PLATING WITH ALUMINUM.

[From the *Deutsche Industrie Zeitung*. by Dr. Clemens Winkler.]

Seventeen years have passed since H. Daville first produced aluminum on a commercial scale; but the expectations regarding this very interesting and meritorious invention of the distinguished French chemist have not as yet been fulfilled. Although many of those expectations were somewhat exaggerated, they were not and are not so unreasonable as many people believed them to be; for a metal with so many valuable properties would be useful in many of the technical arts. Among these properties are a beautiful color that does not change in the air, nor yet in sulphurous exhalations, and further, remarkable lightness, an agreeable resonance, and a capability of being worked into any shape. Moreover, in the use or manipulation of aluminum, there have not hitherto been observed any deleterious effects.

It is generally conceded that the cost, and not the absence of properties which make other metals valuable, has prevented the more extensive application of aluminum; and the price, although it is considerably less than it was at first, has remained high during the last few years. The cost of production of this metal, which can only be effected by the use of sodium, cannot possibly be the only cause of its high price; for the commercial manufacture of sodium may be considered as a solved problem, and, as soda ash is very cheap, sodium might be produced at a moderate cost if the demand were greater than it is. Large production is caused by large consumption, and the use of aluminum has been hitherto limited, mainly because custom and use have opposed the introduction of such a novelty. Stories have been told and written about poisoning by cooking vessels made of copper, by glazings containing lead, and the formation of verdigris on spoons of (alloyed) silver; and if people were only determined to produce these utensils from aluminum, all danger from poisoning would be removed, and they would have vessels the appearance and durability of which would scarcely leave anything to desire. They would be more convenient to handle than our light crockery ware, for they can be made as light, and, what is important, cannot be broken. Splendid pitchers, plates, goblets, lamps, etc, might be manufactured from deadened and embossed aluminum; and the lightness of spoons of this metal would make them more convenient than those of silver now in use. It is rather surprising that they have not yet been more commonly introduced, for people are generally more particular as to their spoons and forks than as to any other table utensil. In this case, it is not the price, but only prejudice, which presents itself as a drawback, for the price is only half of that of good silver; besides, the difference in the specific weights of both metals and the consequent cheapness in the use of aluminum are so great that, for the value of one silver spoon, at least seven equally large aluminum spoons might be bought. True, aluminum is neither a rare nor a noble metal, but it possesses nevertheless advantages over alloyed silver which give it a much finer appearance; it does not get black, nor does it form verdigris, and what it lacks in brilliancy and appearance, is well compensated for in its agreeable lightness Otto says very truly: "If spoons of aluminum were even more beautiful and durable than silver spoons, they would nevertheless not be used in the households of the wealthy, merely because they are cheaper than silver spoons. It is surely more agreeable to hold a light spoon than a heavy one, but the silver spoons are made as heavy as possible, and tea spoons are made as large as children's spoons to exhibit the wealth of the owner. The larger the spoon, the wealthier the man." We may let time conquer these prejudices, and hope that all-subduing fashion will make itself useful in this field.

