Benefits to Readers.

MESSRS. EDITORS—Having been a subscriber to your most invaluable paper (the "Scientific American") for upwards of four years, I trust I may take the liberty of directing a few ideas of my own to you for consideration.

I wish I could persuade a thousand of my young fellow countrymen to become subscribers to the Scientific American, it certainly is just the paper for this Province. First, I will state the benefit I am about to reap by being a subscriber.

Last spring I started a new steam saw-mill of thirty horse-power, to saw boards from white pine, the trimmings of which are poor fuel; and from the economical manner my gang works, going round sweeps, &c., the trimmings were not sufficient to keep up steam, consequently I was at an expense of $1000 per annum for coal. This winter, noticing in No. 15. Sci. Am., the plan of fire bridges adapted to shaft boilers (of which I have two, 42 feet long by 3 feet diameter), I fitted up three of them, and the result is, that, notwithstanding the wetness of the present season, I have no more need of coal, and consequently I shall save the above sum.

I will now describe an occurrence that took place one day at the mill. This mill was wholly constructed and conducted by myself; the whole establishment cost $12,000, besides this, there were logs afloat enough to make 5,000,000 feet of board; under these circumstances you may readily comprehend my feelings, when a man came into the engine room giving an alarm of fire; I sprang to the door and discovered the rafters overhead in a blaze. I felt that it was too bad to have mill and all burn up, when there was plenty of water in the boilers and a force to throw it out; as quick as thought it struck me that the steam might be thrown loose and quench the fire. I sung out to have the doors closed, seized a wrench, started off the nuts at the butt end of the cylinder, threw forward the slide valve, and, in much less time than I pen this the mill was full of steam, and the fire quenched.

After the steam cleared away, drops of water fell copiously from the roof inside. It seems to me that had the engineer of the ill-fated Amazon closed the hatches and started the covers of the valve boxes, the fire would soon have been put out. It would be a good plan to have branch pipes running fore and aft steam vessels, with valves, or cooks, so arranged as to be able to turn out the steam into whatever apartment might take fire, the largest one being in the boiler apartment, that being the part most exposed.

E. D. DAVISON.

Mill Village, Nova Scotia, 1852.

[Many steamships and boats have pipes connected with the steam boilers, to use in case of fires. It would be a good thing if all such vessels were provided in this manner —The use of steam, as a fire extinguisher, has been known to us for a great number of years.

We publish the above to show what benefits have been conferred on one of our readers by the article on Boilers. We receive letters daily from readers, speaking of this and that benefit which they have received from the Scientific American. We do not like to publish them, as that would seem like blowing our own trumpet too loud; still, in many cases, and like the one of Mr. Davison, it would scarcely be unjust to ourselves and readers not to publish the letter. Our time and talents have long been devoted to acquiring, collecting, and spreading *useful* information among the people. Sources are open to us for this purpose which few possess, and we endeavor to cull that which is practical and profitable for the benefit of our readers. We are confident that there is something contained in our columns, in every volume, which is worth, to each subscriber, the amount of his subscription, and which he could have obtained no where else. One subscriber told us, a short time ago, he had copied a receipt of japanning from Vol. 3, Sci. Am., and sold it to a man for five dollars, and afterwards he was told by the same person that he considered it worth twenty dollars, for he had been in search of it for five or six years.

In America, granite is not found higher than 12,000 feet above the sea.

Recent Foreign Inventions.

Richard A. Brooman, of the firm of J. C. Robertson & Co., London, of the Mechanics' Magazine, has recently taken out a patent in England for improvements of a most varied character in the manufacturing arts. The objects of the improvements are for *felting*, cleansing, preserving, and dyeing, flax, cotton, hemp, wood, &c., also for making seeds germinate with great rapidity. The following are condensed extracts from the patent selected from the Mechanics Magazine:—

To produce a "contracting," or as it is techanically termed "milling" or "felting" effect on the goods operated upon, I so combine certain substances as to form a compound or salt incorporated bodily therein, or intimately combined therewith, taking care that the combination is not preceded by decomposition. For example, I steep the goods in dilute sulphuric acid, and then without any intermediate washing, immerse them in caustic soda, whereby a sulphate of soda is formed, which produces the desired result. Other acids than sulphuric, and other hydrates than soda may be substituted. If I employ oleic, or any other similar organic acid, instead of sulphuric, a compound is formed in the material itself, and the same result obtained.

