Correspondence

Dental Plates.

MESSRS. EDITORS:—You will confer a favor on the public if you will say what description of dental plate—sets of teeth—is most durable and least injurious to health.

I have used teeth set in gold for several years, and the set for the lower jaw was covered with tin to make it heavy. The plate for the upper jaw broke several times, but was mended again, but I am afraid with an impure metal, judging from the galvanic action in the mouth from which I suffer so constantly.

My health has been giving way for many months past, and recently an idea has possessed me that the cause is the slow imbibing of a metallic poison. Will you enlighten me a little on this subject?

American Telegraph Co., Jan. 25, 1865. S. H.

[The salts of all metals, with the single exception of iron, we believe, are poisonous, and all metallic poisons have the insidious property of accumulating in the system. If two metals are placed in contact, the effect is to protect the less oxidizable metal completely from rust, and to increase the action upon the other. We should suppose that dental plates ought to be made of a single metal, and one having but slight affinity for oxygen—the best being gold.—EDS.

Paper from Cane, Hemp Stalks, Wood, Etc.

MESSRS. EDITORS:—In your issue of January 28, 1865, a letter from Mr. F. H. Sellers is published which contains some statements in relation to the disintegrating process by which Mr. Lyman obtained a patent some years ago. Mr. Sellers says that he and his father having obtained a license to use the Lyman process tried it upon cane in July, 1863, at Seller's Landing, in Hardin County, Ill., found it dangerous and costly, and that "the disintegration was not into ultimate fibers, but into long bundles of fibers, which, to separate, had to be treated with caustic alkali, under pressure, precisely as straw is treated, and then again blown through a small opening by steam power."

Mr. Sellers does not mention the fact that the license which his father obtained to use Lyman's process was dated April 12, 1862, and required him to have the guns in full operation within nine months from that date; and that he having failed to fulfill that condition received notice in February, 1863, that the license was forfeited, and that he would be sued as an infringer if he used the process.

Mr. Sellers, in his published letter before referred to, says that he did not use the process after that date, viz: in July, 1863, and was quite dissatisfied with it. Be that as it may, it is very certain that he could not use the guns if he had desired to do so. The Fiber Disintegrating Company, having become the owners of Lyman's patent, purchased from Mr. Sellers the two guns which he set up upon his farm in Illinois, and have lately ordered them to be removed to the works of the company, in the vicinity of St. Louis, where they intend to prepare cane, flax and hemp stalks for paper stock and textile material. Mr. Sellers, it appears, intends to prepare cane for paper stock by some process of his own, and has availed himself of your columns to show the superiority of his invention. It seems to be very probable that the use of the guns was dangerous to his farm hands; but, the fact is, that there is no danger in the use of them as they are now constructed when in the hands of competent persons. They are constructed to bear a pressure of over 1,000 pounds to the inch, whereas the pressure used is less than 200. They are supplied with steam from the Harrison or Bulb boiler, which is safe at 1,000 pounds pressure. What boilers Mr. Sellers had upon his farm I cannot say, but it is certain that he had no boilers of this construction. With respect to the cost of working the guns, and their capacity, I would observe that four guns of fifteen inches diameter, which have within the last few days been sent to the company's works, at St. Louis, have capacity sufficient to disintegrate over fifty tuns a day, at a cost of less than $2 a tun. It is true that "the disintegration is not into ultimate fibers, but into long bundles of fibers;" but then these long bundles of fibers are much more easily treated with chemicals than the raw cane could be. When they are boiled an hour or less in an open vessel, in a weak chemical solution, and then washed, they become good pulp. But Mr. Sellers tells us that by "a system of sap volatilization" he dispenses with the use of chemicals, and is able to produce what you call "a very fine article of wrapping paper" from three-fifths cane and two-fifths of some other material. What that "other material" is, is not stated. By the Lyman process a very fine white printing paper is produced from the cane alone, but not without the use of chemicals. Great improvements have been made in the construction and use of the guns and in the process subsequent to the blowing, and very large works have been erected during the past year in Brooklyn, where the company expect to make at least twenty tuns of paper pulp daily. The blowing process will also be applied in the West to tangled unretted flax straw and to green hemp stalks to produce textile material.