The more important question which now deserves our attention is: Whether it be not possible to plate certain metals and alloys, of unsatisfactory color or which are subject to changes in the air, with aluminum, so as to give them, at least superficially, the advantages and properties of this beautiful metal? For this purpose, as so small a quantity is used to cover a large surface, the present high price would not be any drawback; and the question now remains: Is the coating of ordinary metals with aluminum practicable? This question has lately been propounded in the *Deutsche Industrie Zeitung* as follows: "Does any one know of a recent and reliable process for electroplating other metals with aluminum or its alloys?" This question must be answered in the negative. There are, in general, two methods known, which are employed to coat one metal with another, namely, the galvanoplastic process and plating with foil. The separation of aluminum by the galvanic current succeeds only when the anhydrous double salt of chloride of aluminum and sodium is used; this salt melts at 185° C., and thus an incoherent coating only is obtained, which, besides, contains chloride of sodium, and is in no wise durable. From watery solutions, aluminum has not as yet been precipitated in a metallic state, and Gore certainly errs in stating that, with a weak current, copper may be plated with aluminum. In regard to plating with foils of this metal, it is possible in some degree, but the resulting product is perfectly useless. Plating in this manner requires a sort of brazing and a final intimate unification of both metals by rolling, and these conditions cannot be fulfilled with aluminum. As is well known, the ductility of this metal is almost destroyed by only a small admixture of other metals; iron makes it fragile, and copper imparts to it the brittleness of glass. Although it is possible to melt a sheet of aluminum upon another metal, an alloy is formed at the surface, by contact of the two metals, which possesses no ductility whatever, so that rolling crushes it to powder, and so the foil gets loose and separates. And, even if it were possible to plate with aluminum, it remains very questionable whether there would be anything gained. Aluminum in a compact form is very durable and not readily changed, either by oxygen or sulphur; but it is very changeable in a finely divided state. In sheets and powder it is very oxidizable, and when amalgamated, it heats spontaneously in the air and separates into alumina and quicksilver. The layer of aluminum on the plated metal would in any case be very thin, and it is probable that this otherwise unalterable metal would lose its durability by the extreme tenuity.

The Steam Excavator.

Mr. Isaac Otis, of Houghton, Mich., writing to the *Railroad Gazette*, says that the Steam Excavator, now so commonly used, was the invention of his brother.

His name was William S. Otis, and at the time he was a resident of Philadelphia. The first machine was built for him by Eastwick and Harrison, somewhere about 1837, and they afterwards built several, including two for the Russian Government, which were used in the construction of the Petersburg and Moscow railroad.

Messrs. Eastwick & Harrison afterwards (in connection with Mr. Williams, of Baltimore) went to Russia, where they built all the locomotives and rolling stock of this great Russian railway.

Mr. Otis died in the year 1839: at the time of his death, he was one of the celebrated firm of contractors under the style of Carmichael, Fairbanks & Otis. Many of the foremost railroad contractors now living commenced as foremen for Carmichael, Fairbanks & Otis, among them such men as Sidney Dillon, O. S. Chapman and others.

These excavators have been, and are still, largely used in the construction of railroads and canals, and, in the shape of dredging machines, in digging out our harbors.

At the time of Mr. Otis's death, his firm were engaged in constructing some of the heaviest sections of the Boston and Albany railroad (then the Western railroad), and were using steam excavators; among other points, the sand cut, just east of Springfield, Mass., was taken out by one of these machines.

The cheapest work ever done in the United States, if not in the world, was in the filling up of the great trestle bridge at Girard, Pa., on the line of the Lake Shore railway. This embankment, of a million cubic yards, was made of earth dug by steam excavators. The contractors were Messrs. Dillon, Chapman & Clyde, and the work was done at a cost of not more than six cents per cubic yard, including digging, hauling and dumping, the contractors furnishing everything except the ties and railroad iron for the track.

The excavators are now built by Messrs. John Southern & Co., of Boston, cost about $8,000, weigh some 22 tuns, last indefinitely (some machines are still at work that were built thirty years ago), and will dig and put into cars 1,000 cubic yards of sand or gravel per day; in fact, about the only limit to their powers in soft digging is the ability to take the material away as fast as the machine can load it. They will dig the hardest earth, and in fact some kinds of rock. The shovel holds 1¼ cubic yards, and in sand they can fill this and dump the material into cars twice in one minute.

Three men are employed in running the machine, an engineer, cranesman and fireman; it consumes about one cord of wood per day, or its equivalent of bituminous coal.

They are locomotives as well as excavators, and can be fitted with extra wheels to run upon a 4 feet 8½ inch gage. They are used in working sectional tracks of 4 feet lengths, and after digging all the earth within reach move themselves up ready for a fresh bite; they make a through cut wide enough for a single track railroad without widening out.

Many railroads have them in use to load their gravel trains.

Cut Flowers.

