Incrustations in Steam Boilers.

Mr. Editor.—In No. 3 vol. 4, Scientific American, is an article by R. Bartholomew in answer to mine in No. 2, wherein I had stated that the labor of a previous article of his seemed to be directed against Mahogany Dust, &c. This he says is not true. He also says he had no knowledge of its being secured by patent until he saw my "ill tempered letter." A reference to his article No. 50 vol. 3, will show this language: "For all the many professed ways which have been discovered to prevent incrustations" "we believe from the practical evidence of more than one that Mahogany Dust," "which was once to be the panacea for all incrustations," "has utterly failed to confer a single benefit." Again—"Indian meal is the best thing so far as we are yet acquainted to remove it" (incrustations.) "It is at least equal to more expensive substances and altogether superior to exhausted dye stuffs, for which a patent was secured three years ago." This was under date of Sept. 2d, and Oct. 7th, he says his reference to mahogany dust "almost" (not quite) "carelessly" done—and I suppose his denial of any knowledge of the patent was also "almost carelessly" made. Thus much for Mr. Bartholomew's consistency and veracity, for which the reader will doubtless give him due credit.

In my article in No. 2, I stated in plain English—that of Mr. Bartholomew I knew nothing. "But that on reading his article with its italics and cants at Mahogany Dust as a patent," the idea was presented to the mind, that he imagined himself to be witty in his attempts at ridicule—and also that he belonged to that class of men, who are incapable of appreciating an honest effort at improvement. With an emotion truly fanciful, Mr. Bartholomew has discovered that I, by this language impute to him the wonderful fancy of imagining himself to belong to that class. No, No, Sir, I have subscribed my name to no such nonsense, for I am fully impressed with the idea that in order to entertain any such just notions of himself—

"The Lord must first the power gie' him,
To see himsel as ithers see him."

Mr. B. says, "I honestly confess that I cannot appreciate the honest effort to secure a monopoly of all the mahogany saw dust that may be used in steam boilers in these United States for 14 years." Here again is evidence of a wonderful fancy, powerful logic, and scientific reasoning. What an odious monopoly it must be to secure all the mahogany dust which may be used for 14 years, when its use "has utterly failed to confer a single benefit." Indeed—well may the man who can thus reason lament that he "feels not the joy which the warrior feels to meet the foeman worthy of his steel."

Mr. Bartholomew says, "high pressure engines seldom need any remedy for incrustations." Now, Mr. Editor, many of the disastrous explosions on our western waters, where high pressure engines alone are used have from investigations of causes, been attributed to large deposites and incrustations upon the flues and bottoms of the boilers, to such an extent as entirely to exclude the water from the surface of the iron, which being exposed to the action of the fire becomes heated until the expansion causes a rupture, or break, in the incrustation or scale, when water comes suddenly in contact with the heated iron, causing the collapse of a flue, or an explosion, besides the use of high pressure engines at sea, have universally been condemned. on account of difficulties and dangers of incrustations, under high steam in salt water—but these being facts, have not probably come within the range of Mr. B.'s scientific investigations.

Mr. Bartholomew says I have advanced but one scientific idea, and that is, that mahogany dust tends to prevent deposites of carbonates and salts, keeping them in suspension, rendering it less frequently necessary to blow water from the boiler, with, than without, the dust—and this idea seems to trouble him—he says it is a new fact for chemists. Now, although it is undoubtedly a new fact to him, yet chemists will have no difficulty in appreciating the fact, that carbonates, salts, or earths, being kept in suspension until the water is fully impregnated with them, would require much less frequent discharge to carry off a given quantity of those substances, than would be necessary were the carbonates, salts or earths to settle or harden into incrustations, leaving the water blown but slightly impregnated with them.

Daniel Barnum.

New York, Oct. 1848.

[This controversy has not been the least instructive to us, and we presume, of as little benefit to our readers. We opened our columns, for reply, as we are perfectly impartial in these matters. We now close them peremptorily except for explanation.

Of the Comparative Duty of Long and Short Stroke Engines.

