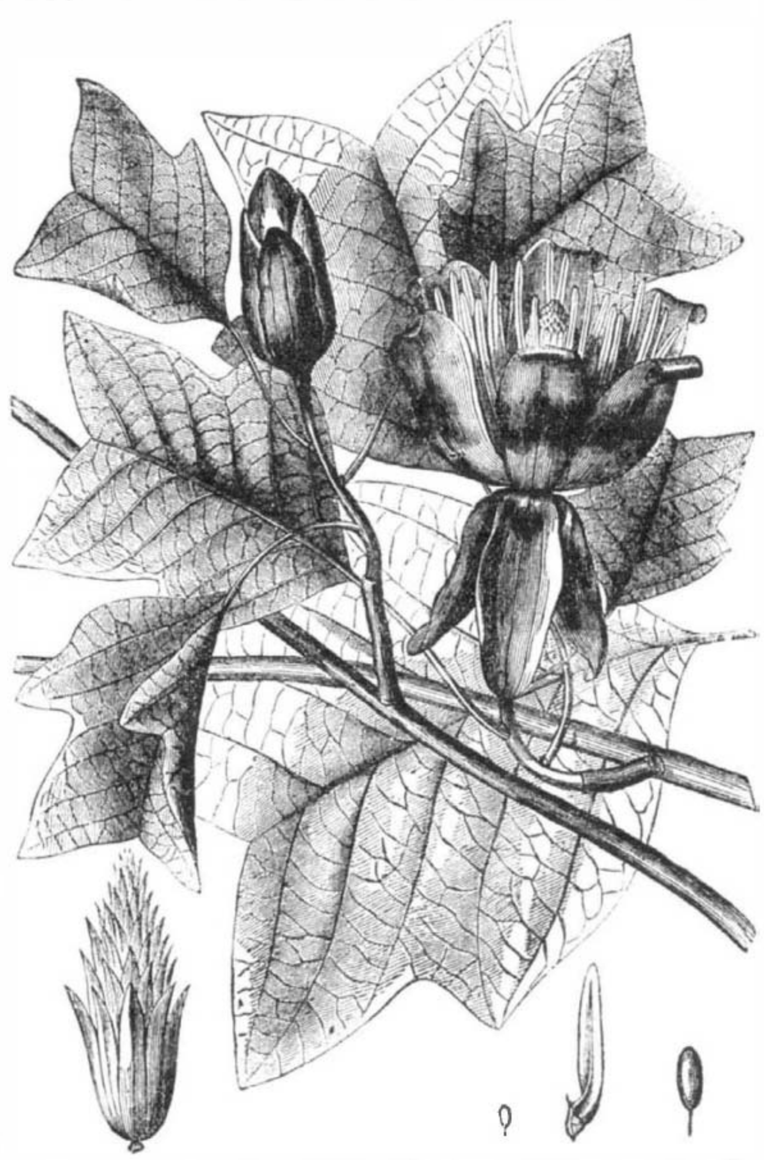
THE TULIP TREE.

This noble tree deserves a place on every lawn, as it seldom fails to develope itself into a stately specimen in any good,deep,well drained soil. In habit of growth, it closely resembles the common maple, but its conspicuous orange-tinted blossoms and scaly fruits at once suggest its near affinity to magnoliads, to which it belongs. The flowers are not unlike those of a tulip, and hence the name by which it is most generally known. The broadly expanded leaves, instead of being palmate as in the plane, are irregularly four-lobed,and somewhat resemble a saddle in conformation; and it is sometimes called in the vernacular the saddle tree, from this peculiarity. Our illustration gives an excellent idea of the flowers, foliage, and fruit. The flowers are profusely borne during the summer months; and although not strikingly ornamental on the tree on account of their being somewhat hidden amid the ample foliage, when cut and arranged in a vase with the foliage that naturally belongs to them, they have a distinct and striking appearance. This tree is from 100 to 150 feet in hight, but in Europe it rarely exceeds 70 or 80 feet. In the old arboretum at Chiswick, Eng., there used to be two specimens of this fine tree,one having much largerand brighter colored flowers than the other; and, doubtless, other varieties of it exist where plants are raised from seeds. All through the summer the foliage is of a fresh, pale green; and, in the autumn, it dies off a brilliant golden yellow. Striking effects might, therefore, be obtained by grouping it with *quercus coccinea* or the purple-leaved beech. In addition to its ornamental properties, its distinct and noble port commending it at once to the notice of intending planters, it is valuable as a timber tree, the wood being firm in texture and capable of taking a fine polish.



FOLIAGE, BLOSSOM, AND FRUIT OF THE TULIP TREE.

The Diving Bell.

M. Toselli states that he has been making experiments with his submarine vessel, or "marine mole," as he calls it (of which we gave a description on page 19 of our last volume). He is struck with the correspondence, of many of the phenomena, to those observed in ballooning; and considers that it is at the bottom of the sea that the problem of aerial navigation will be solved. In a liquid mass which is still, the machine moves quite well in obedience to the screw propeller, which is driven by the hand. But if the vessel meets a current, it is vain to think of contending with it. Another difficulty, as in balloons, is orientation. Once a balloon has got to some distance from the earth, it becomes impossible to tell the direction in which it is going. The needle is useless. And, similarly, in the "marine mole," when it is only 0·39 of an inch under the surface, and nothing is seen in motion but the fish, the compass is found of no use. To go to a certain point, an artificial meridian has to be arranged outside. M. Toselli remarks, too, on the great distinctness with which sounds are heard. At a depth of 110 feet, the screw of a steamer, passing about 660 yards off, sounded in the (hermetically closed) mole as if directly overhead. The contrivance of M. Toselli, affording, as it does, a novel opportunity of observation, may furnish some instructive data in physics.