Those of our readers, says the *Gardener's Monthly*, who live in what in a social sense we may call the country, have little idea of the growing immensity of the cut flower trade in the large cities. While it is believed that gardening as a fine art, or even the mere cultivation of flowers as a luxury, has not kept up in ratio with the increase of population, the mere florists' trade, that is, that which furnishes plants and flowers for temporary ornament and decoration, has probably doubled within the last ten years. Not only do florists grow flowers of their own in great quantities for baskets and bouquets, but many away from the immediate circle of the cities find it profitable to grow flowers to sell again to those who put them up; and even private gardens frequently contribute to supply the demand. Indeed the tendency of this division between the one who grows the flowers and the one who sells is continually growing greater. Land in the city is high and taxes heavy. Flowers are light and travel easily by rail or wagon, and thus can be raised to better advantage away from the expenses of a large town. The principal flowers grown for this purpose are roses and camellias, but heliotropes, violets and many other popular flowers come into good use. These leading flowers are sold at a price per hundred flowers —camellias in their best time wholesaling at about $20 00 per hundred, and roses at about half this rate. As a general thing, camellias are raised in pots or tubs, but roses are most generally grown in the natural ground under a glass house erected for the purpose. A rose house on this principle is a very pretty sight in the winter season—not quite as gay perhaps as its rival the camellia, but with a fragrance which, if plants have sensation as some wise folk tell us, the camellia doubtless envies. Many roses do not flower freely under glass in winter unless the houses are very tight, or unless they have some age. For most general purposes, Saffrano, Bon Silene, Luxembourg, Isabella Sprunt, Archduke Charles, and Hermosa are popular, flowering young and freely when there is room, good light, and a year or two of age. Lamarque and Marshal Niel are great rose house favorites.

THE HEALTH OF THE WORKMEN OF THE EAST RIVER BRIDGE.

Mr. F. Collingwood, in a paper read before the American Institute of Civil Engineers, alludes to the adverse criticisms of the press on subterranean foundations, on account of the danger, to the health of the workmen laboring within them, by the pneumatic pressure, and cites, as a case in point, that of the caissons of the East River bridge. On the Brooklyn side, the men worked 8 hours, in two shifts of 4 hours each, down to the full depth of 44·5 feet without injury. On the New York side, the time was reduced correspondingly from 7½ hours at 45 feet to 4 hours at 77 feet. The first fatal case which was considered as fairly attributable to compressed air took place at a depth of 75 feet, from congestion of the lungs. The man was of full habit, and an examination of but two days before had proved his lungs to be sound. There were perhaps a dozen cases of paralysis, which all recovered in from three days to three weeks. At from 50 feet depth to the end, severe pains in the legs and arms were frequent, but did not last long. The remedies employed were ergot and morphine to alleviate pains in the limbs; stimulants, together with Jamaica ginger, were given for epigastric pains. Where vomiting set in and was persistent, paralysis frequently followed. Coffee was always served to the men immediately after coming out of the caisson, and bunks were provided in which all who wished could rest.

An important conclusion from the records kept of cases is that the greater number of those who have retained their health throughout are wiry, somewhat spare men; while most of the sick and all who died were fleshy men of full or large size.

The following are the rules for the workmen in the caisson: 1. Never enter the caisson with an empty stomach. 2. Use, as far as possible, a meat diet, and take warm coffee freely. 3. Always put on extra clothing on coming out, and avoid exposure to cold. 4. Exercise as little as may be during the first hour after coming out, and lie down if possible. 5. Use intoxicating liquors sparingly; better, none at all. It is dangerous to enter the caisson after drinking intoxicating liquors. 6. Take at least eight hours' sleep every night. 7. See that the bowels are open every day. 8. Never enter the caisson if at all sick. 9. Report at once to the office all cases of illness, even if they occur after returning home.

Steam on the Canals.

The Fountain City, a new boat, is the name of a new canal competitor for the $100,000 prize, which arrived at Albany recently, after a five days' trip from Buffalo. The propelling wheels are described as so arranged that the waves produced by one wheel are broken down by those from the other. Her speed averaged over three miles per hour. The wheel is said to have all the power of a screw in the fore and aft blades, and a square pull, in addition, by one of the side blades, and consequently will develope more power, it is supposed, with fewer revolutions per minute, than ordinary wheels.

