

I imagine that both these forms are new; and, as remarked above, the occurrence of members of this genus seemingly only on birds in and around New Zealand is somewhat interesting.

EXPLANATION OF PLATE XVII.

- Fig. 1. *Ixodes apteridis*, female, dorsal view, about seven times natural size.
 Fig. 2. " male, dorsal view, about ten times natural size.
 Fig. 3. " mouth-organs, magnified.
 Fig. 4. " rostrum, highly magnified.
 Fig. 5. " foot, highly magnified.
 Fig. 6. " spiracle, highly magnified.
 Fig. 7. *Ixodes aptericola*, female, dorsal view, about five times natural size.
 Fig. 8. " rostrum, highly magnified.

ART. XXVIII.—*Further Coccid Notes: with Descriptions of New Species, and Discussion of Points of Interest.*

By W. M. MASKELL, Registrar of the University of New Zealand, Corr. Mem. Roy. Soc. of South Australia.

[Read before the Wellington Philosophical Society, 20th January, 1897.]

Plates XVIII.—XXII.

THE following paper contains, perhaps, fewer "novelties" than some of my former ones, but such species as *Lecanium mirificum*, *Inglisia fossilis*, or *Sphærococcus socialis* are as interesting as any yet known; and I think that if my identification of *Monophlebus burmeisteri* is correct, as I believe it is, we have here a valuable addition to our knowledge of Coccids.

I am greatly indebted to Messrs. Koebele, French, and Lea for the numerous specimens which they have sent me. Those from Mr. Koebele are especially interesting as showing the wide range of many species already known—e.g., *Aspidiotus ficus* and *A. destructor*, *Parlatoria zizyphi*, *Eriochiton cajani*, *Icerya seychellarum*, &c. Some of these, such as *E. cajani*, *Ceroplastes rubens*, are doubtless indigenous in many lands; others, such as *A. ficus* or *P. zizyphi*, have probably been introduced by the modern extension of traffic. Fifteen of the species mentioned in this paper have been received from Mr. Koebele, from China, Japan, and adjacent countries: of these, I find that only three can be considered as new; but, in fact, the collection of Coccids in the extreme oriental region is

as yet only in its infancy, and there are surely many scores still to be discovered.

The appointment of Mr. Lea as Government Entomologist of Western Australia has naturally resulted in the finding of many Coccids, several of which are given in this paper and are very interesting. Reverting to an old question of mine still unanswered, I should be obliged to any one who could suggest or explain how such a species as *Sphærococcus socialis* forms its gall.

In the "Berliner Entom. Zeitschrift," 1894, Mr. E. H. Rübsaamen has a paper upon certain Australian Homoptera and Diptera. Much of this is taken up by rather rough criticism of some observations of Mr. J. G. O. Tepper, of Adelaide, as to which it may be sufficient to say that the critic would have done well to acquire some greater knowledge of Coccids than he appears to possess before he proceeded to vilify others. As regards the only Coccid in his paper with which I am connected, I cannot by any means accept his *Crocidocysta froggatti*, which is nothing but *Cylindrococcus amplior* of my paper of 1892 (mentioned without a name by me in 1891). Mr. Rübsaamen's fig. 19, in his pl. xv., of the adult female, is an extraordinary one, showing four distinct wing-cases. Probably these are intended to represent segments with processes such as are shown in my figures of *C. casuarinæ* (1891). When naming *C. amplior* in 1892 I stated that the female is exceedingly like that of *C. casuarinæ*, and the larva also. Mr. Rübsaamen's figures of his larva are almost exact copies, a little enlarged, of mine of *C. casuarinæ*, his figure of the gall is like those of both *casuarinæ* and *amplior*, and the details (feet, antennæ, &c.) answer entirely for either. I see absolutely nothing, either in his figures or in his description, to warrant the establishment of "*Crocidocysta*." It is to be observed that Mr. Rübsaamen, writing in 1894, appears to have been entirely unacquainted with any of my papers except that of 1891, and, indeed, attempts to make merry over poor Mr. Tepper, who had referred to my name, "*Idiococcinæ*," of 1892, which his critic knew nothing about.

There is a point in the paper just mentioned which is of greater importance. I mean the proposal to change Schrader's name, "*Brachyscelis*," to a new one, "*Apiomorpha*," on the ground that the former was employed by somebody in 1834 for something else. It is high time that this practice of upsetting on trivial grounds a well-established custom should be abolished. Convenience may dictate that when an author has invented a generic name previously appropriated he should be recommended to change it for another. But this should be done either by that author himself or during

his lifetime by another person with his consent. No man would be so rude as to disregard a civil remonstrance or refuse to make a necessary correction, and there could be no possible difficulty in finding the address of any systematist. But it is not right that one who has made a special study of any form, or group of forms, and who has inadvertently duplicated a name, should be deprived of the honour (whatever that may be) which should attach to his work. It is still more intolerable when the wrong is done to one who is dead. For the corrector, who may perhaps be partially or wholly ignorant of the subject itself, and simply a grubber amongst catalogues or antiquated books, poses henceforth as the real student, relegates the original worker to the secondary position of a synonymist, and parades, like the proverbial jay, in peacock's feathers. The thing is, indeed, becoming an intolerable nuisance, and in this particular case I strongly protest, on behalf of Schrader, who is long deceased, against his removal to an inferior position in favour of Mr. Rübsaamen, for the name "*Brachyscelis*" has been in common use for nearly fifty years, and Schrader's work has never, as far as it went, been found erroneous.

I do not desire to be understood to deprecate all and every wish for clearness and accuracy. When, in 1884 (Trans. N.Z. Inst., vol. xvii., p. 17), I objected to the use of the name "*Chermes*" in both *Aphididæ* and *Coccidæ*, and proposed to confine it to the *Coccidæ*; calling the aphids "*Kermaphis*," my argument was based on the fact that the two families are Homoptera, and closely allied; consequently confusion might very easily arise. But what confusion could there be between, say, a Mammal and a Crustacean, a Mollusc and a Conifer, or, as in Schrader's case, between a Chrysomelid and a Coccid?

Further, I agree that in the case of any species mentioned by various authors under various generic and specific names the credit should be given to the first describer. Thus Hartig, in 1837, described a Coccid as *Aspidiotus pini*. Signoret, in 1870, pointed out that it belonged to the genus *Leucaspis*. Rightly the insect has since been known as *Leucaspis pini*, Hartig. In the same way the insect described by Douglas as *Crossotosoma ægyptiacum* is now correctly *Icerya ægyptiaca*, Douglas. But if any one had objected to *Crossotosoma* merely as having been previously used it would have been an injustice to Mr. Douglas if, without his consent, he had been set down as merely a synonymist.

Mr. W. L. Distant, in the Ent. Mo. Mag., Jan., 1895, has some remarks on this matter which are eminently correct. Mentioning that the name "*Zygæna*" has been used in connection with both Insecta and Pisces, he says, "There is

nothing to prevent a collector of British moths, by the substitution of a name, from figuring as the creator of a genus of sharks." Really the thing will ere long be reduced to such absurdity that it will kill itself, and the sooner the better.

Recognising, as I do, the fact that this "priority" craze has been the outcome, to a great extent, of an "International Congress of Zoologists," held in Paris and Moscow (and Zurich?) during the last few years, I yet venture to point out that science is essentially republican, not subject to the dictation or domination of anybody; consequently blind obedience to the orders of such a congress is not necessary. I find in a copy of the results of the congress, obligingly sent to me by my friend Dr. R. Blanchard, of Paris, the following dictum: "Every generic name which has been already employed in the same kingdom must be discarded." This, of course, permits any amount of duplication between the animal and vegetable kingdoms; and, in strict interpretation, it does not authorise any one except the original inventor to make alterations: yet from some such rule as this has come the mischievous system which I have referred to. In its actual wording the rule is unexceptionable; no author ought to select for a genus a name previously in use if he can help it. But this is not saying that another person has any right to correct such an error without the author's consent, and so to usurp credit which does not belong to him.

For myself, I intend to employ the name "*Brachyscelis*," Schrader, whenever it comes in my way to refer to the genus to which he gave that name.

Section DIASPIDINÆ.

Genus ASPIDIOTUS.

Aspidiotus bossiezæ, Maskell.

I find that the real colour of the female puparium in this species is snowy-white. The specimens from which I originally described it were obscured by fungus. Mr. French has sent me several during the year (on the same plant, *Bossiea procumbens*) which are not so covered, and they look as if coated with white sugar, with a small ring over the larval pellicle. They form quite a pretty microscopic object.

Aspidiotus ceratus, Maskell.

I have received specimens of this species from Mr. Lea, Western Australia. Some of the puparia have a slightly yellow tinge. Mr. Lea says, "Only one twig on a tree usually affected, but that twig densely covered."

Aspidiotus rossi (Crawford), Maskell.

This species is fast becoming cosmopolitan. It is found in

California, China, Australia, South Africa, and other countries; and has now reached New Zealand. Specimens have been sent to me by Captain Broun, on olive, from Whangarei. It is by no means particular as to either locality or food-plant.

Aspidiotus articulatus, Morgan, var. *celastri*, var. nov.
Plate XVIII., fig. 1.

Puparium of female larger than that of the type; and the colours of the pellicles and of the secreted portion are rather brownish than greyish.

The adult female is also larger than the type, reaching a length of $\frac{1}{11}$ in. The abdominal lobes and scaly hairs, the deep groove separating the thorax from the abdomen, and the prominent small subconical process on each side of the thorax above the groove are identical with those of the type. But there are four groups of spinnerets, as against two in *A. articulatus*; the upper groups have 6 to 8 orifices, the lower (which are long and narrow) 8 to 12.

Hab. At the Cape of Good Hope, on *Celastrus laurinus*. My specimens were sent by Mr. Lounsbury on a plant in the Museum herbarium at Capetown, collected in 1825.

Mr. Morgan, in his description (Ent. Mo. Mag., Aug., 1889, p. 352), does not make any mention of the small conical process or spine on the margin of the thorax of this species. This, however, appears to me to be a sufficiently important character, and its presence in the insect now under review is a strong incentive to me to make it only a var. of *A. articulatus*, in spite of the greater number of spinneret groups. There is something analogous to this spine in *Diaspis boisduvalii*, Signoret, but there it is much less conical.

In the Ent. Mo. Mag., Sept., 1896, p. 199, Mr. E. E. Green describes two new insects allied to *A. articulatus*, with figures, but he neither mentions nor delineates any marginal cones on the thorax.

Aspidiotus ficus (Riley), Comstock.

This insect occurs in Japan, on *Quercus cuspidata*, and probably on several other plants. I have had specimens sent by Mr. Koebele during the year.

Aspidiotus destructor, Signoret. Plate XVIII., fig. 2.

