

## Glimpses of Nature.

### VI.—THOSE HORRID EARWIGS.

BY GRANT ALLEN.



HIS is an age of vindications. Robespierre has been vindicated, and so has Marat; officious apologists have attempted to whitewash the unamiable character of Richard III.; Tiberius has been described as "a wise and great ruler"; and even poor Caligula has been lamely excused, on the ground of insanity, for such playful little freaks as making his favourite saddle-horse a Roman consul. Nobody's reputation is safe nowadays from the vindicator. It is the same in the animal world. New light is constantly being cast on the idiosyncrasies of the rattlesnake; we are assured from day to day that the cobra, though slightly venomous, is an excellent wife and a devoted mother; the scorpion only stings when you put him on the defensive or when he runs for his life; and the tarantula, we are told, has been most unjustifiably and cruelly blown upon. Has not the poet of "The Bad Boy's Book of Beasts" informed us that—

The tiger, on the other hand, is kittenish and mild;  
He makes a pretty plaything for any little child;  
And mothers of large families (who claim to common sense)

Will find a tiger well repay the trouble and expense.

In the midst of all these vindications, shall the harmless, unnecessary earwig go unvindicated from the aspersions that too often assail his character? A thousand times, no! Because he is small, he shall not be insulted with impunity. I see a helpless animal unduly exposed to vile detractions, and openly pursued with undeserved asperity. The sight arouses all the latent chivalry of my nature. I will gird on my sword to do battle for the right, and rush in, a scientific St. George, in defence of the innocent but persecuted earwig.

That my hero (or heroine) has a bad name in the world I am not careful to deny. Calumny has dogged it from its earliest days. Its very name enshrines a myth which is in itself a libel. It is called earwig, gossips will tell you, because it creeps into the ears of incautious sleepers in the open air, and so worms its way to the brain, where, if you will believe the purveyors of folk-lore natural history, it

grows to a gigantic size, "as big as a goose's egg," and finally kills its unhappy victim. It is true, science knows nothing of this form of brain-disease; it has tried the case before an impartial tribunal, and the earwig has left the court without a stain on his character. Some etymologists have even endeavoured to persuade us that the name earwig itself is but a corruption of ear-wing, a word which they suppose to be derived from the shape of its flying organs. There, however, our philologists are surely crediting the people with more knowledge than they possess; very few gardeners or countrymen are aware that earwigs have wings, while the general public never sees them flying. Besides, the German name *Ohrwurm*, or "ear-worm," and the French *Perce-oreille*, or "pierce-ear," suffice to show that the myth is not confined to our own country. All over the world this harmless and on the whole beneficent creature (for he is a good scavenger) is regarded with superstitious fear and aversion; all over the world, he is ruthlessly destroyed whenever found; and modern science alone is the first to attempt the Herculean task of rehabilitating him.

Before you begin to rehabilitate anybody, however, it is first desirable to know something about himself, his family, and his antecedents. I will therefore set out with a brief description of the earwig and his relations. Almost everybody knows well that earwigs are black little creeping insects, which frequent dark spots, avoid the light, and love to take refuge under stones or woodwork. The earwig, in point of fact, is a nocturnal animal. Like the bat and the owl, he hides during the daytime, and only prowls forth at night in search of food and adventures. Plain as he is to outward view, his diet might suit the daintiest of poets, for he lives for the most part on the petals of flowers, on which account he is hated with a deadly hatred by gardeners. But the diet of the race is not wholly floral. Earwigs prefer petals and other soft parts of plants; but they will put up with leaves or growing shoots, and even feed to a small extent on dead or decaying animal matter. That they are fond of fruit you must have observed for yourself in the case of peaches and strawberries; though I fancy they never attack a perfect

specimen for themselves. My own experience is that they wait till a wasp has bored a hole in the rind of an apricot or a nectarine, and then creep in to enlarge it by their additional efforts. If on any such occasion instead of throwing the fruit away in disgust you will watch the little robbers with a pocket lens, you may (if fortunate) have a chance of observing the mode of action of the mouth organs. That is the difference between the point of view of the naturalist and the general public. The outsider says: "What a nuisance! This peach is full of earwigs!" The naturalist says: "How lucky! Now I shall have a chance of seeing how he uses his mandibles!"

