creek at Port Johnston	....	....	2 85	2 85	2 60	3 00
Lehigh at Amboy (L. V. C. Co.)	3 50	....	2 82	2 85	3 00	2 60

* These prices are for the city and harbor of New York. For all points on North River and north of Rondout the price is 15 cents less.

† These prices are for the city and harbor of New York. For all points on North River and north of Newburg the price is 10 cents per ton less.

‡ These quotations represent the average prices of the last auction sale.

Boats towed by the D. & H. C. Co. at its expense to and from New York Harbor.

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to N. Y	40c.
" " South Amboy to New York	40c.

Freight by the boats of the companies from Hoboken, Port Johnston, Weehawken, South Amboy and Perth Amboy to New York City and vicinity 40c.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 70	$5 50
" " at S. Amboy.	5 00	5 50
Kanawha at Richmond	4 10	5 40
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
Youghiogheny, Waverly Co., at Balt	4 50	5 65
Despard, West Va	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	5 85
Fairmount, West Va., " "	4 40	5 70
Newburg Orrel, Md. " "	4 50	6 00
Cannelton Cannel, West Va	....	10 00
" Splint " at Richmond.	6 00	7 00
" Gas Coal at Richmond	4 00	5 65
Peytona Cannel W. Va. at Richmond	....	10 00

Manufacturing and Steam Coals.

Cumberland at Georgetown and Alexandria, Va	2 85@3 10	4 35@4 50
Cumberland, at Baltimore	3 10@3 25	4 35@4 50
Clearfield f. o. b. Canton, Baltimore	3 25@....	4 35@4 50

Clearfield "Eureka" and "Franklin" at mines per ton 2,000 lb. 75c.; f.o.b. Baltimore and Philadelphia per ton of 2,240 lb., $3.25; f.o.b. South Amboy, $4.25; alongside at New York, $4.50.

Foreign Gas Coals.

	Sterling.	Am cur'cy
Newcastle, at Newcastle-on-Tyne	8/6@10/6	5 50@ 6 00
Liverpool House Orrel, at Liverpool	25/	13 00
Ince Hall Cannel "	35/6	18 00
" Gas Cannel "	25/6	10@10 50
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S.	1 75	4 50
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 60	4 25
Lingan, at Lingan Bay	1 75	....
International mines at Sydney	1 75	4 50
Pictou, Vale mines, at Pictou	2 00	4 70

Retail Prices

Anthracite.

Per 2000 lbs.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, delivered	$4 50	$4 50	$4 50
Lack. coal, delivered below 59th St.	4 00	4 00	4 00
*Wilkes-Barre, delivered	4 25	4 50	4 00
*Lehigh and Locust Mountain, del'd.	4 25	4 50	4 00

* These prices are for coal delivered below Canal Street The prices for coal delivered above that point are 50c. per ton more.

Bituminous.

Delivered, per ton of 2000 lb.

Liverpool House Orrel,	$18 00	American Orrel	$11 00
Liverpool House Cannel	18 00	Red Bank Cannel	7 00
American "	11 00	Cumberland	9 00
Cannelt'n Block, or splint	10 00		

Baltimore. Nov. 15, 1877.

Specially reported by Messrs. E. STABLER Jr., & Co.

Wholesale Prices per ton of 2,240 lb.

Hard White Ash.

AFLOAT BY CARGO.

Lump and Steamboat	$3 20	Stove	$3 45
Broken	3 25	Chestnut	3 10
Egg	3 35		

In cars in dealers' yards or on switch, 15c. per ton additional

Lykens Valley Red Ash.

AFLOAT BY CARGO.		BY RAIL IN CARS.	
Broken	$3 58	Broken	$3 80
Egg	3 58	Egg	3 80
Stove	3 58	Stove	3 80
Chestnut	3 28	Chestnut	3 40

From wharf or yard to the trade, 65c. per ton additional.

Boston. Nov. 10, 1877.

Coal continues to favor the buyer. Freights are higher, but the cutting of prices by the coal companies at tidewater more than offsets the advance.

The amount of coal going to market weekly is large for the season, but will probably show a falling off hereafter. November is a broken month, work is more or less irregular, the mines being affected by the season, and the market being well filled by this time. We may expect to hear shortly of the ending of "the season," and the beginning of the winter's idleness. Whether this will be long or short, total or partial, it is yet too early to guess.

We quote Boston wholesale prices as follows:

Anthracite, broken	$4 00@4 25	Cannel, English	$16 00
do. egg	4 00@4 25	do. Buckeye	11 00
do. stove	4 25@4 50	Lingan	4 50
Cumberland	4 50@4 75	Pictou	4 75
Clearfield	4 25@4 50	Penn	6 00@6 10
Westmoreland	6 00@6 10	Youghiogheny	6 00@6 10
Caledonia	4 25		

—Commercial Bulletin.

Buffalo, N. Y. Nov. 14, 1877.

Specially reported by C. M. UNDERHILL.

The following are the prices of Lackawanna, Scranton, Henry Clay and Black Diamond coals, per ton of 2,000 lb. for Buffalo local trade for the present.

	To Dealers.			To Consumers.
	F. O. B.	On car or boat.	In yard, screened.	Delivered at Retail.
Grate	$4 45	$3 95	$4 15	$5 20
Egg	4 45	3 95	4 15	5 20
Stove	4 70	4 20	4 40	5 45
Chestnut	4 60	4 10	4 30	5 35
Blossburg	4 00	3 85	4 35	5 00

Our yards are located as follows: Lackawanna coal at 667 Exchange Street, also at foot of Ohio street. Scranton, Henry Clay and Black Diamond coals at yard foot of Genesee street.

Chicago, Ill. Nov. 13, 1877.

Specially reported by Messrs. RENO & LITTLE.

Retail prices of coal delivered per ton of 2,000 lb.

Lackawanna Stove	$6 75	Erie and Brier Hill	$5 50
" Chestnut	6 75	Wilmington and Ill.	5 50@4 00
" Grate	6 75	Blossburgh	6 50
" Egg	6 50	Piedmont	7 50

Cincinnati, O. Nov. 15, 1877.

Specially reported by the Consolidated Coal and Mining Co.

	AFLOAT. Per bush. of 72 lb.	AFLOAT. Per ton 2,000 lb.	DELIVERED. Per bush. of 72 lb.	DELIVERED. Per ton 2 000 lb.
Youghiogheny lump	10c.	$1 78	12c.	....
" nut	8c.	2 22	10c.	....
" slack	4½c.	1 25	8c.	....
Camden, W. Va	7c.	1 94	11c.	...
Peytona Cannel	13c.	3 71	18c.	....
Connellsville coke	...	3 60	10c.	....
Youghiogheny coke	5c.	2 64	8c.	....

Anthracite per ton of 2,000 lb.

	Wholesale.	Retail.
Wilkes-Barre and Lackawanna (all sizes)	$5 50	7 00
Lehigh	6 50	7 50

Cleveland, O. Nov. 15, 1877.

Specially reported by F. A. BATES, Esq.

Per ton of 2000 lbs. f. o. b. vessels.

WHOLESALE.

Brier Hill (Church Hill)	3 30
" " No. 2 Grades	3 10
Straitsville Lower Vein	2 75
Hocking Valley	2 75
Massillon [No. 2 grades 15 cents less)	2 75
Tuscarawas Valley	2 30
Columbiana	2 30
Nut coal, various grades	1 90@2 20
Screenings, " "	1 35@1 75
Youghiogheny gas coals	3 75

RETAIL TRADE.

	1 to 10 tons.	10 tons. upw'd.
Brier Hill lump	$4 00	$3 75
Massillon and Mineral Ridge lump	3 75	3 50
" " " nut	3 50	3 25
Straitsville Lower Vein, and Hocking lump	3 60	3 35
" " " " nut	3 40	3 15
Rich Hill lump	3 50	3 35
" " nut	3 25	3 00
Columbiana, lump	3 00	2 75
" nut	2 50	2 35
Lacka'a., Wilkesbarre and Pittston egg and grate,	6 10	5 85
" " " stove	6 25	6 00
" " " chestnut	6 25	6 00

Lehigh $1 00 per ton higher.

All sales to be strictly cash with order or C. O. D.

Hamilton, Ont. Nov. 15, 1877.

Specially reported by H. BARNARD.

Retail Prices, Delivered per ton of 2,000 lb.

Scr. or Wilkes-B. Grate	$5 00	Lehigh Lump	$6 00
" " Egg	5 00	Brier Hill	5 50
" " Stove	3 25	Massillon	4 50
" " Nut	5 25	Smithing	5 50

Indianapolis, Ind. Nov. 14, 1877.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers

BITUMINOUS.

White River, per ton	$ 2 50	Peytona Cannel, per ton.	$ 5 75
Brazil Block, "	2 25	Indiana Cannel	4 50
Highland, grate, "	2 00	Hocking Valley	4 25
Block coal, nut, per car.	18 00	Youghiogheny	4 50
Highland " "	18 00	Blossburg (smithing)	6 50
Block Slack "	17 00	Piedmont "	6 50
		Gas Cake, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre).

Broken	$7 60	Nut	$6 70
Egg	7 60	Stove	6 70

Lehigh Anthracite.

Broken	$7 60	Nut	$7 30
Egg	7 60	Stove	7 70

Retail, per bushel, delivered.

Sand Creek	13c.	Block Nut, steam	8c.
White River	13	" Slack, "	6
Brazil Block	13	Virginia Cannel	27
Highland Grate	11	Youghiogheny	16
Block Nut, domestic use.	11	Blossburg	26
Highland Nut, " "	11	Piedmont	26
" " steam	8		

GAS COKE (measured.)

Crushed	14c.	Lump	12c

Louisville, Ky. Nov. 15, 1877.

Specially reported by Messrs. BYRNES & SPEED.

Wholesale per bushel of 72 lb.

Pittsburg	11c.	Kentucky nut	8@9c.
Raymond City	—	Kentucky	8c.

Retail per bushel of 72 lb.

Pittsburg	14c.	City Make Coke	9c.
Raymond City	13c.	Pine Hill	12c.
Indiana Cannel	17c.	Kentucky	10 to 11c

Anthracite $7.50 per ton of 2,000 lb.

Montreal. Nov 15, 1877.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Wholesale per 2,240 lb.

Scotch Steam	$4 00	Cape Breton Steam	$3 25
Pictou	3 75	Newcastle Smith's	5 00

Anthracite at retail, per 2,000 lb. delivered.

Milwaukee, Wis. Nov. 8, 1877.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2,000 lb.

Anthracite, egg, chestnut, and stove	$6 50		
Lehigh lump	$7 00	Connellsville coke on RR. track	$7 25
Briar Hill	$5 25	Straitsville	4 80

New Orleans, La. Nov. 8, 1877.

Specially reported by Messrs. C. A. MILTENBERGER & Co.

