

NOTES ON AUSTRALIAN FUNGI, No. II.
PHALLOIDS AND GEASTERS.

BY

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With Plates XXIV and XXV.

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PHALLOIDS.

In 1907 C. G. Lloyd of Cincinnati wrote a most excellent account of the Phalloids of Australasia, and in 1909 a 'Synopsis of the Known Phalloids.' In these papers the account of the Phalloids in Cooke's 'Handbook of Australian Fungi,' is critically reviewed and the number of species recorded for this continent materially reduced. Having a considerable number of Phalloids under our observation, either in our private collections or in the National Herbarium, we have in this paper recorded notes concerning them which in some respects supplement Lloyd's accounts. In addition, we append a list of the species given by Cooke with their diagnoses as collated from Lloyd's work, as well as a new list of the Australian Phalloids which may be accepted as replacing that compiled by Cooke.

Phallus rubicundus var. *gracilis*, (69, p. 8, fig. 5). Syn. *Phallus novæ-hollandiæ* Corda (40), *Ithyphallus novæ-hollandiæ* Cooke (37 No. 1184, fig. 98), *Cynophallus Caylei* Berk. in F.v.M. (104 p. 119), *Phallus libidinosus* Caley (MS.) Cooke (33, p. 57).

In the National Herbarium, Sydney, there is a fine collection of specimens of this species collected at Campbelltown State Nursery by Mr. J. H. Maiden, in December, 1900, and also two specimens from Grafton collected by Mr. Heinreich in December, 1913. Lloyd suggests (69, p. 8) that *Phallus vitellinus* F.v.M. (Fragm. 7, p. 122) and also *Ithyphallus atrominiatus* Bail. belong to this species.

Phallus indusiatus Vent. Syn. *Dictyophora phalloidea* Desv. in Cooke (37, No. 1175) and *D. tahitensis* Schlecht. of F.v.M. (104) and Cooke (37, No. 1176).

We have specimens of this species from Neutral Bay collected by Dr. E. A. D'Ombraïn, spores $4.2 \times 1.2\mu$ and from Fiji, collected by D. J. North in March, 1908. It had previously been recorded from Richmond River by F. v. Mueller (*l.c.*) and from Booyong by Jackson (54). Also on the Endeavour River and at Brisbane, Lloyd (69, p. 4).

Phallus multicolor Berk. and Br. (25, p. 67, t. xiv, fig. 16), Lloyd (69, p. 6). Syn. *Dictyophora multicolor* Berk. in Cooke (37, No. 1178).

According to Lloyd (*l.c.*) the type specimen of this plant is in the British Museum. It was collected at Brisbane by the late Mr. F. M. Bailey. Our specimen was collected in a moist spot in sandy soil at Ballina, near Lismore, by Miss R. Rothwell in April, 1910, and agrees exactly with the description and illustration given by Lloyd.

Mutinus curtus Berk. (13), Lloyd, (69, 70), Cooke (37, No. 1188). Syn. (?) *Mutinus papuasius* Kalch. (55), Lloyd (69, 70), Cooke (37, No. 1189).

Of *Mutinus curtus* Lloyd says (in 1907) that the description is based on a single collection made sixty years ago by Drummond. It impressed him as based on undeveloped plants and the figure given by Corda (which he reproduces) he thinks is largely imaginary, and he can see no warrant

for the *lobed* volva. Of *Mutinus papuasius* he states that the plant is only known from Kalchbrenner's figure (reproduced), which was made from specimens sent him by Mueller. He adds that it is not really known whether the plant is a *Mutinus* or a *Phallus*, and that if it is a *Mutinus* it is the most slender species known.

Although these two figures appear at first sight to represent quite different plants, we have collected on two occasions a *Mutinus* which, in certain stages of its development, could be represented by either figure (with certain reservations), whilst the mature fungus might figure as a third species. From the comparisons of our specimens with the figures we have little doubt that one species is alone involved which approaches *Mutinus bambusinus* in general appearance, but is best called, at present at any rate, *M. curtus*. The explanation of the figures seems to be as follows: At an early stage within the volva, the receptacle is drum-stick shaped, consisting of a delicate white stem capped by a relatively large dull sage-green knob; which elongates later. The apex of the knob is white, the gleba being here deficient, and has a well-marked ostiolum. Both these features are clearly shown in the figure of *M. curtus*, as is also the elongated gleba-bearing knob. The stem is also attenuated downwards but is thicker than in our specimens. The figure is so evidently diagrammatic, however, that this may be overlooked, whilst the five 'lobes' of the volva suggest either the artificial cutting of the closed volva to expose the contents or the delineator's idea of what it would have been had it ruptured in the course of growth. The figure of *M. papuasius* (reproduced in Cooke's Handbook of Australian Fungi, fig. 99) very closely resembles our plants, especially if the stem were considerably shortened. As the figure was drawn from specimens sent to Kalchbrenner which, if our contention is right, had not yet

emerged from their volvas, it is quite reasonable to suppose that the artist would be directed to represent the plant as it would be supposed to appear at maturity, an elongation of the stem being the result. In reality, however, as the plant matures the whole stem enlarges rapidly, becoming more or less uniformly cylindrical but tapering at the summit, whilst its upper half is covered with the gleba.

In further support of the view we hold, that our plants belong to the same species as the two mentioned, it is pointed out that we have obtained it on rotten wood on two separate occasions in different localities on the Blue Mountains, suggesting that it is not an uncommon species, and is therefore likely to have been described. Further, when collected all the specimens were immature, one only emerging during the night from its volva showing how different the adult was from the immature form—immature specimens being, therefore, those most likely to have been collected.

The description of our specimens is as follows:—The 'egg' is more or less globular. On being opened at an early stage, there appears a very slender white stem ($\frac{3}{16}$ in. long), slightly attenuated downwards, capped by a globular slightly rugose dull sage-green head ($\frac{1}{3}$ in. high) having a white apex with a minute ostium (the sage-green material being the gleba, the white apex a portion of the stem free from this). Later, when the stem and its head are half-an-inch high, the two together form an elongated inverted cone, the basal half being white and vaguely transversely rugose, whilst the distal half except at the apex is slightly rugose, being covered with the dull sage-green gleba, the apex itself being slightly raised and with a marked ostium. Covering the gleba is an obscure wide-meshed whitish network, such as may be seen on opening a *Clathrus* egg, attached to the jelly-like material where this came in contact with the

folded branches and contained gleba, though in the *Mutinus* the network adheres to the gleba and not to the jelly. On removing the gleba from the *Mutinus* at this stage, the hollow stem is found to be attenuated both ways, though more rapidly constricted at the apex, whilst the part covered by the gleba is pale reddish, the rest of the stem being whiter.

