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DIAMOND ROCK DRILLS.

The subject of rock drills has of late occupied much of the attention of engineers engaged in blasting and tunnelling. The constant wear and tear, the slowness of operation and many other defects have proved that something more lasting and effective than the ordinary drills is required. The extreme hardness of the diamond induced some ingenious men to construct machines in which that stone performed the cutting. One of these is so arranged that it cuts out a core, which after a certain time is removed. In another, which we illustrate, diamonds are similarly employed as the cutting material, by forcing them against the rock and giving them a rotary motion, like that of an auger, the triturated rock being removed by water. Fig. 1 is a perspective view of one modification of the machine, having the engine that drives it attached to it. In it there are three principal parts, the frame generally attached to a truck, the motive power, and the drill. The frame is made of T iron, being light and strong at once. At its top and bottom there are cross-bars, in the upper of which there is a screw by means of which the machine may be attached to the roof as in tunnels, where this is practicable. The lower one is bolted to a frame on wheels so that the drill can be brought up to the face of the rock or withdrawn when necessary. This truck may be dispensed with where it is impossible to use it, owing to the narrowness of the passage.

In such cases, the drill can be steadied by the screws shown in Fig. 2, and may be placed at any angle necessary. To this frame a small oscillating engine is attached, in such a way that it can be readily raised or lowered at will. The arrangement of the valves and connections of this engine is somewhat peculiar. By turning one cock, the engine can be either started, reversed, or stopped. The crank-pin of the engine is attached to the driving-wheel, which meshes into a pinion secured to a loose sleeve passing through and revolving in the horizontal shaft. The drill-rod passes through this sleeve, and is turned by it, by means of two keys, which fit longitudinal slots which run nearly its whole length. The horizontal shaft can turn a half circle, without interfering with the engine, so that the drill-rod passing through it can be turned at any angle required. A screw is cut the whole length of the drill-rod, and to it a nut is attached in front of the shaft and sleeve. This nut has a flat groove on its periphery, in which a steel spring is placed, the ends of which are fastened to a bent lever. To one end of the lever is attached a steel spring, which can be tightened by means of a screw. The spring keeps a constant tension on the band round the nut, thus preventing its turning. When the drill is forced against the rock, it presses the nut against the sleeve which rotates the drill, carrying it with the drill against the friction of the band that is round it. The friction keeps it constantly screwed up, forcing the drill forward as fast as the rock is cut away by the diamonds.

On the end of the drill-rod is screwed a tool-head, in the end of which the diamonds are placed in rows, as shown in Fig. 2, or promiscuously over its surface,

but in such a manner as to cut the whole of the rock, leaving no central core to be afterwards removed. In the rear of the tool-head, but attached to it, is a loose collar, which is nearly the size of the hole cut, and acts as a guide, to prevent the tool from running to one side; for if it should tend to do so, the collar bears against that side of the rock when the tool-head revolves in it, thus preventing wear and keeping the tool in a straight line. A current of water is forced

inches to fifteen feet an hour, according to the nature of the rock.

We have seen it at work in the machine shop. Its operation was admirable. It drilled in two minutes a hole seven inches deep, through hard grey stone, and with quite as much facility as a gimlet passes through soft wood. The machine can be seen in operation at the Jersey City machine works, foot of Morris street, Jersey City, and business details may be learned, by addressing J. F. Case, care of P. O. box 5969, New York.

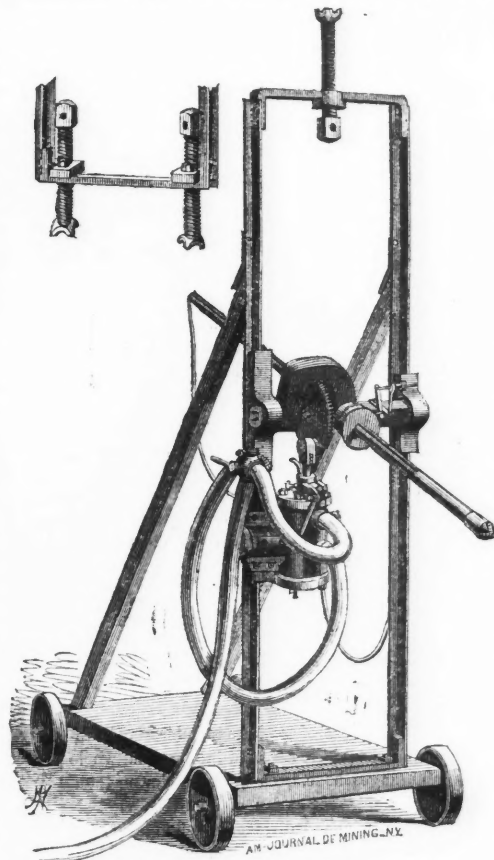


FIG. 1.

CASE'S IMPROVED DIAMOND DRILL.

through the drill-rod (which is made of hydraulic tubing) and out through the tool-head, which washes out

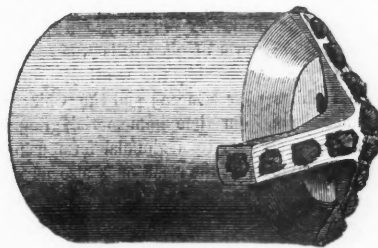


FIG. 2.

the cuttings as fast as made, and also keeps the diamonds from heating, as they otherwise would. The inventors claim that this drill can cut from eighteen

Looming Up.

Alabama is taking her stand in the rank of gold-producing States. The Philadelphia Mint the other day, assayed and tested gold of a very fine quality sent from Atanga county, about in the middle of the State. This is in direct southwest range with the gold belt extending through Northern Georgia, North Carolina, Virginia and Maryland, and is very probably the continuation of that curious zone of slates, talcose, chloritic, hornblende and micaceous, which enclose an infinite series of small, kidney-shaped quartz veins, all more or less auriferous. These were the sources from which nearly all our American gold was produced before the discovery of that metal in California, the Southern States yielding an average of a million dollars yearly, sometimes running far above that sum. They are said to have been worked by civilized men as long ago as De Soto in the sixteenth century.—*Ex.*

New Amalgamator.

We learn from the San Francisco *Times* that Mr. Andrew Hunter has invented a new machine for saving gold, called the Eureka Rubber and Amalgamator. It seems to answer the purpose for which it is intended, and marks another step forward in the improvement of machinery for saving gold extracted from quartz. This machine differs from the ordinary amalgamator. It has an oscillating movement, the bottom having strips of wood and iron alternately on end. The rubbers are made of wood, covered with copper plates and shod with iron. The sides of the machine are lined with copper. The pulp passes from the machine on to a table covered with copper plate, with an oscillating motion. The machine and table have at least thirty square feet of copper plate, with sixty movements to the minute. The power to run a machine is about a fourth of a horse power. The wear of iron is about one-sixteenth of an inch a month on the shoes. Mr. William Watt, of Grass Valley, after a trial of two weeks of this amalgamator, new cleaned up, found it had saved seventy-five cents per ton over and above what was got from the copper plates of the other batteries.—*Ex.*

A Bug Mine!

The Virginia (Nevada) *Enterprise* gives the following amusing account of a veritable bug mine: Several gentlemen have located an oil well on the margin of a small lake a few miles beyond Ragtown, on the Reese river road. They have now reached a depth of fifty-five feet with their auger, and water is flowing

out of their well. Very curious water it is, too. We saw some of it yesterday that had just been sent in by the workmen. Floating upon the water contained in the bottle was a scum an inch or two in thickness, which seemed to be made up of myriads of eggs not half as large as mustard seed. The smell of the contents of the bottle was fishy and almost intolerable—a sort of cross between rotten dog-fish and Limberger cheese. Under a powerful microscope, magnifying about 5,000 diameters, the eggs appeared like hens' eggs. The lake is very salt and covered with a species of larvæ which produces a peculiar bug or fly—doubtless the same that is found swarming on Mono lake—and it is supposed that the eggs yield these larvæ, which afterwards shed their skins and become flies. Some of the water and contents was put into a Florence flask to be distilled for oil, while another lot was placed in a porcelain saucer and put in a warm place under a stove to hatch out bugs. We think the prospect for bugs is good, but mighty slim for oil. A curious thing about the water flowing from the well is that when it comes in contact with that in the lake it curdles, and in a very short time hardens into a mass of soda. Tubing is used in the well, as it is being bored in quicksand, though pieces of fuller's earth have been brought up by the auger latterly. Three or four years ago there was talk of coal having been discovered near this lake, or at least good indications; there was also a story about a big snake living in it, said "snak" sometimes coming ashore and devouring sheep and young cattle—besides other stories of a tide in the lake, a wall round it, etc. Its true character is doubtless about to be found in it—it is an immense bug mine. The owners have a big thing, and can easily make their fortunes out of the eggs—manufacturing caviar.

Bauxite.

At a recent meeting of the Lyceum of Natural History, Dr. Mayer made some remarks upon a new mineral which had recently been found in France, and was sold in commerce under the name of bauxite. It may be regarded as a hydrated oxide of alumina, in which iron is replaced by aluminum. No deposit has been found in this country, for the reason that no search has been made for it. The proper place to look for it would be in beds of clay, iron ore and yellow iron stone. The remarkable thing about it is the entire absence of silica, so that it does not resemble kaolin or potter's clay. It appears to bear about the same relation to kaolin that the hydrated oxide of magnesia (brucite) does to serpentine. If we omit all mention of the iron and other impurities. Bauxite has numerous applications in the arts. It is employed in the manufacture of aluminum. The oxide of alumina behaves like an acid, and will expel many acids at a white heat, without itself being decomposed. It forms a soluble compound with baryta, by which the alumina can be separated from iron. By fusing bauxite with soda ash the aluminate of soda is produced, an article of commerce which finds extensive application in calico printing, and which could be employed in making glass and ultra marine. It is proposed to fuse bauxite with common salt, as one step in a new process for the preparation of soda ash. Chile salt-petre, or nitrate of soda, is decomposed by bauxite, nitric acid being expelled and a laminate of soda resulting from the fusion. Doubtless by fusing common salt, nitrate of soda and bauxite, soda, aluminate of soda, chlorine gas and nitric acid would be produced, and if the aluminate of soda were to be decomposed by carbonic acid, the alumina could be employed the second time. The extensive manufactures in Newcastle now prepare sixty tons of sulphate of alumina every month from bauxite. They also manufacture aluminate of soda, lime and baryta and sulphate of alumina. The latter salt is extensively employed in the manufacture of beet sugar. Bauxite will find application as a substitute for alum, and it can be employed for the decomposition of chloride of potassium in working up kelp and the residues from salt works. It is also proposed to use it for the decomposition of baryta. Very few minerals of recent discovery have attracted so much attention, and it is to be hoped that deposits of it will be discovered in the United States.

—*Journal of Applied Chemistry.*

Hydraulic Gold-Gleaner.

Charles Schofield, of Havilah, Kern County, California, has invented what he calls a Hydraulic Gold-gleaner, which is described as follows in the *Courier* of that place: The crushed rock is conveyed through sluices into a box with a sieve for a bottom. About six inches below this is another box, the bottom of which is lined with quicksilver. Water is conveyed from any desired height by means of a pipe, and flows up through the sieve. This action of the water carries off all the light gravel, etc., while the gold, sulphurets, etc., resist the action of the water, and fall through the sieve into the lower box containing quicksilver, where any desired number of faucets are affixed, with which to regulate the current of water flowing up through the sieve, and at the same time to draw off the sulphurets. The inventor offers \$100 per ounce for all the gold which may be extracted from the tailings of this machine.

Original Papers.

THE MICROSCOPE:

History of its Invention, Its Geological Teachings, and Its Uses, for the Miner, Mineralogist, and Chemist.

Written for the *JOURNAL OF MINING*, by P. H. VAN DER WEYDE, M. D., late Professor in the Cooper Union, New York Medical College, and Girard College, Philadelphia.

Chemistry, at the same time the teacher and the servant of mineralogy, has, in a period of time less than one single century, been elevated from a mere mass of unconnected facts, to a systematic science, founded on positive immutable laws.

It has been said by one of the greatest chemists of our time, that it owes this wonderful progress to the use of four substances: glass, platinum, cork and india-rubber. This is true to a certain extent; but I must remark that it is not alone the use of the cheaper and most common of the chemist's tools, as crucibles and retorts, and the materials for closing and connecting them made from these substances, that the greatest progress of modern chemistry, considered as a positive science, is due.

The progress of modern chemistry is chiefly due to three rather expensive pieces of apparatus, indispensable to all who wish to be at the level of the present state of the science, and, if possible, to contribute to its farther progress: they are, the Balance, the Microscope, and the Spectroscope.

Notwithstanding the first of those, the balance, is a very old invention, the sensitive, superior, and costly chemical balances are a product of later time, and the most indispensable, and I almost would say the most beloved, of the modern chemist.*

The invention of the spectroscope is quite recent, and for qualitative analysis of the greatest service. By its direct indication of the elementary substances present in any compound or mineral, it causes the saving of considerable time, and, besides the discovery of several new elements, it has given rise to a new branch of science—Celestial Chemistry—in the pursuit of which Mr. Rutherford, of New York, stands foremost.

The microscope has not been less useful to the extent of the store of our knowledge, and we may apply to it what has been said of the telescope, that its invention was equal to the gift of a new organ of sense to mankind.

Of these three precious tools, I will treat at present of the microscope, in a succession of articles; and devote a few columns—

1. To the history of its invention; this being interesting and instructive, and not universally enough known.
2. The obligations of geology to microscopic investigations; they have revealed the fact that whole mountain ranges have been built up, during thousands of years, by the action of infinitely small organic beings, which (individually insignificant, and invisible by the unassisted eye, however) by their combined operation have produced the most stupendous results.
3. The use of the microscope for the modern miner, mineralogist, and chemist.

I.

HISTORY OF THE INVENTION OF THE MICROSCOPE.

The magnifying power of glass balls was known from antiquity, as is proved by the mentioning of it by the old philosopher Seneca; and the Chinese and Japanese have, from time immemorial, ground pieces of quartz crystals to a globular form, using them for magnifying, and the small ones also as an ornament. Those globular ground crystals are, at the present day, occasionally imported from Japan

* At the total destruction of the University Medical College, New York, last year, Prof. Henry Draper happened to be in the neighborhood, and, rushing up stairs to his laboratory, the only things he saved were his two chemical balances, in glass cases, with which he walked out of the building, one under each arm, a fact demonstrating what is dearest to a chemist.

as curiosities. It is highly probable that the cameo-makers and engravers of antiquity used glass globes as magnifiers in the pursuit of their profession.

Next we find that the learned monk, Roger Bacon, who lived and died in the 13th century, was acquainted with the magnifying power of convex glass surfaces, and predicted that the most important discoveries were to be made by their use, recommending investigations with them. Afterward John Baptiste Porta, of Naples, speaks in his book, *Magia Naturalis*, published 1590, of the advantages to be derived from a combination of different glass lenses, like Archimedes' combined mirrors. This same Porta is generally supposed to be the inventor of the *camera obscura*, and his book was several times reprinted, and became universally known.

Lenses for spectacles, correcting optical defects of the eyes, were known and used a long time before—how long is difficult to ascertain; but the next information in regard to the combination of lenses is, that Adrian Metius, an eminent mathematician in Alkmaar (Holland), made a telescope in 1606, containing several lenses, and that Hans Lippershey, in Middelburg (Holland), did the same in 1608.

That these combinations were the result of the study of the book *Magia Naturalis*, by Porta, I think is more probable than the story universally repeated, namely, that the children of Lippershey, in playing with spectacle glasses, accidentally found the telescopic combination.

Already, in the fall of the same year 1608, such a telescope, made in Holland, was sold for a very high price at the annual fair in Frankfort (Germany), to the Royal Counsellor Von Bimbach, of Anspach, who gave the use of it to the mathematician of that city, Simon Mayer, well known under the name of Marius. By this means, it is highly probable, that the telescope became known in the scientific world of that day, and two years later, 1610, its use bore the first fruits: Galileo, in Padua, discovered the thus far totally unknown satellites or moons of the planet Jupiter, and at once several philosophers and astronomers made use of this new instrument. The result was the demonstration of the existence of mountains in the moon, the calculation of their height by the observation of their shadows, the solution of the milky way into myriads of stars, the demonstration of the infinite size of the celestial space, and the confirmation of the truth of the astronomical system of Copernicus.

The generals of that day were also among the first to make a practical use of this instrument, in the art of war, for reconnoitering at a distance fortifications, troops, and their operations. The Prince Mauritz, of Orange, the greatest general of that period, is reported to have first used the telescope in 1608, when commanding the Dutch troops against the Spanish. That thus far I have only spoken of the telescope, is because it is, in fact, an instrument founded on the same principles as the compound microscope, which at first was called engoscope; which means literally near-seer—like as telescope means far-seer. The Italian Demisiano gave it its present name microscope, which means seer of small objects; and its invention was a natural consequence of that of the telescope. However, in a book on the last instrument by Syrtur, printed in Frankfort 1618, no mention is made of the microscope, which, however, after the Jesuit Sirelus, was used by Frank Fontana of Naples, in that same year. The well-known philosopher Huyghens, testifies that Drebbel (a Hollander) exhibited in London in 1620, a compound microscope, consist-

† Not to be confounded with Lord Bacon, who lived 300 years later, was a very bad man, and who, with all his philosophy, with which, now-a-days, so many are infatuated, never discovered any thing whatsoever, nor contributed one iota to the stock of human knowledge. (See John W. Draper, History of European Civilization.)

ing of a combination of lenses, of which some were very small, and of highly magnifying power, and reports also that Drebbel received from the Archduke Albert the present of a telescope made by Lipper-shey.

The honor of first practically using this wonderful instrument for the progress of science belongs to the Italians. It was in 1625 that Dr. Stelluti made the first microscopic dissection of the body of a bee. Malpighi, the great anatomist, attempted to use it in the most delicate researches of human dissection, but without any results. The physician Swammer-dam, in Holland, was more successful, and labored in this line for many years, with great personal sacrifices, discovering an astonishing amount of new details in the field of microscopic anatomy, and finally published the results of his labors in 1683, under the title of *Bybel der Natuur* (the Bible of Nature.)

It is a singular fact that among the first men who made practical use of the telescope, were those who sometimes for a good, but, alas! too often unworthy cause, hurl thousands of human beings to destruction—namely, the generals, who introduced the use of the telescope in the battle-field and in the fortress; and that foremost among the first men who made practical use of the microscope were those who have devoted their existence to the alleviation of human sufferings, and, if possible, the salvation of human life—namely, the physicians, who introduced the use of the microscope in the hospital and in the dissecting room.

But seventy years after the Galileo of the heavenly bodies, appeared the Galileo of the minute organic life; the man who penetrated with the limited means of his time—namely, with his simple microscopes—as deep as ever in our time has been done with the most perfect instruments, and who, even as the first Italian Galileo, investigated the infinitely large spaces of the universe—among the revolving planets and constellations, and investigated in the infinitely small recesses of the revolving atoms of organic life. The name of this man is Leeuwenhoek, and it is Ehrenbergh, the greatest microscopist of our age, who calls him the Galileo of organic life.

Leeuwenhoek was simply a private citizen (and not a manufacturer of spectacles, like some English biographers make him) living in Delft, Holland, and being occupied in the attempt to see in the water the atoms on which Descartes founded his, in that time, so celebrated *C. sterica Philosophy*. He discovered the living atoms, the infusoria, which discovery, in a certain sense, may be compared with that of the new heavenly bodies by Galileo, namely, in regard to the infinite extent of the investigation of the human mind in the limitless small as well as in the limitless large. Neither Swammerdam nor Leeuwenhoek used the compound microscope of Fontana or Drebbel, but simply very small glass lenses. It is not the more convenient, perfect microscope of later day which produced the greatest discoveries and penetrated the deepest in the recesses of nature, but it was the appropriate use of simple lenses which accomplished this. Leeuwenhoek's first investigations had relation to the origin of vegetable growth, after that the organism of man and animals, and by sound critical observation and profound reflection, he opened the road by which even at present we progress with perfect success.

The German author Henle, in his excellent work, *Allgemeine Anatomie* (General Anatomy), published in Leipsig, speaks repeatedly of the discoveries of Leeuwenhoek, and states that he, with his simple lenses, saw on those parts he prepared and examined as many details, and even sometimes more, than we see at the present day with our new, beautiful and complicated instruments.

TO BE CONTINUED.

(WRITTEN FOR THE JOURNAL OF MINING.)

METALLIFEROUS VEINS AND MINERAL LIFE.

By A. BLATCHLY, M. E.

(No. III. Continued from Page 153.)

In many veins, bones or portions of the country rocks are found enclosed in the veins. Their sizes differ greatly, but have a general correspondence to the size of the veins in which they are found. But in one peculiarity they are all alike—their thin edges and angular points are as sharp and clearly defined as when they were first riven from the walls of the veins of which they once formed a part. Now, a small portion of the country, falling into a fused mass like a large vein, would be melted and incorporated with the veins, and larger portions would be partially fused, especially the edges and sharp corners of the masses; but such is not the case.

