

WIREWORMS AND SKIPJACKS.—(Knowledge.)

BY E. A. BUTLER.

In turning up the soil round garden plants, we sometimes find a stiffish, elongated, shiny, yellowish-brown, worm-like thing, about the thickness of a stout pin, and about three-quarters of an inch in length. Under the impression that any living creature found in garden-soil is an intruder that should be summarily disposed of, we may proceed to endeavour to put these ideas into practice, only, however to find that this is not quite so easy a matter as it seemed; the thing is so stiff and tough, that even a good hard squeeze seems to make but little impression on it. This tough, worm-like thing is a wireworm (Fig. 1), and so dire a foe is it to vegetation, that we are perfectly justified in making all efforts to despatch it. On examining it more closely, we find that it is not truly cylindrical, like a piece of wire, but somewhat flattened beneath, and that it is made up of a series of thirteen segments, placed in line, one behind the other. The first of these is the head, and the next three carry six short legs, one on each side of each segment, with which the creature crawls along, trailing the remainder of its body after it. The head is black, and is furnished with a pair of stout, transversely-moving jaws, and a pair of short antennæ.

Wireworms are the larvæ of various kinds of beetles, called "skipjacks" or "click beetles," from a peculiar of springing up into the air, and at the same time, produce a sharp clicking sound. Skipjacks are narrow, elongate insects, with short legs and hard integuments (Fig. 2). The head is small and often much sunk into the thorax, and carries a pair of long, distinctly jointed antennæ; the thorax is of large size, and, roughly speaking, more or less quadrangular in outline, and convex above and beneath. The elytra or wing-cases cover the body, and conceal a pair of ample membranous wings. Each is somewhat triangular in shape, and they form when closed a strongly arched, shield-shaped surface; they are usually marked longitudinally with parallel grooves or furrows and covered more or less densely with short hairs. The under-surface also is strongly convex, and the legs are short, and capable, like the antennæ, of being folded close up to the body. When thus compactly folded up, the insect may easily be mistaken for a piece of stick or earth. When surprised or alarmed, it will thus feign death, relaxing its hold of what it may have been clinging to, and falling to the ground, as often as not, on its back.

Now usually, when a beetle gets into such a position, it frantically waves its legs about till one of them by chance strikes the ground; then, seizing any irregularities of surface with the sharp claws at the end of its feet, and assisting itself with the end of its shanks, it levers itself over sideways. But, owing to the convexity of its back and the shortness of its legs, a skipjack is unable to use this method, unless there happen to be close to it some objects of sufficient height to be reached by its waving legs; failing this, however, it would be were it not for a remarkable contrivance, as helpless as a turtle in a similar position, and would stand a good chance of being doomed to continue its unavailing struggles, at the mercy of any passing foe, till exhaustion ended its woes by death. The contrivance is as follows:—The hinder edge of the thorax is produced in the middle underneath into a long curved blunt spine, which is received into a little pit at the base of the body. The thorax is loosely articulated to the abdomen, and can be freely moved up and down like the lid of a box on its hinge. When on its back, therefore, the skipjack arches its body by bending its thorax backwards, and so balances itself on the two extremities of its body; this movement releases from its hollow the spine above referred to. Having stretched itself to the utmost in this attitude, the insect suddenly and forcibly resumes its former supine position—a movement which has the effect of causing it to rebound from the ground and shoot upwards into the air to the height of several inches, at the same time bringing the spine back into its sheath with a sharp clicking sound. On returning to the ground, the insect generally manages to land itself right side up; if not successful the first time, however, it renews the attempt, and continues skipping till the desired result is obtained.

About 60 species of skipjacks belong to the British Fauna, and three or four of them, brownish insects belonging to the genera *Athous* and *Agriotes* are exceedingly common; the latter genus furnishes the most destructive wireworms. In their larval existence they are subterranean in habits, living for several years a little below the surface and spending their time

in devouring the roots and underground stems of plants, and thus, of course, doing much more harm than can be measured by the amount of matter actually devoured. In the winter they retire to a greater depth, descending farther and farther as the frost increases, and pausing in their depredations only in the coldest weather. They devour all kinds of agricultural produce, destroying both root, grain, and fodder crops. Carrying on the ravages as they do in the complete obscurity of subterranean life, they are rarely detected when at work, and the first evidence that the fatal work has been done is seen in the apparently causeless withering of the plants.

It is fortunate that creatures so destructive have natural enemies. Among the most important of these is the mole, which devours the larvæ with avidity. It is aided in its praiseworthy efforts by several kinds of birds, such as rooks and lapwings. A variety of artificial remedies have been proposed for checking the spread of the mischief, such as the application of liquid manure, which has the twofold effect of strengthening the plants that have not been irreparably injured, and driving away or killing the wireworms; paring off a thin coating of the soil, which will contain most of the insects, and then burning it; imbedding in the soil at short distances apart slices of carrot and turnip to serve as traps, and then examining them and destroying the wireworms every other day. The latter method has been found serviceable in hop-grounds, as many as 150 wireworms having been trapped close to a single hop-hill. It should be remembered in this connection that the abundance of many agricultural pests is due in great measure to man himself. We greatly increase the supply of suitable food for these creatures, and in other ways make the surroundings more and more favourable to their existence, and we need not wonder, therefore, that the inevitable result follows, and that the additional task devolves upon us of devising means to counteract the excessive development we have ourselves unintentionally occasioned.

The group to which these insects belong possesses a few British representatives of considerable brilliance in colouring, but they are far surpassed, both in beauty and in size, by exotic forms, some of which are amongst the most brilliant of all beetles. To this group, also, belong the well-known and remarkable Fire-flies of the West Indies, not to be confounded with the Lantern-flies, which are members of a widely-different order of insects, the Homoptera. The light emitted by fire-flies proceeds from two patches on the thorax and from others concealed beneath the elytra when they are closed, but rendered visible when they are spread for flight. An old writer, Pietro Martire, gives the following quaint account of a method of catching these creatures: "Whoso wanteth cucuij, goeth out of the house in the first twilight of the night, carrying a burning firebrande in his hands, and ascendeth the next hillock that the cucuij may see it, and hee swingeth the firebrande about, calling cucuius aloud, and breaketh the ayre with often calling and crying out 'cucui, cucui!' Many simple people suppose that the cucuij, delighted with that noise, come flying and flocking together to the bellowing sound of him that calleth them, for they come with a speedy and headlong course, but I rather think that the cucuij make haste to the brightness of the firebrande, because swarms of gnattes fly into every light, which the cucuij eat in the very ayre, as the martlets and swallows doe. Some cucuius sometimes followeth the firebrande, and lighteth on the ground; then he is easily taken, as travellers may take a beetle, if they have need thereof, walking with his wings shut. In sport or merriment, or to the intent to terrify such as are afraid of every shadow, they say that many wanton, wild fellows sometimes rubbed their faces by night with the fleshe of a cucuius, being killed, with purpose to meet their neighbours with a flaming countenance, as with us wanton young men, putting a gaping vizard over their face, endeavour to terrify children or women who are easily frightened."

MONSTER RUSSIAN BRIDGE.—It is reported from Russia that the question is being agitated of connecting Cronstadt and Oranienbaum by a bridge at a cost of 2,400,000. The structure is to rest upon granite pillars fixed by the caisson method, each of them protected from the action of the waves during the prevalence of south-west winds by an angular wall-like guard of stone. The bridge will be about five miles in length, and it is expected to be completed by 1889. When finished—if it ever is finished—it will consist of two parts, a railway and a foot-bridge.