Entomology.

Ants and their Cows.

Among the many wonderful habits and instincts of ants, none perhaps is more curious than their practice of looking after and waiting upon the aphides or plant-lice, and deriving from them a sugary fluid, much in the same manner as we obtain milk from our cattle. Kirby and Spence, in their entertaining introduction to Entomology, give the following account of this procedure:—

"The loves of the ants and the aphides have long been celebrated, and that there is connexion between them you may at any time, in the proper season, convince yourself; for you will always find the former very busy on those trees and plants on which the latter abound; and if you examine more closely you will discover that their object in thus attending upon them is to obtain the saccharine fluid, which may well be denominated their milk, that they secrete. This fluid, which is scarcely inferior to honey in sweetness, issues in limpid drops from the abdomen of these insects, not only by the ordinary passage, but also by two bristle-like tubes placed, one on each side, just above it. Their sucker being inserted in the tender bark, is without intermission employed in absorbing the sap, which, after it has passed through the system, they keep continually discharging by these organs. When no ants attend them, by a certain jerk of the body, which takes place at regular intervals, they ejaculate it to a distance: but when the ants are at hand, watching the moment when the aphides emit the fluid, they seize and suck it down immediately. This, however, is the least of their talents; for they absolutely possess the art of making them yield it at their pleasure; or, in other words, of milking them. On this occasion their antennæ are their fingers; with these they pat the abdomen of the aphis on each side alternately, moving them very briskly; a little drop of fluid immediately appears which the ant takes into its mouth, one species conducting it with the antennæ, which are somewhat swelled at the end. When it has thus milked one, it proceeds to another, and so on, till being satiated it returns to the nest.

But this is not the most singular part of this history; for the ants make a *property* of these cows, for the possession of which they contend with great earnestness, and use every means to keep them to themselves. Sometimes they seem to claim a right to the aphides that inhabit the branches of a tree or the stalks of a plant; and if stranger ants attempt to share their treasure with them they endeavour to drive them away, and may be seen running about in a great bustle, and exhibiting every symptom of inquietude and anger. Sometimes to rescue them from their rivals, they take their aphides in their mouth; they generally keep guard round them, and when the branch is conveniently situated, they have recourse to an expedient still more effectual to keep off interlopers—they inclose it in a tube of earth or other material, and thus confine them in a kind of paddock near their nest, and often communicating with it.

The greatest cow-keeper of all the ants is a yellow species, which not being fond of roaming from home, and liking to have all its conveniences within reach, usually collects in its nest a large herd of a kind of aphis that derives its nutriment from the roots of grass and other plants; these it transports from the neighbouring roots, probably by subterranean galleries, excavated for the purpose, leading from the nest in all directions; and thus, without going out, it has always at hand a copious supply of food. These creatures share its care and solicitude equally with its own offspring. To the eggs it pays particular attention, moistening them with its tongue, carrying them in its mouth with the utmost tenderness, and giving them the advantage of the sun. It is of great consequence to them to forward the hatching of these eggs as much as possible, in order to ensure an early source of food for their colony; and they doubtless bring them up to the warmest part of their dwelling with this view.

They are also equally careful of their aphides after they are hatched; when their nest is disturbed conveying them into the interior; fighting freely for them if the inhabitants of neighbouring nests, as is sometimes the case, attempt to make them their prey; and carrying them about in their mouths to change their pasture, or for some other purpose. When we consider that from them they derive almost the whole nutriment both of themselves and larvæ, we cannot wonder at their anxiety about them, since the wealth and prosperity of the community is in proportion to the number of their cattle.

Distribution and Habitat of Insects.

The distribution of insects is in exact proportion to the diffusion of plants; the richer any country is in plants, the richer it is also in insects. The polar regions, which produce but few plants, have also but few insects; whereas the luxuriant vegetation of the tropical countries feeds a numerous host of insects.

With respect to their habitation, insects are divided into those which live upon land and water.

Those which live in the water, either never leave that element, or are able to live at will, either in the water or on the earth, at least for a short time; for example, many water-beetles. Many live at certain periods of their development in water; at others, on land; such as many sorts of flies, and all the dragon-flies, which as larvæ and pupæ live in water, but as perfect insects on land, or in the air.

Land insects live either in the earth, under stones, in decayed wood, or in putrid animal substances. Of these some pass their whole lives in these places, others only during a particular period of their development. The larvæ of the dung-beetle live deep under the ground, while the perfect insect inhabits the excrement of animals; many of the larvæ of flies live in carrion or excrement, while the perfect insect flies about in the open air. A very great number choose the different parts of plants for their abode, as the roots, bark, inner bark, alburnum, wood, pith, buds, flowers leaves and fruit. They change their abode in every new stage of their development. Thus the bark-beetle, which in the larva state lived under the bark, swarms in its perfect state upon the trees, the curculio of the apple-tree, the larva of which infests the bottom of the apple blossom, crawls on the trees, or on the surrounding ground; the mining-moth, which as a larva lives under the cuticle of the leaves, flutters in its winged state about the flowers and leaves.