WM. P. ARNOLD,
Secretary of the Fiber Disintegrating Company, No. 29 Broadway, N. Y.—January 30, 1865.

Careless Handling of Fire-arms.

MESSRS. EDITORS:—Since the St. Alban's raid several persons in this vicinity have procured revolvers, and several serious accidents have occurred from the imprudent use of them—generally by persons foolishly pointing them at others, not thinking they were loaded. Now my opinion is that a person who will point a pistol at another, whether it is loaded or not—yes, a person that will even point a broom-handle, in imitation of a rifle, at any one—is not only a good candidate for an asylum of idiots, but is deserving of rough horse-whipping. I would like very much to have your opinion given in the columns of the widely circulated SCIENTIFIC AMERICAN.

Bristol, Vt., Feb. 3, 1865. E. G. P.

[One of our playmates once pointed a gun directly at the head of his younger brother, and pulled the trigger, supposing of course that the gun was unloaded. It was in the old days of flint locks, and as he turned back the hammer, to his horror he saw that the pan was filled with powder. On trying the gun again at a robin, it was discharged, and the bird fell dead at his feet. The first time the gun accidentally missed fire, and by this chance only was he spared from blowing his brother's head to pieces. We believe that by far the largest portion of accidents with firearms occur from handling them carelessly when they are supposed to be unloaded.—EDS.

Pyroligneous Acid in Chimneys.

MESSRS. EDITORS:—Our stove stands twelve feet from the chimney, which is twenty-five feet high; flue 4 inches by 12 inches, open top. Moisture condenses and runs down the chimney. If you know any remedy other than placing the stove nearer the chimney, will you be kind enough to indicate it? Stewart stove and dry wood are used.

Racine, Wis., Jan. 26, 1865. D. W. E.

[This moisture is doubtless pyroligneous acid and water. If the action continue long enough, our correspondent will find that the acid will dissolve the lime in the mortar, and the bricks in his chimney will be as loose as if they were laid in dry sand. His stovepipe will also be corroded. We know of no remedy.—EDS.

The Two Wheels.

MESSRS EDITORS:—In answer to "A Mechanical Problem," in a late number of your paper, I would say that the statement of the question is incorrect.

Two wheels composed of materials of different specific gravities cannot have "precisely the same size, weight and form," and at the same time have the materials differently disposed with relation to each other. If the iron at the rim of the one be placed at the center of the other the two wheels may have the same weight and form but not the same size—or the same weight and size but not the same form. The problem is fallacious. J. J. DUNLAP.

Springfield, Ohio, Feb. 9, 1865.

[Suppose you make two wooden wheels weighing one pound each, and of the same size and form; then turn a groove in the periphery of one, just large enough to take a ring of iron weighing one fourth of a pound, and bore a hole in the center of the other of just the size to receive a cylinder of iron weighing one fourth of a pound?—EDS.

Drilling and Turning Glass.

Glass may be readily drilled by using a steel drill, hardened but not drawn at all, wet with spirits of turpentine. Run the drill fast and feed light. Grind the drill with a long point, and plenty of clearance, and no difficulty will be experienced. The operation will be more speedy if the turpentine be saturated with camphor gum. With a hard tool thus lubricated glass can be drilled with small holes, say up to three-sixteenths, about as rapidly as cast steel. A breast or row drill may be used, care being taken to hold the stock steady, so as not to break the drill. To file glass, take a 12 inch mill file, single cut, and wet it with the above mentioned solution, turpentine saturated with camphor, and the work can be shaped as easily, and almost as fast as if the material were brass.

To turn glass in a lathe, put a file in the tool stock and wet with turpentine and camphor as before. To square up glass tubes, put them on a hard wood mandrel, made by driving an iron rod with centers through a block of cherry, chestnut or soft maple, and use the flat of a single cut file in the tool post, wet as before. Run slow. Large holes may be rapidly cut by a tube-shaped steel tool, cut like a file on the angular surface, or with fine teeth after the manner of a rose-bit—great care being necessary, of course, to back up the glass fairly with lead plates or otherwise to prevent breakage from unequal pressure. This tool does not require an extremely fast motion. Lubricate as before. Neat jobs of boring and fitting in glass may be made by these simple means. I have endeavored to turn glass rods with diamond pointed steel tools, etc., but without success. The whole secret lies in good high steel, worked low, tempered high, and wet with turpentine standing on gum camphor.

