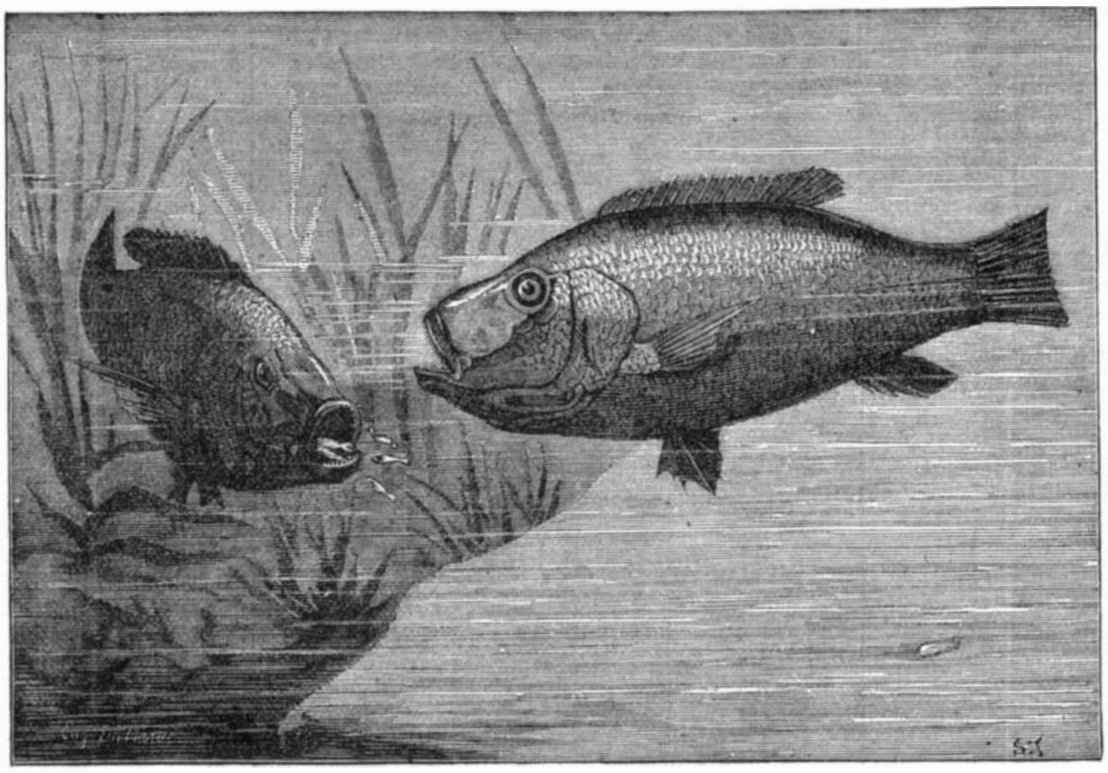
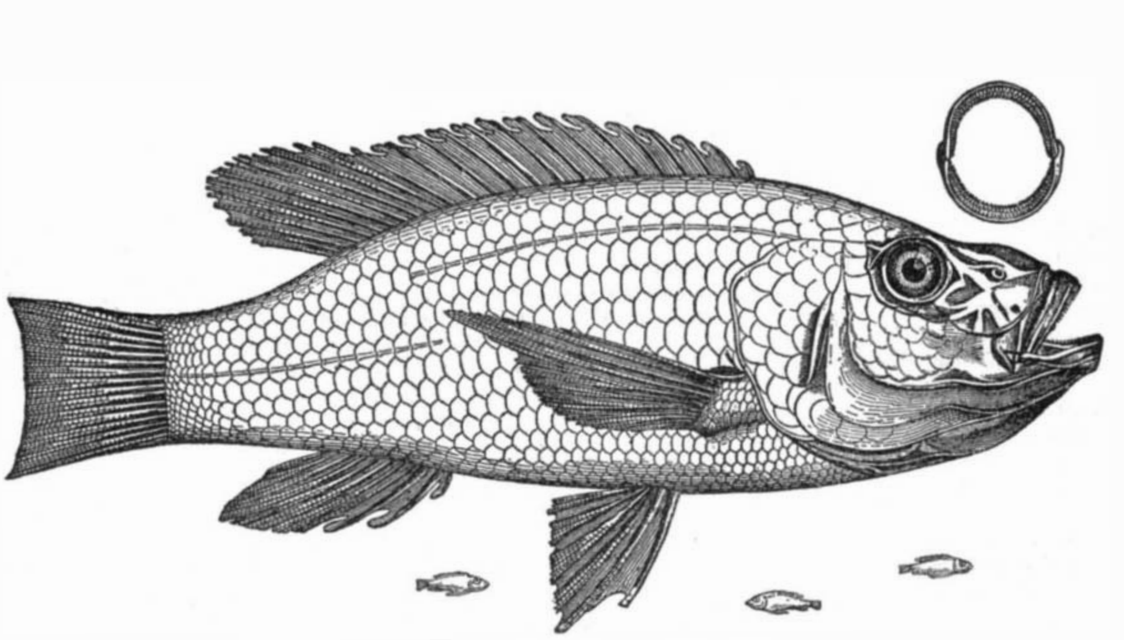
THE CHROMIS PATERFAMILIAS.

