Newport, Kentucky, Aluminum.

In a sheet issued at Newport, Ky., styled the *Aluminum Age*, is a statement saying that a representative of the SCIENTIFIC AMERICAN witnessed some very interesting experiments showing what "the new aluminum process" is capable of producing in the shape of wrought iron steel castings, at the aluminum works, Newport.

After making this false statement—false because it is untrue that a representative of the SCIENTIFIC AMERICAN has visited the Newport works or witnessed experiments as stated—the writer goes on to give a detailed account of the pretended experiments, saying that the furnace was charged with coke, scrap, aluminum alloy and a secret paste, which were melted, and from which wonderful castings were made, etc. Various other details are then given, which are garbled from an article published in *Industries*, of London, relating to Brin Brothers' establishment in that city, which was quoted in the SCIENTIFIC AMERICAN of November 10, 1888, p. 296.

The Perfume Industry in the United States.

During the recent development of horticulture in Florida and California many experiments have been made in the production of perfumes from flowers, and many of these have resulted successfully. There is little wonder, therefore, that inquiries are often made as to the possibility of growing flowers at a profit for manufacturing purposes in the genial climate of these and other States. Many of these inquiries are evidently from persons who have not even a vague idea of the result to be arrived at, not to speak of the details to be pursued, so that perhaps a few hints from one familiar with the products may be useful. Despite all the triumphs of modern chemical science, which has produced synthetically many odors which are more or less useful, it still remains the fact that all high class floral extracts, by whatever name known, are composed, to a greater or less extent, of one or more of the following odors: violet, rose, jasmine, acacia, orange, tuberose, and jonquil. With one or more of these in combination with some resins, oils and animal secretions, the skillful perfumer is able to imitate the odor of any other flower and produce pleasing bouquets. These odors are bought by the perfumer in the form of pomades, experience having taught that this is the only feasible means of securing them properly. Practically, then, our citizens have this problem before them very clearly, namely, to produce a highly charged pomade at a price which will enable them to compete with the flower farmers of Southern France, who at present supply the world's markets. This pomade is marketed in eleven and twenty-two pound tins, varying in price according to quality. It pays fifty per cent duty, and the present wholesale price is about $2.50 per pound for violet, and $1.50 to $1.65 for the others.

Like all manufactures, the making of pomade cannot be taught by books, but a few hints may help the experimenter. The process of extracting odors is known as *enfleurage*, and it is carried on either with or without heat. Jasmine and tuberose flowers are exposed to lard spread thinly on sheets of glass in suitable frames; this soon absorbs the odor, and by renewing the flowers the grease becomes saturated. The perfume of the other flowers is extracted by hot *enfleurage*. In this case an addition of beef fat is made to the lard (insuring a higher melting point); this mixture is heated to the melting point, when the flowers are thrown in and rapidly stirred through the grease; the semi-liquid mass is put under a strong press with suitable filtering material until the flowers are separated. The process is continued till the grease is practically saturated with odor. These processes are simple, and with a supply of flowers there is no reason why a good pomade cannot be produced in this country.

Judging from some inquiries, however, it does not seem to be generally understood that the process depends primarily on securing perfectly pure and odorless lard, which is by no means the same as the lard of commerce. No amount of perfume will make impure grease fragrant, and the perfumer will not buy an article of the kind at any price. In his laboratory the perfumer is one of the most practical of men, and buys his materials on their merits. It is just as important to have his pomades free from false odors as that his spirits should have no trace of fusel oil.

The process of securing lard free from albumen, membrane and blood, is as follows: Cut up the fat in small portions, separating the membranes as far as possible by hand, and wash till the water runs clear. Melt with a gentle heat in an iron or copper vessel over a water bath and continue till it becomes anhydrous, or free from water, which may be known by its becoming perfectly clear. Finish by filtering through a clean cloth. This lard will retain an odor which may be removed by remelting and adding a small portion of alum or common salt, and keeping it over the fire till a scum rises, which should be skimmed off. The salt must then be washed out and the lard again rendered anhydrous. Such lard is kept in a moderate temperature in tin, sealed from the air, and it will remain sweet as long as is usually necessary.

