engine room. I then gave orders to stop the experiments, and have the fires hauled and fire hose attached; but before the orders could be executed, the front part of the engine was enveloped in a sheet of flame. This occurred during broad day light; no lamps were used about the engine, and the boilers were in another room. Will some one inform me to what to attribute this fire if not to superheated steam?

A. F. NAGLE.

Mechanical Engineer, Providence Water Works.

REMARKS BY THE EDITOR.—This fire was probably occasioned by the presence of oil in the jacket or in the wood covering, or both, the increased heat being sufficient to excite the combustion. It is well known that oil and wood, oil and cotton rags, oil and various other materials will, under certain conditions, spontaneously ignite without being aided by artificial heat. But under other conditions they require to be assisted by a certain degree of exterior heat before they inflame. Such probably was the case in the present example. All engineers understand the importance of guarding well against fires from oily wiping rags or cotton. Care should also be taken to prevent access of oil to the jackets and wooden coverings of steam cylinders, pipes and boilers.

Although in most cases of spontaneous combustion in mechanical establishments, it will be found that oily matters were present and were the inducing cause, still it is well to remember that there are conditions in which substances will spontaneously inflame without the presence of oil. For example, charcoal may be so prepared, its water so completely expelled by heat, and its particles rendered so finely porous that it will absorb oxygen from the air so rapidly as to ignite spontaneously, with but very little assistance from exterior heat. Clean cotton, when sufficiently dried and its fibers placed in a favorable position, may if gently heated be made to inflame spontaneously. There have been well authenticated instances of spontaneous fires in cotton factories where clean cotton had been allowed to remain in proximity to steam pipes. As one example of this kind, we might refer to a fire which broke out in the picker room of the Utica Steam Cotton Company, Utica, N. Y., in January, 1872. There are various kinds of inflammable materials which, if they are arranged so as to furnish the proper conditions of porosity and temperature, will spontaneously ignite.

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

For the items of meteorological information, for those of auroras, and for some of the computations in the following notes, I am indebted to students.

The places of the planets and the times of rising and setting are given approximately, the aim being to furnish to every-day readers such information as will enable them to recognize the principal planets. M. M.

Position of Planets for February, 1873.

Mercury.

Mercury is very near the sun throughout the month. It souths at 41 minutes before noon on the 1st, and at 38 minutes after noon on the 28th. It rises on the 1st at 6h. 40m. A. M. and sets a little before 4 P. M.; on the 28th it rises about 7 A. M. and sets at 6h. 15m. P. M.

Venus.

On the 1st, Venus rises a few minutes after 9 in the morning and sets a few minutes after 9 in the evening. On the 28th, she rises about a quarter after 8 in the morning and sets a quarter before 10 in the evening.

At this time (January 20) Venus as seen through the telescope has the appearance of the moon at first quarter, or half moon.

Mars.

Mars is increasing in apparent diameter. He is near the star λ *Virginis* on the 1st, being a little above it when on the meridian. It passes below this star, and, on the last of the month, souths nearly at the same time with α *Libræ*, but is above that star in altitude.

On the 1st it rises at midnight, souths 21 minutes after 5 in the morning and sets 20 minutes before eleven. On the 28th it rises at 10h. 58m. P. M., and sets at 9h. 16m. A. M.

Jupiter.

Jupiter rises on the 1st at 6h. 24m. P. M., and sets at 8 A. M. He rises on the 28th at 4h. 20m. P. M., and set sat 6h. 6m. A. M.

On January 19, the bands which cross the equatorial portion of Jupiter's disk were seen to be flecked by dark and light spots, brown and white, while a rosy tinge colored the belted region. The dark spots can be seen with telescopes of small power; the white spaces are seen only by the use of a good telescope.

Saturn.

February 1, Saturn rises at 6h. 20m. A. M., and sets at 3h. 44m. P. M. February 28, he rises at 4h. 48m. A. M., and sets at 2h. 12m. P. M.