Up to the present time naturalists have recognized but very few fishes which incubate their eggs in the mouth or in the gills. Agassiz, during his voyage up the Amazon river, discovered one species. Latterly the macropode, a Chinese fish of very singular characteristics, has been remarked to have the same peculiarity. Both the macropode and the species noted by Agassiz belong to the great group of *labyrinthobranchia*; and it was the opinion of the abovenamed naturalist that to that order alone belonged all fishes which, through the possession of a bronchial sac, are enabled therein to incubate their eggs in so curious and abnormal a manner.

The recent discovery, however, of the *chromis*, having the same peculiarity, shows that Agassiz was in error; for this creature has gills disposed in simple layers, and is wholly destitute of any special apparatus for retaining either eggs or fry, and yet it carries upwards of 200 young fish in its gills and mouth. This remarkable incubation is done by the male. When the female has deposited her eggs in a sandy cavity or among the weeds, he approaches and by an inspiration draws them into his mouth. A peculiar movement then follows, the mechanism of which is as yet unknown, but the result is to force the eggs between the leaves of the gills. The gentle pressure on the eggs, afforded by the gill layers, serves to keep them in place, and there, in the midst of the respiratory organs, they undergo their changes. The young grow rapidly, and soon struggle to escape from their narrow prison. Eventually they find an exit through the opening into the mouth of the parent, and there they crowd together as thickly as the seeds of a pomegranate, distending the jaws of the old fish until the mouth is unable to close. Sometimes the young, although in a perfect state, remain in the gills, all, however, with their heads directed toward the mouth of their progenitor. How they pack themselves together, how the parent manages to feed without swallowing his offspring, and when the latter finally escape from the mouth, are matters still unknown.

The chromis, an excellent representation of which is given in the annexed engraving, taken from *La Nature*, is seven inches in length and one inch and seven tenths in hight. The teeth are very fine and acute, and disposed in several series, and are of a yellow tinge. The scales are cycloidal, more broad than high. The color on the back is an olive green, shot with blue. The belly is brilliant silver, marked with green and blue. The fish is found in Lake Tiberias, in Palestine, near Ain-tin, the site of ancient Capernaum. In that locality there are several hot springs which unite to form a moderate-sized stream which enters the lake. The chromis is principally met with in the hot waters.





THE CHROMIS PATERFAMILIAS.

Medicated Ice.