The Remarkable Mineral Treasures discovered in Massachusetts --- Rich Mines of Gold, Silver, Copper, and Lead.

Since the gold excitement a quarter of a century ago, says the Boston *Advertiser*, when the "forty-niners" flocked to the Pacific coast, there has been no discovery of the precious metals so important and yet exciting so little general interest, as the developments made during the past three months in the little town of Newbury, in Essex county,Mass. Four months ago the existence of any such ores was known to but two persons, and they were by no means aware of the magnitude of their discovery. When the matter got into the local papers, one gentleman of this city thought it worth while to investigate it, and the result has been, in brief, preparation for mining on an extensive scale, with prospects of returns far more remunerative than were ever known before.

The discovery dates back only to 1868,when a Byfield man, named Rogers, said to be a rather dissolute character, in his wanderings over Highfield Pasture first noticed the ore. Something in the weight of the stones which he picked up, and occasional gleams as the sun glanced on small, smooth surfaces, induced the belief that there was metal in their composition; and if metal, then something of value. With this idea he collected a number of the best specimens, and some time after took them to Mr. Albert Adams, a quiet bachelor farmer residing in Newbury. Mr. Adams became greatly interested in the matter, believing that a great discovery had been made. He began to study mineralogy and geology. Becoming convinced that metal was present in quantity, he was soon confident that it was silver and lead. He pursued his investigations very quietly; and finally concluded to secure by purchase the land on which the specimens were found. For this purpose advances were made to an old farmer named Jaquish, who had long owned the pasture, and the lot, measuring twelve acres, was transferred to him for $350 early in April of last year. He then began digging. The surface finds, or float ore, were naturally more or less oxydized by the action of the elements, but at a depth of six feet he struck the true vein. Several tuns were then taken to his barn and further examination made.

Dr. E. S. Kelley, of Boston,and Professor R. H. Richards, of the Institute of Technology, subsequently examined the premises and minerals. From their report it seems that the rocks in the vicinity are gneiss nodes, and quite hard. The strike or line of outcrop is about N. 70° to 80° E. the dip about 30° to the N. W. As he found it, the line of the vein was about N. 72° E. by the compass. Four specimens were assayed. The first,coarse grained galena,assayed for silver, yielded $56.37; and the second, fine grained galena, $75.23 per tun. The third, a comparatively pure piece of gray copper, containing also some quartz and galena, assayed for silver, copper, and incidentally for gold,yielded, of silver, $1,270 per tun; gold, $129 per tun; and about 27 per cent of copper. The fourth specimen, weighing about three pounds, tried for lead, was found to be nearly pure and hammered quite readily. The lead was fifty-two per cent of the whole matter.

After this a large extent of the adjoining property was secured, and in September last systematic mining operations were begun by the sinking of a shaft ten feet square. As the shaft increased in depth, the vein—which is what is known as a fissure vein, that is, metal between two walls of granite, where in all probability it was thrown by volcanic action—broadened from three feet at the surface to seven feet at present working, twenty-five feet down. As the men descend, the vein grows richer and purer, the proportion of silver and gold increasing, while that of lead remains about the same. The south wall has not yet been reached. The men are therefore working on the pure metal, the north wall being perfectly perpendicular. In consequence of this fact, which is totally without a parallel in mining history, there is but the smallest possible expense incurred in removing the ore—about one dollar per tun. About ten tuns are taken out, being hoisted up in baskets, every twenty-four hours. To work this quantity, only four men are required by day, and a relieving gang of equal number by night. This ore,which is piled in a storehouse,as at present mined yielded $90 per tun of silver, $70 of lead, and $11 of gold; a total of $171. The cost of smelting and separation is $20 per tun, so the profit is about $150 per tun. Near this first shaft, on the forty acre lot, they have sunk the second shaft, begun in last October. This is of about the same size as the first and is down almost as deep, the vein working about four feet in width and the ore being of similar purity. This vein, like that first found, broadens as it is dug out. Four men work in this shaft at night and four during the day. Shaft houses have been erected over the mines, and a large storehouse and a boarding house for the men built near by. Housing the shafts will enable the men to continue work during the winter.

Mining experience has demonstrated that a fissure vein is always without bottom. This vein is estimated by geologists to extend in its general direction,20° east of north,about six or seven miles in length. Bearing this fact in mind, the wealth to be reasonably expected from this "find" can only be estimated by comparison. The Comstock lode in Nevada, hitherto supposed to be the richest silver mine in the world, yields only $45 per tun on the average, while the Newburyport yields just double that. The Mariposa mines, which were sold a few years ago to a company for $10,000,000, yield only $15 per tun of silver. The Belcher mines in Colorado, which yield about $40 per tun, divided $900,000 among the stockholders as the profits of work during the month of August, 1874; and these mines had not the additional profits accruing from the product of lead.

