

VARIOUS SPECIES OF ANT LIONS.

The *neuroptera* are an order of insects known by the possession of four equal-sized membranous wings, divided into a great number of little cells, technically called areolets. The mouth is furnished with transversely movable jaws, and the females do not possess a strong or a valved ovipositor. In this order are comprised the dragon flies, May flies, termites, lace wings, and lastly, the very curious insects which form the subject of our engraving herewith given, the ant lion. The interesting period of the life of these creatures occurs during their larval state. They then appear as represented at 4 a in the illustration. The shape is ovoid, color a reddish gray, and the body is covered with down. They resemble flattened maggots with rather long legs and very large jaws, the legs being apparently useless as organs of progression, all movements being made by the abdomen. It is on account of this inability to pursue and capture its prey, which is wholly composed of living insects, that Nature has provided the insect with instinct to resort to strategic means to bring its victim within its clutches.

It is common to find in sandy fields of the old world small cavities, varying in diameter from one tenth of an inch to two and a half inches in diameter, and about three quarters deep as wide. These are the pit falls (see engraving at 4b) made by the ant lion, and closer examination will show the claws of the insect protruding, as it lies in ambush, buried in the sand. To make these hollows, the creature selects a locality where there is fine sand. It begins operations by bending down the extremity of its body and then pushing or rather dragging itself backwards by the assistance of its hind legs, but more particularly by the aid of the deflexed extremity of its body; it gradually insinuates itself into and beneath the sand, constantly throwing off the particles which fall upon it or which it shovels with its jaws or legs upon its head, by suddenly jerking them to the rear. It works in a spiral, commencing at the outer circumference of its cavity and gradually diminishing the diameter of its path until the conical pit is formed. Should a pebble be encountered the insect insinuates its head beneath it and labors until it gets the obstacle fairly balanced on its back. Then it attempts to climb up the slope it has hollowed with its load, often unsuccessfully, for the stone easily loses equilibrium and rolls down to the bottom. But the ant lion is obstinately pertinacious and a marvel of patience besides, so that the effort is repeated again and again until the stone is finally thrown clear of the pit. Its trap constructed to its liking, the larva buries itself as already stated, spreads its jaws, and waits. Any insect, whether caterpillar, ant, spider, or fly, serves as food, so long as it is living and active. Dead insects the ant lion rejects and tosses out of its hole in disdain. It is rarely that any crawling insect escapes from the pit after once entering it; its efforts to climb out are fruitless, for the particles of sand roll beneath its feet, and it gradually slides down to the bottom and into the jaws of the watcher. Should the victim, however, attempt to stop its downward progress by thrusting its claws into the sand, the ant lion converts its head into a catapult and throws up sand, which deepens its hole and renders the side steeper, and also covers the unfortunate insect with a shower of particles by which it is compelled to let go its hold. The instant the ant lion grasps its prey, its ferocity redoubles. Neither wasp nor bee can offer any successful resistance, for their captor dashes its prey again and again to the ground, and shakes it in its terrible pincers until it becomes stupefied and motionless. Then the larva quietly devours it.

Previous to assuming the pupa state, the larva forms a globular cocoon (5 and 6 in the engraving) of less than half an inch in diameter, of fine sand, glued with silken thread spun from a slender telescopic spinneret, placed at the extremity of the body. The pupa is small and lies with its

limbs folded upon its breast. When ready to assume the perfect state, it uses its mandibles, which are quite unlike those of the larva, to gnaw a hole through the cocoon, and pushes itself partly through the aperture in which it leaves its pupa skin. The abdomen then extends to nearly three times its previous length; and the perfect insect closely resembles the dragon fly, save that the wings are lighter, softer, and broader.