It will be well for one who intends to try the perfume industry to secure a sample of the French pomade from some perfumer, so that an idea may be had of the strength of odor desired in the market. The prospect of success offered by this industry can only be learned by experiment, but it is certain that no careless methods will answer. As in other things, there is room at the top, and high class products are certain of a market.—*J. N., in Garden and Forest.*

AMPERE AND VOLT ANALOGIES.

T. O'CONOR SLOANE, PH.D.

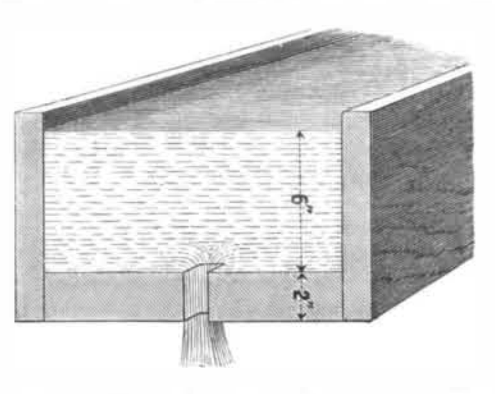
In the SCIENTIFIC AMERICAN of February 28, 1891, page 133, a graphic illustration of the volt and ampere was furnished in an extract from some testimony given by Thomas A. Edison. He invoked the waterfall as the representative of a current of electricity, compared its height to voltage and its volume as so many gallons per second to amperage.

This illustration, while admirably suggestive to the popular mind, is not exact, because it appeals to an absolute quantity of water and to a time unit in obtaining the analogy to an ampere.

It is unquestionable that no analogy for an electrical unit can well be perfect, but it so happens that for the ampere a peculiarly close analogy is found in a very well known water measurement unit, namely, the miner's inch. It is upward of a year ago that the writer described this analogy in the columns of this paper. It is one that must have often impressed electricians.

The miner's inch is defined as the quantity of water which will flow through an aperture an inch square in a board two inches thick, under a head of water of six inches. Here, as in the case of the ampere, we have no reference to any abstract quantity such as gallons or pounds. There is no reference to time. It is simply and purely a rate of flow, exactly what the ampere is conceived to be in electricity.

In the illustration a representation of a tank whence



water is flowing through a hole one inch square extending through a two inch plank, and under a head of water of six inches, is shown. The perforated plank is shown as horizontal, simplifying the pressure question. Referring to these conditions, we may consider the head of water, six inches, as the representative of electrical pressure; in this case representing one volt. The aperture restricting the flow of water may be assumed to represent the resistance of one ohm; the flow through a resistance of one ohm under the pressure of one volt is of course one ampere; the flow through the resistance of a one inch hole two inches long under the pressure of six inches to the upper edge of the opening is one miner's inch.

The expression "one miner's inch per second" would be just as meaningless, or at least redundant, as the expression "one ampere per second." On the other hand, the miner's inch-second is the correct analogue to the ampere-second; the one denotes a specific quantity of water, 0·194 gallon; the other a specific quantity of electricity, a coulomb; 0 194 gallon per second of flow represents a miner's inch; one coulomb per second of flow represents one ampere; 1·94 gallons per second is supplied by ten miner's inches; 10 coulombs per second is supplied by 10 amperes.

If we attempt to apply Ohm's law to the miner's inch, we naturally fail, because the laws of hydraulics differ from those of electricity, but none the less it is a very excellent analogy, and one which is of importance in conveying the idea of rate of flow.

The same idea could be carried out in application to power. Into power the idea of time does not enter. We can have a horse power-second of work, but one horse power per second means nothing more than one horse power. Accordingly, for electric power the unit is the volt-ampere; for work, the volt-ampere-second or volt-coulomb. In the same way we might take the foot-miner's inch as the unit of power. Then the foot-miner's inch-second would be the corresponding unit of work.

