was first to be kept, but it is natural to suppose that the new arrangement would be brought into force as soon as possible, that is, in the then existing year.

It is probable that this reform of the calendar was not effected without much opposition. It lasted through the reign of Ptolemy III. But in B. C. 222-1 he died; his son Ptolemy Philopater succeeded him, and then this sixth intercalary day was no longer kept. There seems to have been a reaction Sirius the year was no longer observed, and the common year, of 365 days only,again prevailed. The old irregularities gradually became apparent; and the reform, which in consequence became necessary, was effected during the reign of Augustus in the year B. C. 26.

The latter part of the inscription recounts the honors decreed to the deified Princess Berenice. Her statue is to be placed in the great temple at Canopus, near the statue of Osiris. In all temples of the first and second orders, a statue of her, made of gold and adorned with jewels, is to be kept in the adytum; a four days' festival in all the temples is to be kept in memory of her, beginning on Tybi 17th (March 7th), the day on which the mourning for her ceased and her apotheosis was decreed. On the festivals of the other divinities her image is to be carried in the procession. Hymns are to be sung in her honor, and regular rations given to the maiden daughters of the priests who do service to her.

Lastly, the presiding high priest in each temple, and the temple scribes, are charged to set up in every temple of the first, second, and third order, and in the most conspicuous place, a copy of the decree, carved in Hieroglyphic, Egyptian and Greek characters, on a pillar of stone or brass.

Out of the many copies that must have existed, this is the only one hitherto discovered.

Correspondence.

The Ventilation of the United States Senate Chamber.

To the Editor of the Scientific American:

Allow me a few words of comment on the article on ventilating the Senate Chamber in your issue of December 13, 1873.

Ventilation is a very simple thing; and to secure it, it requires only to be not prevented or obstructed. Nature will ventilate any apartment if it is only allowed to do so. As easily as a man draws his breath, so will an apartment, crowded or not, ventilate itself if it be allowed a throat to do it with. To devise fans, steam engines, exhausts, or injectors to ventilate the senate or other house, is only foolishly trying to help Nature to do work which she can better do without help. It would be no more absurd to invent a whirligig to put into a man's mouth to help him to draw his breath than it is to devise an injector and an exhaust to force in pure and draw out impure air to and from a room. To help a river over a waterfall is not more preposterous than, by moving apparatus, to accelerate the entrance of fresh and the exit of foul air from a crowded hall. The same force which makes the water descend, gravity, forces cold air under hot air and makes it ascend. If the foul air of a crowded hall could be seen and handled, the nature of its movements would have been long ago as well understood as those of water. Supposing foul air were the color of dense smoke, it would be seen to accumulate at the ceiling. If it could be seen that it always tended upwards, a hole in the roof would be the natural result of the desire to get quit of it. The amount of haziness regarding this simple matter in the minds of scientific men is unaccountable. The thousands of pounds and the amount of abortive invention spent on the ventilation of our Parliament Houses might make the angels weep,and all for what? To force atmospheric air to obey a law of its nature, which it cannot of itself disobey. As the sparks fly upwards so will heated air, if it is not restrained; and herein consists the whole secret of ventilation. It needs no device to float a cork; neither does it need any machine, fan, steam engine, exhaust, or injector to purify the air of the Senate House. All that is strictly required is an entrance for fresh air below, and an exit for foul air above. These provided, ventilation will work in spite of all the wrong headed theories of the *savans* and without the well meant but useless inventions usually erected to assist Nature. If these holes are large enough,no hall need be either impure or oppressive. If the place be half filled, the supply of pure air will be enough. If crowded, it will be augmented to meet the larger demand. Every person who enters is a machine to make the current inwards and outwards work more vigorously; and every one who leaves deducts from the demand and the power to supply. The atmosphere is a nicer balance than ever man made, and vibrates to a counterpoise infinitesimal beyond his conception. It is a comfortable as well as an undeniable fact that the objects which require ventilation are the very means to create it. Fires, lights, and man himself, if they consume pure air, also heat it, causing it to ascend and give place to a new supply, which in turn is consumed, heated and pushed upwards. This process, which is never ending, is simple, admirable, exact, and complete. It requires no assistance, has worked from the beginning of time, and will work, though there be neither *savan* nor machinist in existence.