Mr. Koebele sent me some leaves of *Celtis occidentalis* from Hongkong, on which were several insects which I cannot attach to any species except *A. destructor*, for the reason that the two median lobes are shorter and smaller than the next pair outside them. As the species is probably widely distributed in the tropics (at least, in the Oriental region), I give a magnified figure of the extremity to exhibit this cha-

racter. In size, colour, scaly serrated hairs, &c., the insects from Hongkong exactly resemble those on cocoon from Mauritius and the Laccadive Islands. (See "Indian Museum Notes," vol. iii., p. 66.)

Aspidiotus setiger, sp. nov. Plate XVIII., fig. 3.

Puparium of female very dark-brown or intense dull-black; circular; convex; diameter, about $\frac{1}{11}$ in. The larval pellicle is central, very small, forming a minute apical shiny-black boss. Texture of puparium thick and solid. On turning it over the inside is smooth and black, with reddish edge.

Puparium of male light-brown, subelliptical, flattish; length, about $\frac{1}{25}$ in. Pellicle yellowish.

Adult female very dark-brown; form normal; length, about $\frac{1}{15}$ in. Abdomen tapering, with rather wavy sides; terminated by six subequal lobes, the outer margins of which are sloping and very minutely serratulate; between the two median lobes are two short, slender, club-shaped organs, and above them four others longer and larger. The margin of the abdomen beyond the lobes is serrated and marked with many short, elongated pores set closely together. Between the lobes are some short, serrated, scaly hairs. Four groups of spinnerets: upper groups with 10 to 14 orifices; lower groups, 10 to 12. On the thoracic and cephalic regions there are several rather long hairs with tubercular bases.

Adult male unknown.

Hab. In Japan, on *Quercus*, sp. My specimens were sent by Mr. Koebele from Yokohama.

This insect approaches *A. rossi* in the form and colour of the puparium and in the abdominal lobes, but it is larger, and differs also in the club-shaped organs. The thoracic and cephalic spiny hairs appear to separate it from all known species.

Aspidiotus dictyospermi, Morgan, var. *arecæ*, Newstead.

This insect has been sent to me by Dr. Alcock, of the Indian Museum, on tea, in India: the exact locality is not mentioned. All the characters agree with Mr. Newstead's description.

Genus DIASPIS.

Diaspis calyptroides, Costa.

During the year I have received from Dr. Alcock, of the Indian Museum, Calcutta, an insect on prickly pear from Southern India, which I found on examination to be identical with a form known as *Diaspis cacti*, Comstock (2nd Cornell University Report, 1883, p. 91). On further and closer scrutiny it appeared to me that *D. cacti* could not be speci-

fically separated from *D. calyptroides*, the differences mentioned by Comstock being, first, a slight variation of colour, and, secondly, slight variations in the spinnerets. I cannot help thinking that these are not specific differences, and I have frequently refrained from using them as such, and, indeed, have not always made them foundations even for varieties. Therefore I gave Dr. Alcock an identification of his insects as *D. calyptroides*, var. *cacti*, Comstock.

In 1893 Mr. Newstead described (Ent. Mo. Mag., 1893, p. 188) an insect on cactus from Demerara as *Diaspis opuntiae* (a name which he afterwards changed to *opunticola*). I agree with Mr. Cockerell, who (Canad. Entom., 1894, p. 127) considers this as a variety of *D. cacti*; further, I believe that *D. opuntiae*, Cockerell (Journ. Inst. Jamaica, 1893, p. 256), is the same species. Probably climate, or a variation of the species of cactus on which the insects feed, may account for the small differences noticed, and I think the classification of the species may be taken as—

- D. calyptroides*, Costa, 1827; syn. *Aspidiotus echinocacti*, Bouché, 1833.
- " var. *cacti*, Comstock, 1883.
- " var. *opuntiae*, Cockerell, 1893.
- " var. *opunticola*, Newstead, 1893.

Mr. Cockerell has priority for his variety, which was published before that of Mr. Newstead, so that the latter will disappear if the two are found to be absolutely identical. I may remark that my observations have been made upon type specimens of all except var. *opuntiae*.

***Diaspis amygdali*, Tryon.**

Specimens of this insect, which have been sent to me from Hongkong, on geranium, are identical with a form which Mr. E. E. Green sent me in 1893 on the same plant from Ceylon. At that time Mr. Green proposed to give the insect the name of *D. geranii*, and I am not sure that it may not very well be considered as a variety. But in his paper in "Indian Museum Notes," vol. iv., No. 1, p. 3, he mentions it as *D. lanata* (which = *D. amygdali*), and I will not now disturb the arrangement.

GENUS PARLATORIA.

***Parlatoria perpusilla*, sp. nov. Plate XVIII., figs. 4–9.**

Puparium of female waxy, dark-orange-coloured, semi-transparent, very convex, the base circular and in some specimens with a slightly flattened margin, the form sometimes subspherical sometimes subconical and truncate; the height is equal to the base. The upper portion is frequently

marked with a reticulate pattern, which is more noticeable in the truncate than in the spherical specimens. The enclosed insect may be detected through the puparium, but it is impossible to make out with any approach to distinctness either of the two pellicles. Diameter of the base of the puparium about $\frac{1}{80}$ in.; scarcely visible to the naked eye.

Puparium of male not certainly observed, but probably white and elongated.

Adult female of normal form, the anterior portion smoothly rounded, the abdomen distinctly segmented and tapering. Colour dark - reddish - brown. Length, about $\frac{1}{90}$ in. The margins of the anterior abdominal segments are somewhat truncate. The abdomen ends in the normal deep serrations of the genus, which extend along the whole margin, and between them many broad scaly hairs extending beyond the serrations and ending in distinct denticulations. There are no groups of spinnerets.

Adult male unknown.

Hab. In Western Australia, on a species of *Hakea*, which bears instead of leaves many cylindrical, rather thick, light-green spikes with sharp points. My specimens were sent by Mr. Lea, from Geraldton.

This is the smallest Coccid known to me; the unaided eye can only just detect on the greenish spikes of the plant some excessively minute reddish specks, which are the puparia. I have placed it in *Parlatoria*, on account of the deep serrations of the abdominal margin and the prominent denticulate scaly hairs; but the puparium is unlike any others with which I am acquainted, and the absence of spinneret-groups is also abnormal.

Parlatoria proteus, Curtis.

Mr. Froggatt has sent me specimens of this species, on *Pinus insignis*, from the Botanical Gardens, Sydney. They are slightly smaller than usual, a fact which may be attributed to the slenderness of the pine - needles. In other respects they perfectly agree with the type.

Parlatoria proteus, Curtis, var. *virescens*, var. nov

Puparium of female distinctly green in colour; the pellicles orange. The secreted portion is subelliptical, the pellicles comparatively small, terminal. Length, about $\frac{1}{8}$ in.

Puparium of male green, elongated, subcylindrical; length, about $\frac{1}{5}$ in.; pellicle dark-orange, small, terminal.

Adult female of normal subglobular form, dark-brown. Abdomen terminating in the usual six elongated lobes with a fringe of conspicuous broad serrated scaly hairs. Beyond the lobes on each side there is an exceedingly small and

short spine with a tubercular base. Four groups of spinerets, each with 6 to 10 orifices.

Larva subglobular, dark-brown; length, about $\frac{1}{100}$ in. Abdomen terminated by a minutely-serrated margin, on which are four small subcylindrical lobes.

Male pupa dark-red, elliptical; length, about $\frac{1}{5}$ in. The abdominal margin exhibits six lobes and a fringe of broad scaly hairs as in the female.

The female puparium when overturned is seen to have two longitudinal keels, which form a deepish groove in which the insect lies.

Hab. In China, on *Myrtus*, at Amoy, and on *Camellia*, at Macao: the latter are somewhat smaller than the former. My specimens are from Mr. Koebele.

All the species of *Parlatoria*, with the exception of *P. zizyphi* and *P. perpusilla*, are difficult to differentiate. The colours of the puparium vary somewhat, and the present form, by its greenness, approaches rather to *P. myrtus*, Mask., 1890, than to *P. proteus*, in which the puparium is light-brownish-yellow; and in the smallness of the pellicles it also resembles *P. myrtus*. But I have preferred to attach it to *P. proteus*, on account of the small spine on the margin beyond the lobes, which entirely agrees with my specimen of that species, and also with a figure of it given by Comstock (2nd Cornell Report, 1883, plate iv., fig. 3). This spine is wanting in *P. myrtus* and also in *P. pittospori*, Mask., 1890, and it is replaced by a small lobe in *P. pergandei*, Comst., 1880.

It is possible that at a future time *P. proteus* may be taken as a type, as follows:—

- P. proteus*, Curtis, 1843.
- " var. *pergandei*, Comstock, 1880.
- " " sub-var. *camellia*, Comst., 1883.
- " var. *myrtus*, Maskell, 1890.
- " var. *pittospori*, Maskell, 1890.
- " var. *virescens*, Maskell, 1896.

Parlatoria zizyphi, Lucas.

I have received specimens of this species during the year from Hongkong, on oranges, sent by Mr. Koebele. Evidently the insect is being rapidly spread over the world now by the extension of the fruit trade.

In connection with this point the following circumstance may be interesting, and also amusing, at least to economic entomologists. In my paper of 1895 I reported that *P. zizyphi* was found in Western Australia on oranges and lemons imported there from Sicily. The fruit sent to me by Mr. Lea was very thickly-covered with insects—indeed, dangerously so;

and it appears that the Agricultural Department of Western Australia came to the conclusion that the interests of fruit-culture in that country demanded stringent measures. Therefore they prohibited, if not entirely, at least to a large extent, the importation of these fruits. In consequence, the price of oranges and lemons rose considerably, and as the climate is hot, and the goldfields population thirsty, there was some little trouble. A newspaper of Perth, the *Morning Herald*, sent a representative to interview a principal fruit merchant of that city, and to obtain from him his views on the matter. To the question, "What is your opinion regarding the regulations of the Bureau of Agriculture with reference to the importation of fruit?" the merchant, a Mr. Harris, gave the following reply: "Speaking from a common-sense point of view, I think them harassing and unnecessary. The authorities maintain that the regulations are made to protect the colony from the introduction of scale. In common with many other close observers, I believe that scale is no disease at all, but that it is produced by the dripping of moisture from the leaf on to the rind of the fruit. Crystallization is produced, and then animalculæ. Although unsuspectedly, these do not affect the development or the flavour of the fruit, and when it is peeled the insect life ends." This almost inconceivable rubbish is printed by the newspaper in large type, and seemingly without any comment, and the intelligent reporter appears to have been perfectly satisfied that "close observers," who must of course be competent, believe fully in the generative powers of "crystallized dew" ! Mr. Harris's views were naturally tinged by considerations of interest; but it is scarcely satisfactory that nonsense of the sort should be promulgated by the public Press. It will not in the least surprise me if some day we see in our own newspapers a paragraph stating that scale is now discovered to be no insect at all, but a product of the crystallization of water; and many people who dislike restrictive regulations which interfere with them will eagerly accept this view as another argument against scientific knowledge or authority.

