

when produced and exposed to the water, becomes a mass of dark, horny fibers that serve as anchor chains by which the animal attaches itself to the rocks. We find the mouth directly opposite the so-called siphon, provided with a pair of peculiar lips, leaf-like, which have the faculty of aiding in sending currents of water bearing food to the mouth. We see the long coiled intestine, the stomach, and liver, and in a bag or sac a marvelous rod, clear as crystal, seemingly distinct from the body and without purpose, a backbone unattached as it were, known as the crystalline style; an organ that is well known, but which is still a zoological mystery.

The heart is an interesting object, the blood pouring from the gills into the two auricles, then passing into the median ventricle, which pumps it into all parts of the body. The gills are prominent objects, apparently hanging on either side, and made up of a marvelously complicated series of tubes. If in imagination we could follow the blood current of the clam, we should see it collecting in a large tube at the base of the gills, from which it passes into the tubes and so to the heart. During the passage through the tubes which make up the gills the process of breathing is accomplished, which brings us to the consideration of the long siphon of the clam.

This singular organ has various offices. It is likethe trunk of an elephant, inasmuch as it can be elongated to obtain food at a distance from the body, illustrated by the clam at the bottom of its burrow, while the tip of the pseudo trunk or siphon is at the opening receiving food. The siphon has two tubes; the one furthest from the hinge, or the lower, may be called the mouth proper, as it sucks in a continual current of water. The other performs an opposite work, rejecting the accumulation, and can be compared to a chimney, out of which passes the rejectamenta after consumption. In this one act of drawing water through its long siphon the clam eats and breathes. The water, laden with food and oxygen, is brought into the clam in a remarkable manner, which is readily observed. The gills and other parts of the clam are covered with minute, hair-like organs, which may be compared to oars, which all wave or work in a given direction, always away from the incurrent siphon opening, thus creating a current through it, the water from without rushing in to fill its place, and so powerfully do the cilia work that a few in a small section of the gills removed for the purpose have been known to move six millimeters in a minute. The water from the incurrent siphon, laden with food particles and charged with oxygen, is then wafted by millions of paddles over every portion of the gills, when the blood in the tubes takes up the oxygen and ejects the carbonic acid. On it passes, the cilia or paddles sweeping it on in the direction of the mouth, which, as it passes, seizes the atoms of food, the rejected portions, the impure water now laden with carbonic acid, being swept along and finally forced out of the upper tube of the siphon. So it will be seen that the perfect type of the siphon, with its two tubes, as illustrated by the clam, is a marvelous organ; and that the simple "head" of the clam, in popular parlance, is more like the tip of a long proboscis, really a very complicated and beautiful organ in all its parts, having various and important functions, interesting not only to the naturalist, but to any stroller along shore.

The mollusks are by no means the low creatures generally supposed. They are endowed with many senses; indeed, the wonderful siphon, like the trunk of the elephant, has such varied offices that it seems gifted with a special sense. The clam has olfactory organs, these being found in what is known as the parieto-splanchnic ganglia. It has minute eyes, in the pecten thirty or more are seen on the edge of the mantle, gleaming like gems. Sometimes the eyes are situated upon the siphon, as in the solen or razor clam. They are the simplest form of eyes, yet are sufficient to warn the owner, as every clammer knows, who has seen the wily razor dart down into its den as the shadow passed over it. The ears of the clam are delicate sacs, each containing an otolith, which, like the tongue of a bell, jangles against the cilia that line the sac, so producing sound waves.

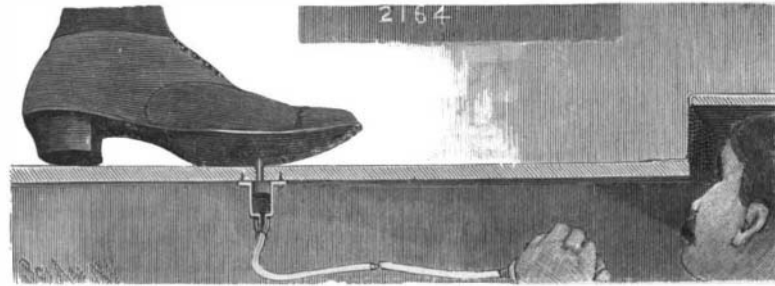
A study of the siphons of the mollusks shows the greatest variety. The clam illustrates the maximum length. In the razor clam, ensis, and others, it is very short. In *Tellina tenera* the siphons are remarkably

long, several times the length of the shell, and well illustrate the forms in which the siphons constitute separate tubes.

MENTAL WONDERS.*

The most sphinxlike problem ever presented to the public for solution was the second sight mystery. There have been many exposés of "mental magic," and some of the best of them are described in "Magic: Stage Illusions and Scientific Diversions, including Trick Photography."

We have now to concern ourselves with "mental magic," where the results are obtained by clever tricks. There have appeared from time to time before the public individuals who generally work in couples,



THE FOOT TELEGRAPH.

termed "operators" and "subjects," who have given performances which were termed mental wonders, silent second sight, etc. The operator invariably tries to impose on the public with the idea that he possesses some mysterious power over the "subject," by which he is enabled to communicate information to her by his will power over her mind without a word being spoken. There are, of course, various methods of performing this trick, as by a code of predetermined signals in which sentences like the following are used: "Say the number. Well? Speak out. Say what it is." But these methods are not comparable with the mechanical means which we are about to describe.

