

RAMMING THE MOLD.

There are many simple little operations which every working man performs in the everyday routine of his trade, and



which, though inconsiderable of themselves, nevertheless are not devoid of interest when made the subjects of the draftsman's ready pencil. Of such a nature is the process depicted in our sketch—merely a molder busily engaged in ramming the sand into his flask. The pleasing combination of form attracted the casual notice of our artist a few days since, while visiting a large industrial establishment; and in a spare moment he jotted down the lines which, by one of those marvelous processes of photo-engraving, we have caused to be represented in perfect facsimile in thousands of copies of the SCIENTIFIC AMERICAN. The design will be an agreeable memento of possibly the daily practice of many into whose hands our paper may find its way, while, perhaps, it may be not entirely without a mission of its own. The earnest face of the workman and the firm grasp with which he wields his rammer show very clearly that he is delivering no gentle blows, and that his task is being done with a will which is a sure guarantee of its thoroughness. Now ramming molds is not a complicated performance, nor does it require the ability of a very skilled artisan; on the contrary, it is a very small portion of the multitudinous operations which must be accomplished before the perhaps great structure, to which the piece of metal in the flask belongs, is completed. But insignificant as this process may be, zeal and thoroughness are just as much called for as in the most delicate manipulations, and no mechanic will ever be the loser by using his best efforts on just such little things. Faithfulness in the accomplishment of small tasks brings with it the ability to perform thoroughly much greater ones; and the working man who proves himself energetic and honest in doing the former will soon find that his talents are needed in larger operations, which will insure him increased credit and profit.

The American Centennial Exhibition at Philadelphia in 1876.

The committee have adopted the general plan of Vaux & Radford of New York for the building, known as the "pavilion plan," which contemplates a building which will be mainly a succession of immense cast iron arches, the whole forming a rectangular elevation which can be enlarged in any direction to an almost indefinite extent, as the exigencies of the Exhibition may demand.

The principal part of the building covered by the pavilions becomes one spacious hall 408 feet wide and 2,040 feet long, with a transept 408 feet wide and 952 feet long. The vistas, of course, extend 952 and 2,040 feet in length. The building is capable of both central and intermediate points of emphasis, direct lines of transit throughout its entire length and breadth, diagonal lines of communication, if deemed necessary, and especially an entire relief from any appearance of contraction, because the visitor will always be in an apartment or pavilion 140 feet wide, that opens immediately into other apartments of the same width.

Features suggested by the plan of Sims & Brother, of Philadelphia, are to be introduced in constructing distinct parts of the building. The material will be iron and brick.

The Accidental Color of Bodies of Water.

From early ages, the red color of certain natural deposits of water has been a subject of human speculation, and has given rise to the many grotesque fancies of bloody showers, rivers turned to gore, and the similar ghastly imaginations with which ancient legends abound. Homer in his Iliad speaks of a dew of blood which preceded the combat between the Greeks and Trojans; and in the Bible (Exodus, chapter

VII), it is stated that "blood was seen in all the land of Egypt." Similar natural phenomena appearing in more recent times have engendered superstitious fears among the ignorant and have been eagerly seized upon by religious fanatics as "signs and wonders" from the heavens, indicative of direct and miraculous celestial intervention.

Modern science, however, teaches that fresh water, thus accidentally tinged, owes its color either to the presence of infusorial animalculæ (*euglena viridis*, *e. sanguinea*, *astasia hæmatodes*), or to microscopic vegetation (*oscillatoria rubescens*, *sphaeroplea annulina*), and sometimes even to small insects, *entomostæacæ* (*daphnia pulex*, *cyclops quadricornis*). Sea water, as is well known, also presents hues of varied character. Thus the blue or green tint of the ocean on the coast of Greenland has been found due to an animalcule resembling the *medusæ*. Of these minute beings 64 have been found in a cubic inch, 110,392 in a cubic foot, and 23 quadrillions 888 trillions are estimated to exist in a cubic mile. Arago considers that the green bands of water noticeable in the polar regions are due to myriads of *medusæ*, the yellow color of which, in connection with the blue tint of the sea, produces the green appearance. Near Cape Palmas, on the coast of Guinea, the ocean sometimes becomes covered with animalculæ, floating upon the surface, so that it is said that vessels seem to be sailing through milk. Also on the coast of Portugal, the Atlantic for a space of some five miles square has appeared of a dark red; the phenomenon being due to a minute vegetable known as the *protococcus atlanticus*. So infinitesimal are these *algæ* that it is estimated that 40,000 of them would not cover a space of over 0.03 of a square inch. The waters of the Red Sea owe their periodic rubefaction to the presence of a confervoid sea weed, called *trichodesmium erythraeum*. Pallas states that there exists in Russia a salt lake called Malinovoë-Ozen, or raspberry lake, because its salt, as well as the liquor left after distilling the same, is red, and has an odor resembling violets.

