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THE

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AND

MAGAZINE OF NATURAL HISTORY.

MELBOURNE, JANUARY, 1883.

VOL. III.

Definitions of some new Australian Plants,

by Baron Ferd. von Mueller, K.C.M.G., M.D., Ph. D., F.R.S.

[Continued.]

Bossiæa Scortechinii.—Diffuse; branchlets very thin, neither compressed nor angular, almost silky; stipules minute, semi-lanceolar; leaves scattered, narrow- or ovate-oblong, at the margin entire and recurved, at the summit blunt or retuse, on both sides appressed-hairy, finally glabrescent; pedicels twice or three times as long as the calyx, bearing a pair of minute bracteoles towards the middle; calyces silky-hairy, their lips about as long as the tube, the lower rather longer, the upper deeply divided and thinly acuminated at each side; petals all glabrous, the upper slightly exceeding the others in length; pods linear-oblong, appressed-hairy, 7-9-seeded.

On the Dumaresq-River; Rev. B. Scortechini.

More closely allied to the West Australian *B. eriocarpa* than to any Eastern species, unless *B. Neo Anglica*, as indicated by the discoverer. Compared with that species it is found to be weaker and laxer in habit, the vestiture is more generally developed, the leaves are upwards wider than downwards, hence not so broad at the base, the stipules often broader, the pedicels usually longer, but without showing the several broad and much persistent bracts of *B. eriocarpa*, the flowers are smaller, the petals not red, the pods longer, blunter, and of less rigidity.

Isandra.

Calyx almost bellshaped, midway 5-cleft. Tube of the corolla gradually widened; lobes 5, nearly equal, very short, roundish, induplicated and not twisted while in bud. Stamens 5, equal, inserted close to the base of the corolla; filaments filiform, thickened towards their base. Anthers oblong, dorsifixed, for some time coherent; their two cells parallel and contiguous, bursting outward longitudinally. Pollen-grains oval, smooth. Style exceedingly short. Stigma minute, slightly bilobed. Ovary two-celled. Fruit unknown.—A small erect viscid short-hairy shrublet, resembling some of the small-flowered species of *Anthocercis* and indeed also some *Eremophilas* of the section Pholidia; its leaves scattered, short, broadish- or oblong-linear, with revolute margin; flowers small, axillary, solitary, on very short stalklets; corolla pale; stamens enclosed.

Isandra Bancroftii.—This new genus differs from *Duboisia* and *Anthocercis* already in having five perfect stamens, from *Anthotroche* in the narrow corolla, from both in not divergent anther-cells and very short style, possibly besides in fruit.

Between Stirling's Range and the eastern sources of Swan-River; Th. Muir.

The species is dedicated to Dr. Joseph Bancroft of Brisbane, who so lucidly investigated the physiological effects of two *Duboisias*, and who therefore has particular claims to be remembered in reference to any plants of this group.

Luisia teretifolia—(Gaudichaud in Freyc. Voy. Bot. 426, t. 37.)—Leaves cylindrical; peduncles very short, bearing a few crowded flowers; lower bracts truncated, upper deltoid; tube of the calyx about as long as the limb; the three outer lobes oval-oblong, somewhat exceeded in length by the two narrow-oblong and somewhat cuneate inner lobes; labial lobe only slightly incised, nearly quadrangular in its lower part, suddenly renate-semiorbicular in its upper portion.

Goode-Island; Walt. Powell.

The Australian plant agrees precisely with the typical species from Guam, as figured by Gaudichaud. Lindley in his Fol. Orchid. (1853) draws to this species *Epidendrum triste* of G. Forster (Florul. Ins. Austr. Prodr. 60), but without having seen any authentic specimen; nor seems the New Caledonian plant to have come under notice of Reichenbach, that distinguished orchidographer not alluding to any *Luisia* in Garcke's Linnæa, 1876. But the *L. teretifolia* of Blume, accepted as the genuine plant by Lindley and also subsequently by Miquel, is evidently a distinct species, according to illustrations given on pl. 194 and 197 of the Rumphia, the flowers being fewer and larger, and the labellum having deep incisions, also a longer and less blunt terminal lobule. Indeed

Dr. G. Reichenbach pointed out these discrepancies already in 1861, and called Blume's plant *L. confusa.* The latter is closely allied to *Luisia brachystachys*, figured in Wight's Icones, pl. 1689 as *Cymbidium tenuifolium* and described in the text as *C. triste*, while pl. 3648 represents, as shown by Reichenbach, *L. trichorrhiza* of Blume. Perhaps some of these may also extend to Australia.

Philotheca Hassellii.—Leaves clavate-linear, slightly pointed; sepals rather large, oval-orbicular; petals glabrous; tube of the stamens outside densely velvet-silky, on both sides towards the base woolly-bearded, inside beset with short somewhat scattered hair, towards the summit as well as the filaments purplish; five of the latter without anthers; style long, quite glabrous; stigma large, depressed-globular.

North-east of Janamonjup; A. Y. Hassell.

This plant is nearer allied to *Ph. calida* from Queensland than to *Ph. ericoides*, but the characteristics of all three have to be still further traced from future ampler material. *Ph. australis* differs from them in short sepals, in the petals being only along a dorsal line glabrous, in not exserted stamens, in the development of 10 anthers, in the short and at the middle bearded style, in the minute stigma and in the oval-rhomboid fruitlets. It holds nearly the same position to the species of the section Drummondita, as the Boronias with perfect stamens to those of the section Heterandra; but as in the latter barren anthers are developed, it remains optional, whether the genus Drummondita should be maintained or not.

Chloanthes lepidota.—Vestiture scaly, at first yellowish-brown, at last silvery, covering all external parts of the plant except the corolla; leaves small, lanceolar-oblong, flat, comparatively thick, narrowed into a very short stalk; flowers short, axillary, solitary, crowded at the summit of the branchlets almost sessile; lobes of the calyx deltoid-semilanceolar, rather blunt, reaching to the lips of the corolla; the latter outside thinly velvet-downy; stamens hardly emersed; spurs of the anthers minute; style slightly downy towards the base; ovary silky towards the summit.

North-east of Janamonjup; A. Y. Hassell.

This species bears resemblance solely to *C. loricata*; but the leaves are much smaller, the bracteoles broader, the lobes of the calyces less acute and the corollas not glabrous outside. The plant must be placed in Pithyrodia, should that genus be maintained.

A New Orchid from the Solomon-Islands,

DESCRIBED

BY BARON FERD. VON MUELLER, K.C.M.G., M.D., F.R.S., F.G.S.

Dendrobium Goldfinchii.—Stems upwards almost flat, with but slight petiolar denticulations, the joints mostly concealed by the pale adnate sheathing leaf-stalks; leaves alternate, forming two rows, lanceolate-linear, somewhat carnulent, not streaked, their flattened edges turned towards the stem; flowers few, in terminal racemes, rather large, tender-membranous, quite glabrous, pale greenish with a faint tinge of yellow; stalklets at the base closely surrounded by bracts, passing gradually into the narrow and short ovarigerous calyx-tube; upper calyx-lobe ovate-lanceolar; inner lobes nearly as long as the others, lanceolar; lower lobes deltoid, decurrent into the ample pouchlike anteriorly-slit projection; all lobes several times shorter than the latter; labellum in outline obovate-cuneate, in texture and color similar to the rest of the calyx, reaching from the base of the projection to the summit of the lobes, soon recurved; its lobules exceedingly short; the middle one cleft into two roundish segments; the lateral lobules also roundish; undivided portion of the labellum traversed along its middle longitudinally by a broad-linear smooth yellowish plate with slightly prominent marginal lines and a faint terminal green dilatation; genital column adnate up to the anther, bearing at the anterior base a depressed oval green callus; pairs of pollen-masses clavate-ellipsoid, upwards coherent.

This species belongs to the section Aporum of the genus; from *D. anceps* it differs already in narrower leaves, in larger flowers forming terminal racemes, in longer stalklets and in the projecting portion of the calyx being more extended, when compared to the size of the lobules; from *D. acinaciforme* our new congener is also readily distinguished by the flowers being neither quite yellow, nor very small, nor short-stalked; from *D. Macfarlanei* by racemous flowers with considerably longer pouch and by none of the labellum-lobules being thickened; from *D. calceolum* at once by not orange-colored calyces.

This interesting plant was brought from a but little explored island-group by Lieut. Goldfinch, of H.M. Ship Emerald, and was reared in the Conservatory of Arthur King, Esq., who obligingly afforded me the opportunity of rendering it descriptively known.

NATIVE PLANTS OF THE GRAMPIANS AND VICINITY.

Arranged generally under the direction of

BARON FERDINAND VON MUELLER, K.C.M.G., Government Botanist.

BY D. SULLIVAN.