Uranus.

Uranus is among the small stars of *Cancer*. February 1, it rises at 4h. 17m. P. M., and sets at 6h. 53m. A. M.

February 28, it rises at 2h. 26m. P. M., and sets at 5 the next morning.

Neptune.

Neptune, which cannot be seen without a good telescope, rises on the 1st at 10h. 15m. A. M., and sets at 11h. 9m. P.M.

On the 28th, it rises at 8h. 30m., souths at 2h. 58m., and sets at 9h. 26m. P. M.

Occultations.

The star τ *Tauri* was occulted (the moon seemed to pass over it) on the 9th of January. The star disappeared at 10h. 38m. 59·4s

Sun Spots.

A very large spot can be seen at this time (January 20) on the sun. It has passed the center of the disk, but can be seen for some days.

Aurora.

There was a fine aurora on January 7. It was first noticed about 6 P. M. At times during the evening, it extended from the northwest far around to the east, with red and greenish tints; and between 10 and 10.20 P. M., the flashes were brilliant, and followed one another with unusual rapidity.

Meteorological Items.

FROM DECEMBER 15 TO DECEMBER 31, INCLUSIVE.

Highest thermometer	2 P. M.,	December	20	35°
Lowest "	9 P. M.,	"	25	-4°
Highest barometer	2 P. M.,	"	19	30·53
Lowest "	7 A. M.,	"	22	29·11

Amount of rain very slight. Prevailing wind northwest, not violent.

FROM JANUARY 1 TO JANUARY 15, INCLUSIVE.

Highest thermometer	2 P. M.,	January	3	43°
Lowest "	7 A M.,	"	12	-3°
Highest barometer	9 P M.,	"	15	30·64
Lowest "	9 P. M.,	"	9	29·55

Amount of melted snow and rain, 2·75 inches. Prevailing wind south, not violent.

PLUMBAGO, BLACK LEAD, GRAPHITE.

"Plumbago (black lead, graphite), its uses and how to use it; by Orestes Cleveland, President of the Joseph Dixon Crucible Company, established 1827. Jersey City, N. J. Published by the Company. 1873."

The above is the title page of a valuable little work, in which we find the following useful information concerning plumbago. Most of it is new to the public, and will be read with interest.

The purposes for which plumbago is valuable, the best methods of applying it, the properties and true character of the mineral itself, its sources, and the circumstances that surround it in the commerce of the world, the various grades and adulterations, are all points upon which great numbers, even of those who come in daily contact with it or use it, are by no means familiar, and many are wholly ignorant.

We have been forty-five years engaged in the manipulation of plumbago, being the oldest house in the trade in this country, handle more of it now than any other single establishment in the world, and have been successful in its application to different branches of industry; we may, therefore, offer information without being accused of not understanding the subject treated.

The black lead of commerce, and what is so called by the trade, in first hands, is found only in Europe, principally in Germany, that which comes to this market being wholly from that country.

The plumbago of commerce comes mainly from the island of Ceylon, in India, but is found in many parts of the United States, being mined successfully, however, only at Ticonderoga, in the State of New York. It is also mined to a small extent in the Ottawa region of Canada, though I believe so far without profit.

It is, therefore, known in trade as Ceylon plumbago. It is very refractory. I have experimented by subjecting, for two hours, a piece, with sharp projecting angles, to a heat that would melt steel, and on cooling found the sharpest points perfect; but it will exhaust if left on top of such a fire. It is found in veins in a pure state, is removed in lumps, and a selection of these forms the "prime lump" of commerce.