When mature, the whole of the stem is about 1 in. high, the basal half being slightly rugose and whitish. The distal half is of the same size at the junction of the two and attenuates slightly to the blunt apex, in which is a minute orifice. This portion is also somewhat rugose and is slightly yellowish, being wrapped round in its lower part by the dull greenish gleba which has fallen away from the apex. Spores $3.5 \times 1.8\mu$.

On a rotten fallen log, Mount Wilson, N.S.W., June 1915. Also immature specimens on a trunk from Kurrajong Heights, N.S.W., Oct.

Jansia rugosa Lloyd (70), Cheel (27). Syn. *J. truncata* McAlp. in Lloyd (84).

We have specimens in our collection from Rookwood, N.S.W., collected by Mr. A. G. Hamilton, which have been already recorded by one of us (E. C.). These when fresh were noted to have a whitish receptacle slightly tinged pink, gradually deepening into crimson near the apex, with a band of purplish-coloured gleba about a quarter of an inch from the extreme tip. One of the specimens was photographed when fresh by Mr. Hamilton (Plate XXV, *h*). This was reproduced by Lloyd (*l.c.*) who says (93):—"There is no real difference between *J. truncata* of McAlpine and *J. rugosa* on which a species may be based, but the Australian plant is so much larger and more robust and its truncate apex is so much more prominent that it is well

entitled to a name as a form." In addition to the Rookwood specimens, we have also collected examples of this species on several occasions in November and December, 1914, growing, after heavy rain, on a shady sloping bank near a watercourse at Mosman, Sydney. The spores measured $3.4 \times 1.5\mu$.

Lysurus Gardneri Berk. (14, p. 535, t. xvii, f. 2).

We have a fine series of specimens which we prefer to place under the above specific name, as the fine photographs together with notes on the specimens examined and recorded by Lloyd (69 and 70) clearly show that this is a very variable species and will embrace all the Australian forms described under the following names:—*Lysurus australiensis* Cooke and Massee (35, p. 6), Cheel (28, p. 396); *L. tenuis* Bailey; *Mutinus sulcatus* Cooke and Massee (34); *M. pentagonus* Bailey (3, p. 35), and *M. pentagonus* var. *Hardyi* Bailey (8, p. 494).

In October, 1906, two specimens were collected by one of us (E. C.) at Penshurst. The receptacles or columns were of a whitish colour and measured two and a half and three and a half inches long respectively, being about three quarters of an inch thick in the upper part and tapering slightly in the lower part. A complete volva was secured with one of the specimens which measured about $1 \times 1\frac{1}{4}$ inch, opening at the apex by an irregular rupture and not into definite lobes as depicted in some of the published illustrations of Phalloids. The largest specimen had seven distinctly free lobes and the smallest specimen had six lobes, also free, and in both specimens the inner sides of the lobes were covered with a gleba of a bronze-green colour containing the spores which measured $3 \times 1\mu$. The outer parts of the lobes were more or less fluted or channelled and somewhat notched on the margins. Some specimens collected in the Botanic Gardens have the five arms or lobes

free, while one specimen from the same group of plants has six lobes, four of which are free and the other two united at the apex by a thin membrane, which gives the specimen a somewhat clathrate appearance.

A solitary specimen has also been collected at Woolwich near Sydney, which has three free lobes, whilst the other two are consolidated at the apex as shown in the accompanying Plate XXIV, (a). In a group of specimens collected at Killara, six volvas were clustered together, almost cohering at their sides, five of which were expanded whilst the sixth was unopened. In examining the specimens it was found that three of the receptacles had six lobes, one of which had two lobes just united at the apex by a thin membrane, whilst one specimen had seven lobes, and two had five lobes quite free. The specimen with seven lobes was in the unopened volva which was cut and photographed as shown in Plate XXIV, (b). A solitary large specimen collected at Wahrenonga is fully four inches long and from three-quarters to one inch thick. This has five distinctly free lobes and three smaller ones consolidated somewhat at the margins but free at the apex.

The spores of a specimen collected on the Hawkesbury River are elongated, $4 \times 1.8\mu$. It is interesting to note in making a transverse section of one of the specimens collected at Killara, that the receptacle or stem is quite hollow or tubular in the centre, but is distinctly cellular in the outer part. In the fine series of specimens photographed by Lloyd (82, p. 407, fig. 243), a transverse section is shown with a single row of cells in the outer structure. In our specimens a drawing (Plate XXIV, c) made by Miss M. Flockton shows the structure to have at least two distinct rows of these cells. It is quite probable that in the smaller specimens the structure would contain a single row, whilst in the larger specimens two or even more rows of cells will be found.

The following is a list of the collections of this species contained in the National Herbarium, Sydney:—

Killara (H. Selkirk, March, 1905);

Penshurst (E. Cheel, October, 1906);

Wahroonga (Dr. Eric Sinclair, April, 1907);

Botanic Gardens (W. F. Blakely, June, 1908);

—— (W. Challis, April, 1910);

—— (E. Bennett, 1911);

Woolwich (F. Smith, June, 1908);

Milson Island, Hawkesbury River (J. B. Cleland and
E. Cheel, July, 1912);

Cronulla Beach (E. Breakwell, 1912);

Campsie (J. Nichol, April, 1912);

Hawkesbury Agricultural College, Richmond (C. T.
Musson, 1914);

Neutral Bay (C. Thackeray, May, 1915).

See Cooke (37, No. 1198), Cheel (26, p. 159 and 204) and Musson (106) for previous records.

Anthurus Archeri. Syn. *Lysurus Archeri* Berk. (16, p. 264) figured in the same work on plate clxxxiv, as *L. pentactinus*; *Anthurus aseroeformis* Cheel (28, p. 607).

The following also appear to belong to this species:—*Aseroe lysuroides* Fischer and *Lysurus aseroeformis* Corda of Cooke (37, No. 1202); *Anthurus Muellerianus* Kalchb. var. *aseroeformis* Fischer (52, fig. 136, f. and g.); *Anthurus aseroeformis* McAlpine in Lloyd (70, fig. 46 and 83, fig. 244); *Pseudocolus Archeri* Lloyd (94 and 95); ? *Aseroe rubra* var. *pentactina* Endl.