The following experiments by J. G. Bodmer, an English engineer, will be found to be not a little interesting to our engineers.—From Mr. Bodmer's experiments he has proven (perhaps a mistake) that different from common opinion, the short stroke consumes 20 per cent. less steam than the long stroke, but the opinions expressed are founded on the compensating principle over the single crank system; and it is Mr. Bodmer's opinion that this advantage consists in the steam acting simultaneously upon two pieces connected with the same crank in opposite directions. The question seems to reduce itself to this—whether an effort which produces no useful effect, is not so much power lost; and whether therefore, if reaction can be converted into effective action, so much power must not necessarily be gained? For argument's sake, we may assume a 12-pounder cannon to be placed at the height of say 50 feet from a perfect level, and a ball to be fired off with a charge of 4 lbs. of powder. If the length of the cannon be eighteen times its bore, the ball will touch the ground at a distance of say 1800 yards; and suppose the cannon, whose weight shall be 200 times that of the ball, to be suspended in the air, it will, by the shot, be made to recoil the two-hundredth part of 1800 yards, or 9 yards—the force which projected the ball to a distance of 1800 yards being evidently equal to that which sent the cannon a distance of 9 yards. Now if the breech of this cannon were cut off, and a ball placed on either side of the charge of 4 lbs. of powder, on the shot being fired, would not the cannon remain stationary, and would not the joint effect of the two 12 pounder balls be far greater than the effect of the one ball, upon which the whole of the 4 lbs. of powder had been expended? And it so, wherein does the principle differ from that of the compensating engine? It was observed, that the lateral rocking of the train no doubt constituted a very perceptible element in the resistance to railway trains; probably the back and forward motion between the locomotive engine and the carriages attached to it may also be considered to have some share in the matter. These deteriorating movements may be traced to the peculiar action of the single crank engine. The lateral rocking motion is owing to the pressure of the pistons being exerted alternately to the right and to the left, upon a lever the length of which is represented by the distance from the centre line of the engine to that of each of the cylinders. But if, as in the compensating engine, the thrust in one direction is counterbalanced by a pull of equal force in the opposite direction, such rocking motion can by no means take place. And experience proves that it does not take place.

The longitudinal back and forward, or reciprocating motion, may be explained from the circumstance that the cranks are, at every revolution of the crank axles, placed in such positions that almost the full pressure upon both pistons is exerted alternately in opposite directions; the thrust one way having evidently a tendency to separate the locomotive engine from its tender, and that and the carriages from each other; whilst the pull in the opposite direction throws the locomotive engine back upon the tender and the carriages. In the compensating engine the thrust and pull are again equally balanced, and consequently this longitudinal reciprocating motion cannot take place.

It would be most interesting if it could be ascertained by experiments to what extent, with regard to its action, the compensating locomotive engine really differs from those of ordinary construction; and whether, by their use, the co-efficient of resistance to railway trains would be to any perceptible extent affected.

Results obtained from a comparative trial of a 60 horse-power long stroke and short stroke (compensating) non-condensing steam engine, with Prony's brake. Both engines were tried on the same day and with the same brake.

Data.	Long stroke.	Short stroke.
Diam. of cylinder,	28.5 in.	21.65 in.
Sec. area cylinder,	683.49 sq. in.	368.13 sq. in
Length of stroke,	7 feet.	3.018 ft.
Pres. of steam sq. in.	43 lbs.	45 lbs.
Back pressure,	2 3-8 lbs.	6 lbs.
Steam cut off at, of the stroke,	0.9	0.537
Veloc. of crank shaft, rev. per minute,	21.6	91.91
Effect obtained,	170.17 hr. p.	132.55 h. p.
Consump. of steam per h. p. per min.	8.01 cub. ft.	6.28

Wine in Australia.

There is now every reason to believe that Western Australia will one day become a great wine country. Its vineyards are becoming more numerous and extensive every year, and the wine produced in them is of a quality to lead us to believe that when the art of preparing it is better understood, it will be found of very superior quality. It will, however, be a new kind of wine, and therefore, before it will be prized in Europe, prejudices in favor of older wines have to be overcome.—Soil and climate combined give to different wines their peculiar flavor. The vines which in Madeira produce the wine of that name, when brought to another country, even in a corresponding latitude and planted in soil that chemically approaches as closely as possible to that which they have left, will produce a wine materially different from that called Madeira. So with the the vines of Xeres and Oporto, or Constantia. Different countries produce wines peculiar to themselves; and the wines of Western Australia will be found to be entirely *sui generis*.—All that I have tasted though made from the poorest of grapes the common sweet water, have one peculiarity. A good draught, instead of affecting the head or flushing the face causes a most delightful glow to pervade the stomach, laborers in harvest prefer the home-made colonial wine to any other beverage. Every farm settler is now adding a vineyard to his estate.—*Landen's Bushma.*

Importance of the Insignificant.

It is one of the marvellous arrangements of Providence, that results of the greatest magnitude and importance are not unusually caused by operations apparently so insignificant as to be reckoned scarcely worthy of notice. Nothing, however, is really insignificant—all has a meaning—all tends to one harmonious whole in the order of creation.