If our halls, like the ancient Greek, were without roofs, ventilation would cause us no thought. The foul air from our lungs and bodies would ascend right into the air, and a fresh supply would come down to us through the same opening. But our houses and halls are ceiled, and the currents are prevented taking their natural courses. Even in a ceiled chamber, if an open space be left large enough, the ascending and descending currents through it would supply all the ventilation required by a crowded assembly. But it is more convenient, as the modern fashion of buildings is and as our climates require, to admit our fresh air at the lower part of our houses instead of at the top. By this mode a smaller opening in the roof suffices. A very much smaller opening is needed than many would suppose. And here I beg to take exception to a statement in the article referred to. It is there said that the machinery injects 25 cubic feet of air per minute for every man of 1,200 assembled, or it is capable of doing so. This quantity is ridiculously overdone. A man does not consume even one foot of air per minute by breathing; 15 inhalations of 60 cubic inches each make only 900, and a cubic foot contains 1728. Take man by man in an assembly, half a foot per minute is all each will consume. One can inhale through a half inch tube more air than he requires. Even a quarter inch one will not oppress him much. I speak of a round tube, but, if you will, take a square one. Of this a square foot will represent 576 persons' breathing area, and will admit air sufficient to supply that number. It may be said the velocity of air into a crowded chamber is not so great as that of the air through the tube when one breathes by it. But it is to be remembered the air is passing into the lungs only half the time, while the inward rush to supply an assembly hall is constant. The fact is the current inwards and outwards in a chamber, ventilated in the natural way which I indicate, is quite as fast as the current in and out of a man's windpipe.

But in an assembly hall at night, the lights must be supplied with fresh air as well as the occupants. I need hardly mention fires, as it is not usual to have them in such places. If they be used, they also must have their supply of air, and they will take an amount of inlet for themselves, equal to the united areas of their chimneys. I suppose there are no fireplaces in the Senate Chamber; but a crowded hall gets heated, and an extra supply of air is demanded on that account. If such is the case, it calls in its own supply. The velocity both inwards and outwards increases and the temperature falls. If the air of a hall be pure, heat is not so oppressive. It is impure air that exhausts and makes people pant. Taking your estimate, 1,200, as the usual number in the Senate Chamber, a hole in the roof equal to two square feet, with an under inlet the same, are ample to supply all the breathing air required. The lights may be allowed as much, and the heat an equal space. As a large hole is about as cheaply made as a small one, and as plenty of outlet does not affect the people below, the openings may be made double or even treble the size mentioned without fear of inconvenience. These openings must be free to the atmosphere, but may be made with louvres to keep out the rain. A hinged skylight is as good as anything else. As a cistern of water will be emptied if any sort of hole be driven through the bottom, so will a crowded hall be refreshed if any sort of hole is driven through the roof.

I am sorry I did not get admission to the Senate House when I visited Washington, else I might be more precise in my suggestions. But I believe that there is a ceiling between the outer roof and the audience, and that this ceiling is pierced with ornamental fretwork, and that the piercing is equal in area to what I have indicated as necessary for outlet.

The inlet of fresh air is the next thing to be considered; and while it is equally simple in principle as the outlet, it is not exactly so in practice. The outlet may be anywhere in the roof. It may be far larger than really required. It may be one large opening, or it may be many small ones. The inlet must be a great many small openings, or a disagreeable current will blow in one place and inconvenience those near it. But even this is a simple matter. An opening in the masonry under the joists of the floor, communicating with the outer air, will allow a fresh current to rise through small gratings in the passages between seats. Or if the corridors have proper air holes, a supply to the main chamber may be got from them by slits above the doors. Or air may be let in along the channel where lie the heating pipes and allowed to find its way to the chamber through small grate work along the base of the wainscoating. The modes for small inlets are endless. And let me say the united areas of the divided inlets need not be so great as those of the outlets, because they are supplemented by chinks of windows, thresholds of doors, etc. I would impress on all objectors that no inconvenience from the currents will be felt, if an inlet area of 8 or 10 feet be properly scattered over a room of the size of the Senate Chamber.