Again, the heterogenous character of the minerals found between the walls of the veins, and the manner in which they are deposited. In all, or nearly all veins, the minerals are arranged in strata or laminae, which are parallel with its walls, and each lamina differs from the other in the character and composition of its minerals. This arrangement would be impossible in a vein formed by forcing a molten mass into a fissure. Few, if any, of the combinations found in metalliferous veins would be possible in a heat that will liquefy quartz; and it is almost impossible to imagine the degree of heat necessary to retain a small vein of only two or three inches in thickness in a fluid condition, while it is slowly forced up through many miles of cold rocks. The walls of veins show no more evidence of heat than are found in the adjoining country rocks. Such would not be their condition had they been exposed for a long time to such a heat as would be evolved from a mass of molten quartz several miles long, four or five hundred feet thick, and extending down to the earth's centre. In that case we would find the walls of the vein fused, and all the marks of extreme heat that are found near the craters of volcanoes. This conclusion is unavoidable when we consider the exceedingly slow motion absolutely necessary to just force the vein to the surface of the earth and not to overflow. In no instance are volcanic deposits found in the form of veins. Neither is there an instance on record where volcanoes have ever ejected ores of the precious metals or any metals in the combination in which they are usually found in metalliferous veins. The next and last theory is the aqueous. According to this theory, fissures were formed in the earth's crust by volcanic or earthquake forces, and that currents of water, impregnated with various minerals passing through them, deposited these minerals in the form of metalliferous veins. If, at some periods of time, the water were impregnated with one variety of mineral, and at others with another, this would account for the great number of minerals found in the same vein. This is far more plausible than any of the other theories, as it accounts for more of the phenomena observed in veins, and is the one most generally held by the mineralogists and geologists of the present day; it is found in all of the books and is taught in the schools.

Even this has a remembrance of the igneous theory, as it is said that the minerals in certain cases are deposited by waters which arise from below, sharing the prevalence, though in a somewhat modified form, of the idea that the centre or interior of the earth is the source of all of the precious metals. The objections to this theory are that any fissures opened by earthquake or volcanic force would close immediately, and never would remain open until it could be filled by depositions from water; and in nature we never find fissures

open like those that would be required for the formation of veins by this theory. In all mines of any considerable extent one of the most costly and difficult operations is keeping the walls apart so that the ore can be extracted from the vein fissure. The most massive timber work, in conjunction with re-filling the fissure with earth and stone, will not suffice to keep the walls of the veins in their original position; and lateral pressure is found to be apparently as great as vertical pressure in all mining operations. The pressure on the earth's crust at the surface is the same as in an arch, both vertical and lateral. As horizontal fissures are vastly more numerous than vertical ones, we should naturally expect to see horizontal more numerous than vertical veins, not only from their greater number, but also from being in a more favorable position to receive a deposition from water; but it is very doubtful whether any veins are ever found in that position, and those which are now found in nearly that position were formed in a vertical position, or nearly so. It is impossible to account for the formation of those numberless small veins, which are found imbedded in the solid unfractured rock, where water could not get to them unless it were filtered through the solid granite, lime or sandstone, which would have a tendency to filter out any substances with which they might be supersaturated. And why do not the substances deposited follow the law of substances—the heaviest sinking to the bottom, and the strata thus formed being horizontal instead of vertical? And how are masses of gold, weighing several pounds, deposited at the top of a vertical vein? And why are the upper portions of veins usually richer in gold than the lower portions? and the richest silver mines almost always in countries of great altitude?

TO BE CONTINUED.

Translated for the AMERICAN JOURNAL OF MINING, by ADOLPH ANDERSON, Mining Engineer.

A Comprehensive View of the History and Present Standpoint of Geology:

Being the Introduction to Prof. BERNHARDT GÖTTA'S NEW WORK,
"Die Geologie der Gegenwart."
No. VI.—Continued from Page 161.

A very extraordinary impulse towards an exact knowledge of the exterior formation of the globe was given by the construction of geological maps, which has assumed importance only in the present century. It seems that the Englishman Pake made the first experiment in representing by signs on a map of Kent, the distribution of different rocks. He was followed, in 1778, by v. Charpentier, who first employed colors to signify the extension of rocks in the Electorate of Saxony. Again Saxony leads the van with a precise geological map of its whole country—the one which was issued after long preparatory work in the year 1844, under the direction of the Royal Mining Office of the Freiberg Academy, by Naumann and the writer. Since that time innumerable others, published by governments or individuals, have made their appearance, affording a general view of the geological formations of Europe, North America, and some coast regions of the other continents.

A large portion, even of the dry land of our globe, is, therefore, still geologically unknown; nevertheless those parts already investigated show, in spite of their disconnected positions, so great a general harmony of interior structure, that it is possible to deduce from them with certainty the general structure of the earth's crust. We now turn to a very different series of facts and conclusions, belonging to the geological history of the development of organic life on the earth's surface, which is treated more fully in parts II. and VII. of this work.

Even as late as the time of Werner fossils were collected as curiosities merely, while still more anciently they were sometimes considered as mere *usus naturæ*. It is true that several naturalists,

even in very early times, expressed excellent views in regard to fossils; but it was Wm. Smith, an English architect, who first made, during his frequent visits at many quarries in England, the observation, that these fossil remains of former organisms are by no means accidentally distributed in the strata of the earth's crust, but that certain forms occur only in certain strata, and that every species maintains a certain unchangeable position in the series of sedimentary deposits. This discovery directed in a high degree the attention of geologists, and especially those of England, to the subject of petrification, and it was soon proved, that the same law of distribution obtained, not only for England, but for sedimentary rock in general.

Thus was at once discovered an extremely important fact and the most convenient means to determine the geological age of stratified rocks containing fossils.

A great revolution in geology was thus inaugurated; an entirely new method of investigation was discovered, and the study of organic remains became for a long time so exclusively the fashion, that many other questions remained unnoticed, until they came again to notice in our days, after the study of fossils has attained a certain degree of perfection. It is obvious that the gradation of age of strata could not have been determined *a priori* from the fossils alone which they contained; it could only be deduced from the relative stratigraphical position. But after such a scale of age had once been established for the strata and their fossils, and after it had been proved correct by numberless observations, nothing was needed for the determination of the relative age of deposits but a certain number of well-preserved fossils.

This afforded also a means of comparing the deposits of two countries, separated by the ocean, according to their age; which could not be accomplished before in any other manner, since the mutual stratigraphical relation cannot be observed under the ocean, and the changeable nature of rock-structure never allows of its being used as a means of determining age.

As is often the case with new and important discoveries, this too, was, for a time, in a certain sense over-estimated, and therefore wrongly applied, whilst its real value, its great significance in a more general sphere, was not yet recognized and appreciated. This consists much more in the light thrown upon the course of the development of organic life on the earth's surface, than in the practical application for determinations of age.

The over-estimation and wrong application consisted principally in assuming that identical fossils must necessarily occur in all marine strata of equal age; and that every dissimilarity of organic remains must always signify a difference of age. It was overlooked that, even in the earliest geological periods, individual species were not distributed universally over the whole globe, and that then, as now, the inhabitants of the coasts must have differed from those of the deep seas. It was further presumed, that the appearance of new species, and the extinction of existing ones, was always simultaneous—an opinion which has also been proved erroneous. Indeed, the idea was adopted as a starting point, that sweeping changes of species were periodically occasioned by violent catastrophes, in such a manner, that in each geological period, almost no species of the previous period remained to be preserved in its strata by petrification.

So long as, under the influence of such prejudices, only limited regions, like Germany, France, and England, were examined, and even in these only a small portion of the fossil species were known, the views described seemed to be confirmed, and this apparent confirmation led to their still more extreme development in the establishment of most sharply defined geological horizons, based upon individual

so-called "Leit-muscheln" (peculiar fossils) and considered to be all but universal in their validity.

The study of the organic remains of the Alpine strata overthrew this prejudice decisively. Here it was seen that in an almost absolutely continuous field of deposition, the contemporaneous sediments were not only of totally different petrographical character, but contained also very diverse petrifications. These data were established beyond doubt by the geologists of Vienna, Munich and Switzerland, and, at the same time, the dark mystery was dissipated, which, till then, partly through the agency of the prejudices we have mentioned, had hung over the interior structure of the chain of the Alps. Other instances followed; and now we know that every formation of sedimentary rock, with its own peculiar phenomena, occupies a limited field of extent only, outside of which it has its equivalent in contemporaneous deposits, totally different in petrographical composition, and often also in palæontological character.

It becomes, therefore, absolutely necessary to distinguish between geological ages and geological formations, since many formations may obviously belong to one and the same period, so that it is no longer possible to consider one formation as the only representative of a period, although the periods may continue to be named after their earliest discovered and most clearly determined formations.

(TO BE CONTINUED.)

TRANSLATED FOR THE JOURNAL OF MINING.

AMALGAMATION—No. XII.

By J. H. DEMANN, M. E.

(Continued from Page 161.)

At Arang-Idka 20 per cent. of matte is considered sufficient, and even at Freiberg good results have been obtained with 20 to 23 per cent., though, as a rule, less than 30 per cent. is not willingly used. The apparent opposite results obtained with the same amount of salt need not cause surprise; they depend upon the difference in the pyrites, in the earthy components of the ore, or, perhaps, in the difference of manipulation in the roasting. The same results obtained from ores with a certain amount of pure pyrites, cannot be expected when the pyrites contain blende; in the latter case a larger quantity is required, depending upon the amount of blende. And for calcareous ores a larger amount of matte is requisite than for silicious ores, the amount of matte increasing in proportion to the amount of lime. If the ores themselves are free from pyrites, either clean pyrites, magnetic pyrites, iron matte, or sulphate of iron, must be added; if they are too rich in pyrites they must be subjected to a "fore-roasting" before the salt is added. Lastly, fineness of the ore is one of the principal requisites for amalgamation, and for this reason levigated ore is preferable to stamped ore. Upon this depends the success both of the roasting and the amalgamation.

ADMIXTURE USED IN AMALGAMATION.

The admixtures used in the process may be divided into first, admixtures in the roasting; and second admixtures in the amalgamation.

In roasting, generally, but one admixture is used—salt; and only in exceptional cases is the addition of pyrites, matte, or green vitriol necessary. Lime may be useful sometimes when the amount of pyrites or quartz in the ores is too great. In the amalgamation, water, quicksilver, and a precipitating metal are requisite.

SALT.

It has already been shown what an important article salt is in the amalgamation of silver ores. It is mixed with the pulverized ores before roasting, and is obtained of different degrees of purity, by which its action is very much modified. The best salt is that obtained by evaporation from salt springs.

The amount of impurities is generally trifling, and consist principally of sulphate and chlorate of alumina, gypsum and water. Sometimes it is purposely adulterated by the addition of water, Glauber salt, pulverized gypsum, &c. Sea salt is generally inferior to spring salt; it not unfrequently contains large quantities of free soda, and when used in the same quantities in amalgamation, almost always gives richer tailings than spring salt. The poorest salt is that obtained from salt pits; the actual amount of chloride of sodium is often less than one-eighth of the whole, the remainder is free soda, all kinds of earths, and other salts. The characteristics of a good salt are whiteness, a fine, compact, crystalline grain, a pure, sharp, but not bitter taste, and dryness. It must not absorb moisture too easily, but, at the same time, must dissolve readily and without noise in water, without coloring or otherwise impurifying it when heated. When heated it must decrepitate, but not melt. With a good spring salt, 10 cwt. of salt to 100 cwt. of ore is about the proper proportion. Very often it is necessary to use 11, 12 or more cwt. of salt in order to prevent the tailings becoming rich in silver. It has been already explained why such a large quantity of salt is necessary in the European amalgamation, and the formation of matte has been alluded to, which otherwise is formed in large quantities, and enclose particles of silver. It has been ascertained that only with salt is the decomposition of the sulphurets effected so completely that the mixture which alone yielded from 30 to 35 per cent. of matte, after roasting with salt gave, at the most, but two or three per cent.

If the salt is left out in roasting, such a quantity of sulphurets and sulphates remain in the ore, as to yield in the crucible from 8 to 15 per cent. of matte. The amount of silver in the tailings depends principally upon the amount of matte left in the roasted ore, and if the former is to be reduced to a minimum, the latter must be first reduced to a minimum by a sufficient amount of salt in roasting, because the silver diffused through the matte in the tailings can not be extracted by amalgamation, any more than silver in an ordinary matte, or in unroasted or unroasted pyrites. It might be possible to effect a saving in the salt, by first drying the mixture before roasting, and then grinding it to produce a fine equal grain, and to effect a more intimate mixture of the salt and pyrites. The cost of this extra labor would be counterbalanced by rendering unnecessary the breaking of the lumps during the roasting, and also, perhaps, the subsequent sifting of the roasted mass. This drying and grinding of the unroasted mixture has been heretofore omitted, out of regard to the health of the workmen, the dust from the raw ore being very detrimental to health, but it has been introduced in the amalgamation of copper matte.

(TO BE CONTINUED.)

Transatlantic Telegraphy.

At a recent meeting of the Liverpool Polytechnic Society, a paper contributed by Mr. John De la Haye was read on "Ocean Telegraphy," in continuation of one forwarded to the society a short time since on the same subject. He now supplied certain data which he at that time omitted. The writer was altogether opposed to the use of external wires in deep-sea cables. The only use, he said, was to give it additional strength whilst the cable is being submerged, and he contended that this end could be attained by the plan he suggested, which would afford protection to the core without the extra bulk, and at a less expense. The core, $\frac{1}{4}$ inch in diameter, he proposed to cover with a closely plaited shield of steel wire, making the cable when complete only $\frac{1}{2}$ inch in diameter, and of merely sufficient weight to allow of its sinking into the depths of the sea; so that the strain would be very slight, whilst the strength of the cable would be three times greater than is requisite for any strain which might be brought to bear upon it. Mr. De la Haye said the maximum cost would be about £125 per mile. The inventor has now had samples of the improved cable made, and it is undoubtedly the strongest and lightest cable yet manufactured.

Mining Summary.

GOLD AND SILVER.

Nevada.

OFFICE JOHN H. BOALT, M. E., }
AUSTIN, Nevada, May, 1867. }

EDITORS JOURNAL OF MINING:

GENTLEMEN—The fact is now pretty generally acknowledged that it would have been much better for the mines of Eastern Nevada if some of the districts near the Reese River districts had been discovered and developed before the Reese River district itself. We would not be understood to dispute the richness of the Reese River ores or the permanence of the veins; but there are certain difficulties of milling and mining in that district which cannot, at present, be generally overcome. We may mention among these:

1st. The narrowness of the veins and the occurrence of the rich ore in chimneys, or chutes.

2d. The necessity of roasting and the consequently high price of beneficiation.

On account of the former of these difficulties, the average cost of raising ore in Austin is probably greater than anywhere else in the United States. On account of the latter difficulty none but very high grade ore can be profitably milled, and thousands of tons, which would elsewhere yield a handsome profit, are annually thrown useless on the dump pile. There are some mines near Austin which contain so much first-class mineral that they can even now be worked with success in spite of all obstacles, and there are probably many more which will prove equally successful, but their number must remain small in proportion to the other and less fortunate ones until these two great difficulties are obviated or overcome. Just as soon as expenses have been reduced and processes improved far enough to admit of profitably working the low-grade ores of Austin, the Reese River district will take its proper position among the best mining districts of the world. We are as confident of this final success as we are of the existence of Yankee ingenuity and enterprise. The obstacles to be overcome are only such as have been overcome before and elsewhere, and the experience of a few years, since the district was first discovered, is sufficient evidence that improvements can and will be made. But notwithstanding this prospect—we may almost say this certainty—of ultimate success, it is to be regretted that the Reese River district was the first to receive attention and investments of Eastern capitalists. Mining in gold and silver is in this country a comparatively new business. Capital has only recently been attracted toward it. Upon the success of the investments already made must depend, to a great extent, the estimation in which this class of investments will be held in the future. If they return quickly, capital will be eager for new openings. If they return slowly, capital will be slow to follow. One bad enterprise defeats a dozen good ones. It is, therefore, peculiarly unfortunate that, at the very outset—at the time when success was doubly important and defeat doubly disastrous—so much capital should have been invested in mines which cannot be expected to become immediately remunerative. If the reasons for these things were generally known; if the causes of the success or failure of mining enterprises were generally understood—if, in short, mining were like the other branches of business which capital makes use of, and studies and understands because it does make use of them, this inevitable delay would not be of so much importance. But in the present condition of things delay is almost synonymous with defeat. There is no greater retarding influence than premature development. To make a boy discouraged with mathematics, let him commence with calculus. Beginners should take the easiest job first. If the Twin River, or the Philadelphia district, been discovered when the Reese River district first became known, and had been developed with the same enterprise and energy, we should now hear a different story from eastern Nevada. There would no doubt have been difficulties to overcome and obstacles to surmount, but not such as to delay the progress of the country or make Eastern investors sick with waiting. The veins in these districts are broad and regular, and the ore occurs in such immense quantities as to guarantee a constant supply for the mills. It has generally the same chemical constituents as the Reese River ore, viz: silver, combined with sulphur and antimony, and will therefore require the same process of working, although in many instances the decomposition near the surface has rendered roasting temporarily unnecessary. The Murphy, of the Twin River district, will serve as a fair example of the success of these mines. This mine was bought for \$50,000 and one-fifth of the capital stock. It was organized in New York, with a nominal capital of \$800,000, divided into 8,000 shares of \$100 each. The mine was energetically developed, and a mill of twenty stamps, with capacity for twenty more, was built near it. The mine now shows several thousand tons of first-class ore and a large dump of reserve on hand, which secures the mill against contingencies. The mill was not run up to its full capacity, and was necessarily stopped several times during the first two months to

admit of alterations and corrections in the machinery rendered necessary by its extended transportation in wagons, and consequent loosening of screws and rivets, etc. But the result of the two months of November and October, in spite of these interruptions, exceeded \$80,000 in gold. The future operations may be arrived at by the following figures. The twenty stamps are expected to crush twenty tons per day. Estimate it at eighteen. The ore works over \$170 per ton. Estimate this at \$160. At these certainly very reasonable figures the daily yield would be \$2,880. The expense per ton ought not to exceed \$40. Estimate this at \$50. The daily profit would then be \$1,990, or, with three hundred working days in a year, \$594,400 net annual profit in gold, or over 100 per cent. on the nominal currency capital. These estimates are made, in every case, to the disadvantage of the mine, as every one versed in these matters will at once perceive, and show only the initial production. Add the twenty additional stamps, for which the mine already has the capacity, and consider the rapid fall in the price of provisions, labor, machinery, and all the necessaries of mining, incident to the advance of the Pacific Railway, and the development and settlement of the country, and the brilliant future of this mine is too obvious to require further comment. Its stock now commands from 102 to 110 at private sale, and promises to rise much higher in the coming year. But this is not the only mine of this district whose future is assured. The Macdonald, the other half of the Murphy, is certain to have the same success. It lies in the same lode, immediately south of the Murphy, and contiguous to the end which has been developed. It was organized in New York, with a capital of \$1,000,000, and with Chauncey M. Depew, A. S. Diven, William Bond, Charles Tuttle and Clark Bell as trustees. This company, stimulated by the success of its neighbor, will soon open up its mine and add another to the list of fortunate enterprises in eastern Nevada. In the district north of Twin River district (North Twin River district), the Buckeye and La Platte mines are on the way to brilliant success. In Philadelphia district the various locations on the Highbridge and others not yet so well known, belong to the same category. In addition to these there are several other recently discovered districts where the mines appear to be of the same character. The great importance of the success of these mines cannot be overrated. They supply what has long been needed. Public confidence has been shaken by the failures and delays of the past, and something more than mere theory is wanted to revive it. There is no argument like a dividend. People will realize by-and-by that there are varieties in mines like everything else. Some will pay now, some will pay in a year or two, and some will never pay. What is wanted now is mines which will pay at once. The others can wait. With increased knowledge will come increased confidence. Nor is this all. Success will bring improvement and a reduction in the expense of working. Prosperity begets prosperity. A poor mine can seldom afford to experiment. Only successful mines can do this profitably. Without experiments there will be no progress. With improvements in machinery and processes and a reduction of the present enormous expense of working to a more reasonable sum, the mines which now lie neglected or abandoned will start into new life, and many a lost investment will acquire a new value. One thing is certain: all the croaking in Christendom cannot stop the advance of that industry which last year took \$106,000,000 out of the earth west of the Rocky Mountains.

JOHN H. BOALT, M. E.