Doctor N. Joly communicates to *La Nature*, from which journal we extract the accompanying engravings, the following interesting details regarding his investigations into the phenomenon of accidental coloration or rather rubefaction of water in the salt marshes of Villeneuve, a few miles from Montpellier, in France. The liquid

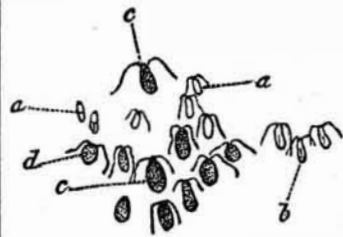


Fig. 1.

is of a strongly marked red color, resembling blood, and a quantity taken from the surface and examined with the microscope showed myriads of little beings. Their bodies were oval and long, sometimes cylindrical. While young they are colorless, afterwards turning green, and finally red. The mouth is in the form of a conical prolongation, and is retractile. No eyes could be recognized, nor could the stomach be distinctly made out. By the aid of powerful lenses two flagelliform prolongations, extending from the rear of the animalcule were found, by agitating which it propelled itself in the drop of water on the slide of the instrument. The author was led by this discovery to the conclusion that the *protococcus* is an animal and a true monad. On further examining the animalculæ after death, they appear globular in form, and hence the mistake made in determining their nature by previous investigators. A single drop of alcohol, or even of fresh water, in the liquid (on the slide) in which the monads exist, causes them to become motionless and globular, while the same result takes place if they be cut off from

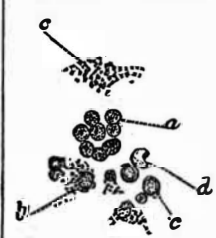


Fig. 2.

access to the atmosphere, as it appears that respiration is absolutely necessary to their existence. Fig. 1 shows the monads (*monas Dunali*) alive, and magnified 420 times. *a* are the young ones, colorless, *b* are older and of a green color, while those at *c* and *d* are adults, more or less red. Fig. 2 represents the animalculæ after death, in their globular state. It may be noted as an interesting fact that they strongly resemble the *protococcus nivalis*, or microscopic vegetation to which the phenomenon of red or green snow in the arctic regions is due. They seek the light with avidity, always gathering, when confined in vessels, to the brightest side.

It has been believed by many savants that the *artemia salina*, a minute crustacean, also aided in giving the water of the salt marshes of the Mediterranean its ruby color. This

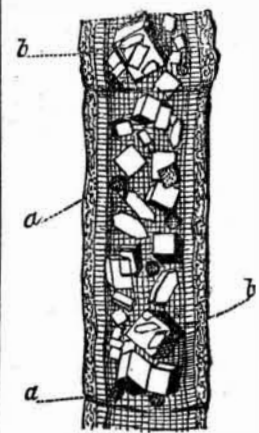


Fig. 3.

Dr. Joly does not believe, and he proceeds to demonstrate some curious properties of this strange animal. He states that the *artemia* owes its own color to its consumption of the monads which are taken into its digestive canal. The *artemia* is naturally colorless, and its food, together with crystals of marine salt, shows through its body, thus causing it to appear red. Fig. 3 is a section of its digestive tube, in which *a* are the monads, not yet digested, and *b*, the cubical crystals of sea salt. The animal itself is represented in Fig. 4, in both its natural size and highly magnified. *o* and *yy* are eyes; *a* and *e*, antennæ;

p is the incubating pocket, showing the eggs within; 1 to 11 are feet, serving both for purposes of respiration and propulsion; *a b* is the abdomen, and *a p*, the caudiform appendage;