In the National Herbarium collection there are specimens which when opened out of the unexpanded volva show the lobes slightly incurved and somewhat cohering at the apex but yet quite free and the tips of the five lobes very shortly bifid as shown in the figure of the original specimen figured by Berkely (*l.c.*). We have also a fully developed

specimen which one of us recorded under the name *Anthurus aseroeformis* (28, p. 607) from Mount Royal near Scone. This specimen has five lobes, two of which are slightly united at the apex with a thin membrane, whilst the others are quite free, as shown in Plate XXV, (i).

From Yarrowitch near Walcha, some fine specimens were collected by Mr. G. W. Broughton which agree exactly with the description drawn up by Mr. D. McAlpine and published with a photograph by Mr. Lloyd (70, fig. 46 and 82, fig. 244).

We have carefully compared the above specimens, together with another for which no specific locality is given, but which was probably collected by Mr. A. Grant, with the photograph of the specimen collected in a garden at Melbourne, Victoria in April 1907 by Mr. C. French, and communicated to Mr. C. G. Lloyd and referred to above, and have come to the conclusion that they all belong to the same species. The colour of our specimens was of a reddish tint. They were all five lobed, the lobes being more or less channelled on the outer side and convex on the inner side, and either entire and obtuse or very slightly bifid in one specimen at the apex. In addition to the above we have a sketch together with a description of a fungus collected at Squdgy Creek near Bulli Pass in October, 1903, by Mr. W. Benson, which seems to belong to this species.

Mr. Benson's description is interesting and may be given in full as follows:—

"It is what (if such a thing were possible) might be called a flowering fungus. Habitat, Squdgy Creek near Bulli Pass. Appearance a five-rayed starfish. Tips raw-meat-purple, paler pink towards the centre, and the tube nearly white. Down the centre of each ray, some brown slime which appeared to be part of the plant (but the whole place was muddy). Surface of the "flower," rough, like a sheep's tongue. On picking the "flower"

it came away complete, leaving a cup in the ground. But the "flower" immediately collapsed and broke to pieces in my hand. Its substance was almost structureless jelly, nor could I see any pistil, stamens, or other organs. The rays were of the same thickness, perhaps one-eighth inch. The cup was like a puff-ball or young potato in colour, of a tough jelly consistency, and strengthened by internal perpendicular partitions; a thin skin peeling here and there enclosed the cup. From a pimple underneath, two white threads of roots sprang. Unfortunately in scrambling out of the rough spot where I found it, it fell and got lost."

The sketch drawn by Mr. Benson leaves no doubt in our minds that his plant belongs to this species, as it compares very well with a photograph (Plate XXIV, fig. *i*) taken from a specimen collected at Mount Royal Range, on the edge of a swamp at an elevation of about 4,500 feet above sea level, by Mr. H. V. Haynes, in April, 1910. A description of the specimen collected by Mr. Haynes may be given as follows: Volva $1\frac{1}{4} \times 1$ inch in diameter. Receptacle on a short stipe protruding about half an inch from the volva and then dividing into five lobes, each of which is about two and a quarter to two and a half inches long, and of a bright red colour towards the tips, getting gradually paler or almost white towards the base. Lobes coarsely reticulated, the reticulations or rugæ very unequal. The inner parts of the lobes somewhat convex and more or less covered with the dark bronze or greenish coloured gleba, the outer part of the lobes concave. Spores somewhat cylindrical, 5 to $7 \times 2\frac{1}{2}$ to 3μ . Specimens have apparently been seen at Port Macquarie, as Mr. G. A. Waterhouse in a pencil sketch of a fungus seen by him there seems to indicate that it was this species.

Aseroe rubra Labill. (63), Cooke (37, No. 1201), Cheel (26, p. 204). (See Plate XXIV, *a* and XXV, *g* and *j*)

This interesting species was originally collected in Tasmania by La Billardiere, who published a description together with a figure in the year 1798.

Since this date there have been no less than ten species of the genus described, but it is very doubtful if more than three distinct species will stand when the whole of the material collected has been properly investigated and compared with fresh specimens. The following is a list of the names of those species which have been recorded for Australasia in addition to the original *A. rubra*:—*A. actinobala* Corda; *A. pentactina* Endl.; *A. Muelleriana* Lloyd; *A. lysuroides*; *A. Hookeri* Berk.=*A. viridis* Berk.; and *A. poculiformis* Bail.

In addition to the above there are four species found in other countries, the names of which are as follow:—*A. zealandica* Berk., a native of Ceylon; *A. junghuhnii*, common in Java; *A. pallida*, a native of New Caledonia, and *A. arachnoida* Fischer.

The last mentioned species is a native of Cochin China and Java and seems to be quite distinct from any of the Australian forms. *A. zealandica* seems to be very little different from the Australian species and has been regarded as a variety of *A. rubra* by some authorities.

In the National Herbarium of Sydney, there are five dried specimens collected in Tasmania near the type locality by R. C. Gunn, who has written the following remarks concerning them on the sheets with the specimens:—"Aseroe *rubra*? Labill.—I saw it abundantly, February 1851, growing in light decomposed vegetable matter in a dense forest of *Fagus Cunninghamii*. It bursts out of a ball like *Ileodictyon*. Colour very bright crimson, smells like tainted meat. The centre of each was full of blackish or brown slimy matter. Very brittle and not easily dried."

Two of these specimens have nine bifid lobes, one has seven bifid lobes, and a fourth specimen is too imperfect for examination. On another sheet, a very large specimen is mounted with the following remarks, also in Gunn's handwriting:—"Aseroe rubra? Labill. I annex observations to the other specimens sent herewith. This genus is obviously closely allied in many points to *Ileodictyon*. La Billardiere's figure is so bad that it is not easy to identify the species by it, but as the country where he gathered his original specimen formed a dense *Fagus* forest, it is probably the same, yet he says in his Voyage, the whole surface of the *Aseroe rubra* is smooth, whereas this one is *not*. I send you specimens in spirits." Gunn's specimens were sent to Hooker who handed them over to Berkeley for determination. It is evident that this species has attracted the attention of several collectors in New South Wales also, for we find it frequently mentioned in Berkeley's early works on Fungi. It was collected near Sydney as far back as 1844 by Leichhardt, who forwarded specimens to Berkeley. Other collections were also made near Sydney as will be seen from the following observations by Berkeley who also published a figure (12):—

"This singular fungus was found in the Government demesne by Lieut. Lynd, Barrack Master at Sydney, growing early in April on rotten wood, not fifteen yards from the seawards."