The possibility of using antiseptics in medicine was recently pointed out by Mr. Edward Martin, in a letter to the *Lancet*, from which the following is taken:

"Every practitioner has at times to face the difficulties of the scarlatinal throat in young children. It may sadly want topical medication; but how is he to apply it? Young children cannot gargle, and to attempt the brush or spray often fills them with terror. In many cases neither sternness nor coaxing avails. Yet these little ones in almost every case will greedily suck bits of ice. This has long been my chief resource where I could not persuade the child to submit to the sulphurous acid spray. Lately I have been trying an ice formed of a frozen solution of the acid (or some other antiseptic). Though, of course, not so tasteless as pure ice, the flavor is so much lessened by the low temperature, and probably also through the parched tongue very little appreciating any flavor whatever, that I find scarcely any complaint on that score from the little sufferers; they generally take to it very readily. The process of making it is very simple. A large test tube immersed in a mixture of pounded ice and salt is the only apparatus required, and in this the solution is easily frozen. When quite solid, a momentary dip of the tube in hot water enables one to turn out the cylinder of ice as the cook turns out her mold of jelly. I have tried the three following formulæ, all of which answer, though I think I prefer the first:

1. Sulphurous acid, ½ drachm; water, 7½ drachms: mix and freeze.
2. Chlorate of potass, 1 scruple; water, 1 oz.: dissolve and freeze.
3. Solution of chlorinated soda, ½ drachm; water, 1 oz.: mix and freeze.

"However, the form is of secondary importance, as each practitioner can construct his own. Boracic acid, salicylic acid, or any other harmless antiseptic with not too much taste, would, doubtless, be as useful as those indicated."

Making Maple Sugar.

"A great many farmers," says a sugar making correspondent of "*The Christian at Work*, residing in Ohio, "might make a few hundred pounds of superb maple sugar, and a barrel of superb maple sirup, just as well as not. They have the trees, an abundance of cheap help. and wood that would cost nothing except the labor of preparing it for the fire. The only difficulty in the way is a disinclination to engage in such a job. Let us make our own sugar this year," says the writer, and then follow his directions for doing it.

"My process of reducing the sap is this: I keep the larger pan supplied with fresh sap, by means of a spout with a coarse cloth strainer over the end, from the reservoir, so adjusted as to admit a supply equal to the evaporation from the pan. From time to time I transfer sap from the larger to the smaller boiler, passing it through a fine woolen strainer. After accumulating a desired quantity in the small pan, and reducing it to a thin sirup, it is clarified by putting into a quantity which will make three or four gallons of molasses the white of an egg beaten up with about a gill of sweet skimmed milk. The sirup should not be hot enough to cook the egg. The egg and milk will entangle any sediment or foreign matter in the sirup, so that when brought to the boiling point everything will rise, when it is skimmed off, leaving the sirup clean. I then continue to boil it as rapidly as possible, till it is reduced to the desired consistence. I reduce my molasses to what I suppose to be about 38° B. My process of making sugar is to reduce the molasses to a degree which I should think to be about 48° or 50°, and pour it into a cask with one head out, with a spile at the bottom, to which other lots are added from time to time, as they are made. In a short time the mass will begin to granulate; and after having stood some days the molasses will drain out, leaving a white and beautiful sugar."

Borrowed Plumes.

An indignant naturalist writes to the London *Times* denouncing the ladies' fashion of ornamenting their dress with spoils from the feathered kingdom. A chance catalogue, or portion of a catalogue, of a sale of birds' feathers was the provoking cause of his communication. He says:

"The second page of this document (the first being occupied by the title) relates to 2,077 bundles of herons' or egrets' feathers (they go by other names 'in the trade',) the weight of which I find to be given as 702 ounces. How many feathers may go to a bundle I cannot say; but weighing some twenty exceptionally stout feathers (not herons') which happened to be on hand, I find them to balance one fourth of an ounce exactly. I think, therefore, that these 2,077 bundles cannot well contain fewer than 56,160 feathers; and allowing twenty of them to each bird (which I believe to be a fair allowance), we have evidence of the death of 2,808 herons or egrets. The next page relates to 2,948 similar bundles, weighing 1,168 ounces, showing, on the same estimate, 4,672 birds. To this follow other lots, which, in like manner, I compute to represent 2,220 birds, or in all 9,700 herons or egrets. All these lots are said to have arrived from India, and nearly all to have been warehoused last autumn. The spoils of how many more birds were included in the catalogue itself, to which this is a first supplement, or of how many in the second supplement, I, of course, cannot say; but, even if there were none, I venture to affirm that no country could long supply nearly 10,000 herons or egrets, killed in a single breeding season, without the stock becoming utterly rooted out. Yet I am told that there is one or more of those sales almost weekly."

