

THE TILE FISH.

BY DANIEL C. BEARD.

How little is really known, even by our most learned scientists of that wonderful country that lies hidden beneath the waves! What we know of its geography, aside from the summits of the mountains and highlands that are high enough to rear their heads into our world of air, is barely sufficient to mark out safe routes for vessels from point to point. Of the creatures that dwell in this unknown region our knowledge is limited to such specimens as accident may cast up, or the fisher's net gather along its outer edge, or the dredge of the scientific explorer capture in its depths.

We can scarcely imagine creatures more hideously monstrous or more wonderfully beautiful than some of the known denizens of this immense world of the sea! For aught we know to the contrary the great sea-serpent may yet prove to be a living reality, for has there not been within the last few years discovered, captured, classified, measured, and publicly exhibited a sea monster as horribly strange and terrible as the fiery dragon of fairy tale? What was once called the fabulous devil-fish is now known to every school boy as the giant squid.

The discovery of a new and strange food fish need, then, be no surprising matter. Some three years since a Yankee fisherman caught a number of fish whose odd triangular crest, or adipose fin on the nape of their neck, at once marked them as strangers, and created a stir among savants and naturalists; but if they were surprised at this sudden appearance of a new fish, they were more surprised and puzzled last month when the commanders of two vessels brought in reports of sailing through miles of dead carcasses of this newly-discovered fish, the *Lopholatilus chamaeleonticeps*, or tile fish. Whence these mysterious strangers came, or what caused their wholesale slaughter, are questions we know not how to answer, but of the facts we have sufficient proof.

A specimen of the tile fish that was sent to the U. S. National Museum measured thirty-three inches in length; the illustration accompanying this article was drawn from the Washington specimen.

We first hear of the "tile fish" from the report of Capt. William H. Kirby, of Gloucester, Mass., who took five hundred pounds of a remarkable fish, new to both fishermen and scientists, and forming a type of a new genus and species. These fish were caught on a codfish trawl eighty miles S. by E. of Noman's Land, lat. 40° N., long. 70° W., in eighty-four fathoms of water. According to Capt. Kirby the largest fish weighed fifty pounds.

We next learn of this fish from Capt Wm. Dempsey, also of Gloucester, Mass., who, in July, 1879, caught some with menhaden bait at a point fifty miles S. by E. of Noman's Land, in seventy-five fathoms of water, bottom hard clay; two miles inside there is nothing but a "green ooze on which no fish will live." Capt. Dempsey gives the following particulars of this *lopholatilus*: "Liver small, somewhat like that of a mackerel, and contains no oil. Flesh oily, and soon rusts after splitting and drying. The stomach and intestines are small, the latter resembling those of an eel. The swim bladder is similar to that of the cod, and he adds that "the fish were very abundant and bit freely." The largest fish caught by Capt. Dempsey had a bifid nuclear crest.

Some of the first tile fish that were brought into Gloucester were sent by Prof. Baird to Fish Commissioner Blackford, of Fulton Market. These fish were cooked and served at the Windsor, and their qualities as a food-fish tested by Mr. Phillips, secretary Fish Culturist Society; Mr. John Foord, president of the Ichthyophagous Club, and Mr. Blackford. We next hear of this mysterious denizen of the deep from several of the daily papers. In their issue of the 23d of March, there appeared accounts of immense numbers of dead fish that were seen by people aboard vessels that passed the southern end of St. George's Bank, New-

foundland. On the 3d of last month Capt. Henry Lawrence, of the bark Plymouth, from Antwerp, and Capt. George Coalfleet, of the bark Dunkirk, witnessed this phenomenon.

When a drawing of the *lopholatilus* was shown by Mr. Blackford to several of the sailors of the above named vessels they at once declared it to be a drawing of the same fish whose dead bodies had so astonished them off "The Banks." These sailors had cooked and eaten some of the dead fish. The meat was fresh and hard, and according to their account very good eating.

fleshy prolongation upon each side of the labial fold extending backward beyond the angle of the mouth. For this genus we propose the name *Lophotilus*" (G. Brown Goode and Tarleton H. Bean, "Proceeding of U. S. National Museum.")

Fish Fodder for Cows.

Travelers in the country about North Cape, Norway, are apt to be amazed to see the natives eking out the scanty fodder for their cattle by giving their cows rations of dried fish. According to Captain Atwood, of Provincetown, Mass., the Cape Cod cows used to do better—or worse—and feed heartily upon raw fish. According to a statement by him, communicated to the Fish Commission by Isaac Hinckley, and printed in the *Bulletin*, the Provincetown cows being "kept up" have lost the fish-eating practice; but prior to the passage of the Massachusetts statute forbidding owners of cows to allow them to roam at will (which statute was enacted to protect directly the beach grass which checked the drifting of sand), the cows flocked to the shore while the fishermen were cleaning their catch. These cows sought with avidity the entrails and swallowed them. They seemed willing to eat the heads also, but lacked the ability to reduce their bulk sufficiently to allow of this.

A species of ling or blenny, weighing three pounds or more, and discarded by the fishermen, was freely eaten also by the cows.