Wooden Ware Works.

The Erie Wooden Ware Company's works, at Erie, Pa., occupy a main building 250×125 feet. They have one engine of 70 horse power; two pail lathes, one tub lathe, one automatic saw for broom handles, one broom handle lathe, two top and bottom lathes, three stave saws, one matcher for edging up, one planer, and three saws for slitting staves the right lengths. The workshops, says the *American Manufacturer*, are quite interesting and present a very pleasing picture. First the rough logs are cut up into required shape and length, and then, by a peculiar machine, the staves for the tub are cut from it in a slightly curved form, which entirely does away with the old system of bending them; and from one man to another the staves are handled until the rough pail is made or fixed together; then one man turns the outside with chisel and sand paper until perfectly smooth, and another does the same for the inside; then it sent to another department for the bottom and lid, and then for the hoops. Everything is in place, all are unusually intelligent men, and order reigns supreme. The whole implement reminds us of some magic apparatus. After being made in the shop, the pails are sent to a floor above where the handles are put on, and those intended for dairy purposes are taken to the painter's room, and after receiving his attentions are packed in another department for shipment. We were particularly interested in seeing the drying houses, situated some distance from the main building, of which there are ten, six of which are for steaming purposes, and four are operated upon by hot air, for which purpose the company have four separate boilers. There are constantly 50,000 feet of lumber, about 500 cords of pail bolts, and from 400 to 600 cords of cut staves being operated upon. The specialty of this company is in the manufacture of tobacco tubs, and they are certainly made with great skill and high-finished material. The company own 4½ acres of land here and intend to double the capacity of the present factory as soon as possible. They have sixty-five men and boys constantly employed, and have orders ahead; and, at present, their income exceeds $250,000 per annum. The officers are S. S. Spencer, president; G. W. F. Sherwin is general superintendent, and R. W. Flower, Jr., secretary and treasurer.

THE Academy of Sciences of Bologna, Italy, offers a prize of 1,200 francs ($240) for the best essay on the applications of galvanism. The papers may be written in Latin, Italian, or French, and must be submitted before June 30, 1874.

The American Pneumatic Railway Brake in England.

It is perfectly well known that it forms no part of the policy of this journal to advocate the adoption of patented inventions. It is our policy, however, to advocate the adoption of substantial improvements in the arts of construction, whether they are or are not patented. It is without hesitation, therefore, that we state our conviction that, by the adoption of such a brake as that recently introduced into this country by Mr. Westinghouse, collisions might cease to have any important existence. It is right that we should explain why we single out the Westinghouse from many other systems of continuous brakes, more or less efficient, which have been tested in this country. The reason is this:—No locomotive superintendent or manager is justified in incurring a large expenditure on an unheard-of or comparatively untried invention. We know nothing of the existence of any other form of continuous brake which has been so extensively used as that we have named. In their immediate effect, all continuous brakes are pretty much the same, when once the wheels are skidded. The difference lies in the means by which the wheels are skidded. We believe, in common with a very large body of engineers, that Mr. Westinghouse has solved the problem of constructing a good continuous brake. It is quite possible that a far better brake may be invented, but with this we have nothing to do. The Westinghouse brake has passed far beyond the limits of the first stage. Its construction occupies hundreds of hands and all the resources of a manufacturing establishment of great dimensions in the United States. All the principal American lines use it already, or are adopting it. Many hundreds of the little air-pumping engines have been made. The operation of the brake is eminently satisfactory. Why should it not be adopted extensively in this country? We are not hard to please; we do not, be it understood, write to advocate the adoption of the Westinghouse brake, but we write to advocate, nay, to insist on, the general adoption of a first class continuous brake on our railways, no matter who is the inventor, and we cite the Westinghouse brake because it affords a direct and complete answer to those who argue that there is no good continuous brake in existence, and that they will wait till one is invented and tested. We cut the ground from beneath these gentlemen at once, by asserting that all that can be required is provided ready to their hand. It remains to be seen whether, among the multitude of our readers, one can be found to argue that we have advanced a single statement which is contrary to truth, reason, and common sense.—*Engineer.*

Faraday and Field.