[Read before the Field Naturalists' Club of Victoria 23rd January, 1882.]

[Continued.]

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(8). MYRTACEÆ—*continued.*

Leptospermum lanigerum—var. *grandifolium*—(SMITH).—Among rocks on all the ranges ascending to the summit of Mount William. A profuse flowerer. Habit straggling.

grandiflorum—(LODDIGES).—Wet heaths, and on the summit of Mount William. Height 6-9 feet.

myrsinoides—(SCHLECHT.).—Heath-grounds and scrub-hills throughout the district. Height 5-7 feet.

Eucalyptus rostrata—(SCHLECHT.).—On all our flats, often reaching to the bases of the mountains. Height 60-80 feet.

pauciflora—(SIEBER).—On the summit of Mount William. Height 12-15 feet.

macrorhyncha—(F. v. M.).—On heath-ground, and ascending Mount William to about 3,000 feet. Height 80-100 feet.

capitellata—(SMITH).—On the heath-grounds and lower slopes of Mount William. Height 80-90 feet.

obliqua—(L'HERITIER).—Everywhere about the mountains. Height (on the mountain) 100-120 feet. This tree is of very low stature on the heath-grounds.

leucoxylon—(F. v. M.)—(var. "White Gum").—On barren hills in many places. Height 80-90 feet. Bark white and smooth. Timber said to be useless except for firewood.

Stuartiana—(F. v. M.).—Pretty generally distributed. Height 40-50 feet. Used only for fuel.

viminalis—(LABILL).—Common over the entire district. A middle-sized tree. Used for firewood only.

Gunnii—(HOOKER).—In swamps and wet flats near the mountains. Height 80-100 feet.

melliodora—(A. CUNNINGH.).—In a very few places about granite ranges. A middle-sized tree.

alpina—(LINDLEY).—On the summit of Mount William *only.* Height 5-9 feet. It only attains the latter height in shady places.

Eucalyptus goniocalyx—(F. v. M.).—On all the stony and gravelly hills of the district, and on Mount Ararat to a height of 1000 feet.

amygdalina—(LABILL.).—On heath-grounds and sand-hills in a stunted form.

(9) RHAMNACEÆ.

Pomaderris apetala—(LABILL.).—In the deep gullies of the mountains. Height 12-15 feet.

vaccinifolia—(F. v. M.).—About streams, especially in Hall's Gap. Height 7-9 feet.

elliptica—(LABILL.).—Ravines of the mountains.

elachophylla—(F. v. M.).—On the Grampians, about rivulets, at an elevation of about 1,200 feet, not common. I found it on Mount Cole (Pyrenees) at a height of above 2,500 feet. Height 7-9 feet.

prunifolia—(A. CUNNINGH.).—On spurs of the Grampians and adjoining ranges, not common.

Cryptandra amara—(SMITH).—Sparsely scattered over the heath-grounds. Height 1½-2 feet.

Trymalium Daltoni—(F. v. M.).—One gully in the Grampians and one on Mount William. Height 5-6 feet.

Spyridium parvifolium—(F. v. M.).—Pretty common on the ridges of the mountains and about streams near their bases. Height 5-7 feet.

(10) ARALIACEÆ.

Astrotriche ledifolia—(D. C.).—In gullies and on the lower slopes of the mountains, not common. Height 2½-4 feet.

(11) UMBELLIFERÆ.

Hydrocotyle Asiatica—(LINNE).—On clayey soil generally about brackish creeks, not widely diffused.

densiflora—(D. C.).—Very common on the gravelly and sandy soils of the district.

callicarpa—(BUNGE).—Same as the last.

capillaris—(F. v. M.).—Common on flats about Mount William, rare elsewhere.

Trachymene heterophylla—(F. v. M.).—On some of the lower slopes of Mount William. I have not seen it elsewhere.

Daucus brachiatus—(SIEBER).—Common throughout the district.

Eryngium vesiculosum—(LABILL.).—Common throughout the district, especially on clayey soils.

Apium prostratum—(LABILL.).—On clayey flats, not rare.

Trachymene Billardierii—(BENTH.).—Common on all the ranges.

Oreomyrrhis andicola—(ENDL.).—Sandy flats, rare.

THE PARROTS OF VICTORIA.

BY T. A. F. LEITH.

[Read before the Field Naturalists' Club of Victoria 11th December, 1882.]

PART III.

The RED LORY, BLUE-CHEEKED LORY, PENNANT'S PARRAKEET, &c.—*(Platycerus Pennantii)*.—Next in the list of Victorian Parrots comes the Red Lory, or Pennant's Parrakeet. For the first year these birds are called Green Lories, on account of their plumage, which is, with the exception of their crown, throat, and shoulders, a dull olive green. When the male has donned his adult plumage, his breast and belly are a rich blood-red color; on the back the red feathers are tipped with a black crescent; the cheeks are blue; and the shoulders a pretty violet blue; primaries, &c., blue and black; rump red, tail blue, with margin of the feathers light blue. The female is not so fine in plumage, and somewhat resembles a young male; the red on the breast is "splotchy." Sometimes hybrids are met with between this parrakeet and the Rose Hill; I possess one at present.

The Red Lory is found all over the southern parts of the Colony; and whilst they are young, getting together in large flocks, visiting cultivated grounds and sometimes orchards: now is the time to open fire on them; for at this youthful period of their existence they make an admirable currie; or, roasted on the top of toast, with bread-sauce, they more than merely fill a vacuum in the stomach; and the grain and fruit take their place alongside of the milk and honey in the selector's hut; thanks to the fowling-piece, and No. 4 shot.

I do not in these remarks advocate the wanton destruction of harmless birds; but at certain seasons the crops and orchards must be protected from some kinds of parrots; and it is better that some of them should die than that the settler and his children should starve. Last autumn the owner of an orchard, to my knowledge, had to kill from 1,400 to 2,000 parrots of one variety. Length of male Red Lory about 14½ inches.

The YELLOW-RUMPED PARRAKEET—*(Platycercus flaveolus.)* —In size and general form this parrakeet much resembles Pennant's, but not in plumage, for in the yellow-rumped the forehead is red, with the crown a dirty yellow; the cheeks are blue; on the back the feathers are black with a mealy-yellow crescent tipping them; shoulders light blue; primaries, &c., dark blue, turning to black towards the tips; tail feathers dark green, bluish towards the extremities. The breast is yellow, shot with orange red; in the adult male the belly and rump are a sulphur yellow. The female is not nearly so bright in plumage as the male, the yellow on the breast and belly being very dull in colour.

This very fine parrakeet is met with along the belts on the Murray; but as a rule does not come far south in this Colony, although it is not safe to lay down the boundaries of any parrots' range on this Continent, for at times, especially if the season is a dry one, they will make long journeys to the south, like other families of birds that leave the sugar plantations and cedar trees of Queensland for the cool valleys bordering the Latrobe in South Gippsland, or the shady slopes of the Victorian Alps.

This Parrakeet is about 14 inches long, and there is not much difference in the length of the female and that of the male, either in this or Pennant's Parrakeet.

The Rose Hill Parrakeet, Rosella Parrot, &c.—(*Platycercus eximius*).—This beautiful and now well-known parrakeet takes its name from having first been seen at Rose Hill, Sydney. Like many other birds that are quite common, it is a gem of the first water, and a great favourite as a domestic pet in every homestead, from the bark hut to the well-furnished mansion. Forced from its snug home in the hollow of some patriarch of the forest, it is hawked about the streets in a half-fledged state, and offered to the passer-by for eighteen pence or two shillings: should he be induced to become its purchaser, it is conveyed home, packed in the smallest possible compass, and for some time it is crammed, whenever it makes a noise, with soft food. The next memorable mile-stone in its existence passed is when one of the juveniles of the house gives it its first lesson in loquation, the words chosen being usually "Pretty Joey." Leaving the young Rosella in captivity, we now proceed to describe the adult male as we find him in freedom. The head, neck, and breast are a fine rich scarlet, with a white patch on each cheek nearly meeting under the chin; the bottom part of the breast is yellow, and the abdomen is green; the feathers of the back are black, margined by a yellow crescent; the rump is a bright pale green, shoulders a beautiful shade of light blue; primaries, secondaries, &c., blue and black; centre tail feathers green; outer, blue, lighter towards the tips, and beneath the root of the tail a red patch of feathers. The female is a faint reproduction of the male, wanting in colour and brilliancy of plumage. Length of male about 12½ inches, the female being somewhat shorter.