To produce an expansive effect, or one the opposite to contraction, or milling, or felting, I first saturate the material with some compound (say, for example, a carbonate), which on subsequent contact with an acid will suffer decomposition, accompanied by the escape of gas. I sometimes employ, instead of an acid, some salt, such as alum, which having an acid reaction, decomposes the first compound, and sets free the gas. Mere heat alone may be made to serve the same purpose as the acid body; and so also cold may be substituted for the alkaline action. Thus, milling or felting may be produced by immersing a heated body suddenly in a cold medium, and expansion effected by reversing the process.

To clean or decolorise a fibrous or membraneous substance, I first produce chemical decomposition in the substance itself. By decomposition, here is meant the separation of the constituents forming a compound body, which separation must always be accompanied by an evolution of gas. Thus, if a substance be immersed in a carbonate, and then exposed, to the action of a sulphuric acid, carbonic acid in the state of gas is evolved, and a sulphate of the base is formed. Instead, therefore, of following the ordinary chlorine bleaching process, I proceed in the following manner:—

Suppose white China silk is the article to be operated upon, I first immerse it in a solution of sulphate of magnesia, then transfer it to a bath of carbonate of potash or soda, upon which an insoluble carbonate of magnesia is formed in the silk; I then dip the silk so impregnated in an acid which will decompose the carbonate and form a soluble salt which is afterwards easily removed by washing.

A good compound for cleansing as well as for milling and felting purposes, is formed by combining some oily, fatty, or resinous compound (hydrocarbons) with an alkaline carbonate or hypochlorite. In this case a hot solution of carbonate of soda is first prepared, and there is then added to it cold oleine, fat, resin, or other suitable hydro-carbon until the base is saturated. To facilitate the combination of oily, fatty, or resinous compounds with alkalies, I saturate cloth or other porous material, such as pumice-stone, with the oily, fatty, or resinous compounds, and then boil it in an alkaline solution, by which means I obtain a larger surface to act upon.

To preserve animal or vegetable substances, I form a salt or compound of an anticeptic nature within their cells or fibres, taking care that the combination is not preceded by decomposition, or accompanied by the evolution of any gas, thus, for example, I immerse it first in muriatic, nitric, or acetic or saccharic acid, or other equivalent compound, and then into a solution of some basic hydrate, which, with the preceding acid or any other equivalent acid compound, will form in the meat itself an anticeptic salt. The meat thus treated will be perfectly wholesome, and will keep so for a long time.

To preserve and tan hides and skins, I form in like manner within those substances some conservative salt; for example, I steep them in tannic or other similar acid, and then immerse them in a mixture or solution of some hydrate, such as those of soda, lime, magnesia, baryta, or alumina.

As it is important, however, to avoid the formation of tannates of soda or potash on account of the deep color communicated by them to the hides, I prefer those bases which, with tannic acid, give the least amount of color; such, for example, as magnesia.

To preserve wood, canvas, and other like fabrics, I form a salt within the fibres thereof, by first immersing them in some suitable acid; such as sulphuric, pyroligneous, or muriatic, and then in a solution or mixture of some suitable base.

If I wish to produce color in wood or any other vegetable substance, as well as to preserve it, I use a solution of catechu or some other coloring material, and afterwards a solution of caustic soda or potash, whereby subinate of soda or potash is formed within the fibres of the substance.

To promote the germination of seeds, and cause them to throw out powerful first and second sets of leaves, whereby they may the more rapidly and effectually absorb food from the air, I form some fertilizing or stimulating compound within the seed themselves in the following manner:—I steep the seeds in phosphoric acid, and then in ammonia, potash, or lime, whereby a phosphate of one of those bases is formed within the seeds.

The Megatherium.

This leviathan of the vast plains of South America, which were once occupied by immense numbers of the race, now entirely extinct, partakes of the generic character of the existing diminutive sloths. It rivalled in size the largest rhinoceros, was armed with claws of enormous length and power, its whole frame possessing an extreme degree of solidity. With a head and neck like those of the sloth, its legs and feet exhibit the character of the armadillo and the ant-eater. Some specimens of the animal give the measurement of five feet across the haunches, and the thigh bone was nearly three times as thick as that of the elephant. The spinal marrow must have been a foot in diameter, and the tail, at the part nearest the body, twice as large, or six feet in circumference. The girth of the body was fourteen feet and a half, and the length eighteen feet.