Specimens recorded from other localities by Berkeley (18) are as follows:—Dandenong, Victoria (Boyle); New England, N.S. Wales (C. Stuart); Lake Gillies (J. Stuart). Berkeley published the following remarks concerning these latter specimens:—

"Amongst rubbish left by river-floods. Very fugacious. In all these specimens the rays are bifid only at the very extremity; spores .0003 in. long. Dyes the fingers when fresh, but the colour is very fugacious."

In the same paper, Berkeley mentions *A. pentactina* Endl. from New England, Timbarry (C.M.) and makes the following remarks:—

“Hymenium distinctly rugose as stated by Corda; but this is also the case in the Dandenong specimens which I at first thought might be distinct. R. Brown was inclined to an opinion that all the Australian specimens were referable to a single species.”

We have not seen this latter species but as the specific name *pentactina* implies that the specimen has five lobes, and Berkeley states that “the rays are bifid only at the very extremity, it would seem that this is nearer to the genus *Anthurus* than to *Aseroe*, and may possibly be the same as *Anthurus Archeri*. According to Lloyd (Mycological Notes, No. 32, p. 424) the species extends to New Zealand, as specimens are represented in the Museum at Upsala, which were collected there by G. von Scheele and Berggren.

The most common form in New Zealand is one originally called *Aseroe viridis* by Berkeley who afterwards named it *A. Hookeri*. This appears to be a very small plant according to the descriptions and figures given by Berkeley and Lloyd, and is very similar to, if not identical with, a solitary specimen in our collection from Nundelong Road, Balmoral, collected by Mr. Bragg in June, 1902. The specimen is much smaller than the normal forms of *A. rubra*, and has six bifid rays, but unfortunately there are no colour notes with the specimen, so that we prefer to regard it at present as a form of *A. rubra*.

In the National Herbarium there is a splendid collection of specimens, mostly preserved in alcohol or formalin. The following is a list of the localities where these were collected, together with the names of the collectors and date of collecting:—

- New South Wales—Byng, near the Canoblas (no collector given, July, 1893);
Peakhurst (W. Buckingham, June, 1899);
Turramurra (H. G. White, June, 1900);
Clyde Pottery, Camperdown (Mrs. McArthur, April, 1903);
Penshurst (E. Cheel, April, 1907);
Killara (W. Benson, March, 1907);
Woollahra (H. Waters, November, 1909);
Raydon near Dural (R. Turner, January, 1911);
Parramatta (A. Thompson);
Chatswood (Booth, March, 1911, and Gilfillan);
Lismore (Miss Rothwell, October, 1900);
Rookwood (A. Spencer, July, 1910, photographed by Mr. A. G. Hamilton);
Weston (V. Davis, 1912);
West Maitland (Miss Cranch, 1912);
North Sydney (Dr. H. I. Jensen, 1912);
Neutral Bay (J. B. Cleland, May, 1914).

There is extreme variation in the size as well as in the general structure of the specimens as will be seen from the following remarks:—The specimens from Turramurra have eight lobes, all of which are bifurcate at the tips. There are two specimens from Lismore with six lobes, and one with seven lobes. Two specimens from Peakhurst have six lobes, and two are in the unopened egg or volva stage. The specimens from Clyde Pottery, Camperdown, are especially interesting as there are six in a cluster, three of which are in the volva stage unopened, one with six bifurcate lobes, one with four bifurcate lobes and the fifth lobe with three tentacles fused together in a clathrate manner at the centre but with four quite free tips. From Penshurst there are four specimens altogether, one with six bifurcate lobes, one with six lobes—five of which are bifur-

cate whilst the sixth lobe is quadrifurcate; the other two specimens being in the volva stage. A solitary specimen from Woollahra has eight bifurcate lobes. The Dural specimen is exceptionally large, measuring five inches across from the tips of the rays, and four inches high, whilst the volva is two inches in diameter. In addition to the above localities, specimens have been recorded from Mulum bimby, Brunswick River by Kesteven (62), Richmond by Musson (106), Norfolk Island by Mueller (105) and Grant (53), and from New South Wales without specific locality by Turner (117).

The following interesting particulars, together with a coloured sketch showing eight bifid rays, with specimens from Killara collected by Mr. W. Benson, are of special interest:—

“A year or so ago I sent you a fungus which simulated a starfish. I now send you one (or rather sketch of one) which is equally like a sea anemone, though I fear that, as before, I may be one hundred years too late to call it a novelty. It seems to be another *Aseroe*. It was found yesterday, in a drenched paddock at Killara, near another curious patch of fungi, resembling cauliflower coral. Covering a hollow, porous-looking, pink tube, about two inches high, is a thick mass of liver-coloured fungus matter which shapes itself into eight petal bases, and from each base spring a pair of tentacles, vermilion for about one quarter of an inch and then for another inch up to their tips bright orange, just like the tentacles of a sea anemone. The central mass, which may be one and a quarter inches across, having the throat of the tube in its midst, is rather tough in texture, ‘nubbly’ as regards surface, and very suggestive of ‘protuberant proud flesh’ round an abscess. Odour, putrescent. Down the tube for about half an inch, the inner surface is covered with little projecting points like miniature tubercles; these may be up to one-sixteenth of an inch long at the throat where they are largest. The section and rough sketch at foot may make my description clearer.”

The specimens from Rookwood were photographed by Mr. A. G. Hamilton, who sent a copy to Mr. C. G. Lloyd, who published the following remarks concerning it (90):—

“*Aseroe Muelleriana*, the broad limbed form, cf. *Phalloids of Australasia*, p. 18. It is the first specimen of this form I have seen. Heretofore I have only known Kalchbrenner’s figure.”

In a subsequent memo it is again referred to by Lloyd (93) under the name *Aseroe Hookeri*, and again by the same author (85), who reproduces Mr. Hamilton’s photograph, under the name *A. rubra*.

Pseudocolus rothae Lloyd (69, p. 20, fig. 21, and 70, p. 53, fig. 69). Syn. *Clathrus triscapus* Turp. in Cooke (37, No. 1191) and Bailey (10, p. 746, fig. 813); *Colus rothae* Fischer (50).