Cows when first arriving at Provincetown from the rural districts refused fish; but their owners, by adding minced fish to their cows' rations, soon taught the cows to imitate their neighbors in respect to eating entrails.

JERBOAS, OR LEAPING MICE.

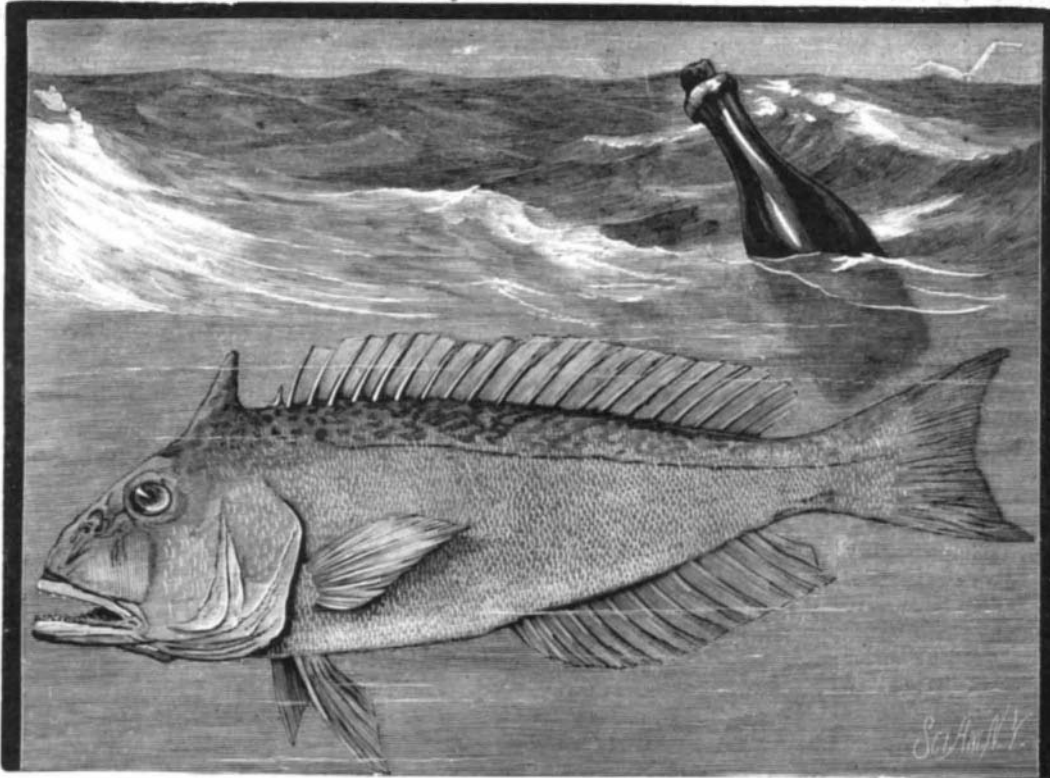
The jerboa is a small rodent, or gnawer, with very long hind legs and diminutive fore ones, and is the principal representative in the Old World of the rodent sub-family *dipodena*. Its general form and habits have some striking resemblance to a bird's. His body, like that of a bird, is supported on two long legs, and, in both, the length of the leg is caused by the excessive prolongation of that part of the foot called the tarsus or metatarsus, so that, when standing, the heel is elevated much above the ground. The bones of the metatarsus, which are normally fine among the vertebrata, are, in this instance, reduced to three, and occasionally even to one single bone in that part of the foot that extends from the heel to the toes. The folded fore legs of the jerboas are as unnoticeable as the folded wings of a bird, and its skull is large and spare, like that of many birds.

These resemblances might be greatly increased, but though they are very curious they are merely accidental, and do not at all prove that the jerboas are related to the bird family.

The jerboa has a large head, ending in a little muzzle, long moustaches, enormous soft black eyes, and long sharp ears. His tail is long and cylindrical, enlarged at the end, so that it can be used, like the kangaroo's, to support the body while jumping, and has a little tuft of black hairs tipped with white. The foot is protected under the toes by elastic cushions of flesh covered with stiff bristles. The body is generally about the size of

a rat, but in one species found in Middle Africa, the *Pedetes cafer*, or jumping hare, the body is as large as a rabbit. The fur is soft and fine, a charming fawn color above and underneath a brilliant white.

These little animals belong almost exclusively to the Old World, and are found in the deserts of Africa, Asia, and Eastern Europe. One single species is known in America as the *Jacules hudsonian*, or jumping mouse, as it is popularly called. It is found as far north as latitude 61°; its body is about five inches in length, its tail a little longer, ending