And here let me call your attention in passing to the portrait of a male earwig, the father of a large family, in illustration No. 1. You will observe at once for yourself that he has a long body, divided as a whole into three well-demarcated portions. In front comes the head, with its two beady-black compound eyes, its round upper lip, its long waving antennæ, and its shorter jaw-feelers. Next to the head come the three rings or segments of the body proper (called, technically, the *thorax*), each ring being here provided with a pair of legs, while the two hinder rings bear also wings or wing-cases. Last of all comes the abdomen, or tail, with its numerous flexible rings, of which the male has one more than the female. Notice also the powerful pair of pincers at the extremity of the tail, which are the most conspicuous organs in the full-grown insect: they are more curved in the father of the family than in his faithful spouse, and are likewise provided in his case with curious teeth or indentations. The use and meaning of all these parts will come out in detail as we proceed with our inquiry; for the present, I will content myself with calling your attention to the fact that

"that horrid earwig" is a far handsomer animal when you come to examine him at close quarters than you were inclined to believe on a casual and disgusted summary inspection. Confess now that his beautifully jointed legs, his translucent thighs, his toothed pincers or forceps, and his feathery antennæ are very much finer than anything you expected from him when you first saw him.

In No. 2, Mr. Enock has given us the counterfeit presentation of the earwig's wife, for comparison with the portrait of her noble lord. You will observe at a glance that she differs from her mate in two main particulars only. She has one less segment to her tail; and her pincers, which are toothless, are almost straight and nearly parallel. The air of distinction which the husband thus gains over his wife is almost as marked as that which

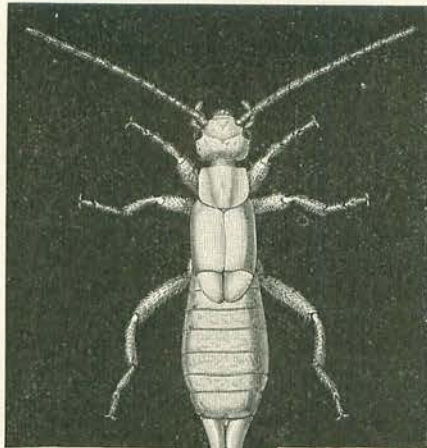
is given to man over woman by a couple of inches additional height, and by the noble appendage of a pair of black moustaches. Compare the two as you see them in the illustrations, and you will never again have a doubt as to the real nature of masculine superiority. If you are a man, indeed, I

don't suppose you have ever had one. I have called the earwig black, but that is only true on a general survey. In reality, the head is rich chocolate brown, with the many-faceted compound black eyes standing out against it; the legs are amber-coloured, the jointed antennæ are pale amber, and the wing cases are transparent or horn-like in colour.

Now, these two faithful portraits represent the earwig as we all best know him — the common or garden earwig, engaged in crawling about during the hours of sunshine, and seeking some cranny where he may hide himself from the light that irks and distresses him. But there is another side to earwig life which in all probability you have



1.—PORTRAIT OF A GENTLEMAN. (OBSERVE HIS TAIL.)



2.—PORTRAIT OF A LADY.

never suspected. While day lasts the earwig shelters himself underground, or lies hid beneath stones or in the crevices of bark. But when night arrives, oh, then he sallies forth, on love and feasts inclined; he seeks his dusky mate, or batters on pink rose-petals. Then is the time to see him flying abroad on expanded wings; and then is the time when he really enjoys existence, till some late-flying swallow or prowling bat puts an end to his brief revels.

"But I never knew earwigs flew!" you exclaim. "I never thought they had wings. Those I have seen were always creeping and crawling."

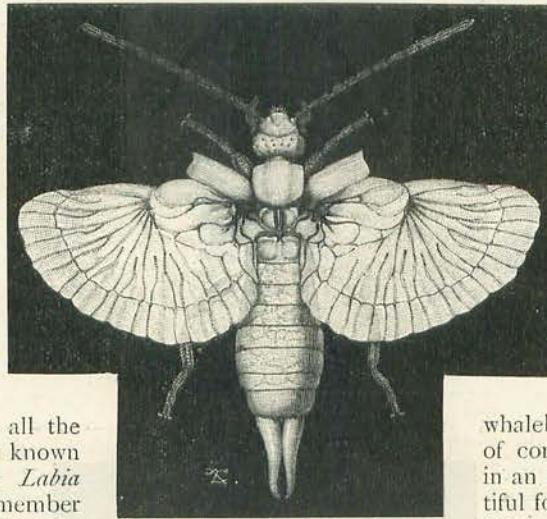
That is quite true; and in this matter I will not deceive you. The common earwig does really fly; but he is an infrequent aeronaut. Indeed, I believe he seldom uses his wings except when he is courting or changing his residence. However, there is a smaller species of earwig, not minutely discriminated from the common sort by housewives and gardeners (who kill all the race impartially), but known to entomologists as *Labia minor*. This lesser member of the tribe may often be seen disporting himself on the wing on warm afternoons in summer; and even the larger earwig occasionally ventures out after dark in the same manner. The approved method of taking earwigs on the wing is by means of a tarred board, on which they may be caught in small numbers. When the broad transparent wings are expanded, they are really beautiful and striking objects.