The Crimson-bellied Parrakeet, Yellow-vented Blue Bonnet, &c. — (*Psephotus xantharrhous*).— This very pretty parrakeet has the forehead and cheeks blue; crown olive brown; the back and breast are greenish grey, while the belly and abdomen are crimson; the upper wing coverts are a golden brown, and the shoulders are marked with tourquoisine blue; primaries, &c., blue and blackish; centre tail feathers greenish grey, extending into blue at the tips, outer greenish blue, lower half white. The female is not so brilliant in colours nor so distinctly marked as the male. These parrakeets abound in the Mallee country, especially bordering the Murray river, but are met with in other parts of the colony at times—not, however, in the most southerly parts. One local name for them is "Blue Bonnet."

The specimen exhibited is a female, as I had not a male that I could bring,—which I regret, as he is a very brilliant bird in plumage, if procured at the spring of the year, prior to nidification time. Length not quite 12 inches, but of course in this and other varieties different specimens vary a little at times, owing to climatic and other influences; and the Tasmanians, notwithstanding their modesty, boast that their "Rosellas," and many other of their birds, also found here, are finer than ours.

The Varied or Many-colored Parrakeet.—(*Psephotus multicolor*).—This exquisite little parrakeet abounds in the forest belts bordering the Murray river, and in other parts of the Colony where the scrub is thick; but does not, as a rule, appear far south. It has been rightly named the Many-colored Parrakeet, for in the male I am sure there are over a dozen shades of green alone, besides many other colors. The male, when full grown, has a red mark above the beak, the crown is a bright green with a red patch on the back of the head; neck and cheeks light bright green; back darker green, fading into lighter green towards the tail, with a red mark above it; breast and belly green; abdomen crimson; patch on shoulders, beautful orange yellow, margined by pale green extending in a band to the tips of the feathers, the rest of the wing being blue; centre tail feathers dark green, outer light blue with greenish tint. The female has the upper surface dull olive brown, and a red patch on the shoulders where the orange yellow is found in the male.

This charming bird must be seen in freedom before one can form any idea of its brilliant many-colored plumage, its head and neck throwing off the rays of the emerald,—its breast the beautiful verdure of the young shoots of the Murray pine. Its wings exhibit the richest colors of the Trogon, the Regent Bird, and the Azure Kingfisher; while the back seems as if the Prussian blue and gamboge of the wings had blended together and formed a green of the richest hue found in the natural order of the Coniferæ. The length of this bird is between 10 and 11 inches.

The Red-rumped Parrakeet, Red-back'd Parrakeet, Blood-rumped Parrakeet, &c.—*Psephotus hæmatonotus.*—We find this parrakeet more or less numerous in all parts of the

Colony, from the Murray to South Gippsland. The crown is a dark green, the forehead and cheeks paler; the back is a brownish green, with a red patch on the rump; the upper tail coverts are dark green, fading into blue; the breast is green and the belly yellow. The female has no pale green on the head or cheeks, but all the upper surface is dark brownish green, and the breast is a mixture of grey, green, and yellow, with the tip of the tail feathers white.

These parrakeets delight in a hay-stack. I saw some twenty-four or more on a small one a few months ago; and although I was quite close to them (and had a loaded double-barreled fowling-piece in my hand), that organ in the cephalic region that causes destructiveness, I suppose, is not so large in me as in some people; for I did not fire at them, making it a rule myself never to shoot birds that I do not want for some purpose that will benefit mankind. Length of male about 10 inches; female not quite so much. There are eleven more parrakeets found in Victoria.

Oology of Australian Birds.

By A. J. Campbell.

Part vi.—Order—INSESSORS.—*(Continued.)*

Family—*Luscinidæ*.—(Continued).

245. Sphenœacus gramineus—(Little Grass-Bird). *Locality*—Australia and Tasmania. *Egg*—Fleshy-white, freckled and streaked all over, particularly at the larger end, with purplish red: in some instances large obscure blotches of reddish grey appear as beneath the surface of the shell. Length nearly 8 lines; breadth 6 lines.

Family—*Sylviadæ*.

246. Calamoherpe australis—(Reed-Warbler). *Locality*—Australia, and occasionally Tasmania. *Egg*—Greyish white, thickly marked all over with irregular blotches and markings of yellowish brown, umber brown, and bluish grey, intermingled together without any appearance of order or arrangement. Length 10 lines; breadth 7 lines.

247. Calamoherpe longirostris—(Long-billed Reed-Warbler). *Locality*—West Australia. *Egg*—Dull greenish white, blotched all over, but particularly at the larger end, with large

Eggs marked thus * not described by Gould, or not previously described.

and small irregularly-shaped patches of olive, some being darker than others, the lighter-colored ones appearing as if beneath the surface of the shell. Length 9 lines; breadth 7½ lines.

248. MIRAFRA HORSFIELDII—(Horsfield's Bush-Lark). *Locality*—Australia. * *Egg*—Very like the *Anthus*, excepting smaller in size and being more completely speckled with drab or grey. Length 9 lines; breadth 6½ lines.

FAMILY—*Fringillidæ.*

249. ZONÆGINTHUS BELLUS—(Fire-tailed Finch). *Locality*—Queensland, New South Wales, Victoria, and Tasmania. *Egg*—Beautiful fleshy-white, and lengthened in form. Length 8½ lines; breadth 6½ lines.

253. ÆGINTHA TEMPORALIS—(Red-eyebrowed Finch). *Locality*—Queensland, New South Wales, and Victoria. *Egg*—Beautiful fleshy-white. Length 7 lines; breadth 5½ lines.

255. AIDEMOSYNE MODESTA—(Plain-colored Finch). *Locality*—New South Wales and Victoria. *Egg*—White. Length 6 lines; breadth 4½ lines.

257. STAGONOPLEURA GUTTATA—(Spotted-sided Finch). *Locality*—Australia, except North and West. *Egg*—White, rather long in shape. Length 9 lines; breadth 6 lines.

258. TÆNIOPYGIA CASTANOTIS—(Chestnut-eared Finch). *Locality*—Australia. * *Egg*—Bluish white tinge. Length 7 lines; breadth 5½ lines.

FAMILY—*Merulidæ.*

269. PITTA STREPITANS—(Noisy Pitta). *Locality*—Queensland and New South Wales. *Egg*—Pale creamy-white, marked all over with irregularly-shaped blotches of brown and deep vinous grey, the latter appearing as if beneath the surface of the shell. Length 1 inch 3 lines; breadth 10½ lines.

271. CINCLOSOMA PUNCTATUM—(Spotted Ground-Thrush). *Locality*—Australia except North and West, and Tasmania. *Egg*—Ground-color white, blotched with large marks of olive-brown, particularly at the larger end, some of the spots appearing as if on the inner surface of the shell. Length 1 inch 4 lines; breadth 11 lines.

272. CINCLOSOMA CASTANEONOTUM—(Chestnut-backed Ground Thrush). *Locality*—New South Wales, Victoria, South and West Australia. *Egg*—Description assimilates very closely to that of the Spotted Ground-Thrush. Length 1 inch 3 lines; breadth 10 lines.

275. OREOCINCLA LUNULATA—(Mountain Thrush). *Locality*—Queensland, New South Wales, Victoria, and Tasmania. *Egg*—Buffy white or stone color, minutely freckled or blotched

all over with reddish or pinking-brown. Length 1 inch $4\frac{1}{2}$ lines; breadth $10\frac{1}{2}$ lines.

This bird is one of our earliest breeders. Nests with eggs have been taken in Tasmania, in July, when the snow has been on the ground.

FAMILY—*Paradiseidæ.*

276. PTILONORHYNCHUS HOLOSERICEUS—(Satin Bower-bird). *Locality*—Queensland, New South Wales, and Victoria. * *Egg*—Well shaped, and its character of markings may be easily imagined, as it is very similar to the well-known egg of *Mimeta viridis* (New South Wales Oriole), only proportionally larger. The ground-color varies from a rich cream to a dirty yellowish color, irregularly spotted and blotched with umber and reddish brown, also a few purplish grey markings appear as if beneath the surface of the shell. In some specimens the blotches are very bold and the markings under the surface of a bluish-black shade. Length 1 inch $8\frac{1}{2}$ lines; breadth 1 inch $2\frac{1}{4}$ lines.

On the 23rd of November my young friend Mr. Lindsay Clark found near the Bass River, Western Port, a nest of this extraordinary bower-building bird containing a clutch of two fresh eggs. He described the nest as being placed about 12 feet from the ground in a scrubby bush. The nest was loosely constructed of twigs, &c., and lined with leaves, and, on being removed from its position fell to pieces.

About the middle of October, 1876, Mr. A. E. Cox, of Sydney, also found at Mittagong, New South Wales, a nest placed on the top of a ti-tree stump, with two eggs, but in this case they were nearly hatched.

277. AILURÆDUS SMITHII—(Cat-bird). *Locality*—Queensland and New South Wales. *Egg*—Comparatively small for the size of the bird. The ground-color is of a delicate bluish green, sprinkled all over with light reddish brown dots and spots, larger and more crowded on the thicker end, and with also a few irregular linear scratchy markings or hair lines. Length 1 inch $2\frac{1}{2}$ lines; breadth $10\frac{1}{4}$ lines.—(Ramsay).