PITTSBURG COAL.

At wholesale (by boat load)	50c. per bbl. of 180 lb.		
To steamboats	55c.	"	"
" manufactories	60c.	"	"
" families	75c.	"	"
In hhds. (for shipment)	$7 00 per hhd. from 5 to 6 bbls.		

ANTHRACITE COAL.

Per ton of 2,000 lb.

At wholesale	$7 00 to 8 00		
" retail	10 00 to 11 00		

VIRGINIA CANNEL COAL.

At retail	$1 25 per bbl. of 180 lb		

ST. BERNARD (KY.) COAL.

To steamboats	50c.	"	"
" families	70c.	"	"

Pittston, Pa. Nov. 12, 1877.

Pennsylvania Coal Company's Coal in yard, ton of 2000 lb.

Retail.

Lump, Egg and Stove	$2 25
Chestnut	2 00
Pea	1 00

Delivered, fifty cents per ton additional

Philadelphia. Nov. 15, 1877.

Specially Reported.

Since the heavy rain of last Friday the shipments over the Reading have very much decreased. The effect of it was sudden and unexpected,—many collieries are still reported crippled by it. The local trade is a little more active for the smaller sizes, but the shipping is dull. Vessels are in better supply, and freights not so strong as in the beginning of the week. The Reading Coal and Iron Co. having lately bought some collieries, it has given rise to many rumors as to their future plans. The probabilities of a combination are discussed—also the advisability to have the curtailment controlled by the miners. This last plan is certainly the worst of all. We have heard it suggested that prices and partial curtailment could not be carried out faithfully—that the only cure for the present condition of things was a limit of the production to prevent merely an excess, that it could only be carried out practically, by absolute stoppages at times for a limited period, and that if it is dangerous to depend on the miners, and impossible to expect concert of action amongst the present managers of the large corporations, it might be left to a certain number of business men entirely disconnected with the coal trade, and inspiring confidence to all, who would act after hearing all sides, and by consent previously secured, have the power to regulate the stoppages. There seems to be some practicability in such a plan.

Richmond, Va. Nov. 15, 1877.

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2,240 lb., f. o. b.

Kanawha Cannel	$9 00	New River Bituminous	$3 70
Coalburg Splint	5 70	Clover Hill Coal	3 00
Lewiston "	5 70	Norwood Gas & Steam Coal	7 70
Kanawha Gas Coal	4 90		

San Francisco, Cal.

From the *Commercial Herald* of Nov. 8, 1877.

COAL—Imports from January 1 to Oct. 30:

	Tons.		Tons.
Anthracite	18,173	Vancouver Island	84,094
Australian	61,246	Rocky Mountain	123
Coos Bay	25,504	Saghalien	40
Cumberland	10,129	Seattle	88,167
English	75,645	Bellingham Bay	8,600
Chili	8,145	Ione, Cal.	2,718
Mt. Diablo,	68,698	Carbondale, Cal.	177

Imports continue large and free, with no improvement in price to be noted. Fortunately, much of that lately imported was purchased prior to arrival, at prices above those now ruling. The local house consumption of coal, for two seasons past, has been comparatively small, by reason of the mild and open winters, and such is now the general complaint among dealers. The arrivals during the week embrace the following cargoes: *Yosemite*, 1,760 tons Seattle; *Alaska*, from Hull, 1,650 tons; *New York*, from Liverpool, 2,500 tons English; *E. J. Harland*, 1,759 tons Ardrossan; *Ellen Munroe*, 1,672 tons Liverpool; *Jane Sprott*, 1,650 tons Australian; *Excelsior*, from Hamburg, 100 tons, etc.

Sandusky, O. Nov. 8, 1877.

Specially reported by C. E. BLACK, Agt. Con. Coal & Mg. Co

We quote coal on cars at Sandusky, as follows:

Per ton of 2,000 lbs.

Anthracite.

	Grate.	Egg.	Stove.	Chestnut
Wilkes-Barre	$4 80	$4 80	$4 80	$4 80
Lackawanna	4 80	4 80	4 80	4 80
Lehigh	5 80	5 80	5 80	5 80

Bituminous.

Massillon	$2 90	Straitsville	$2 65
Del Carbo	2 65	Shawnee	2 65
Hocking Valley	2 65	Blossburg	4 75

Prices f. o. b. vessel for soft coal, 15c. advance on car prices. Prices retailed delivered 50c. above car prices.

St. Louis, Mo. Nov. 14, 1877.

Reported by JAS. J. SYLVESTER, Secretary of the Anthracite Coal Association.

Retail prices, delivered. Ton of 2,000 lb.

ANTHRACITE. per ton.

Lackawanna	$8 00@8 50	Schuykill	8 00@ 8 50
Wilkes-Barre	8 00@8 50	Lehigh	9 00@ 9 50

BITUMINOUS.

Blossburg	9 00	Big Muddy	3 00
Pittsburg	4 50	Illinois Coals	2 50@3 00
Indiana Block	4 00	Connellsville Coke.	6 50

Toledo, Ohio. Nov. 15, 1877.

Specially reported by Messrs. GOSLINE & BARBOUR.

We report prices of coal on cars at Toledo as follows:

Ton of 2,000 lb.

Straitsville lump	$2 70	Hocking Valley nut	2 30
" nut	2 30	Massillon lump	3 00
Shawnee lump	2 70	Cumberland	5 40
" nut	2 30	Blossburg	5 40
Hocking Valley lump	2 70		

Prices of hard coal on cars at Toledo are as follows:

Ton of 2,000 lb.

	Grate.	Egg.	Chestnut	Stove.
Pittston	$5 55	$5 55	$5 70	$5 80
Wilkes-Barre	5 55	5 55	5 70	5 80
Lackawanna	5 55	5 55	5 70	5 80
Lehigh	6 15	6 15	6 30	6 40

For retail delivery in city the prices are as follows: Stove and chestnut $6.45; grate and egg, $6.20 per ton; Lehigh, 60c. per ton additional.

Prices soft coal f. o. b. vessel for Lake shipments will be from 15 to 20c. per ton more than prices on cars.

Rates of Transportation on Anthracite Coal to Tide Ports.

Schuylkill Coals. per ton of 2240 lb	From	From Tamaqua.	From Schuylkill Haven.	From Port Clinton.
To *Port Richmond*, via P. & R. R. R., Main Line, for shipment	1 45	1 40	1 25	....
Harrisburg, via Lebanon Valley Branch	98	1 37	1 22	....
Allentown, via East Pennsylvania Branch	1 22	1 17	1 02	....
Lancaster, and Points on Lancaster Branch, via R. & C. R.R.	1 30	1 25	1 10	....
Dauphin, via Schuylkill and Susquehanna Branch	70	1 18	1 03	....
Statedale Junction, via Berks and Lehigh ranch	1 34	1 29	1 14	...
Lebanon, via Lebanon and Tremont Branch	81	....	....	.
Philadelphia via Schuylkill Canal, including freight and charges for the use of cars and barges and for tolls (exclusive of cost of unloading)	....	....	1 15	1 04
New York via Schuylkill Canal, including freight and charges for the use of cars and barges and tolls on the Schuylkill Canal and Delaware and Raritan Canal and the towing between Fairmount and Bordentown and between New Brunswick and New York (exclusive of cost of unloading)	....	....	2 00	1 89

From *Tamanend, to Catawissa, McAuley, Mainville, Rupert*, and *Danville*, via Catawissa and Williamsport Branch Railroad 90

From *Tamanend* to *Williamsport, Hall's*, and *Montoureville*, via Catawissa and Williamsport Branch Railroad 1 25

Coal sent to points on the Catawissa and Williamsport branch will be charged one and one-half cent per ton per mile, and two cents per ton additional to Tamanend.

An additional charge of 25 cents per ton will be made on Chestnut and Pea Coal to whatever point consigned. If the shipper signs a release of all demands arising from a deficiency of weight at the place of destination, and agrees to indemnify the company from all claims by reason thereof, such additional charge will not be made. Releases, properly prepared, will be furnished, and can be signed at the coal offices of the company, at St. Clair, Palo Alto, Schuylkill Haven, Mount Carbon, Pine Grove, and Tamaqua.

For shipment via Main Road or Schuylkill Canal, one and one-half cent per ton per mile, and two cents per ton additional to Schuylkill Haven, Pine Grove, Tamaqua, or Port Clinton, for Canal, as the case may be. Provided no charge shall be less than 15 cents nor greater than 45 cents per ton.

For consumption at local points in coal region, including Shamokin, Herndon, Schuylkill Haven, Pine Grove, and Tamaqua, three cents per ton per mile, and two cents per ton

additional ; and a charge for *car service*, of fifteen cents per ton to individuals, and five cents per ton to manufacturers, when in Philadelphia and Reading Railroad cars. Provided no charge, including freights, tolls, and car service, shall be less than twenty-five cents per ton.

Sent westward via Northern Central Railway (in N. C. R. W. Co.'s cars), four and two-tenths cents per ton per mile, to Locust Gap, Shamokin, or Herndon Provided no charge will be made less than fifteen cents per ton.

One mile extra will be added for coal passing through the East Mahanoy Tunnel.

Fractions of distances and rates will always be stated in *tenths*.

No charge will be made for weighing or making returns of coal shipped, and the latter will be furnished free of charge, upon application to the Weighmaster ; if these returns are to be sent by mail, envelopes, properly stamped and addressed, must be furnished to the Weighmasters.

All coal will be charged the rates (both lateral and Main Line) current on the day it is weighed ; it will also be way billed on the same day.

Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

From the Mines to Piedmont, Cumberland or State Line, 4c. per ton of 2,240 lb. per mile on distances less than 4 miles, and 3 cents per ton per mile on distances over 4 miles, and 2 cents per ton per mile on distances over 100 miles.

From Piedmont to Baltimore (206 miles), $1.85 per ton of 2,240lb., or $1.65 per net ton.

From Cumberland to Baltimore (178 miles), $1.54 per ton of 2.240 lb., or $1.37 per net ton (¼ cent. per ton per mile for use of hoppers over C. & P. RR.).

From Cumberland to Georgetown (152 miles) by canal, 70c.@ 90c. Tolls 40c.

From Osceola to Greenwich, Phila. (say 248 miles, per T. & C. RR. per ton bituminous coal of 2.000 lb, less drawback. $1.90@ $2.15.

From Osceola to South Amboy, N.J. (317 miles), per 2,000 lb., $4.03, less drawback, $1.28 ; net rate per ton of 2,000 lb., $2.75 ; net rate per ton of 2,240 lb., $3.08 ; transhipment charges 20 cents additional.

Freights on Bituminous Coal and Coke over the Chesapeake and Ohio Railroad.