The Comstock.—The San Francisco *Mercantile Gazette*, April 29, says: The improvement in the Mining Share market, inaugurated some time since, has continued in a very material degree, and nearly all first-class stocks have been actively dealt in at higher rates. Recent developments in several claims are regarded with much favor, and more confidence in the future value of the Comstock lode is now felt than for a year past. The present fine weather has greatly improved the roads, giving teamsters active employment in carrying ore to the different mills. . . . Hale & Norcross—no sales since our last review: \$3,500 per foot was asked. We have nothing of special interest to report relative to this company's mine. The new shaft is down 281 feet. . . . Savage has been rather quiet, though the comparatively few shares sold show an advance, opening at \$2,600 and gradually rising to \$2,775, closing on the 27th at \$2,950. This company's mine produced only 678 tons of ore during the week ending April 20th, of which amount 29 tons came from the old works, 116 tons from the sixth station, 506 tons from the seventh station, and 127 tons from the Curtis shaft works. The assay value is given at \$25,149, or \$32 32 per ton. The quality of this ore does not represent an average of the breasts, since most of it came from points where it could be obtained without timbering. This they were obliged to do on account of the short supply of mine timber, the Washoe grade being in such a condition as to prevent hauling; however, we learn that teams are able to pass either way. It is said that some fine ore is obtained from the upper floors, at the southeast end of the breast on the sixth station, at which point it is believed a considerable body yet remains. In the seventh station the breasts are said to look well, and from which a good quality of ore is

taken. The drifts toward the ledge on the third station from the Curtis shaft, are now in softer rock, as is also the sinking of the shaft toward the fourth station, which has attained a depth of 30 feet. . . . Crown Point has been in marked request at enhanced figures, the sales having been larger than for some time past, advancing from \$1,395 to \$1,500, buyer 3; receding to \$1,400, then selling at \$1,460, and closing at \$1,470. During the week ending April 19th, owing to an accident to the engine, which delayed hoisting for a few days, only 350 tons of ore were taken from the mine. The lode on the 500-foot level, is said to look very promising, and the drift on it extends some six feet to the north. In the west drift, same level, work is at present suspended for the purpose of putting a pump down, and making preparations to sink for another level. . . . Yellow Jacket advanced from \$1,300 to \$1,350, seller 30, then sold at \$1,325, and closed at \$1,352. . . . Gould & Curry receded from \$480 to 450, and closed at \$500, buyer 30. We learn that this company's mill continues to run upon ore from its own mine, but the supply is said to be rapidly diminishing. . . . Chollar-Potosi continues in great favor, and large sales have been made, opening at \$400, advancing to \$475@500, and closing on the 27th at \$535. During the week ending April 20th, 2,400 tons of ore were sent to custom mills; previous week, 1,686 tons. The old Santa Fe station is said to be looking better than ever, especially in breasting north, where the ore is found to be of a much better quality than in any other part of the slope. The winze from this station is down 60 feet, and the bottom is said to be in good ore. Work has been suspended in this winze for a few days on account of the bad air. The drift which is being run to come in 127 feet below the Santa Fe station, has been already opened 100 feet. It is thought that if the ore keeps the pitch which it has in the winze, it will attain a width of about 70 feet in the new station. In the first station drift from the new shaft, the body of the ore is said to be getting larger and wider every set they raise upon it. It is now about 60 feet long, and from 10 to 20 feet wide, producing from 65 to 70 tons of ore per day. . . . Ophir has changed hands to a large extent, improving from \$345 to 400, then selling at \$360@368, and closing at \$360. This company continues to drift south and north on the tenth station. In the south drift a cross-cut has been run west to the ledge, but without developing ore at the latest advances. The main drift south is in about 110 feet. The north drift has been recently started, and will reach the ledge in about 60 feet running. . . . Imperial has been well maintained within a range of \$278@282, and closed at \$270. The bullion returns of this company to the second clean up of the present month amounted to \$37,000, against \$29,000 for the same period in the month of March. The mills continue to crush the usual amount of ore—the Rock Point 90 tons per day and the Gold Hill 40 tons. Preparations have been made to place buildings at the Imperial Empire shaft. . . . Belcher advanced very rapidly from \$205 to \$355, dropped to \$250, then sold at \$310, and closed at \$830. Empire sold within a range of \$185@193. Alpha obtained \$425 per foot. Bullion sold at \$32@350, and closed at \$60. Overman advanced from \$28 to \$42 50, and closed at \$39. Confidence commanded \$36@38, then sold at \$47@60—an assessment of \$10 per share having been levied upon the capital stock of this company on the 23d inst.—and closed at \$59. Daney sold at \$7@10. An assessment of fifty cents per share was levied by this company on the 25th inst. Sierra Nevada closed at \$15 per share.

Manhattan.—From the Belmont Reporter, April 27, we learn that Manhattan district is at present the chief attractive point for all prospecting parties starting out from that town. Hr. Holland, who has prospected the district, states that the ledges occur in a belt of slate some five or six miles in width, with granite on either side—the granite being found at each base of the ridge, while its central portion is formed of the slate belt containing the veins. Three distinct parallel lodes, of great magnitude, can be traced throughout the length of this peculiar formation, which extends for a number of miles in a northerly and southerly direction. As a general rule, the quartz upon the extreme surface, presents a barren appearance, but upon breaking, it is found to be well loaded with mineral. Upon the western side of the ridge overlooking Smoky Valley, there are many springs of water, and there are large quantities of wood in the neighborhood.

Reveille.—The Rutland mill is running successfully. The result of the mill's first workings has given all connected with that institution exalted hopes and a firm belief that it is a decided success, as well as stimulated the miners of the district to renewed exertions in the development of their mines. An assay of the bullion, produced a bar weighing sixty six and a half ounces, 947 fine, and containing \$80 09 in silver and \$4 16 in gold. About 1,000 ounces were produced at the run and forwarded to Austin. . . . The Reveille, April 19, says: The ore obtained from the Fisherman ledge of the Bullion Company, in the Reveille district, continues to yield handsomely of silver. Samples of the pulp of one ton of the ore, which was brought in and delivered to the Empire mill for re-

duction, have been assayed by David Lundbom, and gave the hands the yield of \$492.98 per ton.

Colorado.

The following letter concludes a series written for the *Journal of Mining*. The first letter will be found on page 298, Vol. 2 (issue of Feb. 2).

THE SILVER MINES OF COLORADO.

Leaving the region of Argentine and the immediate vicinity of the Baker and surrounding lodes, the main line of travel passes down the west fork of the south branch of South Clear creek towards Georgetown. There is a considerable extent of country from the mouth of Kelso creek to a point about five miles north therefrom, that has thus far been very imperfectly examined. The general formation is very favorable to the location of silver lodes, and a few have been located, none however that have attained any notoriety. On the bank of a small tributary of Clear creek, about four miles from Georgetown, are located several lodes of more or less note, among these the Mammoth, Coin and Brown, are prominent and are the first discoveries. The Brown lode at the surface presented indications of being a wonderfully rich and strong lode. A vein of galena was opened twenty-two inches wide, which averaged at the surface in value \$672.39 per ton. Development showed the existence of zinc blende in the vein, which greatly reduced the value of the ore. At a depth of twenty feet this micaceous visitor was disappearing, and the mineral vein about one foot in width was rapidly improving. The shaft disclosed a sheet in the strike of the vein, that made it almost certain that it was identical with the U. S. Coin lode. Both lodes belong to the same parties, so that the only result of this discovery is to diminish the number of feet owned. The lodes in this vicinity occur in a syenitic formation. Above these lodes about 400 feet is a recent discovery called the W. H. Gray. This vein is about eleven feet wide at the surface, the north wall is exposed and is an unmistakable member of the syenitic family. The ore of this vein is a fine-grained argentiferous galena, probably crystallized in connection with antimony and iron; its average assayed value varies from \$206.10 to \$217.89 per ton, and is very uniform. The vein has been traced nearly or quite 4,000 feet, and is known some 3,000 feet east as the Cherokee ledge. The formation, dip and ores of the vein, are wonderfully uniform throughout its entire length. Still further down the creek and about one and a half miles from Georgetown is the Elijah Hise ledge. It is located on the southern slope of the mountain and about 600 feet above its foot, in an admirable position for tunnelling. At the discovery the north wall is very prominent, protruding some thirty feet above the ground, and remaining smooth and unbroken at the bottom of the shaft, over ninety feet below. It is a porphyritic rock and unusually hard. The ores of this vein have been and are remarkably rich, and consist of argentiferous galena, silver glance, and black sulphurets of silver and copper pyrites. The surface ore is stained with carbonate of copper. The mineral crevice varies in width, to a depth of thirty-five feet, from four to sixteen inches. Numerous assays have been made during the workings of the mine, and from every variety of the ore, the average of the clearest galena has been \$705.91, of the galena and sulphurets combined, \$1,342.51, of that portion containing marked traces of glance, \$1,685.70; the gangue, which consists of quartz interspersed with cubes of galena, yielded in one or two instances about \$75 per ton, and the average of seven assays of this material is \$52.37. This lode is owned by the Georgetown Silver Smelting Co., and the Saerman Silver Mining Co. It is unquestionably the best defined and richest lode in all the silver district. At the depth of fifty-two feet both walls are plain, and distant from each other about five and a half feet, the south wall which came in at this depth is entirely different from the other. A foot or two below this point the mineral crevice which had been pinched for a distance of sixteen feet, suddenly opened, disclosing a vein of fine-grained argentiferous galena mixed with copper pyrites, its assayed value averaging \$751.22. Its rapidly increasing width and the fact of water making its appearance with it for the first time, argues favorably for its permanence. An adit has been run about twenty feet west, disclosing a fine vein of the best ore throughout its entire length, and giving a vent to thirty feet of workable ground overhead. About ten tons of ore have been taken out of these workings that averages about \$870 per ton in bullion, at an expense of \$1,785.10; rating the transportation and smelting at \$50 per ton, there remains a profit of \$616.50 per ton. These figures may seem extravagant but are borne out by the facts in the case. Of the future yield of the mine but little can be known except the deductions that may be drawn from its productiveness to the present time. It is a large strong vein running at right angles or nearly so to the general stratification of the rocks. Feeders enter it at many points upon the surface, and its presence in the peculiar formation, together with the indubitable character of its ore, go far towards establishing its high character as a true fissure silver vein. It is regarded as a test of the district, and the confidence universally felt in its richness and permanency is exhibited in the increase of mining and the rapid growth of a town in its immediate vicinity. In the neighborhood of the Hise is the property of the Pioneer Silver

Mining company, consisting of 12,000 feet of claims on different lodes, prominent among which are the Sallie Ward, Gen. Marshall, James Guthrie, and Ben. Harding. The ores of the Sallie Ward lode very much resemble those of the Hise both in quality and composition. Assays of the average yielded \$1,122.70 per ton. The ores of the other lodes are mostly galena, crystallized in cubes, that of the Marshall yielding about eight ounces, and the Guthrie about 600 ounces, the Ben. Harding from 200 to 210 ounces per ton. The value of their other property is not sufficiently determined to speak of definitely. It is a very noticeable fact that the ores of the galena lodes are richer at the surface than below the line of oxydization; this is owing to the enpelation of the lead ore by atmospheric agencies, the result of which process is to concentrate the richer and more indestructible portions of the ore. In consequence of this all assays of lead ores quoted in this paper are made from the pure and dressed mineral, and are really metallic analysis for lead and silver. Out of some 375 assays of ores in the immediate vicinity of which these communications treat less than ten were found to give even a trace of gold in the results. Future letters must treat of the peculiar advantages these mines enjoy as to location, water, fuel, &c., and their adaptability to smelting, &c. But it is certainly pardonable to digress from these plain matter of fact descriptions of leading mines, to say that your readers will be justified in drawing the most flattering conclusions as to their future, from the daily growing testimony labor is affording as to their value. To be sure capital is needed, and if it be but judiciously and economically expended good returns are certain. Surely the experience of the gold region can be profitably applied here; there need be no repetition of vain experiments. Smelting is the key to success, and whatever may be the value of the opinions here expressed time alone can tell, but it is believed that process of which amalgamation is a feature will be signal and disastrous failures. This is ventured because several parties about to become interested here have determined upon such a plan of working the ores, and although good results may be obtained, the general characteristics of the ores are almost insuperable obstacles to thorough practical success. BENEVO.

Georgia.

New York, May 27th, 1867.

EDITORS JOURNAL OF MINING—GENTLEMEN: Enclosed please find copy of a letter (lately received from a friend in Georgia). I deem it of sufficient importance to the public to ask of you the favor of its publication in the columns of your excellent JOURNAL OF MINING. To my mind, it strikes at the very root of the matter, and good may result from it. Permit me, also, a few words by way of introduction. I am aware there have been a good many letters published recently in the journals of this city in regard to the gold mines in this country, and, as a general rule, the writer from each section of the country would have you believe that the mines in his section are the best paying mines in the world; or rather, that as soon as so and so, does so and so, great results may be looked for. But it is a rare thing to see a statement from any of the mining districts that tells the truth, the whole truth, and nothing but the truth. I hold that the truth half told is simply a lie; not that I charge all those who make these statements with intentional falsehood; far from it; many, no doubt, suppose they have told the whole truth, when in fact all they have said leads the public to believe a lie, although all that was said was perhaps literally true, yet it would be as easy to justify the thief who should plead that he had a right to steal because "the Bible bids him who stole to steal," as it would to justify any statement that conveys a false impression, although every word might be literally true, as far as it went. I suspect many of these statements are made for effect, and many more without knowledge; in either case much mischief is done, to wit: if received as the whole truth, and acted upon by the capitalists, he loses his money, and, what is worse, his confidence in everything of a similar character, and ever after will not listen to any project, no matter how great the inducements offered he has no faith, no patience, but entertains a perfect disgust for everything of the kind, and for ever, body presenting them. This works wrong both ways: the capitalist is prevented from doing good with his money, and the poor devil who has spent perhaps the best years of his life to devise a means to insure success, and needs only the money to do it, is turned away with an air of scorn and contempt. S. W.

CHEROKEE, Ga., May 1st, 1867.

To S. W. *****—DEAR SIR: I have spent much time, during the last eighteen months, in the gold fields of Georgia (in an official capacity); first, in a geological examination of the great gold belt, and, secondly, in looking into the mode of working the mines, and thirdly, into the treatment of the ores, and I find the mines all right—gold everywhere (on the belt), and the best varying from twenty-five to fifty miles in width and running entirely across the State, and the gold in such quantities as to justify any reasonable outlay for working—even the out-croppings—if conducted in a regular business way by men skilled in the business. It may, then, be asked, why is it that

nearly all who have invested in these mines get no returns? There are two plain, simple answers to that question. One is, the want of integrity and honesty of purpose, and the other, the want of skill or ability to treat the ores. These two answers tell the whole story. I visited about thirty mining properties, not one of which, at that time, were paying expenses and for the reasons before stated; and yet, any one of them could be made to pay largely, if properly conducted. The great want in the management of the business is integrity and skill in the treatment of the ores, and in some cases both, but in no case was the fault in the mine. It was painful to see such waste of ores, time and money. There you see old miners without a particle of scientific knowledge, treating all ores alike, just as their fathers did before them, no matter what their combination. They reject all improved machinery and sneer at those who claim to know anything about treating ore scientifically, simply because they do not know how to work the ore or comprehend the other. Ignorance, absolute ignorance, on the part of the owners and those in charge at the mines, and downright swindling in the management of corporations, are the stumbling-blocks to the development of the best and most profitable gold mines in the world. I say most profitable, because of their proximity to the Atlantic coast and the low price of labor and fuel, and the facility with which the ores may be treated by scientific and practical men. As an evidence of this I might refer to two or three of the mines where small mills of a peculiar construction have been introduced, and, when worked according to the programme of the inventor, yield from twenty-five to fifty per cent. more than the same ores are made to yield by any other process now in use, and at the same cost of working. Is it not clear, then, that when a sufficient number of these, or similar mills, shall have been introduced into the mines, and of sufficient capacity to work any considerable quantity of ore in each mine, under the management of scientific and practical men, the result will be astonishing. Please examine this matter and see if admitted facts will not sustain the foregoing statements. It will not be denied that hundreds of tests of the ores, from scores of the mines, have been made by panning, by washing, by stamping, by crushing, by smelting, and by assaying, and all prove the existence of gold in large quantities. Millions have been panned and washed from the surface diggings and sent to the mill. Shafts have been sunk down upon the quartz veins, and the quartz crushed or stamped, and the gold washed out, sufficient to demonstrate the fact that the gold is there, varying in quantity from ten to one hundred dollars per ton of ore. These ores can be brought to the surface and laid down to the mill door at an average cost of three dollars per ton, and can be treated in the mills for two dollars per ton. Total cost of working, five dollars per ton. This may seem incredible, but it must be borne in mind that the best of laborers can be had for one dollar per day, and board themselves; wood, one dollar per day laid down at the mill-door, and twenty men can raise from the shaft, and work through the mill, ten tons per day, and get all the gold, if managed right. It is true, it was not so formerly. All the mining in Georgia, previous to the war, was done in the rudest manner imaginable, so bad that not one-half, and in many cases not one-tenth, of the gold was saved, and much of that taken out was stolen, and, of course, the business did not prove very lucrative. Since the war considerable new machinery has been set to work, but nearly all of it the old style, and managed the old way, but on a more extensive scale and more expensive, and of course wastes more quartz and spends more money, with but a poor chance of making the business remunerative; and until the people shall learn to work their ores so as to obtain all the gold at the least possible cost—which can only be done by men of superior skill and attainments; men who make the treatment of mineral ore a specialty—you must not expect much. But when this is done, when such men are employed, and the most improved machinery adopted, the yield of gold from the Georgia mines will be immense. Then, if the earnings are not wasted upon drones who idle away their time upon carpeted office-floors in New York or Boston, the dividends upon the actual outlay will be sufficient to satisfy the most avaricious. R. W.

Arizona.

The S. F. *Alta*, April 7, gives the following letter from H. H. Moore, a gentleman just returned from the mining regions: Theulture lode, opened four years since by Henry Wickenburg, paid, for two years, with astras, an average of \$100 per ton. Since it has been worked with more elaborate machinery, it has averaged \$70 per ton. A large new mill is to be erected. The gold is free. Some Montana miners are reported to have discovered a vein of the same kind twenty-five miles east of Wickenburg. The other prominent gold quartz leads found north of the Gila, are nearly all situated within a circuit of thirty miles from Prescott. The veins upon Lynx Creek, fourteen miles east of Prescott, are the most numerous, if not the richest, to be found in Arizona. The most worked of any being the Accidental, owned by Bowers and others, of Prescott, who have prospected it with results amounting to about \$100 a ton, by means of a two-stamp mill. K. S. Woolsey has lately completed

a five-stamp mill, to run by water power on the Agua Frio, a branch of the River Verde, about twenty-five miles east of Prescott. The Colonel is working rock in the mill from the very rich leads known as the Ticonderoga, Green Tree, and others discovered and owned principally by him. He is also setting up one of the Thunderbolt crushers near these leads, intending to give that machine a fair trial in comparison with stamp mills. The mill of the Moss company, on the east bank of the Colorado, about a mile above Hardy's, is one of the most complete in the Territory. It only awaits the arrival of Mr. Strong, the superintendent, to commence running. The dry washing process, practiced principally by Mexican gambusinos, produces in the aggregate no inconsiderable amount of gold. Copper and silver are also mined for by these gambusinos, and sometimes with results astonishing to the white miner. Machines for dry washing have lately been taken to Arizona, many portions of which contain the richest placers, without water near them, and especially adapted to that mode of working. As these machines are not costly, and may be packed about upon mules, they are likely, if of the right kind, to prove profitable to those introducing them. The average yield of gold from all parts of Arizona, in the aggregate, may be estimated at the present time to be from \$4,000 to \$5,000 a day. That of the other metals cannot be easily estimated. But in the course of the present year, a considerable increase in the yield of gold and of all the other metals found in the Territory may be confidently predicted. The *Miner*, of March 9th, says: The Sterling mine is doing well. The difficulties heretofore experienced in amalgamating are gradually being overcome. The Azilan mill of ten stamps, lately erected on the Umpqua lode by Noyes & Curtis, is one of the first class. Private advices state that the condition of things arising out of Indian hostilities is worse than it has been for years past. The military authorities are unable to control the Apaches who commit, as is their wont, all kinds of depredations on the settlers and miners.

New Mexico.

Correspondence of the Denver, Colorado, *News*, dated Santa Fe, April 22, states: Great excitement comes up here from Chihuahua in regard to the discovery of a rich placer, about seventy-five miles from Chihuahua, on the Presidio del Norte road. Thirteen men have already been killed quarrelling and fighting over the claims. The Governor of Chihuahua has sent five hundred men to quell the riot and protect the Gambosinos. The diggings are reported as very extensive; are rich beyond all precedent. California not excepted. This news I have received from good authority. The *New Mexican* April 13, says: On Thursday afternoon, Mr. John D. Baker, an old resident of the Territory and a practical miner of California and Colorado experience, paid us a visit. He has been prospecting in the Thermo Mountains for five months past, and reports having discovered some very rich gold-bearing quartz lodes, specimens of which can be seen by calling at the office of Adjutant General Gwyn. The *Wilmington Journal* states: The Pinos Altos Mining Company, consisting of Messrs. Masten, Jones, Amberg, Reynolds and Greggs, have just erected a 13-stamp mill at Pinos Altos, 299 miles east of Tucson, and 100 miles west from the Rio Grande. They are now about commencing crushing rock (gold-bearing quartz.) Their ledges are said to be very rich in gold and silver, and have been worked with good results by the *astras* process. Other mills are to be erected in the Pinos Altos district this summer.

British Columbia.