Allow me a few words on the long pipe proposed, to suck the air from the park 220 feet off. I do not know what purer air people would wish than that at the Capitol. It blew on me as fresh as mountain breezes. It is all people have to breathe who are walking outside; and if those inside get the same, what else do they want? One undeviating law of air currents is that they always take the shortest available cut and depend upon it, the ventilating air of the Senate house will never run through a long pipe if it can get in at an open door nearer its work. The whole thing is of a piece with the London delusion, and indeed is a counterpart of it from beginning to end.

Paisley, Scotland. WM. MACKEAN.

To the Editor of the Scientific American:

I have read an article in your issue of December 13th, 1873, on the above subject, and I understood the difficulty (remedied by the charges described) to be the want of sufficient area, and the proper arrangement of the air passages from the old fan to the Senate Chamber. Unless there is some mistake in your explanation, there was, in my opinion, no necessity for the new fans, engine, and the two air shafts, which in all probability occasioned a large expenditure. I venture my opinion on these grounds: You say that the capacity of the old fan was 80 revolutions per minute, discharging 500 cubic feet of air at each revolution, making in all 40,000 cubic feet of air per minute; and that in consequence of the defect, it was producing but one fourth of the ventilation that it had the capacity to furnish. As you state the capacity of the new fans to be 30,000 cubic feet per minute, it appears there was at least no want of capacity in the old fan, and that in comparison with forced ventilation, there is no advantage in ventilating by exhaustion. In my opinion, Mr. Hayden selected a very indirect, as well as an extravagant, method of remedying a very simple matter.

CHICAGO.

Mental Arithmetic.

To the Editor of the Scientific American:

The young mechanic who hopes to excel in his chosen trade should endeavor to become skillful in mental arithmetic; and at the last analysis, all computation is strictly mental, the figures employed being only tallies to record results. I will give a table illustrating the theorem that the product of any two numbers is equal to the square of half their sum less the square of half their difference, that long practice proves to be a useful method of multiplication:

$$6\times 6=36=6^2$$
$$7\times 5=35=6^2-1^2$$
$$8\times 4=32=6^2-2^2$$
$$9\times 3=27=6^2-3^2$$
$$10\times 2=20=6^2-4^2$$
$$11\times 1=11=6^2-5^2$$

This theorem may be expressed algebraically, thus: $(a-x)\times(a+x)=a^2-x^2$, and numerically as in the table.

Suppose it is required to multiply 53 by 47. Half their sum is 50, the square of 50 is 2,500, and the answer sought is that sum less $3^2=9=2,491$. In practice, such an example can be solved almost instantaneously. If 47 times 54 were required, proceed as in the example and add 47 to the product.

To use this method, considerable knowledge of square numbers and of some of their remarkable properties is required; and the careful study of difference series will be beneficial. This study has proved an excellent means of initiating pupils into the mysteries of square and other roots, enabling them to become proficient in a short time. There are many similar things in the curious and wonderful science of numbers that, like the magic squares given in your issue of December 20, 1873, are of far more value than is generally supposed. Let some one arrange them in a suitable form and put them into the hands of the Yankee boy.

New Britain, Conn. F. H. R.

The Relative Attraction of the Earth and the Sun

To the Editor of the Scientific American:

The semidiameter of the earth is, in round numbers, about 4,000 miles, and that of the sun 425,000 miles. An object situated on the surface of the earth will, therefore, when turned toward the sun, be 22,874 times farther from the center of solar attraction than it is from the center of terrestrial attraction; and when turned from the sun, it will be 22,876 times as far from the sun's center as from the earth's center. Now as the strength of attraction varies inversely as the squares of the distances, the pull of the earth's mass will be $22,874^2$ times as great (on a body on the surface of the earth turned toward the sun) as the pull of an equal solar mass will be; and when the object is away from the sun, the pull of the earth will be $22,876^2$ times as great as the pull of an equal solar mass. But, as the sun's mass is estimated to be 215,000 times as great as the earth's mass, the total pull of the sun on an object in the two supposed situations will be: $\frac{315,000}{22,874^2}$ and $\frac{315,000}{22,876^2}$ times that of the earth.

$$\frac{315,000}{22,874^2}=\frac{315,000}{523,176,276} \text{ and } \frac{315,000}{22,876^2}=\frac{315,000}{523,211,376} \text{ or } \frac{1}{1,660,877}$$

and $\frac{1}{1,660,688}$.