Dr. Gladstone, in his "Memoir of Faraday," just republished here by the Harpers, tells the following story, which is worth reproducing:—

"Inventors and promoters of useful inventions frequently benefited by the advice of Faraday, or by his generous help.

A remarkable instance of this was told me by Cyrus Field. Near the commencement of his great enterprise, when he wished to unite the old and the new worlds by the telegraphic cable, he sought the advice of the great electrician, and Faraday told him that he doubted the possibility of getting a message across the Atlantic. Mr. Field saw that this fatal objection must be settled at once, and begged Faraday to make the necessary experiments, offering to pay him properly for his services. The philosopher, however, declined all remuneration, but worked away at the question, and presently reported to Mr. Field: 'It can be done, but you will not get an instantaneous message.' 'How long will it take?' was the next inquiry. 'Oh, perhaps a second.' 'Well, that's quick enough for me,' was the conclusion of the American; and the enterprise was proceeded with."

Leaves for Flavoring.

The *Garden*, an English periodical, after remarking that leaves are by no means so much used for flavoring as they might be, adds the following practical suggestions:—

One of the most useful and common of all leaves for flavoring is that of the common syringa. When cucumbers are scarce, these are a perfect substitute, in salads or anything in which that flavor is desired. The taste is not only like that of cucumbers, but identical—a curious instance of the correlation of flavors in widely different families.

Again, the young leaves of cucumbers have a striking likeness, in the way of flavor, to that of the fruit. The same may be affirmed of carrot tops, which are as like carrots in taste as may be. In most gardens there is a prodigious waste of celery flavor in the sacrifice of the external leaves and their partially blanched footstalks. Scores of sticks of celery are cut up into soup, when the outside would flavor it equally well or better.

The young leaves of gooseberries added to bottled fruit give a fresher flavor and a greener color to pies and tarts. The leaves of the flowering currant give a sort of intermediate flavor between that of black currants and red. Orange, citron, and lemon leaves impart a flavor equal to that of the fruit and rind combined, and somewhat different from both. A few leaves added to pies, or boiled in the milk used to bake with rice, or formed into crusts or paste, impart an admirable and almost inimitable bouquet.

Moonlight Reflections.

When standing by a lake side in the moonlight, you see, stretching over the rippled surface toward the moon, a bar of light which, as shown by its nearer part, consists of flashes from the sides of separate wavelets. You walk, and the bar of light seems to go with you. There are, even among cultivated people, many who suppose that this bar of light has an objective existence, and who believe that it really moves as the observer moves—occasionally, indeed, as I can testify, expressing surprise at the fact. But, apart from the observer, there exists no such bar of light; nor when the observer moves is there any movement of this glittering line of wavelets. All over the dark part of the surface the undulations are just as bright with moonlight as those he sees; but the light reflected from them does not reach his eyes. Thus, though there seems to be a lighting of some wavelets and not of the rest, and though, as the observer moves, other wavelets seem to become lighted that were not lighted before, yet both these are utterly false seemings. The simple fact is that his position in relation to certain wavelets brings into view their reflections of the moon's light, while it keeps out of view the like reflections from all other wavelets.—*Herbert Spencer.*

Spectroscopic Observations of Fluorescent Light.

In a recent communication to the *American Gas Light Journal* by Professor Henry Morton, containing details of a variety of experiments on the above subject, the author says:

In addition to the vast field already occupied by the spectroscope as a means of discrimination, another useful though limited range may be given to it in connection with that remarkable property of matter, in relation to light, known as fluorescence. This action was first thoroughly investigated by Professor Stokes, who, in 1852, published in the *Philosophical Transactions* an admirable memoir on the subject, in which he conclusively showed that when blue or violet light fell on a vast number of substances it was absorbed and re-emitted; with, however, in all cases, a lowering of its rate of vibration, or in other words a change in its color, from blue or violet, to green, yellow, orange, or red. His observations showed that the colors emitted by different substances varied greatly, and when analyzed with a prism broke up, in many cases, into characteristic groups of bright colored shaded bands. The spectroscope had not then, however, been introduced, and having no means of exact measurement, his results were rather qualitative than quantitative.

