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Discophora, a sub-class of hydrozoa, contains a number of free ocean swimming forms, mostly known as jelly fish, often growing to a very large size. In the first order (*Rhizostomida*) the tentacles hang down like a bundle of twigs from the under central portion of the umbrella-shaped mass, as is well seen in *Rhizostoma cuvieri*, a beautiful species often to be found in great numbers cast ashore on the south coasts of England and Ireland. In the second order (*Pelagiada*) the tentacles are placed all around the margin of the umbrella. The mouth is central. The accompanying figure will give some notion of these fragile forms. They are rarely solitary, but seem to wander about in considerable battalions in the latitudes to which they belong. During their journey they proceed forward with a course slightly oblique to the convex part of their body. If an obstacle arrests them, if any enemy touches them, the umbrella contracts and is diminished in volume, the tentacles are folded up, and the timid animal descends into the depths of the ocean.

In respect to size the species vary immensely. Some are very small, while others attain more than a yard in diameter. Many species are phosphorescent during the night.

Most of them produce an acute pain when they touch the human body. The painful sensation produced by this contact is so general in this group of animals, that until very recently all the animals of the group have been, after Cuvier, designated under the name of *Acalephæ* or sea nettles, in order to remind us that the sensation produced is analogous to that occasioned by contact with the stinging leaves of the nettle.

Bundles of Snakes.

The statements made by Humboldt as to the piles of snakes he saw in Guiana, can be verified here in our northern woods and swamps. I personally had the pleasure of observing it twice, both times very early in spring, and in locations which could be called wildernesses. I first saw such a bundle of snakes in the neighborhood of Ilchester, Howard county, Md., on the stony bank of the Patapsco river, heaped together on a rock and between big stones. It was a very warm and sunny location, where a human being would scarcely disturb them. I reasoned that the warmth and silence of that secluded place brought them together. Some hundreds of them could be counted, and all of them in a lively state of humor, hissing at me with threatening glances, with combined forces and with such a persistency that stones thrown upon them could not stop them nor alter the position of a single animal. They would make the proper movements and the stone would roll off. All the snakes in this lump were common snakes (*Eutamias sirtalis*, L.). The second time I noticed a ball of black snakes (*Bascanion constrictor*, L.) rolling slowly down a steep and stony hillside on the bank of the same river, but about two miles above Union Factory, Baltimore county, Md. Some of the snakes were of considerable length and thickness, and, as I noticed clearly, kept together by procreative impulses.

It is surely not agreeable to go near enough to such a wandering, living, and hissing hundred-headed ball to examine the doings and actions, and search for the inner causes of such a snake association. As, furthermore, the localities for such mass meetings of snakes are becoming rarer every year, and our rapidly increasing cultivation of the country must make it hotter for snakes everywhere, only a few naturalists could see such a sight, even if they should look for it in proper time, which, as stated above, seems to be the first warm days in spring.—E. L., *Ellicott Mills, Md.*—*American Naturalist.*

The Circulation of the Blood Made Visible.

Dr. C. Hüter, a German savant, of Greifswald, has devised a simple arrangement which demonstrates the circulation of the blood in the human body by making it visible. Dr. Hüter's method is as follows: The patient's head being fixed in a frame, on which is a contrivance for supporting a microscope and a lamp, his lower lip is drawn out and fixed on the stage of the microscope by means of clips, the inner

surface being uppermost, and having a strong light thrown upon it by a condenser. When these preparations are completed all the observer has to do is to bring the microscope to bear on the surface of the lip, using a low power objective, and focusing a small superficial vessel. At once he sees the endless procession of the blood corpuscles through the minute capillaries, the colorless ones appearing like white specks dotting the red stream. Dr. Hüter asserts that by taking careful note of variations in the bloodflow and changes in the corpuscles he has derived great advantage in the treatment of medical cases. This is the first instance of the flow of the vital fluid in one person being watched by another.

An Odd Fish in the Far West.

A correspondent writing from Hutchinson, Kansas, to the St. Joseph, Mo., *Herald*, says: "This place is considerably

Curious Mental Relations of Self-Consciousness.