The circumstance that birds' feathers are the most beautiful and consequently more valuable at breeding time makes their speedy extermination all the more certain.

"But this sale included also the skins of other birds—mostly, to all appearance, from South America or its islands. Of these there are enumerated 15,574 humming birds, 740 of which are specified as being of one kind, the ruby humming bird. I will not occupy your space by giving details of the rest; sufficient to say that parrots, kingfishers, trogons, tanagers, and various other brightly colored birds are there by the thousand. It may be that the Government of India might take steps, by establishing a close time, to save the herons and egrets from utter extirpation; and the same might be done in our colonies of Trinidad and Demerara, whence I have reason to think that many of the other victims are procured. But the most effectual remedy would be for every rightminded man or woman to discountenance the wearing of feathers on the person or their use in the decoration of furniture."

Mr. Buckland on Crabs.

Mr. Frank Buckland suggests a new way of killing crabs, which we commend to the notice of Mr. Bergh and other protectors of the brute creation. Usually the unfortunate crustaceans are placed in a pot of cold water, which is allowed to heat gradually over a fire, so that the crabs suffer the pangs of a lingering death, the reason for which is that, if at once thrown into hot water, they cast their claws. The proposed mode of painless killing is merely to run an awl or needle through the heart, which is situated in the center of the body, just below the mouth. Crabs, as a general rule, are popularly supposed not to be the most digestible of foods; but Mr. Buckland thinks otherwise. He says that, together with oysters and lobsters, they "should form the diet of all persons engaged in business or literary pursuits where much wear and tear of the nerve power takes place from day to day." No substance conveys phosphorus so readily into the human system, he adds, or assimilates so readily therewith, as the flesh of crustacea.

Effects of Lightning.

The examination by Professor Calladon, of Geneva, of a case of a pyramidal poplar struck by lightning, enabled him to verify some of his previous conclusions, and to add some new observations. The flash which struck this tree, situated 12 yards from the shore of the Lake of Geneva, left perfectly intact the upper portion. At seven eighths of its hight commences the trace left by the lightning, in the form of a wound (*plaie*), 1 to 1¼ inches in width and from 2 to 2½ inches in depth. This wound descends as far as the ground, turning round the trunk in the form of a screw, and describing four fifths of the complete circumference of the tree. Fragments of wood of various sizes were projected to distances as far as 50 yards. Some are pierced by jagged holes, indicating a violent eruption of the electric fluid from the interior to the exterior, the track of the fluid having probably been in the layer which separates the alburnum from the old wood or duramen. The places where the emission of the fluid occurred are sometimes indicated by spots of a red color, similar to the effect which might be produced on wood by the application of a hot iron. They correspond to a slight depression of the surface of the wood. The wound of the tree is turned from the shore of the lake, lightning striking more readily plants which grow near watercourses, visible or underground.

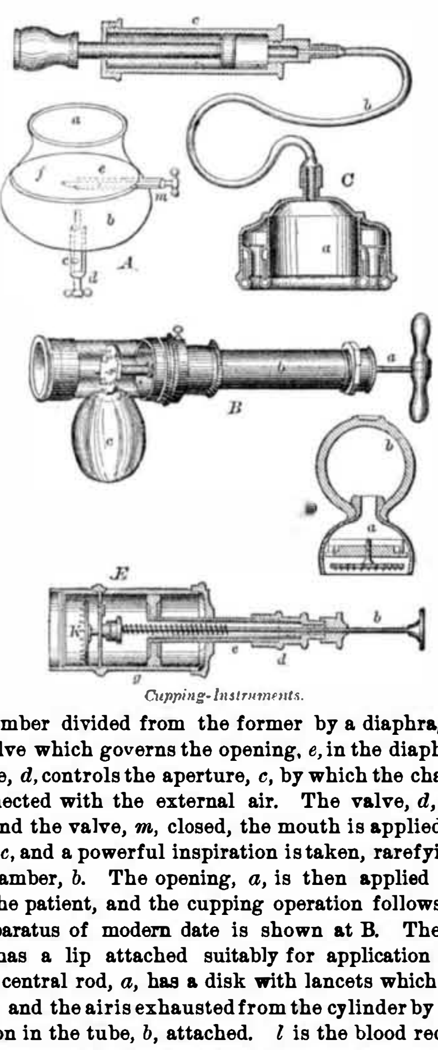
MEDICAL AND PHILOSOPHICAL INSTRUMENTS.