What becomes of the wings, however, when the insect is at rest or crawling? Well, they are almost invisibly tucked up in a most curious and marvellous way under the horny outer pair, or wing-cases. In beetles, the horny front pair or wing-cases completely cover and hide the hind pair or flying wings. But earwigs are in many ways a less advanced and perfect group than the beetle tribe; as we shall see hereafter, they are a rather primitive type, only half way up in the scale of

development towards the highest insects. And among their imperfections one may mention this—that the hind wings are only partially covered by the front pair or wing-cases.

When I say so, however, I do not mean to be unkind to the earwig, who, within his own limitations (as we say of minor poets), must be looked upon as one of the most marvellous and complicated of animals. And I propose to illustrate this fact for you in a single direction by a brief consideration of the way in which he folds and tucks away his pinions when he has done with them.

No. 3 represents a female earwig in flight, with the thin, transparent wings fully expanded.



3.—FEMALE EARWIG WITH HER WINGS EXPANDED.

You will notice here that the first pair, or wing-cases, which are hard and horny, are held open in front out of the way; and that the second pair, or true wings, are flat and papery behind, but have a curious horny rib or "stiffener" in their front portion. This stiffener acts exactly like the

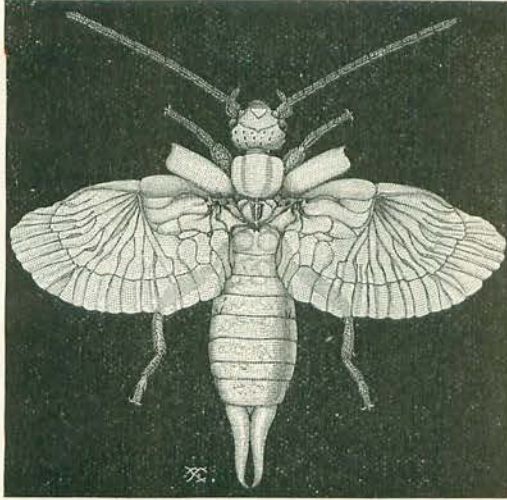
whalebone or steel in a pair of corsets, or like the ribs in an umbrella. The beautiful folds and creases in the true wings resemble those in a fan or Japanese parasol; but they run two ways, some

lengthwise, and some transversely. They are exquisitely true in their wrinkles, and enable the insect to shut up the wing with perfect accuracy.

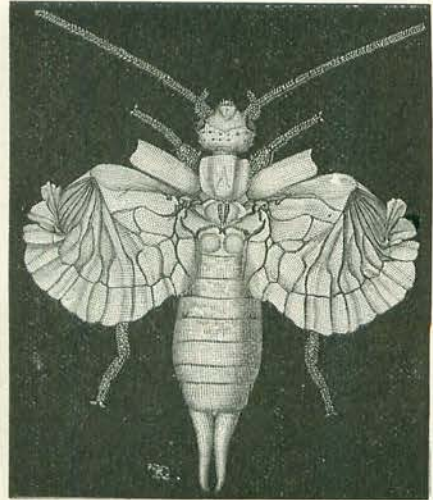
No. 4 and the subsequent illustrations show us the various stages in the very complicated closing process; and Mr. Enock has so drawn them for me as to let us follow in detail every step in this wonderful piece of insect jugglery. Cinquevalli himself does nothing more admirable. To see an earwig close her wings is a study in the perfection of nature's mechanism. In No. 4 itself, which is the first of the series, the rib or stiffener is just slightly depressed, so as to make the tip of the wing drop a little. In No. 5, the stiffener bends at the joint in the middle, and thus makes the edge of the wing curl inward like a fan, the pleats folding neatly

with the utmost precision. With the stage illustrated in No. 6, the wing begins to flap; and in No. 7, the first part of it disappears round the corner, while the remainder turns up like a hinge at the intermediate

much as they can do in the way of tightening up, by their unaided efforts. And now comes in the use of the tail with its curious appendages; and very odd it is. The pincers supplement the action of the wing-muscles.