How to make an Eye-piece Micrometer.

By W. M. Bale, F.R.M.S.

[Read before the Microscopical Society of Victoria 26th October, 1882.]

Among the accessories generally in use with the microscope, few are more important and necessary than the micrometer, and no record of observations can be considered complete unless it includes the dimensions of the objects under consideration. The methods of measurement in general use (at least among English microscopists) are three, and are carried out respectively by means of the stage-micrometer, the eye-piece micrometer, and the cobweb micrometer. The first of these is simply a rule on a small scale, a small part of the centre of a glass slide being ruled off into several divisions usually of $\frac{1}{100}$ of an inch each, and one of these divisions being again divided into ten parts, each of $\frac{1}{1000}$ of an inch. This scale is laid on the stage, and the object placed upon it, the diameter of the latter being found by observing how many of the ruled divisions it covers. As, however, the scale has to be covered with thin glass to protect it from injury, while at the same time the object is usually placed on another slide, the difference in focus between the object and the micrometer renders this mode of measurement almost worthless. The stage micrometer may, however, be used advantageously in connection with the camera lucida, the images of the ruled lines as seen on the paper at the distance of ten inches being marked with a pencil, when a comparison of their distance apart, with the actual distance of the ruled lines themselves, readily enables us to ascertain the amount of magnification, and to deduce from that and from the diameter of the image of the object as drawn on the paper the true size of the object.

The eye-piece micrometer consists of a ruled scale placed in the eye-piece, so that its divisions are visible at the same time as the object, the *magnified image* of which is thus measured. The scale may consist of a glass disc ruled with equidistant lines, of which there are usually two sets, transverse to each other, or it may be a scale set in a brass frame, with a screw at one end and an opposing spring at the other, for convenience in bringing the zero point into coincidence with one side of the object image, but the principle is in each case the same. It must be remembered that while it is easy to read off on the scale the number of divisions covered by the image, these divisions have no fixed and absolute value, but their value differs with each eye-piece and object-glass employed, as well as with each alteration in length of the draw-tube, and must be ascertained with each combination by the aid of a stage micrometer, and recorded for future reference. Thus it may be found that each division of the scale will measure $\frac{1}{1000}$ of an inch with the quarter-inch objective and $\frac{1}{4000}$ with the one-inch, but unfortunately it rarely happens that the fractions are as convenient as these; for instance, the value with the quarter may be the 990th of an inch, and that with the one-inch $4\frac{1}{5}$ thousandths: this inconvenience may often, however, be remedied by the use of the draw-tube, which may be drawn out to such an extent as to make the divisions measure a more convenient length.

The cobweb micrometer is also used to measure the magnified image of the object, and is applied to the eye-piece. A single cobweb is fixed across the field, while a second cobweb is made to approach or recede from it by a fine screw, the head of which is divided by numbered lines. The micrometer being arranged so that the two cobwebs are apparently coincident, and at one extremity of the object, the screw is turned till the moveable cobweb has passed over the whole image of the object, when the number of complete turns of the screw may be read off on a scale in the field of the eye-piece, and the fractions of a revolution on the screw-head itself. As in the former case these divisions are arbitrary, and their value with each objective must be ascertained by experiment with a stage-micrometer. The cobweb-micrometer is costly, and requires great care in its use, but it is an instrument of extreme delicacy and is theoretically capable of measuring spaces far smaller than can be distinguished by the most powerful objective. Its accuracy, however, is entirely dependent on that of the stage-micrometer used to ascertain the value of its divisions.

Some months ago I brought under the notice of the Society a design for a stage-micrometer which I had not previously seen described, but which I afterwards found, on consulting the Journal of the Royal Microscopical Society, to be in use in Germany, in connection with the mechanical movements of the stage. It consisted of a brass frame in which a perforated slip of thin brass, or preferably of boxwood, carrying the slide, slid to and fro, being acted upon by a screw at one end and an opposing spring at the other (as in the Jackson eye-piece micrometer.) The screw-head would be graduated like that of the cobweb-micrometer, and the screw might be made with 75 or 100 threads to the inch. To measure an object the micrometer with the slide upon it should be placed upon the stage, and the margin of the object brought into coincidence with a single silk fibre or cobweb stretched across the eye-piece; the screw should then be turned till the opposite extremity of the object is coincident with the same thread, when the number of divisions of the screw-head which had passed a fixed point would give the exact diameter of the object in parts of an inch. Thus, supposing the screw to have 100 threads to the inch, and the head to be divided into 60 parts, it is obvious that each division would correspond to $\frac{1}{6000}$ of an inch. This instrument could not take the place of the cobweb micrometer in measuring very minute distances, but for ordinary purposes it would be much more convenient, as it would always give the absolute dimensions of the object, independently of the magnifying power used, while its cost ought to be very much less.

I do not propose to bring before you to-night any novelty in principle, but merely to point out how a simple but efficient eye-piece micrometer for ordinary work may be constructed without any expense, except of a little time and patience. The material is fine silk, a single fibre of which is not perceptibly thicker than cobweb, and is far less difficult to manipulate. It may be ravelled out of a ribbon; a corded ribbon, in which the transverse threads are straight, and woven over by two series of longitudinal threads, is better than an ordinary one, in which the threads of the warp and woof have acquired a series of "kinks" which are difficult to get rid of. The best eye-piece for the purpose is a C or D. The method of procedure is as follows:—Unscrew the field-lens, and at two opposite points on the under side of the diaphragm (not close to the edge) apply minute spots of rather stiff balsam. Cut a piece of the silk fibre about as long as the diameter of the eye-piece, and with the forceps place one end of it in contact with one of the spots of balsam, to which it will adhere, after which the other end is similarly attached to the opposite spot of balsam. With a pointed but blunt penknife the two ends are pressed well into the balsam and drawn apart till the line is "taut," the balsam being at the same time spread out and made drier and stiffer. The field-lens is now screwed in, and the eye-piece held to the light and examined, to see if the thread is straight; and if it be found to have in it a number of small flexures due to the weaving, it is best to replace it by another. So far there is no particular difficulty, but the next step, which is to attach another fibre parallel with the first and very close to it, is rather a delicate operation, as it must be done without disturbing the first, and the distance apart of the two must be regulated with the utmost nicety. This distance will of course depend on the space to be measured; assuming that it is desired to measure $\frac{1}{1000}$ of an inch with a C eye-piece and a quarter-inch objective, it will be about $\frac{1}{30}$ of an inch. The field-lens having been replaced, the eye-piece is inserted in its proper position, and a stage-micrometer laid on the stage, with the thousandth divisions in the field (under the quarter-inch); the eye-piece being now placed so that the silk lines are parallal with the ruled lines on the stage micrometer, it can at once be seen whether the fibres are too close or too distant. If either is the case the field-lens must be removed and one of the fibres shifted, which may be done without much difficulty with the blunt-pointed penknife, pressing down the ends in the balsam and at the same time gently rolling them almost imperceptibly to one side. The field-lens is again replaced and the eye-piece placed in position and examined, and if necessary the operation repeated, till the two fibres are exactly coincident with two of the lines on the stage-micrometer, when the space between them, as seen on the magnified image, will represent $\frac{1}{1000}$ of an inch. I have fixed a third line at the same distance as the second from the central one, but on the other side of it, also two others on opposite sides, each measuring a space of $\frac{5}{1000}$ of an inch from the central one, or $\frac{1}{100}$ of an inch from each other. These last two threads are near the opposite sides of the diaphragm, their actual distance apart being about $\frac{7}{16}$ of an inch. Finding the balsam scarcely sufficient to keep the fibres tight, I cut very small narrow slips of postage-stamp paper, moistened them, and fastened down the ends of the fibres with them, at the same time pulling them "taut," with a slight pressure, but taking care not to move them laterally; there is a good deal of risk, however, of the latter, and as the mucilage dries immediately, it will be necessary, should the fibres prove on examination to be displaced, to remove the paper forcibly, most likely breaking the fibre, and necessitating its renewal. The dots of balsam being placed well back from the margin of the diaphragm, there is room for the attachment of the slips of paper between them and the edge. If a transverse line is desired crossing the others, it is best to fix two fragments of the paper on the opposite sides of the diaphragm, and mount the ends of the thread *upon* them (fastening them down with other pieces), so that the fibre is clear of the others, and there is no risk of dragging them out of place in attaching it. The eye-piece, as described, gives direct measurements of 1, 2, 4, 5, 6, and 10 thousandths of an inch. The lines on an ordinary stage micrometer appear with the quarter-inch fully six or eight times as thick as the silk fibres, and the latter should therefore be made to coincide with the centres or corresponding edges of the ruled lines: it is, however, impossible to attain perfect accuracy unless the stage-micrometer be much more truly divided than those in ordinary use.

