THE CICADA, AND ITS ORGANS OF VOICE.

THE Cicadæ are insects belonging to the order called *Hemiptera*, (half-winged,) on account of the wings partaking generally of a double character, being partly of a leathery substance and partly transparent; in the Cicadæ, however, this distinction is not so apparent. The Cicadæ are found in abundance in most of the warmer parts of the globe; there are also several species, natives of more temperate regions. These insects are noted for the singular noise they produce, and on this account they were in great favour among the ancient Greeks. They were kept in cages for the sake of their song, and were a favourite image of innocence and cheerfulness with the poets of Greece. One bard intreats the shepherds to spare the innoxious *Tettix*, (the Greek name for the Cicada,) that nightingale of the Nymphs, and to make those mischievous birds, the thrush and blackbird, their prey.

Sweet prophet of the Summer, (says Anacreon, addressing this insect,) the Muses love thee; Phœbus himself loves thee, and has given thee a shrill song; old age does not wear thee out; thou art wise, earthborn, musical, impassive, without blood.

The sound produced by the Grecian Cicada must necessarily have been musical; it was called by the same name as the music of the harp.

A Cicada, sitting upon a harp, was a usual emblem of the science of music, which was thus accounted for:—When two rival musicians, Eunomus and Ariston, were contending upon that instrument, a Cicada, flying to the former, and sitting on his harp, supplied the place of a broken string, and so secured him the victory.

The Cicadæ of modern times are equally famous for the power, if not for the musical property of their voice. Dr. Shaw, in his Travels, says,—

In the hotter months of Summer, especially from midday to the middle of the afternoon, the Cicada is perpetually stunning our ears with its most excessively shrill and ungrateful noise. It is, in this respect, the most troublesome and impertinent of insects, perching upon a twig, and squalling sometimes two or three hours without ceasing, thereby too often disturbing the studies or short repose, which is frequently indulged in in these hot climates for a few hours.

The Brazilian Cicadæ are said to sing so loud, that they can be heard at the distance of a mile. On account of the sound this insect produces, it is called in the United States, the American Locust.

The apparatus by which the male Cicada produces the sound for which it is famous, is thus described in Kirby and Spence's beautiful work on Entomology.

If you look at the underside of the body of a male, the first thing that will strike you is a pair of large plates, of an irregular form, B; in some semi-oval, in others triangular, in others again a segment of a circle of greater or less diameter, covering the anterior part of the belly; these are the drum-covers, or opercula, from beneath which the sound issues, at the back of the posterior legs. Just above each operculum there is a small pointed triangular process, (*persillum*,) A, the object of which, as Réaumur supposes, is to prevent them from being too much elevated. When an operculum is removed, beneath it you will find, on the exterior side, a hollow cavity, with a mouth somewhat linear, (like a slit, the width of a line,) fig. 2, A, which seems to open into the interior of the abdomen. Next to this, on the inner side, is another large cavity, B, of an irregular shape, the bottom of which is divided into three portions: of these the posterior is lined obliquely with a beautiful membrane, which is very tense, C; in some species semi-opaque, and in others transparent, and reflects all the colours of the rainbow; this mirror is not the real organ of sound, but is supposed to modulate it. The middle portion is occupied by a plate, of a horny substance, placed horizontally, and forming the bottom of the cavity B. On its inner side this plate terminates in a crania, or elevated ridge, common to both drums. Between the plate and the after-breach, (*post pectus*,) another membrane, folded transversely, fills an oblique, oblong, or semilunar cavity. In some species I have seen this membrane in tension, probably the insect can stretch or relax it at pleasure, but even all this apparatus is insufficient to produce the sound of these animals. One, still more important and curious, still remains still to be described. This organ can only be discovered by dissection. A portion of the first and second segments being removed from that side of the back of the abdomen which answers to the drums, two bundles of muscles, fig. 3, B, meeting each other in an acute angle, attached to a place opposite to the point of the *mucro* (a pointed prominence, like a sharp tooth,) of the first ventral segment of the abdomen will appear. These bundles consist of a prodigious number of muscular fibres, applied to each other, but easily separable. Whilst Réaumur was examining one of these, pulling it from its place with a pin, he let it go again, and immediately, though the animal had been long dead, the usual sound was emitted.

Fig. 1.
Under View, with the Drum-covers in their Places.

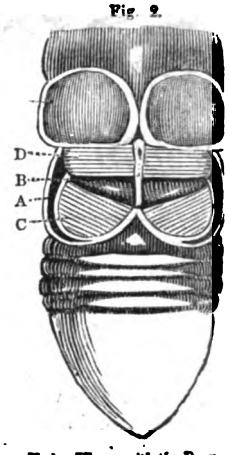

Fig. 2.
Under View, with the Drum-covers turned back.

If these creatures are unable themselves to modulate their sounds, here are parts enough to do it for them, for the mirrors, the membranes, and the central portions with their the cavities, all assist in it. If you remove the lateral part of the first dorsal segment of the abdomen, you will discover a semi-opaque, and nearly semicircular concave-convex membrane, with transverse folds, fig. 3, A; this is the drum. Each bundle of muscles before mentioned, is terminated by a tendinous plate, nearly circular, from which issue several little tendons that, forming a thread, pass through an aperture in the horny piece that support the drum, and are attached to its under or concave surface. Thus the bundle of muscles, being alternately and briskly relaxed and contracted, will by its play, draw in and let out the drum, so that its convex surface being thus rendered concave when pulled in, when let out, a sound will be produced by the effort to recover its convexity, which sound striking upon the mirror and the other membrane before it escapes from under the operculum, will be modulated and augmented by them. I should imagine that the muscular fibres are extended and contracted by the alternate approach and recession of the trunk and the abdomen to and from each other.

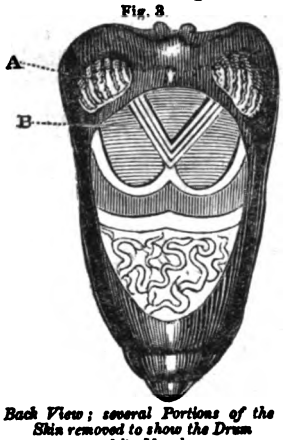

Fig. 3.
Back View; several Portions of the Skin removed to show the Drum and its Muscles.


THE CICADA.


The Drum of the Cicada, and the Muscles by which it is moved.

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