Baron Liebig's "Soup for Children."

With that remarkable estimation of the greatness of small things which is the most valuable of his many high intellectual qualities, and with a tender appreciation of the importance of small people, Baron Liebig devotes a special article in an English scientific periodical to the description of a new diet which he conceives to be the most fitting substitute for the natural nutriment of children robbed of their mother's milk. It is well known the cow's milk does not adequately represent the milk of a healthy woman, and when wheaten flour is added, as it commonly is, Liebig points out that, although that starch be not unfitting for the nourishment of infants, the change of it into sugar in the stomach during digestion imposes an unnecessary labour on the organization, which will be spared it if the starch be changed into the soluble forms of sugar and dextrine. This he effects by adding to the wheaten flour a certain quantity of malt. As wheaten flour and malt flour contain less alkali than woman's milk he supplies this when preparing the soup. This soup may be shortly prepared, as follows:—"Half an ounce of wheaten flour and an equal quantity of malt flour; seven grains and a quarter of bicarbonate of potash and one ounce of water are to be well mixed; five ounces of cow's milk are then to be added, and the whole put on a gentle fire; when the mixture begins to thicken it is removed from the fire, stirred during five minutes, heated and stirred again till it becomes fluid, and finally made to boil. After the separation of the bran by a sieve it is ready for use. By boiling it for a few minutes it loses all taste of the flour." The immediate inducement for Baron Liebig making this soup arose from the fact that one of his grandchildren could not be suckled by its mother, and that another required, besides his mother's milk, a more concentrated food. The soup proved an excellent food—the children thrived on it. Baron Liebig has himself used this soup with tea as a breakfast, and a most thoroughly nutritious meal it must be.

FROM the experiments of Regnault, it appears that the sum of the latent and sensible heat of steam increases with the temperature by a constant difference of 0·305 for each degree Fahrenheit.

The Bursting of the Parrott Guns---Report of the Naval Committee.

The *Army and Navy Journal* contains the elaborate report of the naval committee appointed to consider and report on the subject of rifle cannon for the navy. The report is dated Washington. January 18, 1865. The committee find that seven hundred and three Parrott guns of all callbers have been issued to the naval service, and that of these twenty-one have burst or been otherwise injured by explosion. Several of the injuries have appeared in fracture or rents, enabling the withdrawal of the guns form service in time to avoid casualties, and many of them have occurred in the chase or at the muzzle, and not, as is customary with other guns, at the breech; thus affording evidence that they arose from the premature explosion of shells within the guns—a fact which is proved by the direct testimony of several officers in charge at the time. That these guns have in some instances been injured by other causes than the premature explosions of shells, such as the use of compressed powder, projectiles deemed by Mr Parrott unsuitable for guns of his construction, by keeping guns loaded for a great length of time, and also by the neglect in heat of battle to lubricate the projectiles as required by the ordnance instructions—a most necessary and important precaution, having for its object not only the free movement of the projectile, put particularly as a means of neutralizing the tenacious deposit from the powder—which is admitted in some cases to have been done there seems little doubt; but they are exceptional cases. The committee, however, recommend that as the premature explosion of shells is one, and, in their opinion, the principal cause of the failure of the Parrott guns, experiments should be conducted at Cold Spring, or elsewhere, to place the question of this cause of bursting beyond dispute, and to decide whether it may be abated or not. With this view, the committee give directions as to the manner in which the experiments should be conducted. The result of these experiments will decide the question of retaining in the service, or rejecting, the Parrott guns. Pending this decision, they recommend to the Bureau of Ordnance that a circular be issued, directing certain. reductions of the charge of one hundred pounders, and other precautionary measures to be taken. In consideration of the endurance exhibited by the Parrot rifle guns in proof and in service the committee deem it proper to state that in their opinion, the bureau was fully justified in adopting them for the naval service, as the best guns to be obtained to meet its immediate wants—various other systems of cast-iron rifled ordnance, having either failed or been withdrawn from service as unreliable. They therefore, in the belief that the guns of this description which have burst or failed may have been affected by one or more of the causes heretofore enumerated, especially the explosion of shells within them at the time of bursting, or previously, recommended the retention of all classes of those guns, except the 156-pounders, until the experiments herein recommended shall have been made. They also suggest the immediate withdrawal of such of the guns as may have been subjected to any one of the deteriorating causes arising from premature explosions and other causes, and that they be issued to vessels of the navy only as chase guns, not to exceed two for large and one for small vessels exclusive of rifled howitzers. The report, as published in the *Army and Navy Jour.*, is accompanied by voluminous appendices, with valuable tables, by the evidence of Mr. Parrott before the committee, and by a letter from the same gentleman, giving in detail his views as to the causes of the bursting of the guns. Commodores Missroon, Hitchcock, and Hunt, and Lieutenant Commanders Aulick and Jeffers, constituted the Committee.