FIELD NATURALISTS' EXCURSIONS TO THE YOU YANGS AND BEACONSFIELD.

By Messrs. French and Best.

[Read before the Field Naturalists' Club of Victoria 11th December, 1882.]

In accordance with our annual custom, excursions had been arranged for Cup Day, 31st October, and Prince of Wales Birthday 9th November, that on the former occasion being to the same spot as last year, viz., the You Yangs, and that on the latter to Beaconsfield, the next station on the Gippsland line this side of Pakenham, which was the spot selected in the previous year.

The early morning of Cup Day (Tuesday) gave promise of a grand day for collectors, of whom five (Messrs. French, Best, Dixon, Spry, and Barnard—all in the entomological line), duly arrived at the Station in time to catch the 6·30 train to Little River, distant from Melbourne about 30 miles. To the last-named gentleman must be given the palm of the greatest enthusiasm, for we think it will be readily conceded that, unless full of that more than interest for which the members of the Field Naturalists' Club are so proverbial, he would never have arisen from his comfortable couch, at the unseasonable hour of 4 a.m., and tramped all the way from Kew—in itself at least half-a day's work.

Having partaken of some slight refreshment, we took our seats in the train, and, duly arriving at our destination, at once struck out across the plains for the Ranges, keeping, of course, a sharp look out for any unconsidered trifles, in the way of specimens, that might be unlucky enough to catch the eagle-eyes of any of our party. The number of stones, some of them large enough to require the united exertions of three of us to move, that were carefully turned over would doubtless have excited the curiosity of the good folks of the district if, there had been any good folks to excite, but the only human beings observable were three or four parties evidently intent on capturing rabbits, and they, we imagine, considered us as so many lunatics allowed out for the day, as no amount of explanation could make them understand the pleasure we derived from collecting insects, a form of life which, in their view, was only useful for the ignoble purpose of fishing-baits. The results of these herculean labours were not very successful, almost the only good, and certainly the best, specimen secured being a fine Carabus Beetle (Carenum sp.). The vegetation over the plain offers not much field to the collector, being principally short grasses, well eaten down by sheep; but on a rather low portion there was a good deal of a little yellow flower (*Trichorhyne elatior*), and off these were taken a number of a pretty little blue and yellow beetle, about an eighth of an inch in length, name unknown. Scattered about, here and there, was a peculiar plant (*Trichinium spathulatum*), the flower of which is feathery, and not unlike that of a small bottle-brush. The results, so far, not being sufficiently encouraging to induce a longer delay, speed was put on to reach the foot of the ranges and see whether the leaves of the blue gum (*Eucalyptus globulus*), stringy bark (*E. obliqua*), blackwood (*Acacia melanoxylon*), and she oak (*Casuarina quadrivalvis*), would yield better results. Beyond, however, a specimen or two of a pretty little Longicorn Beetle, about $\frac{3}{8}$ of an inch in length, and having a red thorax, nothing was obtained worthy of special mention. Leaving these behind us, we next tried the *Prostanthera lasianthus*, a shrub very plentiful, and having a white and violet flower: the flowers being well out it was anticipated a good number of the Buprestis beetle (of which several were taken last year), would be secured, but only about a dozen or two were obtained, a result owing, doubtless, to the great heat, which caused the insect to be exceedingly active on the wing, and consequently very difficult to capture. A few months since a single specimen of this beetle was received by a member of the Club from Illawarra in New South Wales, so that it has evidently a pretty extensive range. One of the main objects of the party being to obtain, if possible, specimens of the Longicorn Beetle (*Uracanthus* sp.), first taken here last year by Mr. Dixon, attention was now directed to this object, and the branches of *Aster glandulosus* were carefully searched for indications of their whereabouts, these indications being branches apparantly broken short off, and on examination proving to have a hole carefully stopped up, with very small particles of the wood gnawed off by the Caterpillar after first making its way well into the branch. The wood of this shrub being very tough, it required a strong knife to split it for the purpose of tracing the insect, and when it is mentioned that the caterpillar will often eat its way down several feet, it may be imagined that our labours were somewhat arduous. Although but comparatively few specimens of the perfect insect rewarded our exertions, many caterpillars were obtained, and from these no doubt several of the beetles will be reared. Up to this time the weather has been all that could be desired by collectors, but now the Sun became obscured, heavy clouds began gathering, and, worst of all, the wind commenced rising, rendering it difficult to make much use of the umbrellas for shaking branches. About this time, also, we divided into two parties, and after struggling for another hour or so against an increasing wind, and with but little success, we eventually met again about one o'clock at the appointed rendezvous, viz., a spring of water, and regaled ourselves with the luncheons we had all been careful enough to take with us. The replenishing of the inner man, and the half hour's rest afterwards, infused fresh vigor into us, and we started again with a determination to secure specimens if there were any to be secured. The locality was a by-no-means pleasant one for travelling, as we had to make our way continually over heavy boulders, and we could recommend any one visiting the You Yangs to be sure and provide himself with a pair of very substantial boots. Our success was again but very poor, only a few specimens of the Uracanthus being taken, and as by this time, about 2 o'clock, the wind had risen to almost hurricane force, and as the rain threatened every moment to come down in torrents, the three of us, who had again become separated from the other two, made tracks to an unoccupied cottage we had espied on the plain, and were fortunate enough to arrive just as the rain commenced falling. On our way down we did not fail to try all the shrubs in our road, but Mr. Barnard was the only one who met with any success, he securing off the common wattle (*Acacia mollissima*), specimens of two Longicorn Beetles, viz., *Macrones* sp., and *Amphirhoe decora*. In this habitation we were prisoners for about an hour and a half, during which we were joined by several shooting parties, who came in looking pictures of misery, wet to the skin, and having no sport whatever to show for it. Indeed it may be here mentioned that whereas last year the rabbits were literally swarming—could, in fact, be knocked over with a stick,—this year not a dozen altogether were seen by our party. It was explained to us afterwards by some of the residents that, grass having been very scarce, the rabbits had readily devoured the poisoned oats laid down for their delectation, and had thereby fallen victims to the lure. For intending sportsmen it was at the same time mentioned—also by the residents, and doubtless with the view of encouraging a large gathering—that by Christmas it was anticipated there would be as many rabbits as ever; but whether this proved to be so or not we are unable to say, as none of us paid a second visit to the spot. It is, we think, but right to give our testimony in favor of the You Yangs as a most healthy and prolific breeding ground for that blessing to the human race, the common flea [*Pulex irritans*], for the three of us who underwent the torture of an hour and a half's confinement in the before-mentioned "country residence" will, we believe, bear witness to the energy with which they "went," for us, —one at all events, will, as he did not effectually get rid of *his* share for some hours afterwards. The rain having completely destroyed all prospects of any further collecting, we made for the railway station, and, to our great joy, found that since our 1881 visit an enterprising individual had re-opened the adjoining hostelry, at which we did not fail to somewhat sumptuously regale ourselves. After we had been some time at the station, the remainder of our party turned up, they having secured shelter from the rain under the lee of a large rock, but success had not greatly rewarded their longer stay in the ranges. The greatest drawback to our pleasure—even worse than the rain—was the presence of a large number of so-called shooting parties. We do not, of course, refer to the legitimate sportsman, but to the boys who are foolishly entrusted with guns, and who fire away at anything they see moving, from tomtits upwards, and know as much about using firearms properly as did Mr. Winkle, whose feats are recorded in the celebrated "Pickwick Papers." They blaze away recklessly in all directions, and one is in continual fear of suddenly receiving into his body a charge of shot sufficient to kill a bullock, and probably intended for some very small bird, whose greatest safety undoubtedly lay in remaining in the spot where he was first espied. Seriously, however, it is much to be regretted that such boys should be allowed out with guns, as they only endanger the lives of all in their vicinity, whether engaged in shooting rabbits, or, like ourselves, on more scientific sport intent. Incidentally, it may be mentioned that the variety of "guns" one sees on these holiday excursions is something to be remembered: all the pawn-shops in Melbourne, if put together, could not produce such an array. Here may be seen specimens of rifles (what *these* may be intended for it would be difficult to imagine), muskets, fowling-pieces, blunderbusses, &c., many at least 30 or 40 years old, and some so heavy as to make it quite a labour to lift them to the shoulder, and varying in price from the 15s. "Brummagem" twist to the expensive breech-loader. The latter part of the afternoon was bitterly cold, which was all the more felt as we were arrayed in summer costume, and it was with a strong feeling of relief that at about a quarter past seven we took our seats in the train which conveyed us to Melbourne, arriving there about 9 o'clock, tired out, and very glad to get to our homes, have some supper, and thence to bed.

