Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

For the Scientific American.

GAS EXPLOSIONS--THE SAFETY LAMP.

The Southbridge (Mass.) *Journal*, gives an account of the explosion of a gasometer, or rather gas holder, which occurred a few weeks ago at the gas works of the Hamilton Woolen Company at New Village, by which five lives were lost, which seems to furnish an opportunity for a few remarks on the subject of gas explosions, that may be useful. We copy the report of the disaster:

"No gas had been made since last spring, and there was but a small quantity on hand. The manhole in the top of the gasometer had been open five days to allow this to escape. Repairs were being made, under the superintendence of Mr. White, master machinist for the Hamilton Woolen Company, and all Saturday he was engaged with a force of men pumping the water out of the tank. During the progress of the work, he was frequently reminded of the danger from igniting the gas, and on one occasion when he suggested that a light might be used, the superintendent of the mill expressed himself plainly in regard to its impropriety. The work was not quite finished Saturday afternoon, and being desirous to begin the work of repairing on Monday, Mr. White had his employés come back after tea. The work went on till half-past eight o'clock in the evening, when, without any warning to the half dozen people who were in the building which covered the gasometer, he took a lighted lantern and lowered it by a cord into the pit, apparently to examine its condition, when the explosion occurred with considerable force, blowing the house and gasometer some twenty feet into the air, and shrouding the whole in a sheet of fierce flame. Mr. White, who was directly over the manhole, was thrown upward with much violence against the roof, crushing in the top of his head, and then fell with the burning mass into the pit or tank of the gasometer, where the fire raged with the most violence. Those who were inside the building when it rose in the air, were blown literally out of the building, followed by a terrific rush of flame. John Brown and James Brogan fell near the building. Brogan was terribly burned and lived but a little while after being taken out of the ruins. Brown had his head, side, and arms, terribly burned and crushed, and died after about three hours of suffering. Rochelle was severely burned and died the following Wednesday. Devoy, the last victim, died Thursday. Clemence and Holmes fell still further from the building, near the bank of the river, retaining their senses, and as soon as they felt the rush of flame, they jumped into the water, and thus saved their lives."

It is to be regretted we do not have a more particular account of this catastrophe; it would be well to know the capacity and form of the gas holder, and the point where the manhole was located. The usual shape of gas holders is cylindrical with a crowning top or roof, the manhole being generally near the perpendicular wall for convenience of introducing a ladder and leaning its top against the wall. The frame of the roof or crown is usually of iron bars, to which are riveted the plates of sheet iron of which the gas holder is built. In this case the manhole had been left open five days to allow the gas to escape, although, as no gas had been made for several months, the holder could not have been very heavily charged. Yet there was gas enough in it, notwithstanding these facts, to blow a building to pieces, kill five men, and start a destructive fire.

We think the cause of this accident—if so it may be termed—perfectly plain to be seen. Gas is lighter than air, and will seek the highest point. Assuming (which was probably the case) that the manhole was near the outer edge of the roof, and below the highest part of the holder, its being open five days, or five months, would not free the holder of that portion held in the upper part; the gas could no more run down to the manhole than water can run up hill. If there were no leaks in the higher parts of the roof, the gas would have been retained there in its integrity for years. There was gas—hydrogen—mixed with sufficient quantity of atmospheric air—oxygen—to constitute a highly explosive mixture, requiring only a flame to ignite, and that was supplied by the lantern. Consequence, a terrific explosion.

Now, what should Mr. White have done in this case? He might have detected the presence of gas in the crown of the holder by punching a small hole at the apex, and applying a lighted match over the hole. If hydrogen was there it would have escaped, and that portion escaping would have ignited as it mixed with the atmosphere; only the lower stratum in the holder could have been explosive. Or, the puncture would have been sufficient to permit the gas to escape. Perhaps several small holes would have been necessary to insure perfect safety, as the ribs of the roof, if meeting the sheet iron covering air tight, might form compartments, each being an independent gas holder. We would here suggest the formation of minute passages between these compartments in building gas holders, by simply cutting scores across the bars, next the sheet covering, and forming a safety hole with suitable covering, to be removed as occasion may require, located at the very top of the crown. Thus the holder could be readily and entirely discharged of its gas.