Now if the foregoing estimates be correct, there must be, in certain situations, a sensible difference between the weight of a given mass when on the surface of the earth in the direction of the sun, and the weight of the same mass when the earth has turned it away from the sun. This could be verified by experiment.

Let the place be at the equator, and the time of the experiment be one of the equinoxes. Suppose scales to be constructed of the capacity of several tuns and of the utmost possible delicacy. Now let us try our experiment with a weight of 10 tuns. Its weight at noon will be 10 T$-\frac{1}{1660877}$ of 10 T. and its weight at midnight will be 10 T. $+\frac{1}{1660688}$ of 10 T. or: Noon weight$=$20,000 lbs.$-$12 lbs. 10 drams$=$19,987 lbs. 15 ozs. 6 drams. Midnight weight$=$20,000$+$12 lbs. 8 drams$=$20,012 lbs. 0 ozs. 8 drams, making a difference between the noon weight and the midnight weight of 24 lbs. 1 oz. 2 drams.

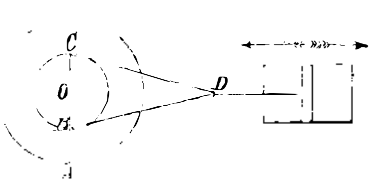
If astronomers have miscalculated the relative masses of the sun and the earth, will not this experiment indicate the fact? And if we experiment in the same manner with the moon's attraction, may it not lead us to modify our statements of relative masses still further? And, moreover, may it not lead to a reconstruction of our tables of distances? If the principles set forth herein be correct, would not such an experiment be as worthy the interest of the great powers as are those expeditions of observation, so munificently aided, to make the transit of Venus and the total eclipse of the sun contribute to our stock of astronomical knowledge?

Brownville, Neb. W. B. SLAUGHTER.

Adjusting Journal Boxes Horizontally.

To the Editor of the Scientific American:

Apropos of recent suggestions for taking up the wear of journal boxes, permit me to say that there is a common error among machinists to the effect that the wear upon the side of the main journal box nearest the cylinder is double that on the side opposite. Strange to say, the same idea is advanced as a theorem in a work on machine drawing, recently published by a noted writer on graphics. Some machinists, again, think that the wear is equal on each side of the center. The following is a demonstration of the true case:



The diagram being the skeleton figure of a locomotive or stationary engine, let A, the point of traction on belt or rail, be taken as the axis of moments.

Let P = pressure on piston, let x = pressure on front of box at O, let y = pressure on back of box at O, let R = radius of wheel, and r = radius of crank. With crank pin at C, we have $x = \frac{P \times (R+r)}{R}$ by equaling moments. With crank pin at B, we have $y = \frac{P \times (R-r)}{R}$. Whence $x \div y = \frac{P(R+r)}{R} \times \frac{R}{P(R-r)} = \frac{R+r}{R-r} = 1 + \frac{2r}{R-r}$, by performing division. But if x = 2y, then $x \div y = 1 + \frac{2r}{R-r}$ must equal 2; whence $\frac{2r}{R-r} = 1$ and $2r = R - r$ or $R = 3r$. That is, the pressure on the front of box is double that on the back of box only when the radius of the wheel is three times that of the crank.

Or in a locomotive, let P, x and y be as before, and T = train resistance. Then going forward, with crank at C, $x = P + T$: or with crank at B, $y = P - T$, whence $x \div y = \frac{P+T}{P-T} = 1 + \frac{2T}{P-T}$ which, as before, is equal to 2 only when $P = 3T$. The wear on both sides of the box will be equal only when $T = O$. The wear on the front box will always therefore be practically the greater, but not necessarily twice as great.