We learn from the *Walla-Walla Statesman*, of April 5, that late advices are to the effect that great excitement prevails in Colville valley in relation to the mining discoveries on Forty-Nine creek, and that the settlers are abandoning their claims and rushing wild to the new gold fields. So great is the excitement that very many of the farmers have neglected to put in their spring crops, and dropping everything else, have struck a bee-line for the mines. Owing to this fact, it is believed that the crops in the valley will prove a failure this season. A French creek correspondent of the *Oregonian* says: Mining continued in the creek until the 9th of December, the following claims paying better than they had done during the season, namely: Discovery, Dagget, Kan, Mountain and Hall-Breed. Two men in the Discovery took out 175 ounces in the last week. Every one here, that is 75, on this creek, and 12 on McCulloch, has the greatest confidence in Gold Hill Bench. There are five companies prospecting, and the Robertson claim, two men working, continues to pay thirty dollars to the foot. There are now over 165 claims taken up and recorded on the bench, and I would advise any one in Victoria who has interest in the Hill to mind and keep them properly represented. There is some excitement about the Scotch Canadian Company who are prospecting through the Blue Nose tunnel, for the ground is rather getting richer and richer, and the workers are well satisfied that the channel is pitching into their ground; they are now about fifteen feet only from their lines. From Cariboo we learn that mining continues prosperous; no new strikes, but paying claims continue to yield. Rumors of a new strike on Canyon creek; no precise information to hand.

COPPER.

Michigan.

The Lake Superior (Ontonagon) *Miner* asks the question, "Shall we work or suspend?" This seems to be a question on which mining companies are divided. There are many reasons, we think, why the policy of suspension is a bad one generally and will probably prove detrimental to the best interests of the companies that may adopt it, but we do not propose to review them now but simply point to a single fact, viz.: the decreased production of copper this year over last—to show that the chances for a rise in market rates are good. We see no reason why the consumption will not be as great in this country and greater in Europe for 1867 than it was in 1856, yet it is quite certain that the amount of refined copper produced on the Western continent will be 4,000,000 to 5,000,000 pounds less.

PRODUCTION AND CONSUMPTION OF INGOT COPPER FROM THE SMELTING WORKS IN THE UNITED STATES FOR 1866:

Lake Superior mines	11,000,000
Tennessee mines	1,000,000
Baltimore works from foreign ores	5,900,000
New Jersey smelting works	1,500,000
Revere smelting works (Boston)	1,300,000
	22,800,000
Foreign refined copper	1,200,000
	24,000,000

The stock of copper on hand April 21, 1867, is about the same as in April, 1866, showing a consumption in 1866 of 24,000,000 in the United States, none exported. The Bergen Port Smelting works suspended work last November, and the Baltimore and Boston works are not likely to produce this year over 2,000,000 against 6,200,000 pounds last year. Of foreign copper it is not thought that any will be imported, and from Tennessee and this Lake we may not look for any material increase, as forces at the mines have been reduced sufficiently to compensate for any increased production in the Calumet district. The Chilean mines, it is said, are losing money at present prices, and are not likely to continue many months at this rate.

COAL & IRON.

Pennsylvania.

The *Pottsville Standard*, May 25, says: There were no shipments of black-band from the McGinnies shaft at Mill Creek for the week ending May 18th, on account of the flooding caused by the recent heavy rains. The water is now nearly all pumped out, and mining has been recommenced. The vein is about twenty inches thick, but is rapidly increasing in thickness. At the shaft of James P. McGinnies & Co., on the same tract, the mining of black-band continues with success, and shipments of ore will soon commence. The vein is about two and a half feet thick. The black-band, mixed with other and inferior ore, has been fully tested in light castings by Mr. Joseph Deer, and in heavy machinery by Mr. Geo. W. Snyder, and in all cases with success. That it exists here in paying quantity, men of experience do not doubt, and that, when fully developed, it will be a source of immense wealth to this region, is equally certain.

California.

The *San Francisco Mercantile Gazette*, mentioning California coal, says: This branch of the mineral resources of the Pacific coast has been less affected by the severe weather, which has prevailed during the greater portion of the first quarter of 1867, than any of the others. The important mines located at Bellingham Bay, from which a very superior quality of coal is obtained, have not been in working order during the quarter—the mine having been on fire, to extinguish which it was found necessary to flood it with water, which has since been pumped out. Work was resumed in March, and a vessel is daily expected with a cargo from these mines. Professor W. P. Blake, who has recently been on a tour of inspection in that section of the coast, reports the discovery of very important seams of coal on the Cowlitz River, and also on the banks of the Columbia, at points very convenient for shipping. The Mt. Diablo mines are producing a better quality of coal as the depth of the workings increase. A recent analysis of coal, taken from the lowest level reached, made by Mr. Blake, yielded only three or four per cent. of water, with less ashes than any of the samples heretofore examined by the same gentleman. The average of water in nearly all the coal in the district has been from ten to thirteen per cent. The quantity brought from the mines to this city from January 1st till March 31st, foot up 22,955 tons, against 8,320 tons during the same period last year. This does not include the large quantities sold at the mines, which are not brought here. The Black Diamond mine alone shipped 6,150 tons to this city, and sold 1,000 tons at the mine. This company have, within the past few days, completed their lower tunnel, which strikes the vein 477 feet below the present working. The vein at this depth is four feet thick, very compact, and inclosed in sandstone. The use of coal is rapidly extending in this city. Alto-

gether the prospects of the coal miners were never more cheering than at present.

MISCELLANEOUS.

Russian America.

Hon. Charles Sumner in a speech delivered in executive session of the United States Senate recently gave, among other interesting facts relative to Russian America, the following touching her mineral products: It is not entirely certain that iron has been found in this region, although frequently reported. The evidence points to the south, and also to the north. Near Sitka it was reported by the Russian engineer Doroschin, although it does not appear that anything has been done to verify his report. A visitor there as late as last year saw excellent iron, reported to be from a bed in the neighborhood, which was said to be inexhaustible, and with abundant wood for its reduction. Then again on Kotzebue's Sound specimens have been collected. At 66° 35' m. Kotzebue found a false return in his calculations, which he attributes to the disturbing influence of iron. A resident on Youkon thinks that there is iron in that neighborhood. Silver also has been reported at Sitka by the same Russian engineer who reported iron there; and, like the iron, in "sufficient quantity to pay for the working." Lead was reported by the Russian explorer, Lieut. Zagoysskin, on the lower part of the Kwilchpak; but it is not known to what an extent it exists. Copper is found on the banks of the Copper river, called by the natives Mjednaja, meaning copper, and of its alluvial, the Tshitachina, in masses sometimes as large as forty pounds. Of this there can be little doubt. It is mentioned by Golowin in the *Archiv of Erman* as late as 1863. It was undoubtedly from this neighborhood that the copper was obtained which arrested the attention of early navigators. Traces of copper are also found in other places on the coast; also in the mountains near the Youkon, where the Indians use it for arrow-heads. Coal seems to exist all along the coast; according to Golowin "everywhere in greater or less abundance." Traces of it are reported on the islands of the Sitkan archipelago, and this is extremely probable, for it has been worked successfully on Vancouver's Island before. It is also found on the Kenanian peninsula, Alaska, the island of Unga, belonging to the Shannun group, Oumalaska, and far to the north of Beaufort. At the latter place it is "slaty, burning with a pure flame and rapid consumption," and it is supposed that there are extensive beds in the neighborhood better in quality. For an account of this coal I refer to the scientific illustrations of Beechey's Voyage. The natives also report coal in the interior of the Kwilchpak. The coal of Oumalaska and probably of Alaska is tertiary and not adapted for steamers. With regard to that of Unga, scientific authorities are divided. That of the Kenanian peninsula is the best and most extensive. It is found on the eastern side of Cook's Inlet, half way between Cape Anhor and the Russian settlement of St. Nicholas, in veins three-quarters of a yard or more in thickness, and ranging in quality from mere carboniferous wood to anthracite. According to one authority, these coal veins extend and spread and extend themselves far into the interior. It appears that this coal has been more than once sent to California for trial, and that it was there pronounced a good article. Since then it has been named by the company, not only for their own uses but for export to California. In making these statements, I rely particularly upon Golowin in the *Archiv of Erman*, and also upon the elaborate work of Grovniak in the *Transactions of the Mineralogical Society of Petersburg for 1848 and 1849* (p. 112), where will be found a special map of the Kenanian peninsula. Gold has been found in the mountains of the Stikine river, but not in any sufficient quantities reasonably accessible. But failure in one place will be no discouragement in another, especially as there is reason to believe that the mountains here contain a continuation of those auriferous deposits which have become so famous further south. The Sierra Nevada chain of California reaches here. Traces of gold have been observed at other points. One report places a deposit not far from Sitka. The same writer who reports iron there, also reports that during the last year he saw a piece of gold as large as a marble, which was shown by an Indian. But the Russian engineer, Doroschin, furnishes testimony more precise. He reports gold in at least three different localities, each of considerable extent. The first is the mountain range on the north of Cook's Inlet, and extending into Alaska, consisting principally of clay slate with permeating veins of diorite, the latter being known as a gold-bearing rock. He observed this in the summer of 1851. About the same time certain Indians from the bay of Jakutat, not far from Mount St. Elias, brought him specimens of diorite found in their neighborhood, making therefore a second deposit. In the summer of 1855 the same engineer found gold on the southern side of Cook's Inlet, in the mountains of the Kenay Peninsula. Satisfying himself first, that the bank occupied by the redoubt of St. Nicholas, at the mouth of the Kakuin river, is gold-bearing, he was induced to follow the development of diorite in the upper valley of the river, and as he ascended found a gold-bearing alluvion gradually increasing, with scales of gold becoming coarser and coarser, instead of being scarcely visible as at first.

MARKET REVIEW.

FRIDAY EVENING.

Gold and Silver Stocks.—The market continues demoralized. At first board Consolidated Gregory sold at \$6 60; Corydon, \$2 20; La Crosse, 55c; Quartz Hill, \$1 70@1 76; Rocky Mountain, 75c; Ohio & Colorado, \$1. At second call Consolidated fell to \$5 50, and Quartz Hill to \$1 65.

Table with columns: Offered, May 25, Asked, May 31, Offered, Asked. Lists various stocks like Alameda, American Flag, Atlantic and Pacific, etc.

Copper Stocks.—Rockland has advanced 25c, selling at \$8 75 at first board.

Table with columns: Offered, May 25, Asked, May 31, Offered, Asked. Lists copper stocks like Caledonia, Canada Copper, Charter Oak Copper, etc.

Petroleum Stocks.—

Table with columns: Offered, May 25, Asked, May 31, Offered, Asked. Lists petroleum stocks like Bencehoff Run, Buchanan Farm, Bencehoff Mutual, etc.

Lead Stocks.—Walkill has declined 5c, being offered at 45c.

Miscellaneous Stocks.—Wells & Fargo Express, 65; Amer. Coal, 45; Wilkesbarre Coal, 35; Pacific Mail Steamship Co. 125 1/2 @ 130; Del. Lack. and W. 125; Cumb. pref. 30.

Government Stocks.—Firm and active.

Table with columns: U. S. 6s, 1867, U. S. 6s, 1868, reg., U. S. 6s, 1868, coupon, etc.

Foreign Exchange is firm. Bills at 60 days on London are quoted at 109 1/2 @ 109 3/4 for commercial; 109 1/2 @ 110 for bankers', do. at short sight, 110 1/2 @ 110 3/4; Paris at 60 days, 5 17 1/2 @ 5 12 1/2, do. at short sight, 5 12 1/2 @ 5 10; Antwerp, 5 17 1/2 @ 5 12 1/2; Swiss, 5 17 1/2 @ 5 12 1/2; Hamburg, 36 1/4 @ 36 3/4; Amsterdam, 41 @ 41 1/2; Frankfurt, 41 @ 41 1/2; Bremen, 79 1/2 @ 79 3/4; Prussian thalers, 72 1/2 @ 72 3/4.

Gold opened at 136 1/2; selling at 136 1/2 at 2 p. m.

Copper.—There has been considerable activity, and the market is firm at 24c.

Iron.—The market in Pig quiet. American No. 1, \$45 @ 46; No. 2, \$40. No improvement in the retail trade. Wm. Oothout reports prices as follows: Swedish Iron, \$155 @ 165; common, \$95 @ 100; refined, \$105 @ 110; band, \$137 1/2; rods, 3-16 to 1/2, \$110 @ 170; scroll, 1/2 to 3/4, \$187 1/2 @ 137 1/2; horseshoe, \$132 1/2 @ 137 1/2; hoop, 1/2 to 2, \$142 1/2 @ 200; ovals and half ovals, 1/2 to 1 1/2, \$132 1/2 @ 142 1/2; nail rods, \$96 @ 10 1/2.

Tin.—In the early part of the week there was considerable speculation; quieter on Friday. 32c. for Straits, Cornish 31c.

Lead.—Quiet at 9 1/2c.

Spelter.—Quiet at 9 1/2c.

Petroleum is dull. We quote crude at 10c. in bulk, and 16c. in bbls. Refined, in bond, at 20 1/2 @ 21c. for light straw; 21 @ 21 1/2c. for do. to white; 24 @ 24 1/2 for prime do. do.; 26c. for standard white, and 26 1/2 @ 27c. for prime white.

THE SLATE TRADE.

As we have heretofore noticed, all the quarries are well stocked with Slate, and dealers throughout the country have but little stock, comparatively, on hand. They evidently hope that by holding off prices will come down, so as to enable them to compete more successfully with tin and other roofing materials, which are now offered at low figures. The activity noticed last week continues. City trade, however, on account, principally, of the mechanics' strikes, it is believed will be dull until about the first of September. Manufactured Slates are in brisk demand.

Table with columns: Roofing Slate, Vermont purple, 1st quality, per square, \$11 00 @ 12 00, etc.

Table with columns: PRICES DELIVERED, PER SQUARE, CHICAGO.—Vermont purple and green, 1st qual., \$14 00 @ 15 00, etc.

BUFALO.—\$2 or \$3 lower than Chicago. CLEVELAND.—\$1 higher than Buffalo. CINCINNATI.—40 cents higher than Cleveland. NEW ORLEANS.—\$1 @ 20 per square. CHARLESTON, S. C.—\$15 @ 16 per square.

THE COAL TRADE.

There is no demand. Dealers are generally much discouraged at the long depression that has existed. The decline which has marked the late auction sales is the partial cause of this, while the general dullness in all manufacturing lines, is the prime cause. Strikes of miners, freshets, and other delays in the production of coal, no longer seem to affect the market.

The Scranton auction sale which took place on Wednesday last, and at which there was an average decline of 30c. per ton, has caused "blessings" to arise from the Schuylkill dealers, while the L-high men will have to calculate closely to see the profits of their trade. The prices obtained at this sale show on their face a clear loss to the company, which proves the folly of placing so large a quantity at one time on a weak and depressed market. 20,000 tons would have been an excess of the actual demand, and which amount would have recorded a small decline price.

Foreign and Provincial coal, for gas purposes, are in light supply, and the market is dull, no doubt in sympathy with the Anthracite trade. We hear of small sales to arrive.

The retail trade in the city is almost entirely suspended, and the decline in prices at the sale will in no wise cause a reaction.

The completion and opening of the Wyoming branch of the Lehigh Valley Railroad, from Mauch Chunk to Wilkesbarre, was highly celebrated on Wednesday last. This is an event of great interest to our coal dealers in this city, as it will provide another outlet from one of our richest mining regions, and as competition is the life of trade, afford us good coal at low prices.

The following is a correct account of the Scranton sale, which took place on Wednesday last. The attendance was large, and composed of wholesale dealers here or their representatives. The bidding was slow—85,000 tons were disposed of.

Large table with columns: LUMP, 12,000 tons, 10,000 tons, 8,700 tons, etc.; STEAMBOAT COAL, 12,000 tons, 10,000 tons, 1,500 tons, etc.; BROKEN, 18,000 tons, 10,000 tons, 11,300 tons, etc.; EGG, 9,000 tons, 9,000 tons, 6,300 tons, etc.; STOVE, 20,000 tons, 20,000 tons, 3,700 tons, etc.; CHESTNUT, 9,000 tons, 10,000 tons, 4,400 tons, etc.

Five thousand tons were also sold, deliverable at Washington, N. J., at the following rates:

Table with columns: Quantity, Price. 500 tons grate, \$2 25 @ 2 50; 1,200 tons egg, 2 25 @ 2 30; 2,300 tons stove, 2 50 @ 2 75; 1,000 tons chestnut, @ 2 00.

The quantity of coal shipped over the Philadelphia & Reading Railroad and Schuylkill Canal for this week was by railroad 88,467 tons, by canal 31,484. Total, 119,951 tons.

The following is the quantity of Coal shipped over the principal roads for the week ending May 25, 1867.

Table with columns: 1866, 1867, WEEK, TOTAL, DECREASE. Lists various coal companies like Phil. & Reading R.R., Schuylkill Canal, Lehigh Val. R.R., etc.

Lehigh Coal Trade.

SHIPPED FOR THE WEEK ENDING MAY 25, 1867.

Table with columns: SHIPPERS, CANAL, RAILROAD, Week, Total, Week, Total. Lists various shippers like From Mauch Chunk, Lehigh Coal & Navigation Co., Summit Mines, etc.

RECAPITULATION RAILROAD.

Table with columns: Tons, Tons, Tons, Tons, Tons. Rows include: For the week, Cor. w/k last year, Prev'ly this y'r, Total, Same time last y'r, Increase, Decrease.

CANAL.

Table with columns: Week, Season. Rows include: Total from Mauch Chunk, B. M. Region, From Mahanoy Region, Hazleton Region, Wyoming Region, Total, Same time last year, Increase, Decrease.

Schuylkill Coal Trade.

Table with columns: Tons, Tons. Rows include: BY RAILROAD & CANAL, FOR WEEK ENDING MAY 30, 1867. St. Clair, Port Carbon, Pottsville, Schuylkill Haven, Auburn, Port Clinton, Total, Previously this year.

Cumberland Coal Trade.

Table with columns: Tons, Tons. Rows include: For the week ending May 25, 1867. TRADE ON THE CANAL, Cumberland, during the last week, 125 boats, laden with 12,575 1/4 tons of coal, forwarded by the following companies: American Coal Co., Borden, Central, Hampshire, Cumberland Coal and I. Co., Consolidation, Total, COAL TRADE BY RAILROAD, Statement of Coal shipments over the Baltimore and Ohio Railroad for the week ending May 25, 1867.

Table with columns: Tons, Tons. Rows include: From C. and P. R. R., Consolidation, American Company, From Eckart R. R., C. C. and I. C., Spruce Hill, Blaes Avon, Total, No report from mines on George's Creek.

Table with columns: Tons, Tons. Rows include: GAS COAL, From mines West of Piedmont, Coal transported over the Cumberland and Pennsylvania Railroad during the week ending May 18th, and for the year: For week, For year, During the corresponding period of 1866, there were delivered to the Baltimore & Ohio 151,379 tons, and to the canal 34,492 tons 14 cwt.

Prices of Coal by the Cargo

[CORRECTED WEEKLY.]

At New York, May 31, 1867.

Table with columns: Price, Price. Rows include: Schuylkill Red Ash, choice, White Ash Lump, Steamboat, Broken, Egg, Stove, Chestnut, Lehigh White Ash Lump, Broken, Egg, Stove, Chestnut, Wilkesbarre Lump, Broken & Egg, Stove, Chestnut, Wyoming Lump, Steamboat, Stove, Chestnut, SPECIAL COALS, Locust Dale White Ash, Hoagy Brook, Sugar Leaf, Room Run, Old Company's, Harleigh, Spring Mountain, Sugar Creek, Silver Brook, Fulton White Ash, Stout, Back Ridge, Spohn & Lewis, Shenandoah, Swatara Falls, Red Ash, Henry Heils, E. Franklin, Lorberrry, New England Red Ash, Broad Mountain.

Table with columns: Price, Price. Rows include: Wyoming, McNeal C., George's Creek (Balt.), (Georgetown), Locust Mountain (Repple), Duncan Red Ash, Rossburg & Fall Creek, Newburgh Orrell Gas Coal, Despard Gas Coal, Westmoreland Gas Coal, Wilkesbarre Coal & Iron Co., Agents for these coals may be found in our advertising columns.

At Philadelphia, May 31, 1867.

Table with columns: Price, Price. Rows include: Lehigh Lump and Steamboat, Broken and Egg, Stove, Chestnut, Schuylkill Red Ash Prepared, Chestnut, White Ash Lump and Steamboat, Broken, Egg and Stove, Chestnut, Locust Mt. Lump and Steamboat, Broken, Prepared, Chestnut, Lorberrry Coal, Shamokin, Franklin, (Lykens Valley), Broad Top.

Seranton Coal at Elizabethport, May 30, 1867.

Table with columns: Price, Price. Rows include: Lump, Steam, Grate, Egg, Stove, Chestnut.

Prices for Pittston Coal at Newburgh, May 31, 1867.

Table with columns: Price, Price. Rows include: Lump, per ton of 2240 lbs., Steam, Grate, Egg, Stove, Chestnut.

70 cents additional to New York.

Lackawanna at Rondout, May 31, 1867.

Table with columns: Price, Price. Rows include: Lump, Steam, Grate, Egg, Stove, Chestnut.

Lehigh Coal at Elizabethport, May 31, 1867.