To	From New River District, say, at Quinnemont. Bituminous Coal and Coke. Distances.†	Regular Rate.	Special Rate.
	Miles.		
Charleston	75	1 00	70
Huntington	127	1 20	90
Staunton	158	2 30	2 00
Charlottesville	197	2 80	2 50
Gordonsville	218	3 00	2 70
Hanover Junction	276	3 25	3 10
Richmond	294	3 25	3 10
Richmond *via* Hanover Junction	....	3 50	3 35
James River	297	3 25	3 10

To	From Kanawha District, say, at Blacksburg. Bit. Coal and Coke. Regular Rate.	Special Rate.	Cannel Coal. Regular Rate.	Special Rate.
Charleston	80	50	1 20	1 00
Huntington	1 00	70	1 50	1 20
Staunton	3 00	2 50	4 00	3 50
Charlottesville	3 30	2 80	4 25	3 70
Gordonsville	3 35	2 90	4 40	3 90
Hanover Junc	3 75	3 45	4 50	4 50
Richmond	4 00	3 70	4 50	4 50
Richmond *via* Hanover Junction	4 25	3 95	4 75	4 75
James River	4 50	4 50	5 00	5 00

A Terminal charge of ten cents per ton, in addition to rates above, will be collected on all coal and coke at James River. Also, at Huntington, a charge of five cents per ton for transferring by tipple, or ten cents per ton for transfer from car to barge on the river track.

Local Tariff No. 8 will govern rates to all stations, excepting as modified by this special tariff, but the rate to any station between the stations above designated shall in no case exceed the rates named herein to the first point beyond it, of the stations above named.

Special Rates.—The rates given above in columns headed "Special Rates," will apply on all shipments of coal or coke mined or made on the line of this road, destined for use in steam or manufacturing purposes ; also on all shipments destined for any point off the line of the Chesapeake & Ohio Railroad.

Agents, when they cannot be certain that shipments are destined for use in steam or manufacturing purposes, will collect freight at regular rates as above, and overcharges, if any occur, will be promptly refunded through the General Freight Office.

A Charge of twenty-five cents per ton, in addition to all rates above given, will be made for delivery of coal or coke at points *between stations* requiring the use of an engine.

A Special Coal and Coke Tariff No. 1 dated February 1, 1876, and special coal and coke tariff No. 2, dated November 1, 1876, are superseded by this Tariff.

†These distances are computed from Quinnemont (or the New River District.) Blacksburg (or the Kanawha District) lies 56 miles west of Quinnemont, which distance will be added to all coal going east of the New River District and deducted from Huntington and Charleston, which lie west of the same.

NOTE.—Sales of Coal are made by the Chesapeake & Ohio Railroad Coal Agency at New York on a basis of pro-rating proceeds between the Railroad and the mines, irrespective of fixed rates of freight.

Lake Freights on Coal.

Representing the latest actual charters to Nov. 13.

From Buffalo to Chicago	1.00
" " " Milwaukee	1.00
" " " Detroit	0.30
From Cleveland to Chicago	0.77½
" " to East Saginaw, Mich.	0.55
" " to Milwaukee	0 75
" Oswego, N.Y., to Chicago	1.50
" " to Toledo	0.50
" Black River to Chicago	0.80
" Ashtabula, Ohio, to Chicago	0 77½

Freights

Per ton of 2240 lb.

Representing the latest actual charters to Nov. 15, 1877.

PORTS.	From Philadelphia.	From Baltimore	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me.	. ..	....	....	2 25
Albany	....	....	....	....
Alexandria, Va	73	...	....	....
Brooklyn, N.Y.	†75	....	....	....
Bangor, Me.	....	....	1 90	1 60
Bath, Me.	1 95	1 85	. ..	1 50
Baltimore	55@80	....	....	....
Boston, Mass.	175@190	1 85	1 90	1 50
Bridgeport, Ct.	....	1 55	1 70	70
Bristol, R. I.	....	....	1 70	90
Beverly, Mass	....	.. ..	....	1 50
Cambridge, Mass.	1 75	..	....	1 50
Chelsea, Mass.	1 80	....	....	....
Danversport, Mass	1 75	....	....	....
East Cambridge, Mass	1 75	....	....	....
Fredericksburg, Va.	....	....	....	....
Fall River	1 35	....	1 70	90
Gloucester	....	....	....	....
Georgetown, D.C	72½	.. ..	....	..
Hartford, Conn.	1 60	....	....	....
Hoboken	†92	....	....	40
Hudson, N.Y.	....	....	....	..
Jersey City	....	....	1 50	40
Lynn, Mass	180@185	....	....	....
Medford, Mass.	....	....	....	....
Middletown	....	....	....	90
Milton Mass	....	....	....	..
Nantucket, Mass	....	....	....	90
New Bedford	....	1 75	1 80	90
Newburyport	....	2 25	....	1 75
New Haven	75@92	1 55	1 70	70
New London	...	1 60	1 70	70
Newport	(40	.	....	90
New York	75	1 45	1 60	40
Newark, N J.	....	....	....	...
Norfolk, Va.	70	....	.	....
Norwich	....	....	....	90
Pawtucket	1 40	.. ..	1 85	1 00
Philadelphia	....	....	....	..
Portland	.. ..	....	1 90	1 50
Portsmouth, N. H.	....	2 25	2 10	1 65
Providence	1 35	1 60	1 70	90
Rockland, Mass	....	....	....	...
Rockport	1 90	....	....	....
Richmond, Va.	75	....	....	....
Saco	....	....	....	1 75
Salem, Mass.	....	2 00	....	1 50
Saybrook, Mass.	1 30	....	....	....
Savannah, Ga.	....	....	....	....
Somerset, Mass.	....	....	1 70	90
Troy	97	....	....	....
Thomastown, Me.	1 90	....	....	....
Washington	70@75	....	....	. .
Wilmington, N.C.	1 30	....	..	. ..
West Farms, N.Y.	†75	....	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c per bridge extra.

Rates of Toll

For the above we refer to our issue Sept. 8.

For freights on *Lehigh and Wyoming Coal* we refer to our issue of Sept. 15.

For freights on *Schuylkill Coals* we refer to our issue of Nov. 3.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Nov. 16, 1877.

American Pig.—The season is very near its close, and one by one the more distant points inland cannot be reached by water, owing to the inability to procure boats or vessels, captains fearing that a change in temperature must soon come, and that they might be frozen in were they to take the risk. Following the complete closing of inland navigation, we may naturally anticipate quietness until the large contracts for 1878 begin to be made. This we usually have to contend with, even in better times; but it should have no demoralizing effect, for the fair, or, we may say, even good business that has been done this fall, and the encouraging indications observable everywhere should point to a very liberal trade in 1878. The situation appears to be fully comprehended on all sides; in fact we fear that it is over-estimated, for we learn that eight to ten additional furnaces are just starting, or intend to go into blast. The Thomas Iron Company has just started another furnace, making seven out of their eight in blast. The Lackawanna Iron and Coal Company has also started one. The furnaces that start first will not make very large profits, and we think it better policy to wait until the demands for iron become more fully defined, than to blow in and be compelled to blow out again. The risk is too great for the possible profits. With 2.000 tons added to our weekly products, it is a question whether present prices can be maintained. The active demand for the best brands for prompt shipment enables them to secure extra prices for the moment, while some brands are so far sold ahead as to take them practically out of the market. We note sales in lots of about 500 tons of No. 1 foundry, and 600 tons of No. 2 foundry. We quote, No. 1 foundry at $18 to $19.50; No. 2 foundry, $17 to $18; and forge, $16 to $17.

Scotch Pig.—We quote sales of arrivals as follows: 100 tons of Glengarnock, 100 tons of Summerlee, 100 tons of Carnbroe, 100 tons of Eglinton, and 200 tons of Coltness, all on private terms. We quote Glengarnock at $24.25; Coltness, $25.75@26.50, and Eglinton, $24.

Rails.—We note sales of 15,000 tons of steel rails in the West, and 1,000 tons of iron rails in the East, all on private terms. We quote iron rails at $33@37 at mill, and steel rails at $40@43.

Old Rails.—We learn of no business in these and quote nominally at $18@19.

Wrought Scrap.—We note a sale of 150 tons at $22 here.

Old Car Wheels.—We note a sale of 200 tons at $18; and another of 80 tons of an inferior quality at $15.

Baltimore, Md. Nov. 12, 1877

Specially reported by Messrs. R. C. HOFFMAN & Co.

The pig iron market continues dull with little inquiry and light sales. Prices ruling as follows :

Baltimore Charcoal....$20@30	Mottled and White.$15@16 00
Virginia Charcoal.... 28@30	CharcoalC.B.Blooms 50@55 00
Anthracite No. 1.....19@20	" " Billetts. 55@60 00
" " 2.....18@19	Refined Blooms.... 45@50 00
Anthracite No. 3.....17@18	

Boston. Nov. 10, 1877.

Pig is steady and tolerably firm, but the demand has fallen off this week. the purchases in anticipation of the close of navigation not having been so liberal as last week. The favorite Lehigh brands continue in short supply. We quote $21.50 for No. 1 ; $20@20.50 for No. 2, and $19.50@20 for gray forge. The foreign markets for Scotch pig are cabled firmer.

Bar continues unchanged, quoting $43@45 for refined, and $35@36 for common. American rails, $35@ $38. Nails are in light demand at unchanged prices. Sheet is selling at 3@3¼c. per pound. Russia is quiet at 10¾@11c. Wequote, English spring steel at 7@8c. gold; 9@11c. for German ; 9@11c. for machinery; 14@@15c. for cast; 10@12c. for blister; 8c. for American spring; 13¼@14c. for cast, 9c. for blister, and 8c. for machinery.—*Commercial Bulletin.*

Buffalo. Nov. 10, 1877.

Specially reported by PALEN & BURNS.

No. 1 Ex Foundry	$20 55
No. 2 "	19 55
Gray forge	18 55
American Scotch A 1 Foundry	24 00
Cherry Valley B 1 "	23 00
" " No. 2 "	22 00

Per gross ton 4 months delivery here.

Chattanooga, Tenn., Nov. 13, 1877.

Specially reported by J. F. JAMES, dealer in pig iron, ores, etc

Tenn., Ala. and Ga. Charcoal, No. 1 Foundry	$18 00@19 00
Tenn., Ala. and Ga. Charcoal, No. 2 Foundry	17 00@18 00
Tenn , Ala and Ga. Charcoal, Gray Forge	15 00@16 00
Tenn., Ala. and Ga. Coke, No. 1 Foundry	19 00@20 00
Tenn., Ala. and Ga. Coke, No. 2 Foundry	17 00@18 00
Tenn., Ala. and Ga. Coke, Gray Forge	15 00@16 00
Charcoal or Coke, white and mottled	14 00@15 00
Tenn., Ala. and Ga. Cold Blast (car wheel)	22 00@28 00

Old rails.....18 00@19 00	Wrought scrap,
Old car wheels.. 16 00@17 00	No. 2..... 12 00
Wrought scrap,	Cast scrap..... 10 00
No. 1..... 17 00	Muck bar..... 32 00@33 00

Iron Ores.