The formation most common in the pure state is that of laminated crystals, elongated at right angles with the sides of the vein, if not more than from four to six inches wide; but when the vein widens the crystallization often radiates from numerous centers, and the whole formation is very beautiful; the foliated variety is equally valuable and more brilliant, but rare in any quantity; the acicular form of crystal is not apt to be as pure in the lump, but is useful for most purposes; the granulated variety, the purest of all, is of little use for crucibles, but, with suitable manipulation, produces the finest grades for electrotyping and fine lead pencils, and is unequaled for lubricating. Pure plumbago is free from grit, when pulverized and rubbed between the fingers, and the polish produced in the same way is instantaneous and very bright, being like a darker shade of polished silver. It is found mixed with iron, rhombspar and other forms of lime, the rock and earth in which the vein is carried, and many other foreign substances injurious for all the purposes for which pure plumbago is needed; so that much care is necessary in purchasing the raw material for a given purpose. Lime, for instance, is fatal to plumbago for crucible making. The plumbago is mined in the interior of the island of Ceylon, and is brought down to Colombo in bullock carts. It is there selected into grades; so much as may be finely broken up is sifted, and the coarser part of this is called "chips," while the finer part is called "dust." The "dust" from prime lump is, of course, very different in character from the dust left from the poorer grades of lump, and all of it, whether lump or dust, after being handled and packed in barrels in Colombo, becomes so black and bright, by the poor particles rubbing against the good, that the touch of an expert is required to distinguish between the grades.

The German black lead is not refractory, and is therefore useless for any purpose that brings it in contact with the fire. It has no value for the crucible maker, or for stove polish, and is of but little use as a lubricator. It has a very low conducting power, even in its pure state, and the best quality that comes to market is far from pure. None of it comes in its original state as mined, but all of it is washed and floated, and so the grades are produced. In fact, it resembles a weak black clay more nearly than it does true plumbago in nature as well as appearance. It is used often on account of its cheapness, when it would be cheaper to use the real plumbago even at five times the price.

As this is only intended for a preliminary circular, to be followed by an elaborate work in which the subject will be fully treated, I shall pass at once to such points as seem to me useful for the trade, either as dealers or manufacturers.

PENCILS.

The first, and still the most widely extended, use of plumbago was for marking-crayons or pencils. The original method of manufacture was very simple. The lumps of mineral were cut into the required shape, and used in the natural state. At a later date it was sawn into the shape now used, and covered with wood, making the well known lead pencil; but the Borrowdale mine in England, the best known, finally ceased to produce the mineral pure enough for the purpose, and that method was reluctantly abandoned. The refuse about the mine was then utilized by purifying and pressing it into blocks, and these in turn were sawn into "pencil leads." But the leads made in this way were weak and unreliable; and even had they been useful, the march of civilization required pencils of different grades, some soft and others harder, while the sawn leads were all alike. The present method consists in selecting the best granulated plumbago (found till recently only in Germany), pulverizing it very finely, and floating it in water through a series of vats, the coarser particles settling to the bottom of the first vat, the finer in the next, and so on till, after passing through several, that which settles in the last vat is considered fine enough for the purpose. A suitable clay is found as yet only in Germany, and this is treated to the floating process, the finest only being fit for use. The plumbago and clay are then mixed together with water to the consistency of cream, and ground together like grinding paint. When this operation is completed, the mass is plastic, water enough having evaporated to leave it in that state. It is then placed in a press and forced through an opening of the size desired for the pencil leads, and the leads are cut to a suitable length, straightened, and dried. When dry enough to handle, they are placed in a crucible, the air excluded, and subjected to a high heat, which bakes them and brings them out ready to be placed in the cedar for pencils. The different grades are produced by the different mixtures of clay and plumbago; the more clay the harder the grade produced. Skill in the manipulation, the exercise of great care as it progresses, and an expert to select the raw materials, are absolute pre-requisites for a perfect product, and our success has been greater than we hoped for, to start with. We shall have five grades of the commercial pencils, ranging from the very soft up to a very hard grade. They are smooth, reliable, and pleasant to use beyond any heretofore made, and are a credit to us and to the country as an American manufacture. We are the only Americans making fine pencils, but are not unwilling to place our common commercial polygrade pencils by the side of the finest drawing pencils heretofore used by artists, ours being made by machinery only, while those are made by hand. All of the fine pencils used in this country have so far been imported, but we propose to turn the tide of trade homeward.

