

and groin. Snout short, obtuse. Lower eyelid scaly. Nostril pierced in the nasal; no supranasal; frontonasal broader than long, forming a suture with the rostral and with the frontal; latter shield as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supra-oculars, second largest; six to eight supraciliaries; frontoparietals distinct, longer than the interparietal; parietals forming a suture behind the interparietal; one or two pairs of nuchals; fourth or fifth upper labial below the centre of the eye. Ear-opening oval, a little smaller than the eye-opening, without projecting lobules; twenty-eight or thirty smooth scales round the middle of the body; laterals smallest. No enlarged præanals. The adpressed limbs fail to meet or just meet. Digits subcylindrical; subdigital lamellæ smooth, eighteen or twenty-two under the fourth toe. Tail thick, little longer than head and body. Yellowish or reddish-brown above, each scale with several fine darker lines; sides with dark-brown and yellowish markings; a yellowish dark-edged spot below the eye; lower surfaces yellowish, uniform or spotted with brown.

“Total length, 129mm.; head, 13mm.; width of head, 10mm.; body, 51mm.; fore-limb, 16mm.; hind-limb, 20mm.; tail (reproduced), 60mm.” *Boulenger*.

In habit and coloration this lizard has a strong resemblance to *Liolepisma æneum*.

Distribution.—The neighbourhood of Auckland.

An enlarged palpebral scale, or small disk, is generally present. *Hutton*.

ART. XXII.—*Notes on the Cicadas of New Zealand.*

By A. T. POTTER.

[Read before the Auckland Institute, 6th July, 1896.]

I HAVE had good opportunities of observing the habits of a family of insects which numbers amongst its ranks some of the greatest noise-producers of the whole class—I mean the cicadas. I have so far had several species of these curious and interesting Homoptera, from both the South Sea Islands and this district, and have found that as soon as the sun gets hot the bush resounds far and wide with their ear-splitting sounds, which are certainly more vigorous than pleasing. Now, as is well known, these vocal powers, if I may call them so, are confined to the males, which of itself is a highly-

significant fact, and, apart from all other considerations, lends a distinct air of probability to the theories of those who believe in the auscultatory powers of insects. It is contended by some that the possession of a sound-producing apparatus is no proof of the ability to hear. I maintain that it is strong evidence in favour of that ability, and when such apparatus is confined to one sex the hearing-powers in the opposite sex become evident. When we come to examine the male cicada and see what a large part of it is occupied by the sound-producing organs, such a highly-specialised apparatus must be of importance in the welfare of the insect in which it occurs, and can only have been produced by some very potent factor. Now, as these sounds are emitted only by the male sex, my observations show me that the female seeks the male instead of *vice versa*, which I think is strong evidence that the female can hear, and is attracted by the song of the male. My notes have been made on only two species, which offer greater facilities for observation than the others, and even in these it is very difficult to make accurate observations, owing to the sluggishness of their movements, the height at which they sit, and the fact that the male and female are indistinguishable on the tree unless the male happens to be singing, when the abdomen is slightly raised and the wings held at a somewhat acute angle.

I have watched solitary males when singing, and seen another cicada advance from some other part of the tree with a slow, somewhat jerky gait, stopping every now and then, and passing and repassing the calling insect until it rests alongside him. On netting such insects I have found them to be females. I have noticed that when any females are near a calling male the latter becomes very restless, walking backwards, forwards, and sideways, and giving a sharp flutter with his wings as if to try and attract the attention of the females. If the male utters his shrill cry for the purpose of attracting the female, the explanation of the different calls of the species at once can be seen, for if the female finds the male by his call, and there are a number of different species frequenting the same place, those males which acquire some peculiarly distinctive sound would be likely to attract to themselves more females of their own kind, and thereby would leave more progeny, than those males whose cry more closely resembles that of another species, for these latter would be apt to attract females of another species, with which they could not interbreed; and those females which are most apt at distinguishing the notes of their own mates from those of other species are more likely to pair and leave progeny. I have several times imprisoned male cicadas in my breeding-cage, which is 4ft. by 2ft., in twelve compartments of gauze

and glass, to see whether they would attract females by calling, and have taken the cage into the bush. Unfortunately my experiments have failed so far, as the male has refused to utter a sound beyond an indignant squeak quite distinct from his usual call.

Cicadas do not seem to indulge much in flight, and, considering the numbers there must be about, I have seen very few on the wing except when they have been actually disturbed. Their sluggishness may be accounted for by the fact that these insects are perfectly defenceless, their only protection being their protective colouring, and their greatest safety lies in sitting still. The great majority of unarmed insects, which are well adapted to their surroundings, sit fairly close. This is the case with the cicadas. Several species will allow the branch on which they are sitting to be roughly shaken or even struck with a stick within a few inches of themselves without moving; and yet this is no proof that they have no sense of touch, for to such insects immobility is their safest course up to a certain point.

I cannot see that there is any impossibility for insects to possess additional senses which we have not. I need only mention one instance. It is well known that termites have no eyes, yet any one who has observed them will have noticed that they can perceive light—even to the slightest ray they show a strong dislike. Now, what is the name of the sense which enables them to do this? It cannot be sight, for they are blind; neither can it be any of the four senses as we understand them, for to our ideas light has no smell or taste, and is inaudible and intangible. I should very much like to see the solution of this problem.

ART. XXIII. — *Descriptions of Two New Species of
Lepidoptera.*

By E. F. HAWTHORNE.

[Read before the Wellington Philosophical Society, 9th September,
1896.]

THE two insects here described appear, on the evidence available, to be each eminently distinct from the previously known forms of their respective groups. For the purpose of facilitating identification, those words which are descriptive of the specially distinctive characters of each species are printed in italics.