According to Lloyd (l.c.) there are at the Royal Herbarium, Kew (England), two collections of this species, one from Miss Carter, Moonan Brook, N.S.W., and the other from Bailey, Brisbane. Bailey sent a sketch of this specimen with the following notes:—

“Divisions of the receptacle always three, arched, and joined at the apex, of a rich orange, and obtusely triangular, porous celled. The entire portion (stipe) very short or not extending beyond the volva.”

One of us (J. B. C.) collected some fine specimens at Bulli Pass, in April, 1914, which may be briefly described as follows:—Unexpanded specimens white, globose, half an inch in diameter. The receptacle from a short base at once divides into three, sometimes four, slightly arched columns which cohere at their apices, surrounding in their upper part the dark greyish-black slimy gleba. Out of eight specimens collected altogether, two had four columns and the others had three, but in one of these latter, one column was thicker and divided into two in its upper part. The

columns were about one and a quarter inches high, alveolar on their inner surface, rugosely alveolate externally, hollow, orange coloured above, becoming cream coloured towards the base. Volva fibrously rooting in the rotten trunk on which the specimens were found. Smell slightly foetid. Spores rod-shaped with rounded ends, $3.5 \times 1.5\mu$.

Clathrus pusillus Berk. (13), Cheel (26, p. 839 and 28, p. 396). Syn. *Clathrella pusilla* Fischer (52, p. 284, f. 132c.)

This is a bright ruby-red coloured fungus and is popularly known as the "Ruby Lace Fungus." It was originally collected at Swan River, W.A., and recorded by Berkeley (*l.c.*) who published a figure which has been reproduced by Lloyd (69, f. 24). It has also been recorded for Wide Bay, Queensland, by Cooke (37, No. 1192) as well as for Swanbrook near Inverell, N.S.W. by Cheel (*l.c.*). From Gilgerring near York, W.A., we have received further specimens collected by Miss Bradley which were communicated by Mr. O. W. Sargent in August, 1909, and a solitary specimen was collected at Milson Island, Hawkesbury River, by J. B. Cleland and E. Cheel in July, 1912. The spores of the last mentioned specimen are colourless, elongated, $5.3 \times 2\mu$.

Clathrus cibarius Fischer (Lace-ball Fungus).

This species was originally discovered at Waitake, New Zealand, and described by Tulasne (116) under the name *Ileodictyon cibarium*. Tulasne proposed to separate the genus *Ileodictyon* from *Clathrus* on account of the meshes of the receptacle or net-work being larger, and the branches or arms of the net having a single hollow tube, whilst those of *Clathrus* proper are cellular or pluri-tubular. The species appears to be very common in New Zealand, and has also been found in Chile and South Africa. Some fine photographs of the New Zealand plants are published by Lloyd (70, p. 60, fig. 78, and 83, p. 447, fig. 267 and 69, p. 20, fig.

22). It is very variable in size, the receptacle ranging when fully expanded from two to, rarely, more than four inches in diameter. The arms or branches of the interstices also vary very considerably, those of the typical species being usually about two-fifths of an inch (1 cm.) wide. In the National Herbarium collection, we have specimens identical with those from New Zealand, from the following localities:—

New South Wales—Arncliffe (W. Gayner, June, 1907);
Gladesville (Miss M. Flockton, June, 1907);
Mywee, Yarrangobilly (A. G. Watts, May, 1910).

Sections of the arms or branches of the Arncliffe specimens show considerable variation, both as regards their width as well as their internal structure. In some specimens the diameter of the branches is from 5 to 10 mm. The branches have also been found to contain a single tube in some cases and two or three tubes in others, even in the same specimen.

C. cibarius var. *gracilis* Fischer. Syn. *Ileodictyon gracile* Berk. (11, p. 69, t. 2, fig. 8); *Clathrus gracilis* Schlect. (113, p. 166).

This is much more common than the typical form and is even more variable, as the receptacle ranges in size from two to eight inches in diameter and the branches of the interstices are from half a line to one and a half lines thick in most specimens examined, but occasionally vary from one to two and a-half lines in the same plant.

The internal structure of the branches is for the most part tubular but occasionally it is bi-tubular. Spores of the New South Wales specimens were colourless, elongated, 4.5 to 7×2 to 2.5μ . This variety has a much wider distribution than the typical form, having been recorded for all the Australian States except South Australia. One of us, however, found specimens of a white *Clathrus* on several

occasions at Mount Lofty, in that State, and these were probably the form *gracilis*. We have a fine series of this variety in the National Herbarium collection as follows:—

New South Wales—Botanic Gardens, Sydney (A. Grant, May, 1900);

Centennial Park (E. Cheel, May, 1901);

Botany (L. Abrahams, September, 1901);

Mosman (A. N. Allen, June, 1913);

Manly (Miss V. Gibbons, July, 1910);

Artarmon (A. Cretin, August, 1907);

Roseville (McMillan, June, 1913);

Cheltenham (A. A. Hamilton, May, 1910);

Concord (F. C. Lovegrove, January, 1909);

Rookwood (A. Fathers, 1912);

Parramatta (I. Grainger, March, 1898);

Milson Island (J. B. Cleland and E. Cheel, 1913);

Jerilderie (J. Dykes, August, 1908);

Armidale (Miss M. Tindall);

Gostwyck, Uralla (E. T. Bateson, May, 1908);

Geeron, Forbes (— Carr, September, 1911);

Clareval, Stroud (Miss E. M. Kealy, August, 1910);

Ingleburn (A. R. Ward, 1913);

Springbank, Widgiewoi Siding (Miss M. Mackinnon, July, 1913);

Deepwater (N. S. Kellie, March, 1915);

Moss Vale (W. Challis, June, 1910).

Tasmania—Penginte (R. C. Gunn, No. 1792).

List I. Phalloideæ recorded for Australia by Cooke (37) with Lloyd's identification of each.

1175 *Dictyophora phalloidea* Desv. = *Phallus indusiatus*.

1176 ,, *tahitensis* Schlecht = *Phallus indusiatus*.

1177 ,, *speciosa* Meyen = *Phallus indusiatus*.

1178 ,, *multicolor* Berk. = *Phallus multicolor*.

1179 ,, *merulina* Berk. = *Clautriavia merulina*.