Chalk in Artificial Fuels.

We have remarked paragraphs in sundry home and foreign scientific journals relative to the utilization of chalk, such as is found in natural beds,as a source of heat. Various descriptions of improved fuel have appeared, in which the above material has been mixed with bituminous coal and various earthy substances, and the compound thus produced is stated to have increased calorific properties. How this result can be directly ascribed to any active effect of the chalk, we fail clearly to comprehend.

Chalk is a body already the result of a combination of carbonic acid and lime. By heating at a high temperature, the material may be decomposed; and it absorbs an amount of heat equivalent to that produced at the moment of combination. Carbonic acid and lime result, and these themselves are also burnt bodies, neither of which can individually produce heat. If the carbonic acid, after contact with an incandescent combustible, is transformed into carbonic oxide, it is simply through the absorption of exactly the quantity of heat which would be produced by the transformation of carbonic oxide, in turn, into carbonic acid. So that,theoretically and according to all present chemical ideas, it is impossible to conceive that lime,no matter in what form it be utilized,can be a source of heat.

It remains therefore to account for the advantageous results which are claimed to have been secured by the admixture. In domestic heating, the types of apparatus commonly employed are the grate and the stove. A grate fire utilizes about one tenth of the heat developed by the combustible, that is, about this fraction goes to warm the room, while the remaining nine tenths flies up the chimney. It is radiant heat that warms our apartments. Now if, by mixing chalk or limestone with the fuel, the combustion is retarded, the chalk, by absorbing a portion of the heat which otherwise would be lost, serves to increase the radiating surface, it thus probably augments the quantity of heat utilized.

In stoves an analogous state of affairs exists, and it is not impossible to conceive that such,in the instances noted, may be advantageous. But for the production of steam, wherein active combustion is required, it is certain that the addition of such foreign matter to the fuel can exercise no useful effect.

Talent and Tact.

Talent, it has been said, knows what to do, tact knows how to do it; talent is wealth, tact is ready money; talent has many compliments from the bench, tact touches the fees of the client; talent makes the world wonder that it gets on no faster, while tact excites astonishment that it gets on so fast. Tact makes no false step; it takes all hints, and, by keeping its eye on the weathercock, is able to take advantage of every wind. This promptness in seizing an opportunity, and diligence in following it up, is scarcely less valuable than industry. Instances might be given indefinitely of the results that have followed the immediate utilizing of an accidental discovery in mathematical demonstration, in chemical analysis, in mechanical invention, and in manufacturing operation.

Correspondence.

Remarkable Optical Phenomena.

To the Editor of the Scientific American:

Last evening, a curious optical phenomenon was visible at this place at sundown. For three days the weather has been very sharp (thermometer 10° to 12° below zero); and yesterday afternoon, flaky clouds lay in the west. Just at sunset, the full disk of the sun,considerably magnified,was seen behind a thin veil of cloud, but shorn of its rays, lusterless,and resembling the full moon, which it did not much exceed in brightness. The full disk was so clearly seen in all its parts that it was a matter of surprise that it was not brighter. This surprise was increased on observing, about twenty degrees to the right and a little above, a dazzling brilliancy, as if the sun were struggling to burst through a rift in the the clouds. It was hard to believe that the real sun was the lack-luster orb that was slowly passing down through the distant hemlocks, and not the one of which the radiance was making the whole west a blaze of light. The phenomenon lasted for some ten or fifteen minutes, and until the disk of the sun had completely passed out of sight. The luster then slowly faded away. The explanation that I give is that two clouds of snow crystals lay in such positions that the one cuts off the light from the sun, the other reflected it to our eyes.

To-night,another optical phenomenon has attracted my attention. The frame of a picture in my room has the appearance of being bent, when seen across the room, the lamp being on one side. This is beyond our power of explanation at present. At the point where the light strikes upon the frame, which is a gilt one, it seems bent or broken.

Troy, Pa. O. B. J.

Early Submarine Telegraphy.

To the Editor of the Scientific American:

In your journal of January 9th, Mr George B. Prescott gives a brief account of some of the earlier experiments in sub-aqueous telegraphy. As this is a matter of much scientific as well as historical interest, I trust you will afford me space for a few notes on the same subject.

Prior to the employment of gutta percha for this purpose, various attempts were made to insulate sub-aqueous telegraphic conductors, which were attended with only partial success. The plan usually adopted was that of winding the conducting wire with thread saturated with insulating compound, and inclosing it in a tube. Dr. W. O'Shaughnessy made the first actual experiments of this kind for telegraphic purposes. He built a line, 21 miles in length, of iron wire, supported on bamboo poles, near Calcutta, India, in 1839. His line also embraced 7,000 feet of submerged wire, insulated with cotton thread saturated with pitch and tar. This was the first telegraph line of any length ever constructed in any country, and was worked successfully.

The first public telegraph line in England was opened from London to Gosport, 88 miles, in February, 1845. In the summer of 1846, an attempt was made under the direction of Professor Wheatstone to extend this line across the harbor to Portsmouth by means of a submarine wire a mile in length, but it failed to work successfully. This wire was, I think, insulated with india rubber, and enclosed in a leaden tube.