The Davy lamp is also useful at gas works, as well as in mines, and it is so cheap and easily constructed that it is matter of wonder it is not more generally used. To enable our readers to construct one for temporary purposes, we have engraved two illustrations; one, Fig. 1, of the original Davy lamp, and the other, Fig. 2, of the Struve lamp, considered preferable to the Davy, and easier made. No description is necessary to enable the reader to understand their construction. The lamp, gauze cylinder, and all, should be about 9 inches high, 3 inches diameter at the base, and $1\frac{1}{2}$ inches at the top. The sides and top should be formed of wire gauze, 700 or 800 meshes to the square inch. The edges of the cylinder must be soldered securely together along the side. At the bottom a band of sheet metal should be soldered, which should meet the body of the lamp, and be made so as to be removed for lighting and trimming, and held securely in place when in use.

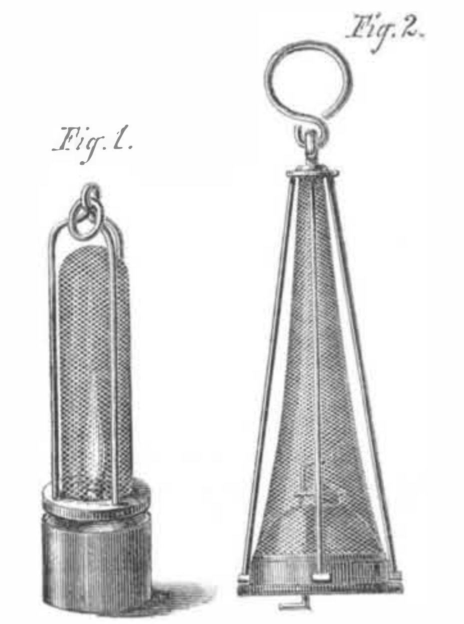

Fig. 1. Fig. 2.

It frequently happens that in buildings furnished with gas, the pipes, stop-cocks, or meter leak. The escaping gas, mixing with the air, becomes explosive, and if confined in a room a lighted match or lamp produces an explosion destructive to life and property. When gas is found in an apartment the doors and windows should be opened, the latter from the top if possible, but if not made to let down, defend the hand with a hat or any other covering and become a glass breaker, smashing out a few of the upper panes. Allow half an hour to elapse, then bring in an uncovered light, *carrying it near the floor*, and do not approach the source of the leak with it. The Davy or Struve lamp, however, is the safest.

Fortunately these explosions are not very frequent. Yet sometimes men, who ought to know better, commit the most egregrious mistakes. As an instance, a civil engineer in Boston, some years since, found the basement of his house filled with gas, and carrying a lighted lamp above his head, and accompanied by his wife, he approached the meter, when an explosion took place that broke his legs, burned him and his wife, and cracked the walls of his house. Another case was that of a graduate of West Point, who was superintending some work on a gas holder which had been found defective. The manhole in this case was near the side wall; and to see the interior he introduced a lighted match, when an explosion occurred that severely injured him and others, and did great damage to buildings in the immediate vicinity.

New York city. F. W. BACON.

Pressure on Steam Valves.

MESSRS. EDITORS:—In your issue of September 9th, in answer to a correspondent, you say, "The pressure upon a closely fitted steam valve, not covering any ports, is as the area of the valve and the pressure of the steam." As this statement is calculated to mislead many youthful engineers and mechanics, I would state that the friction of one smooth surface moving upon another, is no greater under any pressure of steam, no matter how great, than in a vacuum, or in the open air; and it appears singular to me that the reason for the phenomenon in question, if it be a phenomenon, should have been so generally overlooked, for it is evident, beyond the possibility of a doubt, that the action of steam and that of air must be identical with respect to their penetration between two apparently smooth surfaces; for mathematically speaking, there cannot perhaps be such a thing as a smooth surface of measurable extent. It therefore naturally follows that the steam insinuates itself between the two surfaces, and it will then press upward with precisely the same force that it presses downward.