The teeth were admirably adapted for cutting vegetable substances, and the general structure and strength of the frame for tearing up the ground in search of roots, wringing off the branches of trees, and uprooting their trunks, on which it principally fed. "Heavily constructed and ponderously accoutred," says Dr. Buckland, in his eloquent description of the megatherium, "it could neither run, nor leap, nor climb, nor burrow under ground; and all its movements must have been necessarily slow. But what need of rapid locomotion to an animal whose occupation of digging roots for food was almost stationary? And what need of speed for flight from foes, to a creature whose giant carcass was encased in an impenetrable cuirass, and who, by a single pat of his paw, or lash of his tail, could in an instant have demolished the cougar or the crocodile? Secure within the panoply of his strong armor, where was the enemy that would dare to encounter this leviathan of the pampas? or in what more powerful creature can we find the cause that has effected the extirpation of his race? His entire frame was an apparatus of colossal mechanism, adapted exactly to the work it had to do. Strong and ponderous in proportion as this work was heavy and calculated to be the vehicle of life and enjoyment to a gigantic race of quadrupeds, which, though they have ceased to be counted among the living inhabitants of our planet, have, in their fossil bones, left behind them imperishable monuments of the consummate skill with which they were constructed."—[Dr. Mantell.

The dust of the puff-ball (Lycoperdon bovista) is a powder so minute that a cubic vessel of a hair's breadth in size, would hold 125,000 of the little spherule grains. There are, in pepper-water, animalculæ whose thickness is not the 7800th part of a hair breadth. Their length is to their breadth as 50 to 1.

The Mouth of the Mississippi.

The New Orleans Commercial Bulletin, in an article on the Steam Tow-boats of the Mississippi, thus alludes to the difficulties in entering that river:—

But towing large and heavy drafts up and down stream, is only a comparatively small part of the business of tow-boats, as we have before observed. After their work proper is done, there is another extra labor to be performed, in the execution of which the strength and power of steam, iron, wood, hawsers, springs, and cordage of every kind, are tested to their utmost capacity of endurance. At the mouths of the river there are barriers to the ingress and egress of vessels propelled by wind and sails alone, as impassable as if constructed of solid rock, instead of plastic mud. Through, not over, these mud-flats, in water twelve and fourteen feet deep, ships from eighteen to twenty feet draught, are dragged by these boats. Sometimes they stick and hold fast, with an adhesiveness which it seems no power can overcome, requiring the work of hours, often days, and even weeks to remove them from their tenacious moorings. The mouths of the Mississippi, and there are now only two that are used at all for the passage of vessels of even tolerable size, are now so choked up with the alluvian that is brought down by the current, and deposited at the debouche of the river, that they are impassable, without the application of steam power; and no vessel of any size worth speaking of, ever attempts to cross the bar, inward or outward bound, without the aid of a tow-boat, oftener two, and frequently four, pulling and dragging her through the mud, with all their concentrated power, at a snail's pace. This, as it may well be supposed, is hard and tedious work, involving often great risk of property, sometimes jeoparding life, requiring consummate skill and prudence, and always attended with serious responsibility. The boarding of a large ship at sea, with a fresh breeze and a heavy swell, (and these boats sometimes go out fifty and sixty miles), and arranging all the necessary preliminaries for towing her into a harbor is a nice and hazardous undertaking.

A Wonder.

According to some Italian journals, a new organized being has been discovered in the interior of Africa, which seems to form an intermediate link between vegetable and animal life. This singular production has the shape of a spotted serpent. It drags itself along on the ground, and, instead of a head has a flower shaped like a bell, which contains a viscous liquid. Flies and other insects attracted by the smell of the juice, enter into the flower, where they are caught by the adhesive matter. The flower then closes and remains shut until the prisoners are bruised and transformed into chyle. The indigestible portions, such as the head and wings, are thrown out by two aspired openings. The vegetable serpent has a skin resembling leaves, a white and soft flesh, and, instead of a bony skeleton, a cartilagenous frame filled with yellow marrow. The natives consider it delicious food, at least so says the paper from which we copy the above, but we consider the whole story a fabrication.

Mortality at the Andover Theological Seminary.

A most remarkable mortality has attended this institution within a few months. Prof. Stuart has died. Prof. Edwards departed this life among strangers, in the place he visited to seek for health, and Deacon Noyes, the Treasurer of the Institution, late of the firm of Maynard & Noyes, of Boston, died quite suddenly; and besides the loss of these distinguished men, several of the wives of the professors have lost one or both of their parents within the same short space of a few months.—[Boston Journal.

[In Professors Stuart and Edwards our country has lost two of its ablest theological writers. The Bibleotheca Sacra is an evidence of this.

Velocity of sound, as assigned by different philosophers:—Newton, 968 feet per second; Flamsteed, Halley, and Derham, 1142: Florentine Academy, 1148; Du Hamel, 1172; Boyle, 1200; Roberts, 1300; Walker, 1338; Mersenne, 1474.