Since the wear is proportional to the pressure, the formulæ $x \div y = \frac{R+r}{R-r}$ and $x \div y = \frac{P+T}{P-T}$, may be used to determine the relative thickness of the two sides of the box.

Notwithstanding the weight of the engine throws the point of greatest wear towards the top or bottom of the box, the fact of unequal wear, proved above, shows the necessity of making the boxes adjustable horizontally, as suggested by your correspondent. W. L. C.

Lehigh University, Bethlehem, Pa.

Animal Electricity and Magnetism.

To the Editor of the Scientific American:

Among the components that make up the whole of man's vital parts, animal electricity and magnetism are of prominent importance. Their existence has long been known, but almost all else in regard to them seems mystery.

Air when taken into the lungs gives up a portion of its oxygen, which passes into the blood, and, when expired, is converted into carbonic acid gas. The latter gas amounts to about three and a half per cent of the whole expiration. In the process a combustion takes place, wherein a portion of the oxygen combines with the blood, and another portion with carbon, to be exhaled as carbonic acid gas. I presume that this combustion or transformation is the cause of animal heat. But this is foreign to the present subject. Faraday discovered that oxygen was the most magnetic of all gases, holding the same place among gases that iron does among metals. When reduced to proportions and figures, if 17·5 represents the magnetism of oxygen, air would rate 3·4, while carbonic acid gas is diamagnetic and would be represented by 0·0. The amount of carbonic acid gas taken into the lungs with air is quite small, but from each healthy person sixteen cubic inches are exhaled per minute, or twenty-three thousand cubic inches per day. As this gas is composed of carbon one part and oxygen two parts, it follows that about fifteen thousand three hundred and thirty-two cubic inches of oxygen, charged with magnetism in the proportion above stated, has the total amount of magnetism daily eliminated from it by the vital organs of each individual. What becomes of this magnetism thus extracted from the oxygen of the air? It enters the lungs; it does not go out again. The sequence is beyond question: it is taken up by the organism and remains there to be used in the vital forces. Thus in the life giving gas, not only is to be found the property of supporting life, by purifying the blood and furnishing heat for the body, but, also, the magnetism that performs an important, but a far more subtile part. An atmosphere of pure oxygen, if supplied to the lungs, increases the heat, magnetism, and electricity of the body, by the conversion of a much larger proportion of oxygen into carbonic acid gas, and quickens life to such an extent as to cause death from exuberance. When an absence of oxygen from the blood has almost caused a cessation of magnetic and electric currents in the body, an injection into the circulation of blood charged with oxygen will cause their instant return; and just in proportion as carbonic acid gas is exhaled from the lungs, do we find a supply of these fluids remaining.

I have referred to animal electricity and magnetism as identical. In vital economy I believe them to be so in source of supply; and while manifestations of one may be had without the apparent presence of the other, yet there is so much to join them together, and so little to separate them, that the day of doubting their identity, in this respect, has about passed. Oxygen and ozone are the same, and yet how different! Are not both different conditions of the same thing? JOHN HILL.

Columbus, Ga.

THE SILVER MINES OF PERU.

BY PROFESSOR JAMES ORTON.

Peru was conquered and explored by the early Spaniards under the belief that it was *El Dorado;* but there are no famous mines of gold in the Republic save those of Carabaya. It better deserves the name of *La Plata*, for its Andes are threaded with silver. The annual yield of Peruvian silver, however, is decreasing, owing to mismanagement. A thorough scientific survey of the country is needed, and then a judicious system of mining. We are confident this will reveal

> "Rocks rich in gems and mountains big with mines,
> That on the high equator ridgy rise."

