Scientific Museum.

On the Probable Depth of the Ocean of the European Chalk Deposits.

Various geologists, and among them Prof. Forbes, in his excellent and learned Palæontology of the British Isles in Johnston's physical Atlas, have suggested that the ocean of the chalk deposits of Europe was a deep one; and in evidence of this, Prof. Forbes cites the "striking relationship existing to deep sea forms of the English chalk corals and brachiopods, adding that the peculiar echinoderms, (Holaster, galerites, ananchytes, Cidaris, Brissus, and Goniaster) favor this notion, as also the presence of numerous foraminifera.

I beg leave, says Prof. H. D. Rogers, in the proceedings of the Boston Society of Natural History for 1853, to present a difficulty in the way of this conclusion. Several of this genera of echinoderms, as ananchytes, Cidaris, &c., occur in the green sand deposit of New Jersey, referable by every fossil test to the age of the green sand and chalk of Europe. And this American stratum was unquestionably the sediment of quite shallow littoral waters. That they must have had a trivial depth is proved by the circumstance that they repose in an almost horizontal stratification, at a level of not more than from one hundred to two hundred feet lower than the general surface of the hills and upland region to the N. W. of the margin of the zone they occupy as their outcrop. It is obvious that a depression of the cretaceous region, such as would cover the present deposits with a deep sea, would have likewise overspread the low gneissic hills to the N. W. of the Delaware, which present no traces of having ever been submerged during the cretaceous or any secondary period.

Mr. Ayres remarked, that of those genera of echinoderms, which Mr. Forbes regarded as deep sea genera, two or three are found in North America in water not two hundred feet deep. Terebratula, which has been generally regarded as only an inhabitant of very deep water, and whose structure has been described as admirably adapted to the depth at which it has been found, and which Prof. Owen has demonstrated cannot exist at a depth of less than two or three hundred fathoms, exists at Eastport, Me., in water so shallow that it can be taken by hand. In the same locality and position, radiata are found which have heretofore been thought to be only inhabitants of deep water. Some of Mr. Forbes' genera are also found in less than ten fathoms of water.

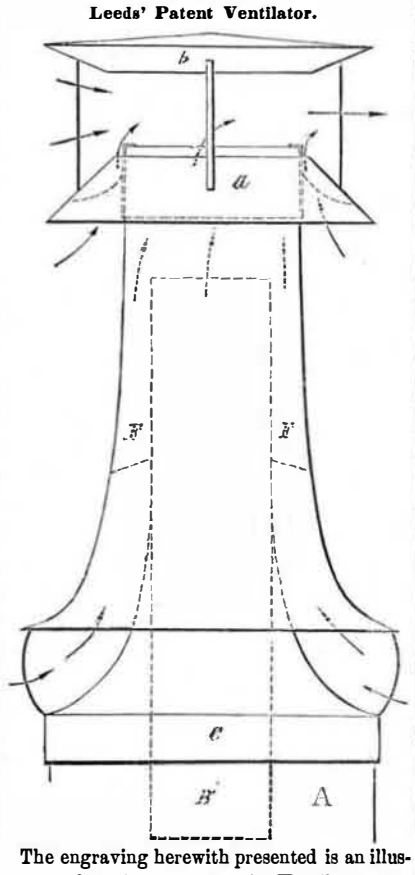
Papyri at Herculaneum.

They were first discovered in 1753, and are now deposited in the Museo Borbonico. Being rolled up in scrolls, they have the appearance of pieces of charcoal; and being piled up, it was only by accident that attention was directed to them, when Latin and Greek characters were seen upon them. They are found reduced to a scorched state, not more substantial than tinder. The difficulty of unrolling them has been overcome by attaching to the back some gold-beater's skin, by a strong gum (as recommended by Sir H. Davy). A small portion of this (when fixed) is then gradually unrolled by hands attached to it, the scroll resting in a semi-cylindrical trough lined with cotton. The process can only go on at the rate of about one inch per day. Several volumes have been restored and published; they appear to be chiefly works of epicurean philosophy. On the authority of one of them the "Economies of Aristole' is decidedly ascribed to Theophrastus.—The majority are Greek. One contains a review of the Iliad, in which the heroes of Homer are considered as all allegorical. The Latin works are on a differently prepared and thicker papyrus. The name of the author never occurs till the end; hence the impossibility of ascertaining what they are until completely unrolled.

