LXXIII.—*A Contribution to the Knowledge of the* Coccidæ.

By T. D. A. Cockerell.

Aspidiotus (*Diaspidiotus*) *Fernaldi hesperius*, subsp. n.

♀.—Scale scarcely over 1 millim. diam., circular, moderately convex, blackish, with a rough, powdery, whitish incrustation; exuviæ central or subcentral, orange. Young scales show a white dot and ring.

♂.—Scale elongated.

♀.—Circular, no constriction between head and thorax; dull orange, appearing by transmitted light pale, with brown marbling, the caudal end orange. Two pairs of lobes, the median lobes like those of *Fernaldi*; second lobes much narrower than in *Fernaldi* and often notched; third lobes altogether absent. Two pairs of interlobular incisions, with chitinous processes or glands; in the first incision the inner process is very much the largest, fusiform, not curved. Spines large, but those at the outer base of the median lobes are short and blunt. Squames (only seen in unboiled specimens) very small, mostly truncate, not in the least fimbriate; a pointed squame in the second interlobular interval; short truncate squames at intervals along the margin beyond the second interlobular interval. Anal orifice to tips of median lobes 30–33 μ; genital orifice to tips of median lobes 96–114 μ. Dorsal glands smaller than in *Fernaldi*, the fourth row absent; first row of about 3 glands, second of about 11, third of about 13.

Circumgenital glands: posterior laterals none to 5, usually 3; anterior laterals 3 to 7, usually 4 or 5; median none to 3, usually 1 or 2.

Hab. Prescott, Arizona, March 1902, densely crowded on the bark of a very large shrub with grey bark and small oval leaves, which are very hairy on the midrib beneath. The scales are so exactly the colour of the bark as to be almost invisible.

This insect will doubtless be considered a valid species hereafter, but it is very close to *A. Fernaldi*, and may stand as a subspecies of it until we know more about the variation of both. It is also close to *A. ostreæformis*, but is readily distinguished from that by the fewer circumgenital glands, the inner chitinous process of first interlobular interval much larger than the outer, and the anal orifice nearer to the hind end.

ALICHTENSIA, gen. nov. (*Lecaniinæ*).

Female scale elongate, with a glassy covering, much like the male scales of Lecaniinæ; a little felted matter, in threads, is visible on the underside of the glassy scale. No rows of air-cells. No ovisac. Antennæ and legs well developed.

Type, *Alichtensia attenuata* (*Lichtensia* (?) *attenuata*, Hempel, Rev. Mus. Paulista, iv. p. 494).

The genus is allied to *Ceroplastodes* and *Lagosinia*.

AUSTROLICHTENSIA, gen. nov. (*Lecaniinæ*).

Female enclosed in a sac which has an elongated dorsal aperture. Margin of female with very long bristles. Antennæ and legs well developed. Skin with numerous tubular glands. Anal ring with six hairs.

Type, *Austrolichtensia hakearum* (*Lichtensia hakearum*, Fuller, Tr. Ent. Soc. Lond. for 1899, p. 457).

PHILEPHEDRA, Ckll., 1898.

The type is *Philephedra ephedræ* (*Pulvinaria ephedræ*, Ckll.).

Philephedra was described as a subgenus of *Pulvinaria*, but recent studies show that it is in reality closer to *Lichtensia*. The sharp marginal spines are just such as are found in *Lichtensia crescentiæ*, *mimosæ*, *lutea*, &c., though *L. viburni*—the type of *Lichtensia*—has these bifid at the end. If *Philephedra* should be considered only a subgenus of *Lichtensia*, then *Lichtensia ephedræ*, Newstead, would have to be renamed.

NEOLECANIUM, Parrott, 1901.