The most famous silver mines in South America, after those of Potosi, are the mines of Cerro de Pasco, sixty leagues northeast of Lima. They are situated on the Atlantic slope of the Andes, over 13,000 feet above the sea, where the prevailing rock is conglomerate. The silver, discovered by an Indian in 1630, occurs in the native state; also as sulphuret mixed with pyrites, with *cobrizo* (a carbonate of copper and lead, with sulphuret of copper), and with oxides, forming what are known in Peru and Mexico as *pacos* and *colorados*. The ore is treated to salt and mercury, but so rudely that generally one pound of mercury is lost to every half pound of silver extracted. Fortunately, Cerro de Pasco is only 200 miles from the celebrated quicksilver mines of Huancavelica. According to Herndon, the ore yields only six marks to the cajou. (A mark is eight ounces, and a cajou is three tuns). A representative specimen in our possession contains 0·004 of silver. During the last two centuries and a half, the mines have produced about $500,000,000. The annual amount of ore mined has been 50,000 cajous, yielding an average of four and a half marks, the amalgam containing 22 per cent of silver. Just now, work has nearly ceased, owing to the inadequate means of drainage. But at Cerro de Pasco, as at other places, it has been found profitable to re-work, by the improved modern method, the tailings left by the old Spanish miners.

Hualgayoc, fourteen leagues north of Cajamarca, has long been celebrated for its rich mines; but it is also afflicted with a plethora of water. There are many good mines in the vicinity of Lampa and Puno on the borders of Lake Titicaca; those of Manto, Salcedo, Chupica, and Cancharani were famous in Spanish history. The ores of Huantajaya near Iquique yield from 2,000 to 5,000 marks to the cajou. Masses of pure silver have been found on the surface of the plain, one weighing 800 lbs. Rich deposits occur also in the province of Cailloma, north of Arequipa; and at Yauli, San Mateo, and other localities near the Oroya Railroad. Extensive veins have been recently discovered at Chileta, the terminus of the Pacasmayo railroad, the ore assaying from $60 to $200 a tun.

But the most numerous and promising silver mines of Peru are, without doubt, located in the department of Ancache, just north of Lima; not because it is a richer region than the eastern cordillera, but because it is the only district which has been scientifically explored. This has been done by the accomplished naturalist, Professor Raymondi, under the patronage of Mr. Henry Meiggs. The report just published at Lima contains assays of specimens from the most valuable mines in which the silver occurs. It appears: (1) That silver is not very common in the native state. (2) That the minerals richest in silver are pyrargyrite ("rosicler" or ruby silver) and stephanite (brittle silver glance). (3) That the greater part of the silver, however, is extracted from tetrahedrite, galena, and many mineral oxides (*pacos* or *colorados*). The pacos richest in silver ore are those which result from the oxidation of stephanite and pyrargyrite; the poorest are found in great part of oxide of iron, in which the silver is minutely disseminated in the native state. (4). It is worthy of notice that the silver ores are constantly associated with antimony. Even the galenas having a cubical structure always contain a small percentage of antimony.

New Houses.

The coincidence of a man's moving into a new house and dying soon after has frequently been a subject of remark, and there is an avoidable cause—the house is moved into before the walls and plaster and the wood are sufficiently dried. Sometimes the cause of death is the poisonous character of the water conveyed through new lead pipes. No water for drinking or cooking purposes should be used in a building supplied with new lead pipes, in whole or in part, for at least one month after the water has been used daily; this gives time for a protecting coating to form on the inner surface of the pipes, when their chemical change from contact with water generally ceases.

But the damp materials of the house have the most decided effect, especially on persons over fifty years old or of frail constitutions; whereas if the person were in the full vigor of life and health, not even an inconvenience would be experienced.

In building a new house, or on going to live in another locality where the water supply is not far from the house, it should be ascertained with the utmost certainty that the spring or well is higher than the privies or barnyards. Insidious and fatal forms of decline and typhoid very often result from persons drinking water which is drained from the localities named.

The safest plan, and the only safe plan for furnishing dwellings with the most healthful and unobjectionable water, is to have a watertight cistern, and let the water from the roof of the house or barn, or other outhouses, be conveyed into it through a box of sand several yards long, this box to rest on a board, or cemented bottom and sides, so that no outside water could not get into it.—*Hall's Journal of Health.*

Solvent Powers of Water.