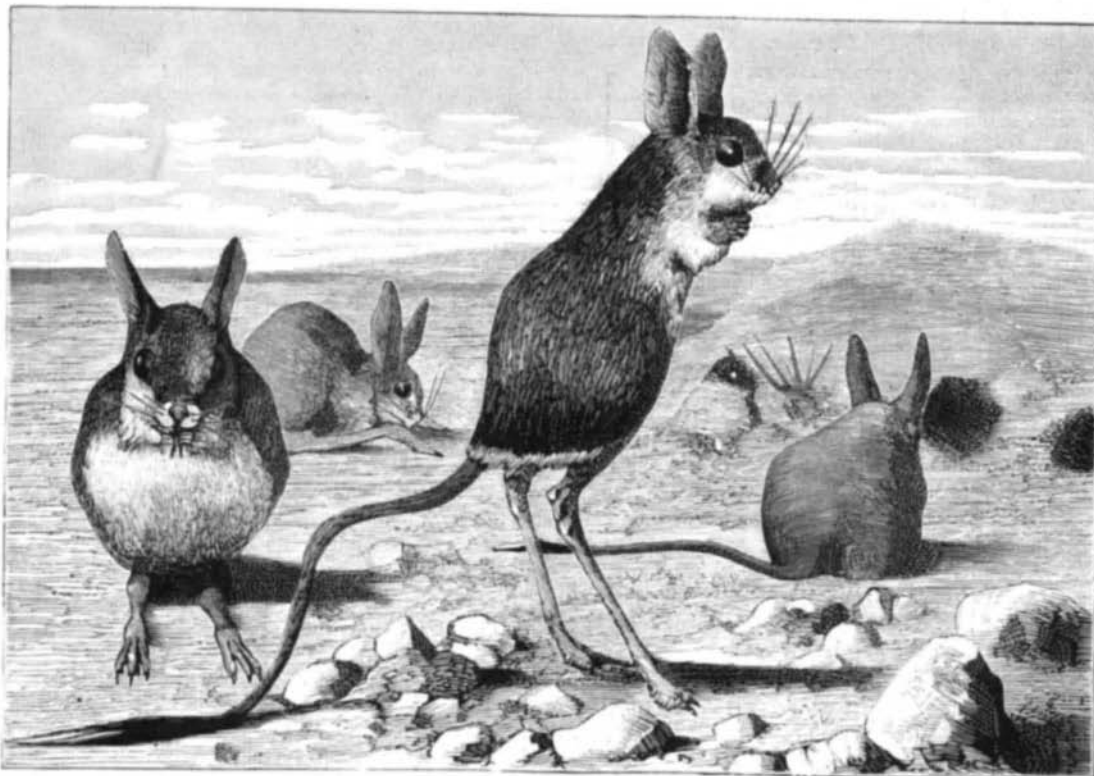


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The following technical description of this fish is from Washington:

Radial Formula.—B. VI.; D. VII. 15; A. III., 13; C. 18; P. II., 15; VI., 5; L. Lat. 93 L. Trans. 8 + 30.

Color.—The operculum, preoperculum, upper surface of head, and major portion of body have numerous greenish-yellow spots, the largest of which are about one-third as long as the eye. Upon the caudal rays are about eight stripes of the same color, some of them connected by cross blotches. The upper part of the body has a violaceous tint, and the lower parts are whitish, with some areas of yellow. The anal and ventral fins are whitish; the pectorals have the tint of the upper surface of the body, with some yellow upon their posterior surfaces; the soft dorsal has an upper broad band



JERBOAS, OR LEAPING MICE.

of violaceous and a narrow basal portion of whitish. Many of the rays have upon them a yellow stripe; there are some spots of the same color, especially upon the anterior portion of the fin.

"The species appears to be generically distinct from the already described species of the family Latilidæ, Gill. It is related by its few rayed vertical fins and other characters to the genus *Latilus*, as restricted by Gill, but is distinguished by the presence of a large adipose appendage upon the nape resembling the adipose fin of the Salmonidæ, and by a

in a hairy tuft, its color is reddish brown, shading into white beneath the body.

There are two species found in Algeria; the Egyptian is the most common, and is represented in our illustration; the other species, the "Dipus hertipes," is rare, and inhabits the extreme southern part of the desert of Sahara; it is smaller, and its fur is more fine and white than the former species, the Egyptian jerboa, which may be taken as a type of this whole family. Its ears are two-thirds as long as its head; its stiff moustaches and the tufts of hair on its tail are brown at the base and white at the tip.

They live in colonies, and dig deep, far-spreading burrows in the ground.

The Arabs catch them by digging into the burrows, in order to eat their flesh, which is considered a great delicacy.

They are very timid animals, and it is only possible to catch them at that season of the year when the female bears her young. At that time, like the rabbits and other burrowing animals, she leaves the common burrows, and digs a new, isolated one for herself, where she can make her nest out of old rags or leaves.

Even in captivity, the jerboa loves to construct a sort of bed for itself, on which it passes hours at a time, rolled up in a ball, or stretched out at full length on its back, like a human being. It is so skillful in unraveling anything with its claws and teeth, that in a short time it will make a downy mattress from an old rope or bit of muslin. It will gnaw through any kind of wood, and frequently will make a hole even in a stone wall, by scratching it with its sharp claws. It finds a double satisfaction in this work, for, besides gratifying its destructive instincts, it makes a pile of dust in which it loves to roll and jump about.

In spite of these habits they make very pleasant pets; they are bright and lively, perfectly gentle, and very affectionate. But they are delicate, and it is difficult to keep them alive even in warm climates.