CRUCIBLES OR MELTING POTS, RETORTS, ETC.

Forty-five years ago the only plumbago crucible was made by the Dutch, the melting pots used in most countries being made of clay and sand; but the late Mr. Joseph Dixon, the founder of our house, in 1827 made crucibles by using the plumbago found in the State of New Hampshire, of a quality so far superior to the Dutch black lead pots that he took the market from the first. He afterwards saw specimens that had been brought from Ceylon as curiosities, by captains in the India trade; and finding them so much better than the New Hampshire plumbago, he procured a shipment, being the first importation of Ceylon plumbago in the United States.

Captain Rogers, who brought that shipment, is still alive and residing in Boston.

For crucibles, the pure lumps known as "prime lump" only should be used, ground to a fineness that leaves the particles bright and glistening when held to the light, but not so fine as to destroy this appearance. It is then mixed with clay, and the best known for that purpose is found at Mayence, comes down the Rhine, and is shipped to this country from Rotterdam. A small amount of finely pulverized charcoal should be added to render the crucible porous. As little clay should be used as will suffice to hold the plumbago together, the object in using the clay being only to cement the particles of plumbago.

After a thorough mixture, the crucibles are turned into the desired shape, much the same as pottery ware; they are then dried and baked in a kiln like pottery.

In use the crucibles should be placed in the fire, and not on it. The fire should surround the crucible to the very top.

If used with a blast, the blast should not strike the crucibles direct, but there should be coal for the blast to strike against.

The crucible should be kept in a dry place, the least dampness being fatal. If they are well made no annealing is needed, the object of annealing being only to complete the shrinkage that should be fully accomplished in the "burning" by the crucible maker. To provide against slight dampness, however, it is well, when possible, to use the crucible for the first time in a new fire, placing the crucible in the furnace at the time of lighting the fire, so that it heats up gradually with its surroundings. After the first time even this pre-

caution is unnecessary. For melting brass, copper, gold, silver, or alloys of metals, a Dixon plumbago crucible should run from twenty to forty meltings according to the fuel, draft, care, or other circumstances.

I have known them used seventy and even eighty times, with a natural draft and great care. For melting steel, they will run from four to six times. They can be made to run longer by care and a system of cleaning the slag from the surface after each melting, and coating the crucible with a mixture consisting of fire clay, plumbago, charcoal and silica, pure fine quartz sand being, in my judgment, the most useful form of silica to employ; other substances have been used, but these are all that are of any real value. The carbon from the interior of gas retorts would be better than charcoal, but it cannot be had in quantity and is too hard to pulverize cheaply; and in consequence of that hardness is used successfully in electric batteries where a carbon is wanted.

STOVE POLISH.

