Scientific American

NEW YORK, APRIL 3, 1851.

Cotton versus Flax.

It cannot be denied that great efforts are now being made in England to improve flax in its manufacture, so as to render it in a great degree a substitute for cotton. The high price of cotton during the past year, and the total dependence, it may be said of British manufacturers upon America for a sufficient supply of it, has led them to look about for some *escapement* which should enable them to regulate their own supply, and consequently their own prices. For this purpose, they have encouraged the cultivation of cotton in the East Indies, at an immense outlay of capital, but hitherto without success. And now just when cotton is so high in price, out comes the alleged new discovery of Clausen—a brief account of which we published last week, which is to make flax a cheap substitute for cotton. The principal improvement consists in treating the flax straw with alkalies and acids; obviating the usual tedious and unhealthy processes of dew and wet rotting; bleaching the straw, and splitting it up by a chemical process into minute fibres termed "flax cotton." Cotton is of a fine plastic rolling nature, which enables it to be easily drawn by machinery. Flax is of a very different nature, and heretofore, never could be operated by cotton machinery. The product of flax to the acre is more than ten times, by weight, that of cotton, but then there is a vast amount of refuse woody matter in it, all of which has to be separated from the fibrous parts, before it can be put upon a spinning frame. The expense of this process has kept flax higher in price than cotton. Mr. Claussen asserts that his new plan obviates the great expense and unhealthy processes hitherto practised for preparing flax. If it were true that the flax by this process could be produced as cheap as cotton, and that it could be spun as easily on the same machinery, surely the price of cotton would have been lowered by it before this, but it has not. There can be no doubt but great improvements may be made in the preparation and manufacture of flax, but cotton requires to undergo no such tedious process to prepare it for the spinning frame, consequently it will always maintain its natural value and standing as the most useful and easily manufactured fibrous material.

The Royal Agricultural Society of England, has taken up the subject of flax culture, with great zeal, and the process of Claussen has received the most marked attention. Measures are now in progress for the cultivation of a far greater quantity of flax in Ireland. Flax can be cultivated in Ireland equal in quantity, if not superior in quality, to any other in the world. That moist climate is peculiarly adapted for feeding a plant which derives so much nourishment from the atmosphere. The question which interests our people, is that of cotton, for it brings in a greater revenue than any other American product. If flax can be used as a cheap substitute for cotton, England will be the gainer and we the losers. Nothing should blind us to this view of the question—it is plain and rational. We have heard it suggested that as the deficiency of cotton crops for the past two years has increased the price of cotton, and "more money has been returned for a small than a great crop, it would be to our profit, to raise less, in order to enhance its price." This would not be good policy, it would certainly lead to the discovery of some suitable substitute that would be ruinous to the cotton business itself. The Dutch cut down the nutmeg trees of Ceylon, to enhance the price of that spice, and the result was most disastrous to such blind policy. The great object of our planters must be to produce the greatest amount of the best cotton to the acre, and to produce that, at the least expense to themselves. This will enable them to stand in the van of agriculturists in supplying the world with a material, the cheapest—and best as such—for manufacturing purposes.—This is a subject which, at the present moment, is of deep interest to our cotton growers.

The Probable Relation between Magnetism and the Circulation of the Atmosphere.

This is the title to the Supplement of the Washington Astronomical Observations of 1846, by the scientific Lieut. Maury, of the Washington Observatory, and which we noticed last week. It is a singular document: it begins with, "the discoveries of Farady in dia-magnetism are calculated to guide me and to illuminate the darkness by which I have oftentimes found myself surrounded, as I endeavored to follow the 'wind in his circuits' over the trackless wastes of the ocean. Oxygen composes one-fifth part of the atmosphere and is magnetic."

[In reference to Mr. Paine's letter, page 114, about Faraday making the discovery of oxygen being magnetic, we would state that he made this discovery years ago, long before the period referred to, as can be found in his published works—consequently Mr. Paine's allusion to Mr. Archibald is something we cannot understand.) The discovery of the magnetic property of oxygen, Lieut. Maury believes, "is the keystone for some of the most grand among the sublime and beautiful structures which philosophy is erecting for monuments to the genius of the age."