Gutta percha was first introduced into England in 1845. In March of that year R. A. Brooman patented the method now universally employed, for preparing the raw material for use in the arts. Covering everything into which gutta percha could be manufactured, this was called the Master Patent. In September of the same year, Henry Bewley patented a machine for making tube, hose, etc., similar in principle to the American lead pipe machine of Tatham, patented in 1841. In 1846 C. W. Siemens of London sent a sample of gutta percha to his brother Dr. Werner Siemens, who had been appointed a commissioner by the Prussian government to consider a telegraphic system, to see whether it would answer for coating subterranean wires. The latter soon discovered its remarkable insulating properties, and recommended an experiment upon a large scale, which having been sanctioned, he laid down a line of about five English miles near Berlin, Prussia, in the summer of 1847, which worked successfully. (*Journal of Society of Arts,* April 23d, 1858.)

In 1847 and 1848 more than a thousand miles of gutta percha covered wire was laid down in Prussia, which for several years proved successful, after which it gradually failed owing to the impurity of the material. In March, 1848, Dr. Siemens made several successful experiments in the harbor of Kiel for the Schleswig-Holstein government, using a gutta percha cable of considerable length for firing submarine torpedoes. The same year he laid across the Rhine, at Cologne, a gutta percha coated wire, which was protected by a strong chain.

In 1846 the Gutta Percha Company was formed in London for the purpose of working the Brooman, Bewley, and other patents. In June, 1846, Mr. Samuel T. Armstrong of New York received from one of the directors of this company a small quantity of the raw gutta percha, together with an invitation to visit the works in London. He left for Europe in March, 1847, spent six months in England and on the continent, visiting all the gutta percha factories then in existence, and finally purchased the patents for the United States, returning to New York in September, 1847. While in Europe he doubtless witnessed the manufacture of the insulated wire for Dr. Siemens, an immense quantity of which was furnished in 1847 by the same Gutta Percha Company of London.

In the latter part of 1847, W. S. Wetmore, of New York, imported a consignment of gutta percha for Mr. Armstrong. It was probably some of this lot with which Mr. Craven experimented, as mentioned by Mr. Prescott. I have been told that Mr. Craven and his wife covered a wire themselves at their home in Newark, N. J., which he laid down as an experiment at the Passaic river crossing, in that city. On the 22d of May, 1848, Mr. T. M. Clark, Secretary of the Magnetic Telegraph Company, wrote to the Treasurer, George H. Hart, Esq., of Philadelphia:

"The wire has been down there (at Passaic river) nearly a month, and it has worked to a charm. It has been tested in various ways to see if there is any difficulty about it, but none has ever yet appeared. I am well satisfied that the plan is a good one, provided the wires can be kept out of the reach of anchors." This cable was therefore probably laid the last of April, 1848. Mr. Prescott states that James Reynolds covered the first cable that was laid across the Hudson River from New York to Jersey City, but makes no mention whatever of Mr. Armstrong, who was the proprietor of the establishment at which the cable was covered, and the owner of the Brooman and Bewley patents under which it was made, Mr. Reynolds (who was then employed by him) being the man who built and probably ran the machine used in coating the wire. This machine was the same in principle as Bewley's and Tatham's, previously mentioned. The cable referred to consisted of a No. 9 iron wire covered with half an inch in diameter of gutta percha. It was laid at 5 o'clock on the morning of the 15th of June, 1848, by the steamboat United States, from Cortlandt street, New York, to Jersey City, under the personal supervision of T. M. Clark and John W. Norton, directors of the Magnetic Telegraph Company. This cable had a leak in it from the start, but New York and Philadelphia telegraphed through it—by alternately cutting off the battery at the receiving station—for four days, when the wire was cut by an anchor

Mr. Craven applied for a patent on the 12th of May, 1848, for his process of insulating wire by means of gutta percha. William Gordon also applied for a patent for the same thing on the following day, May 13. Both of these applications were rejected on the ground that, the insulating property of gutta percha being well known, its use to protect wires was not a patentable invention. Reynolds applied for a patent on his machine, June 9, 1848, which was rejected for lack of novelty. But notwithstanding all this, one George B. Simpson of Washington succeeded in engineering a bill through Congress, giving him a patent for insulating wires with gutta percha, which was issued May 21, 1867, and is now in force. Even if the subject matter were patentable, it is difficult to see how any one in this country could rightfully claim the invention, as it was made by Dr. Siemens in the winter of 1846-47, and the first importation of gutta percha into the United States was not until near the close of 1847. Mr. Prescott says: "One of Mr. Reynolds' workmen named Champlin, shortly after this cable was laid, went to England and communicated the process to the Gutta Percha Company" etc. This statement cannot be correct; for as we have seen, the cable in question was not laid till June 15, 1848, while the Gutta Percha Company probably covered Dr. Siemens' four miles of wire in the summer of 1847, and certainly the 1,000 miles subsequently laid down by him in 1847 and '48.

W. H. Barlow took out a patent in England, April 27, 1848, for covering wire with gutta percha by means of heated grooved rollers. The Bewley machine has, however, been much more generally used for this purpose than any other, having of course received more or less improvement at the hands of subsequent inventors.

Elizabeth, N. Y. F. L. POPE.

Our Visual Organs.

To the Editor of the Scientific American:

The communication of W. S. Turner, published in your issue of January 9, covers only a portion of the subject treated upon.