Plumbago of the best quality is the only suitable material for stove polish, but lower grades will produce a fair polish for trade; and if the manufacturer is sufficiently expert in the examination, he may use the best grade of Ceylon "dust," but much of that which comes to market is too poor. For stove polish, the plumbago should be pulverized till the particles are too small to glisten, and what would otherwise be a shining mass becomes a dead black flour, and this appearance is so near that of the German black lead that the difference can only be discovered by handling. Plumbago cannot be pulverized fine enough in stone mills without running it over so many times that the cost is too great, and hence so much poor stove polish is found in market, offered by respectable manufacturers. The black lead, even when pulverized equally fine, has a harsh feeling between the thumb and finger, polishes but little and with considerable rubbing, leaving a dark, poor polish; while the plumbago, if good, feels smooth, almost oily, and polishes with very little rubbing, leaving a bright silvery polish. The finer the plumbago is pulverized, the better it is for stove polish, as each particle should be so small that it flattens out at once on the iron, adheres to it, and polishes quickly; while larger particles will fly off and be wasted, as well as creating a dust, and requiring more labor to produce a fine polish. The polish from pure Ceylon plumbago will last on the iron for a long time, while the polish from the German black lead will burn a reddish brown when the stove is raised to a red heat. But as the German is less than half the price of the Ceylon, it is used with it as an adulteration, and for the cheaper kinds the German is used alone. The Ceylon is adulterated also with coal dust, pulverized slate, and many other substances. Dishonest makers of stove polish have this temptation, that only experts can detect the adulteration; and they succeed in palming off their mixtures because the particles of adulteration do not prevent the particles of plumbago from polishing the iron to a small extent. For instance, a thousand particles of adulteration and a thousand particles of plumbago, mixed together, can be sold at a low price, and the particles of plumbago will do the polishing, while most of the particles of adulteration will fly off in the process. It is true that the polish will not be as bright, and will require more time and labor to produce it, than if the one thousand particles of pure plumbago had been used alone, so that half the quantity of the pure article is better than the double quantity adulterated. In using the mixture, a great number of particles of the adulteration are rubbed against the iron with particles of the plumbago outside, and in all such cases the polish on that point is poor and the plumbago wasted, because it cannot get to the iron. I do not believe that an adulteration of an equal number of particles of base matter with the best plumbago is worth more to use than from one fifth to one fourth the value of the pure article, and a vast amount of stove polish offered in market has not a fourth part of plumbago in it, and even that is of the lower grades, used only for its cheapness. A thimblefull of the best plumbago, pulverized to the degree of that used by our company for stove polish, will, with the least amount of labor, polish as much surface as a quarter pound package of the usual merchantable stove polish with much time and hard rubbing bestowed upon it, and the polish of the former will be creditable after that of the latter will be a disgrace to a neat housewife. For stove dealers the difference is very great, a poor article being dear to them if it costs nothing. Perhaps no article except mustard can be so successfully adulterated as plumbago. I have been particular in speaking of the adulterations because the remarks will serve to enlighten those who buy for other purposes than stove polish. The proper methods of pulverizing I leave to be described in the future work.

LIQUID STOVE POLISH.

Liquid stove polish, called by quacks in trade "inventions" and advertised as such, are mixtures in which there is no value except the little plumbago they contain, and the liquid is generally water, with a little soluble blue for a "blind." But recently there have appeared "inventions" of this sort which are made with various volatile fluids, the object being to apply something that will evaporate quickly. These liquids are of no value in themselves, plumbago being used in the mixture for the polish; the article would be better if made of only plumbago and water. But some of the mixtures are dangerous to have about a stove from the explosive fluid used. A "patent" article I have seen is dangerous in any kitchen, and no insurance company would write a policy on any building where it is used, if the ingredients were known. Liquid stove polish is the dearest form in which it is put up, because, in order to make the mixture cheap, very little plumbago is used. A ten cent package of Dixon's stove polish would make a dollar's worth of liquid polish, and so you pay ninety cents for a worthless mixture, labor, bottles, cans, etc. Many makers of liquid stove polish are shrewd enough to use in their mixtures a good quality of plumbago, so that when it is tried, of course it gives a good result; but the deluded purchaser forgets that he can buy good plumbago for himself at many times less money.

HOW TO POLISH A STOVE.

The remarks about stove polish and its adulterations should be read by every stove dealer; but the prejudices of the men who polish stoves for the stove dealers are deeply rooted, and their practice very stupid.

For instance, the majority of them still apply a varnish to the stove and then throw against the wet iron a handful of plumbago, allowing the surplus above what sticks to the stove to fall down into a large pan or box placed so as to catch it.

Now, if the plumbago is ground fine enough to be economical to use, this method would scatter it over the store so that everything would be covered with it and a great waste be the result; but the most of that used by stove dealers is so coarse that this does not take place to any great extent; many dealers will pay the price for good plumbago, pulverized fine enough to make it cheaper for them than a low priced article. The varnish creates a disgusting odor when a customer gets the stove home and makes a fire in it, besides being more expensive than water. The proper way to polish a new stove is to mix the plumbago with water to about the consistency of cream, have it in an open dish, apply it to the iron like paint, and with a dry stiff brush polish quickly till dry, and this polish will be brighter and last longer than any varnish polish; and if the plumbago is right this method is much more economical in material and labor.