Table with columns: Price, Price. Rows include: Lump, Steamboat and Broken, Egg, Chestnut, Stove.

At Baltimore, May 31, 1867.

Table with columns: Price, Price. Rows include: Wilkesbarre & Pittston W. A., Lykens Valley & Sunbury R. A., Shamokin W. or R. A.

George's Creek and Cumberland Coal.

Table with columns: Price, Price. Rows include: Run of mine, I. o. b. at Locust Point at Georgetown, Wilkesbarre Coal at Elizabethport.

Table with columns: Price, Price. Rows include: Lump, Steam, Broken, Egg, Stove, Chestnut.

Prices of Provincial Coals.

[REPORTED FOR THE JOURNAL OF MINING.]

BY LOUIS J. BELLOP, JR., 43 Pine street, N. Y.

Duty \$1.25 per ton.

Table with columns: Price, Price. Rows include: Rock House (on board), Gowite, Fagan, Strony, Polton, Chace Bay, International Co.'s, Slack Coal.

Prices of Foreign Coals.

[REPORTED FOR THE JOURNAL OF MINING.]

BY H. L. PARMILLE & BROS., 32 Pine street, N. Y.

Duty \$1.25 per ton.

Table with columns: Price, Price. Rows include: Liverpool Gas Caking, House, Orrell, Liverpool Orrell, screened, Cannel, per ton 2000 lbs. delivered.

Coal Freights.

[CORRECTED WEEKLY.]

From Newburgh.

Table with columns: RIVER, CO'S BOATS, EASTERN. Rows include: Albany, Barrytown, Catskill, Cold Spring, Coeymans, Coxsackie, Fishkill Landing, Greenbush, Haverstraw, Hudson, New York, Nyack, Peekskill, Pongkeepsie, Rhinebeck, Saugerties, Sing Sing, Styvessant, Tarrytown, Troy, West Point, West Troy, Yonkers.

From Port Richmond, Philadelphia.

Table with columns: Price, Price. Rows include: Boston, bridges, Bridgeport, Braintree, Beverly, Charlestown, Chelsea, Cambridgeport, Dighton, Dorchester Point, Daversport, East Cambridge, Fall River, Gardner, Gloucester, Hingham and dis., Milton, Malden, Marblehead.

From Elizabethport.

Table with columns: Price, Price. Rows include: Albany, New London, Newport, New York, Fall River, Hartford, Hudson, Lynn, Middletown, New Bedford, Newburyport, New Haven.

From Georgetown or Alexandria.

Table with columns: Price, Price. Rows include: To Philadelphia, New York.

From Baltimore.

Table with columns: Price, Price. Rows include: To Philadelphia, New York.

Provincial Freights.

Table with columns: Price, Price. Rows include: Sydney to N. Y., Lingan, Cow Bay, Big Glace Bay, Little.

Foreign Freights.

Table with columns: Price, Price. Rows include: New Castle and Ports on Tyne, Liverpool.

BOSTON STOCK MARKET.

(By Telegraph.)

Boston, May 31, 1867.

Table with columns: Price, Price. Rows include: Prices bid to-day were as follows: Canada, Minnesota, Copper Falls, Franklin, Hancock, Huron, Isle Royal.

Sales at Boston Stock Exchange, May 30.

Table with columns: Price, Price. Rows include: 50 shs. Huron, 10 do Cary Im., 200 do do, 100 do Bay State, 100 do do, 100 do Peabody, 50 do Tremont, 125 do Nantuxet.

Weekly Coal Trade Circular.

New York, May 24, 1867.

The interruption to navigation and operations at the mines occasioned by the recent floods has nearly ceased, and coal is again coming forward with regularity. Quite a considerable amount of coal has been kept from coming into the market by reason of these floods. Prices remain without change, and the demand for coal continues moderately active. Freights continue low at Philadelphia and are without change at Port Johnston. Eastern demands are in the market and are shipping quite freely from Philadelphia at the present low freights. A close comparison shows that the actual average decline at the last Pittston sale, as compared with the last Seranton sale, was a little less than five cents per ton. The next Seranton auction takes place on Wednesday next, May 29, when 85,000 tons will be offered for sale. A noticeable feature of the trade this year is that the Lackawanna companies are all increasing their production of coal, as compared with last year, whilst the Schuylkill production, to an alarming extent, is decreasing. The total decrease of production for the season this year, as compared with the corresponding period of last year, to best dates is precisely 194,234 tons. The Schuylkill region has fallen off 323,765 tons; the Lehigh and Susquehanna, 118,463 tons, whilst the Wyoming or Lackawanna region has increased 247,494 tons.

The Tribune of the present week in its financial article, stated that the Lackawanna region holds the keys of the Coal trade, which the above figures seem to confirm most emphatically.

Coal Traffic on French Railways.

The coal traffic of the French railways appears to be steadily extending; thus the Orleans carried last year 1,063,500 tons of coal, as compared with 945,000 tons in 1865, and 821,000 tons in 1864. Even now, however, the coal traffic of the company is singularly small, having regard to the extent and importance of its network. The quantity of coal carried by the company to Paris is somewhat remarkably limited, having been only 19,373 tons, as compared with 13,371 tons in 1865, and 2,417 tons in 1864. The Western of France railway carried last year 499,000 tons of coal, as compared with 430,000 tons in 1865. The increase arose principally in English coal, in consequence of the advance which took place last year in French and Belgian coal; thus English coal, which figured in 1865 to the extent of sixty-three per cent. in the total tonnage conveyed, attained last year a proportion of sixty-seven and a half per cent. The port of Dieppe, which gave the company's system a coal movement in 1865 of 102,000 tons, yielded a traffic of 141,000 tons in 1866, showing an augmentation of 39,000 tons, or thirty-eight per cent.—English Paper.

AMERICAN Journal of Mining.

[ILLUSTRATED.]

WESTERN & COMPANY, EDITORS AND PROPRIETORS.

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NEW YORK, SATURDAY, JUNE 1.

Contents of this Number.

Editorials—The Mineral Wealth of Missouri—Brewing—Jules Verne in America—New Lead—Oregonian Papers—The Microscope, No. 1, by P. H. Van der Weyde—A Comprehensive View of the History and Present Standpoint of Geology—No. 6—Metalliferous Veins and Mineral Leds, by Dr. A. Blüchel—Amalgamation, by J. H. Thompson, M. E.—Illustrated Machinery—Improvement of Sewer Wrench—Mining Summary—Gold and Silver: Nevada, Colorado, Georgia, Arizona, New Mexico, British Columbia, Ceylon, Michigan—Coal and Iron—

the agents of the notorious Scotchman, John Law—the originator of the greatest swindles of modern times, the Mississippi and South Sea schemes—having brought to France galena which they represented to many as silver found in the country which, in French charts of 1718, was designated "the land full of mines." The well known La Motte mine was discovered in 1720, and is, according to the Encyclopedia Britannica, the most remarkable in the world. The lead fields extend through eighteen counties, over 6,000 square miles, and contain sufficient galena to supply the world. Yet it can scarcely be said that there is more than a local market for it. Coal is remarkably abundant. It underlies a large portion of the State, and has already been discovered in thirty counties. In St. Louis county alone there are 166 square miles. The amount of coal in Cooper county is estimated at 60,000,000 tons, and under every acre of Boone county there is supposed to be at least \$1,000 worth of coal. The deposits in the vicinity of Booneville extend over two thousand miles, and are calculated to contain 60,000,000 tons. The entire amount of coal in Missouri is estimated at 200,000,000 tons, a quantity which is so great that, allowing a daily consumption of 100,000 tons, Missourians would have quite enough for three thousand years. These figures are so immense that, while we offer them only as approximations, we would hesitate to do this unless we were fully satisfied of the reliability of the sources from which we derive our information.

The coal of Missouri is, however, not her only element of wealth. The supply of iron is fabulously rich and extensive. It occurs as hematite, and in the form of the ochrey, micaceous, and red oxides. We believe that there are few of our readers not acquainted with the famous iron mountains of Missouri—Pilot Knob, Shepherd Mountain and Iron Mountain. It may appear like a fairy tale to speak of iron mountains, yet these hills are undoubtedly such. Pilot Knob is 581 feet in height—above the Mississippi 1,113—and covers 360 acres. Iron extends for at least 440 feet from the surface, and it is estimated that the upper section of 141 feet contains 14,000,000 tons of ore. Iron Mountain, six miles to the north of Pilot Knob, is one and a-half miles long and 444 feet high. "It's whole top," says a careful writer, "is a solid mass of iron, and one sees nothing but iron lumps as far as the eye can reach." Dr. Feuchtwanger, a competent authority, calculated many years ago that there were 6,000,000 tons of pig iron imbedded in that mountain.

Coal, iron, and a maritime position—or what is equivalent, easy access to the sea—afford to a country whose inhabitants are industrious and energetic, importance and wealth. It was these that made England what she has been, and to them we will owe our pre-eminence. British statesmen and economists foretell the speedy exhaustion of their supplies of coal and iron, and predict the consequent decline of their nation, and her loss of position as the first manufacturing country of the world. They will not have to wait so long for the realization of their anticipations. Long before the failure of her mineral supplies that position will have been ours, provided our statesmen and capitalists develop the resources of such States as Missouri. Manufactories, mines, quartz mills and smelting furnaces ought to abound there, and if capital is invested, if labor is directed thither, the country need not in peace import her iron, coal or manufactured goods, and in more troubled times she need not rely on the assistance of "neutrals" for anything she may require.

More Light.

We have received a long letter from Mr. G. W.

Browne, of Denver, in which he informs us that \$160 has been returned in the report of the Commissioner of Internal Revenue, as the amount of the Miners' Tax collected in the Territory of Colorado. He also shows that the money received from Mr. Calvin P. Clarke in payment of the tax assessed on him, did not reach the Collector's office for months after it was due. This fact was concealed from us, which we regret, as it conclusively shows that there was no irregularity on the Collector's part.

BREWING.

Californians are making ready to rush, with their characteristic irrepressibility, to Russian America. They appear determined to be the first in the field, and learn what the new territory is made of. We have statements that gold, silver, and other valuable minerals exist there, and we may reasonably expect that with the first reports of the finding of gold and silver in any quantity, there will be another of those wild and lamentable excitements, in which the warning voice of experience is drowned, and which, when once started, sweeps irresistibly along to the ultimate ruin of the majority of its votaries. Already plans for extensive trade in furs, coal, gold, silver, etc., have assumed serious shape in San Francisco, and vessels are fitting out to convey hardy adventurers to the new Eldorado. We would advise caution.

INDIAN WAR IN MONTANA.

We have intelligence of great excitement in Montana, in consequence of Indian outrages. Gov. Meagher, with commendable alacrity, has assumed command, and commenced active retaliation. Some two hundred volunteers have set out for Gallatin Valley, the scene of the disturbance. It is stated that the Sioux Indians, who planned the attack on that settlement, are allied with the mountain tribes, and together they assert they will destroy Helena and Virginia cities.

Scientific Meetings.

AMERICAN INSTITUTE—POLYTECHNIC BRANCH.

VANADIUM—A NEW VOLCANO—MOUNTAIN RAILWAYS—MEERSCHAUM—ELECTRIC LIGHT FOR SHIP—WATER METERS AND LEAD PIPES—IS TELLURIUM A METAL?

Prof. S. D. Tillman, on taking the chair on Thursday evening at the Institute, mentioned, amongst other items of scientific news: I. Mr. Mushet has expressed his opinion that a minute quantity of the metal vanadium mixed with iron forms a valuable alloy, and gives a fine, tough, fibrous texture to bar iron. II. Following an earthquake, a volcano burst, several months ago, in the South Pacific Ocean, near the Friendly Islands. Great quantities of lava have been discharged, and a dense smoke rises higher than the neighboring island of Orosenga or Oloosinger—one of the Navigator's group—which is about 2,000 feet high. III. There is a project on foot to construct a railway from Vera Cruz to the City of Mexico. In a distance of 150 miles, the elevation to be reached is 8,400 feet. This height exceeds that attained on any other road yet made. The Baltimore and Ohio Railroad reaches an elevation of 2,626 feet. The height of the Sennering incline is 2,887 feet, and the intended summit of the Mount Ceniz Railway will be 5,815 feet above its lowest grade. IV. M. Holdmann states that the artificial product known as Viennese meerschaum is prepared by mixing 100 parts of silicate of soda at 35°, with 60 parts of carbonate of magnesia, and 80 parts of the native meerschaum—a silicate of magnesia—or with pure alumina. This mixture is then pulverized with the greatest care, and passed through a sieve of very fine silk or horse hair; add water, and boil it for ten minutes; then pour the whole into moulds, placed so that the water may easily separate. V. The electric light has been used on the French yacht Jerome Napoleon, for the purpose of ascertaining whether it will materially aid in avoiding collisions at sea. Beside the ordinary reflecting ap-

*We are in constant receipt of orders for back numbers of the JOURNAL OF MINING, which we are not always able to fill, as many numbers are now out of print. We therefore recommend all our subscribers to file the JOURNAL on its receipt, and have it bound at the end of each half year. It will thus form a useful book of reference. The value of these volumes may be understood, when we state that in consequence of a very great demand for them we are obliged to charge for Volume I, \$25, and for Volume II, \$30.

File, weekly, your copy of the JOURNAL.

THE MINERAL WEALTH OF MISSOURI.

Lately, considerable attention has been directed to Missouri, as a mineral State, but we are of opinion that in all that has been so ably written concerning its mineral wealth, too much has not been said, and we believe that the most enthusiastic advocate could with difficulty exaggerate the immense treasures which, in that important State, extend over an area little short of 18,000,000 acres. The chief minerals of Missouri are lead, iron, and coal, but besides these, there are found in large quantities, cobalt, copper, manganese, tin, zinc, and most of the other useful minerals, metallic and non-metallic. The lead mines have been long known,

paratus, it is proposed to try the Light Condensers, first used by M. Louis d'Henry in solving the following problem: "Being given a luminous point to contrive an apparatus which receives on its surface all the light emanating from that point, and directs it toward a position in space." The apparatus to be used on the yacht consists of an ellipsoid of revolution, by means of which the light placed in one of the foci undergoes three reflections, and is projected sixteen times more intense than the direct pencil of rays. Referring to the note on meerschau, Dr. Feuchtwanger stated that imitation meerschau is made chiefly from the waste shavings pared off to form pipes. Silica is added to it to make it plastic, and magnesia to give it body. The mixture is dried slowly, but is easily distinguished from the genuine meerschau. The note on the electric light and its reflection as proposed, caused some discussion. Dr. Van der Weyde believed it difficult to understand how the light could undergo three such reflections.

Mr. Cochrane explained the construction of a new water meter of his invention, and enlarged on the importance of using it and the immense saving of water it would produce. A conversation followed in which Dr. Parmelee expressed his opinion that it would be a useless expenditure to tax hard working men, to whom every dime was of value, to provide water meters. Some observations were made on the reckless waste of Croton water by the legendary "Biddy," the ideal New York help, which were intended to prove that it would be a saving to the city to provide its inhabitants with meters. It was also stated that at the next meeting there would be given the result of experiments which some members are making to settle the question of lead-pipe poisoning.

Dr. Bradley read a paper containing the results of his experiments on the conductivity of tellurium. Having employed Hill's battery of four cups arranged as a compound battery, and from the tangent galvanometer for intensity the following deflections were found:

WITH NO SUBSTANCE	QUANTITY GALVANOMETER	INTENSITY GALVANOMETER
Tellurium.....	28 deg. 20 min.	62 deg.
Zinc.....	26 " 50 "	62 "
Magnesium.....	27 " 40 "	62 "
Cast Iron.....	27 " "	62 "
Graphite.....	15 " 10 "	61 "
Coke (sandy specimens).....	20 to 27 deg.	61 deg. 10 min. to 62 deg.
Manganese (B. Oxide).....	0	0
Sulphuret of Antimony.....	0	0
Sulphur.....	0	0

With the cups arranged as simple or quantity battery i. e., the positive poles connected and the negative poles connected—

WITH	QUANTITY GALVANOMETER	INTENSITY GALVANOMETER
No Substance.....	28 deg. 20 min.	62 deg.
Tellurium.....	26 " 50 "	62 "
Zinc.....	27 " 40 "	62 "
Magnesium.....	27 " "	62 "
Cast Iron.....	27 " "	62 "
Graphite.....	15 " 10 "	61 "
Coke.....	20 to 27 deg.	61 deg. 10 min. to 62 deg.
Manganese.....	0	0
Sulphuret of Antimony.....	0	0
Sulphur.....	0	0

This shows how little capable a quantity current is of overcoming resistance; for even the manganese, which under the intensity current, admitted a deflection of 19° 20', under this, seemed like a perfect insulator even by the very sensitive quantity galvanometer. Tellurium heats readily, though not quite so rapidly as zinc, and it cools a little more slowly. It is therefore a good conductor of both heat and electricity, and it possesses a brilliant metallic lustre. The question arises, therefore, why is it that chemists, especially those of France, have recently ranked it among the *n-n-metallic* substances? Metallic lustre and conducting power have always been looked to as the distinguishing characteristics of metals. Kane says: "By the combination of these characters, lustre and conducting power, the metallic, or non-metallic, nature of a body is always determined." It is true that tellurium is not malleable nor ductile, as are many of the metals; neither are bismuth or antimony—like the non-metallic substances it unites with oxygen to form acid, soda antimony, arsenicum, gold chromium, manganese, and many other metals. With hydrogen it unites, forming a hyduret; so do potassium, arsenicum and antimony. In short, it possesses the universally admitted distinguishing characteristics of metals, and nothing, either in physical character or chemical behavior, which it does not hold in common with these metals. Dr. Feuchtwanger did not believe that the power of conduction, either of heat or electricity, was any evidence that tellurium was a metal. It is certain that Berzelius has placed it low in his scale, as being nearer the electro-negatives than the electro-positive.

GERMAN POLYTECHNIC ASSOCIATION.

HOW TO PREVENT WATER IN CANALS FREEZING—MEANS OF AFFORDING RELIEF TO OUR CROWDED THOROUGHFARES—THE AERIAL RAILWAY—COUPLING MECHANISM.

The German Polytechnic Association held its regular weekly meeting on Friday, May 24th, 1867—the President, W. Hauff, Esq., being chairman.

Mr. Lucius reported, in answer to the question how much steam it takes to keep the water in a canal eighty feet wide and seven feet deep from freezing, that it requires about 600 lbs. of steam, remarking, however, that the cooling of the surface cannot be decided generally, as it depends too much on the weather prevailing at the time. He then discussed the different plans which were proposed last year to facilitate the traffic between the lower and upper parts of the city, as well as between this city and those on the other sides of the North and East rivers. He enumerated the reasons why certain and quick means of traffic are desirable and even necessary. The proposed means of relief were the following:—The bridge connecting New York and Brooklyn, the underground railroad, the Broadway railroad, the Midblock railroad, the elevated railroad, the cars to be propelled by locomotives, the elevated railroad, the cars to be propelled by means of stationary engines and ropes, and the extended horse-car roads. Mr. Lucius pointed out the characteristics of each style, mentioning several reasons why certain systems could not be carried out, and discussed especially the elevated railroad propelled by ropes. This road consists of a single row of columns, which support the rails by means of cross-beams, which latter are firmly secured to the columns. In the centre, between the two rails, is the third rail which receives the rope, and to which at the same time the mechanism for coupling and disengaging the cars is attached. The rails are fourteen feet above the road, and the distance between the columns is twenty feet. The rope employed is not in one piece for the whole length of the track, but consists of several pieces, the ends of which are conducted through the hollow columns into vaults below the street, where they are joined so as to form an endless rope, and where the rope is driven by the engines.

Mr. Hauff remarked that on the 20th of April the legislature allowed the erection of an experimental road of half a mile in length, and that it already has been commenced to be built in Greenwich street. He further discussed several details, also the arrangements at the places of stoppage, which will be made like a gallery extending to the second stories of the adjoining houses, which will be rented for the purpose of transforming them into waiting rooms.

Mr. Gross also gave some details, especially concerning the coupling mechanism. It consists of a number of small trucks, which are connected to the rope at a distance of 300 feet. The trucks are furnished with horns, which take hold of a lever sticking out through the bottom of the cars. In raising the lever the car becomes disengaged, and when dropped again, the horn on the next truck takes the car along. The trucks coil around the drums with the rope, and the lower part of the endless rope runs back below the street.

Correspondence.

[To insure insertion of Correspondence in our columns the full name and address of the writer must be given.]

Steel Manufacture.

NEW YORK, May 26, 1867.

EDITORS JOURNAL OF MINING:

Gentlemen.—A process invented by Charles Macintosh, of Glasgow, in 1825, for making steel, or converting articles made of iron into steel, such as rails, &c., is attracting a considerable amount of public attention. The abstract of the specification of his patent states that iron, malleable or wrought, is converted into steel by placing it in close fire-resisting vessels, such as crucibles or glass-house pots, in a suitable furnace. When the iron in the vessels is at a white heat currents of gases charged with carbon, such as carbonated hydrogen, are introduced into the pots through suitable openings fitted with the necessary tubes and stopcocks. The gas thus brought into contact with the superheated iron will convert it into steel. An eminent authority, Dr. Ure, states that the steel so produced is of excellent quality, but that

the process does not seem to be so economical as the ordinary cementation with charcoal powder.