Our two years' experience do not induce us to speak in the most favorable terms of the You Yangs as a collecting ground; the locality does not appear to possess any plant, with perhaps the exception of *Prostanthera lasianthos*, an insect peculiar to itself, or which cannot be obtained much nearer to Melbourne. The approach to the hills is altogether uninteresting, whilst the hills themselves offer no attraction to visitors, being of a very rough nature, and totally deficient of the beautiful fern-gullies for which most of our mountain districts are so justly appreciated. Upon reviewing our results they were found to be as follows, viz.:—

INSECTS.

BUPRESTIDÆ.—Four species; two being Stigmoderas, one Melobasis, and one Agrilus.

LONGICORNS.—Nine species:—*Amphirhoe decora, Zoedia triangularis, Macrones sp., Pempsamacra dispersa, Uracanthus* *triangularis*, var. *Dixoni*, *Earinus mimula*, *Phoracantha fallax*, *Callirhoe aberrans*, and the little one, previously mentioned, with a red thorax, and, so far as we know, unnamed.

CHRYSOMELIDÆ.—Five or six species of Paropsis. Also several Carabidæ and Curculionidæ, and a few of one or two other families, all being very common to the immediate vicinity of Melbourne.

Of LEPIDOPTERA very few were taken, they being exceedingly scarce.

TREES.

Acacia melanoxylon, or Blackwood; *Eucalyptus obliqua*, or Stringy-bark; *E. globulus*, or blue gum; *Casuarina quadrivalvis*, or She-oak.

SHRUBS.

Aster glandulosus, *Prostanthera lasianthos*.

SMALL PLANTS.

Nicotiana suaveolens, or Native Tobacco; *Trichinium spathulatum*; *Brachycome exilis*, or native daisy.

FERNS.

Pteris aquilina, var., *esculenta*; *Asplenium flabellifolium*; *Cheilanthes tenuifolia*.

PROCEEDINGS OF SOCIETIES.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

The December monthly meeting of the Field Naturalists' Club of Victoria was held at the Royal Society's Hall on Monday, the 11th ulto., Mr. H. Watts presiding, and there being a good attendance of members.

Mr. J. Saxton, who had been duly proposed at the previous meeting, was elected a member of the Club.

As showing that the usefulness of the Club is extending, it may be mentioned that a letter was received from a gentleman in Sydney enquiring where Mr. C. French's papers on "Victorian Ferns" could be procured, he evidently not being aware that they were regularly published in the *Southern Science Record*.

The papers read comprised a continuation of the description of the Parrots of Victoria, by Mr. T. A. Forbes Leith, the present portion including Red Lory, or Pennant's Parrakeet (*Platycercus*

Pennanti), Yellow-rumped Parrakeet (*P. flaveolus*), Rose Parrakeet (*P. eximius*), Yellow vented Parrakeet (*Psephotus zantharrhous*), and Red-rumped Parrakeet (*Psephotus hæmatonotus*). This paper occasioned considerable discussion, principally relating to the migratory habits of the Parrot tribe, and a good deal of information was elicited in relation thereto.

Mr. A. J. CAMPBELL contributed a further instalment of his series of papers on Australian Oology, drawing special attention to his descriptions of the eggs and nests of the Satin Bower-bird (*Ptilonorhynchus holosericens*), the Spotted Bower-bird (*Chlamydodera maculata*), White-winged Corcorax (*Corcorax melanorhampus*), White-eyed Crow (*Corvus Australis*), and Hazel-eyed Crow (*Corvus coronoides*), some of these not having been previously described, or very inaccurately.

Dr. LUCAS drew attention to Mr. Campbell's statement at the previous meeting claiming to be the first to correctly describe the egg of the *Xerophila leucopsis*, or White-faced Xerophila, whereas it had been previously done by Professor Ramsay, of Sydney. Dr. Lucas also gave another of his instructive lessons on Geology, describing the Upper Silurian rocks, explaining their formations, and showing several interesting specimens therefrom.

The specimens exhibited were more numerous than usual. Mr. C. French showed exotic Longicorn beetles, including *Macrotoma heros*, from Fiji, and six species of Psalidognathus, from Central America; Mr. D. Best, cabinet drawer of Australian Rutelini, or Cockchafer beetles, and Australian Lucanidæ; Mr. F. H. DuBoulay, a new species of Cicindela, from near Melbourne, Moths recently taken in Victoria, and 100 species of Australian Buprestis beetles. Mr. F. Wisewould, Snakes and other specimens from Darling River, near Wilcannia, also English viper recently received; Mr. H. Watts, specimen of Coralline under polarised light; Mr. A. J. Campbell, eggs of the Satin and Spotted Bower birds, and other eggs in illustration of his paper; Mr. J. E. Dixon, 115 species of Lepidoptera collected during the month; Mr. F. Spry, Lepidoptera of the month, including the rare *Danais petelia*; Mr. A. J. North, skin of the nearly extinct bird *Apteryx Mantelli*; Mr. F. J. Barnard, beetles, including the rare Longicorn, *Bimia femoralis*; Dr. T. P. Lucas, Moths taken during the month, Hawk Moths from Queensland, blue variety of egg of the common shrike, eggs of Bristle-birds and Downy Pycnodus, also many fossils in illustration of his paper on Geology.

The usual conversazione brought the meeting to a termination.

THE ROYAL SOCIETY OF VICTORIA.

The ordinary monthly meeting of the Royal Society of Victoria was held in the Society's Hall, Victoria Street, on Thursday, 14th ult. Mr. R. L. J. Ellery, the President, occupied the Chair, and there was a moderate attendance of members.

The PRESIDENT announced that the meeting of that evening would bring the session to a close. In accordance with the rules, nominations of office-bearers for the ensuing session must be forwarded to the Secretary before the next ordinary meeting in March.

Messrs. J. Walters and G. S. Griffiths were elected members of the Society, and Messrs. H. W. [illegible] and J. H. Fraser were admitted as associates. Mr. F. S. Sargood M.L.C., and Dr. James were nominated for membership, and Messrs. C. Stewart and J. Hill as associates.

Mr. R. W. EMERSON McIVOR read a paper entitled "Whakaari, a New Zealand Sulphur Island." The Whakaari, he said, was a conical island in the Bay of Plenty, formed by the summit of an extinct volcanic mountain rising to a height of over 900 feet out of deep water. It was named "White Island" by Captain Cook probably on account of the dense white clouds of vapor which it sends into the atmosphere, and which often almost completely envelope its summit. He (Mr. McIvor) paid a professional visit to this remarkable island in 1880. It might be described as an ampitheatre walled in from the Sea, and provided with natural doorways in its walls. Passing into the crater he observed that the floor was fairly level, and nearly white in color, owing to its being largely composed of gypsum. The ground was warm, and in several places small streams of gas escaped from fissures and holes. This gas was rendered visible by suspended sulphur. On the left or eastern side of the crater he observed a huge bank of sulphur, intermixed with gypsum, rock, and other *debris* which had fallen from overhead. This bank must be about 300 yards long and of variable depth. The "sulphur ore" runs from 50 to almost [illegible] per cent. of the pure element. Near the centre of the amphitheatre was a lake extending from side to side, and covering, in all, an area of 70 acres. This lake was of considerable depth in places, and was liable to violent disturbances by subterranean influences. Its water varied much in temperature and composition. When the hand was immersed for a few moments in the lake and then withdrawn, a tingling sensation, or "bleeding of the skin," was experienced. The Maoris regarded the lake as sacred in its character, and believed that any one attempting to bathe in it would die immediately. Though the water was manifestly too strong for medicinal purposes, yet he could mention two remarkable cures of rheumatism that had [illegible]. On the western side of the lake the production of sulphur was in progress in all directions. Numerous fumeroles were at work, sending into the air to an immense height over the island dense clouds of acid and steam, depositing fine lemon-yellow sulphur, and projecting with great violence dense pieces of amber-colored sulphur to a considerable distance. Every alternate year one fumerole ceases to work, and another burst through the apparently solid ground. A quantity of White Island sulphur was imported into Victoria by Messrs. S. De Beer and Co., and made into sulphuric acid by Messrs. Cuming, Smith, and Co., of Footscray. It was pronounced to be adapted for making artificial manures, and could be used for other manufacturing purposes. Mr. McIvor then referred to the relations existing between the prevailing meteorological conditions and the chemical influences at work in the interior of the island. He concluded by asserting his opinion that the future importance of White Island, from a scientific and commercial standpoint, could not be doubted. It was certainly the most interesting place in an interesting country.

A discussion followed the reading of the paper, in which Dr. Neild, Dr. Jamieson, the Rev. J. J. Halley, Mr. A. Sutherland, and others took part. The unanimous opinion seemed to be that, from a sanatory and commercial point of view, it was highly desirable that the peculiar characteristics of White Island should become better and more widely known.