The fact that steam insinuates itself between the piston packing and the bore of the cylinder, even when both are in perfect order, and condenses in the interstices often sufficiently for all purposes of lubrication, is one among many proofs of the penetrating powers of steam.

If the above statement is not considered satisfactory to your correspondent, I would recommend him to take a slide valve of the ordinary pattern, and having scraped it to a good bearing, place it on a well fitted seat (without ports) inclosed in a chest, and apply steam of any pressure, say one hundred and fifty pounds to the square inch, and he will be convinced as others have been.

Knowing that your journal has a large circulation among mechanics, and that you would not willingly propagate an error, must be my excuse for trespassing on your valuable space. H. M.

[Our correspondent evidently does not mean the same thing by a closely fitted steam valve that we do. We mean by a closely fitted steam valve, one that is steam tight. Our correspondent seems to think that this is impossible. That such perfection is not often reached is, perhaps, true; but that it can be, and is obtained, is the opinion of some of our best engineers. Whether it ever is attained or not, the only basis for computation of the pressure a valve sustains is to assume that it is perfectly steam tight, as no one would pretend that it would be held to its seat if it lay, not upon the seat, but upon a stratum of steam.—EDS.

Coating Brass with Copper---Blowing Hot and Cold.

MESSRS. EDITORS:—Take a piece of brass, dip it in a solution of sulphate of copper, no deposit of copper will cover the brass, as the brass has no affinity for the copper, and will not separate it from the solution. But as soon as you dip the brass in the solution, you lay a piece of saw blade (steel) on it, a beautiful coating of copper will cover the brass, iron, or any other kind of steel will not produce the same results.

The extremes of heat and cold can be produced in a very simple manner. If you open your mouth wide and blow your breath, it is warm—producing heat—as you warm your cold fingers in this way. Pucker your mouth—make a small orifice—force out the breath, and it is cold—producing cold. You cool your fingers by this method when you burn them. Please explain the above phenomena, and oblige,

T. W. B.

Covington, Ky.

[The reason that, when a piece of steel is placed in contact with the brass, in a solution of sulphate of copper, the copper solution is decomposed, and its copper deposited upon the brass, is that the chemical action of the solution upon the steel renders it electro-positive, while the brass is rendered electro-negative. The copper in the solution being the electro-positive element, will be attracted to the negative pole. We think our correspondent is in error about any particular kind of steel being necessary, and that his statement to that effect is based upon defects in his method of experimenting, which of course we can not point out without personal observation.

The explanation of the second statement in his communication is, that heat and cold are merely relative terms. If he should blow upon a piece of iron colder than his breath, it would be warmed; and if the same thing should be done to a piece of iron heated to a temperature above that of the breath, it would be cooled. The sensation of cold is felt in any part of the body when it has less heat than the general temperature. The breath which is heated to a temperature nearly or quite as high as the vital parts of the body, will of course impart its heat to the extremities when they are cold. When a part of the body is burned, its heat is raised by inflamatory action above the general normal temperature. The breath would then feel cool when blown upon the burn.

When the breath is forced in a sharp current, it carries with it much of the cooler air which surrounds it, becoming intermixed with it by friction. When it is gently blown from the mouth, this effect is not produced. Try the experiment by blowing the air gently, with your mouth "puckered," and then without changing the position of the lips, blow forcibly; you will, when blowing gently, experience a feeling of heat, and when you blow forcibly, a sensation of cold will be produced, so you will see the shape or the size of the orifice has nothing to do with it.—EDS.

Flux for Blowpipe Analysis.

MESSRS. EDITORS:—Among the various methods of testing the presence of substances in chemical examinations, that by means of colored flames seems to be of growing importance, not alone with reference to the application of the spectro scope, but in the ordinary use of the blowpipe or gas flame. For unmasking lithia, etc, the books prescribe a mixture of bi-sulphate of potash and fluor spar; but this flux is objectionable, on account of the intense violet tint (potash) which may disguise the reaction due to the presence of small quantities of other substances. Fresenius directs that silicates be mixed with sulphate of lime; but this salt is, by itself, infusible, and its power of decomposing the natural silicates small. On the other hand, a mixture of sulphate of lime and fluor spar, in equivalent preparations (say about two parts of crystallized selenite to one of fluor spar finely mixed), forms an easily fusible bead, which by itself gives only a very faint dull red tint (lime) to the flame, but which renders the presence of such elements as give color, most beautifully evident and characteristic.