- 1180 *Ithyphallus impudicus* L. = *Phallus impudicus*.
 1181 „ *quadricolor* Berk. and Br. = *Phallus multicolor* probably, which has lost its veil.
 1182 „ *calyptratus* Berk. = *Phallus* sp., not determinable.
 1183 „ *aurantiacus* M. = *Phallus rubicundus*.
 1184 „ *novæ-hollandiæ* Ca. = *Phallus rubicundus* (*P. gracilis* = *P. aurantiacus*, Lloyd).
 1185 „ *retusus* Kalchb. = *Phallus rubicundus* (*Phallus aurantiacus*, Prof. Fischer).
 1186 „ *rubicundus* Bose = *Phallus rubicundus*.
 1187 *Mutinus* (?) *Watsoni* Berk. = *Nomen nudum*.
 1188 „ (?) *curtus* Berk. = *Mutinus curtus*.
 1189 „ *papuasius* Kalchb. = *Mutinus curtus* probably (J.B.C. and E.C.).
 1190 „ (?) *discolor* Kalchb. = *Phallus* (?) *discolor* (? a true species).
 1191 *Clathrus triscapus* Turp. = *Pseudocolus rothæ*.
 1192 „ *pusillus* Berk. = *Clathrus pusillus*.
 1193 „ *gracilis* Schl. = *Clathrus gracilis*.
 1194 „ *albidus* Becker = *Clathrus gracilis*.
 1195 „ *cibarius* Fischer = *Clathrus cibarius*.
 1196 „ *crispus* Turp. = *Clathrus crispus*.
 1197 *Colus hirudinosus* C. and S. = *Colus hirudinosus*.
 1198 *Lysurus australiensis* Cke. and Mass. = *Lysurus Gardneri* (J. B. C. and E. C.)
 1199 *Anthurus Muellerianus* Kalchb. = *Anthurus Archeri* (J.B.C. and E.C.)
 1200 „ *Archeri* Berk. = *Anthurus Archeri*,
 1201 *Aseroe rubra* Labill. = *Aseroe rubra*.
 „ „ var. *pentactina* Endl. = *Aseroe pentactina*.
 1202 „ *lysuroides* Fischer = ? (probably wrongly figured).

List II. In addition to the species given by Cooke, the following have been recorded for Australia:—

Mutinus pentagonus (and *M. pentagonus* var. *Hardyi*). Lloyd suggests that these may be young specimens of *Lysurus australiensis* (*L. Gardneri*), with which, as pointed out in our text, we agree.

Mutinus annulatus = *Jansia annulata*.

Aseroe Muelleriana = *A. rubra* (J.B.C. and E.C.)

„ *lysuroides*. Lloyd thinks that Corda's figure represents two different genera.

Clathrus albidus = *Clathrus albidus* (?).

List III. We give the following list, compiled from Lloyd's 'Phalloids of Australia,' and his other works, to replace the twenty-eight species (Nos. 1175–1202) given in Cooke's 'Handbook of Australian Fungi.' An asterisk indicates that we have specimens in our collections believed to belong to the species marked.

1. *Phallus rubicundus* (and (or) as form *gracilis**).
2. „ *indusiatus*.*
3. „ *multicolor* (perhaps only a colour form of *P. indusiatus*).
4. „ *callichrous* (perhaps only a colour form of *P. indusiatus*).
5. „ (?) *discolor* (probably an incorrectly described species).
6. *Clautriavia merulina*.
7. *Mutinus curtus*.*
8. *Jansia rugosa*.*
9. „ *annulata*.
10. *Lysurus Gardneri*.*
11. *Anthurus Archeri*.*
12. *Aseroe rubra*.*
13. „ *rubra* var. *pentactina*.
14. *Pseudocolus rothæ*.*
15. *Clathrus pusillus*.*
16. „ *cibarius*.*
17. „ *cibarius* var. *gracilis*.*
18. „ *crispus* (no Australian specimens known to exist).
19. „ *albidus* (described from Australia in a Swiss publication thirty years ago).
20. *Colus hirudinosus* (no Australian specimens known to exist).

GEASTERS.

The fungi included in the genus *Geaster* are easily distinguished from other species of the Lycoperdaceæ by the double peridia, the outer one of which splits into segments usually revolute away from the endoperidium, and finally becomes somewhat star-shaped, hence they are popularly called "earth-stars." The capillitium is mostly simple, and the spores globose and usually minutely warty or very rarely smooth.

Twenty-two species have been recorded for Australia by Cooke (37) which are distributed in the different States as follows:—Queensland 12, Western Australia 9, Victoria 8, Tasmania 5, New South Wales 5, South Australia 3 species.

Since the publication of Cooke's work, changes have been made in the nomenclature of many of the Australian fungi, and the Geasters have received special attention from Mr. C. G. Lloyd, who has had excellent opportunities for examining all the earlier collections of Australian species which are for the most part deposited in the Royal Herbarium, Kew, and the British Museum. A few collections have also been examined which are deposited in herbaria on the Continent of Europe, and as a result of this examination it has been found necessary to change the names of many of the earlier collections. In the National Herbarium there are numerous collections of these interesting plants which have been carefully preserved by one of us (E.C.) during the past fifteen years. These have been carefully compared with the excellent illustrations given by Lloyd, and together with our private collections, form the subject of the present notes.

Geaster simulans Lloyd (68, p. 17, fig. 11). Syn. *G. hygrometricus* in Cooke (37, No. 1268) but probably not of Persoon.

We have a solitary specimen of this species collected near Adelaide, South Australia, by one of us (J.B.C.) in 1898, which very closely resembles *G. hygrometricus* Pers. as already observed by Lloyd (*l.c.*). Our specimens agree very well with the figure given by Lloyd. The spores measure 4.3μ in diameter and are minutely warted. Lloyd gives the following particulars concerning this species:—

“This plant from Drummond, Australia, I found in Museum at Paris, sent by Berkeley, labelled *Geaster rufescens*. And at Kew under the same label and also the same collection (Swan River 174), labelled *G. hygrometricus*. It has no resemblance whatsoever to *G. rufescens* as now understood, but it is so close to *G. hygrometricus* that I doubt if any ordinary observer can tell them apart, judging from external appearances. The spores readily distinguish it, being in this species the ordinary size of *Geaster* spores 4–5 mic. *Geaster hygrometricus* can always be recognised at once by having large rough spores 10–12 mic. in diameter, such as no other known species of *Geaster* has.”

Mueller (104, p. 119) records *G. hygrometricus* from Western Australia and Queensland, but as no mention is made of the Queensland specimens by Lloyd, and we have had no opportunity of examining specimens, we are not in a position to say whether the Queensland specimens are the same as our South Australian one, but it is quite evident that this species extends from South Australia to Western Australia.

