THE HAIRY CRAB.—(*Dromia vulgaris.*)

This crab belongs to a class which forms one of the connecting links between the crab and the lobster. The last pair of legs are perfectly useless for walking, and are modified into a pair of appendages by means of which the animal is enabled to cling to an object very firmly. The body is covered with hairs, generally filled with such a mass of seaweeds and dirt that it requires a good washing to show the real color of the animal. The peculiar habit of this crab is to drag along some kind of sponge, generally a *Tragus spinosulus* or a variety of *Suberites domuncula*, on its back, and to hold it by means of the deformed pair of legs. It uses this sponge to conceal itself, and only drops it when pursued.

The Touracou.

This curious bird, the touracou (*Turacus albocristatus*), is one of the plantain eaters. This bird has bright red feathers in its wings, the red coloring matter of which is soluble in water, so that the birds are apt to wash their red feathers white when in confinement. The coloring matter, "turacin," as was discovered by Prof. A. H. Church,* is distinguished by yielding a remarkable absorption spectrum, and contains a considerable quantity of copper.

The bird is very common in the Kuys-na, and I was told by sportsmen who had shot it, that in rainy weather it will hardly fly, but crouches down under the bushes, and may sometimes be knocked down with a stick.

A most extraordinary statement concerning these birds, to the effect that the red color, when washed out of the feathers, becomes restored, is made by M. Jules Verreaux.† It seems impossible to understand how this can happen, since there seems no means by which the coloring matter can be conducted from the body of the bird to the web of the feather.

Such a result seems only possible in hornbills, some of which, as is well known, paint their feathers yellow by rubbing in a yellow secretion discharged from glands under the wing. M. Verreaux states that in rainy weather, just as I was informed, the touracous get their feathers wet through, and are, in consequence, unable to fly, but crouch on the ground, instead of resting on the tree tops as usual. He caught several with the hand; the color came out on his hands from the wet feathers. He washed the color out of their wings with soap and water till the feathers were almost white. The bright red color, however, returned directly the feathers were dry, and this occurred even when the same bird was washed twice in the same day. The red coloring matter is scarcely at all soluble in pure water, but the addition of the slightest trace of alkali to the water enables it to extract the pigment from the feathers, and yield a blood-red solution.—*H. N. Moseley, Challenger Notes.*

Sugar Beet Industry in Delaware.

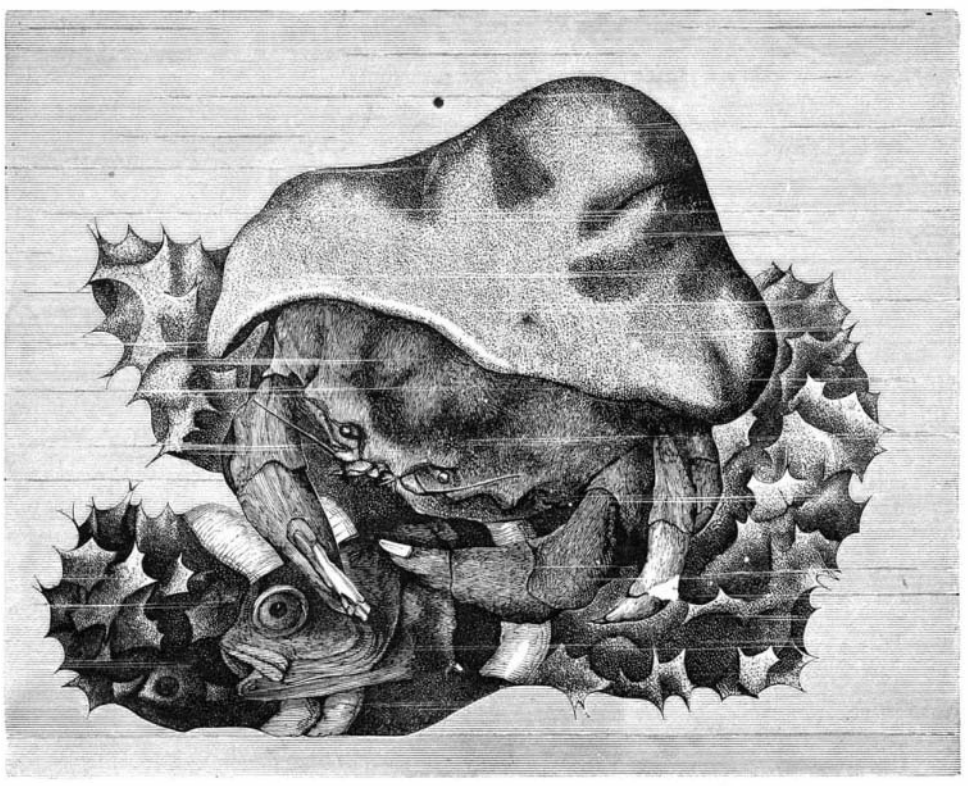
The Legislature of Delaware in 1876 appropriated $300 toward the encouragement for the growing sugar beets within the State, and subsequently increased the appropriation to $1,500, and a commission of three well known citizens of the State were appointed to disburse the appropriation by offering premiums to the growers of beets, and otherwise promoting the new industry. To this end the commission obtained pure imperial sugar beet seed from abroad, which they distributed to farmers who desired to raise them. With the seed were furnished documents containing instructions as to the character of the soil needed and its preparation, the time of planting, cultivation, and harvesting, also copies of the following conditions as the principal ones to be observed: "Select a suitable soil; use fertilizers or well rotted manure; deep plowing in the fall or early spring; straight rows, close together, and plenty of seed; early and frequent working and careful thinning to one beet in a place; place one beet to every 120 or 200 square inches, which will give from 30,000 to 50,000 beets per acre, which, in rich land, will weigh from 1 to 2 pounds each."