Various species of the perfect ant lion are represented in the engraving, for which we are indebted to *La Nature*. Nos. 1 and 1a is the *acanthlaciis occitanica*, during flight and in repose. It is of a reddish brown color, marked with black lines. Its larva, larger than those of the ordinary species of ant lion, are also lighter in color; and instead of digging a pit they back into the sand for a short distance,

fin oil with 6 gallons of water. Both maggots and flies immediately disappeared, and the crop became exceeding large and fine. He recommends that seeds of all kinds should be sprinkled with the oil before sowing, or that a certain portion of paraffin oil should be poured over dry earth or sand, and this prepared earth should be sown as guano. He believes that such earth is a powerful manure as well as a remedy for wire worm, grub, and all garden, field, and vinery pests. He states that grain sprinkled with the oil is quite safe from all birds as well as insect vermin. For watering green vegetables, he recommends a mixture of 2 wineglassfuls of paraffin oil and 6 gallons of rainwater, and states that this will do no injury to the plants, but that the growth succeeding its application is something wonderful, and that onions and carrots should be watered with this when one inch long. Being a Scotchman, he concludes by adding that a glassful of whisky added to the oil makes it more agreeable to the water, and enables it to mix more readily.

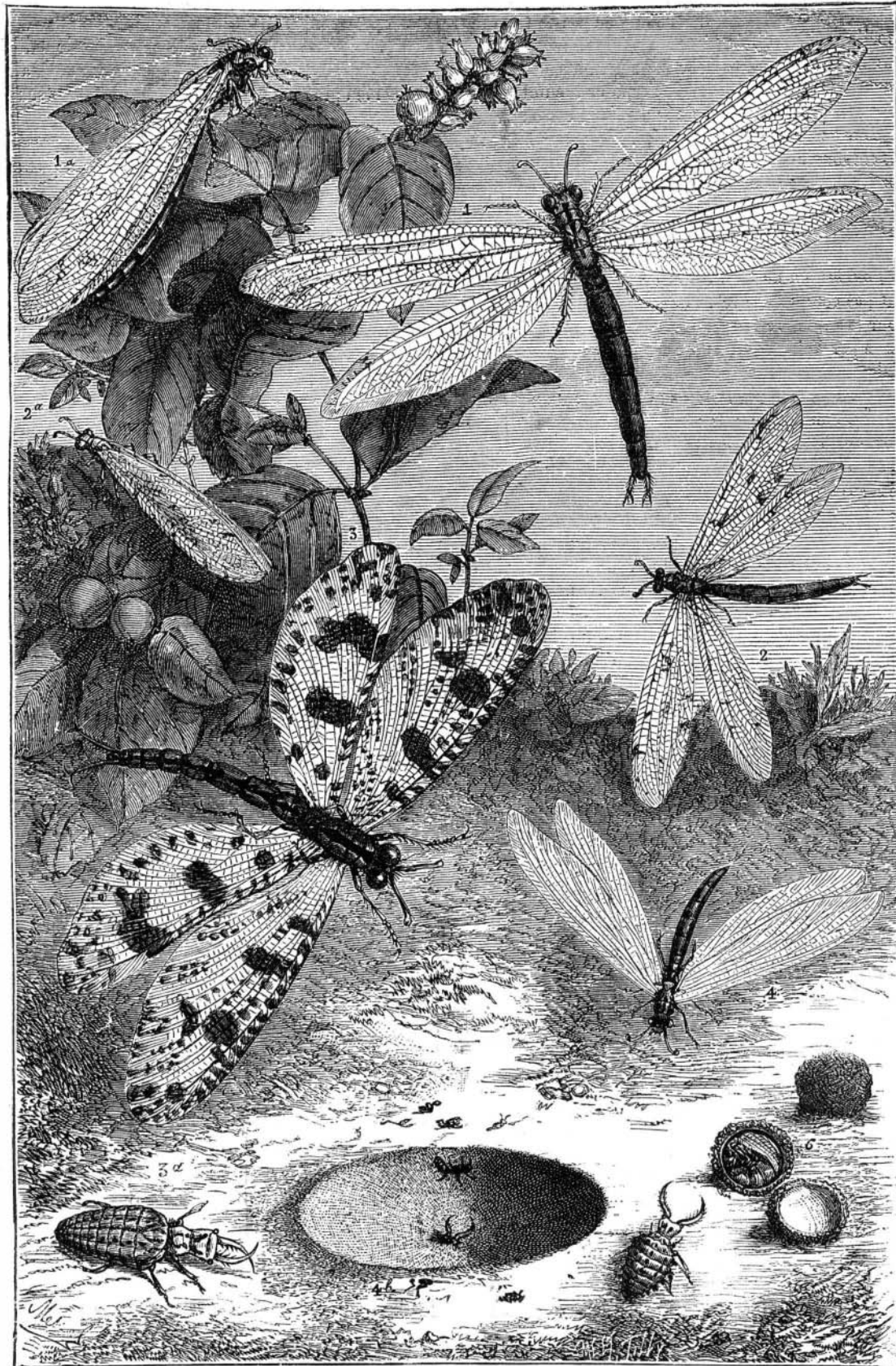
We have not yet had an opportunity of repeating these experiments, but hope to do so, and in the meantime recommend them to the consideration those of our readers who are doing business in agricultural districts. When farmers come to seek shopkeepers for their customary supplies of oil, candles, etc., these experiments may be mentioned, and the farmer induced to repeat them. No harm would be done even if they fail, as the seed would not be injured. If they succeed only partially, both shopkeeper and farmer will gain—one by saving his seed, the other by finding customers for respectable quantities of paraffin oil, as such an application as this, on a practical scale, will demand large supplies. We fear, however, that on one point the correspondent of our contemporary has been more or less (probably more) self-deluded. We allude to the great manurial value of paraffin oil. Now we know that paraffin oil is simply a hydrocarbon, and that mere carbon and hydrogen are not the elements which are thus demanded. Therefore we must renounce all that the elaborate and careful investigations of Liebig and his able compeers and successors have taught us, in order to accept the conclusions of the Dufferline experimenter.