The "operator," after informing the audience of the wonderful powers of divination which the subject possesses, introduces the "subject," who is invariably a lady. She is seated on a chair near the front of the

Each member of the committee is invited to step to the blackboard and touch a figure; no sooner has he done so than the lady calls out the number. Other tests of a similar nature are given, such as the extraction of square and cube root, etc. They all prove that the lady has a thorough knowledge of the numbers on the blackboard and the relative position which they occupy. It is, of course, proved beyond a doubt that the lady cannot see the blackboard. The question then arises, How does she obtain the information? There are two methods of performing this trick. In either case her information is obtained from a confederate, who is generally concealed under the stage, who has the blackboard in sight and who transmits to the lady the desired information.

In one method the lady has a hole 1 1/2 inches in diameter cut out of the sole of one of her slippers. She places this foot over a hole in the stage through which a small piston is worked pneumatically by the assistant. The piston is connected with a rubber tube which runs to where the assistant is concealed. The assistant looks at the blackboard and manipulates the bulb, thus causing the piston rod to strike the sole of the foot, giving signals which can be readily understood by the subject. Robert Heller used a system somewhat similar, only an electro-magnet was used instead of the pneumatic piston.

Another and bolder method of conveying information is the speaking tube. In this case a Vienna bent wood chair is used. The chair is specially prepared for the trick. One leg of the chair is hollow and the air passage is continued to the very top. The lady usually has a long braid of hair hanging down her back, and if not blessed by nature with this hirsute adornment, she wears a wig. In either case concealed in the hair is a rubber tube, one end being close to the ear and the other hanging down with the braid, so that when the lady is seated on the chair the operator can easily connect it with the connecting tube in the chair.

The Current Supplement.

The current SUPPLEMENT, No. 1197, is particularly interesting. It contains an article by H. Percy Ashley, entitled "An Up-to-Date Ice Sloop," accompanied by full working drawings for making the same. As the season for winter sports has now arrived, doubtless many of our readers will wish to make an ice-boat of this kind. Mr. Henry Savage Landor's new book, "In the Forbidden Land," is reviewed at considerable length. Mr. Landor entered Tibet by way of India, and was captured by the Tibetans and tortured by them with great cruelty and very nearly killed. He was finally released and allowed to pass over the border. Mr. Landor's narrative is most thrilling, and his adventures rank among the most interesting travels of the latter part of the nineteenth century. The article is accompanied by illustrations from the book showing Mr. Landor being tortured. "Saline Efflorescence of Brieles" is a timely scientific study dealing with the methods by which this discoloration may be prevented. This number of the SUPPLEMENT contains several papers which were presented at the recent meeting of the Society of Naval Architects: "Economy Test of a Unique Form of Feed Pump," by F. Meriam Wheeler; "Stability of a Battleship under Damaged Conditions," by Prof. C. H. Peabody; "Early Marine Engineering in the United States," by C. H. Haswell. "The Recent Eruption of Vesuvius" is illustrated by an engraving made from an actual photograph of the eruption. "Pekin" is an interesting article describing interesting scenes of that city. "Africa and its Animals" is an article by R. Lydekker. "Distilled Water, its Preparation by Simple Automatic and Inexpensive Apparatus and its Preservation," completes this very interesting number. The usual notes are published.



THE SPEAKING TUBE.

stage in plain view of the audience. Her eyes are heavily bandaged, so she cannot see. A committee is invited to go upon the stage to see that the lady has had her eyes properly blindfolded and also ostensibly to help the operator. A large black board is placed at one side of the stage behind the lady. One of the committee is requested to step to this blackboard and write on it with chalk some figures, usually up to four or more decimal places, and after he has done so he resumes his seat. The lady immediately appears to add up the number mentally, calling out the numbers and giving the results of the addition.

*From "Spirit Slate Writing and Kindred Phenomena." By William E. Robinson, assistant to the late Herrmann. New York, 1898. Munn & Company, publishers. 16mo. Pp. 148. 66 illustrations. Cloth. Price \$1.00.

Contents.

(Illustrated articles are marked with an asterisk.)

| | | | |
|------------------------------|-----|------------------------------|----------|
| Africa, export trade of..... | 370 | Navies of the world*..... | 369, 376 |
| Agricultural report..... | 371 | Navy, additions to..... | 370 |
| Boilers, selling..... | 374 | Notes and receipts..... | 375 |
| Canal project..... | 374 | "Portland," loss of the..... | 370 |
| China, exports to..... | 371 | Rose, Joshua..... | 371 |
| Clam, siphon of*..... | 378 | Science notes..... | 375 |
| Frame, bicycle..... | 375 | Ties, metal..... | 370 |
| Housekeeping, school of..... | 371 | Trolley, underground..... | 370 |
| Mental wonders*..... | 379 | Turbines*..... | 373 |
| Naval report..... | 370 | Viscosimeter*..... | 373 |