Thus, small portions of lepidolite, petalite, etc., mixed with this flux, impart the fine carmine tint; copper, strontium, their well known colors, especially after continued blowing. Potash and soda minerals (feldspar and albite) are at once distinguished.

Presuming that many of your readers are interested in Determinative Mineralogy, I invite them to make use of the above named reagent, and if possible extend its utility.

Lynn, Mass. STEPHEN D. POOLE.

[We have no doubt the flux described by our correspondent will prove a good one, and recommend its trial.—EDS.

Burying Alive.

MESSRS. EDITORS:—In your issue of Sept. 16th there is an article on "Burying Alive;" and in the list of patents from time to time appear devices and compounds for preserving the remains of deceased persons; and particularly I noticed last week a patented coffin which, in the language of the specification, is "rendered air tight," etc.

In regard to the "burying alive" detecter, experimented upon in Newark, N. J., there is manifested a want of practical knowledge with regard to signs of death, and of the real cases that have taken place in the experience of cemetery life. The writer of this article has seen at least fifty thousand interments made in one of the large cemeteries on Long Island, but never witnessed any want of this invention, though I have known cases of watching the receiving vault, and leaving the coffin open, etc., in many instances. I have also seen an instance that would have startled the watchman had he fastened wires, as at Munich, to the hands and feet; for I have known the limb of a crooked-kneed person, deceased, whose remains were crowded to fit the coffin at the knee, to be drawn up by the contraction of the muscles, so as to force the lid of the coffin and hang out at the side. As regards the prejudice and strange stories about being buried alive, and evidences deduced from the fact of remains found with face downward, etc., there is great talk, with little facts. But I have seen a caving in of a grave, or a slipping off of one of the ropes when lowering into the grave, cause the complete turning upside down of the coffin, which would no doubt change the position of the corpse. An incident like this would be forgotten when, years after, the body might be exhumed. Another point about this "burying alive" detector. "A tube at the head" connects the corpse with the surface above! Indeed! Let the practical(?) inventor of this "detecter" go to Greenwood. Imagine "a tube" from the remains of every corpse to the surface above, and this ridiculous impracticable device will appear in the shape of vent holes for the unpleasant gases arising from the decaying bodies below, or, in fact, preventing the need of burying at all!

Another point about patent coffins, etc. If these inventors will go to any large cemetery and witness the styles of coffins used, they will seldom, if ever, of late, see a "metallic case"—a patented coffin, once very popular, but now in the shade. It is used for disinterment now and then, but out of a thousand interments not more than one of two cases of metallic will be seen. And yet inventors are making air-tight coffins in different ways, and all will fail, for the same reason as the metallic case. I wonder often if these inventors, or people generally, know the effect a metallic case has upon a corpse. Do they know that in a short time decomposition is so active that the generated gases and fluids, if not allowed to escape, will aid this decomposition? I have seen the remains of a noted lady that were removed from Chicago to Long Island, so decomposed that they would actually flow jelly-like from one end to the other of the case! Will any one dispute that this fluid aided decomposition? Being air tight, the case holds that which rots the flesh and bones. Plain facts and plain language.

Let me close by remarking that the pine box, which undertakers urge more for an item to make profit on than for utility, is also an error that the public generally are not aware of. I care not for theories of decomposition and preservation, I speak from experience in seeing thousands buried and taken up. The pine boxes, from moisture without and within, soon become tight. They retain the decomposed matter oozing from the coffin, and this soon rots the wood of the coffin, and, instead of preserving the coffin, acts to the contrary.

A common pine coffin, with loose joints, or small apertures above for gases and below for fluids, is better than all your patents.

N. F. PALMER,
Superintendent of Cedar Lawn Cemetery,
Late of Cypress Hills, L. I.

Paterson, N. J.