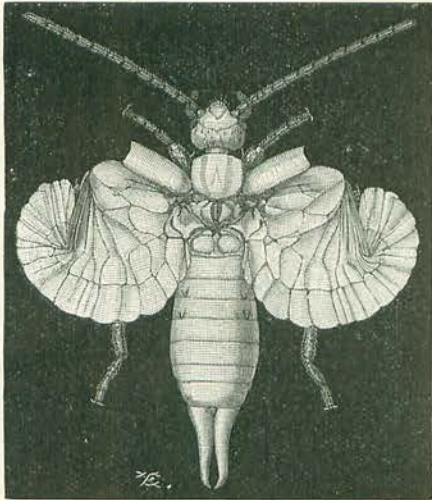
4.—BEGINNING TO CLOSE.



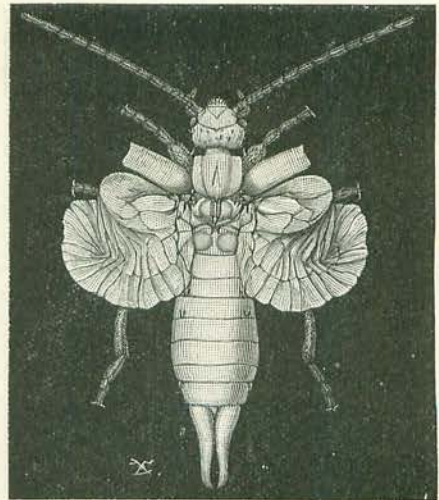
6.—A STAGE FURTHER.

cross - nerves. In No. 8, we find the wing constricted in the middle by the process of folding; while in No. 9, the back part has been nicely tucked away behind the front portion, so that

As soon as the earwig has reached the point of closing represented in No. 11, she suddenly turns up her tail from behind, as you can see in No. 12, opens her forceps, and applies the sharp points of the pincers to the



5.—DOUBLING UP THE FORE-WING FANWISE.



7.—THE BACK PART FOLDING HINGE-WISE.

the whole simulates for a moment a pair of separate wings. In Nos. 10 and 11, again, the folding still continues, till the muscles which move the wings have done as

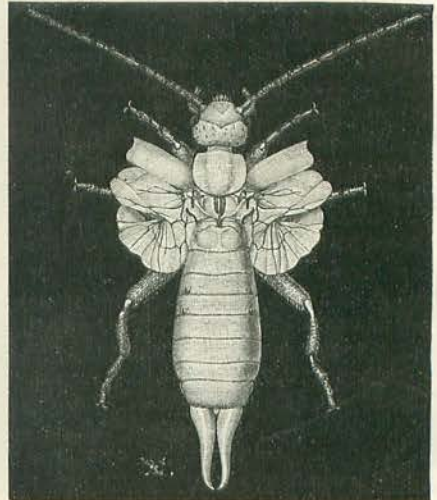
recalcitrant wing-tip, which will not close of its own mere motion. Then, as you can observe in No. 13, she rapidly clips the pincers together, thus tucking in the last bit

of the wing much as a hand might do it. After that, she straightens her body again, as in No. 14, and is ready to replace the folded wings behind the hard wing-covers. Of course, all this process, which we have repre-

has folded them quite back, but has lifted the wing-cases again, as if to fly off once more; this illustration exhibits the size of the wings when fully folded, and enables you to understand their true relation to the outer wing-



8.—A SECOND LATER.



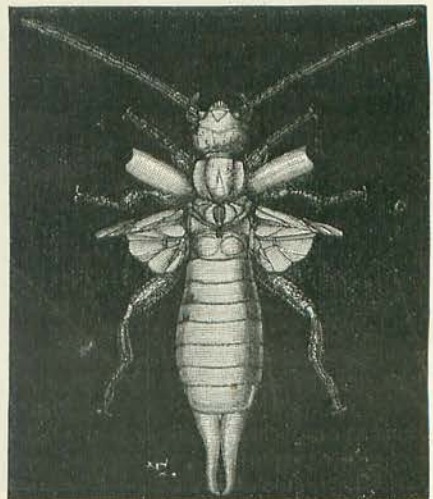
10.—THE PROCESS CONTINUED.

sented here in detail in its various stages, only occupies in life a few brief seconds; so perfect and so automatic is the mechanism that the earwig manages it all as readily as a lady closes up her fan and re-opens it.

cases. Reverting now to No. 2, the mechanism is seen once more completely closed up, and the earwig is prepared to crawl about on the ground in its usual sedate and humdrum manner. But if, after this, you ever despise



9.—THE HIND PART FOLDS BENEATH THE FORE.