They are clean and intelligent. "Of all the rodents I have had in captivity," writes Broehm, "the jerboas have given me the most pleasure. They have so many good qualities that all are delighted with them. They are so inoffensive, so gentle, and so gay, their poses are so varied and so curious, that I have spent long hours observing and playing with it."

The jerboa moves very rapidly, and in its native deserts even those swift dogs, the songhis, that catch the hare and the gazelle, cannot overtake it. It escapes pursuit as much by the irregularity of its course as by its quickness.

The dog jumps on it, and it suddenly springs to one side, and before the dog can recover, is already a dozen miles away to the right or left.

In all circumstances, whether springing or peacefully walking, the jerboa only uses its two strong hind legs; the fore legs are folded under its chin, and cannot be distinguished without careful observation. They are only used to convey its food to the mouth.—*La Nature*.

The Origin of the Menhaden Industry.

Captain E. T. Deblois, of Portsmouth, R. I., has written for the Bulletin of the United States Fish Commission an account of the origin of the Menhaden industry, which, according to Professor Goode, throws new light upon several mooted questions, especially the date of the discovery of the value of menhaden oil, the origin of the manufacture of the oil, the application of pressure in the manufacture of fish oil and the invention of the purse seine. Captain Deblois says that as early as 1811 Christopher Barker and John Tallman began to make menhaden oil by the use of two iron pots upon the shore near Portsmouth, R. I. They boiled the fish, bailed them into hogsheads, and pressed out the oil by means of boards weighted with stones. The barreled oil was shipped to New York. The business was extended in 1814, and that fall two other men went into the business near by. These modest works were destroyed by a severe storm in 1815, and were not restored until 1818 or about that time.

In 1824 Mr. Barker built for use in cooking the fish a box 5½ feet high, 6 feet wide, and 8 feet long, with a fire box at one end and a flue running through the box.

Tallman built the first factory in which the fish were cooked by steam in wooden tanks some time before 1841, at which time the second was built on McGay's Point, near Portsmouth. The next year Tallman, in company with George Lambert, of East Cambridge, Mass., built a factory at the mouth of the Merrimac River, and soon after David Wells built one on the same plan near Greenport, N. Y.

John Tallman (the first), with Jonathan Brownell and Christopher Barker, built the first purse seine in 1826. It was 284 meshes deep and 65 fathoms long.

Charles Tuthill, of Greenport, was "the first to express" fish. The method of applying the pressure is not described.

Fish and "Meat" as Food.

There is some danger, says the *Lancet*, of the fish question falling out of memory. This is not to be tolerated after the interest which has been excited, and for some time maintained, in connection with this important phase of the food problem. Whatever may be the nutritious value of fish as food—and we believe that to be very great—it must be evident that a full and cheap supply of fish would react so as to produce a lowering of the price of butcher's meat. The "purveyors," as they like to be called, are encouraged, and, in truth, enabled, to keep up the price of flesh because there is nothing to compete with it as a staple of the common food of the people. A revival of the old and healthy habit of liv-

ing largely on fish would place the meat supply on an entirely new footing. This is manifest on the face of the facts; but what may not be equally apparent, though it is scarcely less noteworthy, is the consideration that nervous diseases and weaknesses increase in a country as the population comes to live on the flesh of the warm-blooded animals. This is a point to which attention has not been adequately directed. "Meat"—using that term in its popular sense—is highly stimulating, and supplies proportionally more exciting than actually nourishing pabulum to the nervous system. The meat eater lives at high pressure, and is, or ought to be, a peculiarly active organism, like a predatory animal, always on the alert, walking rapidly, and consuming large quantities of oxygen, which are imperatively necessary for the safe disposal of his disassimilated material. In practice we find that the meat eater does not live up to the level of his food, and as a consequence he cannot, or does not, take in enough oxygen to satisfy the exigencies of his mode of life. Thereupon follow many, if not most, of the ills to which highly civilized and luxurious meat-eating classes are liable. This is a physiological view of the food question, and it has bearings on the question of fish supply which ought not to be neglected.

The Assimilation of Fat.

Most physiological text books teach that the fat of the body is not derived directly from the fat of the food. But from statistical analysis Hoffmann has arrived at the conclusion that the formed fat of the animal body arises not only from heterologous elements of the food, but also in part at least from ingested fat. Radzcejewsky concludes that the special destination of this fat is the intramuscular adipose tissue. A series of investigations, undertaken by Lebedeff in the clinical department of the pathological laboratory at Berlin, leads him also to the conclusion that the ingested fat is deposited unchanged in the fatty tissue of the body. Two dogs were kept fasting for a month, losing in the time about forty per cent of their weight. Previous experiments have shown that, under these circumstances, all the fat of the body disappears. The dogs were then fed on a diet which consisted of large quantities of fat foreign to their own nature, and a small quantity of flesh. Both dogs regained their normal weight in three weeks, and were then killed. One had been fed on linseed oil, and from its tissues was obtained more than a kilogramme of fatty oil, which did not become solid at the freezing point of water, and which corresponded closely in chemical characters to linseed oil. The second dog was fed on mutton suet, which had a boiling point about 50° C., and in its body, in the muscles, about the internal organs, and beneath the skin, a form of fat was found which was almost identical with suet. The organs of each dog were free from disease. Thus it would appear that ingested fat, even such as is foreign to the individual constitution, may yet become transformed directly into the fatty tissue of the animal. Other experiments of the same investigator seem to show that this is true also of milk fat.—*Lancet*.