B cquerel worked in the same direction and in the same way, until very recently, and several other observers had added more or less to our knowledge on special points.

Some time since it occurred to me that, if accurate measurements were made of the bright bands found in the spectra of fluorescent light emitted by various bodies, these might become a means of recognition and thus of qualitative analysis. With the assistance of Dr. H. C. Bolton, who kindly supplied me with a very large number of fluorescent salts, I carried out during the past summer a system of observation which developed several interesting results, among which, for example was this, that the presence of impurities could be detected in certain chemical salts, without so much as opening the bottles in which they were sold.

Origin of the Puddling Process.

Davy investigated the nature of the flame, and communicated his discoveries in a lecture before a large audience. He demonstrated that it was within our power to produce a flame which, at a state of extreme heat, contained either free oxygen or unburnt carbon; that a large grate with a limited supply of coal would generate the former, the oxidizing flame, while a small grate with a larger amount of coal would yield the other, the flame devoid of oxygen, but in which combustible substances might be melted without the danger of combustion. Among the hearers sat a young man by the name of Cort, who directed his mind to these remarks. Up to that time cast iron was converted into wrought iron by heating it with charcoal and exposing the melted metal to a blast of air. By this process only small quantities of wrought iron were obtained at a time, through the necessity of producing but one bloom in a heat, which might easily be hammered out; and also on account of the cost of charcoal. In this process, mineral coal could not be placed in contact with the iron, because the never failing presence of sulphur in that kind of coal would render the iron unfit for use. From Davy's lecture on the flame, Cort struck upon the idea of decarbonizing cast iron without exposing it to the danger of the contact with coal, by allowing the flames only of the coal to play upon the cast iron. Thus originated that wonderful operation called the puddling process.—*Mohr.*

Glass Spinning.

The latest improvements in spinning glass are due to the Vienna manufacturer Brunfaut, who has already exhibited his talent in this speciality in 1850 at Pesth. After manifold trials, he discovered a composition which may be made at any time into curled or frizzled yarn. The frizzled threads surpass in fineness not only the finest cotton but even a single cocoon thread, and they appear at the same time almost as soft and elastic as silk lint. The woven glass flock wool has quite recently been used as a substitute of ordinary wool wrappings for patients suffering from gout, and its use for this purpose has been, it is stated, successful. Chemists and apothecaries have found it useful for filtering. The smooth threads are now woven into textile fabrics, which are made into cushions, carpets, table cloths, shawls, neckties, cuffs, collars and other garments, etc. They may be used for weaving the figures in brocaded silk or velvet. As a material for fancy dresses, tapestry, for covering furniture, for laces, embroidery, hosiery, etc, the glass tissue will probably at some future time occupy a prominent place. Owing to its brilliancy and the splendor of its colors, it is the most beautiful material for dressing the hair, neck, and head. In softness, the glass yarn almost approaches silk; and to the touch, it is like the finest wool or cotton. It possesses remarkable strength; and it remains unchanged in light and warmth and is not altered by moisture or acids. Spots may readily be removed by washing. Being non-inflammable and incombustible, it is especially valuable for making dress materials for ladies. Clothes of glass fabrics are much warmer than those of cotton or wool; and at the same time, they are of low specific gravity. They are also adapted for veils, as they repel the dust remarkably well. The composition of the material is still a secret; and the spinning requires extraordinary dexterity and constant attention. This part of the business is said to be very trying to the sight. It is stated that, with a wheel of a diameter of five Austrian yards, one operative is able to spin 3,000 yards per minute. The *loth* (which is equal to about eleven drams avoirdupois) is sold for two florins—ninety-three cents gold. Some manufactures of glass yarn are sold at the following prices:

Bedouin tassels from 46 cents to 69 cents; eagle feathers from 37 cents to $1.39; ostrich feathers from 46 cents to $2.80; bouquets, 76 cents; cuffs, 1.15; ladies' neckties 70 cents: gentlemen's neckties from 46 cents to $2.30; watch chains from 23 cents to 93 cents; chignons from 46 cents to $4.60: trimmings 36 cents and upwards per yard; ladies' cloths from 12 to 18 cents per yard; ladies' hats from $4.60 cents to $14.40 cents. In conclusion, we may state that the Austrian Minister of Commerce has already organized schools for glass spinning in the principal seats of glass manufacture in Bohemia.