By hearing a discussion between some medical men upon the general theory of inverted vision, I was led to conduct a series of experiments, more to enlighten my own mind than to convince others. Of many test experiments, during three or four years, only two or three can be here referred to.

I first tried the stereotyped experiment with the eye of an ox, and soon found a vast difference between looking into or out of an eye, and looking through one. In the latter case, the image is inverted; in the former, it is in its true position. I subsequently constructed an immense eye by boarding up the windows of a large workshop, leaving only a small hole, into which was fitted a double convex lens, from a pair of No. 15 spectacles, my own vision being substituted for the sense of sight to this artificial eye. By placing myself some distance back from the lens, I saw upon it an inverted picture of the landscape lying in front of the building, and a covered carriage before the window was very distinctly represented in the foreground. But by placing my eye close to the lens, I no longer saw an inverted picture painted upon it, but was enabled to look out, through the lens, upon the outer world and view the entire landscape within range of my vision, not inverted, but in its true position. To compare this with the legitimate office of our visual organs: if a person could be found who could not actually look out upon his surroundings, but, to the contrary, saw the picture as painted upon the crystaline lens situated within the interior of his eye, would any scientist suppose that the person's visual organs were performing their proper functions? If not, is it logical to suppose that we receive cognizance of the outer world only through the telegraphy going on between the internal nervous tissue of the eye (retina) and the brain through the optic nerve? A person reading a book while lying supinely, with his head falling over in an inverted position, would naturally hold his book before his face to suit his inverted vision; and this is just what Nature does by crossing the optic nerves, carrying the right nerve to the left lobe of the brain, and *vice versa.*

By investigating still farther, it was found that the anterior portions of the eye (except the outer cuticle, which is tough and hardy) are supplied with a microscopic network of sensitive nerves, well lubricated by a subtle nervous or magnetic fluid, and that this delicate system of nerves forms a conjunction with a more extensive system of nerves running from the spinal column, and these, through the latter, come into communication with every portion of the brain.

I am thus led to the conclusion that through this wonderful arrangement we are enabled through our senses to approach close to and look out through the crystaline lens of our visual organs upon the outer world, unconscious of the fact that an inverted image of things seen is daguerreotyped upon the retina of those organs; and further, that the office of the retina, like the mirror in a telescope, is to collect the rays and reflect them upon the lens, thereby rendering a perfect image. CHARLES THOMPSON.

St. Albans, Vt.

Electroplating Iron Surfaces.

To the Editor of the Scientific American;

I have considerable experience in the beautiful art of electroplating; and having received numerous letters from your readers, asking for information respecting the method of depositing silver upon iron, I give you the following:

It is by no means an easy matter to coat iron with silver. It may, however, be successfully done if sufficient care be taken. Silver may be deposited upon iron either directly or indirectly, the latter plan being much the best, especially for the inexperienced electroplater. In depositing silver upon iron, observe the following instructions: The article should first be rendered free from rust by rubbing with emery cloth, or by dipping it into a pickle composed of sulphuric acid, 2 ozs., hydrochloric acid 1 oz., water 1 gallon. After the article has remained some time in this pickle, it should be taken out and the rust removed by a brush and wet sand. If the oxide cannot be easily cleaned off, it must be returned to the pickle. As soon as the article is rendered bright, it is washed in a warm solution of soda, for the purpose of removing all grease. Lastly, it is well rinsed in hot water, and immediately placed in the plating solution, which should contain only about one fourth as much silver as that used for plating copper and brass articles. The battery power must also be weak. When the object receives a slight coating, the process may be carried on more rapidly by increasing the battery power, and by placing the article in a much stronger plating bath, using about 1 ounce of silver in a gallon of solution.

The indirect method consists in first coating the iron with copper, which insures success. Copper adheres firmly to iron, but silver does not; hence copper acts the part of a go-between. After the article has been cleaned, as above described, it is coated with copper by placing it in a solution composed of carbonate of potassa 4 ozs., sulphate of copper 2 ozs., liquid ammonia about 2 ozs., cyanide of potassium 6 ozs., water about 1 gallon. The sulphate of copper may be dissolved in warm rain water, and, when cold, the carbonate of potassa and ammonia added; the precipitate when formed is redissolved. The cyanide of potassium should now be added, until the bluish color disappears. Should any precipitate be found in the bottom of the vessel, the clear solution may be poured off from it. The solution is worked cold, and with moderate battery power. Let the article remain in the bath until a thin film of copper is deposited, then remove quickly, rinse in hot water, and place in the silvering solution, where the process may go on as rapidly as if plating a copper article. JAMES POOL.

Friendsville, Ill.

Patents and Patent Laws.

To the Editor of the Scientific American:

Some time since a large and enthusiastic meeting of the shoe and leather dealers was held in Boston, Mass., the object of which was to protest against the alleged unjust conduct of the owner of certain patents connected with the manufacture of boots and shoes. The inventor, after trying in vain to collect his dues for the use of his inventions, proceeded to take legal measures to obtain them, and has been insolent enough to sue some very wealthy and influential parties, and to attach their property. The remarks made and the resolutions passed were very strong and earnest, and have attracted much attention; and in addition, there was a general attack upon inventors and patentees, and the whole patent system received no small amount of condemnation.