The Position and Movements of the Stomach.

According to Dr. Leshaft, the Professor of Anatomy at St. Petersburg, the statements current in anatomical textbooks regarding the normal position of the stomach are erroneous. He has made careful observations on the point in more than twelve hundred bodies, and has arrived at the following conclusions; The stomach does not, as is usually asserted, lie horizontally in the abdominal cavity, but vertically, so that the fundus touches the diaphragm; the smaller curvature and pylorus are to the right, and the larger curvature is to the left. Its position is in the left hypochondrium, and the situation of the pylorus is in the vertical line formed by a continuation of the right margin of the sternum. If the stomach is enlarged, no one part can be alone displaced, but all parts are equally moved by the distention. The arrangement of the muscular fibers of the stomach is such that food entering it is moved toward the pylorus, where it can be most thoroughly mixed with the gastric juices, and it then passes back along the center of the cavity to the fundus, where the resistance is least. This movement of the food along the wall to the pylorus, and back again along the center, is rendered possible by the form of the organ, and it is probable that it is to this movement that the peculiar shape of the fundus is due. As is well known, the fundus is absent in newly-born children. Thus the shape of the stomach determines the long retention of food in the organ for the purposes of digestion, and its slow passage through the pylorus. If the transverse colon is distended with gas, it may rise to the left of the stomach, as high as the fourth intercostal space, and even as high as the fourth rib. If the coils of the small intestine are similarly distended, the lower part of the stomach may be pressed forward, and the stomach may assume a more oblique position. Even a large stomach, accustomed to dietetic repletion, maintains a vertical position, but the pylorus is moved a little upward and to the right.—*The Lancet*.

Foul Air in School Rooms.

It is seldom that an assembly room of any kind can be found in which the air is not overcharged with impurities. Some of the worst rooms we have known have been those in which the air ought to have been the purest, namely, school rooms. Yet it is seldom, we trust, that the conditions ob-

taining in school-rooms are quite as deleterious as those found recently in the Packer Institute, Brooklyn, a well endowed school for young women. In response to persistent complaints by the young ladies the *Sanitary Engineer* had the air of the class rooms analyzed, finding in some of them "an amount of impurity present greater than in a crowded theater, in smoking cars, and three times as great as in the public schools of Boston and Philadelphia."

Our contemporary pertinently remarks that such an institution "should be able to claim not only that it furnishes the means of mental culture, but that its pupils are supplied with at least as pure air as is found in the public schools of Boston and Philadelphia. Certainly, this is not a very high standard, but to secure it the amount of air supply in the Packer Institute must be quadrupled and the amount of heating surface largely increased."

A more outspoken statement of the case by the *Times* says that "there were two class-rooms in which the proportion of carbonic acid found in the air was twice as great as that present at 11 o'clock at night in the pit of two of the worst ventilated London theaters, and was only exceeded, according to Buck's tables, by that detected in a few German schools and in the English mines."

To send young people to study in such an atmosphere is simply criminal.

The Geoduck.

BY JOHN A. RYDER.

The following extract from a list of shells sent with some specimens to Mr. George W. Tryon, jr., the Conservator of the Conchological Section of the Academy of Natural Sciences of Philadelphia, by Mr. Henry Hemphill, appears to me to be of importance as a contribution to economical science, and with Mr. Tryon's permission I am allowed to make use of it for publication.

"*Glycymeris generosa*. Olympia, Washington Territory. "I send you a fine large specimen of this species. Its flesh is, I think, the most delicious of any bivalve I have ever eaten, not excepting the best oysters.

"When first dug and laid upon its back, it resembles a fat plump duck. The edges of the shell do not meet, but are separated by a breast of flesh [the greatly thickened mantle] about three inches wide, one inch thick, and about a foot long, including about half of its siphon. This portion is cut into thin slices, rolled in meal, and fried. It is exceedingly tender, juicy, and sweet, and about the consistency of scrambled eggs, which it resembles very much in taste. The boys at Olympia call them 'Geoducks;' they dig them on a certain sand bar at extreme low tide, and sell them to a merchant who ships them to Portland, Oregon, where they readily sell at fair prices. The boys inform me that the Indians on the Sound call them Quenux, and dry them for food with the other clams."

To give the reader some idea of the animal, let him suppose that he has before him a huge soft-shelled clam, with a very thick mantle and a very stout siphon projecting from between the valves. From the habit of the animal it is clear that its propagation is effected in very much the same way as our own clam, and that the fry burrows into the sand and keeps the open end of the siphon projecting just above the surface.