G. floriformis Vitt. (118); Cooke (37, No. 1264); Lloyd (68, 73, p. 143); Bailey (1, p. 83).

Goulburn (E. Cheel, April, 1908); Bibbenluke (J. B. Cleland, March, 1913); Adelaide (July, 1914).

According to Lloyd (*l.c.*) there are two collections of this species at Kew, England, from New South Wales and Victoria, both correctly determined. The spores according to

Cooke (*l.c.*) are $3\frac{1}{2} - 4\mu$ in diameter, brownish, globose and echinulate. The spores of our specimens are 6 to 7μ in diameter, and minutely warty. It is recorded and figured by Lloyd (67, p. 11) under the name *G. delicatus*, and the spore measurements are given as 5 to 6 mic., minutely warted.

This appears to be one of our most common species, as specimens have been collected from various parts of Victoria and New South Wales as well as New Zealand, as will be seen by the records and names of collectors given by Lloyd in his printed letters (86, 87 and 88). It is also recorded for Queensland by Cooke (*l.c.*)

G. argenteus in Cooke (37, No. 1271).

Specimens of this species have been collected at Brisbane and are at Kew, England. According to Lloyd they appear to be a large form of *G. floriformis* bleached by exposure. Cooke (37) also records it for Victoria, but these specimens are not mentioned by Lloyd.

G. Drummondii Berk. (13, p. 63); Cooke (37, No. 1253).

St. Marys (A. A. Hamilton, August, 1910); Rookwood (Miss A. Spencer, July, 1910).

This species has previously been recorded for Western Australia and Victoria by Cooke (37) and also for Victoria by Lloyd (67 and 68) who gives the spore measurements as 5 to 7μ . The spore measurements of the specimens in our collection are 5 to 6μ .

It is a rather small plant, the specimens having a beautiful dark sulcate mouth. It very closely resembles *G. striatulus* Kalchb., which also has a sulcate mouth, and is recorded for Queensland and South Australia, but so far we have not found any specimens of the latter species.

G. plicatus Berk.

This species according to Lloyd (67) is found at Madras, Banin Island, Ceylon and New Caledonia. It has also been recorded from Rookwood, N.S.W. by Lloyd (*l.c.*) and from Centennial Park, Cheel (26 and 27).

We have a fine series of additional specimens from the following localities:—Sikes Gap, Tooloom Range (J. H. Maiden, December, 1909); Badgery's Lookout, Tallong (A. G. Hamilton, September, 1911); Gladesville (Miss M. Flockton, July, 1911); Parramatta (J. B. Cleland, July, 1912). The spores of our specimens are finely warty and measure 4 to 5 μ in diameter.

G. tenuipes Berk.; (Cooke, 37, No. 1250).

This species was originally recorded for Tasmania by Berkeley (16) who published a figure in the same work. It has since been recorded from Byng near Canoblas by one of us (27, p. 689). Lloyd (68) has examined the specimens at Kew (England) that are from Tasmania and New South Wales, and has expressed an opinion that it is an intermediate species between *plicatus* and *pectinatus* and suggests that it should be referred to *G. pectinatus*. We have a specimen collected by one of us (J.B.C.) in April 1913, on the Hawkesbury River, the warty spores measuring 4.3 to 5 μ .

G. Bryantii Berk.; Lloyd (67. p. 16).

Hawkesbury River (J. B. Cleland, July 1912).

A very large and remarkably handsome Geaster found on the Hawkesbury River under a rock seems certainly referable to this species. The lead-coloured pruinose covering of the peridium was very marked. The warty spores measured 7 μ in diameter. (Plate XXV, *f.*)

G. Smithii Lloyd (67, p. 21, fig. 37 and 77). Syn. *G. striatus* Sm., Gard. Chron. 1873, p. 469, fig. 88 (Reproduced in Grevillea, Vol. 2, t. 16, fig. 1); Cooke (37, No. 1251), but probably not of DC.

We have specimens of this species in the National Herbarium from Port Lincoln, South Australia, collected by Mr. W. Gill in December, 1906, and from near Adelaide by J. B. Cleland in 1898, and also from Overland Corner, S.A. (J.B.C.) in December, 1912. Spore measurements of our specimens are 3·8 to 4·3 μ . Lloyd (*l.c.*) gives the spore measurements as 4–5 mic. and states that the spores are rough and apiculate.

G. fornicatus Battarrea.

Hallet's Cove near Adelaide (J. B. Cleland, July, 1914).

According to Lloyd (68) a single specimen of this species is at Kew (England) collected at Brisbane and labelled *G. limbatus*. The spores of our specimen are 5 μ in diameter, warty and dark brown.¹

G. Readeri Cooke and Massee (39); Cooke (37, No. 1254, fig. 116); Lloyd (92).

N.S. Wales—Hurstville (J. H. Camfield, May, 1901); Gladesville (Miss M. Flockton, August, 1910); Dubbo (J. H. Maiden and Dr. J. B. Cleland); Gulgong (J. L. Boorman, April, 1901). South Australia—Overland Corner (J. B. Cleland, December, 1912).

The spores, in the Dubbo and Overland Corner specimens, are 3·8 to 4·3 μ , warted. This species is also recorded from Victoria by Cooke (37) and Lloyd (76, p. 246, figs. 89, 90, 91).

¹ Since this paper was read, we have received a specimen of this species from Casino, N.S.W., collected by Mr. D. J. McAuliffe.

G. minimus Schwein.

Dubbo (J. L. Boorman, August, 1908).

Previously recorded for all the States except Tasmania by Cooke (37) and for Victoria and Norwood, S.A. by Lloyd (68, fig. 21). See also Cheel (29, p. 13).

G. saccatus Fr. (44, p. 16).

This species is recorded for all the States except Victoria and South Australia by Cooke (37, No. 1261), but it has since been found to be common in Victoria (Lloyd, 68, fig. 75, *a*, *b*, *c*., and 8, 15, 17, 38). One of us (E.C., 26, p. 202) has also recorded it from Woy Woy, N.S.W. In addition to the above, we have specimens from the following localities:—Botanic Gardens, Sydney (several collectors); Mosman (A. N. Allen, April, 1912); Neutral Bay (J. B. Cleland, April, 1914); Milson Island (J. B. Cleland and E. Cheel, April, 1912); Mount Jellore (E. Cheel, April, 1912); Willoughby (E. Stack, May, 1904). The spores of several specimens examined are tuberculate, 4.2μ .