Water is a physical rather than a chemical agent in bleaching and dyeing; it is the vehicle which carries the chemical substance to the cloth to be operated upon, or which removes the matters necessary to be removed from it. When a substance is mixed with water, it may either be dissolved by it, and disappear, as salt does; or it may remain in suspension, as chalk does. Nothing is considered to be actually dissolved in water if it can settle out again, or if it will not pass with the water through a filter made of paper or calico; thus to talk of dissolving ground chalk in water is incorrect, for if allowed to stand it would settle out; or, if the mixture were filtered, the water would pass clear, while the chalk would remain upon the calico; but blue vitriol (sulphate of copper), for example, does really dissolve in water, and the liquor all filters through together; to deprive the water of the blue vitriol would require chemical means different in kind from filtration. Water, therefore, dissolves some substances and not others. Water does not dissolve the same quantity of all soluble substances; of some it can dissolve its own weight, and more; of others a small portion; and of some extremely little. As a rule, hot water dissolves more than cold, and more quickly than cold: but, upon cooling, the excess mostly falls out as crystals. This point deserves notice, for a liquor, which is of right strength when a little warm, may be too weak when it becomes cold; left in a carboy, for example, in a cold place, because the salt crystallizes out; this is the case only with those salts that are but sparingly soluble, as chlorate of potash, cream of tartar, sulphate of potash, etc. The crystallizing is sometimes troublesome in steam colors which, right enough when freshly made, become filled with small crystals, and rough on the machine; it is felt in the case of an ageing liquor, which contains chlorate of potash as an active agent, which, crystallizing out, leaves the liquor weak and not able to do its work. As a usual thing, the drug room upon a printing or dyeing works should be cool, but there are some liquors better in a moderately warm place; brown vitriol, for example, in winter time is apt to go solid in the carboys, if kept in an exposed place.—*Am. Tex. Manuf.*

Sir Richard A. Glass.

Sir Richard Atwood Glass died recently at Southampton, aged 53. It was at his factory that 1 250 miles of the first Atlantic cable of 1866 was wholly constructed, under the direction of Mr. Glass, who, on the successful completion of the undertaking, after ten years of unremitting labor, received the honor of knighthood. He retired from the company in 1867, and afterwards became chairman of the Anglo-American Telegraph Company. He was for a short time a member of the House of Commons.

The Detection of Death.

The late Marquis d'Ourche, one of whose friends was buried alive, left a sum of 20,000 francs ($4,000) to the French Academy of Medicine, to be given to the inventor of a simple process of ascertaining when death has really occurred, and a further sum of 5,000 francs to be awarded to the discover of a scientific method of verifying death. Altogether 102 essays were sent in for adjudication. Most of the papers contained such absurd suggestions that the list was practically limited to 32 competitors. The large prize was not awarded, but the 5,000 francs were divided between four competitors. No new facts, likely to enlarge the domain of forensic medicine, have been elucidated by these investigations.

MESSRS. MACNAUGHT, ROBINSON, & CO., of Southwark, London, England, have sent us diagrams of a most complete system of wrought iron girders for building purposes, made by them and kept constantly in stock. Their sections are cheifly of the double T form, and range from 2 to 6 inches in width, and from 3 to 14 inches in hight. The list also includes flitch plates, bolts, nuts, washers, etc., an arrangement very convenient for builders, who by consulting the chart can ascertain the approximate cost.

WE have received from Messrs. Goodnow and Wightman, of 23 Cornhill, Boston, Mass., an illustrated catalogue of tools, lathe attachments, and machinists' supplies, which provides for nearly all the possible wants of model makers and experimenters in mechanics. The line of small gearings is extensive and complete, and the book describes several new gages and combination tools, of value and interest to all inventors and amateur mechanics.

A NEW APPLICATION OF GYPSUM.—Gypsum mixed with 4 per cent of powdered marshmallow root will harden in about one hour, and can then be sawn or turned, and made into dominoes, dice, etc. With 8 per cent of marshmallow, the hardness of the mass is increased, and it can be rolled out into thin plates, and painted or polished.