Genus MYTILASPIS.

Mytilaspis maideni, sp. nov. Plate XIX., figs. 1-3.

Puparium of female reddish-brown, usually straight, sometimes very slightly curved; convex, elongated, very slightly widened posteriorly. Only one reddish-brown pellicle is visible at the extremity, the second pellicle being covered with secretion; but this second pellicle is small, not extending more than one-third of the length of the puparium, and it is also smaller than the adult female. The puparium is marked by conspicuous and deep transverse, corrugations

and grooves, which appear to be usually nine or ten in number. Length of puparium, about $\frac{1}{20}$ in.

Puparium of male similar to that of the female, but smaller; length, about $\frac{1}{25}$ in. In this case, of course, there is only a single pellicle, which is reddish-brown. The puparium is straight, convex, and deeply corrugated, and may be distinguished from that of the female (apart from the size) by the lighter colour of the corrugations, which are usually eight or nine in number.

Adult female dark-brown, elongated, of the normal form of the genus; length, about $\frac{1}{8}$ in. The extremity of the abdomen is truncate, with nearly straight edge, bearing six very small nearly transparent lobes, each of which is sub-triangular, with an indentation on each side: these lobes are placed rather far apart, and the two median ones are a little larger than the others. There are two rather broad conical short spines between each pair of lobes, and sometimes three between the second and third. There are no groups of spinnerets, but many single orifices. The anterior portion of the abdomen exhibits three conspicuous corrugations, each of which bears on the margin at each side three or four broad cylindrical hairs with serrated ends.

The male pupa is dark-brown. The adult male is red, of normal form; length, exclusive of the spike, about $\frac{1}{6}$ in.: the spike is almost half as long as the body. Antennæ rather thick, with the normal ten hairy joints. Wings, feet, and eyes normal.

Hab. In Australia, on *Litsea* (or *Litsaica*) *dealbata*. My specimens were sent by Mr. Froggatt, from Ballina, Richmond River, New South Wales. I have the pleasure of attaching to it the name of Mr. J. H. Maiden, botanist to the Agricultural Department, Sydney.

This is an extremely pretty little species, and the deeply-grooved puparia are unlike any which I have previously seen. On the leaf sent to me there were many more males than females. In the appearance of only one pellicle on the female puparium the species approaches *Fiorinia*, but in that genus the second pellicle is much larger than the adult, and occupies almost the whole puparium.

Mytilaspis citricola, Packard, var. *tasmaniæ*, var. nov.

Puparia of both male and female not differing in any important particular from those of the type.

Adult female similar to the type, except that the third lobe on each side of the abdominal margin is rather more prominent, and that the spinnerets are more numerous: the upper group has 8 to 10 orifices, the upper laterals 12 to 15, the lower laterals 12 to 18.

Hab. In Tasmania, on *Pomaderris apetala*. My specimens were sent by Mr. H. S. Dove, who says that the insect is not plentiful.

***Mytilaspis acaciæ*, Maskell, var. *albida*, var. nov.**

The puparia of this variety are lighter in colour than the type, being greyish-white. The median abdominal lobes are perhaps a little more prominent. In other characters I see no important differences.

Hab. In Western Australia, on *Acacia*. Specimens from Mr. Lea, who says, "Usually on trunk, very seldom on twigs, perhaps never on leaves."

***Mytilaspis defecta*, sp. nov. Plate XIX., fig. 4.**

Puparium of female snowy-white, somewhat pyriform; pellicles yellow; texture loose; length, about $\frac{1}{3}$ in.

Puparium of male similar, but more slender.

The puparia of males and females are frequently on separate twigs.

Adult female yellowish-brown, of normal elongated form; length, about $\frac{1}{10}$ in. Abdomen destitute of lobes; the margin entire; the extreme median portion slightly produced. Five groups of spinnerets: upper group with three orifices; upper laterals, 7 to 9; lower laterals, 9 to 11. Within the margin, near the extremity, and on the margins of the anterior abdominal segments there are wide but shallow tubercular swellings covered with numerous large subcircular or oval pores, the two tubercles near the extremity being more prominent than the others.

Hab. In Western Australia, on (?). Mr. Lea sent me specimens from the Darling Ranges.

The absence of lobes and the marginal tubercles clearly distinguish this species and its variety next to be described.

***Mytilaspis defecta*, var. *tincta*, var. nov.**

Puparium of female similar to that of the type, but slightly tinged with greyish-yellow, and also perhaps with a more solid texture.

Puparium of male as in the type.

Adult female as in the type, but the submarginal pores are smaller, and the tubercles less distinct.

Hab. In Western Australia, on *Hakea*, sp., the same spiky plant which bears *Parlatoria perpusilla*. My specimens were sent by Mr. Lea, from Geraldton.

***Mytilaspis crawii*, Cockerell, var. *canaliculata*, var. nov. Plate XIX., figs. 5, 6.**

Puparium of female irregularly mussel-shaped, but the outline is indistinct, the whole being covered by a very thin scale

of the fluffy hairs from the surface of the leaf. Through this scale a narrow semicylindrical groove is visible, and on turning over the puparium the insect is seen occupying this groove, the pellicles being terminal. The whole is inconspicuous, being about the same colour as the leaf. Length, about $\frac{1}{12}$ in.

Puparium of male similar to that of the female, but smaller. Length, about $\frac{1}{16}$ in.

The adult female is yellow, exhibiting the very large median lobes, hairs, and deep indentations of the type. There are five groups of spinnerets: upper group with 2 to 3 orifices; upper laterals, 8 to 11; lower laterals, 5 to 6.

Adult male unknown.

Hab. In Japan, on *Quercus cuspidata*. My specimens were sent from Yokohama by Mr. Koebele.

Mr. Cockerell, in his description of *M. crawii*, in a paper published by the U.S. Department of Agriculture, 1896, entitled "Some Mexican and Japanese Injurious Insects," makes no mention of any groove in its puparium, and states that it has four groups of spinnerets. This last character is always somewhat variable, and perhaps in his specimens the two anterior orifices were absent. The groove may have been accidentally omitted by him. All other characters are absolutely identical with mine. Curiously, on the very same page of his paper he reports a grooved species from Central America, *M. carinatus* (*carinata*?), but that is clearly distinct in other particulars. I know of no other species with a similar groove except the male of *Fiorinia asteliæ*.

GENUS CHIONASPIS.

Chionaspis aspidistræ, Signoret, and its allies.

In the "Entomologists' Monthly Magazine" for March, 1896, p. 60, Mr. Newstead discusses the affinities of *C. aspidistræ* and *C. brasiliensis*, Sign., concluding that the two are identical. In a paper sent to the same journal (see Ent. Mo. Mag., Oct., 1896, p. 223) I have expressed the view that, whilst possibly they may be of the same species, they are in all probability variations, and that as both were described by Signoret in the same paper (March, 1868) it may be convenient to consider *aspidistræ* the type, alphabetically. Since then I have been led to re-examine the two in connection with *C. theæ*, Mask. ("Indian Museum Notes," vol. ii., No. 1, 1891, p. 60), specimens of which were sent me this year by Mr. Koebele, from Formosa, on tea-plants. I have also re-examined specimens of *C. aspidistræ*, var. *mussendæ*, Green (Ind. Mus. Notes, vol. iv., No. 1, 1896, p. 2).

I do not find any important differences in the puparia of these forms. The male puparia of my Formosan specimens.

of *C. theæ* are a good deal longer than those originally described from India. I cannot, therefore, now lay stress on any difference on this point.

As regards the "spinneret groups," the slight variations noticeable are not of specific importance. The numbers of orifices in these groups frequently vary considerably, even in specimens undoubtedly of the same species and taken from the same plant. Therefore nothing can be founded on this.

I find the marginal hairs varying slightly. In *aspidistræ* (type) there are on each side five or six, of which three are in an anterior group. In var. *mussendæ* I see ten on each side, with five in the anterior group. In *brasiliensis* there are three or four on each side, two in the anterior group. In *theæ*, the same as in *brasiliensis*. I am, of course, here speaking only of the hairs on the pygidial segment; all the forms have also hairs on the anterior abdominal segments.

The terminal lobes also vary. *Aspidistræ* and *brasiliensis* have two small median trifoliate lobes and two other smaller subcylindrical ones at each side; *theæ* has a small median depression; *mussendæ* has the two median lobes proportionately larger than those of the type.

Brasiliensis and *theæ* have less prominent segments than the other two, and, indeed, in the type *aspidistræ* the prominence is quite conspicuous and peculiar.

Size and colour I do not consider as really important points; but, in fact, there is not much difference as regards these in all the four.

On the whole, whilst I am still not prepared to entirely overlook the differences just noted, I have no objection to consider them as variations, and to classify the species as follows:—

C. aspidistræ, Signoret, 1868.

" var. *brasiliensis*, Signoret, 1868.

" var. *theæ*, Maskell, 1891.

" var. *mussendæ*, Green, 1896.

Chionaspis eugeniæ, Maskell.

This species seems to be widely distributed. The original specimens were Australian. I have had it since from China, Japan, and the Sandwich Islands, on many plants; and Mr. Green has two varieties of it in Ceylon.

Genus POLIASPIS.

Poliaspis exocarpi, Maskell.

Mr. Lea has sent me specimens of this species on *Leptospermum*, sp., from Albany, Western Australia.

Genus FIORINIA.

Fiorinia camelliæ, Comstock, var. minor, var. nov.

This insect has been sent to me by Mr. Koebelé, from Hongkong, on several plants, mostly palm. The specimens are smaller than usual, but otherwise present no distinctive features.

The species is common in many parts of Australia, from Sydney to Perth.

I agree with Drs. Berlese and Leonardi ("Chermotheca Italica," Fasc. I., No. 25) in considering *Fiorinia pellucida*, Targioni, as identical with *F. camelliæ*.

Fiorinia rubra, Maskell, var. propinqua, var. nov.

The puparia of this variety have rather more secretion than those of the type, and the general appearance is therefore lighter in colour. The terminal lobes of the pygidium are somewhat farther apart, and I have not detected dorsal spinnerets; but on the whole the characters are so near to those of *F. rubra* that I shall not consider it as a new species.

Hab. In Australia, on *Acacia*, sp. ("mallee"). Mr. French sent me specimens from Goudie, Victoria.

Fiorinia casuarinæ, sp. nov. Plate XIX., figs. 7-9.

Female puparium snowy-white, but the brown second pellicle may be faintly discerned through its not very thick or solid substance. Form very elongated and narrow; length, about $\frac{1}{2}$ in. Of course only one pellicle is clearly visible dorsally at one end.