Besides the miner's inch there is a similar unit, the water-inch, which is equally applicable to this line of explanation.

It curiously happens that the absolute quantity of water is sometimes spoken of in miner's inches. When thus used, a miner's inch flowing for 24 hours is meant, carrying out the precise idea of coulombs as a measure of quantity of electricity.

Proposed Irish Channel Tunnel.

In the paper on this subject which was read by Sir Roper Lethbridge, M.P., before the Society of Arts on February 11, the author stated that, if such a tunnel were ever to be constructed, it must be with the aid of the state as a public work of national importance. Two or three schemes had already been propounded, and last October the mayor of Belfast, Mr. Barton, placed before a meeting of his fellow citizens a scheme which seemed hopeful for a tunnel between Island Magee and the coast of Wigtownshire.

Another proposal is for a tunnel between Whitehead and Portpatrick, while a third, by way of Cantyre, adopts a shorter sea route, and a fourth has been suggested between Donaghadee and Portpatrick. Another ingenious device proposes a submerged tubular bridge, and a channel bridge on the lines of the Forth Bridge has even been talked of. Judging by what has been done by Sir Edward Watkin at Dover, there seems little doubt that a submarine tunnel could be constructed—it was simply a question of cost and time.

After quoting Professor Hull's report on the geological conditions of the channel bed, Sir R. Lethbridge proceeded to consider the question of cost, coming eventually to the conclusion that a sum of £10,000,000 would probably be needed. In order to make a tunnel pay, it would be necessary to earn about £200 per mile per week, and therefore extraordinary sources of revenue would have to be sought. He ventured to suggest three that might be obtainable: First, the railways connected with the tunnel would be largely benefited, and therefore might be called upon to contribute *pro tanto*. Secondly, the whole line of country between the Irish end of the tunnel and the western coast, in view of new transatlantic routes, would be enhanced in value, and on the principle of "betterment" might be expected to contribute. Thirdly, the work being one of national importance, Parliament might come to its aid. In view of the proposals for opening a new route to China, Japan, and Australasia across British North America, Ireland would eventually become the last section on the side of the Old World of the great British trade routes girdling the world. Any project, therefore, for closer intercommunication between Great Britain and Ireland must be worth attention, to say nothing of the advantages that would be conferred upon the sister isle by making it more easy of access to travelers, whether for pleasure or profit.

In the discussion which followed, Sir Edward Watkin said he was especially interested in the question, because he had for many years been considering the feasibility of uniting Ireland with Scotland, and bringing the west coast of Ireland within three and a half or four days' reach of America. He had contemplated a ship canal between Dublin Bay and Galway Bay, which the late contractor, Mr. Walker, told him might be cut for about £8,000,000.

Sir Joseph W. Bazalgette.

The death is announced from London of Sir Joseph William Bazalgette, the eminent civil engineer. Though born at Enfield in 1819, he was of French origin. He was educated in the private schools of England and subsequently became a pupil of the distinguished engineer Sir John MacNeil. He began business on his own account as a civil engineer in London in 1842, and four years later attained wide celebrity in connection with the great railway extensions of that period.

As assistant engineer to the Metropolitan Commission of Sewers, which appointment he accepted in 1848, he designed and constructed over three hundred miles of sewers in London, and on the passage of the Metropolitan Management act, four years later, he was appointed by public competition engineer to the Metropolitan Board of Works, in which capacity he devised the scheme for the drainage of London which was carried out between 1858 and 1865. This achievement, together with the introduction of subways for carrying the gas and water pipes and telegraph wires under the new metropolitan thoroughfares, which he constructed, gave him a world-wide reputation.

In addition, Sir Joseph also designed the Victoria, the Albert, and the Chelsea embankments on the Thames, executed between 1863 and 1874, together with numerous street improvements. A code of regulations and instructions on the construction of bridges and alteration of streets within the metropolitan area was published by him, which is incorporated into all metropolitan railway bills. In 1871 he was created a Companion of the Bath and knighted by the Queen at Windsor Castle, May 12, 1874.