Red Hematite (about 55 per cent. metallic iron) f. o. c. at mines	1 25
Brown Hematite (about 55 per cent. metallic iron)	1 75

Cleveland, O. Nov. 10, 1877.

Specially reported by Messrs. C. E. BINGHAM & Co.

Per gross ton, on four months' time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, L. S. Charcoal.. $25 00	Am. S., No. 1, Ch Val.$24 00
No. 2, " " " ... 25 00	" " B. 1, " " . 23 00
No. 1, Anthracite..... 23 00	" " No. 2, " " . 22 00
No. 2, " 21 00	No. 1, Massillon..... 24 00
No. 1, Bituminous..... 23 00	B—1, " 23 00
No. 2, " 21 00	No. 2, " 22 00

CAR WHEEL AND MALLEABLE IRON.

No. 3 L. S. Charcoal... 26 00	No. 5 & 6, L. S. Charcoal$27 00
No. 4, " " " ... 26 00	

BESSEMER IRON.

Nos. 1 & 2, L. S. Char..$25 00	

FORGE IRON.

No. 1, Gray.....$20 00	White and Mottled....$19 00

Cincinnati, O. Nov. 13, 1877.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

CHARCOAL.

Hanging Rock No. 1 Foundry and B 1	$23 00@23 50—4 mos
" No. 2 "	22 00@ ....—4 mos
" Soft Silver Gray	21 00@22 00—4 mos
" Mill	18 00@20 00—4 mos
Tennessee, No. 1 Foundry	22 00@ ....—4 mos
" " 2 "	21 00@ ....—4 mos
" Mill,	18 00@19 00—4 mos

STONE COAL.

Ohio, No. 1 Foundry	20 00@20 50	—4 mos
" " 2 "	19 00@19 50	—4 mos
" " 3 "	18 00@18 50	—4 mos
" Mill	18 00@18 50	—4 mos

COKE.

Ohio & W. Va. No. 1 Foundry	21 00@22 00	—4 mos
" " " 2 "	20 00@21 00	—4 mos
" " Mill	18 00@19 00	—4 mos

CAR-WHEEL.

Hanging Rock, C. B.	Hecla, Vesuvius, Jefferson, Etna.	40 00@	—4 mos
Maryland, "	Amherst & Cedar Pt.	37 00@	—4 mos
Missouri, "	Maramec	32 00@	—4 mos
Alabama, "	Woodstock	32 00@	—4 mos

BLOOMS.

Charcoal	45 00@50 00	—cash.

SCRAP IRON.

Cast	40c.@ 45c.	"
Wrought	62½c.@ 1 00	"

Louisville, Ky. Nov. 13, 1877.

Specially reported by Messrs. GEORGE H. HULL & Co.

Both prices and the volume of business continue unchanged with no prospect of an immediate improvement in either. The usual time, four months, is allowed on the quotations below.

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$23 00@24 00
No. 2 " " "	20 00@21 00
No. 1 Southern Charcoal	20 00@21 00
No. 2 " "	19 00@20 00
No. 1 Hanging Rock, Stonecoal and Coke	20 00@22 00
No. 2 " " " "	19 00@20 00
No. 1 Southern Stonecoal and Coke	19 00@20 00
No. 2 " " " "	18 00@19 00
"American Scotch"	20 00@22 00
Silver Gray	18 00@19 00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neutral	18 50@19 50
No. 1 Stonecoal and Coke, Cold-short and Neutral	18 00@18 50
No. 2 " " " " "	17 50@18 00
No. 1 Missouri and Indiana Red-short	21 00@22 00
White and Mottled, Cold-short and Neutral	15 00@16 00

CAR-WHEEL AND MALLEABLE IRON.

Hanging Rock, and Cold Blast	34 00@38 00
Alabama and Georgia "	2c 00@33 00
Kentucky Cold-blast	25 00@33 00

Milwaukee, Wis. Nov. 13, 1877.

Specially reported by Messrs. R. P. ELMORE & Co.

Wholesale Price.

Charcoal Iron.

No. 1 Lake Superior per gross ton	$25 00—4 mos.
No. 2 " " " "	24 00—4 mos.

Anthracite Iron.

No. 1 anthracite per gross ton	$25 00—4 mos.
No. 2 " " "	24000—4 mos.

Stone Coal & Coke.

Wholesale Price.

Warner's Am. Sc'th (Bk. Bend) per ton	$25 00@ —4 mos.
Soft Silvery per ton	22 00@23 00—4 mos.
Lake Superior and Lake Champlain ores	24 00@25 00—4 mos.
Sharpsville (Penn.) native ores	24 00@25 00—4 mos

Car Wheel.

Lake Superior ores per ton	$25 00@27 00—4 mos

Montreal. Nov. 6, 1877.

Pig iron per ton, Gartsherrie, $20.75 to $21.25; Summerlee, $20 to $20.50; Eglinton, $19.25 to $19.75; Hematite, $26 to $27; American $20; Langloan, $20.50 to $21. Bars, per 100 lb., Scotch and Staffordshire, $1.85 to $1.95; best do., $2.15 to $2.20; Swedes and Norway, $4.50 to $5.00; Lowmoor and Bowling, 5.50 to 6.00.—*Monetary Times.*

Pittsburgh, Pa. Nov. 13, 1877.

Specially reported by A. H. CHILDS

The demand for pig iron is now fairly active to supply immediate wants. The mills are nearly all running full time with but little stock ahead, and good standard brands sell readily at quoted rates. Foundry irons are in less request, although perhaps not quite so dull as heretofore. Quotations remain unchanged.

	4 mos.		4 mos.
No. 1 F'dry	$21 00@22 00	Mottled & White	$16 50@18 00
" 2 "	20 00@21 00	Hot blast C'coal	21 00@25 00
Gray Forge	18 00@20 50	Cold " Western	38 00@40 00

Richmond, Va. Nov. 13, 1877.

Specially reported by ASA SNYDER, Esq.

This market continues firm for all brands of pig iron. Recent inquiries for our best brands of wheel iron have been difficult to satisfy. The foundry business this fall have been decidedly better than for a like period of recent years.

Virginia Cold Blast Charcoal Pig Iron, cold short	$20 to $26
" " " " " neutral	28 to 31
" Warm " " " "	20 to 25
" Anthracite 1 X	20 to 22
" " 2 X	19 to 21
" " 2	18 to 19
" " Coke West Va. 1 X	22 to 23
" " " X2	21 to 22

San Francisco, Cal.

From the *Commercial Herald* of Nov. 8, 1877.

We have had for a long time a season of unusual dullness and depression, not only in pig iron, but in manufactured iron, such as bar, round, etc. Iron pipe has, however, been in large requirement all the season. Tin plate is neglected; stock large. At auction, on the 2d inst., S. L. Jones & Co. sold an invoice of round iron, at 60 days' credit, as follows: 241 bars ⅝ round, 2¼c.; 446 do. ⅞, 2⅜c.; 358 do. 1⅛, 2½c.; 88 do. 1¼, $2.70; 48 do. 1½, $2.70; 6 do. 1¾, $2.75; 52 do. 2 in., 2½c.; 8 do. 3 in., 2⅝c. The *City of Tokio*, for Hongkong, carried 172,710 lbs. pig lead. Sales, 200 tons Australian pig, private.

St. Louis, Mo. Nov. 13, 1877.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

Pig iron is in fair demand and prices unchanged. Cheap irons are growing veay scarce, and we anticipate some slight change for the better before long. It hardly seems possible that pig iron makers who are constantly selling for less than cost can continue to do so much longer. We do not anticipate much of an advance, only enough to cover actual loss.

COLD BLAST CHARCOAL—ALL NUMBERS.

Hanging Rock	25@38	Assorted Bar Iron $2. rates.	
Tennessee	26@30	No. 1 Wrought Scrap 80c. cwt.	
Kentucky	26@30	Heavy cast "	65 "
Missouri	26@30	Light "	55 "
Georgia	26@30	Old rails	19 00 to 20 00
Alabama	26@30	Old car wheels	17 00 to 18 00

	No. 1.	No. 2.	Mill.	White and Mottl'd.
Missouri stone coal	$22 00	$21 00	$20 00	19 00
" charcoal	22 00	21 00	20 00	20 00
Tennessee charcoal	22 50	21 00	20 00	19 00
Tenn. coke very soft and strong	23 00	21 00	20 00	18 50
Hanging Rock charcoal	25 00	24 00	23 00	.....
" " cold short	24 00	23 00	.....	.....
	Ex No.1	No. 1.	B No. 1.	No. 2.
Alice Hanging Rock coke	$25 00	$24 50	$24 00	$22 50
Quinnimount, W. Va., coke	23 50	23 00	22 00	21 00

METALS.

NEW YORK, FRIDAY EVENING, Nov. 16, 1877.

There has been a very good jobbing demand during the whole Fall. In some articles there has been a good wholesale business this week, although upon the whole the market has been somewhat quiet. The approach of the end of the year, and the usual stock-taking and closing of books must soon be felt. The question of the total or partial removal of the tariff from some of the metals is receiving considerable discussion, but it would undoubtedly be many months before it would ge into effect even were such a bill passed.

Gold Coin.—During the week under review the price of gold has ranged from 102⅝ to 102½, and closed at 102¾.

Bullion.—As the remonetization silver scheme has looked less threatening the past week, silver has declined abroad nearly one penny, being quoted in London at 54⅜d., and about 2c. per ounce decline in this market, the quotation at the close being 117½. The weakness abroad has been increased by an unfavorable condition of India exchange, and by the unexpected sale of silver by the German Government at 54¾d. The best opinion seems to be that nothing will be done by the United States Senate on the silver bill until the regular session, and then that the Government will purchase the silver and do the coinage. It is further thought that at most silver will not be made a legal-tender for more than $100. and probably for much less. This might raise silver a point or two. as we would consume our own annual product, but it could not raise its value materially. San Francisco quotes at 8½ per cent. discount.