Nitro-Glycerin and Boiler Explosions.

MESSRS. EDITORS:—I inclose a communication to our daily paper as an explanation of the cause of our many frightful explosions. I am an old, western, high pressure engineer, and the causes of nearly all, if not all, the boiler explosions I have always thought to be low water, over pressure, and carelessness on the part of the engineer. I have carried over pressure of steam on a set of boilers for months at a time, but with always plenty of water, and exercised careful watching, never relying on the water and steam gage alone, but always using the safety valve and gage cocks, the same as though the water and steam gage were not attached, yet never met with any boiler accident; although in two instances the same set of boilers exploded under the care of other engineers. Was it carelessness, or was it from this agent "Phosphorus" speaks of. For my part I have always adhered to your idea of explosions, and shall continue to do so until some better reason for them is given than that of the inclosed.

GEO. WHIPPLE.

Burlington, Iowa.

[We give the communication to which our correspondent refers as a curiosity.]

NITRO-GLYCERIN CONSIDERED AS A CAUSE OF STEAM BOILER EXPLOSIONS.

1st. Water containing animal fats or oils, subjected to a high pressure of steam, the fats or oils act chemically on the steam, forming fatty acids and glycerin.

2d. Organic matter present in water used for steam, the chemical affinities will set free electricity, which generates ammonia NH_3, ammonia mixed with moist air at a temperature 212° F. over water containing potash, produces the nitrate of potash, KO,NO_5,

3d. Glycerin and nitric acid, readily combine chemically, the glycerin gives up a portion of its hydrogen and takes on a part of the oxygen, when they all combine into a new compound, nitro-glycerin, which has two and one-half times the specific gravity of water.

Nobel's blasting oil is composed of glycerin, sulphuric acid, and the nitrate of potash.

4th. Nitro-glycerin being insoluble in water, and having a greater specific gravity, it readily finds the bottom of the boiler, where it would remain were it not for the sudden rise of temperature. It is not explosive at 212° Fah., but at 360 Fah. (which it soon attains in contact with the boiler plate), explodes with thirteen times the force of gunpowder. Hence those terrific and unaccountable explosions that so often take place under the eye and care of our best engineers, when the boiler contains its maximum of water, and frequently at a low or medium gage of steam.

5th. Now when we take into consideration that at least ninety per cent. of all those terrific and heart-rending marine disasters on our western rivers for the past thirty years, commencing with the ill-fated steamer *Moselle* in 1838, and ending with the *Harry Dean* and *Magnolia*, in 1858, have occurred in the spring of the year when the rivers were full of surface water containing organic matter, fats or oils, potash, and sulphur; or that they blew up at or near the levee of some city, where they had taken on a supply of water contaminated with sewerage, containing the very elements of destruction; we are led to the logical and scientific conclusion that here is the cause of those terrific and unaccountable explosions. That under certain circumstances all the elements for the production of this compound may get into a steam boiler, and that 212° Fah. is favorable to chemical action, even to the formation and deposit of a solid stone upon the inside of a boiler no one can deny.

PHOSPHORUS.

[We have no disposition to treat this hypothesis seriously; we would only suggest that "Phosphorus" need not have imagined impossibilities to arrive at his nitro-glycerin theory, as gunpowder would have answered his purpose quite as well. Gunpowder is composed of carbon, sulphur, and niter. All waters contain more or less organic matters, held mechanically suspended or in solution, and these are partly composed of carbonaceous substances and potash. Here we have two ingredients for our gunpowder—the charcoal and niter—and the decay or decomposition of these organic substances, continually going on, will furnish sulphuretted hydrogen gas which contains the only other ingredient required. As to the relative proportions, we cannot see why they cannot accidentally combine to form gunpowder as our "Phosphorus" elements can to form nitro-glycerin. "Phosphorus" is highly inflammable when exposed to the air. It should be kept tightly bottled; and we would suggest that if this writer intends to construct these explosive theories on any extended scale he had better imitate the substance whose name he wears and not air his ideas too freely.—EDS.

Manufacture of Pins.