LUBRICATING.

As a lubricator none but the very best plumbago will answer. For coarse and common purposes a plumbago not quite pure may be better than none; but for metal surfaces, journal boxes, car axles, and all metal bearings, the plumbago should be pure and entirely free from grit. From the "prime lump" should be selected the very choicest lumps, and these should be pulverized till the particles will not glisten, but the mass becomes a dead black.

It cannot be made fine enough if separated by bolting, but must be separated by floating either in water or air. The simplest method is the water separation, and during the process it should be treated to a bath of dilute sulphuric acid, which will take up the particles of spar and iron, leaving the sulphates of lime, magnesia and iron easily washed out. Details of the whole process will be given in the future work. I have seen a very attractive preparation, very smooth between the thumb and finger, free from grit, and useful for many purposes, but the particles under the microscope show themselves in light scales instead of infinitesimal grains, and this was separated in water; but I think the defect was in the method of pulverizing, it having evidently been done by the use of stones.

The Dixon lubricating plumbago is pulverized by rolling 32 lb. iron balls, and is brought into infinitely fine grains, giving it more body and usefulness than the scale form.

There is no purpose for which plumbago should be as pure and as fine as for lubricating, except for electrotyping; but a large part of that which is offered for sale as a lubricator is adulterated, some of it being composed mainly of the German black lead, and is of no more use than common clay for the purpose. For blowing cylinders, the best quality of Ceylon plumbago, pulverized to the finest grade, pure and left with a good body, is the most economical. For engines, rolling mills, and machine bearings, the very finest should always be used. For wood bearings, after oiling with the plumbago a few times, the oil can be dispensed with, and the pure plumbago only applied in the dry powder. For metal bearings, it should be freely mixed with oil. On hot axles or journals, apply it freely dry, and then oil up as usual. If the railroads would all use the best grade of Ceylon plumbago, pulverized and prepared as described, hot journals would be very rare, and much delay and loss in freighting saved, as well as annoyance to passengers avoided. No substance is known that is so useful for lubricating as plumbago, and yet although used for that purpose more than two hundred years ago, the true method of preparing it was not known till within a few years, and it comes upon the market now little understood, and almost like a new material. It is destined to work great changes. Mixtures and quack nostrums are sold with sounding names, but the plumbago in them is all they contain of the least value, and it is better to use it pure.

ELECTROTYPING.

To the electrotyper absolute purity in his plumbago is a necessity, and hence any adulteration will discover itself at once on trial. The purest selected Ceylon lumps should be treated as described for lubricating, but the separating process should be carried to a finer point, and the acid bath given with care. The acid should be applied till with a thorough stirring no effervescence takes place, or bubbles rise to the surface. In electrotyping, the great conducting power of the plumbago asserts itself.

FACINGS FOR MOLDS, OR FOUNDERY FACINGS.

For this purpose plumbago is but little understood, although it is used to a limited extent. That it is valuable most skillful molders are aware, consequently much of the trash that is sold for "facings" is called plumbago, to make it sell, without containing a particle of anything even resembling the real mineral. Most of that which is sold to the stove plate and other smooth casting founderies for "black lead," is innocent ground slate, but some of it is a mixture of ground coal and German black lead, while charcoal would be better than either if ground fine enough. Ceylon plumbago combines the two qualities of a substance almost as refractory as asbestos, and the most perfect conductor of heat. These are the essentials of a perfect "facing." It cannot be pretended that any other substance will answer as well, unless it will combine and form a flux upon the surface of the metal. As for the mechanical operation of filling up the pores, or smoothing the mold, plumbago has no equal. For iron castings it need not be a perfectly pure article, but that it be pulverized very fine is absolutely necessary for economical work and the best results.