In the distribution of moisture, and the circulation of the atmosphere over the surface of the earth, he often suspected that there was some other agent at work than heat, and the rotation of the earth on its axis. His wind and current charts, which have conferred celebrity on his name, enabled him to trace a belt of calms near the Tropic of Cancer. From the zone of calms at the Tropic of Cancer, there proceed two currents, named the "trade winds." The north-east trade winds proceed from the south side of the belt of calms to the equator; and the south-west trade winds proceed from the north side of the belt of calms, and make up two-thirds of our south-west winds to England. These are surface breezes. From the equator there is a perpetual upper current to the tropical calms, equal in volume to the trade winds. One peculiarity of the trade winds is, that the south-west breezes give out a great deal of moisture, although proceeding from a calm belt to cooler regions, in a course where precipitation is the natural result. The north-east trade winds, on the other hand, proceeding from the same belt of calms, are dry at the very outset. It was supposed that the upper current which flowed from the calms at the equator, descended at the calm belt at the tropics, and then returned on the surface as a trade wind, then ascended at the equator, returning as an upper current, thus keeping up a continual ring of breezes, Lieut. Maury says," he knew of no agent in nature that would prevent the winds taking this circuit, but on the other hand, he knew of circumstances which rendered it probable that such in general is not the course of atmospherical circulation."

But there are also south-east trade winds, and Lieut. Maury has come to the conclusion, that the current which flows to the equator as a surface north-east trade wind, ascends at the equator calms, and passes to the south as an upper current, while the current which comes as the south-east trade winds ascended and passed to the calm zone of Cancer. The reasons for this conclusion are, that the evaporating surface of the south is the greatest, but all the great rivers are in the northern hemisphere, and at those seasons of the year, when the sun is evaporating most at the south, the greatest quantity of rain is falling in the northern hemisphere. Without taking this view of the subject, Lieut. Maury "could find no part of the ocean of the northern hemisphere from which the sources of the great rivers, Mississippi, St. Lawrence, and others, could be supplied. It appeared to me," he says, "that the extra tropical regions of the northern hemisphere stood in the relation of a condenser to a grand steam machine, the boiler of which was in the region of the south-east trade winds," and the north-west trade winds to the Tropic of Capricorn, on the other side of the equator, perform the same office to the regions beyond that tropic, which the south-east winds perform for our northern regions. In this pamphlet various letters are published from farmers dwelling in the south-western states, in answer to enquiries made by Lieut. Maury, stating that south-west winds generally bring rains in those regions. [In New York City, our easterly winds are the rainy currents—an east wind never fails to bring rain.] So far the evidence to the above deductions was only circumstantial, when he received a copy of Ehrenberg's work, from the Prussian Minister at Washington, and in it he found it stated, that this celebrated German microscopist discovered South American infusoria in the red rains of Lyons, Genoa, and other places of Europe. This, then, was direct testimony—*prima facie* evidence of the truth of his theory.

It is stated that, having likened the circulation of the atmosphere to a continued whirl of the wind in the arctic regions *against*, and the antartic *with* the hands of a watch, according to the electro-magnetic discovery of Ampere, he has found this conclusion very significant. The south-west winds enter the arctic regions, on a spiral curve, continually lessening the gyrations, until, whirling about in a contrary direction to the hands of a watch, this air ascends and commences its return as an upper current, to the belt of calms at the Tropic of Cancer.

Lieut. Maury attributes to magnetism that influence or power "which guides the air from the south through the calms of Capricorn, of the equator, and of Cancer, and conducts it into the North," and back again. This he compares to a spiral coil, and the continuous circuit of a magnetic current passing around both poles and winding across our globe. The attractive and repulsive influence is attributed to the nature of oxygen, which, as its temperature is increased, diminishes in para-magnetic force, and which increases as its temperature falls The subject is a sublime one, and is treated in that curt, mathematical, and forcible style peculiar to the old authors. He states that the footsteps, only, of this agent—magnetism influencing the winds—have been discovered. There are yet great mysteries in the ocean of air which envelopes us. The general calms in the arctic regions, and the great storms in the antartic, have yet to be properly accounted for, but hitherto we have looked upon our atmosphere as neutral in relation to magnetic force, because oxygen is magnetic and nitrogen dia-magnetic. Our atmosphere is a compound of a magnetic and a dia-magnetic gas, and the dia-magnetic is as 5 to 1, consequently the oxygen must have the least influence; but may not this account for the difference of whirls at the opposite poles?

Inventions, Patents, Patent Laws, &c., in England.