A correspondent of the New York *Evening Post*, gives the following graphic account of the manufacture of pins as it is now conducted:

The pin machine is one of the closest approaches that mechanics have made to the dexterity of the human hand. A small machine, about the size of a ladies' sewing machine, only stronger stands before you. On the back side a light belt descends from the long shaft at the ceiling that drives all the machines, ranged in rows on the floor. On the left side of our machine hangs on a peg a small reel of wire, that has been straightened by running through a compound system of small rollers.

This wire descends and the end of it enters the machine. This is the food consumed by this snappish, voracious little dwarf. He pulls it in and bites it off by inches, incessantly, one hundred and forty bites to the minute. Just as he seizes each bite a saucy little hammer, with a concave face, hits the end of the wire three taps and "upsets" it to a head, while he gripes it in a counter-sunk hole, between his teeth. With an outward thrust of his tongue he then lays the pin sidewise in a little groove across the rim of a small wheel that slowly revolves just under his nose. By the external pressure of a stationary hoop these pins roll in their places, as they are carried under two series of small files, three in each. These files grow finer toward the end of the series. They lie at a slight inclination on the points of the pins, and by a series of cams, levers, and springs are made to play "like lightning." Thus, the pins are pointed and dropped in a little shower into a box. Twenty eight pounds of pins is a day's work for one of these jerking little automatons. Forty machines on this floor make five hundred and sixty pounds of pins daily. These are then polished. Two very intelligent machines reject every crooked pin, even the slightest irregularity of form being detected.

Another automaton assorts half a dozen lengths in as many different boxes, all at once and unerringly, when a careless operator has mixed the contents of boxes form various machines. Lastly, a perfect genius of a machine hangs the pins by the head in an inclined platform through as many "slots" as there are pins in a row on the papers. These slots converge into the exact space spanning the length of a row. Under them runs the strip of pin paper. A hand-like part of the machine catches one pin from each of the slots as it falls, and by one movement sticks them all through two corrugated ridges in the paper, from which they are to be picked by taper fingers in boudoirs, and all sorts of human fingers in all sorts of human circumstances. Thus you have its genesis;

"Tall and slender, straight and thin,
Pretty, little, useful pin."

A beautiful Yankee trick was once exposed by these modern Yankee pins. A not over-scrupulous antiquarian was displaying the relics of the "Salem Witchcraft" to a wondering throng at a shilling a head. Among the relics was a saucer full, more or less, of pins taken from arms, stomachs, etc., of the bewitched victims. This was a chance for one of the astonished, who was a pinmaker. He gave a close squint at the pins, and opened his eyes very wide. "Do you say that these pins were taken from the unfortunate victims of witchcraft at Salem?" solemnly inquired the pin-man. "Of course they were; what do you ask that question for?" responded the showman. "Because I find one little obstacle to my faith in your story," rejoined the pin-man. "Solid-headed pins were not invented until two hundred years after the Salem witchcraft!" Moral—Showmen of relics should consult antiquarians and experts when "getting up" their stock.

Quicksilver Mines.

Quicksilver exists in quantities worthy of note only in Spain, California, and Peru. For a very long period the Almaden quicksilver mine in Spain was the only one known, and held a rigid monopoly of the trade. The discoveries in Peru opened a new field; but though it reduced the price for a time, it did not seriously affect it. The discovery in California threw such a quantity into the market that the whole quicksilver trade of the world is now ruled by it.

The great mine is at New Almaden, sixty miles south from San Francisco. The ore is taken from a mine in the hills the inside of the coast range of mountains, and is found in chambers instead of veins. The earthquake in October, 1865, which did so much damage to San Francisco, put money in the pockets of the New Almaden owners, as it opened up a new and very rich chamber not previously discovered. The cinnabar ore, from which the quicksilver is taken, is about the color of a well burned brick and looks, when piled up for use, much like a heap of broken and antiquated bricks. The ore is placed in furnaces, a wood fire is built beneath, and the quicksilver flies off in vapor, and is caught and condensed in air-tight rooms filled with water. After condensation it is bottled up in flasks containing seventy-six and a half pounds each, this being the same as the weight used at the Almaden mine in Spain.