Some beautiful illustrations of this proposition are to be found in the animal kingdom, particularly in the immense and wonderful influence of minute animated organisms upon the actual form and mass of the globe! The chalk formation fills every reflective mind with wonder. The chalk-beds of England are many hundred feet thick, and many miles in extent. Who raised this wall of white around that coast? Who piled up those precipitous masses, from which all the labor and skill of man can only detach a few comparatively insignificant morsels? "We did!" utter a myriad-million animalcules, whose dead bodies are thus beheld. It is beyond conception; but the microscope assures us of the fact. These vast beds are composed of the shells of infusory animalcules. A "line" is the 12th part of an inch. Now these creatures vary from the 12th to the 280th part of a line in thickness! It has been calculated that ten millions of their dead bodies lie in a cubic inch! "Singly," says a popular writer, "they are the most unimportant of all animals; in the mass, forming as they do such enormous strata over a large part of the earth's surface, they have an importance greatly exceeding that of the largest and noblest of the beasts of the field." Theirs is a safe humility; for while the greater creatures have many of them become extinct, and left no posterity, the descendants of the ancient earth-architects live and thrive to this very hour. The polishing-slate, or tripoli of Bilin, presents us with another instance in point. The investigation of that greatest of microscopical observers Professor Ehrenberg, have shown that this substance consists almost entirely of an aggregation of infusoria in layers, without any connecting medium. These are much more minute than the chalk animalcules. A cubic line contains about twenty-three millions of them, and a cubic inch has been calculated to be the cenotaph of forty thousand millions of these beings! The weight of a cubic inch is about 220 grains, and that of the siliceous shield of a single animalcule is estimated at the 187,000,000th part of a grain! The infusorial rock at Bilin forms a bed fourteen feet in thickness. Two origins are now ascribed to limestone—one, that of chemical precipitation; the other, which has a direction with our subject, ascribes the formation to the labors of the infusoria. There can be no doubt that many of the enormous beds of this substance with which we are familiar, are the results of the accumulation of innumerable millions of these tiny creatures. They swarm in all waters, indifferently in salt as in fresh; and secreting from the lime held in solution by such water the necessary material for their shields or calcareous skeletons, they form by their enormous aggregation in process of time the vast strata of which we speak. For this purpose, it is necessary that they should be capable of multiplying immensely; and this they do by the different processes of spontaneous fisuration, germination, and the development of ova. The white calcareous earth so common at the bottoms of bogs and morasses has its origin in the ceaseless labors of these creatures; and the "bog-iron ore" of geologists consists of the ferruginous shields of others. Thus, as has been aptly remarked by the old Latin proverb, "iron, flint and lime all formed by worms," which was probably a sly sarcasm against philosophy, modern science has shown to be actually true in the history of the animalcules. The Great Pyramid of Egypt has been looked upon by men as a miracle of human power and skill: yet every stone in its composition is a greater far, for the limestone of which this vast structure is built was erected long ago by an army of humble animalcules more numerous than all the hosts of a thousand Pharaohs. It has been finely said by Young—

Where is the dust that has not been alive?

though perhaps he little knew the wide application of the truth he was enunciating.

Bleaching Straw.

A careful culture insures a requisite degree of fineness and firmness in the material, but for most purposes the color must be diminished or removed. This may be done dy chlorine, sulphurous acid, alkali or atmospheric agents but a violent process injures the fibrous texture. It may be steeped in pure fresh water, for several weeks exposed to the air and then sulphured. According to Kurrer it may be perfectly whitened by repeated steeping in boiling water and very weak alkali, which removes all soluble matter, then treated alternately with very dilute solution of chloride of lime and sulphurous acid vapor, finally washed and dried in the sun. The process is tedious, but it said to remove the varnish which makes the natural straw brittle and to render the fibre brilliant, white and pliant.

It is even more difficult to explain the bleaching process by means of sulphurous acid than that by chlorine. It is generally assumed that the acid combines directly with the color without either giving or receiving oxygen and forms a colorless or slightly colored compound with it; for by the action of alkali or a stronger acid, the original color is restored; and hence also, the color reappears on sulphured goods in the lapse of time by the gradual dissipation of sulphurous acid. The action of of alkali in the above operations with wool, silk and straw, depends simply on the solubility of the coloring or other matters in the alkaline solution.

The English papers admit there is large deficiency in their crops but seem to rejoice that the United States can supply all their wants