Our extract, this week, from Knight's "Mechanical Dictionary,"* includes descriptions and illustrations of a number of improved surgical and philosophical instruments. One of the oldest

CUPPING DEVICES

known is that described by Hero, of Alexandria, and represented at A, Fig. 1. It consists of a glass vessel, having an

Fig. 1.



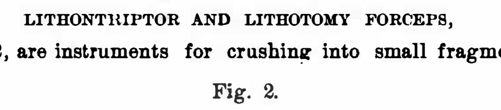
Cupping-Instruments.

inner chamber divided from the former by a diaphragm, *f*. *m* is a valve which governs the opening, *e*, in the diaphragm. The valve, *d*, controls the aperture, *c*, by which the chamber, *b*, is connected with the external air. The valve, *d*, being opened and the valve, *m*, closed, the mouth is applied to the opening, *c*, and a powerful inspiration is taken, rarefying the air in chamber, *b*. The opening, *a*, is then applied to the skin of the patient, and the cupping operation follows. Another apparatus of modern date is shown at B. The glass cylinder has a lip attached suitably for application to the skin. A central rod, *a*, has a disk with lancets which act as scarifiers, and the air is exhausted from the cylinder by means of a piston in the tube, *b*, attached. *l* is the blood receiver. In the instrument, C, the receiver, *a*, is connected by a flexible pipe, *b*, with the nozzle of an ordinary syringe, *c*. The sides of the concentric chamber afford an extended bearing for the cup, and prevent its being driven into the body by the pressure of the atmosphere. In D, the glass has an elastic bulb, *b*, by which the partial exhaustion is effected, and has also an adjustable disk provided with puncturing points to lance the skin. The scarifier, in E, is placed exactly within the hollow piston rod, *e*, which works in a stuffing box on the cylinder, *g*. In using, the air is exhausted from *g* by the motion of the piston, *e*, operated by the handle, *d*. To puncture, the needle bar, *b*, receives a quick downward thrust, forcing the needles on X, into the protuberant flesh within the cup. The spring returns the needle bar and disk into position. The

LITHONTRIPTOR AND LITHOTOMY FORCEPS,

Fig. 2, are instruments for crushing into small fragments

Fig. 2.



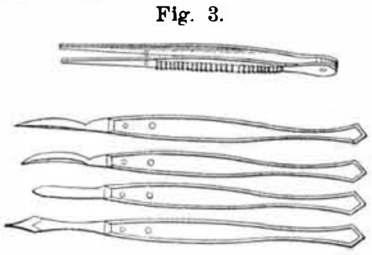
Lithontriptor and Lithotomy-Forceps.

and removing stone from the bladder. The device, *a*, is made in halves, one sliding within the other, and is of the size and shape of an ordinary catheter when closed. It is introduced into the bladder and then, by means of a screw or rack and pinion, worked on the outer extremity, the movable part is made to slide back, thus forming two jaws by which the stone is grasped. By turning the screw or handle, the blade is propelled onward by short jerks, thus breaking the stone into such small fragments that it may easily be voided. The lithotomy forceps, shown at *b*, is used for extracting stone from the bladder through the opening previously made by lithotomy. Its blades are concave and corrugated, and, through their crossed shanks, may be fully opened when inserted, without expanding the wound. Various forms of

DISSECTING KNIVES

are shown in Fig. 3. The forceps, also in the figure, is designed to extend or tighten the flesh at the point of division and to aid in removing divided parts. The shapes of the knives need no special description. The dissection of the human body for purposes of Science was first ordered by Ptolemy Philadelphus, in the college of Alexandria, Egypt, who even authorized the vivisection of criminals condemned to death. Fig. 4 represents

Fig. 3.