This mine has been the subject of much litigation, as indeed has nearly everything valuable in California. It became the property of a stock company, under the management of Mr. Butterworth, of New York. The product in 1865 was 47,194 flasks, worth about $50 per flask, or a total value of $2,359 700. The cost of producing this result was about $800,000, leaving a very fair margin of profit. The ore averages from twelve to eighteen per cent of quicksilver, and frequently exceeds the latter figure. The ore is a deep red color, heavy like a lump of lead, and is said to contain about twenty per cent of quicksilver. A large quantity of quicksilver is used in gold and silver mining on that coast, and the balance goes to various parts of the world. Of the production of 1865, fourteen thousand flasks were sent to China, ten thousand to London, five thousand to Peru, two thousand to Chili, seven thousand to New York, two thousand to Mexico and two hundred to Australia.—*Boston Commercial Bulletin.*

Local Anesthesia.

We have always had our doubts that the local anesthesia produced by the spray of ether, was attributable to the partial or entire freezing of the parts to which it is applied as has been claimed. The *Medical Gazette* contains the following report of case in which ether was thus applied, which confirms our doubts:

"The subject of the experiment, a patient of Dr. Geo. H. Perine of this city, had some sixteen teeth extracted with scarcely any pain, and what little discomfort there was, he referred rather to the gum than to the dental nerves. Richardson's spray instrument was used, and the jet directed upon the external orifice of the ear and a little in front of it for between three and four minutes. One side was anesthetized first and a number of teeth and stumps on that side (upper and lower) extracted, and the same process repeated afterward on the opposite side. The central incisor of the side first operated on caused some pain, partly, perhaps, from subsidence of the anæsthetic action (that being the last tooth removed on that side), partly, possibly, from some inosculation of the terminal branches of the superior maxillary nerve of the opposite, undeadened side.

"Many physiologists hold that the anesthesia produced by the spray instrument is due, not to any specific effect of the agent employed, but simply to a "freezing process," the result of rapid evaporation. In this case, however, even the integument (though greatly reduced in temperature) was not *frozen*, and had it been, it would have been impossible for the mere action of cold to penetrate to the ganglion of Casser. The subcutaneous cellular tissue, fat (the worst possible conductor) muscular and fibrous layers, must surely protect the ganglion from very intense refrigeration, and, moreover, the insensibility of the dental nerves continued for some minutes after the skin had recovered its warmth at the spot where the spray had been applied.

"Dr. Perine has since used this process for the extraction of two or three other teeth, with very satisfactory results, and in one case of severe facial neuralgia succeeded by its means in giving instant (and strange to say, more than temporary) relief."

An Interesting Experiment.

Galignani says: "M. Trèves has made the following curious mechanical experiment: Two steel tuning forks brought to the same pitch were topped with small mirrors, and placed opposite to each other in two vertical planes at right angles. One of them, No. 1, was, moreover, surrounded with a strong coil of wire receiving an electric current from a nitric acid pile composed of four elements. A fiddlestick being now drawn across each of the tuning forks, the vibrations commenced, and immediately a perfectly motionless luminous circle was produced in the mirror of No. 2. But no sooner was No. 1 magnetized by the admission of the current, than the circle became an ellipse, and swayed to and fro, denoting the action of a new vibratory motion. As soon as the current ceased the figure became a fixed circle again. This experiment may serve to investigate the vibratory powers of iron and steel according to their composition and physical state."

WATER POWER OF MAINE.—The State of Maine has issued a report, entitled "The Water Power of Maine," in which detailed information is given respecting the location, characteristics, improvements, ownership, and other features of a considerable proportion of over 2,000 different water powers, representing in the aggregate from 300,000 to 600,000 horse power. It also recapitulates, in a briefmanner, in a "Preliminary statement," the peculiarly favorable conditions, secured both by nature and by the liberal policy of the State, under which the water power can be employed. A copy of the Report will be sent, free of cost, to manufacturers and the employers of mechanical power, also to public libraries, upon application to Walter Wells, Superintendent Hydrographic Publication, Portland, Maine