vibrations of the springs when they are depressed by the load or body of the vehicle in passing over rough surfaces or in ascending or descending a hill.

Mr. Aaron D. Cheney, of Three Oaks, Mich., has patented an improved apparatus for hatcheling or straightening and removing the gummy matter and roots from hair combings or other snarled and tangled hair. The invention consists in a bed or table fitted with hatcheling and combing teeth arranged in a peculiar manner. These teeth are carried by blocks fitted to slide in the bed to allow change or removal of the teeth and the substitution of fine and coarse teeth one for the other, as required.

LONG-BILLED PARROT AND BANKSIAN COCKATOO.

A very singular form of cockatoo is that which is known as the Philip's Island, or the long-billed parrot. This bird is only found in the little island from which it derives its name. It may probably become extinct at no distant period, as its singularly shaped beak renders it an object of attraction to those who get their living by supplying the dealers with skins and various objects of natural history; and its disposition is so gentle and docile, that it readily accommodates itself to captivity. Philip's Island is only five miles in extent; and it is a very remarkable fact that this long-billed parrot is never found even in Norfolk Island, though hardly four miles distant.

Its favorite resorts are among rocky ground interspersed with tall trees, and its food consists mostly of long and succulent vegetable substances. The blossoms of the white hibiscus afford it a plentiful supply of food, and in order to enable it to obtain the sweet juices of the flowers the tongue is furnished with a long, narrow, horny scoop at the under side of the extremity, not very unlike the human nail. As earth has often been found upon the long upper mandible, the bird is believed to seek some portion of its food in the ground, and to dig up with its pickaxe of a bill the ground nuts and other subterraneous vegetation. This opinion is strengthened by the fact that another species of parrot belonging to the same country is known to seek its food by digging.

One species of this genus has been known to imitate the human voice with much accuracy. This is the southern Nestor, or the kaka of the natives (*Nestor hypopolius.*)

The birds which belong to the genus Nestor may at once be known by their extraordinarily long upper mandibles, which curve far over the lower, and remind the observer of the overgrown tooth so common in the rat, rabbit, and other rodent animals. Some persons suppose the long-billed parrots to form a link between the parrots and the cockatoos.

The Philip's Island parrot is dark brown on the upper surface of the body, but takes a grayish hue on the head and back of the neck. Each feather of the upper surface is edged with a deeper tinge, so that the otherwise uniform gray and brown is agreeably mottled. The cheeks, throat, and breast are yellow, warming into orange on the face. The inner surface of the shoulders is olive-yellow, and the abdomen and both tail coverts are deep orange-red. The tail is moderately long, and squared at the extremity.

The banksian cockatoo is a good representative of a very curious genus of cockatoos resident in Australia. The plumage of these birds, instead of being white or roseate, as in some other cockatoos, is always of a dark color, and frequently dyed with the richest hues. About six species belong to this genus, and they all seem to be wild and fierce birds, capable of using their tremendously powerful beaks with great effect. Their crests are not formed like those of the common cockatoo, and the tails are larger and more rounded.

The Banksian cockatoo is only found in New South Wales, inhabiting the vast brush district of that land. Its food is mostly of a vegetable nature, consisting chiefly of the seeds of the banksia; but the bird will also eat the large and fat grubs of different insects, mostly of a coleopterous nature, which it digs out of the trunks of trees with its strong bill.

The flight of this handsome bird is rather heavy, the wings flapping laboriously, and the progress being rather slow. It seldom mounts to any great height, and as a general fact only flies from the top of one tree to another. The eggs are generally two and sometimes three in number, and are laid in the hollow "spout" of a green tree, without any particular nest.

The chin of the adult male is deep rich black with a green gloss. A broad vermilion band crosses the whole of the tail, with the exception of the two central feathers, and the external webs of the outside feathers. The female is also greenish black, but her plumage is variegated with numerous spots and bars of pale yellow.