Cheap Life Insurance.

A novel form of life insurance policy was brought to our attention a few days since, and the inventor has secured it by copyright. By it, the insurance company is only liable for its assurance in case the protected party survives the assured, and thus the insurer is enabled to provide for his surviving wife and children at greatly reduced expense. By it, he does not risk spending his efforts on heirs who may not need the money or in whom he takes but a comparatively small interest. Further, if the insurer prefer, the policy provides for payment of an annual sum during life, instead of the whole at once.

The advantages claimed are such that, under ordinary circumstances, the company can afford to pay, to the protected party, an annuity equal to five times the interest of the sum now secured by a like premium. For instance, a man 30 years of age may secure to his wife of equal age an annuity during her life, after his death, equal to the income of $2,500, by an annual payment of not more than $12.50 (twelve dollars and a half) thus opening the privileges of life insurance to the poorest class. Life insurance companies may obtain full details of the proposed new scheme by addressing the inventor, Henry H. Swift, Millbrook, N. Y.

Origin of Electro-magnetism.

The experiments of Volta resulted in the pile named after him. Two heterogeneous metals, such as zinc and copper, are immersed in a glass of water, to which a few drops of sulphuric acid have been added; both metals we connect by a long wire, and then we find the wire possessed of a new force which can transmit a motion through the distance of a hundred miles and over. For a long time, the voltaic pile had been the subject of unsuccessful experiments for the purpose of finding its relation to the magnet, to which, on account of its poles, it bears a certain resemblance. One day, Oersted, at a lecture in Copenhagen in 1819, noticed that a magnetic needle on his table was disturbed by a communicating wire that happened to pass over it. He removed the wire, and the needle resumed its polar direction; he then replaced the wire, and the needle again turned aside.

Electro-magnetism was thus discovered. At once he recognized the immense bearing of the phenomenon, repeated the experiment in presence of the magistrate, a notary public and other witnesses, and made a Latin affidavit; this places his name, for all time to come, among the benefactors of the human race. The advantage of his invention is enjoyed by all of us who daily read telegrams from distant parts of the world as if this rapid transmission of news were a matter of course. The wonder has become a fact of daily occurrence; it it rises with us and accompanies us through the day.

PREPARATIONS are being made at the Woolwich Arsenal for the erection of the 30 tun Nasmyth steam hammer, the largest ever constructed. It will be able to strike a blow equal to the weight of about 800 tuns, and the bed for the anvil has therefore to be of enormous strength. An excavation 45 feet square and 20 feet deep has been made, then piles, about 100 in number, driven into the solid gravel about 20 feet and the interstices filled up with concrete; on these was placed a block of iron 30 feet broad and 11 inches thick, weighing 160 tons, and on this two layers of oak balks. On this timber was next placed another iron plate, 10 inches thick and 27 feet square, weighing 121 tuns, and then followed a number of oak balks as before, standing vertically and bound together with wrought iron bands. Two more iron plates, weighing together 214 tuns, have also been lowered upon the oak balks, and one heavier than any yet placed will shortly follow. Upon this the anvil block, shortly to be cast, which is to weigh 102 tuns will rest, and it will be surmounted by the anvil face, which will be 12 feet in diameter and weigh 60 tuns.

MR. A. D. BREAZELE, of Alabama, has patented a mosquito frightener composed of the following formidable ingredients: Oils of pennyroyal, savin, origanum, terebinthe and sassafras, tinctures of lavender, chloroform and arnica; gum camphor, niter, alcohol and kerosene oil. If the Alabama mosquitoes can stand such a preparation as the above, they are proof against anything, and the only remaining thing to be done is to set mouse traps to catch them.