German versus American Mining Engineers.

NEW YORK, May 29, 1867.

EDITORS JOURNAL OF MINING:

Gentlemen.—In the issue of the AMERICAN JOURNAL OF MINING, dated April 20th, we observe an article entitled "The School of Mines of Columbia College," which describes elaborately the course of study, mode of instruction, &c., of that college. Finally, at the end, we see several remarks about schools of the same character in Germany, principally in Freiberg, and about German engineers. These remarks we find, moderately speaking, unjustified, and quote them here, viz:—"We endeavor to extract only as much from the ore as will pay. The European miners try to get every grain of metal at a cost of labor and time which in this country would be ruinous. Complaints, too, have reached us that at Freiberg—where there are thirty-seven American students—the laboratory and lectures on metallurgy are not as good as might be expected. German engineers have to unlearn much of their theories before they can work satisfactorily here." Far from pretending to criticize an actual excellent school as the School of Mines of Columbia College, we must reject as unbecoming the reproach made to the mining school of Freiberg. The Royal Mining Academy at Freiberg, Saxony, accomplished such excellent scientific achievements since its centennial existence and educated so many excellent engineers, that these facts must speak for themselves and for the far-famed name which is attached to this old mining academy. We believe there is no other mining college in the world where so many representatives of all countries annually come together for the purpose of scientific and practical studies than there, and it is superfluous to add another word in its defence. Another remark we find in this article is that the European miners try to get every grain of metal, at a cost of labor and time which in this country would be ruinous, and that German engineers have to unlearn much of their theories before they can work satisfactorily here. During the last year a great many young German engineers of mining and metallurgy came to this country; the favorable prospect in the new and rising mining business in this country induced them to leave their homes. Unjustly criticising German engineers as to their want of practical knowledge, &c., can not be indifferent to them, more so as it would be to their disadvantage with the American nation, which so much admires practical knowledge. Whoever is well conversant with the direction and management of German mining and metallurgical works knows that the closest calculations, under the most unfavorable circumstances, are required as the first and principal problem of the managing engineer. Further, is a pure ore, or can an intermediate product, obtained by the smelting process, such as slags, of such character that its further preparing, smelting or utilizing is followed by practical and pecuniary advantages or not? The lower wages (the principal momentum in the management of any establishment) in connection with many other more favorable circumstances in Germany make it advisable and profitable to work materials of a very inferior yield, even by very complicated processes, but this can only be done by the aid and knowledge of scientific principles. Now is this perhaps too much theory of the German engineers which your article finds fault with? It is generally known that the American ores, which are metallurgically treated in this country, surpass the German and European ores as well in quality as quantity; this should never be an excuse not to extract the ore completely. By means of scientific theories, and practical and theoretical exertions, even if only a very small pecuniary profit will result, a great many very poor ores can be worked, the practical and theoretical exertion of a German engineer should be credited to him, and not construed into an unjust reproach.

C. A. WINTER, } Mining and Metallur-
W. H. RUTHER, } gical Engineers.

MEETINGS.

Washington G. & S. M. Co., at 52 Broad st., June 2; New York & Rose River M. Co., at 59 Pine st., June 2; N. Y. & Grass Valley M. Co., at 39 Pine st., June 5; Douglas M. Co., at 22 William st., June 5; Lander Hill Tunnel & S. M. Co., at 74 B'way, June 29; McKean Co. Edinborough Coal Co., Lafayette St., June 4; Western Vermont Marble Co., at 191 B'way, June 12; N. Y. & Silver Peak M. Co., at 74 Broadway, June 25; Adams S. M. Co.,

at 108 Wall st., June 20; Garland Petroleum Co., at 17 Maiden Lane; Chestnut Hill Iron Ore Co., at 327 Walnut st., Phila., June 17, 12 m.; New England Copper Co., at 2 Change Ave., Boston, June 3, 1 p. m.

Patent Claims.

Interesting to Miners, Millmen, Metallurgists Oil-Men and Others.

The following claims have recently been issued from the United States Patent Office:

- 64,620.—WELL-BORING AND DRILLING MACHINE.—Chas. W. Atherton, St. Louis, Mo. I claim the attachment of the chain-drum, J, gearing, K, L, and wheel, M, to the walking-beam, substantially as herein described and for the purpose specified.
64,645.—CUPOLA FURNACES.—James Dougherty, Philadelphia, Pa. I claim, 1st, A cupola or blast furnace, the interior of the lower portion of which is composed of the chamber, G, with vertical walls, and above the latter the basin-like chamber, F, contracted at the top, all substantially as specified.
21. The combination with a cupola or blast furnace of a system of tuyers, having openings so arranged as to discharge a blast of greater volume below than above, as set forth.
31. The air-openings, w, arranged in respect to the projection, m, and basin-like chambers, F, as described.
64,709.—SMELTING FURNACE.—James A. Root, East Canaan, Conn., and J. N. Bertram, Sharon, Conn. We claim, 1st, The constructing of the hearth of a smelting-furnace of cut stones, having their inner surfaces rounded so as to form an interior of inverted conical shape, with a solid or single stone, a, extending across the passage, b, substantially in the manner as and for the purpose set forth.
2d, Having the lower parts of the blast-pipes, B, formed of sections, c, arranged to slide one within the other, substantially as and for the purpose specified.
31. The glasses, f, in the pipes, B, in combination with the openings, d, substantially as and for the purpose set forth.
64,737.—ROLLING MILL.—Royal M. Bassett, assignor to himself and Theo. S. Bassett, Derby, Conn. I claim the employment, in combination with the box of the lower roll of the adjusting wedge, L, inclined shaft, K, screw shaft, F, and hand-wheel, S, or its equivalent, the whole to operate as specified for the purpose set forth.
64,834.—QUARTZ MILL.—Samuel C. Bruce, New York City. I claim, 1st, The revolving wheels, C and D, with velocities varying in some regular ratio, so that wheel, D, shall always revolve faster than and in the same direction as wheel, C, as and for the purpose described.
2d, The arrangement of wheels, C and D, revolving in the same direction in separate but communicating cases, A and B, and so constructing said cases and arranging them with reference to said wheels and their shafts that the external air can enter at aperture, E, only in the periphery of the case, A, substantially as and for the purpose described.
64,887.—MODE OF DESULPHURIZING IRON ORE.—John Little, Newburgh, N. Y. I claim, 1st, The mode of desulphurizing iron ore by heating it in a furnace to red-hot temperature and throwing it then in cold water, substantially as set forth.
21. The combination of processes for desulphurizing iron ore and preparing it for direct use in cupolas by heating, cooling in cold water, crushing between rollers, washing, and mixing with fluxes for the reduction, to clean iron in cupolas.
31. The furnace, a, in combination with the movable plates, S, 2, and the heating-gears, M, 32, for moving these plates with the ore, substantially as set forth and shown in the drawing.

Special Scientific Brevities.

The Day gives some account of the scheme which is now before the British Government for taking over the management of the telegraphs, and which only waits until the Return Bill is out of the way. The capital at present involved in telegraphs amounts to nearly £3,000,000, and the Government scheme contemplates an expenditure of £10,000,000, to be devoted to the buying off of the present shareholders and debenture shareholders, and the debenture of a scheme of postal telegraphs in all parts of the kingdom. Among the improvements which have been suggested at the General Post Office are, according to the Day, the opening of numerous sub-offices in postal districts; the lowering of rates to an almost nominal sum, and rendering them uniform; the issue of telegraphic stamps; the provision of efficient staffs; and frequent periodic, as well as express, deliveries, the latter entailing a slight additional cost, although, when the arrivals of telegrams coincide with ordinary deliveries, the time occupied in transmission will be reduced to a minimum.
Puscher, of Nuremberg, describes a cement for fastening brass work upon glass, as in petroleum lamps. It is essentially a resin soap, made by boiling three parts of resin with one part of caustic soda and five parts of water. This is mixed with half its weight of plaster of Paris. Such a cement, it is said, has great adhesive power, is not permeable to petroleum oils, is a bad conductor of heat, and sets firmly in from half to three-quarters of an hour. Zinc white, or precipitated chalk, may be employed instead of plaster of Paris, but with these the hardening is a little delayed. The cement is said to be only superficially attacked by hot water.
An invention has been patented for an improvement in smelting, which consists in the combined arrangement of coking and roasting cells above an ordinary smelting or blast furnace, in such a manner that the materials may be dropped, whilst red hot, into the smelting chamber of the blast furnace, and the waste heat and gases produced in coking the coal be utilized in calcining, roasting, and partially reducing the ore, preparatory to their being passed into the blast furnace.
The government of Queensland has offered a reward of £3,000 to any person or persons who shall, individually or jointly, make discovery of a gold field situate at least twenty miles distant from any gold field already proclaimed within the colony. Such reward will be payable as soon as it shall be shown that the field so discovered has attracted to it, and supported for the space of six months, a population of not less than 2,000 persons.
The natives in the "Camaroons" country, on the west coast of Africa, use an instrument which they call "El-Renbie," upon which they produce a variety of sounds, audible at several miles distance, and arranged so as to form a perfect and distinct language, in which they send their telegrams from point to point. The instrument has been in use from immemorial time.

A very pretty effect is obtained by scattering small fragments of mica on freshly poured sheets of gelatine, and varnishing it with a dark-colored solution of gelatine. Finely ground mica on colored gelatine also shows very pretty effects; and the very finely ground material mixed with a solution of gum arabic may be used for silver ink.
Tehleisen, a chemist of Wurttemberg, has patented a blasting powder which he calls kaloxilin, and which is not exploded by a blow, a shock or friction. The carbonaceous ingredient is cellulose prepared from sawdust of hard non-resinous woods (nine parts), with three parts of charcoal, and forty-five parts nitrate of potash.
A new method for manufacturing gas by introducing petroleum with water to the retorts when charged with coal, has been patented. It is claimed that the cost of the gas is thirty or forty per cent. less than when made with coal only.
A writer in a French scientific paper says that a combination of ammonia with gun-cotton removes the liability of the latter to spontaneous combustion without injuring its explosive qualities.
Father Secchi, S. J., of Rome, mentions that iron, when heated to an intense red heat, is transparent for some distance.
In a report on the geology of Alabama, Professor Tuomey computes that there are 5,230 square miles of coal fields in the State of Alabama alone.

Mineral and other On-dits.

A discovery has recently been made in South Australia of a lode of misbut, samples of the metal being now to be seen at the Melbourne Exchange, to which place it has been sent from the neighboring colony. This metal is very valuable if found in quantity, and it is stated that the lode discovered contains abundance of rich stuff, but being situated about two hundred miles in the interior, some serious difficulties in the cost of carriage have been encountered. Trouble was also experienced in getting the metal smelted, but a quantity of it was sent to England in ingots recently, and it is expected the supply will be kept up.
Specimens of ore from the silver mines at Guilford, Piscataquis county, Maine, have been analyzed by Professor Hayes, and pronounced equal to Colorado ore, the assay giving \$300 to the ton. It is stated that \$30 will pay. A shaft has been sunk 20 feet, and reveals the fact that four of the veins unite, forming a vein of 20 inches in thickness.
Borings are continued the whole length of the railway lines in the kingdom of Poland; these operations, which have already led to the discovery of four seams of coal, have now obtained a still further success, as a fifth seam has just been found at Dombroff, and a sixth in the forest of Stohemeschiton.
The iron mines along the Juniata river, near Mount Union, Pa., are said to contain both gold and silver. An assay proves the ore to contain \$12 80 of gold and eighty cents of silver to the ton of iron.
Parties prospecting for coal in Kansas City, have come upon a vein of hard, bituminous coal, three feet eleven inches thick, at a depth of fifteen feet beneath the surface.
Hodge & Christie, of Detroit, have recently made some monster machinery for the Hecla Copper mine. A bed plate in the lot weighs 33,785 pounds.
The Black Hills are believed to abound in mineral wealth, and a good part of the population of Dakota is going "prospeoting" there this Spring.
Several specimens of quartz from the gold mines of North Carolina, were sent North the other day, and, on analysis, show a product of \$720 a ton.
Immense beds of the best quality of bituminous coal have been discovered in Henston county, Texas, and quantities of canal coal in San Saba county.
In Canada there are seventy-three gold mines, employing 708 miners. The yield of gold for the last three months is valued at \$690,955.
A mine at Bridgewater, Vt., yields 16 ounces of gold, worth \$300, to ten tons of rock. A company is being formed to work it.

All Sorts.

Some very curious speculations have lately been put forward by M. Dufour, concerning the increase in size of the earth. Will it be believed that our globe is increasing in size year by year, owing to the quantity of meteors (falling stars) which are projected into it from the regions of space? M. Dufour has made calculations showing that the earth sustains an annual increase equal to 134,400,400ths of its weight. It appears that nearly two cubic metres of meteoric dust falls upon every acre of the earth's surface in the course of a single year. It is stated that in England this meteoric dust may be found in accumulations nearly a foot deep.
There is being built on the Tye a vessel intended for exploring the sulphur mines in the islands in the Red Sea. She is to be fitted with large water tanks, and when she has landed men on those islands, she will keep them supplied with water from the main land. She is a vessel of three hundred tons, and will be propelled by a screw.
General Grant has ordered that a company of cavalry shall accompany a number of professors from Bloomington, Illinois, on a scientific tour to the western slope of the Rocky Mountains. The expedition will be absent about three months, and will be furnished with transportation and subsistence.
The expansion of the rails of a railroad 500 miles long amounts, in a hot summer's day, to nearly a quarter of a mile, from the point of the extreme contraction in winter.
Nitro-glycerin is cutting the Pacific Railroad tunnel through the summit of the Sierra Nevada at the rate of fifty feet per week.
Not a few seek to accommodate truth to their views and feelings; it is wiser to accommodate our views and feelings to truth.
There are 346 business firms in Pittsburg, employing a capital of \$114,000,000.
Recent emigration swells the population of Texas to 1,200,000.
America now has 90,000 miles of telegraph lines; Europe 60,000; India 3,000.
A Chinese firm in San Francisco wields a capital of over \$2,000,000.
The tunnel through Mont Cenis continues to progress much more rapidly now than the quartz rock has been

passed through and a softer material encountered. The whole distance as yet penetrated is, on the south 4,119 metres, and on the north 2,523 metres; total, 6,642 metres, which, as the entire length is 12,230 metres, leaves yet to be executed 5,575 metres.
About forty quartz mills will be shipped from Chicago to Nebraska this season.

Velocity of Electricity.

This is so great that the most rapid motion that can be produced by art appears to be actual rest when compared with it. A wheel revolving with a rapidity sufficient to render its spokes invisible, when illuminated by a flash of electricity, is seen for an instant with all its spokes distinct, as if it were in a state of absolute repose, because, however rapid the rotation may be, the light has come and already ceased before the wheel has had time to turn through a sensible space. Insects on the wing, when electrically illuminated, appear fixed in the air; and a rapid succession of drops of water, appearing to the unaided eye a continuous stream, is seen under the electric light to be what it really is. Let a circular piece of paste-board be divided into three sections: let one be painted blue, another yellow, and a third red. Cause it to rotate rapidly; it will appear white, because a sunbeam consists of a mixture of these colors, and the rapidity of the motion causes the distinction of colors to be lost to the eye; but, the instant the paste-board is illuminated by the electric spark, it seems to stand still, and each color as distinct as if the disc were at rest. By the application of this principle, Wheatstone contrived an apparatus by which he demonstrated that the light of the electric discharge does not last the one-millionth part of a second of time.
There are, however, great discrepancies in the different measurements which have been recorded of the velocity of electricity, thus:
Walker (America) with telegraph iron wire makes it 1,870 miles per second.
O'Mitchell (America) with telegraph iron wire makes it 28,574 " "
Fizeau and Gonnelle, copper wire, make it 112,680 " "
Fizeau and Gonnelle, iron wire, make it 62,600 " "
Astronomers of Greenwich and Brussels, copper, London and Brussels telegraph, make it 2,700 " "
Astronomers of Greenwich and Edinburgh, copper, London and Edinburgh telegraph make it 7,600 " "
—Colliery Guardian.

Nature of the Sun.

The sun is the intensified centre of our solar system, and may be regarded as a great mass of gaseous matter, so condensed beneath its enormous atmosphere as to have a specific gravity nearly equal to that of water. This condition is not incompatible with a very elevated temperature, for Cagniard de la Tour's experiments afford reason for supposing that at a sufficiently high temperature and pressure, all matter may assume a gaseous form without any great increase of volume. The temperature required to produce this condition for the chemical elements of the sun would produce dissociation or isolation of these elements, such as happens with water, which at a high temperature is decomposed and separated into a mixture of chemically indifferent oxygen and hydrogen gases, which combine by cooling, and form water. In like manner, the cooling by radiation from the sun would produce combination at its surface, giving rise to an intensely luminous mist of oxydized compounds, which would radiate light through an atmosphere holding them in suspension, and so intensely hot as to still contain, in an uncombined gaseous form, many of the chemical elements. In this way is explained the non-polarized condition of the solar light and its peculiar spectral phenomena. The mist of the oxydized particles, falling toward the centre of the sun, again meets a heat of dissociation, so that the process of surface combination is incessantly renewed. The heat of the sun is maintained by the slow shrinking or condensation of its mass—a diminution of which, equal to one-thousandth of its present diameter, as calculated by Helmholtz, being sufficient to maintain its present supply of heat for 21,000 years. This is essentially Faye's theory of the sun.

The East River Bridge.

It is stated that Mr. Roebling, of Trenton, N. J., the bridge builder, and the parties interested in the Brooklyn bridge, which is to terminate at Sands street, Brooklyn, and near Tammany Hall, New York, have decided that no piers in the stream will be necessary, one being placed upon each bank of the river, and the 1800 feet distance between being accomplished by suspension.

IMPROVED SCREW WRENCH.

We illustrate a new patent screw wrench which is rapidly coming into use and displacing the old style of tool. The number of wrenches used in this country is very large, about five thousand, we are told, being consumed daily—a striking illustration of the magnitude of American industrial enterprise—every mechanic, and even farmer, having constant need of one. During the few years which have elapsed since it was first introduced, the patent records show hundreds of new devices and claimed improvements on the screw wrench, yet it is a question whether these have ever been what they purported to be—improvements on the original principle. Much money has been spent on inquiries and experiments without attaining the desired end. There are nevertheless defects in the ordinary screw wrench. It is liable to bend or break at or near the stationary jaw, and the handle ferrule is as liable to give way causing the screw which moves

Fig. 1

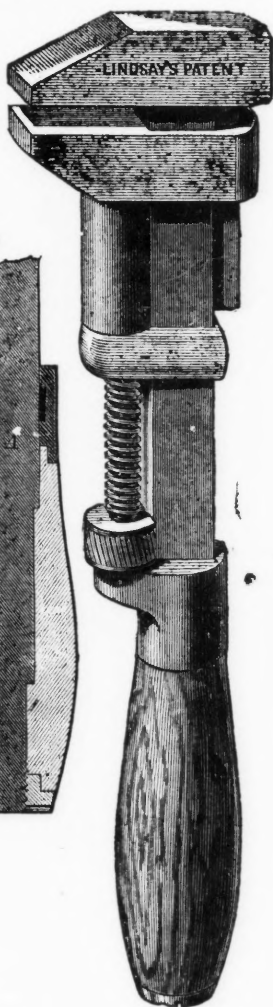
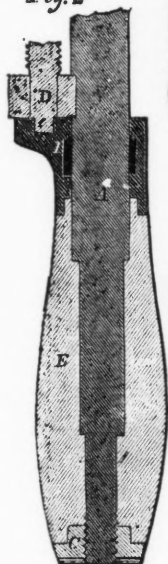


Fig. 2



the adjustable jaw to bend back and break. An examination of our illustration will show how both of these difficulties may be removed. Fig. 1 shows the wrench ready for use, with the rib on the back of the bar, which is forged solid with the bar and stationary head, and effectually obviates all liability to bend or break at that point. Fig. 2 shows the handle and ferrule as constructed; A being the bar; B the ferrule, with its double bearings inside on the bar; C the "handle nut;" D the screw, and E the handle. The only advantages claimed for this tool over the original and the only difference in its construction is in its additional strength without additional weight or change in principle, and in its various parts being made interchangeable, so that any part that may be broken can be readily and easily replaced by the possessor, and the impossibility to bend or break by fair usage, as in all other similar tools. Readers of the JOURNAL OF MINING will from this statement be able to form a fair judgment of the merits of this instrument, and they

will understand how useful it may be to them in the tool shop or in the far West where it is desirable that all tools should be so constructed as not to get easily out of order.

Special Notices.

An Opportunity for Investment in Slate Lands.

In another column will be found, advertised for sale, property in the various slate districts. Our readers will particularly observe that consisting of twenty-one acres near Kregesville, Monroe county, Pa., which the attention of capitalists is called, as being a desirable investment. It appears the quarry is now in working order and has upon it the necessary out-buildings, etc., for its further development, and has also on it a school slate factory. Full particulars are given in the advertisement. We believe the property worthy of the attention of active business men.