Daily Range of Silver in London and New York per oz

Date.	London. Pence	New York. Cents	Date.	London. Pence	New York. Cents
Nov. 10	54¾	118⅛	Nov 14	54¼	117¼
" 12	54½	118¼	" 15	54¼	111¾
" 13	54¼	117	" 16	54⅜	117¼

We give below a statement showing the amount of the latest bullion shipments in addition to that announced in our issue of November 10;

October	Consolidated Virginia	Nev.*	$1,053,475 41
"	California	" †	1,674,586 79
"	Eureka Consolidated	"	350,000 00
"	Martin White	"	30,571 00
"	Standard	" ‡	81,984 97
"	Grand Prize	"	110,271 00
"	Chollar Potosi	"	17,667 00
"	Rye Patch	"	31,000 00
Nov. 3	Tybo Consolidated	"	3,261 00
" 7	Alps	"	2,000 00
" 6	Gila	"	10,722 00
" 1	Northern Belle	"	5,200 00
" 5	Crown Point	"	12,800 00
October	Idaho (G. V.)	Cal.	43,896 00
"	Manhattan	"	110,252 00
"	North Bloomfield	"	63,000 00
"	Minnetta Belle	"	3,000 00
"	Emigrant	"	2,700 00
"	Modoc Consolidated	"	40,015 00
Nov. 3	Endowment	"	2,200 00

* From October 13 to November 6. † From October 18 to November 6. ‡ From October 5 to October 25.

Inyo County, Cal., Bullion Shipments.—The base bullion shipped from this county, during the month of October, will amount to nearly $200,000.

Coin and Bullion in the U. S. Treasury.—Washington, November 15.—In response to a resolution of the House of Representatives, the Secretary of the Treasury to-day transmitted to that body a statement of the amount of coin and bullion in the Treasury at the close of business on October 31, 1877. The amounts are given as follows:

Gold coin in the Treasury, Sub-treasuries, and Mints	$101,486,964 49
Gold bars in Treasury, Sub-treasuries, and Mints	3,586,692 25
Gold bullion (estimated) in Mints	3,700,000 00
Silver bullion in Treasury, Sub-treasuries, and Mints	5,998,387 34
Silver coin in Treasury, Sub-treasuries, and Mints	2,479,137 40
Total coin and bullion	$117,251,181 48

There are also on hand, counted as coin, the following:

Fractional currency redeemed in silver	$49,625 20
Coin certificates in Treasury offices	17,436,420 00
Coin interest, coupons and checks paid	370,696 69
Notes of national gold banks, reducing circulation, etc	8,423 36
Silver coin, etc., in transit	449,233 82
Making a grand total of	$135,565,580 55

Decline of the Australian Gold Output.—We note the statement that the "production of gold in Australia continues a 'declining industry.' The Government mining surveys and registrars in Victoria estimate the yield of that colony for the first quarter of the year 1877 at 182,790 ounces, which is 45,850 ounces less than in the preceding quarter and 58,139 ounces less than in the first quarter of 1876. Two-thirds of this yield is from quartz mines, and only one-third alluvial. The number of miners employed during the quarter was not quite 40,000, about 11,000 being Chinese, and nearly 29,000 Europeans.

The Shipment of Treasure from Oregon to San Francisco for the first ten months of the present year compared with the shipments for a like period in 1876, were as follows:

1876		1877	
Gold dust.	Gold Coin.	Gold dust.	Gold coin.
$406,890	$789,139	$353,598	$848,708

Copper.—The sales of spot copper have been very limited at 17¾@17⅞c.. For delivery after January, there have been sales of from 1,000,000 to 1,500,000 lb. at 18@18¼c. There are no indications of an important demand for spot copper before the middle of January, while at the same time as many of the companies will be occupied in their deliveries, therr may not be much offered.

Messrs. James Lewis & Sons, of Liverpool, under date of Nov. 1, say:

"After the rapid fall advised in our last, the market for Chile Bars became steadier and during the first fortnight of the past month recovered about 10s. per ton, but this advance has since been more than lost, and quotations are now about 5s. lower than they were a month ago. About 800 tons are reported to have changed hands at £65 10s. to £66 for G. O. B.'s, and £66 to £67 10s. for picked and special brands.

"The very low prices paid by smelters for ores offered for sale at the Swansea Ticketings in September caused the owners of the Cape ore to withdraw them from the Ticketing rather than have them sacrificed, and by private treaty they were enabled to obtain an advance of 3½d. to 5d. per unit on the prices paid at the previous Swansea sale, while a cargo of Chile ore realized 12s. 3d., and three cargoes of Chile Regulus 12s. 6d. per unit. Even these prices are considerably below the parity of the Chile Bars; English Precipitate has brought 12s. 9d. per unit, and Spanish 12s. to 12s. 3d."

Tin.—Straits was quoted in London yesterday at £69. This is a decline of £1 to £1.10s. since our last. The jobbing trade is very good, but in a wholesale way we learn of nothing. Straits on spot is quoted at 16¼c., and to arrive in December, 15⅞c., which might be shaded a little. L. & F. has been sold at 16c., but now held at 16¼c.; refined has been sold at 16⅛c, now quoted at 16⅛c. to 16½c.; banca is quoted at 18c., prices all in gold.

Tin Plates.—These have been in good jobbing demand. Common I. C. tins are very scarce at $6.37½ to $6.50, and assortments, including X's, $6.12½ to $6.25. Ternes are scarce at $6.06¼. Coke tins are quoted at $5.60 to $5.62½, and ternes, $5.37½ to $5.50. prices in gold per box.

Messrs. Robert Crooks & Co., of Liverpool, under date of Nov. 1, says of tin and terne plates: "The chief item of last month's business was the large sale of coke tin, oil grade, at 17s. for deliveries extending over the next three months. In consequence, this grade of plate is decidedly firmer, there being now no sellers of any favorite brand at the bottom rate, an advance of 3d. to 6d. being asked by those who are able to deliver promptly; and the same advance is also asked for shipment over the early months of next year. Terne, both coke and charcoal, have been in fair jobbing demand for prompt shipment at full prices; but business is confined to this, as no induce-

ment is offered for forward contracts. Charcoal tins of all grades have been and continue in very light demand, in spite of concessions held out by makers."

The shipments from Liverpool for the month of October, 1876 and 1877, were:

	1877. Boxes.	1876. Boxes.
To New York	71,006	43,407
" Boston	19,269	16,441
" Philadelphia	17.461	16,013
" Baltimore	16,641	7,255

Lead.—We are reported ordinary sales aggregating about 200 tons at 4¾c. In addition to this we are reported sales of several hundred tons to cartridge makers, particulars withheld. It is a plain fact, however, that this lead had to compete with foreign, without duty added, and must therefore have been sold at a considerable concession from market rates. By this move the bears strengthen their position by ridding the market of a part of the large accumulation, without lessening their market for the balance. Should we successfully introduce our lead in the markets of China and Japan, the prospects of the producers of lead will be greatly improved, for, with the quantity these countries would take, added to the increased domestic consumption to be brought about by low prices, the competition would be greatly reduced, and prices be regulated by our new markets. We are, however, approaching what has usually been a dull season of the year, and it may be several months before better prices can be looked for, or a firmness guaranteed. The prices would, in all probability, decline were the market not artificially upheld.

We notice that the Tokio, for Hong Kong, carried from San Francisco 172,710 lbs. pig lead.

Spelter and Zinc.—Spelter is in moderate request at 5·80 c.@ 6 c. We note sales of about twenty-five casks of Sheet zinc at 7¼c.@7⅝c.

Antimony.—Cookson's is still at 13⅛ c.@ 13¼ c. gold. Ordinary is quoted at 12¼ c. gold.

Quicksilver.—The San Francisco *Commercial Herald* of November 8 says: "The London price comes through by cable at £7 5s. per bottle. We have at present a sluggish market, the nominal price being 45c. The *City of Tokio*, for Hongkong, carried 1,458 flasks.

Salt Lake Ore and Metal Market.

SALT LAKE CITY, UTAH, November 16, 1877.

Market firmer, but no sales reported, as all the smelters are under contract.

Argentiferous Lead (*Base Bullion*).—$40@42 per ton for lead; $1.17@$1.18 per ounce for silver; $20 per ounce for gold. The quotations for silver are based upon the silver contents in the lead of 80 to 120 ounces per ton of 2,000 lb.

The *Inter-Ocean* correspondent, under date of the 7th inst., says:

"The Revere Mine, of Bingham Canyon, has made an assignment. This is one of the great mines of this district, and has produced well, but the low price of lead and poor management has been too many for it."

FINANCIAL.

New York Stocks.

NEW YORK, Friday Evening, November 16, 1877.

The business in the coal shares shows a large increase over the previous week. Prices are in all cases higher than a week ago. This is the result of manipulation, as there is nothing in the prospects of the companies to warrant an advance, or even to hold prices where they are. Delaware, Lackawanna & Western has been the great feature, the transactions amounting to 167,141 shares at 45½@48¾, closing at 48⅛. The *Tribune* announced this week that a secret investigation had been made of the affairs of this company by an expert, who reports that the company will have to secure $3.75 per ton for its coal on a full business to enable it to pay fixed charges.

It needs but little calculation to show a large financial deficit on the business of this year, and, from the present outlook, it will be a long time (if ever) before these desired average prices per ton of coal will be obtained. The Delaware & Hudson Canal Company claims to be able to pay fixed charges on $3 per ton for its coal; but we have shown pretty clearly in these pages that the assumption is not well founded. The figures given above still further confirm our remarks. The sales of this stock have aggregated 8,968 shares, at 43@44¾, closing at 44¾. New Jersey Central Railroad stock has improved with the others. The sales amount to 3,474 shares, at 10½@13¼, closing at 13¼.

Maryland Coal Company.—This Company not re receiving any proposals for its sinking fund bonds, for which it makes annual provision, was necessitated to allot by drawing. The entire indebtedness of the Company is now reduced to $91,000.

"'The 'Committee on Stock Lists' of the Stock Exchange has recommended the admission to its 'free list' of the bonds of the Pennsylvania Anthracite Coal Company, to be known as the 'First Mortgage Bonds, Lackawanna and Susquehanna Coal and Iron Company, East Side,' and 'First Mortgage Bonds, Lackawanna and Susquehanna Coal and Iron Company, West side,' each issue being for $500,000.'"

Cayuga Railroad Compaay.—The *Weedsport Sentinel* of the 8th inst. says:—"It has recently been discovered that there is a claim upon the personal property of the Cayuga Railway Company; also that the right of way has not been wholly obtained or all paid for. It will make it bad for the title desired by the Lehigh Valley Company."

Baltimore & Ohio Railroad.—The last monthly meeting of the Board of Directors of this company for the fiscal year was held at Camden Station, on the 14th inst. Mr. Garrett, president of the road, read the annual report to be presented to the stockholders at their annual meeting next Tuesday. The report will not be given for publication until it is read at the stockholders' meeting. It is understood that this company proposes to give to Cumberland, Md., the benefit of competitive railroad rates to the city by conceding to the Pennsylvania road the use of the Pittsburg & Connellsville and the Cumberland & Pennsylvania roads, thus offering to save the city a large part of the proposed loan for the new road. A correspondent in the Cumberland *Alleghenian* of the 14th inst. says: "The proposal is specious, but is it desirable that the roadway by which Cumberland is to get competitive rates should be wholly under the control of a road hostile to competitive rates? The larger part of this conceded track carries all the canal freights and the whole of the passenger and burden trafic of the Pittsburg & Connellsville road. It is obvious that it would be easy for the Baltimore & Ohio road, which controls this conceded track, by occasional changes in the time schedule to so embarrass the Pennsylvania railroad in its use as to make the concession valueless if at any time they found the competition too active for their interest. Is it well to give this advantage to the Baltimore & Ohio railroad? Has it been so solicitous for the welfare of Cumberland as to deserve it?"

