

For the Scientific American.
Explosion of a Boiler.

I noticed in a recent number of your valuable paper an account of the explosion of the boiler in the paper mills of E. & David Smith Barrons, Grenville, Conn., in which your correspondent asks for your opinion as to the cause of the explosion. This you omitted to give, and I agreed with you in giving it up until I saw another account in, I think, the Journal of Commerce. In this account the form, &c., of the boiler is described as that of a sugar loaf standing on its base, with a cast iron bottom some eight feet in diameter, and having a door in it 20 inches square; the bottom was of cast iron 1½ inches thick. Now suppose the pressure within the boiler to have been 20 lbs. to the square inch, (not a very unusual pressure for such an operation) the whole pressure upon their bottom was say 160,000 lbs. The material to resist this pressure was the cast iron base, 1½ inches thick, having the aperture of 20 inches square out of the centre, closed by a door; when this gave way by the effort of this pressure—which it would have done had it been loaded with a dead weight to that extent—the resistance to the pressure to the same extent which the steam was exerting upon the other parts of the boiler, in exactly the opposite direction, was suddenly removed; and the boiler received an impulse to 'leave that' equal to 180,000 lbs. The elasticity of the steam followed this impulse up, and the boiler, which weighed only some 8000 lbs., was obliged to make this flight sky high, to compensate for the difference between its own weight and the impulse it had received. This phenomenon is *layed* by simple facts and figures—as all steam boiler explosions can be explained, if the facts can only be arrived at.

Every steam boiler maker, for whatever purpose, should sing as he labors, the "Song of the Steam"—

"Harness me down with your iron bands,
Be sure of your curb and your rein," &c.

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Dr. Furman's Remedy for Stranger's Fever at the South.

If the patient be of a pethoric habit, or full of blood, and the symptoms run high, that is the pains, heat and redness of the eyes, with a hard pulse—bleed moderately at the beginning, but without delay; take three drachms of Seneca Snake Root and reduce it to a powder, put in a convenient earthen vessel, and pour into it a half pint of boiling water, cover the vessel and let the tea simmer before the fire about half an hour, when it will be fit for use; then put a dose and a half or two doses of salts, (say four ounces for an adult) into a vessel, and pour on them as much of the hot tea as will be sufficient to melt them, and as soon as the mixture is cool, give a small wine-glass full every twelve, fifteen or twenty minutes, until fifteen or twenty motions are procured, or until the stomach or bowels are well cleansed, for it is of the utmost importance that they be well emptied as soon as possible; then stop the use of the mixture and give tea alone, in the same quantity as before, but at intervals of an hour and a half, observing to sweeten it with sugar, by which it will be rendered more agreeable to the stomach—this is to be continued until the fever and pains are removed, which is often effected in the course of twenty four hours or less. Should the first doses of the salts and tea mixed be thrown up and the body of the patient be found to be in a costive state, it will be proper to use injections early, in order to ensure and facilitate the operation of the medicine as a cathartic, and if after the first evacuations, and the use of the tea alone for several hours, the body be not kept sufficiently open, which may generally be known by the redness of the eyes—the offensiveness of the stools—a dry skin—a hard, and sometimes feeble pulse—drowsiness or restlessness, and a disposition of the stomach to eject the tea, it will be proper to resort to the mixture again, until free evacuations are procured, or until the patient has five or six motions—then go on with the tea alone, as before. But should the disease assume a putrid form and any matter of a black or dark appearance be ejected

from the stomach or pass from the bowels, a little weak lime water alone, or united with sweet milk, may be given in the intervals between the times of taking the snake root. Injections, also may, from time to time, be administered to advantage, when the skin is dry and the patient uneasy, especially when the body is not sufficiently open. When the fever goes off it will be proper to give small doses of Colombo root, say five grains, at intervals of an hour and a half, and if they set well on the stomach and the patient feels invigorated, the dose may be augmented to 10 grains, but should there be a return of the fever, this medicine must be laid aside, and the snake root used as before. When the disease is evidently in its putrid stage, the Virginia or small snake root may be used to advantage, with which, in certain cases, the decoction of bark may be combined; a weakness of the pulse, and a general debility of the patient, will point out the propriety of this combination. When in the first stage the fever is high with a distressing heat and dry skin, it will be proper to give a few grains of nitre every hour or two, and to wash the hands, face, and feet, in cold water, several times in a day. The application of cold water to the forehead, by means of a linen cloth several times folded, when the head is much affected, but especially if there is delirium, is of excellent use; the cloth, during this state of things, should be frequently immersed in the coldest water that can be procured, but when perspiration commences, this application, and the washing, must be laid aside. The clyster, mentioned above, may be of the usual kind of very thin gruel, to which may be added a little molasses and oil, and a small quantity of salts; or it may be made of mallow or mullein tea, with the addition of a little oil and salts. Should a state of extreme debility take place, the small snake root tea, with the decoction of barks, may be injected. The patient, from the first, may freely drink cold water during the fever, and take for nourishment good pure meal gruel, roasted apples, or any ripe fruit easy of digestion.