What constitutes individuality or personality has long been one of the hardest nuts for metaphysicians to crack. There was a famous instance in the early part of the seven-teenth century, on which both Descartes and Spinoza sharpened their wits. A Spanish nobleman received a blow on the head, from which he apparently recovered completely, but with total forgetfulness of everything and everybody that he knew previous to his injury. He was obliged to learn the language anew, and could not be brought into any mental relation with his former self, though in other ways quite sane. Spinoza does not hesitate to say that he was a different person than before, another individual.

His argument is subtle; in a modern version it may be stated thus: as we recognize personality to continue, although all the matter of which the body is composed changes every few years, or, as some say, every few months, the element of personality must rest in the continuity of psychical impressions; when this is absolutely severed, then personality ceases; otherwise, if we maintain that it does not, because the body remains, we are in the position of the man who claimed his knife was the same after he had got a new handle to the blade and a new blade to the handle!

Physiology comes to the aid of metaphysics by defining the sense of personality as one of the cerebral forces dependent on nervous action at once continuous and related. There are examples where it is continuous, but not related. A famous example occurred in the Franco-German war. A soldier wounded in the head recovered with the odd sequel of a double mental life; for several weeks he would live one life, then pass into another, with no recollection of the former one, but with its own independent series of acquisitions and impressions; then he would revert to his first life again without a shadow of memory of his intermediate existence, and so on alternately.

This duplicate existence is quite common in epileptics, and the clinical records of that malady offer a number of carefully recorded cases. In a less degree it may be said to be the case in dreams. It is explainable on the supposition that certain portions of the brain are active at one time, dormant at another; or that during one period one half of the brain is at work while the other half is not; and that when this condition is reversed, total forgetfulness of the intervening period ensues.

Several recent cases have been recorded in the medical journals analogous to those we have referred to. In one, a man of about fifty years, with some money, well dressed, and with a traveling bag, found himself in a small city in Ohio, without any knowledge of who he himself was, whither he was going, or whence he was from. On other subjects he was perfectly sane, proving quick at figures and an expert penman, of good education and polished manners, altogether a competent man of business, except this one extraordinary and remarkable trick of memory.

What is unusual and a little suspicious was the fact that nowhere about him was any old letter, note book, mark on his linen or clothing anywhere, which bore a name, initials, or monogram. It looked as if he had prepared himself to lose himself. It were well, if this thing grows common, for every prudent man to have a line in his pocketbook to this effect: "Mem.: I am John Smith, of Smithville," so that when he forgets who he is, he can remind himself of the fact.

In one of the recent numbers of *Lippincott's Magazine* is a case, probably an imaginary one, but quite consistent with facts, where a man believes he has lived two distinct lives, remembering each with equal certainty; one as a well-to-do lawyer, the other as a needy New England farmer. As he was in truth the latter, the "remembering happier things" was constantly to him, as the poet says, "a sorrow's crown of sorrows." In certain forms of progressive paralysis, the "délire des grands-âges," an analogous condition, is witnessed. The confident belief expressed, and no doubt entertained, by Mahomet, Swedenborg, and other mystics, that a large part of their lives was spent in heaven, or in delightful converse with heavenly visitors, is a closely allied delusion. The common mental trick of almost unconsciously doing an



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excited over the finding of a fish with four legs and a frill or sort of a ruffle about its neck, in a well forty feet deep. This little curiosity is the same as that discovered by Professor O. C. Marsh, in 1868, at Lake Como, in Wyoming Territory, to which he gave the name of *Siredon lechnoides*. Out in that territory they are known as the "fish with legs," and are from five to ten inches in length. The one found at this place is about three inches in length, as a sireon enjoys the external branchial appendages or gills, making a partial frill to the neck, and membrane along the back and tail, resembling that of the tadpole. The head is like that of the yellow catfish, the body of a dark olive color, and partly transparent.

According to Professor Marsh's experience with the sireons, this little creature will undergo a change like the tadpole, and the beautiful ruffle about the neck and the tadpole-like membrane will be absorbed by the body; various other changes will follow, and the little wonder of Hutchinson will be transformed into a complete animal, formerly known as the *Amblystoma macrorhinum*, and the doctrine will be proven that all sireons are merely larval salamanders.

action or keeping up a formal conversation while the intellect is delighting itself in wholly remote fields of thought or imagination, so beautifully described in Xavier de Maistre's "Voyage autour de ma Chambre," under the figures of *le bête et l'âme*, illustrates how closely the ordinary processes of the mind may parallel these extraordinary vagaries.—*Medical and Surgical Reporter.*

MISCELLANEOUS INVENTIONS.