LONG-BILLED PARROT AND BANKSIAN COCKATOO.

Eastport Sardines.

Eastport, Maine, depends for its prosperity almost entirely upon its fishing interests, large quantities of cod and other fish being caught within a few miles of the town. The putting up of small herrings sardine fashion has latterly become a prominent industry, giving employment to many fishermen and canners. The fish are very abundant at certain seasons, sometimes a hundred hogsheads being taken at one time. Large weirs are constructed along the shores and around the islands of Passamaquoddy Bay, and the fish, swimming in with the tide, are caught behind them. When the tide falls and the fish are crowded into narrow spaces, they are dipped out in great quantities. When taken to the extensive factories along the shores the fish are cured by boiling in oil, like sardines, and put up in small boxes in imitation of genuine sardines. The business is said to be controlled by New York firms. The fish are also potted and put up in various other ways. The large herrings taken during the winter are frozen and shipped to market in barrels.

England's 100-ton Gun.

A successful trial of England's new 100-ton gun was made September 22. Loaded with 441 pounds of pebble powder (in cubes of 1¼ inch) it drove a 2,000 pound projectile 45 feet into a sand butt. The velocity of the projectile was 1,556 feet a second.

The Daddy Long-legs in England.

For some four years past Miss E. A. Ormerod—a lady living at Dunster-lodge, Isleworth, who takes a great interest in meteorological and agricultural matters—has been collecting observations on injurious insects and plant life from all parts of the United Kingdom, and the success of her work may be imagined from the fact that this year some 400 observers—some as far north as Caithness—have sent in reports. These reports will not be published in the usual annual form until the observations of the entire year are completed. Enough is, however, now known of the great damage done this year, and of the experience gained in the destruction of these pests, to enable farmers and gardeners to protect themselves to a very great extent from their ravages in the future.

The reports from all parts of the country show that great damage has been done by the grubs of the *Tipula oleracea*—known better by the popular name of "daddy long-legs." Previous observations have shown wet weather to be favorable to the development of this fly, and the experience of the present year is quite in harmony with them. The eggs deposited in the clover stubbles last autumn produced myriads of grubs—as many as 150 to 200 sometimes in a square yard—which have been destructive to crops generally, but especially to corn. The grub works by gnawing the plant through, or partly through, beneath the surface of the ground, thus wasting far more than it needs for food, and as it can bear being thoroughly immersed for more than three days and nights, and can (at least, exceptionally) support a temperature of —10°—that is, 10° below zero, or 42° of frost—winter influences are not to be looked to for any very efficient help against it. The experiences of the present year also show that when the grub is fairly established in a field, special applications or dressings on the grub itself do but little towards killing it, and that the best remedies in a "grub run" field are dressings of guano, or of any quick acting manure that will stimulate and encourage a healthy and vigorous plant growth. The great lesson of the year is, that greater attention should be given in the autumn to the thorough cleaning of the ground.

The clover stubbles are the headquarters of the *Tipula oleracea* for egg-laying, and the legless grubs lie just below the surface, and, except when torpid, require to eat. What is needed is either to kill them at once, which can be done, to a great extent, by paring and burning, or to starve them out before the new crop is put in by thorough cultivation. The grub is very active and feeds on many plants, so that mere common cultivation does but little towards getting rid of it; but if the ground is thoroughly worked, and the rubbish collected and burnt at once, the attack in the coming season has been found to be very much lessened. The soil is thus put in a good state to run the next crop on, many grubs are destroyed by being either thrown up to the birds, burnt, or buried too deep to come up again, and if a sufficient time has been allowed to elapse before putting the new crop in, a very large number will have been starved out. All the reports of careful observers show that farmers have good cause to be thankful for the work done by birds in the destruction of insect pests. Starlings, rooks, and lapwings—all of which are scarcer now than a few years ago, the cold and wet destroying large numbers—are powerful helpers in keeping down these injurious ravagers of our crops. Another pest, which has appeared in unusual numbers during the past two months, is the mangel-wurzel fly (*Anthomyia betæ*), which does harm by its small, legless maggot gnawing away the inside pulp of the leaves between the upper and lower sides. This has, however, but rarely caused any serious mischief in this country, and as the reports of the past week all show that the rains are fast recovering the injured crop, the loss from its ravages will not probably be large this year. Among the other more prominent pests this year is the celery fly and the wheat midge (*Cecidomyia tritici*), the latter being very prevalent in some of the southern and midland counties. Miss E. A. Ormerod will be always pleased to receive from any persons specimens of insects or maggots doing injury to plant life, together with an account of their ravages, whether in the garden or in the field. Suc-