Origin of the Plow.

To understand its form and origin, it is necessary to bear in mind that the plow was undoubtedly a substituted instrument, intended to accomplish more expeditiously, on a larger scale, by means of animal draught, that which would, in the first instance, be the work of a simple tool used by the hand. In this country we would pronounce that tool to be the spade; but if we go no further off than the shore of Spain and Portugal, we shall be induced to pause before we award the palm of antiquity to that implement. The city of Cadiz was colonized, at a very remote period, from the eastern shore of the Mediterranean, by the Phœnicians. No district of Western Europe claims so high a pedigree in regard to the useful arts as the coast of the Peninsula, reaching from Vigo to the Straits of Gibraltar—and there we find that the implement of single-handed cultivation is not the spade, but a sort of hoe, with a very long blade. With this the workman cleaves the ground, dragging towards him the broken soil; as he stands on which, the treading of his foot helps, in a dry climate, to break the clods as they are turned away from the "land side." This mode of cultivation would not suit a moist climate. The Portuguese, who got it through the Phœnicians from the East, have in turn carried it to their own colonies, where it may be seen in Madeira, the Brazils, the West Indies, and even at the settlement of Macao, in China, as the common instrument of tillage, as the spade is with us. In Portugal it performs its task, tearing up the soil to the depth of two, and even three feet. It is an instrument with one long blade, but bent to a more acute angle with the blades of the pickaxe, and sometimes connected with it by a crossbar of wood or iron, reminding one of the capital letter A, with one leg shorter than the other.

In the Egyptian paintings and hieroglyphics the object often occurs both by itself and in the hand of the workman. Now let us imagine him, tired of the slow progress of tearing up the soil by hand with this implement, to conceive the idea of yoking a pair of oxen (for

horses were never used in ancient agriculture) to the end of the handle, and making them drag it along the field, tearing up a sort of furrow as it goes; he himself following, and holding it at the point where the blade and the handle join. The oxen would, in this case, only be doing more quickly and on a larger scale what the workmen had been doing slowly, though with more care and finish. The instrument would tear up the soil as it went, and throw it in irregular lumps on both sides; the workmen, however, would desire that it should throw the soil on one side only, in order to leave a clear trench to receive the next furrow-slice in coming back; he would soon find it convenient, however, to give a twist to the blade of the instrument, so as to make it cast out the furrow-slice on one side. Now picture the yoke of oxen pulling at the end of the long handle, the man holding the instrument by the apex, extended out a little to give him more leverage and command of steadying it, the blade twisted obliquely, so as to cut forward and press on the soil sideways, and the little cross-bar sharpened so as to cut the soil in advance, instead of being an impediment; and we have at once the rude elementary form of the Egyptian plough—the same instrument used by the Lycian peasant to this very time, and containing the skeleton of the machine, from the first that ever was invented, down to the latest "new and improved" plow of the present day.

Curiosities of Royalty.

The Royal Palace of Stuttgart, in Wurtemberg, has many curiosities and eccentric works of art. In one of the sleeping apartments is a *necessaire* or toilet box, worth at least 5000 guilders, about 12,500f. and a bed made for Napoleon Bonaparte, which cost 40,000f. When you cross the threshold of one of the saloons, a white spaniel springs barking to the door, being moved by clock work and a spring. Another clock represents a female figure made of porcelain, the full size of life and in national colors. The mouth of the figure is open, displaying 12 front teeth, all numbered from 1 to 12. In the morning at 6 o'clock these teeth have disappeared, and the mouth is toothless. At 7 o'clock the lady takes a tooth from the box on her right and places it into her mouth; at 8 she adds another—and thus she continues to add one after another, till at six in the evening all 12 are in. At 7 o'clock she takes away one, and thus on, until 6 o'clock in the morning, the jaws are once more toothless.