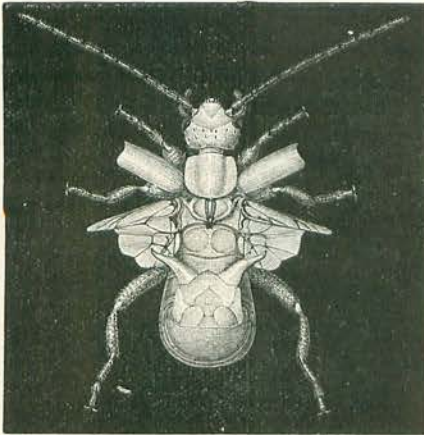


11.—THE WINGS THEMSELVES CAN GO NO FURTHER; SO—

In No. 15, our earwig is shown in the act of replacing the folded wings over the abdomen; while the hard, horny wing-case is beginning to cover them. In No. 16 she

those horrid earwigs, I shall think you have no taste for the wonderful in nature.

Perhaps, however, the most marvellous point in the history of the female earwig is



12.—THE TAIL COMES IN TO HELP THEM.

the fact that she sits on her eggs and takes care of her young exactly as a hen does. She retires underground to lay her eggs, which she deposits in some safe and convenient cranny—usually ready-made for her. She is not herself a good digger, like the mole-cricket, nor has she feet specially adapted for clearing away the soil; she therefore takes advantage of accidental cracks in the ground (being a cave-dweller, not an excavator), and is particularly fond of following the disused burrows of earth-worms. You must remember that the surface-soil is literally honey-combed with burrows of worms, which are not mere holes, but neat small tubes, cylindrical in outline, carefully engineered, and lined throughout with a layer of fine earth, as solid as concrete. The mouth of the burrow is also frequently papered with dead leaves, cemented to the wall by a sticky secretion from the worm's body. These underground tunnels often penetrate the earth to a depth of many inches, and occasionally go down as much as six or seven feet. They thus form excellent approaches or adits, which the earwig can use in prospecting a suitable cranny for her own nursery. If you ask why the worm does not expel the intruder, or stick up a notice to say that trespassers will be prosecuted, I would point out in reply that hundreds of such tunnels are rendered tenantless each day by means of thrushes, starlings, and other

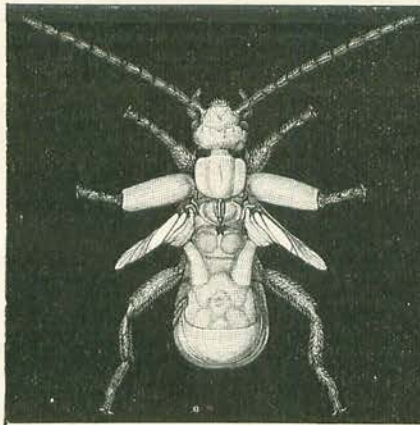
worm-eating birds, which prowl about lawns, gardens, and meadows, picking out the earth-worms as fast as they show their noses above the level of the soil; while hundreds more are made desolate by moles and centipedes. There is thus never any lack of empty burrows which the earwig can appropriate, as the hermit-crab appropriates the empty shells of whelks and periwinkles.

In No. 17 we see the mother earwig safely installed in a nice underground nest, and sitting like a hen on the eggs she has deposited within it. You can dig up such nests and eggs in any garden in January and February. Mr. Enock tells me he sometimes finds them at a depth of six inches. The average number of eggs in a brood runs from

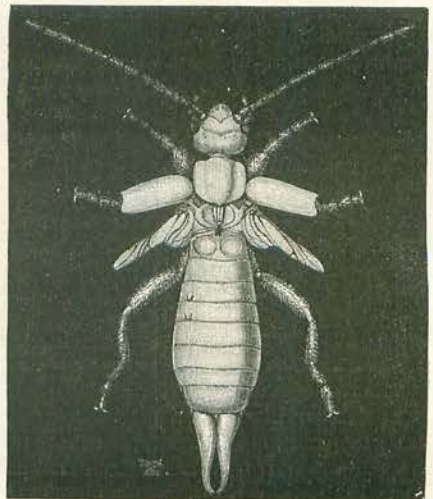
fifty to sixty. The good mother sits on them till they are all hatched out, and even then continues to watch them, as a hen does her chicks, till they have arrived at years, or rather weeks, of discretion.