The same methods of propagation would apply to both species. Artificial impregnation, which has been accomplished by the writer in the case of the clam, could no doubt be effected in this case. Then, with the proper incubator, or hatching-box, provided with a bibulous membrane interposed before the outlet, the water could flow through and out, without losing the eggs; shallow pans of sand could also be provided at the bottom of the box for the young to bury themselves in, just as has already been proposed in the case of the clam. This is a subject which merits the attention of all interested in keeping up the productiveness and richness of our American shell fisheries.—*Bulletin U. S. Fish Commission*.

Magnetic Bricks.

It was lately observed by Herr Kepner, at Salzburg, in the Tyrol, that some old bricks had an attractive or repellent force on a compass. From each of eight varieties of clay in the neighborhood two bricks were moulded, and one of the two in each case was baked. The unbaked bricks had no action on a magnetic needle, but seven of the eight baked bricks proved polarly magnetic. Some further experiments have been made by Herren Kell and Trientl. Particles of powder of the magnetic bricks adhered to a steel magnet. Breunerite, mica-slate, argillaceous iron-garnet, chlorite, and hornblende were, before heating, unmagnetic, but intense heating produced a magnetic polarity, the axis of which seemed to be perpendicular to the plane of stratification.

An Electrical Ballot.

An electrical apparatus has been devised by a resident of Syracuse for recording votes cast in political and other societies. It provides a number of knobs hidden from all in the room except the person immediately before them. Each knob represents a candidate, and the voter has merely to press whichever he chooses. At each touch a bell rings, thus making more than one vote by the same person impossible without detection. All the bells ring alike. When the voting is finished a register on the side of the machine opposite the knobs is discovered, and the result of the ballot is seen in plain figures.

Ancient Beads in Africa.

A writer in *All the Year Round* describes two classes of ancient beads much prized by the natives. They are of glass, one kind being opaque, the other clear but rough. They are called respectively Aggry and Popo beads. There are many varieties of Aggry, some more treasured than others; only one of Popo. Both are dug from the earth, where the corpse with which they were interred is thought to have long since perished. The Aggry is found along the west coast, far into the interior. The Popo is rare in Ashanti and Fantiland, becoming more frequent near Lagos. It must not be understood, however, that either sort is common. The Birmingham manufacturers, and more especially the Venetian, have been trying many years to imitate the Aggry bead. To an English eye their success is perfect, but the youngest negro is not deceived. For all their science and study, for all the wondrous effects of the same kind which they have produced in transparent glass, Europeans cannot find the secret of running a colored pattern through and through the opaque substance exacted. They can make a facsimile of the surface, but that is all. The Popo bead has defied all attempts of imitation. Its peculiarity is that the glass looks blue in light, yellow in shadow. This change puzzles European workmen, who could turn out blue beads or yellow exactly like it, 10,000 of them, for a less sum than a single tiny cube of the real sort fetches. The best authorities suppose both kinds to have been of Egyptian manufacture—ancient Egyptian, that is. Such glass is seldom or never found with mummies in the form of beads, but small bottles of material very similar are frequent enough. If this be so, it is not surprising that Aggries and Popos are not discovered in Egyptian tombs. Made for a savage commerce, the civilized manufacturers disdained to use them, and one would only expect to find deposits in the excavation of a merchant's warehouse or of a glass-blower's works. The curious point of the matter is the evidence thus offered of a commerce very much wider than had been credited to Egypt. Chinese and Indian productions have long since been identified in the plunder of her tombs, and it would seem that she dealt, directly or indirectly, with negroid races on the shore of the Atlantic.

In a note on the Aggry (or Aggri) beads, lately read before the Anthropological Institute in London, Mr. J. E. Price said that they sell in Africa for more than their weight in gold, and on the Gold Coast are among the most valued of royal jewels. Mr. Price exhibited specimens of the beads recently discovered in Colchester, England. He thought their presence in England might be explained by the circumstance that when the Romans occupied the country they brought with them many African slaves, who, probably, wore necklaces with Aggry beads attached, and that when the slaves died their necklaces were buried with them.

The Boracic Acid Treatment of Diphtheria.

Dr. T. D. Harries, of Aberystwith, reports in the *Lancet* a very successful treatment of diphtheria by the local application of boracic acid in solution. The solution is prepared and applied as follows:

Boracic acid, two drachms; glycerine, half an ounce; water, half an ounce—to be applied freely to the fauces every hour at first, diminishing in frequency with the disappearance of the deposit and general symptoms. The application should be continued for some days after the throat has become perfectly clean. If discontinued too abruptly, the deposit is almost certain to re-form, with a return of the general symptoms; and with the view of warding off this danger, I make it a rule to continue painting up to the eighth day, after which date the patient may be considered comparatively safe. The solution seems to have no injurious effect when swallowed, as I have frequently applied an ounce during twenty-four hours in the cases of children of from four to five years of age.

Chinese Method of Manufacturing Vermilion.