An improvement in oil cans has been patented by Mr. Jacob Rhule, Jr., of Pittsburg, Pa. The object of this invention is to provide a safe and convenient receptacle for oil; and it consists in providing an oil can with a stopper which, if the can be accidentally overturned, will not allow the oil to escape.

Mr. William Huey, of Cambridge, Md., has patented an improved means for transporting eggs and other fragile or perishable articles. It consists, first, in a case formed with parallel partitions subdivided into cells for the eggs by elastic wings secured flexibly upon one side to the parallel partitions, and overlapping at their free ends to form expandible cells or pockets to receive and protect the eggs.

Mr. William A. Galbraith, of Flint, Mich., has patented an improvement in that class of carriage poles that are capable of being adjusted and readily fitted to vehicles of any width, the object being to decrease the weight of the poles and make them more durable and effective in their operations.

Mr. James W. Hammett, of Willow Island, West Virginia, has patented a simple and effective apparatus for making wells. It consists of several distinct parts or tools that must co-operate to effect the purpose aimed at. The invention cannot be clearly described without engravings.

Mr. Louis M. Candius, of Brooklyn, E. D., N. Y., has patented an improved apparatus for curing leaf-tobacco by means of steam without contact between the steam and tobacco, and at the same time carry off the vapors expelled from the tobacco.

Mr. James B. Parker, of Memphis, Ala., has patented an improved cotton picker, which consists in combining with a suitable framework and driving mechanism improved devices for picking the cotton from the bolls, for removing the fiber from the pickers, and for carrying off the collected fiber.

Mr. William W. Bolles, of Toledo, O., has patented an adjustable ornamental window cornice that without alteration can be adjusted to a window of any width. The invention consists of an ornamental piece of moulding, on which are secured thicker and grooved or channeled edges, and on each end of which is rigidly fixed a mortised truss, the whole forming the center piece of the cornice. The side extensions of the cornice consists of two pieces of moulding that are made to slide in the mortises of the trusses and the channels or grooves of the edge strips, and meet behind the center piece. The mortises in the trusses conform in their general outlines with the outlines of the mouldings, and the trusses are also cut through from their tops to the mortises, in order to make them so elastic that they will not bind on the sliding cornice extensions.

Mr. William C. Doddridge, of New Madrid, Mo., has patented an improved heating device of the kind forming an attachment or appendage of a stove or furnace pipe, and commonly employed as a substitute for a stove or grate in apartments contiguous to that in which is situated the stove or furnace with which such pipe connects.

Mr. Charles Rosencrans, of Philadelphia, Pa., has patented an improved box loop for harness saddles provided with transverse ribs which keep the leather covering in its place, and also protect it from abrasion and wear, and having a solid flat bottom with centrally projecting lugs.

Steam Pressure and Temperature.

The temperature of steam developed from water by boiling will be in an unconfined state 212°. This temperature is increased by putting a pressure on the steam, *i. e.*, by confining in a closed vessel, provided with a safety valve to work at a certain pressure. The following will give an idea of the ratio in which the temperature rises in steam under pressure:

Pressure.	Temperature, Fahr.	Increase of Temperature.
1 lb.	214°	
100 lb.	338°	124° first 100
200 lb.	388°	50° second 100
300 lb.	422°	34° third 100
400 lb.	448°	26° fourth 100

Natural Lime.

To the Editor of the Scientific American:

In Vol. xlii., No. 2 (new series), SCIENTIFIC AMERICAN, January 10, 1880, page 25, a correspondent of the *American Architect* is quoted, giving a lucid account of "Kansas Natural Lime." He closes with the inquiry, "Does such a strange product as this occur in any other section of our continent?"

I answer, yes. From 1870 to 1874 I was United States Consul at Paso del Norte, Mexico. And, while prospecting for silver ore, I discovered a large deposit, in what miners term pocket formation, of natural lime, located in blue limestone, in the foot hills, one and one-half miles west from the city of Paso del Norte, Mexico. I gave it various trials, and found it to possess all the good qualities of manufactured lime, and for whitewashing far superior to the manufactured article. WM. M. PIERSON.

Fort Bayard, Grant County, New Mexico, Jan., 1880.

New Transit Instrument.