The action of the commission induced a large number of farmers in Delaware to commence the culture of the sugar beet as an experiment, and premiums were awarded for the growth of 1878 to twenty-two farmers in Kent county, ten in New Castle county, and one in Sussex county. The reports from the various parties contain a description of the soil, the time of plowing, and the mode of cultivation. The premiums for the growth of 1879 were $100 for the best one acre and upwards grown under contract; $75 for second best; $50 for the third, and $25 for the fourth. This action of the commission stimulated the farmers, and, according to the Philadelphia *Ledger*, from which we derive our information, during the past year from 75 to 100 of them, principally in Kent and New Castle counties, cultivated the beet with an aggregate production of about 600 tons. The result of the experiment was considered so favorable that a company was formed under the name of the Delaware Beet Sugar Company, to erect a factory for the purpose of manufacturing sugar from the beet. A lot was purchased on the line of the P. W. and B. R. R., four miles north of Wilmington, and about six months ago a brick building was erected in which the work was to be carried on. About four months ago the machinery necessary for the operation was set in motion, and since that time has been in constant operation.

The method adopted for the manufacture of the sugar is known as the diffusion process. The beets are first placed in a cylinder of wood, with slight openings, and thoroughly washed, after which they are conveyed by an elevator to the second story and emptied into a cutting machine, where they are cut into thin slices, and from there carried by another elevator into the diffusion battery. This arrangement consists of eight iron tanks, each holding about 1,500 pounds of cut beets, into which the water is introduced. The water is started in one of the tanks, and, after passing through it, is conveyed to the outside by means of pipes, which connect all the tanks, so that the water from the first tank flows through each, thus absorbing all the sugar possible. When the water has thus become impregnated it is shut off, and the juice, as it is now termed, is withdrawn and conveyed to larger iron tanks, where lime is introduced with the juice so as to absorb its impurities. Carbonic acid gas is then introduced to precipitate the lime, after which the production is run through bone-black to clarify it. From these tanks the juice is passed to a steam pump, where it is forced to the filter presses, which still further extract impurities. From here it is conveyed into the vacuum pan, where it is concentrated almost to the crystallization point.

After having passed through this process, the juice is placed in iron wagons and run into a room with a temperature of about 125°, where it remains from four to five days, when it is ready for the last process, which consists in passing the juice through a centrifugal machine. This revolves at the rate of 1,500 revolutions per minute, and from one end runs the molasses or sirup, and from a box a dark yellow substance, known as raw sugar, is taken, and which is sold to the refiners.

The capacity of the present works is 25 tons of green beets per day, but it is expected to increase them to 200, as the cultivation of the beet increases throughout the State. The product so far has been from 8 to over 18 tons per acre, and the price realized was about $4 per ton. After extracting the sugar from the beet, the pulp is sold to farmers at $1 per ton, and used by them as food for cattle. The only other establishments now making sugar from beets is one in Maine and one or two in California.



HAIRY CRAB (*Dromia vulgaris*) COVERED BY A SPONGE (*Suberites domuncula*), NATURAL SIZE.

Fast Horses.

The running horse in this country is not so valuable as the trotter. Pierre Lorillard paid $18,000 for the famous runner Falsetto, three years old, recently sent to England. Mr. Keene paid $15,000 for Spendthrift. When we come to the trotters we find the prices up. Mr. Bonner paid $40,000 for Pocahontas, $36,000 for Rarus, $33,000 for Dexter, $20,000 for Startle, $16,000 for Edwin Forrest, and $15,000 for Grafton. Mr. Smith, of New Jersey, paid $35,000 for Goldsmith Maid, $32,000 for Jay Gould, $30,000 for Lady Thorne, $25,000 for Lucy, and $17,000 for Tattler. Mr. Vanderbilt paid $21,000 for Maud S., and $10,000 for Lysander Boy. The largest sum ever paid for a horse in England, where they have few trotters, was close on to $72,000, paid for Doncaster by the Duke of Westminster.