A small number live upon other animals, on the skin, such as lice, or in the inside of the body, as the ox and horse breeze-flies (*Estridæ*). The two latter leave their first abode before entering the pupa state, which they effect in the earth, and hover as flies round the animals to deposit their eggs upon them.

Most insects live solitarily, either without any definite dwelling, or they construct for themselves a house composed of various kinds of vegetables or animal matter; for example, many caterpillars. A few species live in society, such as bees, ants, wasps, &c.

By obtaining a general knowledge of the abode of insects, it is evident that the observer of the economy of insects will be able more satisfactorily to combat many that are injurious to him; thus he can, with little trouble, greatly diminish or entirely annihilate those that he has ascertained to live in society, or in places of easy access.—*Köllar.*

Value of Insects.—Great Britain pays annually $1,000,000 for dried carcasses of that tiny insect known as the cochineal; while another—also peculiar to India—gumshellac, or rather its production, is scarcely less valuable. More than 1,500,000 human beings derive their sole support from the culture and manufacture of the fibres spun by the silkworm, of which the annual estimated value is said to be $200,000,000. In England alone—to say nothing of the other parts of Europe—$500,000 are spent every year in the purchase of foreign honey, while the value of that which is native is not mentioned, and all that is the work of the bee; but this makes no mention of 10,000 lbs. of wax imported every year. Besides all this there are the gall-nuts, used for dyeing and making ink; the cantharides, or Spanish-fly, used in medicine. In fact, a large proportion of the insect tribe contributes in some way—directly or indirectly—to swell the amount of our commercial profits.—*Ex*

Miscellaneous.

The late Mr. Rarey.

We find the following appreciative notice of the celebrated American Horse-tamer, lately deceased, in *The Farmer*, (Scottish.)

"Rarey, the American horse-tamer, was fortunate enough to make a fortune by teaching all those capable of learning, besides hundreds who were neither capable of understanding or of learning, how to apply Xenophon's maxim, that 'horses are to be ruled by patience and gentleness, not by harshness." When the secret became known, many superficial people who could not understand the principle involved, sneered at his process as a mere trick. They could not see the principle on which the process was based—viz., never to fight with a horse at all if you can help it, but if you are obliged, then always to place him in such conditions that the man must prevail over the brute. It was a significant fact that the very great horsemen, experienced in all the traditions of the school and the field, most highly appreciated Rarey's method and manner. Sir Tatton Sykes said 'it was worth all the fee to see the way in which he approached and conciliated a wild thorough-bred colt.' The late Earl of Jersey pronounced a horse-taming spectacle 'the finest thing I ever saw'—and only a season ago Mr. Anstruther Thomson, the master of the Pytchley hounds, and one of the finest horsemen of our time, who is always ready to purchase any well-bred horse however restive and violent, if up to his weight, observed, in reference to his extraordinary success in subduing such horses, 'Rarey taught us a great deal.' Rarey's courage was of a most perfect character. He was courageous without an effort—in the most dangerous circumstances, when a hair's breadth saved him from having his brains dashed out, he never flinched or winked, not the slightest change took place in his particularly fair complexion. He was utterly unlike the popular notion of an American and a showman, modest, quiet, self-possessed, and singularly subdued in his tone and language when led to speak of his marvellous exploits.

Although he could do almost anything with a horse, and ride anything bare-backed, he made no figure in riding across country with hounds. It was an art he had not acquired, and he did not stay long enough to learn. His success in England made him the lion of the season, and he was admitted into the best 'horsey' society, but he remained unspoiled, as simple and unaffected as on the first day that he was introduced to a select party of noblemen, headed by Lord Palmerston, who was one of his first pupils."

☞ Giles Tumut, being ill, was asked whether he had taken any remedy. "Not as I knows of," he replied; "but I've taken lots of physic."

☞ A New Haven company has commenced manufacturing compressed stone for building purposes. It is made of sand, pulverized quartz and silicate of soda, and hardens from the consistency of putty, in twenty-four hours, to the solidity of stone.

Coal Oils as Lubricators.—It is stated that American manufacturers, especially those employing fine machinery, have found, by a thorough system of tests, that coal oils as lubricators are superior to sperm oils in the ratio of 100 to 84, a discovery extremely satisfactory from the great difficulty heretofore of obtaining regularly a grade of sperm or whale oil of uniform density free of gum and foreign mixture.—*American Artizan.*