Steam Fire Engines.

The Buffalo *Advertiser* says:—

Never was the value of our steam fire engines more fully demonstrated than during the recent conflagration. With no sinews to tire or muscles to grow stiff, they stood there, hour after hour, obedient to the fire-men and engineers, sending their never-ceasin streams upon the flames. Even the old "C. J. Wells," which was thought to have grown feeble and useless from age and hard service, was brought into requisition, and did honor to itself and its god-father. When it was feared that the machines might be disabled from freezing, rude coverings of carpets, old quilts, etc., were erected about them, giving them a decidedly unique appearance. Ever and anon the cheery sound of the steamers' whistles would be heard, as if hailing and encouraging each other amid the storm, and still they worked ceaselessly on.

The Artillery of the Future.

Mr. W. T. Carrington, Chairman of the Society of Engineers, England, made the following assertion on the occasion of his opening address :—

"The time will come when there will be no such thing as a rifled gun—all our guns will have perfectly smooth bores. Then we shall have guns of steel of the least weight combined with the necessary strength. If a smooth bore gun be rifled it is considerably reduced in strength; let the grooves be made as small as possible, still that gun is weakened. Take a cylinder, a beam, or anything that has to resist strains and groove them in a contrary direction to the direction of the strain, as in the case of a rifled gun, and you will find them far weaker and less able to bear the same strains than the cylinder or beam without the grooves, although of precisely the same weight. It is very easy to make a small groove in any beam, and reduce its strength by one half, although its weight is reduced but a fraction. Is it wise, therefore, to weaken the greater number of our guns by grooving them when we can have better results in one sense, from a smooth bore? 1st, there is a much stronger gun from the same weight of metal; 2nd, a less costly gun; 3rdly, a gun simpler and, therefore, more easily kept in order; 4thly, less strain on the gun from the same quantity of powder and same weight of shot; 5thly, greater velocity of the shot when leaving the gun. It can easily be shown that, with the same quantity of powder and weight of metal to be projected, the strain in a rifled gun is greater than in a smooth bore. We must admit that many guns would burst if the shot was so fixed in that it could not move by the force of the powder when exploded—one method to fix the shot would be to screw it in, the inclined plane of the screw being, say, 1 in 24, the gun would certainly burst before this screw slipped. What is a rifle but a screw? Although the inclined plane is very steep, it is a screw, and therefore requires some extra force to make the ball slide on the inclined planes, and this extra strain must of necessity be given to the gun by the same quantity of powder as used in the smooth bore for a greater velocity of the projectile with less strain. What I mean is this:—Possibly the ball or shot may yet be rifled—not the gun. If the rotary motion is given by the rifling of the gun, the ball has the greatest circular motion at the commencement of its flight, and the least at its termination, so that, independent of the objections to rifling the guns, the balls have their own reasons for being rifled themselves. If the money already spent on experiments on rifled guns had been employed in experiments on feathered or rifled balls, satisfactory results might have been obtained. It can only be decided by experiment which method of rifling or feathering the balls, will be best. Many schemes have been proposed. Spiral grooves might give sufficient rotary motion; if not, a short tail, having the necessary twist or screw, or two or more twisted faces on the nose of a shell or shot—which would be acted upon like the sails of a windmill to give rotary motion—or feathers imbedded in the side of the shot until leaving the gun, when they should be made to spring out and give the necessary surface for the atmosphere to give sufficient rotary motion."