I do not know the inventor, nor am I in any way whatever interested in any kind of pegging or other machinery for the manufacture of boots and shoes. But I have read the proceedings of that meeting, and stood pretty well the patriotic allusions to "Bunker Hill" and the "Heroes of the Revolution," etc.; but I have always noticed that when, in business, the American eagle is very much spread, and "Bunker Hill" and the "Boston Tea Party," etc., are much paraded, the cause behind is either very weak or positively bad. I think also that in this case two questions will at once arise in the mind of every honest and fair-minded man. First: If the invention is good for nothing, and there are other devices just as good or better, why have the shoe manufacturers used this invention? Secondly: If they have used and still do use it, why not pay him the royalty like honest men? It may be that the inventor has been very unjust in his proceedings, but it is but fair to infer that his claims for royalty upon his highly useful invention have been long and persistently refused by those who have made money by its use; for unless this is the case, no sane man would institute the measures he has taken to obtain redress.

In one corner of the village graveyard in Billericay, Mass., there is a monument which bears the following inscription

1845.
In memory of
MAJ. SAMUEL PARKER,
who died October 14th, 1841, aged 69.
This stone is erected by those who have been benefited by his mechanica genius.

Who was Major Samuel Parker? He was the original inventor of the leather-splitting machine; and by his genius and his labors, tens of thousands of leather dealers and shoe manufacturers have been enriched, and the wealth of our nation and of the world very greatly increased. His invention has saved tens of millions of dollars worth of property from utter waste. For all this, Major Parker received nothing from the leather dealers and the public but outrage and wrong. They infringed upon his patent, hunted him from court to court, and robbed him of all he had. Four years after his death some of them came and placed the small, cheap granite monument above mentioned upon his grave. Truly, of the leather dealers and the business world, in return for the immense services he had rendered them, the great inventor asked bread, and they gave him (after his death) a stone. Doubtless they thought it an ample return for all he did and suffered. Looking back, I cannot help thinking that the men who had robbed and wronged him for years only insulted his memory in placing a monument upon his grave, though it is some gratification to know that in doing this they also unconsciously recorded upon the stone their own meanness and dishonesty!

In view of the facts above narrated, it is certainly most gratifying to learn, from the speeches and resolutions at the late meeting, that the shoe and leather dealers of the present time are in the highest degree noble, honest, and honorable men, who in all their dealings love nothing so much as justice. Yet it seems evident that the meeting was intended to be an encouragement to the crusade which is beginning throughout the country, the object of which is to destroy or to render nugatory the rights of inventors and patentees. The Granger combination, supposing that invention and improvement in agricultural implements have reached their highest point, have begun a systematic warfare upon patents and patentees, and the great manufacturing interests seem disposed to follow the lead of the Grangers in their efforts to break down the legal protection—always slight enough—which the inventor has of the profits upon his invention for a short term of years. But however much certain class interests may be benefited, or seem to be, by the destruction of the rights of inventors and patentees, the public cannot afford quite yet to spare them. Amazing as has been the progress of invention, the field is hardly yet entered upon, and in every direction new inventions and improvements upon old ones are called for, and the vital interests of the world demand that all the rights of those who produce useful inventions should be sacredly guarded.

One gentleman at this meeting proposed that, when a man applies for a patent, notice of his application should be given broadcast over the country for six months. Of course to do this a description of his invention must necessarily be given. Now there is nothing perhaps so cheap in this country as perjury; and a small chance indeed would the real inventor have, after his secret has been published to the world for six months, to obtain his patent. Scores of scoundrels with well trained witnesses would claim the invention, proving that they had long used the same thing, and perjury would win the day. As it now is, the inventor who seeks to obtain a patent is obliged to use the greatest care and secrecy to prevent being cheated out of his rights. As to the inventor's contemplated effort to get his expired patent renewed, the question is not (as stated at the meeting) whether his family are starving or not; but whether he has received a full and sufficient compensation for the great benefit his inventions have been to the boot and shoe manufacturers, and to the public. I hope, therefore, that the Committee on Patents will not be influenced in their decision by the loud clamor of deeply interested men about Bunker Hill and the Boston Tea Party; but that they will judge the matter upon its merits only, and decide it justly. The claim for the renewal or extension of a patent for a useful invention is a right in equity which belongs to the inventor who has not been adequately rewarded for his invention. It is a right based on long usage in the management of patents by the United States Government, and all honest men will endorse the usage as a matter of justice, right, and true policy. The difficulties which beset inventors are many. Men devoid of either conscience or honor are constantly on the watch to find out good inventions, which are likely to become profitable. If the inventor is poor, these men commence a system of annoyance to compel him to sell out his patent for a trifle to avoid long and costly litigation in the courts; and they too often succeed in their nefarious attempts. Even if the inventor is not hunted by these human wolves and driven into ruinous litigation to maintain his rights, yet (if his invention is of any magnitude) such is the indifference and prejudice, with which almost every new invention of importance is received by the public, that a large portion of the seventeen years allotted to him expires before he can overcome them and start his invention. In fact it is too often considered that the inventor is a fair subject for jeering and insult, and that neglect and derision are the only suitable reward for the man who attempts to create some new thing for the use of the public. Empty your factories tomorrow of all the patented machinery therein, and see how much will remain of them besides the bricks and mortar of their walls.