cessful treatment in any case will be welcomed, and proper forms will be sent to any one for filling in the information, and also a copy of the annual report containing the observations of the year. In Ireland, especially, a few additional observers would be welcomed.—*London Times.*

BATOIDEI, OR RAYS.

BY A. W. ROBERTS.

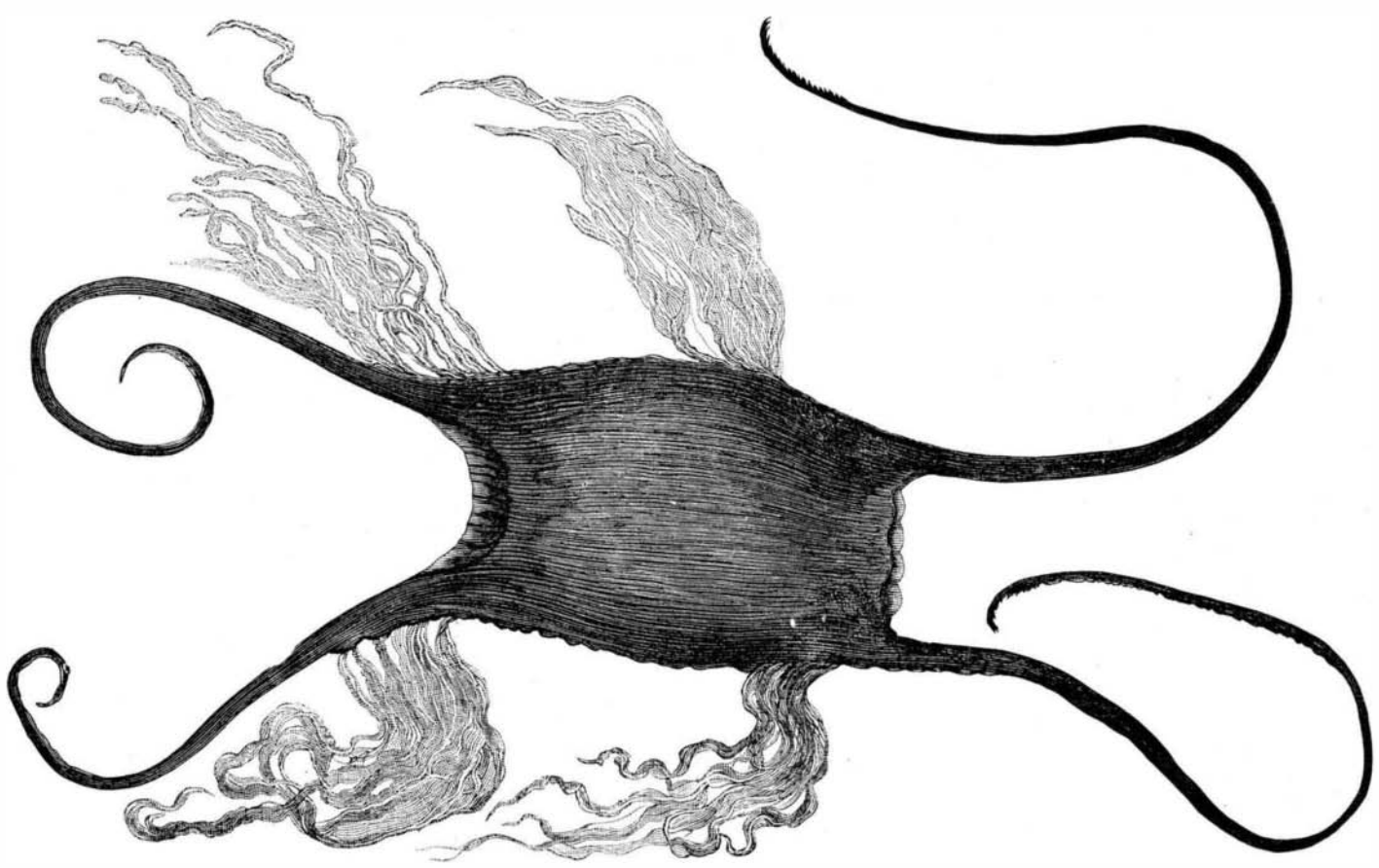
The rays or skates resemble sharks in their organization, but not in their external form. The body has a round and