No 18 is a portrait of the earwig and her numerous family in their first condition. And this picture leads us up to one most interesting point in the earwig's development. You will notice here that the young insects closely

resemble their mother in most respects—far more closely than a caterpillar resembles



13.—THE USE OF THE PINCERS.

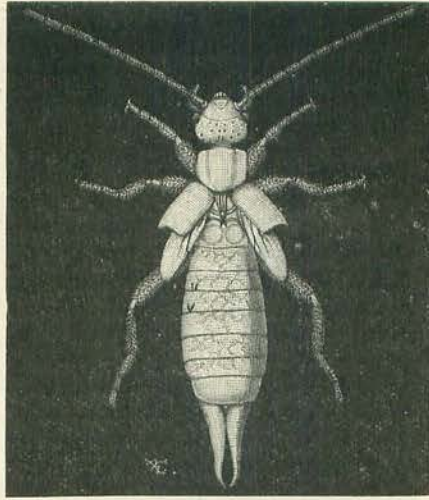


14.—THE TAIL STRAIGHTENED OUT AGAIN.

its butterfly ; they have the same sort of head, the same sort of body, the same sort of tail, and the same peculiar pincers ; but they are quite wingless. Now, this brings out in a very clear way their analogies to and their differences from most higher insects ; it enables us to form a distinct idea of the origin of that standing miracle, the metamorphosis of the maggot into the fly and of the caterpillar into the butterfly.

Some insects have wings, and some have none ; but among insects with none, we may distinguish two classes : those whose progenitors could fly, but who have themselves degenerated so as to become wingless ; and those who never had wings at all, but represent the primitive non-flying ancestor. Several of these early wingless types still persist to the present day ; and they very closely resemble the young of the earwigs. They have a head with a couple of waving antennæ ; they have a body of three segments, each of which bears a pair of legs, but no wings ; they have a long, jointed abdomen ; and at its end they have two appendages which, though not specialized into pincers, distinctly suggest the forceps of the earwig. Indeed, if the baby earwigs always remained in their first larval stage, we might easily mistake them for some of these primitive wingless creatures. No. 19 is a rough sketch of such an early type of non-flying insect, by name Campodea.

The young earwig, however, does not stop short at this point. When born or hatched from the egg, he closely resembles his parents in most respects, and as he grows and moults, he becomes at each change more and more like them, till at last he is justly considered "the

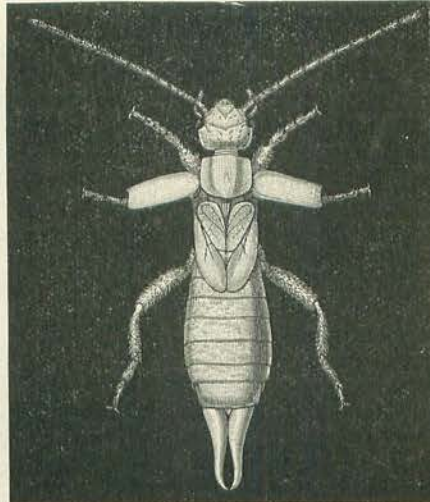


15.—REPLACING THE WINGS BENEATH THE WING-CASES.

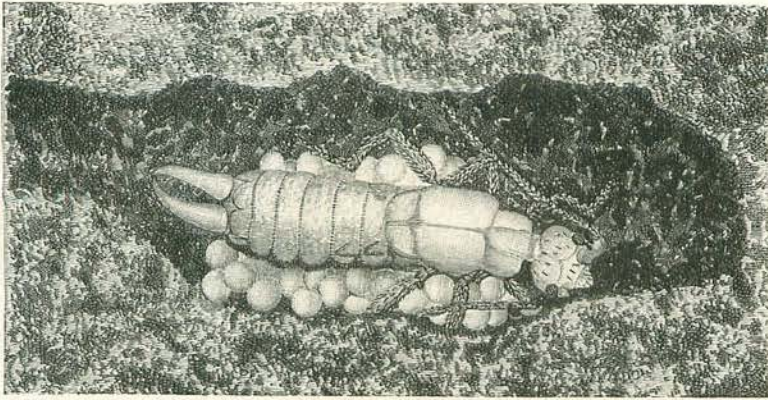
very image of his father." At a certain stage in his development, indeed, we find that on two segments or rings of the body, two prominences or protuberances begin to make their appearance. These are the rudiments of the wings and wing-cases, which grow gradually under the skin, and become fully developed after the last moulting. We may fairly take it for granted, therefore, that in this case the young earwig when first hatched out resembles the original wingless ancestor of the race ; but as time goes on, he begins to assume the various forms which the race has passed through in its advance to the modern winged condition. In other words, the metamorphosis of the individual sums up for us in brief the evolution of the kind.