ONE of the features of the grand parade in Des Moines during the Iowa State Fair was an electrically propelled buggy, the current being furnished by storage cells.

Animal Photography.

A lecture on "Wild Animals in Captivity" was recently given in London by Major J. Fortune Nott, president of the Richmond Amateur Photographic Society. The lecture was illustrated by the beautiful slides made by Major Nott from negatives taken by himself in the Zoological Gardens and other places, and was attentively listened to by an audience which filled the hall.

Major Nott prefaced the exhibition of the slides by some remarks on the attraction which the sight of wild animals in captivity had exercised on all civilized nations from the earliest times. Portraits of the camel, which, although one of the earliest of domesticated animals, still remained the same as it had been in the time of the patriarchs, and showed no signs of increasing intelligence, as had been the case with horses and dogs, were thrown on the screen. Two very interesting pictures were those of a camel and its young one, found by an English officer on one of the Egyptian battlefields, wounded, and apparently dying. The officer determined to try to save the lives of the animals, and had them shipped to the Zoological Society, in London. When they arrived they were nothing but skin and bone, their humps had entirely disappeared, and they could not walk. So bad was their case that permission to kill them was sought by telegram. The telegram, however, fortunately miscarried, and during the delay that ensued the camels began to recover, and their portraits as they appeared when landed and as they are at present provoked great applause.

Among the finest of the pictures were those of the lion, tiger, panther, giraffe (one of which showed the animal as seen directly in front, and enabled the extraordinary length and thinness of the neck to be well seen), hippopotamus, rhinoceros, kangaroo (with young one peeping out of the pouch), deer of several species, seal, sea lions, monkeys (including a portrait of Sally, who can count, and objects to take her tea unless offered in a cup and saucer), buffalo, wild asses, and zebras.

Major Nott gave interesting details of each of the animals as it was shown, and mentioned in the case of the sea lion, which is said in most of the school text books *not* to be so called because it has a mane, that this was evidently wrong because the specimen he had photographed showed the mane clearly. This was owing to the fact that the animal had been some time in the sun and the mane had dried. When wet it was hardly perceptible.

A photograph of a curious picture of a rhinoceros by Albert Durer, dated 1515, was shown. This was taken from an engraving in the British Museum, and bore on it an affidavit (as it would now be called) that the portrait was from life.

It represented an animal remotely resembling a rhinoceros, but clad in a complete suit of what looked like plate armor richly ornamented. This provoked much applause, and Major Nott stated that so much faith was placed in this affidavit that the pictures of the rhinoceros in all books since the date of Durer's engraving were copied from it down to a very late period.

The Destruction of Two Gasholders at Glasgow.

One of the most remarkable occurrences on record, in connection with gasholders, took place, says the *American Gas Light Journal*, at Glasgow, on the 15th ult. The gas undertaking of this important city is the property of the municipal authorities, and comprises three different stations. The one in question, known as Dawsholm, is situated in a somewhat isolated position outside the town, and includes three gas holders arranged in line, about 25 feet apart, but fortunately, as it turns out, at some little distance from the rest of the buildings and plant. The three gasholders are all similar in respect to diameter, being 160 feet across. Two of these have lately been enlarged by the addition of a third lift, which made them 90 feet in height, and equal to containing more than 1,500,000 cubic feet of gas each. The third remained a double lift, consequently about 60 feet high and holding something over 1,000,000 cubic feet of gas when full.