Miscellaneous Sales and Quotations.

Sales and quotations of the stocks and bonds dealt in here at Philadelphia, and Baltimore for the week ending the 16th inst. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.

	Quotations.—Highest.	Lowest.	Closing.	Sales Shares
American Coal Co	—	—	35	—
*Cambria Iron Co	—	—	50	—
*Pennsylvania Salt Manf'g Co.	—	—	64	—
*Westmoreland Coal Co	—	—	62	—
*Buck Mountain Coal Co	—	—	25	—
*Schuylkill Nav. Co	—	—	—	—
St. Louis, I. M. & S. RR. Co	7½	6¾	—	520
Spring Mountain Coal Co	—	—	30	—
†Balt. & Ohio RR. Co. pref	—	—	—	30
" " " common	—	—	103	—
†Pittsburg & Connellsville RR.	—	—	—	—
†George's Creek Coal Co	—	—	99	—
†Santa Clara Mining Co	—	—	8¾	—
†Atlantic Coal Co	—	—	1.30	—

BONDS.

D. L. & W. 7s, Convt., 1892	J. & D.	—	—	102	—
" " 2d mtge., 1881	M. & S.	—	—	104	—
N. J. C., 1st mtge., new	F. & A.	111	—	111	$1,000
" " 1st mt., cons. 1893	Q.	67¼	66½	66⅛	13,000
" " Convt.	M. & N.	61	61	61½	13,000
L. & W. B. Coal Co., cons.	Q.	28	25	27⅛	80,000
Am. Dock & Imp. 7s	J. & J.	—	—	36	—
D. & H. C. Co., 1st m., 1884	J. & J.	99	—	99	7,000
" " " " " 1891	J. & J.	101	—	100	6,000
" " " " " 1877	J. & J.	—	—	—	—
" " " reg., 1894	A. & O.	96½	—	96½	1,000
" " " coup., 1894	A. & O.	—	—	—	—
St. L.I. M. & S., 1st mt. 1892	F. & A.	100½	100	101½	27,000
Ches. & Ohio, 1st mt., 1899	—	—	—	26	—
*L. V. RR., con. m. 6s, 1923	J. & D.	98	—	97¼	10,000
" " 2d m., 7s, 1910	M. & S.	113	—	113	1,000
" " reg., 1898	J. & D.	110¼	—	110	1,000
" " coup., 1898	J. & D.	—	—	109	—
*P. RR., 1st mtge., 1880	J. & J.	106½	—	106	8,000
" Gen. mtge. reg., 1910	A. & O.	106⅝	—	106½	5,000
" Con. m. 6s. cou.. 1905	J. & D.	94	—	93	25,000
" " " reg. 1905	Q.	—	—	—	—
" gen. M. Coup., 191c	J. & J.	106¾	—	106½	2,000
" New Loan 5s	—	108½	108¼	—	600
*P. & R. RR., 7s, 1893	A. & O.	—	—	109	—
" " con. m. 7s. cou. 1911	J. & D.	102	101½	101	15,000
" " Deb. 6s, 1893	J. & J.	—	—	—	—
" " New convt. 7s. 1893	J. & J.	—	—	56	—
" " Con. mtge. 7s. reg.	J. & D.	—	—	101	—
" " 6s, 44-80 1880	J. & J.	105	—	105	1,500
*P. & R. C. & I. Co. Deb. 7s	M. & S.	—	—	—	—
*P. & R. C. & I. Co.	—	*63	—	—	1,000
*L. C. & N. Co. 6s. 1884	M. & Q.	103¾	102½	102½	2,300
" " RR. loan 1897	F. & Q.	—	—	—	—
" " Con. mtge. 7s.	J. & D.	—	—	—	—
" " Cvt. gold, 1894	M. & S.	—	—	—	—
" "Gold Loan, 1897	J. & D.	87½	87	87½	2,500
Schuylkill Nav., 6s. 1897	M. & Q.	—	—	—	—
Pa. and N. Y. Canal, 7s.	J. & D.	—	—	111½	—
Pa. Canal Co	J. & J.	—	—	—	—
Susquehanna Coal Co. 6s.	—	—	—	—	—
†Ches. & Ohio 1st m. 6s.	M. & N.	—	—	—	—
†Balt. & Ohio 6s. 1880	J. & J.	—	—	104	—
† " " 6s. 1885	A. & O.	104	—	123½	2,900

Total transactions for the week.....$224,900

* Helfenstein Tract.

Philadelphia Stocks.

PHILADELPHIA, Friday Evening, Nov. 16, 1877.

Pennsylvania Railroad, as usual, has been the feature of the week. The sales have amounted to 69,998 shares, opening at 30@30¼, advancing to 31⅞ yesterday, and closing to-day at 31⅝@31½. The other coal carrying roads are without feature. Prices have been fairly steady.

Danville, Hazleton & Wilkesbarre Railroad.—Suit has been brought against this company. It is instituted by Simon P. Kase, a former president, on behalf of himself and other mortgage bondholders and stockholders, on account of disputes as to advances covenanted by the Pennsylvania Railroad Company to purchase D. H. & W. coupons; also, to stay the joining of the bondholders in an agreement to sell the seven per cent. D. H. & W. bonds and take in exchange forty-five per cent. of their par in new five per cent. D. H. & W. bonds and fifty per cent. of income bonds, amounting to $3,350.000 in lieu of $1,400,000, the present bonded indebtedness. The proceedings are to hold the Pennsylvania Road to what is claimed its present liabilities.

AUCTION SALES OF STOCKS AND BONDS, during the week, have been as follows;

Schuylkill Navigation Co.—$731 of the 6 per cent. bonds at 89½; $177.50 of the conv. mortgage 6s at 60; $550 boat loan 7s at 60¼.

Reading Railroad Co.—$70 scrip at 61.

Morris Canal.—41 shares preferred stock at 123.

Allentown Iron Co.—20 shares at 25.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Nov. 16, 1877.

The business of the week under review shows a greater aggregate of shares sold than the previous one. This is largely accounted for by transactions in Bertha and Edith to the extent of 19,900 shares, at 3c. @ 9c., closing at 8c. The sales of fractional currency stocks covered more than half the transactions of the week, and are of but little interest to others than those who occasionally make or lose a dollar in the fluctuations. Caledonia shows an advance from Monday, when it was 2½, to 4 to-day. Eureka was steady until to-day, when it declined 1¾ per cent. Moose has been very steady, with transactions amounting to 14,500 shares. New York and Colorado has come forward with transactions, amounting to 5,900 shares, at 1⅞ @ 2½. American, the newest stock on the list, has been dealt in to the extent of 7,800 shares, at fairly steady prices. Hukill has steadily strengthened on sales of 800 shares. This property is now reported to be free of indebtedness, and should be able to go ahead and pay good dividends. The dealings in Seaton have amounted to 800 shares, the latest sale being at 1.50 as against 1.70, the highest price reached in the late rise. Before anything can be expected of this property, it will have to be released of its indebtedness, and have additional working capital put in. The interest in mining investments continues to increase, and every week teaches us that the general public are taking a large share in them.

The day is approaching when we will see another mining excitement in this market. Already there is a good deal of business being done in mining investment in a quiet way, not recorded by the Stock Exchange.

MINING STOCK QUOTATIONS IN SAN FRANCISCO.

We give below a table showing the closing price of mining shares in San Francisco yesterday, 15th inst.

Alpha	13¼	Mexican	12
Belcher	5¾	Northern Belle	14⅜
Best & Belcher	19	Ophir	28⅜
Bullion	6¼	Original Comstock	..
Caledonia	4	Overman	22
California	25¾	Raymond & Ely	9
Chollar Potosi	33½	Santiago	..
Con. Imperial	1	Savage	9¼
Con. Virginia	22¾	Seg. Belcher	34
Confidence	6	Sierra Nevada	4½
Crown Point	5¼	Silver City	..
Eureka	42⅜	Silver Hill	3
Exchequer	5	South Comstock	..
Gould & Curry	6¾	South California	..
Hale & Norcross	8¾	Southern Star	..
Indian Queen	..	Trenton	..
Julia	3	Union Con	6½
Justice	11¾	West Belcher	..
Kentuck	6¼	Yellow Jacket	11¾
Kossuth	..	Young America	..
Leopard	1½		

The *Commercial Herald* of the 8th inst., says of the market: "The business of the mining stock market is largely due to the transactions in the outside stocks that have so recently taken such a prominent place, but during the past week they have not been in such marked demand, the fluctuations showing a disposition to avoid them to a more or less extent. Taking the entire stock field into view we can see an increased firmness in a number of them, while the list generally is somewhat stronger at the close, with a slight increase in the aggregate sales. The movements for a rise seem to be abortive in every direction, and so the market lacks that activity which has been so long looked for by the old-time investors who cannot be classed with the speculators and manipulators, but who became purchasers and holders for a legitimate purpose, and an advance which the developments in the mines and the desires of the market would justify. Instead of obtaining this activity the work of the sharpers was transferred to a class of wildcats which still hold a much higher position than their merits warrant, and in which a comparatively new class have made ventures with such an indifferent success as to hurt them quite severely in a financial point of view. At present nothing of an encouraging nature presents itself in the way of valuable new ore discoveries on the Comstock."

Sutro-Tunnel.—The *Gold Hill News* of the 7th inst. says of this work:

"The header is now being advanced at a much more

COAL TRANSPORTATION AND GENERAL MINING STOCKS.