This name was proposed as a subgenus of *Lecanium*; it seems best to regard it as a valid genus. It contains the following species, hitherto referred to *Lecanium*:—*N. imbricatum* (Ckll.), *N. Urichi* (Ckll.), *N. perconvexum* (Ckll.), *N. tuberculatum* (Twns. & Ckll.), *N. Silveirai* (Hempel). The two following are referred here provisionally:—*N. chilaspidis* (Ckll.), *N. Sallei* (Signoret). All of these are Neotropical.

MESOLECANIUM, gen. nov. (*Lecaniinæ*).

Type, *M. nocturnum* (*Lecanium nocturnum*, Ckll. & Parrott, Biol. Centr.-Am., Rhyn. Homop. vol. ii. pt. 2, p. 13).

This appears to be the form from which *Neolecanium* was

derived by the degeneration of the legs and antennæ. The skin shows many large circular or oval pits, a condition intermediate between that of *Calymnatus* and *Saissetia*. The legs and antennæ are well developed. It is a matter of opinion whether this group should be regarded as a genus or as a subgenus of *Calymnatus*. My principal reason for treating it as a genus is that I think it has been independently evolved in the neotropical region, the true *Calymnatus* being derived from the Old World, though some of the species are now cosmopolitan through introduction by human means. *Calymnatus schini* (from Mexico), *C. rubellus* (from Jamaica), and *C. nanus* (from Trinidad) are as yet known only from the neotropical region; but the first may possibly prove not to be a genuine *Calymnatus*, while the other two have very possibly been introduced from the Old World tropics *.

The following, described under *Lecanium*, are now transferred to *Mesolecanium*:—*M. nocturnum* (C. & P.), *M. Mayteni* (Hemp.), *M. phoradendri* (Ckll.), *M. batatæ* (Ckll.), *M. obscurum* (Hemp.), *M. baccharidis* (Ckll.), *M. pseudosemen* (Ckll.). The following are referred here provisionally:—*M. jaboticabæ* (Hemp.), *M. campomanesiæ* (Hemp.).

STICTOLECANIUM, gen. nov. (*Lecaniinæ*).

Type, *Stictolecanium ornatum* (*Lecanium ornatum*, Hempel, Rev. Mus. Paulista, iv. p. 421).

Allied to *Mesolecanium*, with well-developed antennæ and legs, but distinguished by the arrangement of the glands, as described by Hempel. It perhaps represents a transition towards *Eucalymnatus*. I have specimens from Mr. Hempel.

Other American species hitherto placed in *Lecanium* are to be referred as follows:—

TOUMEYELLA mirabilis (Ckll.), Hubbard, *T. quadrifasciata* (Ckll.), *T. turgida* (Ckll.), *T. parvicornis* (Ckll.). Doubtfully referred here are *T. sonorensis* (C. & P.) and *T. pini* (King). All these are North American.

MALLOCOCCUS lanigerus (Hempel). This reference may be doubtful, but I cannot see what else to do with *Lecanium lanigerum*, Hempel.

* *Aspidiotus sacchari* and *Pseudococcus sacchari* (*Dactylopius sacchari*, Ckll.), which I described from the West Indies, have now been traced to the Old World tropics. Numerous other species are known to have been brought to America from the Old World.

Akermes. For the present I will refer here *A. punctatus* (Ckll.), *A. Townsendi* (Ckll.), *A. monilis* (Ckll.), and the Australian *A. levis* (Mask.) and *A. pinguis* (Mask.).

Eulecanium Eugeniæ (Hempel). A surprising reference, but I do not see what else to do with the species.

Saissetia discoides (Hemp.), *S. dura* (Hemp.), *S. glanulosa* (Hemp.), *S. zanthoxylum* (Hemp.).

Eucalymnatus gracilis (Hemp.), *E. brunfelsiæ* (Hemp.), *E. tessellatus* (Signoret).