FIG. 3.—BARN-DOOR SKATE.

rhomboid form, the sides of which are represented by the large pectoral fins, which are attached to the hind part of the head. The snout is pointed and elongated; the mouth, nostrils, and gill openings are situated on the under side of the body. (See Fig. 3, showing the egg of a blunt-nosed skate, partially cut away, displaying the young skate with umbilical sac) The narrow and long tail of the rays generally has two dorsal and one anal fin, the latter unequal in its lobes. Their eyes show a very remarkable peculiarity, consisting of a fringed curtain that hangs down from the upper border of the iris, and covers part of the pupil. The eggs of the rays are wider than those of the shark's, have a less transparent case, and resemble flat cushions with long coiled strings at the four corners.

The "torpedo," "cramp fish," or "numb fish" (*Torpedo occidentalis*), the "prickly ray" (*Raia Americana*), the "barn-door" skate (*Raia lævis*), the "spotted ray," "sting ray," "butterfly ray," "cow-nosed ray," and "monk fish," belong to this family, and are more or less common on our coast.

The sharks and the rays come together so closely as regards their eggs and structure that it is hard to determine where the departure or blending of the two families takes place. For instance, take Fig. 2, showing the eggs of the shark or dog fish, common on the British coast, and the eggs of rays common on our coast, Figs. 1 and 3. In each case the eggs are of a softish, horn-like consistence, so that they are not liable to be broken or easily penetrated. The general shape of the egg has been aptly compared to a pillow case with strings tied to the corners or sides, the inclosed pillow being the young shark. The long curling, tendrilous, and silky appendages speedily affix themselves to seaweeds, shells, or other objects, and from their form and material anchor the egg firmly. To enable the little ray or shark to breathe there is an aperture at one end of the egg, through which the water passes in sufficient quantity to renovate the blood. And in order to permit the inclosed fish to make its escape when sufficiently developed, the end of the egg nearest to the shark's head is formed so as to open by the slightest pressure from within. After the newly born skate has left the egg, there is no perceptible external change in the shape, for the egg, being elastic, closes up as before. One of the most common skate eggs found on our outer coast is shown in Fig. 1, life size. This is found of various sizes, and often of various tints, although it is usually of a very dark brown or rich olive green. It will at once be recognized by the illustration given. This egg is the production of one of our largest skates, known as the sharp-nosed skate, and harmonizes well with the strange, weird-like aspect of the creature from which it is produced. If one of these eggs is picked up in the early part of the year, it will usually be found to contain the young of one of these animals, not a very prepossessing creature, but very interesting to students of embryology. Perhaps the reader may remember Hogarth's "Gate of Calais," where a fisherwoman has upon her knees a huge skate, in whose countenance the painter has wickedly infused an expression precisely like that of the storm-beaten, withered old dame who holds it.