There are three vermilion works in Hong Kong, the method of manufacture being the same in each. The largest works consume about six thousand bottles of mercury annually, and it was in this one that the following operations were witnessed:

First step.—A large, very thin iron pan, containing a weighed quantity, about fourteen pounds, of sulphur, is placed over a slow fire, and two-thirds of a bottle of mercury added; as soon as the sulphur begins to melt, the mixture is vigorously stirred with an iron stirrer until it assumes a black pulverulent appearance with some melted sulphur floating on the surface; it is then removed from the fire, the remainder of the bottle of mercury added, and the whole well stirred. A little water is now poured over the mass, which rapidly cools it; the pan is immediately emptied, when it is again ready for the next batch. The whole operation does not last more than ten minutes. The resulting black powder is not a definite sulphide, as uncombined mercury can be seen throughout the whole mass; besides, the quantity of sulphur used is much in excess of the amount required for mercuric sulphide.

Second step.—The black powder obtained in the first step is placed in a semi-hemispherical iron pan, built in with brick, and having a fire-place beneath, covered over with broken pieces of porcelain. These are built up in a loose porous manner, so as to fill another semi-hemispherical iron pan, which is then placed over the fixed one and securely luted with clay, a large stone being placed on the top of it

to assist in keeping it in its place. The fire is then lighted and kept up for sixteen hours. The whole is then allowed to cool. When the top pan is removed the vermilion, together with the greater part of the broken porcelain, has a brownish-red and polished appearance, the broken surfaces being somewhat brighter and crystalline.

Third step.—The sublimed mass obtained in the second step is pounded in a mortar to a coarse powder, and then ground with water between two stones, somewhat after the manner of grinding corn. The resulting semi-fluid mass is transferred to large vats of water, and allowed to settle, the supernatant water removed, and the sediment dried at a gentle heat; when dry, it is again powdered, passed through a sieve, and is then fit for the market.—*H. Maccallum.*

MISCELLANEOUS INVENTIONS.

Mr. Brooks French, of Fort Wayne, Ind., has patented a simple, easy-working, and effective stop action, by which there may be obtained a greater number and variety of stops with one stop drawer; also, to regulate and control the opening of the mutes by simple devices.

Mr. Rufus W. Blake, of Derby, Conn., has patented a bell attachment for organs, constructed in such a manner that it can be conveniently applied to the organs, and can be readily thrown into and out of gear with the mechanism of the organs.

A novel pencil sharpener has been patented by Mr. Franz F. Kullrich, of Berlin, Germany. The invention consists of two convex plates with roughened surfaces, and having a strip of felt or other fibrous or hairy material attached to their inner ends, which plates are hinged to each other or connected by a spring, so that they can be separated to admit the point of the pencil, and can be pressed together; as the diameter of the pencil point is decreased, by rotating or twirling the point between the roughened plates.

Mr. Edmond A. G. D'Argy, of Paris, France, has patented an improvement in the class of cigarette wrappers which are provided with a moisture-proof coating at one end; and it consists in constructing the wrapper and coated end or portion in one single piece, and in such manner that the wrappers shall be conveniently adapted for being put up in packages for use in making cigarettes at the convenience of the smoker. A cigarette paper which is made saliva-proof before being applied as a wrapper is adapted for making a better cigarette wrapper than can be made by applying a saliva-proof coating after the cigarette is made, since in the latter case the coating is liable to close the end of the cigarette, and, owing to the fact that the coating cannot then be applied to the folded part of the wrapper, the protection thus sought cannot be secured so well as where the paper is prepared in the manner above described; and it is well known that the manufacture of cigarettes with a waterproof coating according to the usual methods has been found impracticable.

An improved flaxseed cleaner has been patented by Mr. George Beal, of Gilman, Iowa. This invention relates to machines for screening flaxseed for the separation of chaff and other impurities. In operation the screen is in a horizontal or slightly inclined position. The material is to be fed by a spout to the screen surface, and during the screening operation a body of material will be on the screen and be worked gradually toward the delivery end. The smaller particles—such as mustard and foxtail seeds—pass through screen and escape; the flaxseed pass through another screen and out at another opening, and the remaining material passes off by a separate spout. The material is supplied to the screen at a uniform rate, and moves forward slowly at a speed regulated by the rapidity and extent of vibration. This insures effective and thorough separation.

An improvement in quilting frames has been patented by Mr. John R. Sheldon, of Montville, Conn. This invention relates to that class of quilting machines which carry the quilt under the needle arm of the sewing machine, and at the same time give it a transverse motion for stitching the pattern. It will form a perfect pattern and will stitch the last seam in the quilt perfectly.

Mr. William F. Smith, of Overton, Texas, has patented an improved baling press, in which the bale box has the lower part of its ends made flexible and adapted to be elevated with the follower. The object of the invention is to facilitate the baling of cotton by simplifying the operation of introducing the cotton into the press.

An improved wagon hub has been patented by Mr. Angus McKellar of Fort Douglas, Utah Territory. This invention consists of such construction of the metallic hub that the hub is adapted to be used on light freight, farm, and other wagons having wooden axles, the same number of spokes being used in the wheel as is ordinarily used with the wooden hubs used on such wagons.