At about 4:30 in the afternoon the outlet valve of No. 1 was open for the supply of the district, No. 2 shut off, and the inlet of No. 3 was open to receive the make of gas. The valve man, McAlister, opened the inlet of No. 2, with a view apparently of diverting the make from No. 3. At this time No. 1 was three parts or more full, No. 2 a little less, but sufficient to cup the lower lift, and No. 3 was not far from being full. Before McAlister could complete his purpose by closing No. 3 inlet a large mass of flame was observed shooting high into the air, over the roof of No. 2, the center holder. It was accompanied by a loud rumbling noise like the shock of an earthquake, together with a concussion that caused windows to rattle violently, and greatly alarmed the inhabitants of the neighboring part of the town. This appears to have been caused by the bursting of the roof of the gasholder in all parts. It was quickly followed by the destruction, with a second concussion, of No. 1 holder, and in a few minutes the whole structure of both holders lay in a confused mass at the bottom of the tanks. Fortunately this was unattended with loss of life or even serious injury. Workmen who happened to be in the vicinity were scorched, and some haystacks 100 yards off were set on fire; but the enormous volume of some 3,000,000 cubic feet of gas appears to have passed steadily up into the air, and burnt away as fast as it could meet with sufficient oxygen to support combustion. The whole affair was over in four or five minutes.

The experts report they are satisfied that the holders did not contain any explosive mixture, nor did they possess structural defects. But there were "indications of an explosive material having been placed on the crown of No. 2." The explosive power, striking inward, ruptured No. 2, and the concussion was considered sufficient to account for the damage to No. 1. The "indications" appear to be an irregular fracture, having the edges bent *inward*, and corroded as if by the action of chemicals.

The corporation have offered a reward of £1,000 for the apprehension of the author of the catastrophe.

Sorting Letters at Sea.

The establishment of ocean post offices, similar to the railroad service, has been approved by the government, and will be adopted between the United States and Germany. By this plan postal clerks on the ocean steamers plying between New York, Bremen, and Hamburg will have ample time to assort the mails, so that upon the arrival of the steamers the letters can be promptly forwarded to their destination. The expense of this ocean mail service is to be equally divided between the two countries. The new arrangement will go into effect April 1 on vessels leaving the German ports on that date and on April 15 for outbound vessels from New York. Should the plan prove satisfactory, there is no doubt that it will be adopted in the postal intercourse between the United States and other countries.

UNIVERSAL FILE HANDLE.

This malleable iron file handle has just been placed on the market by the Millers Falls Company, 93 Reade

UNIVERSAL FILE HANDLE.

Street, New York City. It is five inches long, japan finish, and weighs five ounces. Thumbscrew of forged steel, strong and durable, and will hold perfectly files of all sizes and shape tangs, from a 15 inch mill file to the smallest size in use. It holds equally well twist drills, screw drivers, auger bits, gimlets and all tools having shanks less than ⅜ of an inch square.

A Chance for the Inventor.

The wonderful ingenuity developed by our mechanics, inventors, and contrivers during the past generation or two has about spoiled the dear public. It does not make much difference as to the purpose for which any piece of mechanism is designed, it must be more or less automatic and "self-operating" to take with the average buyer. In some respects the demand —craze we might call it—has been carried to the verge of absurdity; in others it has proved of the greatest benefit to the human race, while certain fields, in which the automatic principle should be peculiarly available, have failed of all benefit in the efforts of the inventor.

Take for instance the ordinary heating apparatus in our dwellings, whether it be steam, hot water, or warmed air that is employed. Many of the makers thereof have strong claims to advance for the "automatic" character of their appliances, and yet there is not one among them all that can be safely trusted, to use a homely phrase, to "go it alone," even for a limited period. Here is a furnace man who will fit up your residence with a wonderful arrangement of electric thermostats, or thermometers having electric limit connections, by which he will guarantee to keep your house at an even temperature all winter. A steam heating outfit is provided with a diaphragm valve that controls the damper of the furnace and keeps just so much pressure, which means an equally well determined degree of heat. The hot water man has something else; all are equally infallible, but the only difference in their operation is the effect they exercise on the pocketbook. Either they are dismal failures, in spite of all that can be done for them, or they take so much looking after that the deluded purchaser reverts after all to the poker, shovel, and shaker, which, controlled by the human sense of comfort and its opposite, are the best regulators of the modern heating apparatus.