The Society then adjourned until the second Thursday in March.

COLLINGWOOD MICROSCOPICAL SOCIETY.

We hail with delight the fact that a Microscopical Society has been established in the large suburban City of Collingwood. It is under the presidency of the Rev. J. Porter, a well-known and able microscopist. The Society will, for the present, meet alternately at the members' residence. The third meeting was held on Tuesday, Dec. 10th, at the residence of Mr. H. Watts, Wellington-street. There was a good attendance of Members, each of whom brought with him his instrument, as well as some specimens of his own preparation.

Mr. J. ALLAN exhibited some stained sections of wood, and, with Mr. Wilson, the Secretary, had also some good polariscope objects.

Mr. H. WATTS placed his large collection of specimens, of almost every branch of Microscopical Science, at the use of Members. Particular interest was directed to the living Diatoms, Desmids, and Infusoria growing in aquaria.

The next meeting was appointed to be held at the residence of the Secretary, Mr. Wilson, Johnston Street, Collingwood.

THE ROYAL SOCIETY OF NEW SOUTH WALES.

The general monthly meeting of the members of the Royal Society of New South Wales was held, 7th Dec., in the Society's House, Elizabeth-street, North. The President, Mr. C. Rolleston, C.M.G., occupied the chair, there being about 25 members present. The minutes of the previous meeting were read and confirmed.

The PRESIDENT stated that he was desired by the Council to give notice that the four essays—1. On the Aborigines of New South Wales, prize £25; 2. On the Treatment of Auriferous Pyrites, prize £25; 3. On the Forage Plants Indigenous to New South Wales, prize £25; 4. On the Influence of the Australian Climates and Pastures upon the Growth of Wool, prize £25—were in the course of being considered by the council, and in a short time—about a week hence—the council would be prepared to give its decision upon them.

It being necessary to appoint two auditors to audit the treasurer's account for the past year, Messrs. J. Trevor Jones and F. Poolman were elected to fill the offices.

The PRESIDENT also announced, at the desire of the council, that arrangements were being made for the delivering of a course of lectures on the geology of Australia by the Rev. J. E. Tenison-Woods in connection with the Clarke Memorial.

Sixty-five donations of books, magazines, reports, &c., were acknowledged.

A ballot being taken, the following gentlemen were unanimously elected members of the Society:—Mr. James J. O. Atkinson, J.P., Dr. Thomas Chambers, Rev. John G. Fraser, M.A., Dr. A. Norrie, and Mr. Surgeon J. Steel.

A paper was then read by Dr. W. A. Dixson, on "The Ashes of some Epiphytic Orchids."

The Rev. J. E. TENISON-WOODS, F.G.S., F.L.S., &c., then read a paper on "A Fossil Plant Formation in Central Queensland," which is intended to be published.

Mr. C. S. WILKINSON, Government Geologist, exhibited a number of coral formations which had been collected for him by Mr. Barling, of the Harbour and Rivers Department, on his visit to the Elizabeth Reef, Lord Howe Island, for the purpose of seeing that the provisioned lifeboat kept there in the event of shipwreck was secure. He had submitted them to the Rev. Mr. Tenison-Woods for his inspection, and that gentleman had made some notes on them.

The Rev. J. E. Tenison-Woods, said that the corals were all of reef-building formation, such as were never found out of tropical or very warm seas, and as Lord Howe Island was some 300 miles to the south of any place where such corals were known to be formed on tho Australian coast there must be some peculiar condition of temperature in that locality to account for their occurrence—probably a warm current from the north. The collection included several new species, among others that named the "brain coral," which would be subsequently described by him, and which were all found on the north-eastern Barrier Reef of Australia in warm seas. There was a coral reef off the coast of Western Australia named the Hautman's Abhronthos, in probably the same latitude as the Elizabeth Reef, Howe Island, and which was known to be in the midst of a warm current flowing south from the Indian Ocean.

The President announced that it had been determined by the council that the library should, next session, be opened on week days from 1.30 o'clock p.m. to 6 o'clock p.m., with the exception of Saturday, when it would be open from 9 o'clock a.m. to 1.30 o'clock p.m. He also stated that the then present meeting would be adjourned till Wednesday evening next, with a view to affording Mr. Russell, the Government Astronomer, an opportunity of communicating to the Society the results of the observations made upon the transit of Venus. (Applause). A vote of thanks was then passed to Dr. Dixson and the Rev. J. E. Tenison-Woods for their valuable papers, and the meeting adjourned till Wednesday next.

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 27th December. The President, Dr. James C. Cox, F.L.S., &c., in the Chair.

The usual announcement was made of donations received.

The following papers were read:—

1. "Occasional Notes on Plants indigenous in the neighbourhood of Sydney," No. 2. By Edwin Haviland, Esq. This paper treats chiefly of the construction and habits of *Utricularia dichotoma*, of the order Lentibulorinæ, showing the provision made to enable the plant (which usually grows in shallow creeks) to float in case of an increase in the depth of the stream; thus avoiding injury to the pollen, which would occur if it were submerged. The author also referred to the peculiar construction of the flower, favouring cross-fertilization, while at the same time self-fertilization is prevented by the corolla falling off, carrying with it the stamens and pollen before the stigma is mature.

2. "Description of a new *Belideus* from Northern Queensland." By Charles W. De Vis, B.A. A species in size between *B. australis* and *B. sciureus*, differing from both in its markings, in having shorter ears, and in the more slender and less hairy tail. *Belideus gracilis* is the name he gives it.

3. A paper by the same author describing two new Queensland Fishes—*Callionymus achates* and *Mugil nasutus*.

4. By the Rev. Dr. Woolls, on "The species of Eucalyptus first known in Europe." Of the twelve species described by Willdenow, eleven are from the immediate neighbourhood of Sydney, and one from Tasmania. This tree, the Tasmanian Stringy Bark, *E. obliqua*, was the first Eucalypt known in Europe, the specimen having been collected during Furneaux's Voyage. On it L'Héritier founded the genus, 1788. The early descriptions are, as it may be supposed, very vague and imperfect, and their identification has been a matter of much difficulty and hesitation, now happily removed.

5. "On some new species of *Tubicolous Annelides*." By William A. Haswell, M.A.. B.Sc. This paper contained descriptions of five new species of *Tubicolous annelides* from New South Wales and Queensland.

6. "On New Species of *Agaricus* discovered in Western Australia." By the Rev. C. Kalchbrenner. The new species described, which were collected by Mrs. Forrest, were named *Agaricus Forrestiæ*, *A. carneo-flavidus*, *A. turbinipes*, *A. plagiotus*, and *A. bicinctus*.

7. "On some points in the anatomy of the urogenital organs in females of certain species of Kangaroos." Part I. By J. J. Fletcher, M.A., B.Sc. This paper continues the subject treated of in a former paper, and gives an account of the urogenital organs of sixty female kangaroos, of which forty-four specimens described in Part 1 were taken from animals which had certainly produced young. The results are—(1), Corroborative of the *post partum* existence of a direct communication between the median vaginal and urogenital canals in *H. ruficollis*, *Osphranter robustus*, and *Osphranter rufus*, in all of which species it has been met with before. (2). Descriptive of its existence in two species (*H. dorsalis* and *Onychogalea frænaa*) in which the female organs have been hitherto undescribed. (3). Corroborative of the absence, as a rule, of the direct communication in *Macropus major*, even after parturition. Part II, treating of the organs of virgin animals, with summary and conclusion, will be given later on.

8. The Rev. J. E. Tenison-Woods read a paper on a species of *Brachyphyllum* which was found in the Tivoli coal mine. The specimen was a very beautiful and perfect one, showing a large amount of the ramifications and foliage, as well as the peculiar Lepidodendroid markings on those portions of the stem

from which the leaves had fallen away. In many respects this species resembled the well-known *B. mamillare* of the British and Continental Oolite, but lest any confusion should arise from a doubtful identification, and as the stems and leaves of this specimen were much thicker, and the leaves more fleshy than in *B. mamillare*, the author distinguished it as *B. crassum*. He considered that the discovery of this specimen served to place the Jurassic age of the Ipswich (Queensland) coal-beds beyond much doubt.

A note was read by Dr. H. B. GUPPY, of H.M.S. "Lark," on the cocoa-nut eating habit of the *Birgus* of the Solomon Islands. Dr. Guppy had no doubt from what he had observed that the Robber-Crab is in the habit of breaking open the shells of the cocoa-nuts with its powerful chelæ.

Mr. C. JENKINS, L.S., of Yass, exhibited a collection of Palæozoic (Devonian?) fossils, chiefly Brachiopods, collected by him between Cobar and Wilcannia. The formation appears to belong to the same horizon as the fossiliferous beds at Mount Lambie, &c.