The above attempt to classify the American (particularly Neotropical) Lecaniines must be regarded as more or less provisional. In the Coccidæ the adults often show the closest possible resemblance, when the larvæ indicate that there is only the remotest real relationship. In order to construct a perfectly satisfactory classification one should possess all the stages and both sexes of every species *. This of course is out of the question at present, and I had shirked the work of grouping the species, referring them, as did others, to the old genus *Lecanium*, which was made to expand indefinitely to suit our convenience. Just now, however, Mrs. C. H. Fernald is about to bring out a bibliographic list of all known Coccidæ, while I have undertaken to revise the genera for Wytsman's 'Genera Insectorum'; so it becomes absolutely necessary to place the species one way or another. This necessity becomes even greater because of the discovery that *Lecanium* has to be abandoned in favour of the prior *Calymnatus* and the undesirability of referring all the species to the latter genus, making a lot of binomials which are certain not to stand.

Dactylopius, Costa (1836?) †.

Through the kindness of Mr. C. D. Sherborn and Mrs. C. H. Fernald I have been able to obtain full particulars regarding this genus, which has been altogether misunderstood by authors. *Dactylopius*, Costa ('Fauna del Regno di Napoli,'

* For example, my genus *Pseudolecanium* was considered an aberrant Dactylopiine, only the larva and adult female being known; but Mr. Kuwana has lately described the various stages, including the male, and Mr. E. E. Green, after studying Kuwana's figures, has reached the conclusion that *Pseudolecanium* is identical with the aberrant Lecaniine genus *Aclerda*, Signoret. When I learned this from Mr. Green I was much surprised, but, after going carefully over the ground, I am sure that he is correct.

† The date of *Dactylopius* has been given as 1835. Mr. Sherborn writes: "date unknown, possibly 1836."

vi. p. 15) was founded on two species—*D. coccus*, Costa, and *D. polonicus*. The latter belonged to the already founded genus *Margarodes*; the former, which is the first mentioned, is to be regarded as the type of the genus. *D. coccus* is said to be *Coccus cacti*, L., but instead of being a synonym of that species (*Monophlebus cacti* *), it is the first available name for the commercial cochineal. The identity of *D. coccus* with the cochineal is thoroughly established by the fact that there is a short Latin description coming before the citations of synonymy, while there follows later a full account in Italian.

The name "*Diasprotectus*" or "*Diaprostocetus*," referred by Signoret and Westwood to Costa, was given only in the Italian vernacular, as I learn from Mr. Sherborn. Berlese cites "*Diaprostechus*, Costa, 1828." Costa wrote "*Diaprostecie*."

The species of *Dactylopius* (usually referred to *Coccus*) will be *D. coccus*, Costa, *D. tomentosus* (Lam.), *D. confusus* (Ckll.), and *D. confusus Newsteadi* (Ckll.).

Pseudococcus, Westwood, 1839.

This name must evidently be used for the genus called *Dactylopius* by authors. It was based on the common mealy-bug and the cochineal—the latter being, as we have just seen, already provided with a generic name. The species first cited by Westwood is *Coccus adonidum*, and it is evident from the context that he meant the mealy-bug, *C. adonidum* &c. of Geoffroy (see also Spon's Encycl. vol. i. p. 699, 1882). I have not been able to find where *Trechocoryx*, Curtis (cited as a synonym by Berlese), was published, but suppose that it was later than *Pseudococcus*.

East Las Vegas, New Mexico, U.S.A.,
April 9, 1902.

Appendix.

Some Brazilian Coccidæ.

The Coccidæ listed below were sent to me by Dr. Göldi and Mr. Carlos Moreira and were all collected in the State of Rio de Janeiro.

Asterolecanium bambusæ, Boisd.

Rio de Janeiro, on cultivated *Bambusa* (*Göldi, Moreira*).

* See Proc. Acad. Nat. Sci. Philad. 1899, p. 261.

Calymnatus viridis (Green).

Rio de Janeiro, on leaves of orange; much attacked by a fungus. The antennæ of this species seem quite variable. Collected by C. Moreira.

Paralecanium marianum, sp. n.