At a recent meeting of the Massachusetts Institute of Technology, at Boston, Mr. S. C. Chandler exhibited and explained a new astronomical instrument designed by himself, for the determination of time and latitude. It is, in brief, a self-adjusting transit instrument. Instead of depending upon the ordinary means of accuracy, such as nicety in fitting the pivots, setting and observation of spirit levels, and other parts, the new instrument is made to float on mercury, and thus level and adjust itself. The instrument was explained as follows by the inventor:

It consists of a base of walnut, with approximate leveling screws at the four corners. From the middle of this base rises a pillar of black walnut firmly bolted to the base and surrounded by collars of hard brass. An outside sleeve of hard brass which turns on these collars supports the remainder of the instrument; this sleeve being rotated in azimuth by a rack and pinion movement, and provided at its base with a graduated setting circle. On top of this sleeve is a wooden crosshead, which supports a wooden trough in the form of a hollow rectangle, and in this trough is placed mercury to a depth of one-eighth of an inch. The trough is constructed of wood instead of brass, because the mercury would attack brass. Whether it would be better to use cast iron is an open question.

In this trough, on the mercury, there floats a wooden float, also in the form of a hollow rectangle, and nearly as large as the inside of the trough, this float being held in position at the middle of the two sides by two cast iron pins, which move in vertical slots in the sides of the float, and which are sufficiently loose not to interfere with its floating freely, but which serve to prevent any violent or sudden motion.

The above mentioned float has attached to it two brass arms, which support the telescope, the latter projecting through the hollows of the hollow rectangles of the float and trough.

The trough is not supported in the middle, but nearer one end, in order to allow of zenith observations; and on this account a counterpoise is attached at the other end of the trough.

The attempt has also been made to so proportion the parts as to bring the center of gravity of the floating part as near the axis of oscillation of the telescope as possible, in order to reduce oscillations due to jars, etc.

The illumination is effected by a series of reflectors, and comes from the side. The cross hairs are horizontal, and not vertical, as in the transit. The reason for this will be explained later. In using the instrument the telescope is set at a certain inclination to the vertical, and as the instrument is rotated in azimuth, the line of sight sweeps out a horizontal small circle of the heavens, *i. e.*, a circle of which the zenith is the pole.

For the determination of the zenith, the free upper surface of a liquid is used, and we have dispensed with the error of pivots, the error of level, and the error of azimuth; and have left only what is, in a certain sense, analogous to the error of collimation in a transit instrument, the characteristic of both errors being that the telescope describes a small circle, parallel, but very close, to the circle in which it is intended to revolve. The amount of this deviation in this instrument is not, however, determined by reversals of the telescope, as in the case of the transit, but by observation of the stars, in a similar way to that by which the azimuth error of the transit is found. As to the disturbance of the instrument by oscillations, the most violent oscillations I have been able to produce have required thirty seconds to have their effect dissipated, and after this time has elapsed the instrument is as quiescent as though it were mounted on stone.

It is, of course, specially adapted for observing equal altitudes, and can also be used to observe the transit of stars across any desired small circle having the zenith for a pole, and hence the reason why the cross hairs are horizontal instead of vertical.

All observations are influenced by refraction, but refraction operates to elevate all the stars equally at the same time. Hence we can disregard the error of refraction in a series of observations taken so near each other that there is no probability that the coefficient of refraction of the air has changed, and we can simply account it as part of the instrumental error; it having the same coefficient, hence when the observations are reduced to middle time this error is almost wholly eliminated. Next, as to the results that can be obtained by this instrument, I have not yet been able to make a great many observations, but those that I have made encourage me to believe that when as good mounting is given to it as is given to an astronomical transit, better results can be obtained with it than with the latter. I have used it very roughly, making observations from the roof of my house, which was subjected to a constant jarring from the teaming in the street below, and where the instrument was exposed to the wind.

I have compared my results with those of larger coast survey transits, and mine are the best.

I have not yet determined all the constants of the instrument. I find that the wind does interfere with it somewhat when employed in the open air and unprotected, but the deflections from this cause are but momentary, and errors due to a draught would be nearly eliminated were a greater number of cross hairs used.

Next, as to latitude. The transit instrument, when placed in the meridian, is used only for time; it can be used for the determination of latitude if placed in the prime vertical.