We have received, through the politeness of Messrs. Thos. Prosser & Son, a brief pamphlet published in England, containing "Observations and Suggestions," by a member of the committee of the Society of Arts, prepared in conformity with certain principles laid down in November, 1850, by a committee of said society, to promote legislative recognition of the rights of inventors. In the observations contained in this pamphlet there are some mistakes: it is stated that "no trace of protection for invention is to be found in the Roman Civil Law." If, by this, it is meant that no written *patent* was issued by government, or its officers, the statement is correct, but that public rewards and honors were bestowed upon authors and inventors, every one who has read history can attest, and there are also laws to be found for their encouragement. A very extraordinary error is made with respect to the American Patent Law. The writer quotes the clause of the Federal Constitution adopted in 1787 giving Congress the power to pass laws "to promote the progress of science and useful art, by securing, for limited times, to authors and inventors, the exclusive right of their respective writings and discoveries," which, he says, is dated in 1790, and which he confounds with the Act of Congress enacted in pursuance of it in 1790. This clause of the Constitution was borrowed from a clause in the Articles of Confederation adopted during the Revolutionary War, and is nearly word for word like it. There are several suggestions touching the modification and improvement of the English statutes, which are worthy the attention of her law makers. We have, on several occasions, advocated a change in the laws of Great Britain, and we still hope that some action will be taken upon them at an early date. To say the least they are very unjust to the English people as well as the inventor.

Silver Change and the Three Cent Pieces.

At the present time it is very difficult for mechanics and tradespeople, in our city, to do their little retail business with grocers, &c., on account of the scarcity of small silver change. No body will give change for bills without a bonus of five per cent. This is owing to the rise in the value of silver. Seme opaque philosophers have not been able to account for this, and say, in some long-winded articles in our reviews, that they do not know whether silver has grown more valuable, or gold less valuable. Just let them ask a mechanic the question, after having changed a V for silver, and they will soon get a correct answer. The silver coin should be reduced at the mint, if it could be, to meet the demand of the relative current value of silver to gold, so as to keep the silver in the country. We are right glad at the prospect of the three cent silver coins, which will soon be in circulation to meet the demand of the Post Office Bill. Three cent pieces are going to be the most convenient coinage for small change that we can possibly have. The following statement will show how easily change can be made with them:—for payment of three, six, five, and ten cents, the existing and proposed silver coins would naturally be used. For nine cents, give three three cent coins; for eight cents, a five and a three; for one cent give two threes and take a five, or give a dime and take three threes.

A Patent Suit.

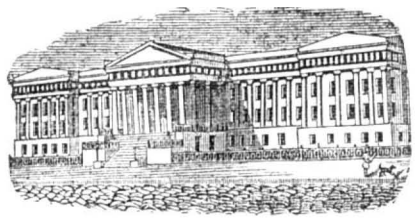
The Trenton True American, N. J., of the 26th gives an acount of the termination of a suit in the U. S. Circuit Court for the district of N. J., Judges Grier and Dickerson presiding, and the parties being Horace H. Day, vs., Charles Goodyear. The motion of the plaintiff was for an injunction to restrain the defendant from prosecuting a suit upon a covenant upon the ground that the covenant sued upon by the defendant was not all the covenant between the parties, and that the complainant could not defend himself against the single covenant sued upon, but could do so upon the whole covenant. The defendant contended that if there were any other agreement than the one sued upon, the complainant might plead it himself, and could not call upon the defendant to set it out in his declaration. The Court decided that this was only a question of pleading, and that it appeared by the authorities that the complainant could not, under the state of pleadings at law, avail himself of his full defence; and that the suit at law should be restrained until answer of defendant was put in. The injunction demanded by Day was granted, and thus confirming the verdict of the Jury at the last term of Court. Vroom, for the plaintiff; Staples, of New York, for defendant.

A Clock for Sixty Cents.

Mr. Chauncy Jerome, of New Haven, Conn., has actually made a time piece, which he will warrant to keep good reckoning, and which he sells for 60 cents at wholesale, and $1 at retail. The works are all made of brass. He makes upwards of 800 a day of these articles.—[Exchange.

[After this let no one want a clock. A few years ago, (only 12 we believe) the old wooden clocks sold for $10, now no one will have a wooden clock. Common brass clocks can be bought in abundance for $2 a piece, but it seems Mr. Jerome has capped the climax of cheap time keeper.