Male puparium similar to that of the female, but without any sign of a second pellicle. Length, about $\frac{1}{8}$ in.

Adult female brown; form normal; length, about $\frac{1}{4}$ in. Abdomen terminated by a curve, without any lobes, and with only very minute marginal serrulations: at the extremity are two fine hairs. There are no groups of spinnerets, but there is a row of very small circular orifices just within the margin.

The second pellicle very nearly fills the entire puparium, and is therefore extremely long and narrow. The abdominal segments are rather distinct, and the last has a median depression, with the margin on each side broken by many deep conspicuous serrations, with two subcylindrical protruding lobes.

The male pupa is red, elongated, with the posterior abdominal margin resembling that of the second female pellicle, but the rudimentary wings, antennæ, and eyes distinguish it.

Adult male unknown.

Hab. In Australia, on *Casuarina*, sp. My specimens were sent by Mr. Lea, from Perth, West Australia.

This species, in the puparium, resembles *F. stricta*, Mask., but the absence of abdominal lobes in the adult separates it entirely.

Section LECANINÆ.

Genus INGLISIA.

Inglisia fossilis, sp. nov. Plate XX., figs. 1-4.

Test of adult female glassy, extremely brittle, yellowish or brownish-yellow, elevated in a double cone whose apices are slightly divergent, the bases attached at one side, conspicuously marked with radiating striæ composed of rows of air-cells. From one apex to the other runs a deep narrow groove closed at the bottom with striated secretion, so that the insect cannot be seen within. In several instances there is only a single cone, and in these there is no groove, the cone being closed at the apex. At the base of the test there is a fragmentary small fringe, but this is often broken off. The base of the test has an average length of about $\frac{1}{4}$ in., with a width of $\frac{1}{8}$ in., and a height of $\frac{1}{8}$ in. There is much black fungus accompanying the insects.

Test of male pupa not certainly observed; probably small, white, narrow, glassy.

Adult female dark-glossy-brown, conical, filling the test but shrivelling at gestation. The margin is slightly flattened, with usually a somewhat wavy outline. Antennæ and feet absent. Mentum doubtfully dimerous. Abdominal cleft rather wide and shallow; lobes normal; anogenital ring with several hairs, and above it a broad chitinous band nearly surrounding it. The margin of the body bears some very minute and inconspicuous conical spines, and there is a single median dorsal longitudinal row of small circular spinnerets.

Second female stage not observed.

Larva red or brownish-red, flattish, elliptical; length, about $\frac{1}{50}$ in. Antennæ of six short thick subequal joints. Feet with the tibia slightly longer than the tarsus; the four digitules are long fine hairs. Margin bearing some small conical spines. Abdominal cleft small, lobes large, terminal setæ long.

Adult male unknown.

Hab. In Western Australia, on *Acacia*, sp. My specimens were sent by Mr. Lea, from the Darling Ranges.

This species is allied to *I. foraminifer*, Mask., 1892, but differs in the form of the test, in the absence of feet and antennæ, and in other particulars. It is viviparous, the female being usually full of larvæ. The length of the tibia in the larva is an exceptional character. The species is a large and handsome one.

The double cone of *I. fossilis* makes it approach in outward

form to *Fairmairia bipartita*, Signoret, a small and curious insect found on various plants in the South of France, and described in 1874. When, in 1878, I first established the genus *Inglisia* on a New Zealand species, *I. patella*, I was influenced principally by the air-cells which are conspicuous in the glassy tests. The test of *F. bipartita* is waxy, and I cannot detect air-cells in it. But these are constant in all the species of *Inglisia* which have been described since 1878, including *I. vitrea*, Cockerell, 1894, a West Indian species. The forms of the tests in this genus vary: some are almost semi-cylindrical (*I. leptospermi*, *I. inconspicua*, &c.), some singly conical (*I. patella*), some double (*I. fossilis*), so that there is nothing to be founded on this. But I think that the glassy structure and the air-cells may be considered as a sufficient basis for the genus.

***Inglisia foraminifer*, Maskell, var. major, var. nov.**

Differs from the type apparently only in size, being rather larger, and in being perhaps rather greener in the colour of the test.

In 1892 I did not know the larva of this species. The larva of var. *major* is yellow, flattish, elliptical, active; length, about $\frac{1}{50}$ in. Antennæ short, thick, with six joints. Feet long and slender; digitules all fine hairs. Abdominal cleft and lobes normal; setæ long. Fragments of a waxy test are visible on the margin.

Hab. In Australia, on *Muhlenbeckia adpressa*. My specimens were sent by Mr. French, from Swan Hill, Murray River.

Genus CEROPLASTES.

***Ceroplastes rubens*, Maskell, var. minor, var. nov.**

Colours of insect and of waxy test as in the type; also the abdominal lobes, anal ring, cephalic papillæ and antennæ. The size is smaller; my largest specimens have a diameter of only about $\frac{1}{8}$ in., whilst the type reaches $\frac{1}{4}$ in.

Hab. In China, on *Pinus sinensis* and *Pinus thunbergii*. Specimens sent from Hongkong by Mr. Koebele.

C. rubens appears to be not uncommon. It is on several plants in New South Wales and Queensland, and I believe that Mr. Koebele has found it also in Japan and the Sandwich Islands.

Genus LECANIUM.

***Lecanium oleæ*, Bernard.**

This species is very commonly known as the "black scale." These trivial names are by no means satisfactory. In the first place, there are many insects quite as black (or

rather brown, for *L. oleæ* is not really black); and, secondly, it is quite common to come across a twig with individuals of every shade on it, varying from dark-brown to quite a light-grey. In fact, the dorsal carinæ and the spots are the best characters for identification.

***Lecanium patersoniæ*.** Plate XX., figs: 5, 6.

When describing this species in 1894 I had not the second stage of the female. Having received this during the year, I find that it is yellow, elliptical, flattish, with a length of about $\frac{1}{16}$ in., and exhibits a submarginal row of pustules, as in the adult. But these pustules are different. In the adult they are multilocular, containing within the limiting ring several minute circular glands. In the second stage there is within the ring a single circular orifice, the termination of a short cylindrical tube. The figures which I give will illustrate this difference.

***Lecanium longulum*,** Douglas. *Lecanium chirimolice*, Maskell.

This insect has come to New Zealand. Captain Broun sent me specimens on *Laurus*, from Northcote, near Auckland. It has evidently been imported from Fiji, between which place and New Zealand there is a rapidly-growing trade in fruit, &c. The species is widely distributed in tropical and subtropical lands. Whether it will spread to the colder parts of these Islands I do not know, but it will surely be found in greenhouses, and I make no doubt will establish itself in the warmer districts of the North Island.

***Lecanium minimum*,** Newstead, var. *pinicola*, var. nov.

The type of this species is described by Mr. Newstead in the Ent. Mo. Mag., 1892, p. 141; it occurred in England on greenhouse plants, and therefore was presumably not a British insect. The specimens upon which I am founding my variety were sent to me by Mr. Lounsbury, from the Cape of Good Hope, on *Pinus insignis*, a tree not indigenous to South Africa. The insect therefore probably came originally from elsewhere. The variety agrees entirely with the type in size and colour, in the dorsal carina, in the antennæ and feet, and in the spines and hairs: it is a little more convex, but that may be accounted for by the extreme slenderness of the pine-needles. The principal difference is the absence of the "large and circular tessellation" on the epiderm, and this is not sufficient in my opinion to raise it to specific rank.

The larva (which was not described by Mr. Newstead) is yellowish, of normal Lecanid form; length, about $\frac{1}{80}$ in. Antennæ short, thick, with six confused joints, the last of which bears several hairs, of which the terminal one is much longer.

than the others. Feet rather swollen; digitules fine hairs. Margin of body minutely serrated. Terminal setæ rather long.

Lecanium berberidis (?), Schrank.

Mr. French has sent me some specimens of a very large *Lecanium*, on vine (*Vitis vinifera*), from Melbourne, which, after much consideration, I have decided to attach to this species. I have never seen the type, but Signoret gives a fairly full description of the insect (Ann. de la Soc. Entom. de France, 1873, p. 403). My specimens from Melbourne agree with the characters therein given as regards size, colour, dorsal carination, the sparse punctuation, the proportions and hairs of the antennal joints (almost), both of adult and larva, and in other characters. I think, however, that the fourth antennal joint of the adult is considerably longer than the fifth.

The principal difference which I can detect is in the feet. Signoret says that in the type of *berberidis* the tarsi of the anterior feet and the tibiæ of the median pair are considerably swollen. I do not see this in the Melbourne insects. But in the "Entomological Monthly Magazine," 1891, p. 267, there is a paper by Mr. Newstead on the alteration of some Lecanids by the action of parasites, in the course of which he says, "While some parasites may not materially affect the exterior of the scale, they are quite capable of malforming the antennæ and legs." I quite agree with this view, and it is partly on this account that I have (I think) never described a species without examination of several individuals, in order to ensure as far as possible having uninjured forms. It is quite possible that the malformation mentioned by Signoret in his European insects, and of which he says, "This is a specific character which I have seldom met with," may have been due to parasitism.

I have not seen any mention of *berberidis* by other authors since Signoret wrote, and it does not seem to be a British species. For the present I shall leave the insect with a note of interrogation. It is a large species, measuring about $\frac{1}{2}$ in. in length, very convex, and in all probability would be very considerably injurious.

Lecanium baccatum, Maskell.

I have received several specimens of the second stage of this fine species from Mr. Froggatt, on *Acacia longifolia*, and from Mr. Musson, on *Acacia linearis*, both from New South Wales. These specimens, when they arrived alive, exhibited the beautiful bluish, almost nacreous, colour mentioned in my paper of 1892 (Trans. N.Z. Inst., vol. xxv., p. 217), but since they have been in my cabinet I find that they have lost

this colour and become whitish. As usual in the species, the males and females were on different twigs.

Lecanium mirificum, sp. nov. Plate XX., figs. 7-14.

Adult female dark-brown or yellowish-brown, but in the latest stage covered with a thin fragmentary coat of greyish, rather greasy wax. Form very convex, with a subcircular or subelliptical margin, the height in some specimens equal to two-thirds of the length. The size varies: early adults may average about $\frac{1}{4}$ in. in length at the base, with a width of $\frac{1}{8}$ in.; fully-developed specimens reach a length of $\frac{1}{2}$ in., with a width of $\frac{1}{3}$ in., and a height of $\frac{1}{4}$ in. The margin all round is somewhat flattened. The grey waxy secretion is not homogeneous, but composed of small adjacent greasy lumps. At the apex of the dorsum there are two rows of rather deep subcircular pits, the normal number of which is six, but some specimens exhibit only four. The abdominal cleft is normal, the dorsal lobes very small. On turning over an adult it is seen to be hollow, the cavity being filled with egg-shells. The antennæ have nine joints, of which the third is the longest, then the last, then the fourth and second, the rest being short and subequal; the first eight are cylindrical, the ninth irregularly fusiform. The feet, in the early adult stage, are moderately long; in the latest stage the two posterior pairs become somewhat atrophied; they present no special features: the four digitules are fine hairs. Mentum subglobular, monomerous. Anogenital ring with eight strong hairs. The margin of the body bears a row of shortish blunt spines. Epidermis bearing many small circular spinneret orifices, which are most numerous near the abdominal lobes; also great numbers of conspicuous irregularly-oval markings (as in *L. oleæ*), which apparently assist in the production of the dorsal wax. In mounted specimens of adult females the six apical pits may be clearly distinguished.