Observe, however, that the young earwigs do not pass through any distinct and well-marked stages of larva, pupa, and imago—grub, chrysalis, and butterfly—like their more advanced relations. It is true, the names of larva and pupa are frequently given to the two earlier phases in the life of the earwig and its allies. But the terms are misapplied. All that happens to the earwig is a gradual

series of successive moults ; and during one of these moults the wings make their appearance. Moreover, the young earwig when just hatched out of the egg (as you can see in No. 18) resembles its mother in everything essential save in the possession of wings. There is no real metamorphosis, or a very imperfect one ; hardly more change, indeed, than takes place in the growth of humanity ; for the acquisition of walking and the addition of a beard and other adult adjuncts may fairly be compared to the develop-



16.—THE WINGS AT REST ; THE WING-CASES RAISED AGAIN.



17.—THE MOTHER EARWIG SITTING ON HER EGGS.

grub or caterpillar. To this very ancient and somewhat shadowy ancestor the larvæ of the higher insects still more or less revert in their earlier stages; and we may believe that many insects so reverted during many generations. But in process of time, the primitive type developed into a wingless, six-legged

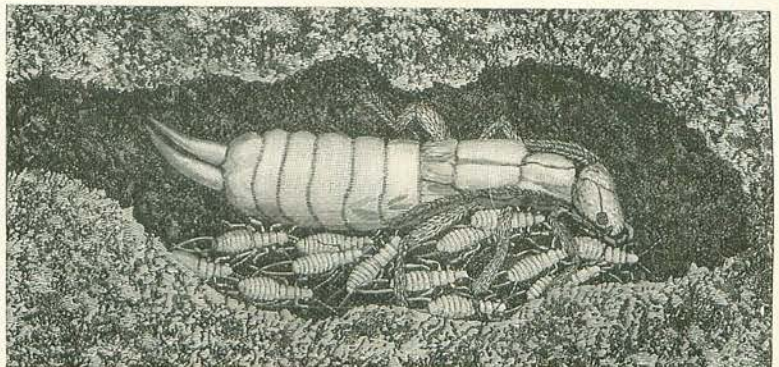
ment of the wings in the growing earwig. It is quite otherwise with those insects which undergo a complete metamorphosis, like bees and butterflies. The young grub in the comb does not in the least resemble the full-grown bee, whether queen, or drone, or worker; the caterpillar does not in the least resemble the beautiful full-grown moth or butterfly.

And here we get another curious piece of cross-relationship; for while the young earwig only "throws back" to a primitive six-legged, wingless insect, such as the one figured in No. 19, the young bee or butterfly "throws back" to a far earlier stage, and is hatched out in the form of a crawling worm—a type which must have belonged to a much more original ancestor. It passes the first stage of its life in this worm-like form; but it does not grow by slow degrees, like the earwig, into its final shape. On the contrary, it suddenly boxes itself up one day in a pupa-case, or chrysalis, lies by dormant for a while, re-arranges its parts entirely, and then rapidly develops into a wholly different creature—a bee or wasp, or moth or beetle. The earwig's change is growth; the butterfly's is a transformation scene.

How are we to explain these facts? I think in this way. Long, long ago, the common progenitor of all the insect tribes was a worm-like creature, with a soft and fleshy body, a few jointed legs, and the general appearance of a

form, like that in No. 19; a form which you can see at once marks a comparatively great advance upon the old, worm-like progenitor. This animal, you can note, has six good legs to run about with, and is already provided with a well-marked head, and with the three body-rings and the long tail or abdomen so characteristic to the last of all higher insects. Its segments have been specialized. From such a type, it is probable the earwigs and their allies were developed by natural selection. But to this day every earwig begins life in a shape which closely resembles that of his first six-legged ancestor, and only gradually acquires his wings and other distinctively earwig-like features.

