(For the Scientific American.)

Plowing by Steam.

MESSRS. EDITORS—This question is now attracting much attention both in Europe and America, and is destined, at no distant day, to be the leading one in agricultural economy. The plan of the *direct* application of steam power to plowing presents many objectionable features. It involves the necessity of furnishing, at all the fields to be plowed, supplies of fuel and water, and these requirements will prevent forever its introduction in many places. It also renders it necessary that some simple and effectual means should be employed to maintain the water at a proper hight in the boiler when the engine is traveling over very irregular ground. And unless the engine can be afforded at a low price, is adapted to general farm work, and free from liability to get out of "kilter," it will fail to meet the wants of the farmer.

But I believe that steam power may be used economically on all fields that are clear of stumps, but not by the direct application of it. The engine must be stationary, and its power should be applied to the plow or plows through an *intermediate* portable machine. This intermediate conveyor of the power of the engine may be a strong metal spring, or compressed air, &c. The plows should be so attached to the intermediate power communicator that they can be easily attached and detached; and the conveyor of power may be made in the form of a carriage, that can be used for various purposes with horses. This conveyor might also be made to answer for a wagon to carry and spread manure, to sow grain, and plant potatoes. This system, I think, is practicable, but whether it would be economical or not, experiment alone can determine. If it can be applied to plowing it can also be applied to reaping, and might also be useful for propelling carriages on plank roads. J. W. G.

Grenada, Miss.

[We are of opinion that unless portable steam engines can be applied to plowing or reaping, no other plan will be. Cheap tanks for water may be sunk at certain points around the field, and it would not be expensive to have deposits of fuel placed at those tanks.

The use of a spring as a power accumulator and conveyor from a stationary steam engine, is certainly impracticable; but not that of compressed air, or an arrangement of standards, pulleys, and endless chains, like the working of carriages on some railroad inclines. The compressed air plan, as well as that by endless chains, would involve an immense expense. The amount of tubing required to plow a farm of one hundred acres by compressed air, from a stationary engine at the very center of the farm, would cost more than the whole price of the engine and plows, yea, the whole farm. And it would be the same with the ropes, chains, standards, and pulleys required to be used by the other method named. On level fields, free from stones and stumps, locomotive steam plows may yet be successfully used; but steam plowing by stationary engines we believe never will. At present, however, horses are more economical for plowing, in any part of our country than steam engines, but we hope to see the time when the steam engine will drive the animal power from the field.

Course of the Electric Current in Baths.

MESSRS. EDITORS.—As the subject of the electro-chemical baths, for the extracting of deleterious minerals from the body, is attracting no small degree of attention, as a lately discovered medical agent, any scientific truth bearing on the subject is of interest to the public.

There are two kinds of electro-chemical baths now in use—the full body-bath and the foot-bath. In one the whole body is immersed in the water up to the shoulders; in the other the feet only. In the full body-bath the electricity does not pass down through the body under the water, but passes immediately to the metallic sides of the metallic bath tub, along and near the surface of the water. In the foot-bath the electricity passes through the whole course of the body before it reaches the water.

I prove that the electricity in the full body-bath does not pass through the body, by the following experiment: First, provide a large metallic bathing tub, and fill it with water, and let the experimenter immerse his body in the water up to his neck. The body in the bath is to be insulated from the tub by being placed upon a board in the bottom of the tub. Connect the bath tub to the zinc pole of the battery by means of a wire. Let this wire, before reaching the battery, be attached to a galvanometer. Now let the man in the bath take hold of a metallic handle attacted to a wire from the copper pole of the battery, and the needle of the galvanometer is deflected ten degrees. This shows that the electricity has passed from the man's body to the metallic bath-tub, and thence on to the zinc pole of the battery.

Now vary the experiment. Disconnect the galvanometer from the wire leading to the bath-tub. Place against the sole of the foot, at the bottom of the bath-tub, a small metallic plate soldered on to the end of a wire covered with gutta percha, to insulate it from the water and the tub. Connect this wire to the zinc pole of the battery, and attach it to the galvanometer. Now let the man in the bath again take hold of the handle from the positive pole of the battery and the needle still points north, proving decidedly that no electric current is passing down through the body in the bath, but that it has left his body at, or near the surface of the water, and is passing along to the metallic bath-tub, and thence to the zinc of the battery. In this experiment the wire from the bath-tub must also be in connection with the zinc of the battery, as well as the wire from under the man's foot. This circumstance is essential to the experiment, inasmuch as we thereby give to the electric current which has entered the man's body from above the surface of the water, an opportunity to take either of the two directions; that along the surface of the water, or that down through the body and out of the feet.