The second stage of the female is, in its early period, flattish, with an inconspicuous median longitudinal elevation, later it becomes more convex, and the dorsal apical pits appear. The colour is a rich-brown, dotted with yellowish small spots. Some specimens exhibit traces of thin disconnected dorsal wax. The length varies with age from about $\frac{1}{8}$ in. to $\frac{1}{4}$ in., the width from $\frac{1}{10}$ in. to $\frac{1}{6}$ in. The margin is flattened and bears short spines, which usually carry small coverings of white wax. The antennæ have eight joints, of which the sixth and seventh are the shortest, the third the longest: on the last are several hairs. Feet as in the adult, but the tarsus is quite as long as the tibia. Anal cleft and lobes, spinnerets, and oval markings as in the adult.

The newly-hatched larva has not been observed, but the

later larva is yellowish-brown, flat, elliptical; length, about $\frac{1}{15}$ in. There is a dorsal longitudinal carina, and indications in some specimens of transverse carinæ. The margin bears spines as in the adult. Antennæ of seven or eight joints, according as we consider a division of the fourth a "false" or a "true" joint. Feet, anal cleft and lobes, and anogenital ring normal. There are many small irregular spots on the epidermis.

Male pupa covered by a white glassy test of the usual Lecanid form, composed of polygonal plates, flat at the top, with sloping sides and a subelliptical base. The length of this base is about $\frac{1}{20}$ in.

Adult male not observed with certainty. One mutilated specimen (which had died when on the point of emergence) was extracted from a test. This specimen is brown, about $\frac{1}{3}$ in. in length, exclusive of the spike, which is moderately long and slightly curved. A fragment of a wing is hyaline.

Hab. In Australia, on *Acacia pendula* (myall). Mr. French sent me several specimens which, he says, came from Goudie, "in the hottest and driest part of Victoria, where it is terribly destructive."

This insect clearly belongs to Signoret's fifth series of the genus, near to *L. cycadis* and *L. oleæ*, while at the same time it approaches my *L. scrobiculatum* in its dorsal pits. Its immense size makes it the largest *Lecanium* known to me. *L. tulipiferæ*, Cook, a North American insect, is the only one which approaches it in this respect; and even *Ctenochiton viridis*, hitherto quite the largest of the Lecanid group, is not its equal.

Genus PULVINARIA.

Pulvinaria nuytsiæ, sp. nov.

Adult female dark-brown, the form, as usual, elliptical at first but shrivelling at gestation, with an elongated narrow posterior ovisac of white cotton. Length of the insect averaging $\frac{1}{15}$ in.; of the ovisac, $\frac{1}{10}$ in. Dorsum elevated in a median longitudinal ridge, the margins flattened. Antennæ of eight joints, of which the third is the longest, the last three the shortest and subequal; the second bears one long hair, the eighth several short ones. Feet normal; the trochanter and femur have no hairs; tarsal digitules fine hairs; digitules of the claw widely dilated. Margin bearing a series of short blunt spines. Abdominal cleft and lobes normal. Mentum conical, monomerous.

Second stage not observed.

Larva yellow, elliptical; length, about $\frac{1}{40}$ in. The dorsum is elevated in a conspicuous longitudinal ridge. Form Lecanid; abdominal cleft and lobes normal, setæ moderate.

Antennæ rather thick, with six joints. Margin bearing some short blunt spines. Spiracular spines rather long.

Male pupa covered by the usual white semi-glassy test formed of polygonal plates. Length of test, about $\frac{1}{5}$ in. The enclosed pupa is dark-reddish-brown.

Adult male not observed.

Hab. In Western Australia, on *Nuytsia floribunda*. My specimens were sent by Mr. Lea, from Walkaway.

This species is allied to *P. maskelli*, var. *spiniosior*, but independently of its much smaller size it differs somewhat in the feet, in the marginal spines, and in the dorsal elevation.

Section LECANOCOCCINÆ.

Genus ERIOCHITON.

Eriochiton cajani, Maskell, 1891.

This species, which I originally described in the "Indian Museum Notes," vol. ii., No. 1, p. 61, has been sent to me by Mr. Koebele, from Hongkong, on *Mallotus cochinchinensis*. He tells me that it is also common there on many trees. I have no doubt that it is widely spread in tropical oriental countries.

In 1891 I was not acquainted with the male; but amongst the specimens from China I have found several. The adult male is dark-reddish-brown, rather large, reaching about $\frac{1}{2}$ in. exclusive of the spike. Antennæ of nine rather long joints, the first globular, the rest slender, with several hairs on each. Feet long; tibia very long and slender; claw very small; digitules fine hairs. Eyes: four dorsal and two ventral; ocelli two. Wings with rather strong nervure. Abdominal spike slender, slightly curved, nearly as long as the abdomen.

Section HEMICOCCINÆ.

Subsection CRYPTOKERMITIDÆ.

Genus MALLOPHORA, gen. nov.

Adult females covered by a closely-felted secretion. Insects exhibiting an abdominal cleft and lobes.

Male pupæ in tests usually more waxy than those of the females.

Larvæ naked, with prominent anal tubercles.

The sacs of this genus resemble those of *Eriopeltis*, *Philippia*, or *Signoretia*; but in those genera the larvæ are distinctly Lecanid, whereas here they are Coccid.

Mallophora sinensis, sp. nov. Plate XXI, figs. 1, 2.

Sac of adult female white, closely felted; the form is properly sub-semiglobular, but many individuals are usually so

massed together that it is difficult to distinguish them. For the same reason the length is not clear, but it may reach $\frac{1}{8}$ in. There are many longish, loose, glassy threads scattered over the surface.

Sac of male pupa elliptical, flattish, more waxy than that of the female. Dorsally there are two longitudinal depressions which give the sac a tricarinate appearance.

Adult female dark-brown, elliptical and convex, but shrivelling at gestation. Antennæ of seven joints, of which the third is the longest, then the fourth, the rest subequal; the last is irregular, and bears some moderate hairs, as also the sixth. Feet moderate; the digitules of the claw are slightly dilated; I have not been able to see any on the tarsus. The abdomen exhibits a distinct cleft, with two small triangular lobes; anal ring with six strong hairs. After treatment the ring frequently protrudes, as in some Lecanids. Margin bearing all-round some longish spines. Epidermis covered with many large circular pores, and also numbers of tubular spinnerets of smaller size. Mentum monomerous.

Second stage of female not observed.

Larva yellowish-red; flattish, elliptical; active; length, about $\frac{1}{60}$ in. Antennæ of six irregular confused joints: the last bears several hairs, of which two are much longer than the rest. Feet long, slender, with four fine digitules. Margin bearing all round a row of moderate spines. Abdomen terminating in two distinct protruding anal tubercles, each bearing a seta and some spines.

Adult male unknown.

Hab. In China, on *Callicarpa tomentosa*. My specimens were sent by Mr. Koebele from Hongkong.

There is no doubt, from the form of the abdomen in the larva and in the adult, as to the position of this species, and I cannot attach it to any known genus on account of the felted sac. I imagine that the small tubular spinnerets produce the felting, while the glassy threads may spring from the large circular pores.

Section COCCINÆ.

Genus PLANCHONIA.

Planchonia bryoides, Maskell, 1893, var. *stellata*, var. nov.

The female insect is almost exactly similar to the type, but the test differs in its more regularly stellate form, resembling in almost all specimens my fig. 3 of pl. v., Transactions, vol. xxvi., whereas in my original material the tests were almost all as in fig. 2 of the same plate. The antennæ and feet also are not entirely absent, the former being represented

by very minute tubercles which bear a few very short hairs, and the latter by equally minute sharply conical tubercles. The spinnerets, anal ring, and other features are identical with those of the type.

Hab. On *Exocarpus cupressiformis*, in the Cumberland district, New South Wales, Australia. My specimens were sent by Mr. Fuller, who informs me that the insect seems to be confined to that particular kind of tree, and that it has been long known in the district, where it goes by the name of the "star-scale."

I have no hesitation in attaching this to *P. bryoides*, while the differences noted are only sufficient to constitute a variety of that species, which came in 1893 from Fiji.

Planchonia quercicola, Bouché. *Asterolecanium quercicola*, Bouché.

I have received specimens of this on oak-twigs, from Sydney, sent by Mr. C. Fuller. They were in company with *Aspidiotus aurantii*.

Genus PROSOPOPHORA.

Prosopophora prosopidis, Maskell, var. *mimosæ*, var. nov.

The test of the adult female is rather larger and flatter than that of the type, but of the same colour and consistence: it has the same very indistinct appearance of segments and dorsal carina, and there is no depression in the twig when the insect is removed.

The adult female nearly resembles *P. prosopidis*, but is rather brown in colour than red. The antennæ, mentum, anal tubercles, spinnerets, and "discs" are as in the type.

Hab. In South Africa, on *Mimosa*, sp. Mr. Lounsbury sent me specimens.

There is nothing but the size and colour, as far as I can see, to distinguish this variety.

Genus RHIZOCOCCUS.

Rhizococcus casuarinæ, Maskell, var. *mancus*, var. nov.

Differs from the type in its slightly greener colour, and in having both the antennæ and the feet very small and almost atrophied.

Hab. In Australia, on *Casuarina distyla*. My specimens were sent by Mr. Froggatt.

This insect affects principally the axils of the twigs, and is usually doubled up and curved round the twig, so that it is very difficult to examine the ventral surface even after preparation.

Genus *ERIOCOCCLUS*.

Eriococcus simplex, sp. nov. Plate XXI., fig. 3.

Sac of female yellow, but frequently obscured by black fungus; form elliptical; length, about $\frac{1}{20}$ in., but variable.

Sac of male of similar form, colour white; length, about $\frac{1}{30}$ in.

Adult female red; elliptical, filling the sac, but shrivelling at gestation. Antennæ of seven joints, of which the second and third are the longest. Feet normal. Anal ring with eight hairs. Margin of the body bearing a row of short blunt spines, which are rather slender; at the cephalic and abdominal extremities these spines are more numerous, and in groups. Epidermis bearing some circular spinnerets.