Copartnership.

We are requested to state that Frank B. Polley has associated with him Mr. Edward W. Clarkson, and will continue the manufacture of steam engines and machinery, at Nos. 277 and 279, First street, Brooklyn, E. D., under the firm name of Frank B. Polley & Co.

WHAT OTHERS SAY.

(From the *Portage Lake Mining Gazette*, May 2, 1867.)

ENLARGED.—We are gratified to notice that the AMERICAN JOURNAL OF MINING, published by Western & Co., 37 Park Row, New York, has met with such encouraging success, that it has been enlarged to twenty pages, an increase of four pages over the original number. The JOURNAL is edited by gentleman of rare attainments and acknowledged abilities, assisted by a splendid corps of correspondents, including the leading scientists of the day. A prominent and commendatory feature in the conduct of the paper is the evident desire to give the truth in its natural condition, and free from all common-place prejudice. This is a most difficult undertaking in journalism, and one in which the JOURNAL OF MINING is, in our opinion, pre-eminent. Like the *Gazette*, it has no sympathy for swindles or white lies, but deals to them the merited castigation, whenever occasion requires. Terms, \$4 per annum; copies can be obtained at Adams' News Depot.

(From the *Reese River Reveille*, April 25, 1867.)

THE AMERICAN JOURNAL OF MINING.—This excellent and handsome paper was enlarged on the commencement of volume third, March 30th, to twenty pages, making it the largest journal of its class in the United States. It is devoted to the science and practice of mining; is a faithful record of the progress of development and discoveries made, and contains many illustrations of mining machinery. It has not neglected the Reese River world, but has been somewhat incredulous respecting the statements of extraordinary wealth made in the *Reveille*; which, as faithful journalists, we have been compelled so often to publish. The large shipments of bullion from so slightly developed a country will give the MINING JOURNAL the evidence it wants, and we may expect in future full attention to our section.

(From the *Humboldt [Nevada] Register*, April 20, 1867.)

AMERICAN JOURNAL OF MINING.—The third volume of this excellent journal commenced on the 23d ult., with its dimensions increased to twenty pages, making it a large, elegant and comprehensive paper, containing an incalculable amount of information relating to all kinds of minerals and to the progression of mining interests, with a carefully prepared report of the markets in stocks, metals, minerals, etc. It should be in every working-man's home as it abounds in reading for their especial welfare. Subscribe for it at once.

TO GOLD MINING COMPANIES!

The undersigned desires a situation as SUPERINTENDENT of the operations of some Gold Mining Company.

Has had the past Five Years' Experience in Colorado, and is well informed in all the various Processes and Machinery and in the Mining of Ores and the Extraction of Gold.

Is an Experienced and Practical Assayer and Metallurgist.

Apply to or address B. KEITH & CO., No. 41 Liberty street, New York,

Or, N. S. KEITH
Black Hawk, Colorado

To Inventors and Others.

The proprietors of the AMERICAN JOURNAL OF MINING have, connected with their establishment, Artists of experience and skill in

DESIGNING, WOOD-ENGRAVING, and LITHOGRAPHY.

Machinery, Buildings, Landscapes, etc. Designed and Engraved or Lithographed from a photograph or a plain comprehensive sketch, or from the object itself. Specimens of work ready for inspection. Terms moderate.

WANTED.—A Situation as Assistant Superintendent of a Blast Furnace, by a Young Man having practical knowledge of the business, and of the Chemical Analysis of Ores, Slags, and other materials and products of the furnace. Address J. P., Box 416, Schenectady, N. Y.

THE MOUNTAIN KING SILVER MINING COMPANY,

OF ECHO DISTRICT, HUMBOLDT COUNTY, NEVADA.

CAPITAL STOCK, \$600,000.

ISSUED FOR MINING PURPOSES—60,000 SHARES AT \$10 EACH. This Company has a paid in cash capital, amply sufficient to complete the tunnel (of which 200 feet are already accomplished) and develop the mine, together with an additional reserved capital of \$50,000 to the stock of the Company. The tunnel being in rapid process of completion, it is now proposed to convert into cash \$50,000 of this \$150,000 reserved capital, wherewith to erect a twenty-stamp mill, which will be sufficient to reduce twenty tons of ore per day.

OFFICERS.

President.—J. CLEMENTS STOCKER.
Vice-President.—JOHN J. THOMAS.
Secretaries.—FRANK LEWIS.
Superintendent.—WM. S. SARGENT.

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J. CLEMENTS STOCKER.....New York City.
JOHN J. THOMAS.....New York City.
JOHN T. GREEN.....New York City.
E. PAGE DAVIS.....Unionville, Nevada.
Hon. STEPHEN HAYNES.....Brooklyn, N. Y.
Subscription Office of the Company, No 39 PINE STREET, Room No. 4. 3-3 2-28

THE DE LERY GOLD MINING COMPANY.

GENERAL OFFICES:

No. 74 Cedar street, New York; and No. 46 Peter street, Quebec.

THIS COMPANY has purchased all the Mineral Rights on the Seigneurie of Rigaud-Vandrenil, in the Province of Quebec; and, about the first of June, will commence practical operations by making mineralogical surveys, by shafting and tunnelling the quartz ledges, and by testing the quality of the rock, in their Stamp Mill, just completed. The area of the seigneurie is 108 square miles, and the quartz-veins are of unusual width and extent, furnishing a basis for the profitable employment of large amounts of capital in separate organizations; and as far as the company's surveys and tests shall show the best locations for new mills, they will furnish Maps, and propose liberal terms to parties desiring to develop mines on their own account. Contracts are now being made for the working of Placer Mines, which have already been abundantly proven to be of great richness.

Full information can be obtained at other office of the Company, or of the local Agent, Mr. Thomas Corbett, on the property.

J. M. WINCHELL, General Manager.

Quebec, April 26, 1867. 7-41

COAL.

DAY, HUDELL & CO.,

MEN AND SHIPPERS OF

HARLEIGH LEHIGH COAL,

And the Celebrated

HICKORY, BROAD MOUNTAIN, EXCELSIOR, SHAMOKIN AND NEW ENGLAND RED ASH.

OFFICES:

Room 51, TRINITY BUILDING, 111 Broadway, Philadelphia, Boston.
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3-4-px

CRANE & FASSITT,

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ANTHRACITE AND BITUMINOUS COAL.

NEWBURGH—ORBELL AND OTHER SUPERIOR GAS COALS.

OFFICES:

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113 BROADWAY. 1 CENTRAL WHARF
PHILADELPHIA: PROVIDENCE, R. I.:
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WILKESBARRE COAL.

DELIVERED DIRECT FROM THE MINES OF THE

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OR FOR RESHIPMENT AT

Elizabethport and Jersey City

OFFICE—No. 16 WALL STREET, NEW YORK.
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HECKSCHER, BOWNS & CO.,

NO. 111 BROADWAY,

Room 79 (TRINITY BUILDING), NEW YORK.

Offer for sale the following Coals at the lowest market rates: GLENHON COAL COMPANY'S BUCK RIDGE, SHAMOKIN, BLACK DIAMOND VEIN, RED ASH, LOCUST MOUNTAIN, WHITE ASH. Agents for the celebrated "Hartford Co. Coal." vol-2-5-qp

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McNeal, Wilkesbarre and Lehigh Coal,

FOR STEAM AND FAMILY USE.

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Room 75, No. 111 Broadway, (Trinity Building), Broadway, N. Y.

3-3-20 WHITE 1-px LOUI T. SNOW

COAL.
AMERICAN AND FOREIGN, BITUMINOUS AND ANTHRACITE,
 FOR
 MANUFACTORIES, STEAMERS, EXPORT, GAS
 AND
 DOMESTIC PURPOSES.

W. Saward & Co.,
 71 BROADWAY, ROOM 24.
 7-2:30

A. T. STOUT & CO.,
MINERS AND SHIPPERS OF
"FULTON" AND "STOUT" LEHIGH COALS.
FULTON LUMP.
 (Especially adapted for smelting iron.)
 ROOMS 41 & 46 TRINITY BUILDING, NEW YORK.
 A. T. STOUT. S. VAN WICKLE. G. LEE STOUT.
 1:3-15

CALDWELL, GORDON & CO.,
 WHOLESALE DEALERS IN
ANTHRACITE AND BITUMINOUS COAL,
HENRY HEILS CELEBRATED COAL,
 Room 35 Trinity Building,
 NO. 111, BROADWAY, NEW YORK.
 F. CALDWELL, JR. F. A. HALL. N. P. GORDON. S. B. YOUNG.
 BOSTON, Office 144 State St. PHILADELPHIA, 112 Walnut St.
 3:2-3:13

E. A. PACKER & CO., MINERS,
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LEHIGH COAL.
 OFFICE,
 50 TRINITY BUILDING, 111 Broadway,
 271 NEW YORK

HONEY BROOK COAL COMPANY,
 Exclusive Miners and Shippers of the Celebrated
HONEY BROOK LEHIGH COAL,
 No 113 BROADWAY,
 NEW YORK.
 JAS. H. LYLES, Agent.
 Wharves, Port Johnston, N. J.
 Philadelphia Office, 209 Walnut street.
 3:6-px **J. B. McCREARY, President.**

WILLIAM I. PARVIN,
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Lehigh, Schuylkill, Locust Mountain,
LOBERRY, LEWIS & SPOHN VEIN RED ASH.
 The celebrated Locust Gap Free Burning Coal.
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LEHIGH, LOCUST MOUNTAIN, SHAMOKIN, RED
ASH, LOBERRY and SCRANTON COALS.
 ROOM 21 TRINITY BUILDING, 111 BROADWAY, NEW YORK.
 1:3-15

REPPLIER, FREEMAN & CO.,
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REPPLIER'S LOCUST MOUNTAIN, DUNCAN
RED ASH, AND
CUMBERLAND COALS.
 WHARF, NORTH EIGHTH STREET, WILLIAMSBURG.
 Office, 111 Broadway, New York.
 1:3-15

WELD & NAGLE,
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AND SCRANTON COAL.
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SAMUEL BONNELL, JR.,
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 Delivered on board vessels at Piers Nos. 4, 8 & 9.
ELIZABETHPORT, N. J.
 Office, 43 & 45 Trinity Building, 111 Broadway N. Y.
 1:3-15

C. E. DETMOLD,
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 OF
Spring Mountain and Honey Brook Lehigh Coals.
 ALSO,
GEORGE'S CREEK COALS.
 ROOMS 40 & 42 TRINITY BUILDING, 111 BROADWAY, N. Y.
 1:3-15

HAMMETT & NEILL,
Miners and Shippers,
 Have for sale the following
CELEBRATED COAL:
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 OLD COMPANY'S "
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 Office, Trinity Building, 111 Broadway, N. Y.
 1:3-15 **H. W. SAFFORD, Agent.**

ENGLISH COAL AND CANNEL.
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PROVINCIAL COAL,
ANTHRACITE COAL,
 For Sale in Lots to suit.
H. L. PARMELE & BRO.,
 AGENCY OF GEORGE WRIGHT & CO., LIVERPOOL,
 3:1-15 No. 32 PINE STREET, NEW YORK

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 SUCCESSORS TO DANIEL PACKER AND CO.,
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ANTHRACITE AND BITUMINOUS COAL,
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NEW YORK.
 PHILADELPHIA, 203 Walnut Street. BOSTON, 29 Kilby Street
 3:2-3:13

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SOLE AGENTS
 OF THE ORIGINAL
SPRING MOUNTAIN LEHIGH COAL,
 Extensively Used for Smelting Iron.
 Rooms 23 & 30 TRINITY BUILDING, N. Y.
 3:2-3:13-15

50TH AUCTION SALE.
80,000 Tons Scranton Coal,
 On WEDNESDAY, May 29, 1897.

New York, May 1897.
 THE DELAWARE, LACKAWANNA AND WESTERN RAILROAD
 COMPANY will sell by Messrs. JOHN H. BRADY & CO., Auc-
 tioneers, at the Company's Sales Room, No. 26 Exchange Place,
 corner of William street, New York, on Wednesday, May 29th
 inst., at 12 o'clock noon,
80,000 TONS FRESH MINED COAL,
 FROM THE LACKAWANNA REGION, of the usual sizes, deliver-
 able at their Depot, Elizabethport, N. J., during the month of
 June, 1897.
 Also, at the same time and place, 5,000 Tons, deliverable at
 Washington, N. J., for Newark, Paterson, and other places on the
 line of the Morris Canal.
 The rates of transportation from Washington will be made
 known at the time of sale.
 TERMS: Fifty cents per ton, payable in current funds, on the
 day of sale, and the balance within ten days thereafter, at the
 Office of the Company.
 9-11 JOHN BRISBIN, President.

MESSRS. WILLIAM MULLANY AND GEO
W. ESSER, of the firm of Jno. White, Wholesale Coal Dealer
 No. 8 Wall street, New York City, and Mauch Chunk, Pa., retire
 from said firm to-day by mutual agreement.
 The business of the firm will be settled by Jno. White, at No. 8
 Wall street, New York City.

JOHN WHITE,
WILLIAM MULLANY,
GEO. W. ESSER.
 The undersigned beg leave to announce that they have this day
 formed a copartnership under the style of JOHN WHITE & CO.,
 for the purpose of conducting a General Wholesale Coal Business,
 at No. 8 Wall street.
JOHN WHITE,
LOUIS T. SNOW,
 Late Treas. McNeal Coal & Iron Co.
 New York, March 1st 1897. 25-2-px

BANKERS.
DUNCAN, SHERMAN & CO.,
BANKERS,
 CORNER PINE AND NASSAU STREETS,
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ISSUE
CIRCULAR NOTES & LETTERS OF CREDIT
FOR TRAVELLERS,
 AVAILABLE IN ALL THE PRINCIPAL CITIES OF
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MERCANTILE CREDITS
 For Use in Europe, China, etc. Also Make
Transfers of Money to California & Oregon,
 by Telegraph.
 2:2-15 INTEREST ALLOWED ON DEPOSITS

FISK & HATCH,
BANKERS,
 And Dealers in
GOVERNMENT AND OTHER DESIRABLE
SECURITIES,
 No. 5 NASSAU STREET, N. Y.,
 Recommend to Investors, the

FIRST MORTGAGE BONDS
 OF THE
CENTRAL
PACIFIC RAILROAD COMPANY.
 This Company is constructing under the patronage of the
UNITED STATES GOVERNMENT
 the Western end of the
Great National Railway across the
Continent.

Their line will extend from Sacramento, California, across the
 Sierra Nevada to the
 RICHEST AND MOST FERTILE SECTION OF CALIFORNIA,
 and thence through the

GREAT MINING REGIONS OF THE TER-
RITORIES,
 To the vicinity of Salt Lake City. It forms the

SOLE WESTERN LINK
 of the only route to the Pacific which is adopted by Congress
 and
AIDED BY THE ISSUE OF UNITED STATES BONDS.
 Their road is already completed, equipped and running for
 ninety-four miles from Sacramento to within twelve miles of the
 summit of the Sierras, and a large amount of the work of grading,
 tunnelling, etc., beyond that point has been accomplished.

THE FIRST MORTGAGE BONDS.
 of this Company afford unusual inducements of safety and profit
 to investors. For the following among other reasons, viz:
First—The rate of interest is Six Per Cent. in Gold, payable semi-
 annually in the City of New York.
Second—The principal is payable in Gold at maturity.
Third—The cost of the Bonds, Ninety-five per cent. and accrued
 interest is Ten per cent. less than that of the cheapest Six
 per cent. Gold Bearing Bonds of the Government.

Fourth—The United States Government provides nearly half the
 amount necessary to build the entire road, and looks mainly
 to a small per centage on the future traffic for re-payment.
Fifth—Owing to this liberal provision, accompanied with exten-
 sive grants of public lands, by which the Government fosters
 this great national enterprise, its success is rendered certain,
 and its financial stability is altogether independent of the
 contingencies which attend ordinary Railroad enterprises.

Sixth—The security of its First Mortgage Bonds is therefore am-
 ple, and the character for safety and reliability is equalled
 only by that of the Government itself.
Seventh—The net earnings of the completed portion are already
 largely in excess of the interest obligations which the Com-
 pany will incur on twice the distance, and are steadily in-
 creasing, rendering the uninterrupted payment of the interest
 absolutely certain.

Eighth—At the present rate of Gold they pay nearly 8 1/2 per cent.
 per annum on the amount invested.
 The Bonds are issued in denominations of \$1,000 with semi-
 annual Gold Coupons attached, payable in New York, and are of-
 fered for the present at 95 per cent. and accrued interest (in cur-
 rency) from January 1.

Orders may be forwarded to us direct, or through the principal
 Banks and Bankers in all parts of the country.
 Remittances may be made in drafts on New York, or in Legal
 Tender Notes, National Bank Notes, or other funds current in this
 city, and the Bonds will be forwarded to any address by Express,
 free of charge. Inquiries for further particulars by mail or other-
 wise will receive punctual attention.

FISK & HATCH,
BANKERS AND DEALERS
 IN
GOVERNMENT SECURITIES,
 No. 5 NASSAU STREET, NEW YORK.

N. B.—All kinds of Government Securities received at the full
 market prices in exchange for the above Bonds. Also,

All Descriptions of Government Securities
 KEPT CONSTANTLY ON HAND,
 And Bought, Sold, or Exchanged,
 Gold Coin and U. S. Coupons bought, sold and collected.
 DEPOSITS RECEIVED ON LIBERAL TERMS, SUBJECT TO CHECK
 AT SIGHT.

COLLECTIONS MADE THROUGHOUT THE COUNTRY.
 Miscellaneous Stocks and Bonds bought and sold at the Stock
 Exchange on commission for cash.
 Special attention given to the Exchange of
SEVEN-THIRTY NOTES
 of all the series for the new
FIVE-TWENTY BONDS OF 1865.

ON THE MOST FAVORABLE TERMS!
 6:30

SLATE.

JOHN GALT,
Wholesale Dealer in Roofing Slate.
 Sole Agent for the
EAGLE SLATE COMPANY OF VERMONT,
 Who produce
PURPLE, GREEN AND RED ROOFING SLATE.
 Sole Agent for New York and the West for the
CHAPMAN SLATE COMPANY OF PENNSYLVANIA,
 Who produce a Superior Black or Dark Blue Slate; also Sole
 Agent for New York and the West for the
LEHIGH SLATE COMPANY OF PENNSYLVANIA.
 General Depot,
Cor. Tenth Avenue and Twelfth Street,
NEW YORK CITY
 Established in 1850.

BRANCH DEPOTS:

Buffalo: W. J. Roberts, Terrace Square.
 Chicago: James Parker, corner Franklin and Washington streets
 Charleston, S. C.: C. J. Demorest, East Bay, near Wentworth
 Street.
 New Orleans: J. J. Lee, 368 Mag. 2nd street.
 I am prepared to give parties the price of slate delivered
 throughout the United States at the nearest Railroad Station.
 Orders by mail will receive prompt attention. 17:2 km.

ATTENTION, TINNERS, SLATERS, QUAR-
RYMEN, ARCHITECTS AND DEALERS.
STAFFORD'S SLATE TABLES,
 With Practical Instructions to those unacquainted with
SLATE ROOFING.
 Exhibiting over Thirty Sizes Roofing Slates; showing the surface,
 in Squares and Feet, covered by any given number of slate, from
 one to twenty thousand. Likewise, several Tables showing the
 Number of Squares and Feet in any given quantity of Tin Plate
 also. Several Useful Tables to Builders, Slaters and others.
 JUST PUBLISHED BY

COOK, OVERFIELD & SNEDKER,
 35 Jay st., New York, and 405 Commerce st., Philadelphia.
 PRICE THREE DOLLARS.
 Sent by mail, postage pre-paid, on receipt of \$3. 25:24f

FOR SALE.

A VALUABLE SLATE PROPERTY FOR
SALE—WILL BE SOLD AT PUBLIC SALE, on Wednesday,
 the 12th day of June, 1867, at the Public House of Samuel J. Ber-
 ger, Lehigh Gap Depot, L. V. R. R., Penn., at (1) o'clock, P. M.
 the following described Property:
 A tract of Land containing about 21 Acres, on which is one of
 the most valuable SLATE QUARRIES now in operation. The ma-
 terial is particularly adapted for Slates, Mantles, and Bil-
 board Tables, and is the most extensive deposit of this class of
 Slate that has yet been developed in this country. The improve-
 ments thereon are: First,

A SCHOOL SLATE FACTORY
 60x20 with all the necessary Out-Buildings and Machinery for
 manufacturing, now in operation and in good order, which is run
 by a never-failing water power, and capable of producing 3,000
 cases of slates annually.

Second, A Frame dwelling and Store House, 24x46, with
 Kitchen and W.C. attached. The store sales amount to
 \$10,000 annually.

Adjoining the Factory is a first-class site for a TANNERY, with
 sufficient water-power to do a large business.
 The above described property is situated near Kresgeville,
 Monroe County, Penn., and is ten miles from Railroad. This sub-
 jects the Slate manufacturer here to 15 cents per case cartage, in
 excess of the cartage paid by the manufacturers on the Lehigh.