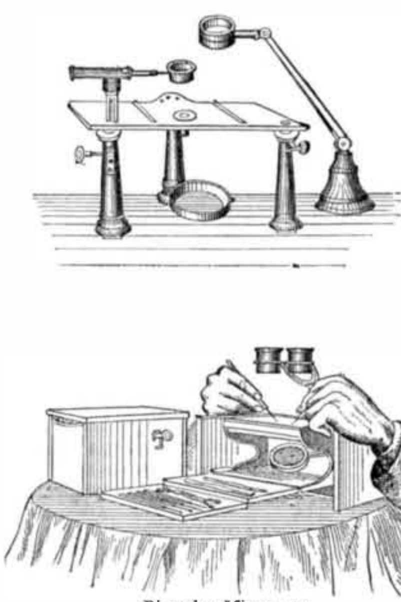


Dissecting-Knives.

DISSECTING MICROSCOPES.

The stage of the upper figure has rack adjustment for focus,

Fig. 4.



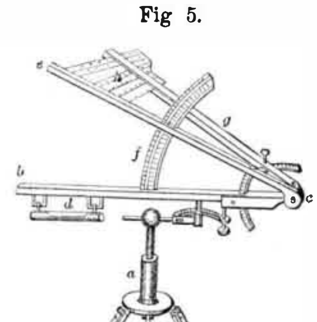
Dissecting-Microscopes.

spring clips to hold object slide, diaphragm, movable arm for carrying the lenses, and separate jointed stand on which any of the sets of lenses can be placed. The lower figure is of a binocular microscope of moderate power. It is made to close up in a box, the top and front of which contain loops to hold the knives, scissors, etc. Beneath the glass is a gutta percha stage and an illuminating mirror.

THE DENDROMETER,

Fig. 5, is an instrument for measuring the hight and diameter of trees, in order to estimate the cubic feet of timber therein. The surveyor elevates the limb, *e*, until that part of the tree to which the measurement is designed to extend is exactly cut by the line of observation, and the angle subtended between that and the horizontal limb, *b* (which is set by the spirit level), is shown upon the vertical arc, *f*. The gradations on this arc are marks answering to feet and inches of a tangent line extending from the horizontal point upward, taken at a given distance from the tree. The horizontal angles, which are to determine the diameter of the trunk, are ascertained by the limb, *g*, which slides on an arc, *h*, which is marked similarly to *f*. The length of the trunk and its diameter at several parts being thus ascertained, recourse is then had to tables, etc., for finding the corresponding solid contents. The

Fig 5.

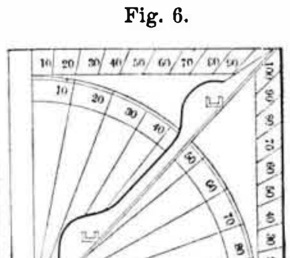


Dendrometer.

GEOMETRIC SQUARE,

Fig. 6, is an instrument for measuring distances and hights. It is made 12 or 18 inches square, and the quadrant is graduated in each direction. The two sides opposite to the axial point of the alidade are graduated to 100 equal parts, with major divisions of 10 of said parts. The 100 point finishes at the angle obliquely opposite the center from which the arc is struck. One side represents the horizon, and the alidade with two sights is equal in length to the diagonal of the square. The alidade has divisions equal to those on the sides of the square. In measuring vertical hights, the distance is measured from the station in the base, and by moving the alidade the angle subtended by the object is observed. The

Fig. 6.

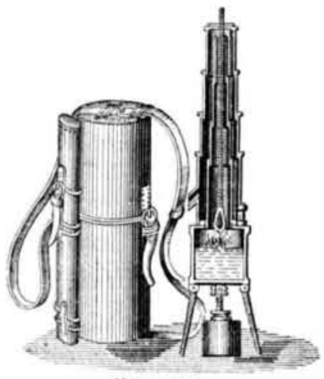


Geometric Square.

HYPSOMETER,

Fig. 7, is used for measuring hights by observing differences in barometric pressure at different altitudes. This is usually done by noting the boiling points of water. The temperature is shown by a mercurial thermometer with a very large bulb and stem, which has a length of 1 inch for every degree of the scale. This is read by a vernier to 1,000ths. It is found that a difference of barometric pressure of 0·589 inches is equivalent to 1° in the boiling point or 530 feet of ascent at moderate elevations.