Because among the large number of inventions patented there are some which are useless, and because in the patent business (as in every department of life) there are some dishonest men, the large mass of inventors and patentees—whose usefulness to society is greater than that of any class of men whatever—are denounced and almost outlawed by those who every day and every hour are receiving the benefits of their genius, skill, and labor. In view of this, it is high time that the public should take this important subject into consideration, and see that justice is done to the Inventors of the Nation. P.

Cure for Catarrh.

A medical authority asserts that the severest catarrh cold can be removed in about ten hours by a mixture of carbolic acid, 10 drops, tincture of iodine and chloroform, each 7·5 drops. A few drops of the mixture should be heated over a spirit lamp in a test tube, the mouth of which should be applied to the nostrils as volatilization is effected. The operation should be repeated in about two minutes, when, after the patient sneezes a number of times, the troublesome symptoms rapidly disappear.

Pigeon Post in France.

The French military authorities are about to organize a carrier pigeon post between frontier fortresses, on the plan already adopted by Russia, Italy, Austria, and Germany. Two thousand pairs of pigeons, it is said, are being trained for the purpose.

IT is one of heaven's blessings that we cannot foreknow the hour of our death; for a time fixed, even beyond the possibility of living, would trouble us more than doth this uncertainty.

Success in Life.

What is success? The answer to this question, says one of our English contemporaries, depends on the different courses which men pursue, and the ends they have in view. The general object of pursuit is that which people most want —money. The money test of success is that which they best understand. To make a certain income, therefore, is among the first duties which the world prescribes. People cannot all appreciate the poet or the thinker, and they estimate his works accordingly by the prices which they realize. There are other ideas of success, however, than this trading notion. The soldier seeks it in promotion by deeds of valor; the scholar in the discovery or enunciation of truth; the poet in the praises of his generation; the lawyer in professional advancement; the politician in the ascendency of his party and his accession to office. When Agassiz, engrossed in scientific pursuits, was told that he ought to look more after the practical ends of life, in leaving a provision for his family: "I have no time," he replied, "to make money."

The making of "getting on" an end in life is purely an English notion. The ideal of man is generally in happy continuance. As to making advancement in the world, as we understand it, the object of existence, an Asiatic would think his life thrown away. "Why should he get on? He is where he is by the Almighty's will, and why should he interfere with the Divine appointment?" It is this anxiety to succeed which gives to English practical life its fierce competition and earnest tone. The attainment of almost any position or dignity being made possible, to suitable talent and well directed effort, inspires hope. What a blessed possession is hope! It is the salt of human life that sweetens all toil and difficulty. Phœnix-like, it "springs eternal" from the ashes, of the pyrites we place in the crucible, as gold; it is the panacea to the disappointment that makes the heart sick; it is the dawn of the radiant orb which, after a season of darkness, is yet to shine in noonday splendor; it is the buoyant element that keeps our bark afloat till we reach the harbor, for without hope there can be no endeavor. *Excelsior* is only hope intensified. Whatever a man's position or calling may be, he should aim at the first rank and the foremost place. "It can't be done" is a cry of indecision, indifference, and indolence. Such a plea is a mere excuse for not attempting at all. Difficulties should serve but to reveal a man's true strength, to test his power of will, to train him to the exercise of his noblest faculties. Failures discipline the strong; only the weak and unstable are overwhelmed. Diligence in business should form part of a man's religion, as it is indissolubly associated with the spiritual in worship.

To attain a position in society, or achieve success in a profession, other qualities must be added to those required to work out results in material nature, because a different class of opposing forces are here encountered. They are not of the nature of those that are overcome by the engineer in the tunneling of a mountain or the bridging of a valley: but such uncertain and subtle elements as public opinion, the want of means, adverse criticism, infirmities of temper, failing health, indecision of character, and other hindrances equally fluctuating, latent or deceptive. Perseverance is essential. All the performances of human art are instances of its resistless force. Attention to the minutest particulars of duty, conscientious watchfulness in little things, that are not really little although trifling in appearance, surmount all obstacles. He who is not disheartened, but boldly and fearlessly grapples with difficulties, never fails. The determination which plods unweariedly through drudgery and details is the foundation of greatness of character and of ultimate success. It accomplishes more than genius.

The New Paris Waterworks.

