AGRICULTURAL INVENTIONS.

Mr. Henry Bell, of McGregor, Iowa, has invented an improved centrifugal churn, which he claims is simpler in construction and of superior efficiency to others now in use.

An improvement in cotton picking machines has been patented by Mr. Frederick F. Trenks, of Round Top, Tex. This improvement relates to machines for picking cotton from the plants by means of a picking cylinder provided with curved fingers and flanges extending beyond the picker fingers.

An improvement in cultivators has been patented by Mr. Peter Gerges, of Skippack, Pa. The object of this invention is to furnish an improved cultivator which shall be simple, convenient, and effective. It consists in a single beam combined with standards and auxiliary blocks and bolts.

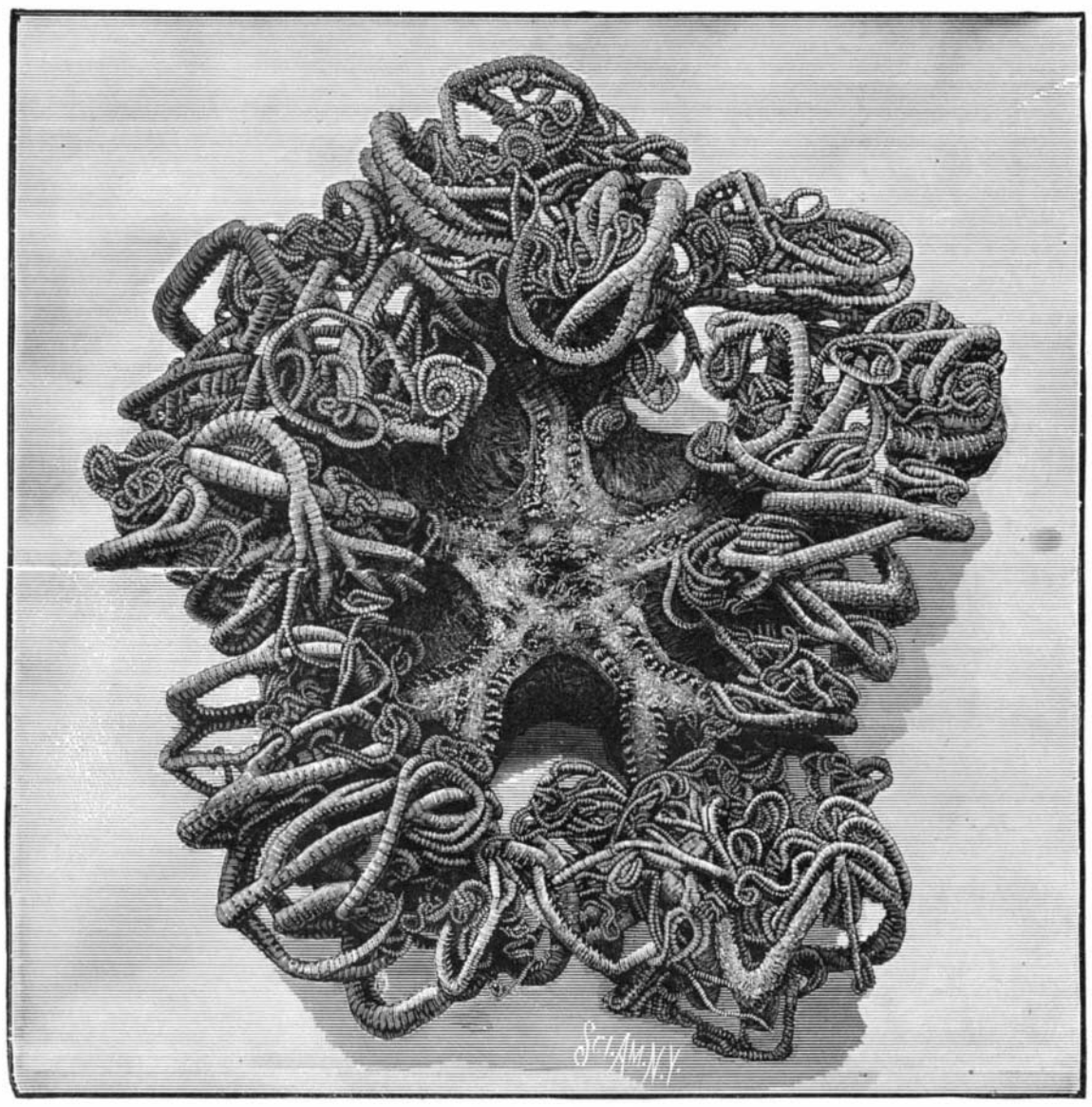
Mr. Marion Smail, of Crawfordsville, Ind., has patented an improvement in combined grader and stalk cutter which consists in combining a drum and loose semi-cylinder with mechanism for operating them.