To Prepare Pure Caustic Potash.

Wohler has given a simple method of preparing caustic potash in a state of chemical purity. One part of pure saltpeter in powder is to be mixed with from two to three parts of metallic copper cut into small pieces, and the whole heated to a moderate red heat for half an hour in a copper crucible. After cooling, the mass is to be treated with water, and the resulting lye poured into a narrow cylinder, which is then to be carefully closed. After the oxyde of copper has completely settled, the supernatant liquor may be drawn off with a syphon, and will contain no traces of copper.

Leeds' Patent Ventilator.

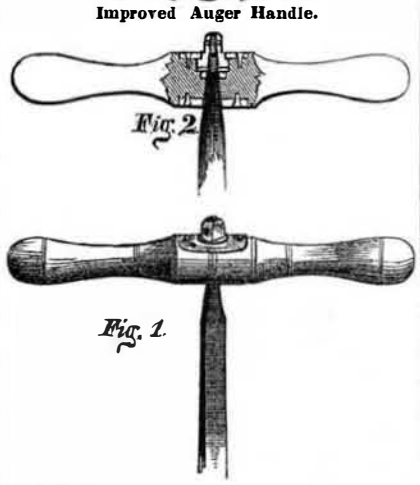


The engraving herewith presented is an illustration of an improvement in Ventilators, by Joseph Leeds, of Philadelphia. The power of draught in this ventilation is derived from two sources. One is the upward current caused by the expansion of the air in the chamber, F, surrounding the inner flue, C, the lower part of which, B, is inserted in the chimney, A. The additional draught is caused by the partial vacuum produced by the deflection of the current of air rising through the cap or deflector, *a*, assisted somewhat in its action by the upper cap, *b*.

The inventor is sanguine of success, and says that it has proved itself efficient whenever tried. He offers to warrant a draught to any chimney on which it may be placed, or to insure thorough ventilation to any room or vessel without admitting rain or snow. There are two patents on this invention, granted August, 1852, and Nov., 1853.

Applications for rights or ventilators may be made to Gilman Davis, State street, Boston, or Jos. Leeds, the inventor, No. 50 South 4th st., Philadelphia.

Improved Auger Handle.



The annexed engravings are intended to illustrate an improved Auger Handle, invented by W. N. Clark, of Chester, Conn., figure 1 being a side view, and fig. 2 a sectional view of the invention. Its object, as will be readily seen, is to furnish a single handle that may be adapted to a set of augers, and this is accomplished as in the common way by a screw thread upon the auger, but with this important though trifling difference, the nut instead of being separate from the handle, and therefore liable to be lost or mislaid, is contained in the handle, so that all that is required is to place the auger in the handle and turn the nut, which, as will be seen, has a collar, which turns freely in a groove in the handle, thus drawing the square shank of the auger firmly into the socket. This is a very convenient implement. For any further information address the inventor.

Indelible Inks, and Paper.

[Abstract of a Lecture on the "Chemistry of Indelible Ink and Paper," delivered before Bacon's Cincinnati Mercantile College, by Prof. Chas. W. Wright, and reported expressly for the Scientific American.]

The basis of most of the so-called Indelible inks of commerce is the nitrate of silver, or lunar caustic. The articles written upon by the nitrate are previously moistened with a solution of carbonate of soda; or ammonia is added to a solution of nitrate of silver until the precipitate produced is redissolved. The latter is a dangerous preparation, as it is liable to give rise to the formation of the fulminating silver, an explosive compound, particularly if it be kept for some time. Nitrate of silver, however, does not make an indelible mark, as all writing executed with it can be discharged by means of chlorine or its bleaching salts.