Name and Location of Company.		Feet on Vein.	Capital Stock	Shares		Assessments.				Dividends.					Highest and Lowest Quotations per Share in Currency.										Sales.
				No.	Par Val.	Total levied to date.	Date and amount per share of last.			Total paid to date.	Last Dividend.			Rate per Ann.	Nov. 10.		Nov. 12.		Nov. 13.		Nov. 14.		Nov. 15.		Nov. 16.		
															H.	L.	H	L	H.	L.	H.	L.	H.	L.	H.	L.	
Coal Stocks.			$			$	Mo.	Yr.	Amt.	$	Mo.	Yr.	Amt.	Per cent.													
Consol. Coal	Md.	....	10,250,000	102,500	$100	*	.....	.....	.....	...	Jan..	1877	2½	10	..	..	25	..	..	..	..	..	..	..	25	15
Del. & H. Canal	Pa.	....	20,000,000	200,000	100	*	.....	.....	.....	38,821,104	Aug.	1876	4	8	44⅛	43¾	44⅛	44	44	43⅛	43¾	43	44⅜	43⅞	44¾	44½	2,968
Del., Lac. & W. RR.	Pa.	....	26,200,000	524,000	50	*	.....	.....	.....	....	July	1876	2½	5	47⅞	45½	47½	46⅝	47¼	45½	47	45½	48¼	46¼	48¾	47½	167,141
Lehigh C. & N.	Pa.	....	10,448,550	208,971	50	*	.....	.....	.....	...	Sep.	1876	1⅜	6	17	16⅜	16½	16½	16½	16	16⅝	16⅛	..	..	16¾	16¾	2,155
Lehigh Valley RR.	Pa.	....	27,042,900	540,858	50	*	.....	.....	.....	....	Oct.	1877	1	5	38¼	38¼	..	..	38½	38½	38¾	38¾	38½	38¾	39	38¾	194
Maryland Coal	Md.	....	4,600,000	44,000	100	*	.....	.....	.....	...	Jan..	1876	1½	1½	..	..	..	..	..	..	..	..	..	..	8	....	....
N. J. Central RR.	Pa.	....	20,600,000	206,000	100	*	.....	.....	.....	....	Apr.	1876	2½	10	11⅞	10½	11½	10¾	..	..	11¼	11⅛	..	..	13¼	12¼	3,474
Penna. Coal	Pa.	....	5,000,000	100,000	50	*	.....	.....	.....	....	Aug.	1877	3	12	..	..	..	..	..	..	..	..	..	..	..	130	....
Pennsylvania RR.	Pa.	....	68,868,700	1,377,376	50	*	.....	.....	.....	....	May.	1877	1½	10	30¾	30	30⅜	30	30⅛	30⅛	31⅝	30⅜	31⅞	31	31½	31⅜	69,998
Phil. & Read. RR.	Pa.	....	34,278,755	685,575	50	*	.....	.....	.....	....	Jan..	1876	2½		15⅛	15⅛	15¼	15⅛	15¼	15	15	14⅞	15¼	15⅛	15¼	15⅛	7,436
General Mining Stocks																											
Alpha Cons. G. S.	Nev.	300	3,000,000	30,00	100	210,000	Aug.	1877	$1 00	....	....	....	.....	..	12	..	12	..	12	..	..	..	12¼	..	13¼	..	600
American	Colo.	....	1,000,000	100,000	10	*	.....	.....	.....	....	....	....	.....	..	4⅜	4⅛	4⅜	4¼	4⅜	4¼	4¼	..	4⅜	4¼	4¼	..	7,800
Am. Flag, G.	Colo.	5,300	600,000	50,000	10	*	.....	.....	.....	....	....	....	.....	..	12c	..	12c	11c	12c	11c	12c	11c	11c	..	11c	..	7,900
Belcher, G. S.	Nev.	1,095	10,400,000	104,000	100	1,072,400	Sept	1877	1 00	15,397,200	Apr.	1876	$1 00	12	5	..	..	..	..	..	..	..	5	..	..	..	500
Bertha & Edith G.	Vir.	645 acs.	3,500,000	350,000	10	*	.....	.....	.....	....	....	....	.....	..	3c	..	..	..	5c	..	6c	5c	5c	..	9c	6c	19,900
Best and Belcher, G. S.	Nev.	545	10,080,000	100,800	100	337,792	Aug.	1877	1 00	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Bobtail, G.	Colo.	2,500	1 736,630	227,326	5	*	.....	.....	.....	....	....	....	.....	..	2⅜	..	..	..	2½	..	..	..	..	..	..	..	500
Bobtail Tunnel, G.	Colo.	....	100,000	20,000	5	6,000	July	1873	0 30	20,000	Dec..	1876	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Bullion, G. S.	Nev.	943½	10,000,000	100,000	100	2,702,000	Nov.	1877	1 50	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Caledonia, G. S.	Nev.	2,188	10,000,000	100,000	100	1,435,000	Nov.	1877	75	....	....	....	.....	..	2¾	..	2½	..	3½	..	2½	..	4	..	4	..	700
California, G. S.	Nev.	600	54,000,000	540,000	100	....	.....	.....	.....	20,520,000	Nov.	1877	2 00	24	..	..	..	..	..	..	..	..	..	..	..	..	....
Chollar Potosi, G. S.	Nev.	1,400	2,800,000	28,000	100	1,496,000	Oct.	1877	3 00	3,080,000	Feb..	1872	1 00	12	..	..	..	..	..	..	..	..	34¼	..	..	..	100
Cleveland, G.	Colo.	3,715	250,000	25,000	10	*	.....	.....	.....	....	....	....	.....	..	..	..	..	..	7½	..	..	..	..	..	..	..	100
Cons. Hercules & Roe.	Colo.	16,500	1,000,000	100,000	10	*	.....	.....	.....	120,000	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cons. Imperial, G. S.	Nev.	468	50,000,000	500,000	100	575,000	Oct.	1877	0 20	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Con. N. Slope & E. C. T.	Colo.	15,000	500,000	10,000	50	*	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cons. Virginia, G. S.	Nev.	710	54,000,000	540,000	100	474,600	June	1873	3 00	34,560,000	Nov.	1877	2 00	24	..	..	..	..	..	..	..	..	..	..	..	..	....
Confidence, G. S.	Nev.	130	2,496,000	24,960	100	243,840	Mar.	1873	1 00	78,000	May.	1865	8 ⅓	..	..	..	5½	..	..	..	5½	..	..	..	..	..	200
Crown Point, G, S.	Nev.	600	10,000,000	100,000	100	1,573,370	Sept.	1877	1 00	11,588,000	Jan..	1875	2 00	24	..	..	..	..	5¼	..	..	..	7	..	..	..	300
Douglas	Colo.	21,000	1,000,000	10,000	100	*	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Eureka Cons. G. S. L.	Nev.	..	5,000,000	50,000	100	100,000	May	1876	1 00	1,150,000	Oct.	1877	3 00	..	46	..	46	..	46	..	46	..	46	..	44¼	..	900
Eureka G. Mg. G.	Cal'f	....	2,000,000	20,000	100	....	.....	.....	.....	2,134,000	Aug.	1877	2 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Exchequer, G. S.	Nev.	400	10,000,000	100,000	100	280,000	Sept.	1876	1 00	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Gould and Curry, G. S.	Nev.	621	10,800,000	108,000	100	2,352,000	Aug.	1877	1 00	3,934,800	Oct..	1870	10 00	..	9⅛	..	..	..	9⅜	..	8¼	..	8⅜	..	..	..	400
Granville Gold	N. C.	9,000	1,000,000	100,000	10	*	.....	.....	0 50	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Hale & Norcross, G. S.	Nev.	400	11,200,000	112,000	100	2,634,000	Nov.	1877	1 00	1,598,000	Apr.	1871	1 00	12	8	..	8⅜	8¼	..	..	..	..	..	..	8¼	..	400
Henry Tunnel	Nev.	3,000	2,000,000	80,000	25	*	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Hukill, G. S.	Colo.	3,288	1,000,000	100,000	10	*	.....	.....	.....	10,000	Nov.	1877	0 10	12	4⅛	..	4¼	..	4⅛	..	..	..	4¼	..	4½	..	800
Julia Cons., G. S.	Nev.	3,000	11,000,000	110,000	100	440,000	Aug.	1877	1 00	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Justice, G. S.	Nev.	2,100	10,500,000	105,000	100	2,027,500	Oct.	1877	2 00	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Kentuck, G. S.	Nev.	95	3,000,000	30,000	100	270,030	Dec..	1874	1 00	1,252,000	Mar.	1870	5 00	..	6	..	5	..	..	..	..	..	5¾	..	6	..	700
Kossuth, G. S.	Nev.	2,700	5,400,000	108,000	50	421,200	Aug.	1877	0 15	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Lacrosse	Colo.	3,900	1,000,000	100,000	10	*	.....	.....	.....	....	....	....	.....	..	31c	30c	30c	29c	29c	28c	30c	28c	29c	28c	29c	25c	17,200
Leopard, L. G. S.	Nev.	1,500	5,000,000	50,000	100	100,000	July.	1877	50	162,500	Dec..	1876	0 50	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Lucerne Mining	Colo.	4,200	5,000,000	500,000	10	*	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Mariposa, preferred	Cal.	44.387	5,000,000	50,000	100	1,425,000	June	1877	1 00	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	1⅞	1¾	1,400
" common	"	acres.	10,000,000	100,000	100	1,425,000	June	1877	1 00	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	1⅛	..	300
Memphis	Colo.	6,000	300,000	60,000	5	*	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Merrimac, S.	Mass.	1,500	500,000	50,000	10	*	.....	.....	.....	90,000	Nov.	1877	10c	12	..	..	..	..	..	..	..	..	..	..	..	..	....
Mexican, G. S.	Nev.	600	10,080,000	100,800	100	181,440	Aug.	1877	0 30	....	....	....	.....	..	13⅜	..	16	..	..	15⅛	11¼	..	13	..	..	..	600
Moose	Colo.	39,000	2,000,000	200,000	10	....	.....	.....	.....	100,000	Oct.	1877	0 25	12	6⅞	6½	6¾	6½	6⅝	6½	6½	6¼	6¾	6¼	5⅞	6¼	14,500
N. Y. & Colo., G.	Colo.	....	1,000,000	50,000	20	*	.....	.....	.....	20,000	Mar.	1877	0 20	..	2¼	2	2⅛	..	2¼	2⅛	2¼	1⅞	2½	2¼	2¾	2⅜	5,900
Northern Belle, S.	Nev.	1,600	5,000,000	50,000	100	....	.....	.....	.....	1,400,000	Oct.	1877	1 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Ontario.	Utah	3,000	10,000,000	100,000	100	....	.....	.....	.....	700,000	Nov.	1877	1 50	6	24⅜	23	..	..	23	..	23¼	..	23⅛	..	23⅛	..	1,175
Ophir, G. S.	Nev.	675	10,080,000	100,800	100	2,934,400	May.	1875	2 00	1,394,400	Mar.	1874	4 00	..	..	..	45	..	..	..	..	..	..	..	..	..	50
Original Comstock, G. S.	Nev.	..	10,000,000	10,000	100	....	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Overman, G. S.	Nev.	1,200	3,840,000	38,400	100	2,567,880	Nov.	1877	3 00	....	....	....	.....	..	..	..	..	..	..	..	..	..	25	..	23	..	200
Pleasant View, G.	Colo	1,200	200,000	20,000	10	*	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Quicksil. preferred	Cal.	8,500	4,291,300			*	.....	.....	.....	....	....	....	.....	..	..	..	35	..	..	..	35	..	35	..	..	..	600
" common	"	acres.	5,708,700	100,000	100	....	.....	.....	.....	....	....	....	.....	..	..	..	17½	..	..	..	17	..	..	..	..	..	500
Raymond and Ely, G. S.	Nev.	5,000	3,000,000	30,000	100	540,000	Dec.	1876	1 00	3,075,000	Sept.	1873	3 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
St. Joseph, L.	Mo.	2600 acs.	1,000,000	100,000	10	....	.....	.....	.....	250,000	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Santiago, G. S.	Nev.	2,000	11,200,000	112,000	100	....	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Savage, G. S.	Nev.	800	11,200,000	112,000	100	3,408,500	Sept.	1877	1 00	4,460,000	June	1869	3 00	..	9	..	9½	..	9	..	9	..	9¼	..	9½	..	1,000
Seaton, G. S.	Colo.	1,700	500,000	50,000	10	*	.....	.....	.....	10,000	May.	1877	0 10	12	1.60	..	1.70	1.55	1.60	..	..	..	1½	..	..	..	800
Seg. Belcher, G. S.	Nev.	160	640,000	6,400	100	244,800	Apr.	1876	5 00	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Sierra Nevada, G. S.	Nev.	3,650	10,000,000	100,000	100	1,800,000	Oct.	1877	0 50	....	Jan..	1871	1 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Silver City, G. S.	Nev.	3,900	6,320,000	63,100	100	15,775	Nev	1876	0 25	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Silver Hill, G. S.	Nev.	5,400	5,400,000	54,000	100	972,000	July.	1877	1 00	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
South Comstock, G. S.	Nev.	1,500	10,000,000	100,000	100	54,000	Jan	1877	0 25	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
South. California, G. S.	Nev.	1,500	5,000,000	50,000	100	....	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Southern Star, G. S.	Nev.	1,500	6,000,000	600,000	100	....	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Trenton, G. S.	Nev.	..	10,000,000	100,000	100	....	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Union Cons., G. S.	Nev.	850	10,000,000	100,000	100	285,000	Oct.	1877	25	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
West Belcher, G. S.	Nev.	1,000	10,000,000	100,000	100	....	.....	.....	.....	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Yellow Jacket, G. S.	Nev.	1,200	12,000,000	120,000	100	1,198,000	Sept.	1877	2 00	2,184,000	Aug.	1871	2 50	..	..	..	..	..	10	..	10¼	..	12	..	12	..	400
Young America, S.	Nev.	1,000	3,000,000	30,000	100	6,000	Oct..	1876	0 20	....	....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Copper Stocks.																											
Allouez, C.	Mich.	..	1,000,000	20,000	50	940,000	May.	1876	5 00	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Calumet & Hecla, C.	Mich.	..	2,000,000	80,000	25	1,200,000	.....	.....	.....	11,850,000	Aug.	1877	5 00	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central, C.	Mich.	..	500,000	20,000	25	100,000	June	1862	0 65	1,160,000	Feb.	1877	7 00	28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Copper Falls, C.	Mich.	..	1,000,000	20,000	50	535,000	May.	1876	.....	100,000	Nov.	1871	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dana, C.	Mich.	..	500,000	20,000	25	68,000	Jan..	1863	0 50	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dawson, S.	Ont.	..	1,200,000	60,000	20	....	.....	.....	.....	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Duncan, S.	Ont.	..	1,200,000	60,000	20	75,000	July.	1876	41⅔	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin, C.	Mich.	..	500,000	20,000	25	360,000	June	1876	3 00	585,000	Nov.	1871	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt, C.	Mich.	..	500,000	20,000	25	100,000	Sept.	1876	0 15	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
International, S.	Ont.	..	1,200,000	60,000	20	....	.....	.....	.....	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Madison, C.	Mich.	..	500,000	20,000	25	123,000	Sept.	1876	0 10	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mesnard, C.	Mich.	..	500,000	20,000	25	160,000	Apr.	1876	0 50	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Minesota, C.	Mich.	..	1,000,000	20,000	50	436,000	June	1869	1 00	1,820,000	Mar.	1876	0 50	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
National, C.	Mich.	..	500,000	20,000	25	105,000	Oct..	1875	1 00	360,000	Oct..	1873	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Osceola, C.	Mich.	..	1,000,000	40,000	25	880,000	May.	1876	2 00	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Petherick, C.	Mich.	..	500,000	20,000	25	165,533	Mar.	1876	0 50	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pewabic, C.	Mich.	..	500,000	20,000	25	185,000	June	1868	3 00	460 000	July	1873	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phœnix, C.	Mich.	..	1,000,000	20,000	50	817,500	Sept.	1870	3 00	20,000	Jan.	1876	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quincy, C.	Mich.	..	200,000	20,000	10	....	.....	.....	.....	2,130,000	Feb.	1877	4 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ridge, C.	Mich.	..	500,000	20,000	25	200,000	.....	.....	.....	90,000	Feb.	1875	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rockland, C.	Mich.	..	500,000	20,000	25	495,000	Jan..	1874	1 00	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Star, C.	Mich.	..	500,000	20,000	25	265,000	Mar.	1876	0 50	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Superior, C.	Mich.	..	500,000	20,000	25	340,000	Mar.	1874	0 25	....	....	....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