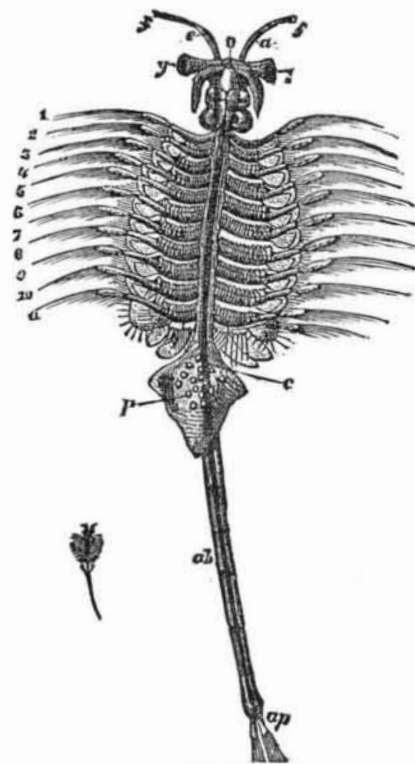


Fig. 4.

c is the digestive tube, colored red by the contained monads. It is a curious fact that the young are produced by parthenogenesis, and are always females.

How a Lawyer Spends his Spare Time.

We clip, from the New Orleans *Republican*, the following interesting sketch of the profitable manner in which a well known advocate employs his leisure moments. United States District Attorney Beckwith is evidently no less able as a mechanic than as a lawyer. Our contemporary says that: "When he can get away from his office in the custom house—away from his books and his briefs—away from his clients and his cases, and the adjustment of 'the doubtful balance of rights and wrongs,' then it is that he lets himself, with his lathe key, into a building unoccupied save by himself, goes up into the third story, takes off his coat, rolls up his sleeves and goes to work.

"It is a queer looking rookery, this workshop of Beckwith's. Tools lie scattered around; two or three turning lathes are mounted in one end of the room; beyond them stands an upright boiler and a three horse power steam engine, mounted on an eleven inch base and capable of making 600 revolutions a minute; a neatly mounted forge, smoke stack, escape pipes, pulleys, bands, benches—everything made and erected by the lawyer-mechanic, the presiding genius of the place.

"The councilor, at whose correctness as a logician and pleader all marvel, astonishes still more those who glance into his workshop, at the perfectness of the machinery he turns out in his leisure moments. The burly lawyer is master here—files and screws and drills and ratchets are as handy to his touch as authorities in the huge bound books, on his shelves in his room in the granite building. The alchemist in his laboratory, seeking for the mystery which should transmute base metal to gold, was not happier or more enthusiastic than Beckwith is in devising some new appliance in his dusty workshop. Even his bellows he blows by a machine he has invented. The larger turning lathe, which he spent years in making, and months of that time in the perfection of a single screw, is adjustable with the precision of a microscope. The governor of his engine did not quite please him, so he has made a new one on a new principle, which works to a charm.

"Understand, all this is the lawyer's pastime. He is not an 'inventor.' He gets nervous when asked if the Beckwith sewing machine is his invention, and vehemently denies the impeachment. He takes no sort of pride, either, in his skill as a workman, and we know will not thank us for this intrusion into his workshop."

Earthquake in Panama.

Panama was visited by an earthquake on the evening of the 13th of October. There were two pretty severe shocks, with an interval of but a second or two between them. The second shock was most severe, and accompanied by a rumbling sound, resembling thunder. In Aspinwall, the shock was felt about ten minutes later, and seems to have been more severely felt than in Panama. The people were much frightened, and the fear of a tidal wave added to the excitement. The duration of the shock in Panama was about four or five seconds, so that it was over before the people had time to run out of their houses. Most people agree that the oscillations proceeded in a direction from southeast to northwest.

In a communication, recently received from Messrs. W. Ladd & Co., London, they complain that the strictures of Professor Morton, in respect to the bad packing of their cells, are unjust, and say that, while there have been many breakages in the past, due to carelessness of the packers, they have so fully remedied the trouble that they now rarely find the breakage of a single cell out of the large numbers they send to this country.