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What is Chemistry?

The arrangement of facts discovered by actual experiment and called "science" is conveniently divided into Physics and Chemistry. Physics treat of the changes of matter, without any regard to its internal construction. Thus the laws of gravitation and cohesion belong exclusively to physical science, because they act with total disregard to the composition of a substance. Chemistry, on the other hand, teaches us the composition of the various forms of matter, and the changes they can undergo one with another.

Water, speaking with regard to its physical or natural characteristics, is a colorless, mobile liquid, boiling at 212°, and freezing at 32°, not capable of compression, and many more similar peculiarities. But chemically speaking, water is a compound of so much hydrogen and oxygen, capable of entering into many combinations, and of causing changes in other forms of matter.

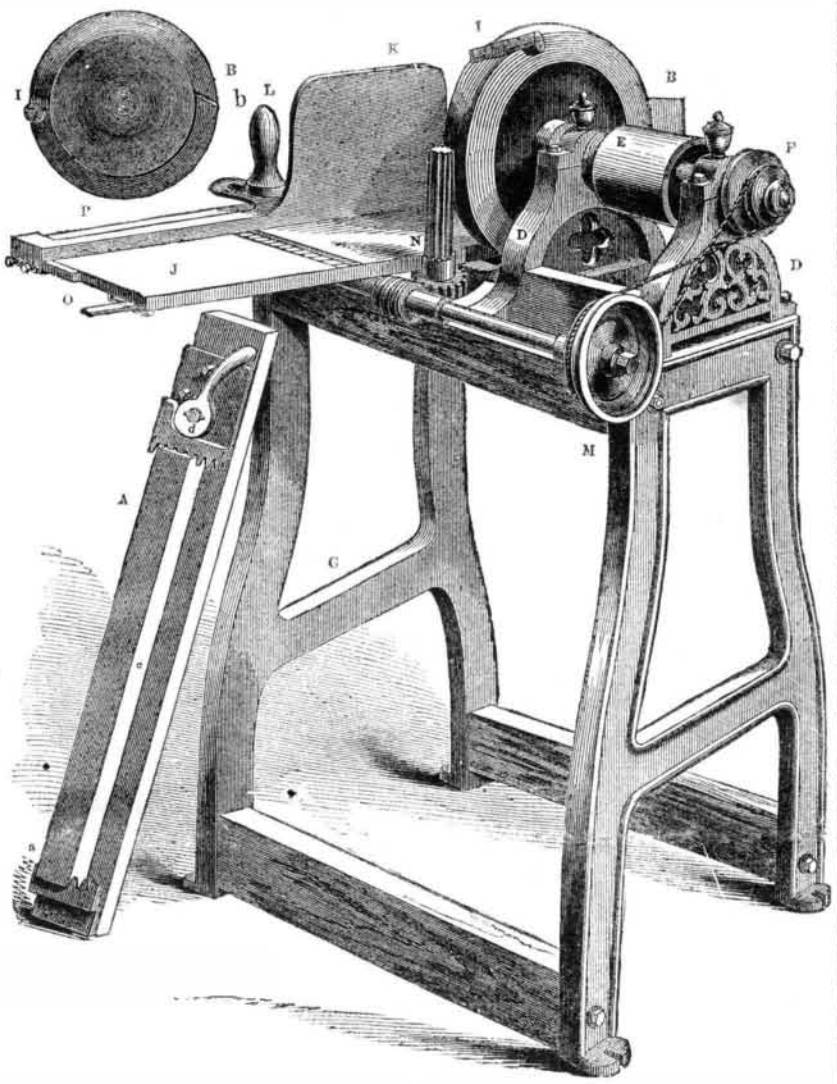
The science of chemistry has undergone a technical division into *organic* and *inorganic*, but in nature there is really no such division—it has only been adopted for convenience of study and expression; for the two classes of substances (organic and inorganic) so lap into each other, that the boundary line is daily becoming more faint, and will in time, perhaps, vanish altogether.

Probably the most safe definition of organic chemistry that can be given in contradistinction to inorganic, is contained in the assertion that the former branch of the science treats of those bodies which are, directly or indirectly, the products of the vital process in animals or vegetables; and this definition is now tacitly admitted by all chemists, although some substances have been produced in the laboratory which are especially peculiar to the process of animal secretion, as for example, uric acid.

Gravitation and Velocity.

M. Boucheporn, of Paris, made an experiment in mechanics, and deduced from it that the force of gravitation varied according to the greater or less speed of the earth in its orbit. A member of the Academy of Sciences has, to all appearance, completely overthrown such a deduction. "If it were true," he says, "the change in the force of gravitation would amount to one 72d part, and it follows that every timepiece regulated by a pendulum, would be advanced or retarded daily at the rate of $72 \times 2 = 144$th part of the number of seconds (86,400) in twenty-four hours, which amounts to ten minutes. Every observatory clock should therefore be disturbed to this extent if such a deduction were true, because the earth is retarded and advanced to this extent in its orbit."

BAKER'S ROTARY PLANER.