The great reservoirs at Montsouris for the reception of the waters of the Vannes possess great interest for the hydraulic engineer. It will be remembered that in July last a portion of the arched roof gave way. The accident has now been repaired, and the water will be let into the upper reservoir in a few days. The arches have been reconstructed as before—that is to say, two bricks thick—but the piers and supporting walls have been strengthened, and the vaulting supported in such a manner that, should one or more arches fall in, they will not carry the rest with them. The area of the reservoirs is 363,800 square feet, and they are two stories high, with an enormously thick wall in the middle of the whole, which divides the reservoir into four chambers, two below and two above. All the masonry of the lower chambers has been finished for a long time, but the conduits and pipes for the distribution of the water remain to be executed. The upper chamber, of which the vaultings have been reconstructed, and which has an area of 181,900 square feet, and will contain 75,000 tuns of water, will be the first filled. The hundred arches which cover this chamber are being covered gradually with mold to the depth of 10 inches; and when this is done, and the arches show no tendency to give way, the mold will be sown with grass seed. The quantity of earth will be about 2,600 cubic yards. Several hydrants are placed around the edge for the purpose of irrigating the grass. The second upper chamber is now being constructed, and is about one quarter finished. Around the reservoirs, earth is now being thrown up to the hight of the roof of the lower chambers, with the double view of adding support to the walls and of keeping the water within fresh. At one of the angles of the main structure rises a structure 132 feet square, and with walls 6 feet 7 inches thick. This is the receiving chamber, and has been for some time in use. Its capacity is about 320 feet square by 13 feet 2 inches deep; the bottom and sides are covered with bluish white tiles, and the water is so pure and translucent that a motto inscribed on the tiles at the bottom is plainly visible. At the bottom of this smaller reservoir may be seen the orifice of a pipe 5 feet 9 inches in diameter, which will carry the water to a point 16 feet 5 inches above the level of the ground; opposite to this is another pipe of the same dimensions, which, when there is an overflow of water, will carry it to the main sewers. Just in front of this receiver are three pipes, two of them 3½ inches in diameter and the third somewhat less, bound together by means of a cast iron hood and fitted each with valves; one of these will serve to fill the upper chambers of the main reservoir, a second the lower chambers, and the third, and smallest, already supplies the highest portions of Passy with water. At the base of the recipient chamber is a telegraphic office, which is in communication with another at the reservoirs at Arcueil, with the prefecture of police, and several other public establishments, to aid in the regulation of the whole service of the city. The public is admitted to view the recipient chamber, and the purity of the water, which will shortly supply a very large proportion of the population, is a constant theme of admiration.

Gramme's Electric Machines.

M. Gramme has made a communication to the Paris Academy of Sciences respecting the improvements which he has made in his electric machines. The original machines ignited four inches of platinum wire 0·0118 inch in diameter; the improved machines will heat to redness four times that length of the same wire, without any increase in the weight of the materials or in labor. This augmentation in the intensity of the current is principally due to the employment of the new thin plate magnets of M. Jamin. The new electro-galvanic machines have only one central ring instead of two, and two electro-magnets in place of four, in the former machines. They weigh only 390 lbs. instead of 1,650 lbs; only measure 19 inches by 1 foot 9 inches in hight, in place of 2 feet 4 inches by 4 feet 5 inches; but deposit 4 lbs. 9 ozs. of silver per hour in lieu of 1 lb. 5 ozs. The power required to work the new machines, as compared with the old, is only as 50 to 75. They have the following advantages: (1) They only require half the space; (2) they are three fourths lighter; (3) they economize three quarters of the copper in construction; (4) they require thirty per cent less motive power. These improvements have been achieved by the suppression of the exciting coil, the bringing of the electro-magnet into the circuit of the current, by an improved arrangement of the copper garniture of the bars of the electro-magnets, and by a slight increase in speed. The original electric light machine fed a regulator of 900 carcel burners, its weight amounted to a tun, and it occupied a space of 2 feet 4 inches square by 4 feet in hight. This machine heated itself, and gave rise to sparks between the bobbins and the conductors. The new machine is composed of a framework in cast iron, two electro-magnetic bars, and a single movable central ring, instead of six bars and three rings. Its normal power is two hundred burners.

Dogs and Books as Vehicles of Disease.

A case of scarlet fever has recently happened in England, in which the disease was communicated to two children by a dog. It is believed that the animal, which had been the constant companion of a scarlet fever patient, had had its hair impregnated with contagious matter. This suggests the possibility of dogs, cats, and other household pets transferring the malady from one house to another, and renders it advisable to keep them out of the way during prevalence of the fever. Another little considered source of disease may be books in public libraries, particularly volumes which are freely circulated and which cannot be prevented from reaching the hands of patients afflicted with contagious diseases.

A Railroad on the Ice.

A brilliant Duluth newspaper proposes a railroad on the ice from Duluth to the Sault—the whole length of Lake Superior. It would simply spike the rails to the ice, without grading, filling, excavating, ballasting, or ties. The track, it says, could be taken up every spring and stowed away. The road would be about 400 miles long, and a dead level. It claims that the ice lasts till April; is thick enough to sustain a train of cars; the freight cars could be transferred to the ice without reloading, and the rails could be spiked to the ice, or they could be fastened in a frame and laid on the ice without spikes, "which would do just as well."

If some ingenious man will provide a way to float the track when the thaw comes, the railway might be used summer and winter, with no occasion to take her up. If Duluth did not then become the capital of an empire, then locomotion would be at a discount.

Horse Clipping.

The *Evening Post* is our authority for saying that Commodore Vanderbilt's mind has been exercised about the cruel, if not actually criminal, custom of clipping the hair from valuable horses, with the idea of adding to their beauty. This veteran horse fancier, who has hardly his superior in America, remarked, in presence of several gentlemen, that he would himself willingly give a handsome premium to any one who would compile a correct report of deaths occurring among the valuable horses in the city of New York from colds and other diseases engendered by this practice. "In fact," added the Commodore, "I thought of this matter before getting out of bed this morning, and I really don't understand how it is that Mr. Bergh has not got after these inhuman fashionables. They certainly deserve his special attention."

Sperm oil is the best for oil stones. Do not use kerosene.