EGG OF SHARP-NOSED SKATE.—(*Raia Americana.*)

Another Mastodon.

The remains of a large animal, probably a mastodon, were discovered in an old swamp near Hopestown, Ill., September 18. The tusks are nine feet long, twenty-six inches in circumference at the base, and weigh 175 pounds each. The lower jaw with teeth is well preserved. The teeth are perfect, though somewhat worn. One weighs eight pounds, and is twenty-one inches in circumference. Several of the leg bones are in good condition. The thigh bone is two and a half feet long, and the tibia three feet. The ribs and backbone are in bad condition as the back of the animal was only three feet below the surface of the ground.

Rhode Island Scallop Fishing.

The scallop season of Narragansett Bay began September 15. By sunrise the scallop grounds were covered with boats, each carrying from two to four dredges and two men. The lawful limit to each boat is fifteen bushels a day. There was landed at Providence the first day about 350 bushels. Visiting the shops at the landing place a reporter of the *Journal* found scores of men and some women, standing up to long benches with knife in hand, separating the pure white muscle or "eye" from the shells and refuse with two or three motions, which display great dexterity, and are acquired by long practice. The muscle is unusually large and plump this year, so they will average about a gallon to every bushel in the shell. Twelve and a half cents a gallon is paid for cutting out, and an experienced cutter will flip the shells from about two bushels an hour. The ruling price is eighty cents a gallon, but if shippers crowd the market and the weather is warm they bring much less.

Pacific Salmon.

While the habits of many of our valuable food fishes are well known, there is yet much to learn in regard to the salmon, and especially those of the Pacific coast. An English traveler by the name of Pennant was the first to call attention to them, and gave the Indian names to the various species. After him came a German who Latinized the popular names. When the territory came into the possession of the United States other descriptions were given, but as the observations were made at different periods of the year, and as the salmon differ according to season, some thirty species were made where there existed but five. The flesh of the salmon in the spring is of a clear white color, with the advance of the season it changes to pink, then to a deep red, and finally becomes mottled, and in some cases almost black. In the early part of the season the scales are silvery and loose, but later they become embedded and dull, while those on the back disappear. The teeth, from being small and fine, grow large, and sometimes reach half an inch in length. The cartilaginous snout and the lower jaw grow out, while the upper jaw hooks down.

Fig. 2.—Eggs of Dog-Fish.

Of many of the habits of these salmon we are still ignorant, but we know they spawn in fresh water and then go down into the salt. Professor Jourdan says that in April, when the Columbia is high, they appear to be attracted from the ocean, probably by the cooler water of the river. They turn into the river, and as soon as they feel the influence of the current they go right up. Near the mouth of the river, and where the water is the least discolored, they can only be taken by the seine. They take the hook in salt water or in perfectly clear fresh water. Up the Columbia the salmon journey, and are found away up in Montana, and following the Snake and its tributaries they penetrate into British Columbia. The salmon will continue up stream as long as water can be found deep enough in which to swim. At the head waters of the river they often present a pitiable sight. They are frequently found with their heads smashed from contact with the rocks, their eyes knocked out, their fins scraggy, and otherwise bruised and injured. Here, after spawning, as they can go no further, unable to obtain food, they die in large numbers, and very few of them which penetrate thus far ever reach the ocean again. The last month or so that they are running up the Columbia they are unfit to eat, being poor in flesh, often covered with blotches and sores, and generally in a poor condition. There are about one and a half million salmon taken annually in the Columbia River, amounting to about 30,000,000 lb. in weight. It has been feared by some of the large canners on the Columbia that the supply might be diminished from the large number annually taken, but probably enough escape the nets and spawn to keep up the supply. The principal salmon used for canning on the Columbia is the Chinook or spring salmon.

Pond Lilies.

An exchange gives the following information in regard to pond-lily culture. A tub of some kind, some garden soil, and water are all the requirements; a