[It has always been our opinion that if a rotary motion is to be imparted to the shot at all, it must be given during its passage out of the gun. It is very certain that if shot of any kind are to be made with spiral wings or feathers, they must be long shot and not balls.—EDS.

Magnesium Light for Dyers.

A dyer of Paris some months ago, saw the magnesium light for the first time, and discovering at once that its rays left colors unaffected, exclaimed "This is just what we have long wanted!" There are many days in winter when those who deal with delicate shades of color are utterly at a loss to discriminate between tint and tint, but the magnesium lamp will, it is thought, answer the purpose of sunlight.

THE RAILROAD UNDER BROADWAY.

We have before us a copy of a report made by A. P. Robinson, Civil Engineer, in relation to the contemplated railroad under Broadway and the Fifth avenue. It is proposed to construct a tunnel 25 feet 6 inches wide, and 16 feet high, under the middle of the street, with two railroad tracks, and with stations half a mile apart. At each station a building is to be erected on each side of the street, with one staircase to ascend and another to descend, under each building. The cars are to be each 40 feet long, besides sufficient space for a steam engine to drive it, and the number of the cars is to be equal to that of the stations, so that cars may start from all the stations at the same time. The cars are to start once in two minutes, and to occupy a minute and a half in running from one station to another. The estimated cost of the work at present prices is $8,487,000. Application for a charter is now pending before the State Legislature. The report concludes as follows:—

"I can conceive nothing so completely fulfilling, in every respect, the requirements of our population, as such a road with such an equipment, and worked in the manner suggested. There would be no dust. There would be no mud. Passengers would not be obliged to go into the middle of the street to take a car. They have simply to enter a station from the sidewalk and pass down a spacious and well-lighted staircase to a dry and roomy platform. The temperature would be cool in summer and warm in winter. There would be no delays from snow or ice. The cars would not be obliged to wait for a lazy or obstinate truckman. The passenger would be sure of a luxurious seat in a well-lighted car, and would be carried to his destination in one-third the time he could be carried by any other conveyance. These would be the advantages to those who ride, and for the other great public in the streets, there would be no collisions, no clashings, no broken wheels or fractured axles, no frightened horses or run over pedestrians. Everything would be out of sight and hearing, and nothing would indicate the great thoroughfare below.

Curious French Harness.

A French gentleman has patented a new invention for instantaneously releasing runaway horses from carriages. The driver, in case of accident, pulls a strap, by which the trace buckles are loosened and the horses run free with all the harness except the traces, which remain attached to the carriage.

[These Frenchmen always do things by halves. If a Yankee had conceived this idea there would have been an attachment to chase the horses, catch and secure them, and remonstrate with them on the impropriety of their conduct. Eds.

THE GOLDEN LILY OF JAPAN.—Several specimens of this rare and gorgeous exotic are on exhibition at the mechanic's fair, San Francisco. It is thus described: Imagine upon the end of a purple stem, no thicker then a ramrod and not above two feet high, a saucer-shaped flower at least ten inches in diameter, composed of six spreading and somewhat crisp parts, rolled back at their points, and having an ivory white skin, thickly strewn with purple points of studs, and oval or roundish prominent purple stains. To this add in the middle of each of the six yellow parts a broad stripe of light, satiny skin, and having the appearance of streamlets. From this delicious flower arises the perfume of orange blossoms sufficient to fill a large room, but so delicate as to respect the weakest nerves.

PRESERVATION OF IRON PLATES ON SEA-GOING VESSELS.—The French iron-clad frigate Invincible has just been taken into the dry dock at Castigneau, which has afforded an opportunity of judging of the efficacy of the system applied to that vessel for preserving her iron plates. A band of zinc, which by isolating the electric currents guarantees the plates from that green coating which causes injury, has transformed the nature of that vegetation, and, instead of a casing of marine herbs, there was found attached to the frigate's bottom a fine collection of corals.—*Galignani.*

[Corals must have changed their habits to grow on ships' bottoms. Should not the word be barnacles? —EDS.