New Method of Extracting Plant Perfumes.

The *Revue Industrielle* states that M. Camille Vincent, who has already created two industrial applications of the chloride of methyl derived from the residue left in the manufacture of beet sugar, has, in conjunction with M. Massignon, discovered still another. Seeing that this substance had the property of dissolving fatty bodies, resins, and essential oils, these gentlemen were led to consider why it might not be made available for the extraction of the odoriferous principles of plants. The first experiment, made upon odorous woods, was successful, but gave a product which had a disagreeable smell, owing to the fact that the commercial chloride of methyl employed contained traces of a pyrogenous matter with a very persistent odor. M. Vincent, therefore, purified the methyl by means of concentrated sulphuric acid, and obtained a product entirely free from disagreeable odor, and having the property of dissolving perfumes and giving them up again, on evaporation, with all their fragrance. A trial was made with orange flowers in a glass apparatus, and a product obtained which was asserted by several perfumers to be much superior to the neroli obtained by distilling the flower with steam. After these first encouraging experiments, an apparatus of modest size was constructed for the purpose of ascertaining the industrial value of the new treatment by operating at one time on several pounds of flowers and different plants. This apparatus, which has now been working with great regularity for several months, consists of: (1) A digester in which the plants are placed; (2) a reservoir of liquid chloride of methyl; (3) a closed vessel in which is received the chloride charged with the principles derived from the odoriferous plants, and in which, by means of a pump, the same is vaporized; (4) of a pump for creating a vacuum above the chloride to be vaporized, and for compressing the vapor into a serpentine liquefier, from whence the liquefied chloride returns to the reservoir. The latter portion of the apparatus is the same as the ice machine of which we have already spoken in a previous number. In extracting the perfumes, the digester is filled with the flowers, the apparatus is closed, and then by means of a faucet the liquid chloride is allowed to flow into vessel No. 2. Here digestion is allowed to take place for two minutes, and the liquid loaded with the perfume is drawn off into vessel No. 3. Then a new charge of chloride is passed over the flowers, and this is repeated several times. Finally a vacuum is created in the digester to remove the chloride which has taken up the perfume, and it is forced into the liquefier; then a jet of steam is passed through the exhausted mass in order to drive off the chloride which is retained by the small quantity of water contained in the flowers, and the damp gas is collected in a gasometer. The liquid charged with perfume and contained in vessel No. 3 is evaporated in a vacuum. On opening the vaporizer at the end of the process, the perfume is found, mixed with fatty and waxy matters. This mixture, treated with cold alcohol, gives up the perfume with all the fragrance and sweetness that it possessed in the plant. M. Massignon's works are prepared to treat 2,200 lb. of flowers per day. This new manufacture makes the third industrial application of chloride of methyl (as before stated), the other two being the manufacture of methylated products and the production of ice.

THE PHYLLOXERA IN CALIFORNIA.

It appears from an article in Prof. Riley's new journal, the *American Entomologist*, that the phylloxera has established itself in the Sonoma Valley of California, and destroyed hundreds of acres of vineyards, while only a few miles distant, in the most important wine district of the State—the Napa Valley—not a single case of phylloxera has been detected. "It is," remarks Prof. Riley in commenting on this singular fact, "fortunate for the California grape-grower that the insect has, to all appearances, there undergone a considerable modification in habit, which very much limits its destructiveness. It is steadily spreading from infected centers, but very slowly indeed, compared to its spread in France. Prof. E. W. Hilgard writes that he believes this is due to the non-appearance of the winged female, as he has not been able to obtain it. If such is the fact it is one of the most curious modifications in habit, as a result of climate, that is on record, and will go far to explain the immunity in the Napa Valley while the Sonoma Valley is being ravaged, and the fact that the insect has not appeared in other parts of California. It also offers an additional incentive to grape-growers in other sections of the State to exercise the utmost vigilance to prevent the introduction into their own locality of infested vines or cuttings. That the species may exist for an indefinite time without the winged female seems highly probable from the fact that the sexual individuals may be produced from hypogean females as well as from aerial ones. Yet so singular a change in the insect's nature can only be accepted upon the most thorough and satisfac-

* Researches on Turacin, "Phil. Trans.", 1870, p. 627.
† M. Jules Verreaux, "Proc. Zool. Soc." 1871, p. 40.

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