If you wonder how an animal so small as an earwig can do all the damage it undoubtedly does in gardens, a glance at No. 20 will explain the mystery. You will see from this sketch that the mouth-organs of the little beast are admirably adapted for destroying the petals of your choicest flowers. Nature has provided the earwig with a beautiful series of instruments for cutting holes in leaves and fruits. The figure in No. 20 is



18.—THE MOTHER EARWIG AND HER BROOD OF CHICKS.



the lower part of the mouth, and is covered when at rest by the upper part, which is here placed below it. *M* are the mandibles or cutting jaws; they are formidable implements employed to saw holes in leaves, petals, or seed-capsules; while *C* is the *clypeus* or shield—in other words, the upper lip, which acts as a patent protector for the whole delicate apparatus. *AS* are the antennæ sockets, the feelers themselves having been removed for the purposes of this sketch. The other parts of the mechanism, I regret to say, can only be described in painfully technical language; but as I am generally sparing in my use of technicalities, I trust I may be forgiven this solitary slip on the ground of previous good conduct. *L* is the *labium* or lower lip, which closes the mouth from below when it is not in action. *LP* are the *labial palpi*, used in manipulating the morsel as it is being eaten. *MX* are the *maxille*, or true jaws, employed in masticating the food, and answering in their functions pretty closely to the teeth of higher animals. Last of all, *MP* are the

*maxillary palpi*, chiefly used like a pair of forks in holding the food, and, perhaps, also, in deciding whether it is fit for eating. From this brief description it will be immediately obvious to you that feeding with the earwig is a solemn and very complicated process. It is carried on by a number of distinct organs and implements, the exact purposes of each of which are only known at full to the insect which uses them.

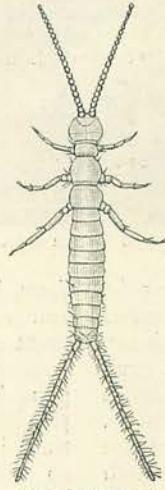
I should add that the antennæ or feelers (not included in this last sketch, but conspicuous in all the previous illustrations) are in all likelihood sense-organs, whose precise nature has never been altogether established. Some naturalists believe that they are used as organs of smell; others that they are combined

organs of touch and guidance; yet others, that they are the seat of a "sixth sense" unknown to humanity. However this may be, it is at least certain that they are useful as a means of communication between the insect himself and his mate, his young, his friends, and his acquaintances.

Earwigs clearly feel their way, to a great extent, by the aid of the antennæ, and also recognise through them their visitors and family. They use them, too, in caressing or fondling their mates and their children. It is known that the antennæ are provided with numerous nerve-terminals, as is always the case with organs of the senses; and I believe myself that, by their means, all insects of the same species are able to communicate more or less with one another by established signals. Perhaps the antennæ emit peculiar perfumes, which are recognised in turn by those of the friend or mate; perhaps it is by touches and strokes that the insects transmit their ideas to one another. But that they do transmit ideas nobody who has watched them closely ever doubts

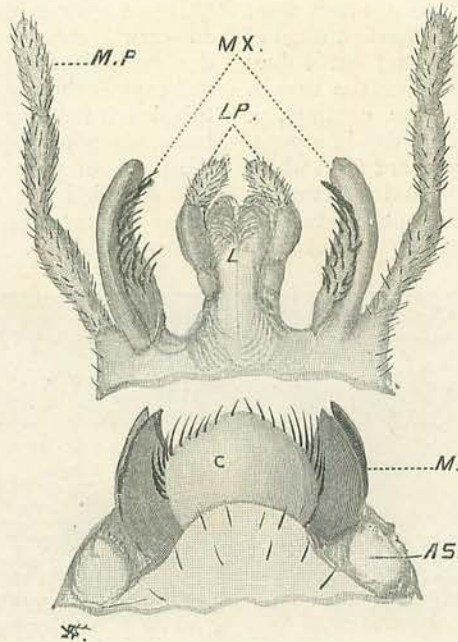
for a moment; and many naturalists even use the word "talking" of the parleys which ants and other insects carry on with their feelers.

It may be thought that an earwig's life, like a policeman's, "is not a happy one." This I hold to be an error. The earwig loves damp and darkness, it is true; but he flies at night in the beautiful twilight or by the soft rays of the moon, while his days are solaced by the companionship of his mate and his chosen comrades; for they are gregarious creatures. The mother tends her young with the assiduity of a hen sitting on her chickens; and food being abundant and cheap, life runs, as a rule, fairly smoothly with the earwig.



19.—CAMPODEA, A PRIMITIVE WINGLESS INSECT.

After Sir John Lubbock.



20.—THE EARWIG'S MOUTH, DISSECTED.