Here is a chance for the inventor. The ingenious individual who will make it impossible for the ordinary heating apparatus to freeze us or "render" us out between bedtime and dawn; that will insure, without a constant worrying of the fires, an even temperature; that will obviate the necessity for flooding the ordinary residence with cold air and incidentally with dust, preparatory to the kiln drying of its contents, will win a fortune and honestly earn it. It does not matter what the heating medium may be or how regulated, provided it is not in any way more offensive, cumbersome, dangerous, etc., than the methods now in vogue; as long as it is reliable and effective it will go, and price will be no object.

There is no doubt but what it will come to pass that the heating apparatus of the future will be as economical of fuel, as safe, as efficient and withal as mechanically beautiful, as the modern automatic high speed steam engine, with its cut-off and perfect self-governing devices, and inventors would find it mighty profitable to be first to the front with anything of the kind that would be really trustworthy. We have looked the field over very carefully, and found several contrivances that may ultimately fill the bill, but which labor under "just one" little defect or weakness that is fatal to their perfect reliability. With all the ingenuity they have thus far displayed in their constructions, the originators should certainly be able to complete them. —*The Sanitary Plumber*.

Electricity as a Measure of Thought.

Mr. J. L. Balbi says: It is well known to the medical profession that every mental effort causes a rush of blood to the brain, and that the amount of blood depends on the "intensity" of the thought; but rush of blood means a rise in temperature, and if we could measure this we would be able to determine, in a *rough* way, the "power" necessary for the generation of any thought or mental effort. I accomplish this object in the following manner: I have a head gear of some light, high-conducting (heat) substance. In its middle or any other convenient position I fix a thermo-electric pile, and connect this, by means of flexible wires or otherwise, to a sensitive galvanometer. The extreme sensibility of the thermo-electric pile is well known, and therefore whatever rise in temperature takes place, consequent to the rush of blood, would be instantaneously indicated by the galvanometer. The utility of such an apparatus may not appear at first sight of great importance, but if we consider for an instant the facility or difficulty with which children at school learn their lessons, any doubts we may have entertained as to its practicability will be immediately dispelled. By such a contrivance would we ascertain the "brain power" of boys and girls, nay, even men, and thus be in a position to indicate in what direction their mental efforts ought to tend.

To Relieve an Overworked Brain.

A Swiss doctor says that many persons who extend their mental work well into the night, who during the evening follow attentively the programme of a theater or concert, or who engage evenings in the proceedings of societies or clubs, are awaked in the morning or in the night with headache (the *Sanitary Inspector*). He is particular to say that he does not refer to that headache which our Teutonic brethren designate *Katzenjammen*, that follows certain convivial indulgences. This headache affects many persons who are quite well otherwise, and is due in part to the previous excessive work of the brain, whereby an abnormal flow of blood to that organ is caused; in part to other causes, for example, too great heat of rooms, contamination of the air with carbonic acid, exhalations from human bodies, and tobacco smoke.

For a long while the doctor was himself a sufferer from headache of this kind, but of late years has wholly protected himself from it by simple means. When he is obliged to continue his brain work into the evening, or to be out late nights in rooms not well ventilated, instead of going directly to bed, he takes a brisk walk for half an hour or an hour. While taking this tramp he stops now and then and practices lung gymnastics by breathing in and out deeply a few times. When he then goes to bed, he sleeps soundly. Notwithstanding the shortening of the hours of sleep, he awakes with no trace of headache. There exists a clear and well-known physiological reason why this treatment should be effective.

Influence of the High Tension Spark.

Mr. Branly has recently found that the spark of a Holtz machine or induction coil has a remarkable effect in temporarily decreasing the resistance of certain badly conducting mixtures, such as powdered or oxidized metals, or pastes formed by immersing filings of iron, copper, or other metals in a non-conducting fluid. The effect is generally increased by connecting one or both of the sparking terminals with the substance under test, although the spark alone may be sufficient. In one case the resistance of a junction of two pieces of oxidized copper, as measured by a Wheatstone bridge, was reduced from 80,000 ohms to 7 ohms in this way. The diminution of resistance of such conductors may last for as long as 24 hours, unless the substance is disturbed by vibrations, in which case the high resistance is restored.