The other use of paraffin oil, namely, that of protecting seed and young plants from birds and vermin, is quite free from any such theoretical objection. On the contrary, it recommends itself, as the hydrocarbons are more or less potent in repelling vermin. Paraffin oil is chemically inert, and will not damage the seed; but if its flavor or the odor of its vapor is sufficiently decided to drive away the creatures that do such serious damage, it will be a farmer's friend indeed, and will thereby be sufficiently recommended without pretending to any miraculous manurial value. To test it fairly, a portion of a field should be

sown with the prepared seed, and further fortified by sprinkling it with the dry earth or sand which—to coin a term—has been paraffined, while the other half of the same field is planted in the usual way, both halves having been equally dressed with ordinary manure. If the paraffin repels the vermin, the unprotected half will probably be rather worse than usual, as it would become an asylum for the refugees, and thus the contrast between the two halves would be instructively heightened.—*The London Grocer*.

Rhubarb.

Lieutenant Colonel Prejevalsky, the Russian traveler who recently performed a journey into the interior of Mongolia, refers to the medicinal rhubarb grown in that province, whence it finds its way all over the world. He gives a full description of the plant, the soil in which it grows, the time and manner of gathering it, and the trade itself in rhubarb. It costs on the spot 2 or 3 cents per lb., and in the town of Si-ning, the chief market for rhubarb, 12 cents per lb. It is the opinion of Colonel Prejevalsky that there would be no difficulty in cultivating and acclimatizing it in Siberia.



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thus concealing themselves, so as to seize passing prey. Nos. 2 and 2 a represent the *myrmeleon formicarius*, the true pit-digging ant lion. No. 4 is another species known as *myrmeleon formicalynx*. No. 3 is the *palpares libelluloides*, the larva of which takes its prey in the same manner as that of the *acanthlaciis*.

An Agricultural Application of Paraffin Oil.

A correspondent of the *Dufferline Journal* tells us that he has tried a number of experiments, extending over a course of years, which satisfy him that paraffin oil is something more than a substitute for the best guano. His garden having been overrun with rats and mice, he had to sow double quantity of peas and beans, and sometimes to sow these twice over. Last year he sowed 22 lbs. of beans and 6 lbs. of peas without any manure, but he previously soaked the seeds for a short time in paraffin oil. None were touched; every pea and bean germinated, and the crop was enormous. Formerly his onions were annually attacked by maggots, and his turnips by flies; but during the last eight years he watered between the rows with a mixture of 2 ozs. of paraf-