With a diamond point, in a good ruling machine, employed by engravers, parallel lines may be ruled upon plate glass as fine as 2,400 to an inch. This would appear incredible, yet it is stated by good authority; and yet, for all this, there are insectoria—active and living creatures, more minute than any of these lines.



☞Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING MARCH 25, 1851.

To Geo. Heffley, Samuel Conrad, and Jas. Wigie, of Berlin, Pa., for improvement in adjustable land sides of Plows.

We claim providing a right-angled heel plate with a hook, for the purpose of interlocking with a hook-shaped projection, attached to the land bar, forming a hook joint, said heel-plate forming the bottom and side of the land bar, and having its rearward portion susceptible of vertical adjustment, by means of a screw, and when adjusted being clamped by a horizontal screw bolt, its shank being placed in a segmental slot, to admit of its moving with the heel-plate, as described.

To C. W. Krebs, of Baltimore, Md., for apparatus for securing shutters in any required position.

I claim the right to the rods, pintles, sockets, screws, and apertures connected, arranged, and acting substantially in the manner and for the purpose described.

To Michael Norton, of Cambridge, Mass., for improved Sash Hook.

I claim the spring to throw the turning hook outwards, the spring-catch, G, (applied to the frame of the hook), and the projection, H, (extending either from the curved rail, or the lower window sash), in combination together, and with the said clamp hook and rail, the whole being made to operate substantially in the manner specified.

To Lewis Thorn, of Philadelphia, Pa., for improvement in Extension Tables.

I claim, first, the slides E and F, in combination with the cross-bars and folding rails; and second, the recess for the reception of the loose leaves; being formed substantially in the manner and for the purpose set forth.

To N. W. Speers, of Cincinnati, Ohio, for apparatus for moving and securing shuttles, etc.

I claim the manner of opening and closing window shutters from the inside, and securing them firmly at any point in their semi-circuit, by means of the horizontal screw shaft inserted in an opening in the lower portion of the window frame metallic nut surrounding the same, and the bar or plate attached to the shutter, substantially as described.

To R. C. Stevens, of Syracuse, N. Y., for improved apparatus for drawing and measuring liquids.

I claim the combination of measures with faucets, cocks, or gates, used in drawing liquids from can casks, barrels, &c., in such a manner, that, by opening the faucet attached to the cask, the measure will be filled; then, by closing the same, the desired amount may be drawn by opening the corresponding faucet in the measure; the whole combined substantially as described and for the purpose set forth.

To E. G. Lamson, of Shelburne, Mass., for improvement in Scythe Fastenings.

I claim the combination of the two wedge shaped bearers, the confining bolt, and the support at the extreme or other end of the shank, as constructed, substantially in the manner specified, the whole being for the purpose of enabling a person to change the positions of the blade of the scythe, in a direction transversely of the plane of the blade.

To Heman Whipple, of Port Richmond, N. Y., for improvement in machines for preparing clay for making brick.

I claim the use of a revolving screen, constructed of bars set at a slight inclination from the horizontal position, having lugs or crushers within it, each lug being hung or suspended at one end, on a bar, and prevented from touching or rubbing the screen, by a cord or chain attached to its other extremity, and rod, supporting it, or constructed and operating in any manner substantially the same and for the purpose herein set forth.

To Henry Klepfer, of Cincinnati, O., for improvement in upright Pianofortes.

I claim the arrangement of the sounding board in upright pianos between the strings and the performer, substantially in the manner described.

To Nathaniel Lamson, of Shelburne Falls, Mass., for improvement in Scythe Fastenings.

I claim the arrangement of the hole or holes of the head of the confining clasp, in such manner, with respect to the axis of the screw that when the said screw is turned one hundred and eighty degrees, the position or positions of the hole or holes, may be changed in such a manner as to secure one or more new and different positions for the shank, the same being for the purpose as specified.

To F. B. Stevens, of New York, N. Y., for improvement in Balanced Valves.

I do not claim, as my invention, valves having seats of such relative diameters, that they shall be retained thereon by the pressure of steam; but I claim the above description of valve, where the disc is held by a support running up through the hollow valve, so forming the valve that the upper seat shall be larger in diameter than the lower one, by means of the ring attached to the valve, and by means of the ring attached to the seat, or by any means substantially the same, for the purpose of retaining the valve in its seat, by the pressure of steam, whenever its position or location, in respect to the steam passages, is such that the pressure of steam is below the valve when closed.