Adult male yellowish-red; length, about $\frac{1}{30}$ in. Antennæ very short, with ten joints, of which the two first are thick and subglobular, the next three more slender, the sixth to the ninth widening consecutively, the tenth short and subconical; all the joints are hairy. The armature of the penis is very large, projecting considerably beyond the terminal abdominal tubercles, and produced into strong spines of considerable length.

Larva yellowish-red; form normal; length, about $\frac{1}{65}$ in. Antennæ of six joints. Margin bearing small conical spines, and there is a double median dorsal longitudinal row of similar spines. Anal tubercles normal.

Hab. In Australia, on *Eucalyptus*, sp. My specimens were sent by Mr. Froggatt.

The adult female is not far removed from *E. spiniger*, Mask., 1895, but differs in the antenna, in the more slender spines, and in their arrangement in terminal groups. The larva, however, differs considerably in being much less spiny. As regards the male generative organ, I have not seen anything quite like it before in the genus, although I find that something analogous exists in *E. danthonia*, Mask.; and the antenna also is not quite normal.

Eriococcus simplex, Maskell, var. *dealbata*, var. nov.

Sac of female white; form elliptical; length, about $\frac{1}{20}$ in., but variable.

Sac of male white; length, about $\frac{1}{30}$ in.

Adult female and larva similar to those of the type. Only one specimen of the male observed, with the armature broken off.

Hab. In Western Australia, on *Eucalyptus*, sp. Mr. Lea sent me specimens, and says, "Seems to prefer the butts of red-gum trees which have been cut down, and from which young shoots are growing."

Although I have been unable to compare the male armature of this with *E. simplex*, I think I have rightly considered it only a variety, differing in having white instead of yellow cotton.

Eriococcus paradoxus, Maskell. Trans. Roy. Soc. South Australia, 1887-88, p. 104.

Specimens of this species sent by Mr. French, on *Pittosporum*, sp., from South Australia, have less agglomerated tests than those originally received, and here and there some whitish radiating waxy projections. The enclosed insects present no variations from the type. Some of the tests are tinged with green. I find that although the feet are absent their places are occupied by short, thick, conical spines, which I overlooked in my original description.

Eriococcus paradoxus, Maskell, var. *indica*, var. nov.

Tests of females agglomerated in a confused mass on the twig, similar in size and colour to the South Australian form, but covered with great numbers of very short reddish-yellow waxy filaments. The enclosed insect differs from the type only in size, reaching almost $\frac{1}{2}$ in., and in the greater number of the figure-of-eight spinnerets. In the type these are of two sizes, the smaller ones being scattered over the body, the larger usually confined to the last abdominal segment, but sometimes found elsewhere. In var. *indica* both large and small are mingled in great numbers over the whole body. The antennæ and feet are atrophied as in the type, the feet being replaced by conical spines.

Male and larva unknown.

Hab. In India, on *Helicteres isora*. Dr. Alcock sent me specimens from Saharanpur, North-west Province.

I have no hesitation in attaching this as a variety to the Australian species. I suppose that it is not at all likely to have been imported into India.

Genus RIPERSIA.

Ripersia turgipes, Maskell. *Eriococcus turgipes*, Maskell, 1892, Trans. N.Z. Inst., vol. xxv., p. 228.

Having received from Mr. Froggatt several specimens of this most curious species, on *Casuarina suberosa*, Sydney, Australia, I have been led to re-examine the characters, with the result that I have decided to transfer it from *Eriococcus* to *Ripersia*. The insect is abnormal in any case. In 1892 I mentioned two characters which seemed to separate it from *Eriococcus*—*viz.*, the six hairs of the anal ring and the long last joint of the larval antenna. These now seem to me

sufficient to remove it from that genus; and I will add the anal tubercles, which are more like those of a Dactylopid than those of an Acanthococcid. It does not entirely agree with *Ripersia*, on account of the shortness of the last antennal joint in the adult female; but *E. fraxini*, Newstead, has to some extent a similar character. The peculiar feet are unlike anything known to me in any genus; and, on the whole, the species is so abnormal that many entomologists would erect a new genus for it. However, I shall now place it in *Ripersia*.

Genus Coccus.

Coccus acaciæ, sp. nov. Plate XXI., fig. 4.

Adult female dark-red, with sometimes a lighter and yellowish tinge; semiglobular, segmented, often much wrinkled; diameter, about $\frac{1}{2}$ in. When boiled in potash it produces a small quantity of dark pigment. Antennæ of six joints, the sixth the longest, the third next, the rest short and subequal; on the sixth, which is fusiform, there are a few short hairs. Feet rather long; tibia only slightly longer than the tarsus; all four digitules are fine hairs. Anal tubercles very small and inconspicuous; anogenital ring small, simple, hairless. Margin without spines or hairs; epidermis exhibiting only very few circular small spinnerets.

Second stage not observed.

Larva red, flattish, elliptical, active; length, about $\frac{1}{50}$ in. Antennæ of six short joints, as in the adult. Feet normal. Anal tubercles prominent but small, bearing a few short spines; setæ moderate.

Male unknown.

Hab. In Western Australia, on *Acacia*, sp. (a plant with very small leaves and many slender thorns). Mr. Lea sent me specimens from Perth.

This is the first species of the genus *Coccus* which I have yet reported. Indeed, there are very few known. The absence of anal tubercles and of hairs on the anogenital ring is a distinguishing character.

Coccus cacti, auct., var. *ceylonicus*, Green. Ind. Mus. Notes, vol. iv., No. 1.

I have received this variety from Dr. Alcock, of Calcutta; the specimens were on *Cactus*, sp. (prickly pear), from the Kurnool and Amantipur districts, India. Mr. Green gives only a very brief account of it in the "Indian Museum Notes"; his detailed description is, I believe, in the press (1896).

Genus DACTYLOPIUS.

Dactylopius ceriferus, Newstead. Ind. Mus. Notes, vol. iii., 1894, p. 24.

I have this species from Japan, China, and the Sandwich Islands, on *Psidium* and other plants, sent by Mr. Koebele.

Mr. Green mentioned, in Ind. Mus. Notes, vol. iv., 1896, p. 6, a species, *D. talini*, which he since considers identical with *D. ceriferus*. Mr. Newstead separates his insect from *D. filamentosus*, Cockerell, only by the eight-jointed antenna. I think that this is scarcely sufficient, seeing that some species of the genus vary in this respect. But the characters of the feet, and the apparent absence of glassy filaments from *D. filamentosus* (in spite of its name), would be distinguishing characters.

No mention is made by Mr. Newstead of the male, nor by Mr. Green up to the present time. Amongst a mass of females from Japan I found one mutilated male. The colour is brown, with iridescent wings; the antennæ have ten joints, the last of which bears three knobbed hairs; the posterior setæ are very long, two from each side; and the sheath of the penis is short and subconical.

Dactylopius aurilanatus, Maskell.

During a late visit to Auckland I found that this species has spread and increased with terrible rapidity, and that it is doing immense mischief to all the varieties of *Araucaria* in that place. Indeed, many fine trees have been hopelessly injured by it, especially in the gardens of Government House. The species has also spread to California.

Dactylopius sacchari, Cockerell. Jour. Trinidad Field Nat. Club, 1895.

In June, 1896, Mr. Lounsbury forwarded to me from Capetown some Coccids, as to which he desired my opinion. They had been sent to him from Mauritius, by Mr. Nash, manager of the Oriental Estates Company in that island, on pieces of the root of sugar-cane. It appears that these insects are usually in company with *Icerya seychellarum*, and the two species are confounded by the residents under the name of the "Pou blanc." Both have white cottony secretion, but, of course, are quite distinct. It is not easy, in view of the confusion which has thus grown round this name, to make out whether the injury done to the cane by Coccids is to be set down in any great extent to the work of the *Dactylopius*; but, as will be seen presently, if we judge by its effects elsewhere, probably this insect is only responsible for the smaller portion of the harm done, and the *Icerya* is the principal offender.

When I first received these specimens I thought (and so informed Mr. Lounsbury) that they would prove to be a variety of *Dactylopius calceolaria*, Mask., an insect which has been found attacking sugar-cane in Fiji and in the West Indies. But after carefully examining them again with a view to this paper I am convinced that they are *Dactylopius sacchari*, Cockerell, first reported on sugar-cane in Trinidad. Mr. Cockerell received his specimens in alcohol, and therefore makes no mention of the lateral cottony tassels which this species, like most of the genus, exhibits, and which are clear in my specimens. These tassels appear to be, on the average, fourteen on each side, those on the abdomen rather the longest. In length and colour the insects agree with *D. sacchari*; also in the seven-jointed antenna, in the relative lengths of the joints, in the hairs on the trochanter, in the digitules, and in other characters.

I regret that Mr. Cockerell makes no mention of the larva. In this stage the insect is reddish-brown or yellowish-brown, flattish, elliptical, segmented; length, about $\frac{1}{6}$ in. The antennæ are long and thick, of six joints, which may easily be taken for four; the sixth is much the longest, fusiform, with several hairs; the fourth and fifth are the shortest. Feet also long and thick; tarsus one-third longer than the tibia; digitules all fine hairs. Anal tubercles very inconspicuous and small, with some moderate hairs.

I do not know the male.

Apart from its size (both adult and larva being very much smaller) this insect differs sufficiently from *D. calceolaria* to form a valid species. The characters of the antennæ and the feet are quite distinct, and may be relied on for separation. Mr. Cockerell says that *D. sacchari* in Trinidad is "not seriously harmful"; and, as remarked above, perhaps the same may be the case in Mauritius. The real "Pou blanc" which does the mischief will be the *Icerya*.

In Mr. Lounsbury's letter to me he mentions that specimens of this species had been sent to Miss Ormerod, who had forwarded them to Washington. In "Insect Life" (a journal whose demise I for one very deeply regret), vol. vii., p. 430, I see that "Miss Ormerod sent specimens of Coccidæ from the Oriental Estates Company, in Mauritius. One proves to be *Icerya sacchari* . . . upon sugar-cane, however, was found another Coccid, which proves to be a species, probably new, of the genus *Westwoodia*." At the same time some doubt is expressed whether this *Westwoodia* might not have been mistaken for an insect on guava, sent with the others. In any case it cannot be that the phrase just quoted refers to our insect. *Westwoodia* has antennæ of eight joints, not only in the adult female, but also in the larva. Whether, indeed,

it is a valid genus I am not prepared to say, never having seen it. But there is no character in these specimens from Mauritius which seems to me sufficient to remove them from the genus *Dactylopius*.