The advantages of this Property are: 1st. The body of Slate is
 inexhaustible. 2d. Slate can be quarried here and split at the
 Factory door for one-half the price paid for them on the Lehigh.
 3d. The lumber used for Frames and for boxing the slates, costs
 25% per cent. less than other manufacturers have to pay. This
 arises from the proximity of the works to the Lumber country.

This is a rare chance for capitalists and active business men to
 purchase a valuable property. One-fifth of said property was
 sold in 1863 for \$12,000, before the improvements were erected.

Persons desirous of purchasing, are solicited to visit the Works
 before the day of Sale, and examine for themselves. Every
 courtesy will be extended and information given by L. E. WILLS,
 the present Superintendent.

Terms and conditions made known on the day of Sale by
 H. W. HARPER,
 L. E. WILLS,
 ALLEN CRAIG.

Administrators of Trusts, Craig, Deceased.
 Post Office address: H. W. HARPER, Lehigh Gap, Pa.
 ALLEN CRAIG, March Clunk, "
 L. E. WILLS, Kresgeville. 9:31

FOR SALE—VALUABLE PEAT LAND.

3 1-2 Miles from New York City.

The advertiser has for sale Fourteen Acres of Peat Land, which
 has been tried to a depth of 30 feet, with favorable results. For
 any one who has the necessary capital for its development, this
 property will prove of great value.

Address

ROBERT E. HULL,

68 Vesey street, New York City.

Call between 8 and 10 A. M. and 3 and 5 P. M. 10:3:3ps

SLATE QUARRIES FOR SALE.

For Sale, at Twenty-five Thousand Dollars, Two Tracts of Slate
 Land, in Heidelberg Township, Lehigh County, Penn., four miles
 from the Railway Depot at Slatington, containing Fourteen Acres,
 more or less, with Three Profitable Quarries, now at work, and
 capable of producing Six Thousand Dollars profit per annum, with
 an indefinite power of expansion. Terms, Ten Thousand Dollars
 cash, the residue on installment, or in trade, at the option of
 buyers. Several Thousand Dollars have been expended in bring-
 ing these quarries to their present state of development. The
 Slate of these quarries is the same as that of the best quarries in
 this region, being located on the same vein. The Company has
 prepared for filing the necessary papers for their incorporation
 under the name above mentioned, and will record them or not, as
 buyers may prefer.

Parties in Lehigh county, near the quarries, will unite in this
 purchase to the extent of one-quarter interest, if permitted.
 A conveyance will be in waiting to drive to the quarries, if par-
 ties (3 days in advance) address

Hon. SAM. J. KISTLER,

Slatington, Lehigh Co., Pa.
 A diagram of the property may be seen at the office of the
 JOURNAL OF MINING, 37 Park Row. 16:v24f

MILLS AND FURNACE RIGHTS.

THE Processes and Machinery invented by Messrs.
J. D. Whiepley and J. J. Storer, for the
WORKING OF ORES OF COPPER, GOLD, ZINC, &c.,
 having been perfected, the undersigned is prepared to sell State,
 Territorial or Single Furnace Rights, and to furnish plans for the
 erection of METALLURGICAL WORKS.

Having acquired the exclusive right to manufacture the
 Whiepley & Storer Breakers and Pulverizers, for all purposes
 excepting for the manufacture of Fertilizers, he is ready to fur-
 nish machines of any capacity, embracing their latest improve-
 ments, for Pulverizing Ores, Plaster, Drugs, Paint and Dye
 Stuffs, Spices, Wheat and Corn.

Small Pulverizers, that may be worked with a treadle or by
 hand, and designed for the light work of the Chemist and Apothecary,
 made to order.
 Pamphlets, with plates descriptive of machinery and processes,
 will be sent to correspondents if desired.

JACOB J. STORER,
 105 State street, Boston.

FOR SALE, A VALUABLE SLATE PROPERTY,
 situated on the famous

PEACH BOTTOM SLATE RIDGE, York Co., Pa.
 This property possesses unusual advantages for mining this
 celebrated quality of slate, now in such great demand, at prices
 beyond all other slate in the market. Parties desiring an unusu-
 ally favorable investment, can obtain full particulars by address-
 ing
 F. A. LUCKENBACH,
 108 South 4th street, Philadelphia.

SILVER MINE, 500 feet on Gold Hill, Southern
 extension of the famous COMSTOCK LORE, near the Crown
 Point—Yellow Jacket—and other well-known mines.
 Apply to, or address,
E. G. SHEPPARD,
 2 Bowling Green, New York. 7:11

P. O. Box. 4083.

MADOC GOLD REGIONS.
12,153 ACRES OF LAND FOR SALE
 in the Madoc Gold Regions of Canada West.
 Apply to the Proprietor,
T. D. LEDYARD,
 74 Yonge street, Toronto. 4:4p

MISCELLANEOUS.

PLAYER'S PATENT HOT BLAST STOVES

AND

BLAST FURNACE IMPROVEMENTS.

ALSO

Player's Plans, Specifications and Detail Working
 Drawings,

To re-model and build Furnaces with or without superintendence.

JAMES HENDERSON, Agent,
 10:3:1y 215 Fulton street, New York.

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ATTORNEY AND COUNSELLOR AT LAW,
18 Merchants' Exchange,
 SAN FRANCISCO, CAL.

Has been practicing Law in California since 1849. He will give
 special attention to applications for United States Patents for Mi-
 ning Lodes, under the act of Congress of the 26th of July, 1866,
 before the local officers of the respective Land Districts in the
 State, and is prepared to give opinion upon all legal questions re-
 lating to the Mining Laws of the States, and upon the Mining Ordi-
 nances of Mexico and Spain.

He refers to the Hon. Stephen J. Field, Associate Justice of the
 Supreme Court of the United States.
 Jan. 1, 1867. 18:12:4p

GROVESTEEN & CO.,

PIANO-FORTE MANUFACTURERS,
 499 BROADWAY, NEW YORK.

These Pianos received the Highest Reward of Merit at the
 World's Fair, over the best makers from London, Paris, Germany,
 the cities of New York, Philadelphia, Baltimore and Boston; also,
 the GOLD MEDAL at the American Institute, for FIVE SUCCESS-
 SIVE YEARS! Our Pianos contain the French Grand Action,
 Harp-Pedal, Overstrung Bass, Full Iron Frame, and all Modern
 Improvements. Every Instrument WARRANTED FIVE YEARS.
 Made under the supervision of Mr. J. H. GROVESTEEN, who has
 a practical experience of over thirty-five years, and is the maker
 of over eleven thousand pianofortes. Our facilities for manufac-
 turing enable us to sell these instruments from \$100 to \$200
 cheaper than any first-class piano-forte. 19:4p

EMPIRE SEWING MACHINE CO.

Principal Office, 616 Broadway, N. Y.

GREAT IMPROVEMENT
 in Sewing Machines. Empire Shuttle, Crank Motion Sewing Ma-
 chines. It is thus rendered noiseless in action. Its motion
 being all positive, it is not liable to get out of order.

IT IS THE BEST FAMILY MACHINE.
 Notice is called to our NEW and IMPROVED Manufacturing Ma-
 chine for wanted, to whom a liberal discount will be given. No
 consignments made.

EMPIRE SEWING MACHINE CO.,
 616 Broadway, N. Y. 6 qp

FIRE! FIRE! FIRE!
EXTINGUISHER!

Portable Self-acting Fire Engine.
 Puts out Fires Instantly.
 No Building safe without them. Send for Cir-
 cular.

LEVY BROS.,
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 Letter-Heads, Show-Bills, Cards,
 Circulars, etc. etc.

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WESTERN & COMPANY,
 No. 37 Park Row, and 145 Nassau St., New York City.
 P. O. Box 6,990

IMPORTANT TO BANKERS AND MERCHANTS.

This Company offer for the consideration of Bankers, Merchants
 and those desiring the best burglar-proof security, the following
 certificates:

OFFICE OF THE NOVELTY IRON WORKS,
 NEW YORK, Dec. 18, 1866.

MESSRS. LEWIS LILLIE & SON:
 Gentlemen: We have subjected the sample of double-chilled
 iron you furnished us to the most severe tests (as regards drilling
 through it) we could bring to bear upon it, and without success.
 It is our opinion that it can only be penetrated by the use of
 a large number of drills, and the expenditure of much power with
 days of time, and we think it impossible for a burglar with his
 time and power to penetrate it at all. Yours truly,
 ISAAC V. HOLMES, Supt.
 LYMAN C. HALL, Foreman.

HINKERY AND WILLIAMS WORKS,
 BOSTON, Mass., Jan. 22, 1867.

We have made an attempt to drill a sample of double-chilled
 iron furnished us by Messrs. Lillie & Son, and failed to penetrate
 it more than five-eighths of an inch, after hours of labor, and feel
 that we can endorse the Novelty Iron Works' certificate in all
 particulars. JARVIS WILLIAMS, Treasurer.

PHILADELPHIA, Pa., Feb. 25, 1867

MESSRS. LEWIS LILLIE & SON:
 Gentlemen: We have tried a sample of double-chilled iron sim-
 ilar to that sent to the Novelty Iron Works, New York, and our
 experience with it is about the same, viz: that it can only be
 penetrated by a long continued operation of the most skillful me-
 chanics and the best tools. Very truly,
 W. H. BRIGHTELL,
 W. H. STRAHAN.

Foremen in Messrs. Merrick & Son's Southworth Foundry, Phila-
 delphia, Pa.

OFFICE UNION FOUNDRY WORKS,
 CHICAGO, Ill., March 13, 1867.

MESSRS. MURRAY & WINNE, Agents Lillie Safe and Iron Company:
 Gentlemen: We subjected the sample of new combination of
 metals for safes sent us by you to as thorough tests of the drill as
 we could, and failed to penetrate the metal at all. We think it
 would be impossible for burglars to enter the safes made of this
 metal by means of the drill, during the longest time in ordinary
 business they could have access to them—in fact, that the metal
 is proof against the drill. Truly yours,
 N. S. BORTON & Co.

OFFICE OF THE NORTHWESTERN MANUFACTURING CO.,
 CHICAGO, March 11, 1867.

MESSRS. MURRAY & WINNE, Agents Lillie Safe and Iron Company:
 Gentlemen: We subjected the sample you furnished us of a
 new combination of metals (to be used in the manufacture of Lil-
 lie's Safes) to the severest tests of our Power Drill, and with the
 best tempered drills our skill and experience could produce.

After operating upon it with different drills several hours with-
 out penetrating it more than half an inch, and at that point un-
 able to make further progress, we became satisfied that it not ut-
 terly impenetrable, it would at least require days of time, a large
 number of drills and machine power to penetrate through it, and
 that it was entirely out of the power of even the most skillful
 burglar to penetrate a safe made of this material.
 R. T. CRASE, President.

LILLIE'S

DOUBLE CHILLED AND WROUGHT IRON

FIRE AND BURGLAR PROOF

SAFES.

A full assortment of these unequalled Burglar Proof Safes con-
 stantly on hand at our Warerooms. Also Sales of every descrip-
 tion, designed for both Fire and Burglar-Proof Security. The
 public are invited to call and examine for themselves as to the
 merits of our Safes.

LILLIE'S

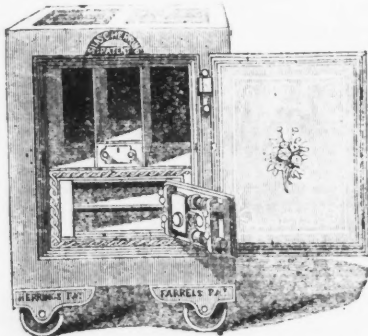
Safe and Iron Company,

LEWIS LILLIE, President.

10:3:6m 195 3rd avenue, New York.

MISCELLANEOUS.

HERRING'S PATENT CHAMPION SAFES.



251 Broadway, corner of Murray street, NEW YORK.

More than 30,000 Herring's Safes have been sold and are now in actual use and over 500 have passed triumphantly through accidental fires without a single loss. The recent great conflagrations in Portland, Me., New York, Richmond, Va., and many other places, have again sustained the long established reputation of Herring's Patent Champion Safe as the

Most Reliable Security from Fire now known. HERRING, FARRELL & SHERMAN, 251 Broadway, New York.

FARRELL, HERRING & Co., PHILADELPHIA. HERRING & Co., CHICAGO.

ARION PIANOFORTE.—PATENTED.

Pre-eminently the best Piano ever constructed, unrivalled for tone, durability and elegance of finish. The Brooklyn Daily Times says: "It has in a higher degree than any Piano that we have met with, the singing quality or character that musicians so much admire and seek for in a Piano; the bass notes reminding you of the deep-toned notes of a large organ. The middle octaves are more elastic and clear than in most other Pianos, while the upper or treble notes possess that pure, distinct, bell-like clearness that is so necessary to the correct rendering of difficult pieces of music, and that also lends such a charm to melody." Professor J. M. Abbott, organist of the Church of Our Saviour, in Brooklyn, says: "For elasticity of touch, for the singing quality so much sought for by artists, and for richness and purity of tone, it is unequalled by any Piano I have ever used." Professor John W. Henry Canoll, editor of the American Educational Monthly, says: "Listen, however, to one of another class, for example, one of the Arion Pianos, made by Manner & Co.; bow your head as the bass sends forth its riches, clear and unblurred; observe the singing, swelling melody that in its middle octaves so wonderfully represents vocal expression, and which predominate above even the silvery brilliancy of the upper treble; then reflect that this is a scientifically constructed and durable instrument." * * *

Is for sale at the Manufactory and Warehouses, 187 and 189 Bowery, second door above Delancey street.

MANNER & CO. N. B.—We have a number of Second Hand Pianos to sell rent. 12-42

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Combination Bank Lock.

Alum and Dry Plaster Filling never corrodes the iron or mold the Books and Papers.

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Only Safes Filled with this Composition

Please send for an Illustrated Catalogue.

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10-2-30

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WM. JAS ROGGS, Secretary. D. P. RHOADES, Pres. For Agencies and Circulars apply as above. 1-26xu



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PUBLISHED WEEKLY AT GOLDEN CITY, COLORADO.

George West, Editor and Proprietor.

The Transcript is devoted to a dissemination of knowledge of the Resources of the mining States and Territories, and Development of the Mineral and Agricultural Wealth of the Territory in which it found its birthplace. It is the aim of the publisher to make it an authoritative medium upon these subjects. To this end it is hoped that the TRANSCRIPT will be enabled to fill a void long felt in Colorado—that of

A COLORADO PAPER,

devoted to her material interest, instead of filling its space with that which we regard as a species of foreign politics. Its subscription list is rapidly extending, making it a most desirable advertising medium, circulating as it does among all classes of readers. The office is well supplied with Book and Job Material, Presses, etc., enabling us to do work expeditiously, and in as good style as can be done in the West. Orders for the paper, for advertising and for Job Work respectfully solicited.

GEO. WEST,

Editor and Publisher.

Golden City, Colorado.

8-4t

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D. W. TILTON & CO., PUBLISHERS AND PROPRIETORS, VIRGINIA CITY, MONTANA TER.

A first class, eight page Journal, devoted to the Mineral, Agricultural and Commercial interests of Montana, now in the third year of its publication, and having a circulation in excess of all other papers in the Territory combined. It is the best advertising medium for Mechanists and Merchants interested in the trade of Montana. Having reliable traveling and local correspondents in all the mining camps, it is a mirror producing each week a reflex of mining affairs in one of the most promising gold and silver producing regions on the continent, and is invaluable to capitalists and companies interested in the Territory.

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" " six months, 5 00 "

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A popular work on Colorado, the aim of which is to give all the information possible about that interesting country.

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Describes the physical peculiarities of the country, its climate and capacity,

Its resources and productions, Especially mining;

Statistical with regard to the present condition of the mines, The nature of the vein-stones,

Methods of treatment,

Names of mining companies, &c., &c.

450 pages, duodecimo, with a large and well defined Map of the Territory. Cloth, \$2.

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SAMUEL BOWLES & CO., Publishers, Springfield, Mass.

For sale in New York by American News Co., and in Boston by Lee & Shepard, 9-3t

American Journal of Mining,

For 1867.

IMPROVED AND ENLARGED.

Of the numerous sources of wealth which this country possesses, none are more important, either in richness or extent, than her minerals. These have added largely to her prosperity, and afford a profitable means of investment for capital, and an extensive field for labor. THE AMERICAN JOURNAL OF MINING is acknowledged by the public and the press to be a faithful and accurate exponent of the important interests dependant on Mining, and to more fully meet the demands of circulating valuable and reliable information, it has recently been increased in size to twenty pages, thus making it the largest paper devoted to mining on this continent.

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A Summary of Mining News, collected from all parts of the continent, and classified geographically and mineralogically.

Original Editorials, devoted to a review of the legislation affecting mining, to a denunciation of fraudulent speculation, to an advocacy of such measures as will advance the interests of miners or will increase public confidence in legitimate mining, and to a consideration of all other matters of value to those interested in mines.

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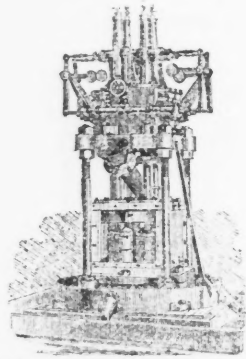
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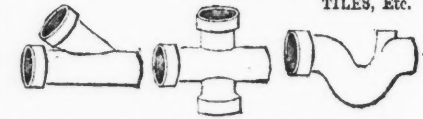
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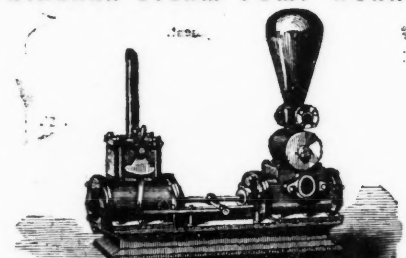
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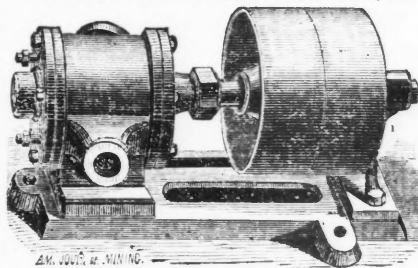
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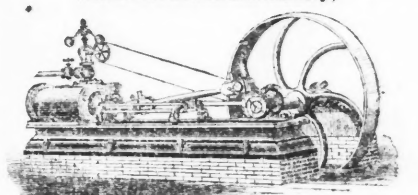
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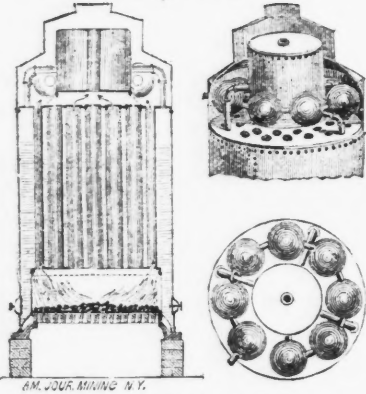
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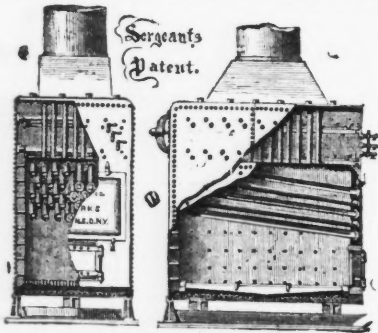
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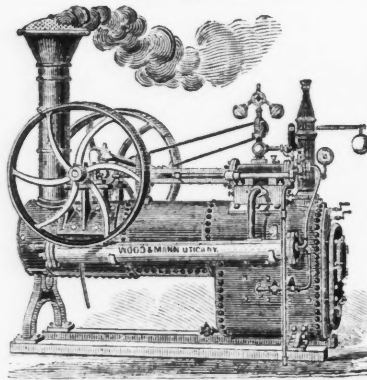
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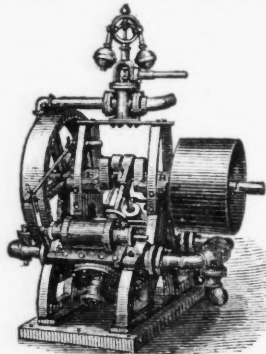
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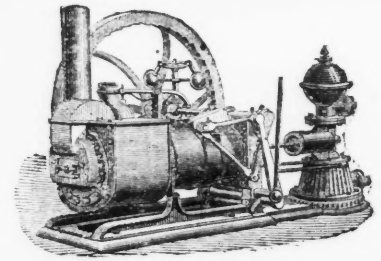
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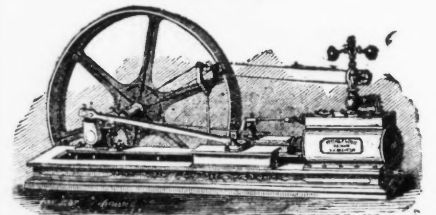
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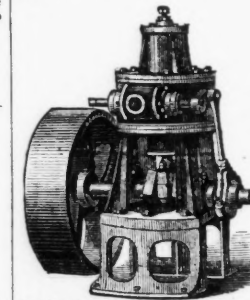
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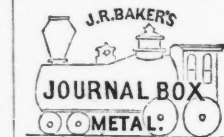


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