THE BASKET FISH.

BY H. C. HOVEY.

This elegant ophiuran (or serpent star) has a measure of historic as well as scientific interest. Hon. John Winthrop, who deserves to be called the pioneer of American naturalists, laid aside for a while his cares as Governor of Connecticut, saying, "We shall omit other particulars here, that we may reflect a little upon this elaborate piece of nature." His account of "A Very Curiously Contrived Fish" was published, in 1670, in the "Philosophical Transactions of the Royal Society" (vol. iv. and vol. vi.); and though not up to the present standard of exactness, it is quite accurate as well as graphic, and is remarkable as being the first purely scientific paper from New England. With excusable hesitation, and giving his reasons for doing so, he called the new and nameless fish "*Pisces-echino · stellaris · visciformis*," which has since yielded to the shorter title of *Astrophyton*. He considerately suggested also the English name of basket fish, on account of its resemblance to wicker work; and this is still the name by which it is known among the fishermen from Nantucket to Labrador.

For full details as to the geographical distribution, anatomical structure, and special marks of the entire family of *Astrophytidæ*, the reader is referred to Lyman's "Catalogue of the Museum of Comparative Zoology," at Harvard College, and other scientific works. The species peculiar to our coast is named for the celebrated Agassiz, and described by his son in "Seaside Studies." It is perhaps the least useful and most ornamental creature caught in the Northern Atlantic; and specimens, dried or in alcohol, adorn many cabinets.



THE BASKET FISH.

The body of *Astrophyton Agassizii* is a pentagonal disk, surrounded by arms. The disk, as measured by me in a single specimen, has a diameter of two and three quarters inches; and one of the arms is, in its entire length, nine inches, but as it lies coiled up, like a basket, it is about eight inches across the whole. The size varies with age, but the above is about the average, many being less than half as large, and others twice as great. The upper side of the disk has ten radial ribs bearing short, blunt spines. The mouth is on the under side, and central. It is set with spiniform bristles hiding twenty-four thorn-like teeth. From around the star-shaped mouth branch five stout arms, each of which is divided at the edge of the disk. The animal is wholly covered with an epidermis, granulated above, but smooth beneath, except that it seems to have a double line of stitches under each arm. The general color is light buff; but the inter-brachial spaces in the living animal vary from dark purple to bright pink.

The constant division of each arm at regular intervals into two smaller ones is a most remarkable peculiarity of the *Astrophyton*. Each of the five main branches is divided into two, making ten in all; each of the ten is divided, making twenty—and so indefinitely down to the least visible filament. Winthrop counted 81,920 of these "small sprouts, twigges, or threds."

The statement seems incredible. But take a single branch and count its bifurcations. There are fourteen. A simple arithmetical process shows that there are then 40,960 arms. Had there been one more fork, that number would have thus been doubled to 81,920, as Winthrop has said. No doubt the number is doubled again in larger specimens. One can readily see that it is not easy to represent pictorially such a living labyrinth; and the difficulty is increased by the fact that, on capture or disturbance, the creature instantly folds its more than Briarean arms closely about its body, shrinking from the touch like a sensitive plant, and assuming the basket shape from which it gets its familiar name. The attempt to untwist these coils generally ends in breaking the delicate but tenacious threads.

Last summer I had a rare opportunity for examining living *Astrophytons* while on board the steamer Speedwell off Cape Cod. Thousands of rare and curious marine specimens were obtained by steam dredging for the U. S. Fish Commission, under the superintendence of Prof. S. F. Baird, and the special direction of Prof. A. E. Verrill. Sometimes only a few basket fish would come up clinging to corals and sponges. Again, a few more would be scattered through a netful of flounders, skates, and fishing frogs. But after one memorable cast of the great trawl (17 feet wide and 50 long), there were hauled in an immense number. The water was 200 feet deep, and long before the beam of the trawl emerged, the golden gleaming of the *Astrophytons* was visible through the green waves. The weight was so great that a special lifting apparatus had to be put beneath to keep the net from breaking. As the huge mass lay writhing on deck, the sailors and others eagerly picked out the specimens most easily disengaged from the net and from one another. After about one thousand of all sizes and varieties had been secured, we grew weary of the work, and the remainder were torn off in clusters and mats and thrown overboard, and the fragments scooped up with shovels. The entire number was estimated at fully 5,000. The trawl had been dragged over one of their favorite places of resort; or they may have the custom, ascribed to star fish, of rolling themselves together in a ball and floating with the ocean currents, and in that case we must have captured an entire colony.