An improved tire cooler has been patented by Mrs. Dora Ammerman, Thomas Baird, and Ebenezer M. Foreman, of Fairmount, Ill. This invention consists of a suitable wheel supporting rack or bed fixed on connected rocking bars of novel design within a water box in such a manner that the wheel rack can be elevated or depressed at will by means of a lever, whereby a wheel, with its heated tire, may be plunged into and raised out of the water in the said box, and the tire thereby quickly and evenly cooled.

An improved broom and scoop mechanism for evaporating pans has been patented by Mr. Carl F. W. Schramm, of Brooklyn, N. Y. The object of this invention is to facilitate removing crystals and other solid matter from evaporat-

ing pans, such as are used in the manufacture of soda and other substances. It consists in a brush or scoop mounted on the ends of arms of a revolving shaft journaled above an evaporating pan in such a manner that when the shaft revolves, the brush and scoop will be caused to sweep over the interior surface of the pan and remove the solid matter on the bottom of the pan into a suitable receptacle that is arranged outside of the pan.

Mr. Henry Morris, of Manchester, County of Lancaster, England, has patented a simple and efficient means of signaling between the signalman and the engine driver by the use of a bell or gong, with or without an air whistle, conjointly with the application of the brake when air brakes are used, whether pressure or vacuum, or when electric brakes are applied, whereby the use of fog signals in foggy weather may be rendered unnecessary, the cost of them, and also the cost of plate-layers' wages for laying them, with all the attendant inconveniences, may be saved, and the use of the distance signal and cost of maintenance may, in many cases, be dispensed with, also to test automatically the bell or gong apparatus and the brake, and to indicate to the man in the signal cabin if his apparatus and connections are in order.

A novel embroidering machine has been patented by Mr. Alfred Heaven, of Manchester, County of Lancaster, England. The object of this invention is to secure circular, oval, or other figures of velvet, satin, or other material to cloth, so that the said figures may be embroidered by an ordinary embroidering-machine. The invention consists of a guide-bar provided with a series of recesses having central apertures, and also in the combination, with the guide-bar provided with recesses and end apertures, of pins hinged to the carriage of the machine which carries the needle-holders, and adapted to enter the end apertures of the said guide-bar, whereby a series of figures is adapted to be held in alignment with and to be placed automatically upon the needles.

Bat Guano in Texas.

The progress of railway extension in Western Texas has led to the development of the beds of bat guano in certain caves in Uvalde county. A recent visitor says that there are two of these bat-inhabited caves, which have been partially explored. The entrance to the smaller, or Cibolo Cave, is about 50 feet high and 25 feet wide. The passage widens gradually for a distance of about 250 feet, when the outer cave is reached. The bottom is of guano. The shape of the cave is like an inverted bowl. The walls are of limestone and unite nearly 200 feet above in a grand dome. The cave is as dark as Egypt. There appear to be neither stalagmites nor stalactites. This cave is 300 or 400 feet in diameter, and the floor is covered with about 30 feet of guano. In some parts it is believed to be much deeper. The atmosphere is very dry, and five years ago the guano caught fire, the whole surface being burned over to the depth of about four feet. Since then, eight feet of guano have been deposited, so that we have proof that the fertilizer is being deposited at the rate of more than a foot and a half a year. On the inner side of the outer cave, in the side of the dome, about 120 feet from the floor, is an opening about 6 by 8 feet in size. Through this all the bats go to an inner cave, which has never been explored. It is believed, however, to be very extensive, because of the immense number of bats which daily sleep in it, and because at the time of the fire in the outer cave great quantities of smoke escaped through crevices in the rock near the Cibolo River, on the opposite side of the hill, two miles and a half from the main entrance. This inner cave is believed to be fully two miles long and very broad. The Uvalde Cave is said to be about six times as large as the Cibolo Cave. It differs from the latter in being moist instead of dry. There is no running water in either cave.

The district is quite hilly, and is composed altogether of a limestone formation. In the abrupt hills many small caves are known to exist, and all of them are inhabited by bats; but only the two mentioned, it is believed, are of sufficient extent to warrant working for the guano deposits.

The first shipment of guano was made from the Cibolo Cave but a short time ago. It is claimed that analysis shows the guano to be worth from \$50 to \$60 a ton. The Uvalde Cave deposit has not been touched. It is said that a factory for the production of sulphate of ammonia is to be set up at Uvalde by the company which owns and works the phosphate deposits at Charleston, S. C.

Removal of Metallic Particles from the Cornea.

The *Glasgow Medical Journal* (February, p 150) quotes from the *Revista de Ciencias Medicas* the following hint as to the treatment of foreign metallic bodies in the cornea. A blacksmith, while forging a piece of iron, received in his left eye a splinter of the metal, every effort made according to the ordinary methods for its removal having failed, Dr. Rodriguez employed a wash consisting of rose water, 90 grammes; iodine, 0.05 gramme; potassium iodide, 0.05 gramme. The result was satisfactory, the particle of metal being converted into iodide of iron and dissolving out, and the cornea regaining its normal condition.

THE Hudson River Tunnel has now reached a distance beneath the river of 839 feet in the North Tunnel, and in the South Tunnel 700 feet. The work is progressing at the rate of 4½ feet per day.