RE-ISSUES.

To Horace Billings, of Beardstown, Ill., for Composition for covering Hams. Originally patented 9th April, 1850.

I do not intend to claim as my invention the covering of meats or other articles, with paper and cloth, or other flexible material, previous to coating them with my preserving composition; but what I claim is the formation of a preserving composition for coating meats, cheese, fruits, vegetables, &c, by the union of rosin, shellac, or seed lac, and linseed oil, or other oil of a similar nature, substantially in the manner and in nearly the proportions as set forth.

To James Phelps, of West Sutton, Mass., for improvement in Washing Machines for cleaning rags. Originally patented Nov. 24, 1843.

I claim an adjustable, rotating water elevator and strainer, arranged substantially as herein set forth, in such manner that it can be raised or lowered in the vat of the washing or beating engine, to vary the quantity of water discharged therefrom; or can be raised entirely from the vat to stop the discharge of water, or for other purposes, as set forth.

I also claim a rotating prismatic screen or strainer, for straining the water from the paper stock, in the vat of a washing or beating engine, in combination with devices for discharging the strained water, the prismatic screen being not only more efficient than a cylindrical screen, but also admitting of more ready repair.

DESIGNS.

To Wm. & Wm. H. Lewis, of New York, N. Y., for Design for Pedestals and Columns.

To Joseph Pratt, of Boston, Mass., for Design for Parlor Grates.

Beware of Eating Red Wafers.

A coroner's jury, in London, lately held an inquest on the body of a child, 9 years old, who came to his death in the following manner:—The deceased was playing in the street with other boys, when, seeing some bright red wafers lying before the door of an oil-shop, they tasted them, and subsequently ate some. All the lads were taken ill, and deceased, who had eaten more then the others, died. The wafers contained red lead, and the symptoms of the boys' illness were those which ordinarily follow poisoning by that metal. The jury returned a verdict of "Accidental Death," with an admonition to the tradesman from whose shop the wafers had been incautiously swept.

(For the Scientific American.)

Practical Remarks on Illuminating Gas.

A lack of general knowledge in a large portion of our community, pertaining not only to scientific, but to matters of universal daily use, is very evident; and a want of inquiry into the causes of the phenomena of the events which are constantly transpiring before us, is likewise very apparent. The most trivial effect has its cause, although it may appear at first enveloped by a seemingly impenetrable cloud of obscurity, still upon a little wise reflection, to every cause can be assigned an effect, and every effect can be traced to its own legitimate cause.

In the present article it is attempted to include such an account as the limits will permit, of the principles and the processes of the manufacture of gas for illuminating purposes.

If the various inquiries, made by many in the community, are any criterion by which we may judge of the tenor of the information of the mind upon this subject, it is time that a practical work should be placed within the means of every person, and particularly such as are now deriving the benefits of this great blessing. The want of a general knowledge and understanding of the principles of illuminating gas, is forcibly and truthfully shown by the ease with which people are led away by new lights (and I may say, too, false lights) which are brought before an unwary public, either from a speculative motive, or to gain notoriety, or perhaps by individuals, who, having more zeal than knowledge, are wrought into a false belief, by tenaciously clinging to what they consider their own new ideas. To aid in the more general diffusion of practical knowledge is the writer's aim, and if he should succeed in adding one thought to any person's vocabulary of wisdom, from whence a single new idea may germinate, his object will be fully gained.

It is within the memory of nearly all of us when the principal streets and avenues of our city were *supposed to have been lighted* by oil at night, and travellers were obliged to grope their way among these now-luminous objects, which seemed to render the darkness more visible, and the surrounding gloom served as an admirable covering, under which depredators could operate unseen and undetected. But now, when we look around us and see the great change which has been brought about through the influence of men of science and ingenuity, and are permitted to pursue our various vocations under the influence of this genial and cheerful light, ought we not to feel greatly indebted to the highly gifted and enterprising individuals by whose talents and industry, so great a blessing has been conferred upon society. And it is to this blessing, this new light, I would call the reader's attention.