***Dactylopius calceolaria*, Maskell, var. minor, var. nov.**

Adult female thick and subglobular, reddish-brown in colour, covered with moderate meal, which in the specimens sent is yellowish, but as they came in alcohol it is difficult to say whether in life the meal is white or whether there are any lateral tassels or not; length of insect, about $\frac{1}{3}$ in. Antennæ of eight joints, the eighth the longest, then the second, then the first and third equal, the rest shorter and subequal. Feet rather long and slender; tibia slightly dilated at the tip, and about twice as long as the tarsus; claw slender; tarsal digitules fine hairs, digitules of claw very slightly dilated. Anogenital ring normal, with six hairs; anal tubercles inconspicuous. Epidermis bearing some small circular spinnerets and a few conical spines.

Larva yellow or yellowish-brown; length, about $\frac{1}{4}$ in. Antennæ of six joints, of which the last is the longest, and fusiform, the rest short and subequal. Anal tubercles very small and inconspicuous.

Adult male unknown.

Hab. In Mauritius, on roots of "onion-grass." Mr. Lounsbury sent me specimens received by him from Mr. Nash, of the Oriental Estates Company, sent together with those of *D. sacchari*. It appears that these also were included under the name of the "Pou blanc," so that probably the secretion on the adult female is in life white.

This is much nearer to *D. calceolaria* than is *D. sacchari*; and, indeed, there seems to be little except size to separate it. I find that in my specimens of *calceolaria* the sequence of the antennal joints varies a little, so that no distinction can be founded on that.

Section IDIOCOCINÆ.

Genus SPHÆROCOCCLUS.

***Sphærococcus rugosus*, sp. nov. Plate XXI, figs. 5, 6, 7.**

Females inhabiting galls of a dark-green colour, which are attached by a very short stalk to the leaves of the plant, though rarely a few are attached to the twigs. The gall is subglobular, produced at the end in a small cone; the surface is very conspicuously wrinkled all over. No orifice is visible at the apex of the cone. The average diameter of the gall is about $\frac{1}{6}$ in.

Male gall not observed.

The adult female is dark-red, and when boiled in potash produces much red. Form globular, filling the interior of the gall, with a small quantity of white cotton or meal surrounding the insect. All the organs have disappeared with the exception of the rostrum and spiracles; the former is very small, the mentum atrophied but apparently dimerous; the spiracles are tubes dilated at each end. There are some small circular spinnerets and some short hairs, which are most numerous near the abdominal extremity; in fact, the insect is no more than a bag containing eggs and larvæ.

Second stage not observed.

Larva yellow, elongated elliptical, tapering posteriorly, active; length, about $\frac{1}{10}$ in. Antennæ of four (?) joints, very short; the last is the longest, and is dilated towards the tip; it bears a few hairs, of which two are very long. Eyes conspicuous, black, tubercular. Feet rather long; femur thick; tibia and tarsus slender; claw very slender; digitules four fine hairs, those of the tarsus being very long. The abdominal margin bears a few spines, and at the extremity are the usual two long setæ, with two small tubercles between them.

Male unknown.

Hab. In Western Australia. My specimens were sent by Mr. Lea, on *Leptospermum*, sp., from Mount Barker. In his letter Mr. Lea says, "The insect is not common." But the larvæ from the galls which I received are exceedingly numerous, and I have not noticed any parasites, so that I should have imagined the species would be widely distributed had he not stated the contrary.

In the absence of almost any organs whatever on the adult female it is difficult to compare this insect itself with any other; but I think we may consider it distinct, on account of the gall.

***Sphærococcus rugosus*, Mask., var. *elongatus*, var. nov. Plate XXI., figs. 8, 9.**

Adult females inhabiting dark-green galls, which are attached by very short stalks, or are more commonly sessile, on the leaves of the plant: none were observed on twigs. The gall is fusiform, conspicuously wrinkled, and there is no orifice at the tip. Average length of a full-grown gall, about $\frac{1}{8}$ in., the diameter about $\frac{1}{14}$ in. Galls may be attached to either the upper or the lower side of a leaf; in either case a small orifice leading into the gall is visible in a small pit on the other side of the leaf.

Male pupæ in galls similar to those of the females, but smaller, more cylindrical, yellowish or brownish, and somewhat less wrinkled.

Adult female and larva not differing appreciably from the type. The larva may be a very little smaller, but is otherwise identical, and as the adult has no organs whatever for comparison it may also be taken as identical.

Male unknown.

Hab. In Western Australia, on an unknown plant with small but broad leaves and clusters of small white flowers. My specimens were sent by Mr. Lea, from Albany.

The only difference which I can detect between this and the Mount Barker insect is the more elongated form of the gall; and the absolute similarity between the larvæ is a very strong indication of specific identity.

***Sphærococcus pulchellus*, sp. nov.** Plate XXI., figs. 10–13.

Adult females covered by a waxy test, which is of a very pale-yellow or buff or whitish colour. The form of this test is peculiar, and it is difficult to describe it in words; the figure which I give of it will best exhibit it. It is very convex, and is attached to a twig, either singly or in clusters, by an elliptical base, from which the sides swell upwards and outwards, with broad and shallow corrugations, like the two parts of a bivalve shell, not quite meeting at the top, but leaving a longitudinal slit through which may be seen an inner shell of the same material; sometimes this slit is very narrow, and the sides seem to touch, but a slight pressure shows that they are separate. In the great majority of specimens there is also another transverse groove, wider than the longitudinal one, but this is absent in some. On the whole, the test looks as if it were double, with the outer part cleft in two directions, but it is not easy to give an idea of its peculiar form in words. The average length of a test is about $\frac{1}{2}$ in., but some specimens reach $\frac{1}{4}$ in.

The test of the second stage is not unlike that of the adult, but whiter in colour and less solid.

Test of male pupa not observed.

Adult female subglobular, black in colour, filling the test. Antennæ and feet entirely absent. Mentum conical, monomerous. Dorsal epidermis covered with many small tubular spinnerets, which are most numerous near the margins, and along the margin runs a broad band, apparently chitinous, in which are large numbers of oval marks, each having a small circular orifice in the centre; towards the abdominal extremity there are three of these bands.

In the latest second or earliest adult stage the insect is similar to the adult, but smaller. Remains of antennæ and feet may be detected. The tubular spinnerets are more numerous, but the marginal bands have not yet appeared, nor the oval pores.

Larva not observed.

Adult male unknown.

Hab. In Western Australia, on (?). Mr. Lea has sent me many specimens from the Darling Ranges, and says, "Common all over south-west Australia, in the vicinity of swampy ground."

As regards the insect itself, this species is much like most others of the genus, simply a bag containing larvæ. The marginal bands distinguish it somewhat, but the principal feature is the very curious and decidedly pretty test, quite unlike anything else known to me.

This is the species from which I bred a parasite, which Dr. L. O. Howard has made the type of a new Hymenopterous genus, under the name *Anysis australiensis*. At the time when I sent him the insect I had not determined exactly the genus of the Coccid host, thinking that perhaps it might be allied to *Eriococcus*. I have since made up my mind on the point, as above.

Sphærococcus socialis, sp. nov. Plate XXII., figs. 1-7.

Insects inhabiting galls attached to twigs. The galls are globular, of a greyish or greyish-green colour; the size varies, some being scarcely larger than a large pin's head, others reaching a diameter of $\frac{1}{4}$ in. The outer surface is formed of very closely imbricated scales, which are apparently aborted and coalesced leaves of the tree. The structure of the gall is not hard, solid, or woody, but loose, and on cutting it open there is seen to be a central shaft from which others more slender branch off in every direction, the ends of these expanded in small fan-shaped or cordate recurved plates, the imbrication of which forms the outer wall of the gall. It results from this arrangement that the interior of the gall consists of a number of hollow cells, which contain the Coccids; these cells and the central shaft are covered with a coating of white meal. A gall may contain several adult female Coccids, besides some male pupæ in sacs, and many larvæ, each gall forming, in fact, a complete colony of families. There is no orifice visible on the outside at any part.

Adult female dark-red, globular; diameter, about $\frac{1}{20}$ in. Individuals which have been parasitised are white. The antennæ are very small and atrophied, and seem to have only one, or two, joints, with some fine hairs at the tip. Feet entirely absent. Rostrum rather large, mentum doubtfully dimerous. Spiracles large, tubular. At the abdominal extremity is a very small simple hairless anogenital ring, with six very short fine marginal setæ near it. On the dorsum the segments are marked by transverse rows of very fine short

hairs with minute tubercular bases, and there are some simple circular spinneret orifices.

Female of the second stage elliptical, brownish-red, about $\frac{1}{30}$ in. in length; flat beneath, convex above. Antennæ as in the adult; feet absent. The dorsum is covered with numbers of very minute pustules.

Larva reddish-brown or yellowish-brown, active, elliptical; length, about $\frac{1}{55}$ in. Abdomen terminated by two very minute and inconspicuous anal tubercles, with very short setæ. Antennæ conical, with rather confused joints, which may be five or six; the last joint bears two long hairs. Feet rather thick; claw strong. I have not been able to detect any digitules. Eyes very small, black, tubercular.

Male pupa enclosed in a small, white, cottony, cylindrical sac, within the gall; length of the sac, about $\frac{1}{20}$ in.

Adult male dark-red, wings grey; length of the body (exclusive of the spike), about $\frac{1}{40}$ in.; the spike is excessively long, in some cases quite twice as long as the rest of the insect, and the penis still longer. The last abdominal segment is cylindrical, and the spike which issues from it is composed of several long, tapering, apparently telescopic joints. Antennæ of ten sparsely-haired joints, the first two short and subglobular, the rest long and slender. Feet not presenting any special characters; there is a terminal spur on the tibia.

Hab. In Western Australia, on a Myrtaceous plant, either *Melaleuca* or *Calothamnus*. Mr. Lea has sent me a large number of specimens, from Geraldton, and says, "There are acres of this." I am indebted to Mr. J. H. Maiden, of Sydney, for identification of the plant, and also for deciding the character of the galls, as to which I was at first uncertain whether they were not aborted seed-vessels. Mr. Maiden says that the fruits are not imbricated, and are open at the end. The galls must therefore be leaves aborted and agglomerated by the Coccids, and I suppose that the central shaft and radiating bars represent the twigs and leaf-stalks.

The adult male of this species resembles, in the very elongated and attenuated spike, that of *Sph. pirogallis*. Since establishing this genus in 1891 I have refrained altogether from defining any generic characters for the males, although I have now four species of that sex. I cannot consider the spike as characteristic, for a similar organ is apparently found in *Ascelis præmollis*, Schr., *Opisthoscelis spinosa*, Frogg., and *O. verrucula*, Frogg.; moreover, in *Sphærococcus stypheliæ* the spike is very short. I must therefore still leave the males generically undefined.

Section MONOPHLEBINÆ.

Genus MONOPHLEBUS.

Monophlebus burmeisteri, Westwood—*Arcana Entom.*, 1841, 1, 22, 4; Signoret—*Ann. de la Soc. Entom. de France*, 1875, p. 364. Plate XXII., figs. 8–16.