A truly indelible ink must contain carbon in the solid form as its basis, as this substance has but two solvents, viz., melted iron and strong sulphuric acid, neither of which are likely to be employed in erasing writing. In the form of charcoal we have numerous instances of the indestructibility of carbon. Thus in the Thames River stakes of oak have been recently found, where they are supposed to have been driven at the time of the invasion of Julius Cæsar, the surface of which was charred and in a state of perfect preservation. At Herculaneum the beams of the theatre were carbonized when that city was overwhelmed with lava, 1700 years ago, and are as perfectly preserved now as the day after that sad occurrence. Carbon is the basis of India ink, which is made by incorporating purified lampblack with glue, and moulding it in suitable forms. As the carbon in India ink is not in solution, it does not sink into the substance of paper like the tanno-gallate of iron, a portion of which is in solution, but flows with difficulty from steel pens, and hence cannot be used as an ordinary writing fluid.

Paper is composed of carbon and the elements of water, as can be very readily shown by bringing it in contact with sulphuric acid, which abstracts the water and liberates the carbon. It is fabricated, as is well known, out of linen or cotton rags, which are reduced to a pulp by machinery and incorporated with a size of glue or alumina, by which, when rolled into sheets, its tenacity is increased and it is rendered less porous. When paper is sized with glue and written upon by common ink, containing free tannic acid, it is affected in a peculiar manner, in fact the letters rest upon a basis of leather, as tannic acid, by combining with gelatine forms that substance. When paper is boiled for several hours in very dilute sulphuric acid it is transformed into that variety of sugar which is found in grapes and honey. When heated with nitric acid, carbonic acid is evolved and oxalic acid generated, but if it be digested for a few minutes in strong nitric acid, or a mixture of nitric and sulphuric acids, in equal proportions, at the ordinary temperature, and washed in water and dried, it shrinks slightly, becomes tough, and is highly explosive, in fact it is identical in composition with the gun cotton of Schoenbein.

Various kinds of paper have been invented to resist the arts of counterfeiters and forgers. In 1826 the French Academy of Sciences appointed a committee to discover a paper to be used for deeds, bank notes, &c., that could not be tampered with without detection. The device agreed upon consisted in covering the paper on both sides with microscopic stars, a delible ink being used, which would be destroyed by the chemical agents employed in erasing writing. Another process intended to accomplish the same purpose, consists in incorporating iodide of potassium, starch, and yellow prussiate of potash with the materials for fabricating paper. When chlorine is applied to such paper to discharge writing, iodine is liberated, and by combining with the starch forms the blue iodide of starch, and the application of acids would give rise to Prussian blue, by the re-action of the iron of the ink on the yellow prussiate of potash. Neither of the above processes are of much value, however, as an expert engraver and chemist could overcome any obstacle which they might present in the prevention of forgery and counterfeiting.

Parchment which was extensively used as a writing material in ancient times, is rarely employed at the present day, except for diplomas. It is prepared from the skins of animals, and is written upon with difficulty by ordinary ink, from its generally being slightly greasy. This difficulty is readily overcome by moistening the parchment very slightly with the water of ammonia, or by adding a little of that substance to the ink just before using it. If the ink contains free tannic acid, the letters rest upon a basis of leather, as in the case of paper that has been sized with glue.

Trial of Pumps.

A trial of pumps came off at the Madison House Covington, on Wednesday, between McGowan's pump and Dodge's patent pump, both being double action. At the first the bystanders were nearly all in favor of Dodge's pump. But when they commenced playing through the nozzles, the tables turned in favor of the Little Buckeye. The McGowan pump beat the Dodge pump about eight or nine feet horizontally, and twelve or fifteen feet perpendicularly, as near as could be judged. The Dodge pump filled a pail in five seconds, and the McGowan one, in about three and a half seconds. The relation of the pumps were thus:—The Dodge pump was three inches bore, and the McGowan one two and a half inches—both pumps having five inches stroke. We heard McGowan say that if Mr. Dodge's agent thinks there was not fair-play at the trial, he would try with him in Cincinnati, provided he would try his pump with a thirty footsuction.—There were competent judges appointed, to see that the trial was fair on both sides.—[Cincinnati Daily Times.

There is said to be great demand in Jackson, Tenn., for carpenters, bricklayers, painters and plasterers.