The basket fish is a voracious feeder, and its peculiar construction aids it in taking its prey. The microscope shows each arm and spine to terminate in a minute but sharp hook. According to Agassiz, the animal, in moving, lifts itself on the extreme end of its long arms, standing as it were on tiptoe, so that "the ramifications form a kind of trellis work all around it, reaching to the ground, while the disk forms the roof." This latticed bower is but a cruel trap for entangling heedless little fishes and shrimps, whose escape from those deadly coils is as hopeless as the efforts of a fly to break loose from a spider's web.

Professor Huxley on Snakes.

The opening lecture at the London Institution for the season was lately delivered by Professor Huxley, F.R.S., to a very crowded audience, his subject being "Snakes," than which, he said, there were, in the popular apprehension, few animals more symbolical of degradation and horror. Quoting the primeval curse in Genesis, he remarked that no creatures seemed more easily destroyed by man, and few less able to defend themselves. Few wounds would be less harmful than a snake's bite were it nothing more than the sudden closing of the teeth. Yet there were not many animals gifted with so many faculties. It can stand up erect, climb as well as any ape, swim like a fish, dart forward, and do all but fly in seizing its prey. The destructiveness of snakes to man was illustrated by the fact that 20,000 human lives are yearly lost in India by their poison, and it might safely be said that they are a more deadly enemy to our race than any other beasts of the field. Professor Huxley spoke first of the three classes indigenous to our own climate—the ringed snake, the coronella, and the viper. Of these the viper alone was venomous, which the differences between its structure and that of the harmless British snakes helped to explain. It might be that the reason there were no snakes in Ireland was the multiplicity of its other plagues. Everybody must be struck with the beauty of the harmless snakes, which formed the overwhelming majority—especially the grace with which they wreathed their bodies into circles, and their fine eyes. The venomous snakes were not so beautiful. None admired our native viper, with its yellowish scales. To adults its bite was far seldomer serious than to the young. Passing to snakes in general, of which there were many hundreds of distinct species, the lecturer illustrated in great detail the adaptation of their organization to its manifold work. Very graphic was his description of the manner in which some of the more destructive snakes dart suddenly on their prey, twisting themselves round its body, crushing it into a shapeless and writhing mass, and at last swallowing it whole. He pointed out some very curious arrangements in the anatomical mechanism and jaw bones illustrative of the statement that the snake cannot properly be said to swallow his prey; he holds on to it rather, gradually working it down its throat in a most leisurely manner, but never letting it go. He would take a sleep for six weeks before giving up his task, and if the morsel were really too big would sometimes die in the effort to get it down. Of course, the snake required a very fully-developed and effective apparatus of salivary glands for this purpose. The poison bag of the venomous snakes was nothing but a modification of the salivary glands of the harmless species, the structure of both kinds being in almost all respects [illegible] parallel throughout but almost identical As another instance of the close relationship, it was shown that the sharp channel needle which conveys the poison of the cobra and its congeners is nothing but the development of the tooth which these murderous reptiles possess in common with innocuous snakes. The fact that the salivary gland was the poison laboratory of the deadly snakes, as well as the known properties of the saliva of dogs or other living creatures affected with rabies, appeared to Professor Huxley to point out the direction in which lay the solution of the difficult problem of the cause of snake poisoning, and of a possible antidote against it. At present there was no man living who could heal the bite of the cobra, except by cauterization in very fresh cases.

Jet.

The mineral itself is nothing more nor less than a species of pitch coal, found in detached masses, grained like wood, splitting horizontally, light, and moderately hard. It is often confounded with "cannel" coal, but it is quite distinct. Cannel coal is much harder than jet, has no grain, and splits in any direction. Jet is not easily fused, and requires a moderately strong heat, burning with a fine, greenish-white flame, and emitting a bituminous smell. The particular value of jet is, of course, its susceptibility for taking on a fine polish. Jet abounds more or less all over the world.