The term *Gas*, in chemistry, synonomous with air, is employed to signify any elastic, invisible, aeriform fluid, permanent at the common temperature of the atmosphere, and not wholly condensable by any known degree of cold, natural or artificial. Animal and vegetable substances contain embodied within themselves gas; and all matter of a fatty, resinous, or bituminous nature, contains carbon and hydrogen, which become liberated when the substance is decomposed by heat, and form a new combination; this new combination is composed of 1 atom of carbon and 2 atoms of hydrogen, its atomic formulæ, therefore, would be $C+H^2$, and is termed carburetted hydrogen gas. Carbon, literally speaking, is the base of all illuminating gases, its richness and value being wholly dependent upon it. Before we proceed farther, it may be well to look into the nature of these two constituents, in order to have a perfect understanding of these important elements, and thereby to become familiar with their properties.

CARBON—This substance is very generally diffused in nature; all animal and vegetable substances contain it as do many of the minerals, either in the form of carbon or carbonic acid, free or combined. In charcoal, soot, coke, and animal carbon, it is black, amorphous, and very combustible; in graphite it is black, with a chrystallized foliated structure; and in the diamond it occurs diamorphous, colorless, and is chrystallized as a four-sided double pyramid (octahedron). United with oxygen it forms carbonic oxide, and with still more oxygen, carbonic acid. Carbon exists in all varieties of natural coal, bitumens, petroleum, and naptha; and in the form of carbonic acid, is contained in limestone, chalk, and various other minerals.

HYDROGEN—This substance was discovered in the year 1776, by Cavendish, and was formerly called inflammable air; its name is derived from two Greek words, signifying *water* and to *generate*. It is the lightest of all ponderable matter known, 14½ measures of it weighing only as much as 1 measure of atmospheric air. It is colorless and, when perfectly pure, inodorous; it is inflammable in an eminent degree, though, like other combustibles, it requires the aid of a supporter of combustion. It is attended with a yellowish blue flame, and a very feeble light. United with oxygen it forms water, and in the same proportions it is, in the aeriform state, an exceedingly explosive compound.

The first account which history affords of the knowledge of the existence of illuminating gas appears to be in the year 1664, when Dr. Clayton made known that combustible illuminating gas was produced during the decomposition of coal by heat; and that this could be collected. It was observed and experimented on, a century after, by Drs. Hales and Watson.

Lord Dundonald built some coke furnaces in 1786 and amused himself by collecting the evolved gases in tubes and burning them, but without any definite object.

Since the year 1792, another Scotchman by the name of Murdoch, to whom we are indebted for the invention of the useful application of gas, occupied himself incessantly with experiments up to the year 1796; which efforts were crowned, in 1798, by the erection of gas works for illuminating the manufactory of Boulton and Watt. Independently, and about the same time, Phillip Le Bon, a Frenchman, succeeded in illuminating his house by an apparatus in which he evolved the bad gas from wood (probably a mixture of carburetted hydrogen, carbonic acid, and carbonic oxide gases). The first establishment for the manufacture of coal was erected in London in the year 1805. In the year 1808, Mr. Samuel Clegg constructed an apparatus for producing gas, and communicated to the Society of Arts in Manchester; and a silver medal was voted Mr. C. for his communication. Mr. Murdoch, the same year, made a communication on the subject of gas-light to the Royal Society, and was complimented with Count Rumford's Medal for the same. Gas was employed for street illumination in London in the year 1812, and in Paris in the year 1815. In 1823 there were four large gas companies in London, having in all forty-seven gas holders at work, capable of containing 917,940 cubic feet of gas, and were supplied by 1315 retorts, which generated, per annum, 397,000,000 cubic feet of gas; by which 61,203 private lamps, and 7,268 public or street lamps, were lighted in the metropolis. From that time to the present the formation of new companies, the erection of extensive manufactories, and large expenditures, have become requisite to meet the increasing demand of the citizens for this highly desirable and economical light. At the present time the annual consumption of gas in the city of London is 3,000 million cubic feet; equal to about from 50,000 to 60,000 tons.

J. B. B.

(To be Continued.)

Fresh Water Frozen Beneath the Sea.

Fresh water was found frozen into solid ice in the lead which conveys the Cochituate water under the sea water of Boston Harbor to East Boston, and which pipe is 36 feet below the surface of the water. The explanation of the phenomena is, that fresh water freezes at 32 deg. F., while sea water requires a reduction of temperature 4½ deg. lower, or to 27½ deg., before it solidifies. Thus, the salt water was doubtless cooled, below the freezing point of pure water, and conducted away the heat from the lead pipe, so as to lower its temperature sufficiently to cause a film of ice to form on the inside of the pipe, and by successive layers of ice the pipe was gradually filled.