The clock is wound up once in six days. A Barometer is so arranged that, when it portends rain, a little man runs out of the house with an open umbrella in his hand, and when it is about to snow, he comes out with a cloak on, and an approaching thunderstorm the little man announces by coming forth, with a prayer book in his hand. These indications take place 12 hours in advance of the impending change. There is also a clock in one of the rooms representing a little man taking a pinch of snuff every hour, and sneezes a number of times corresponding with the hour. In the library there is a copy of Buffon's Natural History in 24 volumes folio, which is printed on pure white satin, while the illustrations are embroidered on it in floss silk. There is a saloon in the palace, 50 feet long and 25 feet broad, the floor of which is covered with one mirror, so thick and solid that one can dance on it.—This mirror was a present from the Emperor Alexander to his sister, the late queen, and cost two millions of silver roubles.

Some Causes of Disease.

Sold substances by decay become volatile, they leave not a vestige behind. Animal and vegetable matter are prone to this destructive fermentation, and they contain all the elements of the most nutritious food and the deadliest poisons. Let this decomposition progress, and who can tell what recompositions are the result of the primary decomposition.

All organic matter consists of two or more of the following four elements, viz: carbon, hydrogen, oxygen, and nitrogen; and in combinations of these elements we have all the necessities for the support of life—the choice of them for its prolongation, and the means of its sudden destruction. The loafbread and the

beef steak contain the elements of Prussic Acid, Morphia, and Strichnia. The stems, leaves, and flowers of plants, contain the same elements; yet some are esculent, others poisonous. What transformations may be effected by recomposition no one can tell. The most wholesome vegetables, the most noxious weeds and the most poisonous plants, growing in the same soil, nourished by the same manures, and vivified by the same atmosphere and moisture. If the properties of plants are as variable as the species, is it improbable that some, even while living, should diffuse a poison, or all after death and during decay should yield an effluvia capable of producing the malarious influence manifested by many melancholy results.

California Steamers and Coal.

In a recent letter Capt. Maury, of the National Observatory, says that the California steamers have been paying from \$30 to \$40 per ton for coal, and that the Pacific steamers will require 100,000 tons of coal this year, and that by the Panama Railway is finished 1,000,000 of tons will be annually needed. He estimates that coal from the Bon Harbor coal mines (160 miles below Louisville) can be delivered at Chagress for \$4 to \$5 per ton; and when the railway is finished to Panama, that \$1.50 or \$2 more will place each ton there, making the whole cost of transporting coal from the mines to Panama \$7 per ton. Capt. Maury also states that the proprietors of the coal mines on the Mississippi River and its vicinity can deliver coal at Chagress cheaper than it can be furnished from any other mines, and that these Mississippi Valley coal mines must of necessity supply to a large extent the coal for the Pacific steamers.

Roads in the North-West.

Memorials are being sent to Congress from Green Bay and vicinity asking for appropriations to construct a road from Green Bay to St. Paul, Minnesota: and another from Green Bay to Copper Harbor, on Lake Superior. The Green Bay Advocate says:

"The necessity for having a road opened to Lake Superior, for winter travel, is becoming every day more and more apparent;—besides, the road will pass near small settlements that are springing up at different points upon the numerous streamson the north-west side of Green Bay, and upon Keewenaw Bay of Lake Superior; and probably mineral lands will be found upon the route or vicinity thereof. The importance of the road is obvious, and from the time it may be opened it will be an important thoroughfare at all seasons of the year—but for winter use it will be indispensable.

Gold on the Yellowstone.

The Grand River Eagle has a letter which says:—I have been credibly informed, and by good authority, that a man, some thirteen years ago, was taken by the Black Foot Indians, and has been kept in a measure confined in that region until within a short time, when he effected his escape, bringing the glorious intelligence that that region abounds in the precious metal; bringing some 60 lbs. of gold dust, taken from the surface, so pure that it is worth \$14 to the ounce, whilst the real pure is worth but \$18; making the amount of his burden, at the time he made his escape, at \$14 the ounce, \$13,440. I understand that the same individual is in Chicago, raising companies, to be equipped with rifles, for the purpose of returning to the golden sands to make a further exploration of the country, and for the benefit of said companies, has deposited in bank \$3000 to pay expenses of fitting out, &c.

Death of an Eminent Artist.

Sir. William Allen, an eminent painter, and President of the Royal Academy of Scotland, died recently at an advanced age. He was of humble origin, but rose, by his talents and perseverance to his high position.

The Louisiana Statesman says that an insect, so small as to require microscopic eyes to detect it, is destroying the orange trees in that vicinity and on the sea coast. They attack the trunk and limbs in immense bodies, covering it as with a second bark, and seem to destroy it by absorption.