It is evident, from this experiment, that the foot bath is preferable to the body bath in the eliminatory of minerals from the system, inasmuch as the electric current in the foot bath passes through the whole body, while in the body bath it leaves the body at or near the surface of the water, passing, consequently, only through the arms and neck. To perform the above experiment, a battery will be required equal in power to ten of Groves' cups.

SAMUEL B. SMITH,

New York. Electro-Magnetist.

Steam Fire Engines for Cities.

MESSRS. EDITORS.—Men's minds are charged positively or negatively upon every subject, when charged or impressed at all upon any. Every new theory and new experiment introduced and made, are favorably or unfavorably received by this or that community, by this or that circle, by this or that man. It is undoubtedly wisdom that we are created to differ in our opinions, as well as tastes and talents, and personal appearances. But there would doubtless be greater uniformity and agreement of sentiment, upon public and important matters and concerns, did not ignorance and prejudice, differing in amount and strength in us, cause us to differ.

When the Steam Fire Engine was brought to this city, some were positively in favor of it—others were of the negative opinion. But its effect upon the conflagration of the Gerrish Market, staying the flames, and thus preserving the buildings around, changed minds from the negative to the positive order by thousands. Power or force is necessary to extinguish a fire by the application of water. Steam power is the most steady of any: it is not subject to fatigue, and can work incessantly for hours and days. The arm of flesh wearies with much doing. Often men are very much wearied upon their arrival at the fire, from the speed and labor usual at such times, in getting there with their engines. But the steam power can work at first and last, and at all times, with equal force,—summer's heat nor winter's cold affect not its operations. Often it is important that the engine should be placed where man could not endure the heat alone, without labor. Steam power is a compact power or force: it can far exceed all the human power or strength that can be made efficient in the extinguishment of fires. In a properly contrived engine, the power can be so high as to throw more water than can be brought by all the hand engines that can accumulate within working distance of a conflagration. The whole or any less quantity of the power can be used as needed from time to time. The hose can be of various sizes. Often a very small stream of water only is necessary to extinguish a fire, and a large amount of water would do an unnecessary amount of damage.

The introduction of steam power would not be seriously injurious to those who might thus be deprived of the fireman's salary. For this, compensation must be gained at the cost of an interruption to other employment, and often it must fatigue one too much to resume his usual employment, for hours if not days. Men frequently lose their health, limbs, and lives at fires. G. B. ONSLOW.

Boston, Mass.

[We heartily respond to the sentiments and views contained in this communication. We are advocates of steam power to supersede any severe drudgery labor now performed by men, and we do not know of labor more severe, and requiring more real brute force than that employed to work common fire engines. Firemen have been and are very useful, but it appears to us that modern mechanical genius cannot be more humanely or wisely encouraged and employed, than in the construction and improvement of steam fire engines, to supersede manual labor on the hand engine, and we therefore hope and expect yet to see all our cities supplied with steam fire engines.

The Thomas Iron.—Glass Growing Stronger with Age.

MESSRS. EDITORS—The Thomas Iron Works are located in the valley of the Lehigh, Pa., about eight miles above Bethlehem, the President, C. A. Luckenbach being a resident of this place. It is gratifying to notice, that the iron produced by these works has, in so short a time, gained so good a reputation, as to supersede the Scotch pig iron,—a reputation which the vastness of their mines will enable them to maintain.

In your "Observations" on the reports of the U. S. Officers of Ordnance, it is stated that the strength of cast iron increases by age, until all the particles have found a state of rest. Now it seems the same phenomenon is exhibited in glass. A neighbor of mine being engaged in putting large panes of glass, of the ordinary thickness into the front of a house, found it necessary to cut the glass to the proper size. But it proved a vexatious business to the glazier, for it would not split according to the cut of the diamond in spite of anything that could be thought of, by way of coaxing or inducing it to do so. Thus a large number of panes of glass were cut and broken until the front was filled, and everybody's good diamond was tried. Afterwards the cut and broken panes were set out, exposed to the weather, as entirely useless, it being proved that no matter how good the cut was, the glass would split its own way.