G. vittatus Kalchb. (55, p. 3); Cooke (37, No. 1260); Cheel (26, p. 202).

Cooke (*l.c.*) records this species for Australia without specifying any particular State. Lloyd (79, p. 310, fig. 145) has found it in Samoa, and considers it only a form of *G. saccatus*. The specimens recorded by Cheel (*l.c.*) were from the Botanic Gardens. In addition to the above, we have specimens from Neutral Bay (J. B. Cleland, June, 1914), Beecroft (T. Steel, June, 1915) and Bowral (Rev. W. W. Watts, May, 1909).

The spores are brown, and minutely echinulate varying from $3\frac{1}{2}$ to 5μ . Kalchbrenner (*l.c.*) gives the measurements as 0.003 mm.

G. velutinus Morgan.

Lloyd (68, p. 21) records this species from Pennant Hills near Parramatta (spelt Pawawetta) and from Gladesville. He has also recorded it for Samoa (67, p. 33). In the National Herbarium collection there are specimens from the following localities:—Waratah, near Newcastle (J. Gregson, May, 1904); Gladesville (Miss Flockton, May, 1910); Rookwood (Miss A. Spencer, June, 1910); Lilyvale (A. A. Hamilton, June, 1910); Lake Illawarra (E. Cheel, April, 1912); Coorei (A. G. Hamilton, July, 1913); Wollongbar near Lismore, (collector not given, 1912).

G. triplex Lloyd (67, p. 25 and 68, p. 23).

We have specimens of this species collected by the Rev. W. W. Watts in July 1911, from Lord Howe Island, which we have compared with a specimen of *G. triplex* kindly forwarded to one of us by C. G. Lloyd. The spores are warty and 5μ in diameter. In our specimens, the expanse of the outer peridium was two and half inches, whilst the inner peridium on its pedicel was nearly an inch high and more than three-quarters of an inch broad.

List IV.—The following is a list of the Australian species of *Geaster* recorded by Cooke (37), revised according to the investigations of Lloyd:—

- 1250 *Geaster tenuipes* Berk. = *G. tenuipes* as a variety of *G. pectinatus*.
- 1251 „ *striatus* DC. = *G. Smithii*.
- 1252 „ *striatulus* Kalchb. = *G. striatulus*.
- 1253 „ *Drummondi* Berk. = *G. Drummondi*.
- 1254 „ *Readeri* Oke. and Mass. = *G. Readeri* as a variety of *G. rufescens*.
- 1255 „ *subiculosus* Cooke = *G. mirabilis*, of which *G. subiculosus* is a large form.
- 1256 „ *lignicola* Berk. We have not found any reference to this in Lloyd's works.

- 1257 *Geaster minimus* Schweinf. = *G. minimus*.
 1258 „ *fimbriatus* Fr. = *G. saccatus*.
 1259 „ *australis* Berk. = *G. saccatus* (approaching the
fimbriatus type).
 1260 „ *vittatus* Kalchb. = *G. saccatus* (as a form).
 1261 „ *saccatus* Fr. = *G. saccatus*.
 1262 „ *lageniformis* Vitt. = *G. saccatus* (as a form).
 1263 „ *Speggazinianus* Toni = *G. floriformis* (probably).
 1264 „ *floriformis* Vitt. = *G. floriformis*.
 1265 „ *pusillus* Fr. Lloyd states that no type exists and
 nothing is known of it.
 1266 „ *rufescens* Pers. = *G. rufescens*.
 1267 „ *lugubris* = *G. mammosus*.
 1268 „ *hygrometricus* Pers. Probably in mistake for *G.*
simulans.
 1269 „ *dubius* Berk. Probably young *G. velutinus*.
 1270 „ *Archeri* Berk. = *G. Archeri*.
 1271 „ *argenteus* Cooke = *G. floriformis*, large bleached
 forms.

In addition to the above *Geaster oxylobata* Kalchb. is recorded for New South Wales by F. v. Mueller (104, p. 119).

List V.—The following list, chiefly compiled from Lloyd's works, is given to replace Cooke's list:—

1. *Geaster Drummondi*.
2. „ *mammosus*.
3. „ *striatulus*.
4. „ *floriformis*.
5. „ *simulans*.
6. „ *plicatus*.
7. „ *pectinatus* (var. *tenuipes*).
8. „ *Bryantii*.
9. „ *Schmideli*.
10. „ *Smithii*.
11. „ *Archeri*.
12. „ *Berkeleyi*.

13. *Geaster mirabilis*.
14. „ *velutinus*.
15. „ *fornicatus*.
16. „ *minimus*.
17. „ *rufescens* (var. *Readeri*).
18. „ *saccatus* (and as the forms *fimbriatus*, *lageniformis*,
and *vittatus*).
19. „ *triplex*.
20. „ *lignicola* }
21. „ *pusillus* } Recorded in Cooke.

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EXPLANATION OF PLATES.

PLATE XXIV.

- a. *Aseroe rubra*. A group of plants showing three specimens in egg-stage, two fully developed and an empty volva.
- b. *Lysurus Gardneri* (*L. australiensis*). Specimen in egg-stage opened at the apex to show the seven incurved free lobes with the gleba inside, and an empty volva.
- c. *Lysurus Gardneri* (*L. australiensis*). Sketch of a transverse section of receptacle, to show cellular structure.
- d. *Lysurus Gardneri* (*L. australiensis*). Showing two of the lobes united at the tips.
- e. *Lysurus Gardneri* (*L. australiensis*). Fully developed plant with five free lobes.

PLATE XXV.

- f. *Geaster Bryantii*.
- g. *Aseroe rubra*. Fully developed plant with volva at base.
- h. *Jansia rugosa*. Fully developed plant and an undeveloped plant in the egg-stage.
- i. *Anthurus Archeri*. Fully developed plant showing two lobes united at the tips with a thin membrane.
- j. *Aseroe rubra*. Showing upper rugose surface of the receptacle.

* * * * * *

We would like to express our indebtedness to Mr. A. G. Hamilton for the photographs of *Aseroe rubra*, Plate XXIV (a), and Plate XXV (g) and (j); of *Lysurus Gardneri*, Plate XXIV (b) and (e), and of *Jansia rugosa*, Plate XXV (h).



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