These planers dress lumber of all descriptions to any desired thickness, bevel or taper, at the rate of about thirty feet per minute, and also take the "wind" out, leaving the surface smooth, and the corners perfect. They are remarkably simple, and not liable to get out of repair.

In our engraving, A is a dressing slide on which the stuff is placed to be dressed and it can be placed on it so as to cut at any angle; at one end are fixed a row of teeth, *a*, and corresponding ones, *a*, on a sliding frame at the other end; this is slid down to the stuff, *c*; and the handle, *d*, rotated when the cam on its edge causes, *a*, to grip into the stuff and an incline on the axle of *d*, binds the slide tight in its place, thus forming a convenient and simple dressing slide. C is the frame of the cutter having two standards, D, supporting the axle which carries a cutter plate, B, and the belt pulley, E, that gives it motion. A series of regulating pulleys, F, are attached to the extremity of the shaft, which by means of M give motion to the feed roller, N, that is thrown in and out of gear by means of the lever, O. The cutter, B, of which a front view is also given, has one or two cutters placed opposite each other, as I *b*; *b* is represented as an ordinary cutter, but the inventor found that these quickly wore down and became blunt, and it cost some little time to sharpen and adjust these cutters, so he has replaced them with tubular ones, I, which require only to be turned around, when blunt in one spot, and a sharper surface can be immediately presented to the work. K is an adjustable gage which can be moved on the bed-plate, J, to any distance from the cutters by employing the graduated inch scale cut on the bed-plate. P is the gage slide, and L a handle that secures it when properly adjusted. The smaller sizes of this planer can be worked by the foot like an ordinary lathe, and from the specimens of work which we have seen done by this machine, in all kinds of hard and soft wood, it appears to us to be the very thing for small work, and will prove a very useful adjunct to the workshop.

It is the invention of H. H. Baker, Newmarket, N. J., and was patented by him August 18, 1857. He will be happy to furnish any further information on being addressed as above.

Will the Atlantic Telegraph Cable operate?

MESSRS. EDITORS.—I have been waiting for some explanation of the cause of Prof. Morse's resignation of the office of "Electrician to the Atlantic Telegraph Company," but nothing has yet appeared. No reason for this has yet been published, although it seems Prof. Morse discovered that, when the cable was being paid out, before it was broken, the electric current grew feebler and feebler. This fact, although somewhat indefinitely stated, affords some data for inferring that the enterprise will prove a failure.

When experiments were made in England to send the electric current through the cable, they were stated to have been successful, but the conditions of that success did not afford data to predict the favorable working of the cable in the ocean.

The cable experimented with was confined in a comparatively small compass, in a coil, and if a secondary current were excited in any of the conductors, it may have been conveyed so as to assist the primary current. A powerful magnetic action will be evinced in a small circuit, in which the current passes through a fine wire, many miles in length, surrounding an electro magnet; but the same will be very feeble in its effects, if sent through the fine wire of the magnet, extending lengthwise through space, instead of being wrapt in a coil. The same reasoning will apply to the cable tested in a coil at Liverpool, and when laid in the bed of the ocean. In the first case, the current should be strong; in the second, feeble. As the capacity of a conducting wire is according to the solid section, it appears to me that the wires of the cable are too small and with the powerful battery which must be employed, they will be liable to fusion.

I make these suggestions so that proper experiments may be made with the cable before the next expedition starts. Instead of being placed in a continuous coil, the cable should be laid crosswise, like the figure 8, to experiment on the influence of secondary currents; because the cable might get crossed and twisted in the ocean and rendered useless.

S.

New York, March, 1858.

American Lap-Welded Iron Tubes.

We have received a letter from a correspondent, in which he states we were misinformed as to the person who first made the above kind of pipes in America, and the time when, as stated in our recent notice of this manufacture. He informs us that the person who first manufactured these tubes was "John Peace who came to this country from England in 1849, and contracted with Morris, Tasker & Morris, of Philadelphia, to establish them in the business; and that in March, 1850, under his superintendence, the first of these tubes were manufactured."

"In 1851, their manufacture was also successfully carried on at the establishment of Seyfert, McManus & Co., Reading, Pa., under the management of Sampson Dain, who also came to this country from England.

Science in Canada.

A circular has been sent to all the mechanics' institutes in Upper Canada, by the Board of Arts and Manufactures, informing them of its objects and asking their co-operation. This Board has especially for its aim the increase of the knowledge of the mechanic arts, and it now proposes to form a library and museum of inventions, models and patents, which will no doubt form the nucleus of a valuable educational system. Exhibitions are to be held and prizes distributed for inventions of practical utility for the purpose of stimulating the inventive genius of the country. We wish them a hearty success and hope that an honest rivalry may spring up in this branch of industry between them and our northern States, so that both may thereby be benefited, and liberality and good feeling increased.

Ancient Silver Mine.

The Huntsville (Ala.) *Advocate* informs us that an old silver mine has been re-discovered in Hancock county. It was walled up with solid masonry, which had to be removed by blasting before the mine could be re-opened. Large trees are growing over and around it, showing that it cannot have been opened for centuries. The ore is said to be very rich.