Fig. 7.

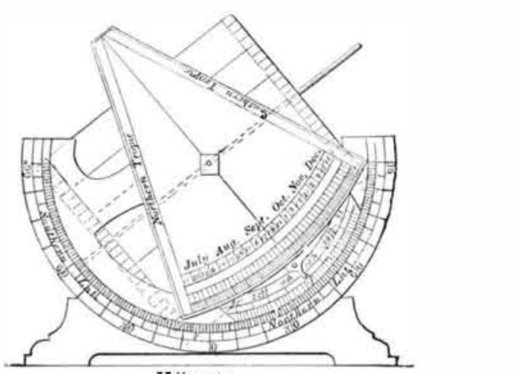


Hypsometer.

THE HELIOMETER,

Fig. 8, serves to ascertain the solar time in all latitudes, and

Fig. 8.



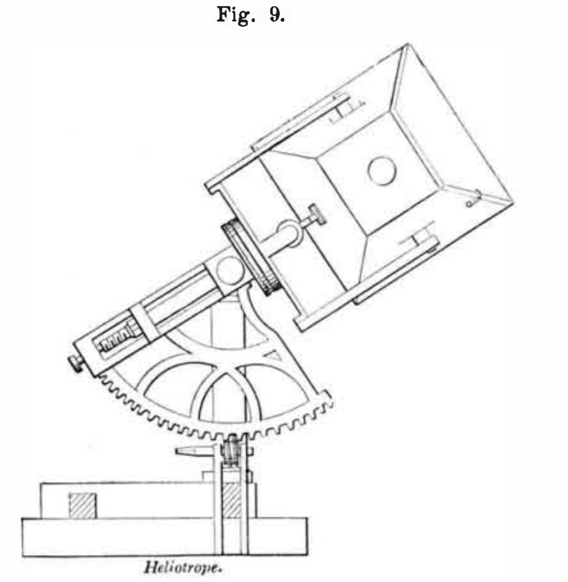
Heliometer.

for ascertaining the latitude when the apparatus is set at noon according to the date. It also is used for finding the date and length of day, sunrise and sunset (other conditions being established), the difference of time between two places, the position of the earth's axis in relation to the level at the point of observation, etc. It does not admit of a brief description.

THE HELIOTROPE,

Fig. 9, is a geodetical instrument used to reflect a ray of light

Fig. 9.



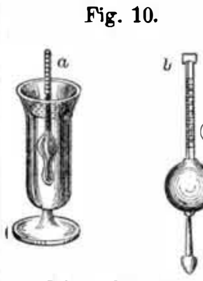
Heliotrope.

to a distant station. That used in the British triangulation has a silvered disk, and has been seen at 100 miles distance, from Cumberland to Ireland. The

HYDROMETER,

Fig. 16, is employed for determining the relative densities of liquids as compared with distilled water. It consists essentially of a float weighted at the bottom so as to keep upright, and having an elongated stem, which in Sykes' instrument, here shown, is graduated into 11 equal parts, which are again subdivided into 22. Eight different weights, numbered respectively 10, 20, etc., to 80 are used in connection with it. The proper weight to be employed depends on the strength of the spirit, etc., to be tested. It is placed on the lower projecting stem, sinking the instrument to a depth corresponding to some one of the gradations on the upper stem. This is noted, and also the temperature of the liquid; and the corresponding strength per cent of spirit is then found from tables constructed for the purpose.

Fig. 10.



Sykes's Hydrometer.

PEAT.—At Clay, N. Y., near Syracuse, the Dodge process for drying and condensing peat into fuel is now in successful operation. $1 a tun is alleged to be the labor cost of production. The specimens we have seen are excellent.

THE French Academy of Sciences has awarded a prize of $4,000 to M. Paul Bert for his original researches on the effect of barometric pressure on the phenomena of animal life.

*Published in numbers by Messrs. Hurd & Houghton, New York city.