♀.—Long-oval, a little over 4 millim. long and 2 wide, shining red-brown, strongly pitted; back obtusely longitudinally keeled. Marginal area with some very thin easily deciduous wax. After boiling the insect remains deep ferruginous, with the submarginal area darker. The darkened submarginal area contains numerous oval hyaline gland-pits, the largest of which are 24 μ long; the larger are placed longitudinally, the smaller mostly have their long axis placed transversely. The central portion of the insect is similarly provided with pits or orifices, but they are smaller and less numerous; about the middle of the back they are 10 μ long and 75 μ apart. Marginal spines or plates fan-shaped, with fimbriate edges; not close together, but separated by intervals of about 30 μ. Stigmatal spines short, in threes, sunk in a deep square cavity. Anal ring with six very long (150–186 μ) very dark brown bristles. Anal plates dark brown, of the usual form, 120 μ long. Mouth-parts 105 μ diameter. On each side in the cephalic region is a large oval opening about 65 μ long, apparently containing an eye. Legs ordinary; femur + trochanter 198, tibia 135, tarsus 72 μ long; claw-digitules with bulbous bases and very large knobs. Antennæ very slender, 7-jointed, joints measuring in μ:—(1) 30, (2) 45–48, (3) 90–99, (4) 69–70, (5) 30–35, (6) 24–27, (7) 51–54. A very long hair near end of second joint and a similar one near end of fourth.

Hab. Maria, State of Rio de Janeiro, on leaves of a tree not determined (*C. Moreira*).

Paralecanium has hitherto been known only from Australia (*P. Frenchii*, Maskell) and Ceylon (*P. planum, maritimum, geometricum, marginatum*, and *expansum*, all of Green). The present form has the aspect of a *Mesolecanium*, but the fan-shaped marginal scales and the cephalic orifices place it without doubt in *Paralecanium*.

Ceroplastes Fairmairii, Targioni.

Rio de Janeiro, on the clove-tree (*Göldi*).

Very much like the Asiatic *C. ceriferus*, but apparently distinct by the longer anal horn. New to Brazil.

Chionaspis citri, Comstock.

Rio de Janeiro, on leaves and stems of orange (*Moreira*). New to Brazil.

Pinnaspis pandani (Comstock).

Rio de Janeiro, on *Areca catechu*; a rather large red form (*Göldi*). Also on *Areca lutescens*.

New to Brazil. (This and the last have evidently been introduced with plants.)

Pseudaonidia trilobitiformis (Green).

Rio de Janeiro, on leaves of *Ficus scandens* in cultivation (*Göldi*).

An introduced species, native of the East Indies.

East Las Vegas, New Mexico, U.S.A.,
April 25, 1902.

LXXIV.—*On Two new Earthworms of the Family* Megascolicidæ. By Frank E. Beddard, F.R.S.

The present communication contains a description of two Acanthodriloid earthworms which I believe represent new species of their respective genera, viz. *Octochætus* and *Benhamia*.

(1) *Octochætus Beatrix*, sp. n.

I refer the single specimen of this worm in my possession to the genus *Octochætus** by reason of the two pairs of spermiducal glands in segments xvii and xix, the diffuse nephridia, the single gizzard, and the eight setæ in each segment. But it is clearly a new species, though not very widely removed in its structure from a species recently described from the same quarter of the world by Miss Fedarb†.

The worm, which is fully mature, measures 70 millim. in length, but is evidently rather contracted. The diameter is 4 millim. at most. The pigment of the skin, if any, has

* This genus was founded by myself (Proc. Zool. Soc. 1892, p. 668) for four species of earthworms (lately reduced by Dr. Michaelsen, in 'Das Thierreich,' Lief. 10, Oligochæta, 1900, p. 319, to three) from New Zealand. I cannot help agreeing with Michaelsen (Zool. Jahrbücher, xii. Abth. f. Syst. p. 242) that Miss Fedarb's *Benhamia Aitkeni* must go into the same genus.

† Journ. Bomb. Soc. xi. 1898, p. 432.