G. Gold. S. Silver. L. Lead. C. Copper. * Non-Assessable.

Total Assessments levied to date.....$47,181,510 | Total Sales of coal stocks for the week..... 259,381 shares.
Total Mining Dividends disbursed to date.....28,356,084 | Total Sales of Mining Shares for the week..... 86,425 do

rapid rate than for the past three or four weeks, and last evening the total length of the tunnel was 18,236 feet. Extensive repairs have had to be done to the timbering a few hundred feet back from the face of the header, owing to the swelling nature of the ground passed through, but this is about completed, and henceforth the header will be pushed Comstockward with no obstacles in the way. The drills are doing good work, and the cars have all they can do to remove the debris.

Ophir Gold and Silver Mining Company—This stock has doubled in value since our last, the closing quotations in San Francisco yesterday was $28 50 against $14 50 a week ago. A rich ore strike is reported in the 1900-foot level which promises to prove of great value and importance. The main drift east at that level ran into it at a distance of 390 feet, and at about 300 feet north of the California line, at a point 60 feet west of the C & C shaft. Up to the 9th inst. only low grade ore had been encountered, but it is showing constant improvement, with every prospect of developing into an extensive bonanza of good paying ore, evidently a continuation of the California ore body. It is proposed to employ the Diamond drill in searching for water and prospecting and determining the size of this new ore body.

The stock of the Mexican Mining Company which adjoins the Ophir, has been liberally dealt in on the San Francisco market during the week at enhanced rates; to-day's quotations, however, are a little below those of a week ago.

Hudson River Gold and Silver Mining Company.—The Kingston, New York, *Freeman* of the 12th inst. says: "Articles of incorporation of this company were filed in the Ulster County clerk's office to-day. The objects for which the company is formed are mining, reducing, refining, separating, concentrating, and otherwise preparing for market gold, silver, lead, copper, iron, and all other ores, building and maintaining necessary roads, erecting structures, etc., for such purposes. The amount of the capital stock is to be $1,100,000, divided into one hundred and ten thousand shares of the par value of $10 each; the term of the existence of the company is to be fifty years. The principal business will be carried on in the town of Esopus, New York."

Assessments, with dates when delinquent.—New Coso, 50c., Dec. 3; Henrietta Gravel, 10c., Dec. 1; Mint, 10c., Dec. 4; Santa Rita, 25c., Nov. 26; Wm. Penn, 5c., Dec. 1; New York Hill, 20c; Andes, 5c; Dec. 13.

The Idaho (G. V.) California Gold Mining Co. has declared a dividend of 5 per cent.

Gas Stocks.

NEW YORK, FRIDAY EVENING, Nov. 16, 1877.

The stock of the Manhattan Gas Co. has advanced $5 per share, with this exception, there are no changes in the quotations worthy of special comment. The transactions are unimportant. The Metropolitan of Brooklyn has declared a dividend of 2½ per cent., payable on the 20th inst.

Ripon, Wis., Gas Works.—These works which have been in course of construction for some time past, have now the machinery for making gas in order, and is by this time supplying the city with gas.

Guelph, Ont.—The price of gas in this city is $3 per 1,000 feet.

People's (Balt.) Gas Light Company.—308 shares of the stock of this company sold during the past week at 13½ per cent.; closing at 13⅜ per cent.

Lighting Philadelphia for 1878.—The Board of Supervisors estimates the expense of lighting the city of Philadelphia for the year 1878 at $409,226.

Auction Sales of Gas Stocks during the week have been as follows:

Metropolitan Gas Light Co.—45 shares par, 100 @ 131.

New York Gas Light Co.—30 shares, par 100. @124.

Northern Liberties Gas Co.—10 shares of the stock at $43 per share.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas stocks, No. 30 Broad street, N. Y.

Companies in New York and vicinity.	Capital Stock.	Par.	Dividends. Rate per an.	Am. of last.	Date of last.	Quotat'ns Bid.	As'd
	$						
Mutual, N. Y.....	5,000,000	$100	10%	2½	Oct. '77	92	95
" Gold Bonds	90,000	1,000	7%	3½	Feb. '77	100	103
N. York "	4,000,000	....	10%	5	Nov '77	123	125
Metrop. "	2,500,000	100	10%	5	June '77	131	132½
" " Certf.	1,000,000	....	7%	3½	" "	100	103
" " Bonds	500,000	1,000	7%	3½	" "	102	—
Harlem "	1,850,000	50	8%	3½	Aug. '77	95	100
Manhat. "	4,000,000	50	....‡	5	Nov '77	210	220
Brooklyn, B'klyn.	2,000,000	52	15%	5	July '77	165	175
Nassau, "	1,000,000	25	....‡	4	July '77	76	80
" " Certf.	700,000	1,000	7%	3½	July '77	98	101
People's, "	1,000,000	10	....‡	3½	July '76	30	45
" " Certf.	300,000	1,000	7%	3½	July '77	80	85
" " B'ds	325,000	....	7%	3	Feb. '77	96	100
Metrop. "	1,000,000	10	5%	2⅜	Nov '77	*65	70
Wmsb'rg "	1,000,000	50	10%	2½	July '77	117	123
" " Certf.	1,000,000	....	7%	3½	July '77	100	102
Citizen's "	1,200,000	20	....‡	4	Jan. '77	80	85
" " Certf.	320,000	1,000	7%	3½	Oct. '77	97	100
J. C., N. J.....	750,000	20	10%	5	July '77	160	—
Cent. Westch. N.Y	466,000	50	7%	4	July '77	80	90
Subur'n " "	295,000	50	7%	3½	Oct. '77	—	95
Municipal, N.Y..	1,500,000	100	.....	.....	.....	71	80

‡ Paid irregularly.

* Ex-Dividend 2½ per cent,

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