For pianos, plumbago is employed to coat the bridge over which the wires are drawn, because of its perfect lubrication; it prevents the wire from adhering to the wood, and should be as free from impurity as that used by the electrotyper, but need not be pulverized as finely.

For organs, it is used to lubricate the slides, and should be the same as that used by piano makers.

The German black lead imparts a peculiar tone to the colors and a softness and smoothness to the touch of felt hats. The very best lump only should be accepted. As it has once been washed and dried in lumps, they will readily separate again in water, and no pulverizing is needed.

For coloring dark glass for carboys, bottles, etc., the best German black lead is used in lumps, but no inferior grade will answer.

For paint, plumbago has long been known as possessing great value. The elements do not exhaust it, water sheds from it as from oil itself, and fire does not affect it. The grade need not be the highest.

For the bottoms of boats and yachts it has long been used especially for racing boats; but only the best Ceylon plumbago, very finely pulverized, is valuable.

REFRACTORY MIXTURES.

For tweers, pointing up furnaces, etc., take "prime lump" Ceylon plumbago, pulverized to scales as directed for crucibles. Then mix equal parts of Dutch pipe clay, fire clay, half the quantity (by measure, not weight) of charcoal, and the same half quantity of silica (pure quartz sand, ground fine, being the best); to this mixture add as much of the plumbago as possible, and leave the mass thin enough to work. It should be made just thin enough with water, so that it will run rather sluggishly.

Plumbago for polishing powder should be of the very best quality, finely pulverized. The German black lead is sometimes used, but is not economical for the powder maker, and for high priced powder is useless.

Shot is polished with plumbago, and it should be absolutely pure, pulverized to the finest grade from Ceylon "prime lump."

FOR BLAST FURNACES.

Plumbago thrown into the blowing cylinders, if adulterated with coal dust, will be worse than nothing. It should be pure and very fine, so that each particle that strikes the side of the cylinder will assist in polishing the surface. The German black lead is of no value, because as many particles of the clay character will stick to the iron, as there will be particles of the black lead character to lubricate the iron and render it smooth.

A more extended work upon the subject is to be published, copies of which can be had free by addressing the Joseph Dixon Crucible Co., Jersey City, N. J.

A Remarkable Explosion.

A most remarkable explosion, which illustrates the expansive force of steam, took place on the evening of January 21st, at Pittsburgh, Pa.

While the workmen at Bateman & Garrison's foundery were moving a ladle filled with several tuns of molten metal, the crane hooks broke, letting the iron fall into a hole which contained some two feet of water, and a terrific explosion followed. The roof of the building was carried away, and the walls cracked. Houses in the vicinity had windows badly shattered. Several workmen were slightly injured though none seriously. The damage to the foundery will amount to about $10,000.

The Shaker and Shakeress.

We have received the first number of the new volume of the "Shaker and Shakeress," of which Elder F. W. Evans, of Mount Lebanon, N. Y., has become editor, and Eldress Antoinette Doolittle, editress. The typography of the paper is excellent; the contents are almost wholly original, consisting of contributions from various members of the Shaker Society, relating chiefly to spiritual affairs.

VEGETABLE AND FLOWER SEEDS.—Mr. J. J. H. Gregory, of Marblehead, Mass., is well know as one of the few leading seed growers in this country. He was the original introducer of the Hubbard squash, the Marblehead cabbages, and many other of our new and valuable vegetables. All seeds from his establishment are sold under three special warrants. His advertisements will be found in this number, and we invite attention to them. His illustrated catalogue for 1873 (now ready) will be sent free to all applicants.

A LONG TRAIN.—The Harrisburgh (Pa.) *State Journal* says that a freight train, consisting of four locomotives and 128 eight wheel cars left that place on the morning of December 15, on the Pennsylvania Railroad, and reached Altoona the same afternoon. The train was considerably over half a mile long.