Adult female brown, but covered with a dense pubescence of short and long hairs, so that the general appearance is greyish. Form elliptical, thick, segmented, as usual in the genus. Length varying from $\frac{1}{8}$ in. to $\frac{1}{4}$ in., but shrivelling at gestation. There is a good deal of very white cotton on most specimens. Antennæ with nine subequal joints, the third and ninth rather the longest; the ninth is fusiform; all the joints bear some short hairs. Feet long, black; tibia a little more than twice as long as the tarsus; trochanter with two long hairs, one longer than the other; the inner edges of both tibia and tarsus bear several spines. Rostrum large; mentum conical, dimerous. The dermal pubescence consists of immense numbers of short hairs and a good many much longer, interspersed with numerous small circular multilocular spinneret orifices. Anogenital ring without hairs; there are two longish terminal setæ.

Second female stage not observed.

Larva greyish-brown, elliptical, active; length, about $\frac{1}{2}$ in. Antennæ black, thick, with five joints, of which the fifth and the third are the longest; the fifth is broadly fusiform, and bears several long thick hairs. Feet black; the tibia and tarsus are subequal, the tarsus a little the longer; both bear many hairs; there is only one digitule, which is a thick short bristle on the claw. Mentum long, conical, dimerous. The body is covered with a dense pubescence of short hairs, and the margin bears many longish setæ, which are most numerous and longest at the posterior extremity.

Eggs large, at first yellow, later dark-brown.

The male pupa is contained in a cylindrical sac of rather solid white cotton, the anterior end rather truncate, the posterior end regularly curved. Within the cotton the skin or case of the pupa is thin and transparent, covered with great numbers of short hairs interspersed with circular multilocular spinnerets. After the adult has emerged the exuviae of the pupal antennæ and feet are dark-brown. The antennæ have six joints, of which the third and sixth are the longest; the sixth is fusiform. The feet are as in the adult female, as also the rostrum and mentum. Eyes tubercular and smooth.

The adult male has a length of about $\frac{1}{2}$ in. for the body, with an expanse of wings of about $\frac{1}{2}$ in. The head and thorax are very dark-brown, almost black, with red patches; abdomen

red; feet and antennæ black; eyes dark-red; wings broad, rather solid, very dark-brown or nearly black, with a red nervure and two narrow longitudinal hyaline stripes, one of which is between the branches of the nervure. Antennæ of ten subequal joints: the first is tubercular, the next eight are long and compressed in the middle, the tenth is fusiform; all but the first bear many very long hairs, which from the second to the ninth are arranged in rings on the thicker portions of the joints. Feet slender, with many hairs; claw with a single digitule. Eyes prominent, semiglobular, placed on a short cylindrical tubercle; very distinctly faceted; there is a rather large tubercular ocellus close to each eye. The abdomen bears on each side five slender hairy tassels; the anterior ones are moderate, the posterior ones rather long, extending a little beyond the extremity. The haltere is broadly fusiform and large, and bears at the end eight curved setæ, the ends of which are knobbed.

Hab. In Japan, on *Pinus*, sp., Yokohama; in China, on *Ficus*, sp., and on *Gardenia florida*, Hongkong. My specimens were sent by Mr. Koebele.

I have decided, after much consideration, to attach this insect to Westwood's species. I have not seen the actual paper by that author in his "Arcana Entomologica," but Signoret copied the descriptions in his Essai, and from these it appears that Westwood never knew anything but the males of the species which he established. This renders it extremely difficult to identify insects, because, as I observed in 1895 when treating of *Icerya rosæ*, var. *australis*, the males of any given genus differ only very slightly from each other. Westwood established seven species of *Monophlebus* on the males alone, and seems to have given only very brief descriptions of them; from these it appears that he took as his principal characters the colour, the size, and the abdominal tassels. In all the seven, with the exception of one, the wings are black—in *M. raddoni* they are partly red, and I think we may here discard that species. Another, *M. illigeri*, a very small species from Tasmania, may also be put aside, and we have left the following, as described by Westwood:—

M. atripennis, Klug (Java): Thorax black, abdomen red, tassels, five (?) on each side.

M. burmeisteri, Westw. (Java?): Thorax black and red, abdomen red, tassels five on each side.

M. fabricii, Westw. (Sumatra): Thorax black and red, abdomen black, tassels three on each side.

M. leachii, Westw. (Malabar): Thorax black, abdomen red, tassels five on each side.

M. saundersii, Westw. (Southern India): Thorax black and red, abdomen red, tassels four on each side.

Assuming a validity here for colour, *M. fabricii* may be discarded as having the abdomen black. There remains the question, for the others, of the tassels; and here it must be noted that these are exceedingly brittle, so that amongst perhaps twenty specimens hardly five are found with the full number, and the box in which I received mine was littered with fragments of tassels. It is therefore quite possible that the "three" of *M. leachii* and the "four" of *M. saundersii* may really be five; indeed, Signoret expresses the opinion that *saundersii* and *burmeisteri* are identical. As for *M. atripennis*, there is a doubt. Westwood's words are not clear. He says, "Abdomine . . . incisionibus profundis inter segmenta, appendiculisque duobus carnosis hirtis apicalibus," which may mean two or more tassels—Signoret takes him to mean several. However, I will also discard this species for the present. The three which are left are so similar in colour, in size, and in the tassels that it seems immaterial which we select; but as *M. burmeisteri* has alphabetical precedence it may be well to adopt it, at all events until we know more about them.

The localities set down by Westwood for his species are all in the oriental region, except for *M. illigeri*, Tasmania, and *M. raddoni*, Western Africa. I see no reason why *M. burmeisteri* should not, like so many other Coccids, range over a wide extent, from India to Japan, or further.

It is to be noted that Westwood, following Burmeister, attributes twenty-two joints to the male antenna of *Monophlebus*. This error arose from a failure to observe the compression of the joints, which those authors took for a real division.

Genus ICERYA.

Icerya seychellarum, Westwood. *Dorthezia seychellarum*, Westw.; Gard. Chron., 1855. *Icerya sacchari*, Guérin 1867. *Icerya sacchari*, Sign., Ann. de la Soc. Entom. de France, 1875, p. 352.

I received during the year, from Mr. Koebele, some specimens of a species of *Icerya*, covered with cotton partly white partly pale-yellow. At first this seemed to be new, and perhaps allied to *I. crocea*, Green, a species from Ceylon with yellow cotton; but two of the specimens were so precisely similar to a drawing of *I. sacchari* by M. Poujade, reproduced by Signoret in his pl. xviii., fig. 2, that there was little room for doubt that they belonged to that species. Further examination of the anatomical details, and comparison with specimens of *I. sacchari* sent me in 1882 by Dr. Signoret, satisfied me on the point. Only one character remained uncertain: Signoret says that in the larva the tibia is excessively

short, whereas in my specimens it is of normal length, but possibly he was examining a larva quite recently hatched, whereas mine had been some time alive.

Westwood's specific name has priority, although his determination of the insect as *Dorthezia* is erroneous.

My specimens were collected by Mr. Koebele on *Rosa*, sp., and *Podocarpus*, sp., in China, at Hongkong, Canton, Amoy, and Formosa. The species is therefore by no means confined to the sugar-cane.

Section BRACHYSCELINÆ.

Genus TACHARDIA.

In my paper of 1894 I erroneously attributed this generic name to Signoret. Dr. R. Blanchard, of Paris, informs me that it was he who proposed its substitution for *Carteria* (pre-engaged) in the first volume of his "Treatise on Medical Zoology," and the genus is therefore *Tachardia*, Blanchard.

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PLATE XVIII.

- Fig. 1. *Aspidiotus articulatus*, diagram to show thoracic spines.
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 Fig. 3. *Aspidiotus setiger*, abdomen of female.
 Fig. 4. *Parlatoria perpusilla*, insects on plant.
 Fig. 5. " the same, magnified.
 Fig. 6. " puparia viewed from above.
 Fig. 7. " puparia, side view.
 Fig. 8. " reticulation of puparium.
 Fig. 9. " pygidium of female.

PLATE XIX.

- Fig. 1. *Mytilaspis maideni*, puparium of female.
 Fig. 2. " puparium of male.
 Fig. 3. " pygidium of female.
 Fig. 4. *Mytilaspis defecta*, pygidium of female.
 Fig. 5. *Mytilaspis crawii*, var. *canaliculata*, underside of puparium with enclosed female.
 Fig. 6. " diagram of abdominal margin.
 Fig. 7. *Fiorinia casuarinæ*, insects on twig.
 Fig. 8. " female, pellicles and puparium.
 Fig. 9. " pygidium of female.

PLATE XX.

- Fig. 1. *Inglisia fossilis*, insects on twig.
 Fig. 2. " test of female viewed from above.
 Fig. 3. " " with double cone.
 Fig. 4. " " with single cone.
 Fig. 5. *Lecanium patersoniæ*, pustule of adult.
 Fig. 6. " pustule of second stage.

PLATE XX.—continued.

- Fig. 7. *Lecanium mirificum*, insects on twig.
 Fig. 8. " adult female, dorsal view.
 Fig. 9. " antenna of female.
 Fig. 10. " markings of epidermis.
 Fig. 11. " female, second stage.
 Fig. 12. " female antenna.
 Fig. 13. " antenna of larva.
 Fig. 14. " test of male.

PLATE XXI.

- Fig. 1. *Mallophora sinensis*, diagram of abdomen of female.
 Fig. 2. " diagram of abdomen of larva.
 Fig. 3. *Eriococcus simplex*, armature of male.
 Fig. 4. *Coccus acaciæ*, antenna of female.
 Fig. 5. *Sphærococcus rugosus*, type, galls on twig.
 Fig. 6. " gall, magnified.
 Fig. 7. " female, ventral view.
 Fig. 8. " var. *elongatus*, galls on leaf.
 Fig. 9. " galls, magnified.
 Fig. 10. *Sphærococcus pulchellus*, insects on twig.
 Fig. 11. " tests magnified, side, top, and end views.
 Fig. 12. " adult female, side view.
 Fig. 13. " chitinous band and marks.

PLATE XXII.

- Fig. 1. *Sphærococcus socialis*, galls on twig.
 Fig. 2. " gall, magnified.
 Fig. 3. " gall cut open longitudinally.
 Fig. 4. " one of the aborted leaves forming the gall.
 Fig. 5. " adult female, ventral view.
 Fig. 6. " antenna of female.
 Fig. 7. " spike of male.
 Fig. 8. *Monophlebus burmeisteri*, adult female, dorsal view.
 Fig. 9. " antenna of female.
 Fig. 10. " larva.
 Fig. 11. " antenna of larva.
 Fig. 12. " antenna of male.
 Fig. 13. " eye of male.
 Fig. 14. " abdomen and tassels of male.
 Fig. 15. " wing of male.
 Fig. 16. " haltere of male.