The Coast Survey have introduced for this purpose the zenith telescope, and have obtained with it the very best results. To compare my instrument with this is a very severe test; although I have had only three evenings on which I could make observations for latitude, the results obtained are remarkably good. The claims, therefore, that I make for my instrument are the following, viz:

1. The ability to use any part of the heavens that are not obscured by clouds. In using the transit it is often impossible to obtain observations when clouds hang in the meridian, even though there be any amount of clear sky on either side. With my instrument we can use any region of clear sky in the heavens, as we can use any horizontal circle whatever; although the use of the same circle all the time renders the computations easier.
2. There is only one instrumental error to determine, instead of four.
3. This instrument is unaffected by errors in mounting.
4. Simplicity in use; requiring no readings of level nor reversals. In the use of the transit about one-half the time is taken up by these processes, which are unnecessary with my instrument.
5. The construction is very cheap.
6. Combination of a time and latitude instrument in one.
7. It admits also of the application of a delicate micrometer on an entirely new principle, as a micrometer screw carrying a weight could be mounted on the float, thus enabling us to move the center of gravity of the floating part, and to tilt the axis of the telescope. We can thus apply here the same methods that we can in the zenith telescope.

The Atmosphere and Yellow Fever.

During the yellow fever epidemic of 1879, Mr. William Van Sloatin, C.E., of New Orleans, made chemical analyses of the air from September 9 to November 24, and found, according to Dr. Clendinning, of Fort Lee, N. J., a series of extraordinary variations in the amount of free and albuminoid ammonia to the million of cubic feet of atmosphere. These corresponded very curiously with the progress and fluctuations of the epidemic. For instance, on September 9, the analysis showed 125.62 grains of free and 350.56 grains of albuminoid ammonia to each 1,000,000 of cubic feet of air. On September 19 the amount of albuminoid ammonia stood at the extraordinary figure of 400.75 grains. This was its highest point, and, with many fluctuations from day to day, it gradually declined as the epidemic wore out its fury, until on November 24 the amount was only 47.25 grains. The curve of the free ammonia was less regular, but the decline had a general correspondence with that of albuminoid, until on November 24 the amount had fallen to 23.31 grains. The amount of ozone showed a similar variation from half a grain per 100 cubic feet of air on September 18, to seven grains on October 22, from which it appeared that the increase of ozone was accompanied by a constant decrease of ammoniacal products. The fluctuation of both from day to day and week to week, as the wave of the epidemic rose and fell, was very striking.

Surveying by Photography.

This was the subject of a lecture lately delivered at the Plymouth Athenæum, by Mr. W. G. Tweedie. The lecturer proposes to use for the purposes of surveying a camera by which a cylindrical projection of the objects is taken on a flat plate. Two such photographs, taken from the extremities of a measured base line, will, he declares, supply all the necessary data for making a map of the whole of the country in front. From these two photographs, by means of two scales of simple construction, the surveyor's work hitherto done in the field will be equally well performed in the office, and by the use of dry plates, the operator is relieved from all chemical operations in the field. The plates can be bought ready prepared, and sent to the professional photographer to be developed. The lecturer exhibited several remarkable instantaneous photographs he had taken, and explained the nature of the camera used and the *modus operandi*. In the subsequent discussion, it was suggested that Mr. Tweedie should practically test his invention by surveying on his new method some of the ruined castles on the moor.

Electrotyping with Iron.

Herr Böttger describes a process for steeling copper plates by electrolysis. 100 parts of ferrous-ammonia sulphate, together with 50 parts of sal-ammoniac, are dissolved in 500 parts of pure water, a few drops of sulphuric acid being added to acidulate the solution. The copper plate is connected to the negative pole of a battery of two or three Bunsen elements, an iron plate of equal size being employed as an anode. The solution is maintained at from 60° to 80°. The deposit of iron is of a hard, steel-like quality, and is very rapidly formed.

Capsuling Bottles.

In France a new system of capsuling bottles has come into vogue which is more rapid than the use of metal capsules, and is thought, by some, to give a more elegant effect. The neck of the bottle is dipped into a viscous volatile liquid and immediately withdrawn with a rotary movement. This leaves a transparent capsule, the effect of which is improved by first attaching a monogram or trade mark to the top of the cork or upper end of the bottle neck. The following is the formula for the liquid: Yellow resin, 20 parts; ether, 40; collodion, 60; fuchsine, or other tint, *q. s.*