After having spent a long winter under snow and ice, it has, however, become exceedingly well balanced in strength, so that it will break along the cut of a diamond, in narrow strips of any length, or in a serpentine line. I have long known that new glass goods were more subject to breaking than old ones; but supposed that the poorer articles only were sooner broken, while the better ones naturally became older. From the foregoing, however, it seems that an article of glass, though not properly annealed, will, in the course of time, be stronger, as the combining atoms acquire a state of rest. A. H. R.

[This information is important and useful. There is still a boundless field before us for invention and discovery. Observation is the parent of discovery. Every atom of information, like the foregoing respecting glass, is a carved stone fitted for a worthy place in the temple of science.

Examination of Engineers.

A correspondent, G. Forrester, of New Orleans, makes an inquiry regarding the rules employed by Inspectors for examining engineers, for the purpose of granting licenses. He asks, "What are the standard rules of qualification for engineers?" and states that these rules ought to be made public, for the information of those who may desire to apply for licenses. We think so, too. We do not know what rules of engineering qualifications the Inspectors have adopted.

Casting Cannon with Cores and Cooling them Inside.

MESSRS EDITORS—I observe in a recent number of the SCIENTIFIC AMERICAN a conflicting claim to the invention for cooling cannon in the interior, by means of a hollow core. On referring to the foundry records of these works, I find that eight-inch guns were cast on hollow cores, under the supervision of Lieut. Rodman, in 1846, as follows:—April 13th, July 18th, and August 4th. In the two former, cold air was circulated through the core; and in the last one, cold water was circulated in like manner. Since that time, numerous guns have been cast on hollow cores, and cooled interiorly, by circulating water through them.

I mention these facts in Justice to Captain Rodman, who is now serving at a remote southwestern military post, where he may not see any notice of this claim to his invention.

Respectfully yours, W. WADE.

Fort Pitt Iron Works, Pittsburg, Pa.

The Steamboat Isaac Newton.

This steamer, which runs between New York and Albany, has been lengthened 60 feet, and now reaches the extraordinary length of 404 feet. Her beam is 41 feet. The lengthening was made amidships, under the superintendence of John Ingliss, and was accomplished in thirty working days.

The cabins and saloons are being made on a magnificent scale: the after saloon contains 112 berths and 56 state rooms, and is beautifully decorated in the Gothic style of architecture. Its length is about 106 by 22 feet, and is 25 feet high. The dining room is about 200 feet by 38 feet, and is finished tastefully in the Corinthian style. The middle saloon, which is in the part that has been added, is 230 feet long; the berths are 6 ft. 2 in. by 4 ft. 6 in. The rooms are all well ventilated, and will be exceedingly capacious and comfortable.

A novel feature in this steamer is her cabins and saloons being lighted with gas made on board, and contained in gasometers. There will be an aggregate of 180 lights, which, doubtless, will conduce much to the comfort and cleanliness of the ship.

The *Isaac Newton* has one beam engine, built at the Allaire Works, New York, in 1846. The principal details are:—Cylinder, diameter, 5 feet; stroke, 12 feet; main shaft journals, 18 1-2 in.; wheel, diameter, 39 feet.; No. of revolutions per minute, 15.

A new air pump is being put in, and with some other smaller repairs the whole engine will be very strong and compact. Two new boilers have been put in by Messrs. Secor, New York; they are a good piece of workmansbip, being very strong and well braced. The following are a few of their details:—Length, 43 ft.; width, 13 ft. 6 in.; hight, 12 ft. 9 in.; round shells, 17 feet diameter, 33 ft. 9 in. long. Two furnaces to each 8 ft. 6 in. long., 6 ft. 3 in. wide, 5 feet 8 in. high. 10 lower or first action flues, 8 of 16 in. and 2 of 24 in. diameter; 6 upper or return flues, 18 in. diameter each; connections, 6 feet in the clear; two bridgewalls, 50 inches below the top of the furnaces. The shells, &c., are constructed of No. 1 and No. 2 iron; the flues of Nos. 3, 5, and 6. Each boiler gives 2612 square feet of heating, and 106 square feet of grate surface. The boilers, without grate bars, weigh upwards of 98,000 lbs. each.

The *Isaac Newton*, when finished, will be a specimen of American enterprise: elegance, capaciousness, and comfort, are all combined, and what with these, and her great speed, she will assuredly become a great favorite, and carry a great number of passengers the ensuing summer.

Hachish:—an extract of Indian hemp—is eaten like opium by the Hindoos, and produces a drunkenness which makes minutes seem like hours in length.