Mr. T. A. TENISON-WOODS gave a curious mythological account of a New Ireland idol, exhibited by him at the last meeting. The story appears to have some connection with the legend of Degei, God of Fiji, as reported by Séeman, Mission to Fiji, 1860-61.

The Hon. P. G. KING, M.L.C., exhibited specimens of *Pieris teutonia*, observed by him in great numbers near Tamworth a few days ago. They appeared to form part of a vast migration, moving without intermission towards the North. The same species has been unusually common in many parts of the Colony during the present summer.

Mr. E. P. RAMSAY exhibited three species of *Oligorus*; one *O. Macquariensis*, from Wagga Wagga, a second distinct species from Wilson's Creek, Richmond River, and a third, also different, from the Mary River, Queensland; also a new species of *Amphisile* from Wide Bay; three species of Mus, various shells from Queensland; samples of Dugong Oil, &c.; and photographs of Australian and New Guinea Aborigines. A collection of birds from the Solomon Islands, with numerous explanatory notes, was also laid before the Society.

Mr. BRAZIER exhibited a copy of "Mawe's Linnean System of Conchology, 1823;" "The Voyagers' Companion," by the same author, and his "Introduction to the study of Conchology," 1832.

Mr. HASWELL stated that he had much pleasure in announcing to the Society that, thanks to the intelligent inquiries made by Mr. Morton, of the Museum, while recently in Queensland, he had hopes that they were on the way towards learning something of the embryology of the *Ceratodus*. Mr. Morton had ascertained that the *Ceratodus* spawns in the Burnet River during the months of June, July, or August, the spawn being deposited in a slight excavation formed in the bed of the river at a depth of eight or ten feet, the male and female remaining in close attendance on it until hatched. Arrangements had been made by which it was hoped that a supply of the spawn might be obtained for observation next season.

THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

A meeting of the Fellows of the South Australian Royal Society was held at the Institute, North-terrace, on Tuesday evening, 5th December. There was a numerous attendance, and Dr. Whittell, one of the Vice-Presidents, occupied the Chair.

Several donations to the library were announced.

Messrs. J. E. Brown, Conservator of Forests; E. B. Grundy, solicitor; and the Hon. Dr. Campbell, M.L.C., were elected Fellows of the Society.

The Chairman stated at the previous meeting of the Society it was resolved that the Council should take into their consideration the advisableness of devoting one evening per month to the informal discussion of scientific subjects, at which no papers should be read, and no notice taken of the discussion in the official proceedings of the Society. The Council had determined to recommend the Fellows to agree to the proposal to devote one night per month during nine months of the year—excluding the summer months—to the purposes indicated.

On the motion of Professor Tate the suggestion of the Council was adopted by the Society.

The Chairman also stated that a letter had been received by the Council from Mr. Wilson, suggesting that the Society should present to Mr. Walter Rutt, the late Hon. Secretary, some slight recognition of his energetic labours during the five years he had held office on behalf of the Society. The Council had accordingly resolved to advise the Fellows to vote a testimonial to Mr. Rutt not exceeding £10 in value.

On the motion of Professor Tate it was resolved that the Council should be asked to purchase a life-membership in the Society for Mr. Rutt, in recognition of his past services as Secretary.

Professor Tate exhibited a specimen of a very great pest which he had met with recently in the South-east, and the devastations of which had become really alarming. It was a very beautiful beetle, apparently of the genus *Cetonia*. In the neighbourhood of Mount Gambier it was very abundant, and more particularly over the volcanic formations in the vicinity of Mounts Burr, Grey, and Muirhead. These beetles existed in great masses, and vegetation was literally laden with them. They exhibited a preference for succulent leaves, such as those of the vine and apple, and they had stripped large numbers of trees of their foliage in the orchards attached to the Glencoe and Mount Graham Stations, besides denuding several varieties of native trees. The numbers were so prodigious that it was practically impossible to deal with the pest, and Mr. Hay, the owner of a station in the district, had given up the attempt to kill them, by shaking them from the trees, in despair, after filling about six buckets, Two years ago the same beetle visited the district in large numbers—in fact the air was full of them. It was evidently a native species, but he had been unable to find a specimen in Mr. Otto Tepper's collection in the Museum from which he concluded that that indefatigable collector had not met with it in the Adelaide district.

Mr. T. H. Smeaton thought the beetle described was known in Tasmania some years ago.

The Chairman remarked that he thought it was similar to one he found at his door some twenty years ago, and had not seen it since.

Dr. Davies Thomas exhibited several specimens of hydatids under the microscope, to illustrate his recent papers on that subject.

MICROSCOPICAL NOTES.

Dr. Pelletan on Septic Bacteria.—Dr. Pelletan, the well-known editor of the "Journal de Micrographie," is disposed to be facetious over the recent discoveries of the Bacilli of various diseases, regarding which he evidently holds opinions of a highly heretical character. We quote the following from the October number:—

"New microbes continue to make their appearance. After the microbe of tuberculosis we have the microbe of syphilis, then the microbe of typhoid fever of the horse, the microbe of erysipelas, and for next week the appearance of three or four other microbes is announced.

"As to the Bacillus of tuberculosis, M. de Korab finds an enemy to it in 'hélénine,' a substance having some analogy with camphor, and resulting from the distillation of the root of elecampane (Inula helenium) with water. M. de Korab, after having isolated and cultivated in the serum of ox-blood the organisms which are considered as the Bacilli of tuberculosis, placed them in ten different tubes. To three of these tubes he added "hélénine."

"On examining under the microscope the contents of these tubes, eight days after, it was ascertained that those which were free from the 'hélénine' were peopled with Bacilli, while those to which it had been added contained only dead microbes. Had the hélénine then destroyed the vitality of the bacteria? To test this, and prove that the first seven tubes really contained the Bacilli of tuberculosis in full development and activity, while the there last contained only inert individuals, experiments were made by inoculating guinea-pigs. Inoculated with the liquid of the first tubes, the animals died tuberculous; with the liquid of the three last they sustained no injury.

"From these facts M. de Korab concludes that we may make use of hélénine to combat tuberculosis. But, in order to find substances which kill Bacilli, it was unnecessary to distil the root of elecampane: a hundred thousand and one substances would have played perfectly well this bactericide röle,—unfortunately, none of them have yet succeeded in curing phthisis.

"Among these substances M. de Korab had only to choose, and we are surprised that he did not think of boracic acid, for boracic acid is the parasiticide, the antiseptic in fashion. There is an end of salicylic acid and the salicylates; here we have boracic acid and the borates—it is the medicament of the day, and, for the moment, it cures everything. Boracic lotion, boracic ointment, boracic injection, boracic glycerine, glycero-borates, boracic vaseline, no matter what, provided that it be boracic, it cures. Let us hasten, then, to be ill, for next year it may be too late, and boracic acid will perhaps be replaced by an acid more disagreeable, and, above all, more expensive."

Dr. Pelletan concludes by expressing his opinion that the doctrine of the parasitic nature of infectious diseases will perish when it becomes established "that there are microbes *everywhere*, and that, consequently, they can be in general only associated with diseases, often products of them, very rarely specific causes, —but for which fact there would be nothing living on the Earth but micrococci, bacilli, bacteria, and bacteridia."

DIFFUSIVE ENERGY IN MICROSCOPY—Prof. Albert H. Tuttle, in addressing the Section of Histology and Microscopy of the American Association at Montreal, and alluding to the advantages of pursuing a definite line of research rather than spending time in discursive observations on all sorts of miscellaneous subjects, neatly remarks that "however it may be with objectives, we may be sure that for Sections of this Association not only penetration but definition also is in inverse ratio to angular aperture."

THE CARBOLIC ACID PROCESS.—We observe from occasional reference in the English and American Microscopical Journals that the value of carbolic acid in balsam-mounting is becoming generally recognized, and that in America especially it is now in common use. We believe this process was first suggested by Dr. Ralph, the President of the Microscopical Society of Victoria, in 1874, and that it was first introduced to English microscopists by a note from Mr. Barnard, of Kew, which appeared in *Science Gossip* in 1880. To Dr. Ralph also is due the introduction of the balsam and chloroform mixture which has been so long and widely used, he having recommended it in an article in the *Quarterly Journal of Microscopical Science* in 1857, though subsequently (in 1865) the same process was brought out in the same journal as a new invention.

CRYSTALS IN WINE.—Those of our readers who follow the apostolic injunction to Timothy may find a beautiful polariscope object in the crystalline grains which are often deposited like fine sand in the bottom of wine-bottles. When the bottle is nearly emptied turn the dregs into a wine-glass, and, if the granules are present, place a drop of the wine containing them in the centre of a slide; pour off the wine, leaving the crystals on the slide, and, when they are dry, mount with balsam. In a specimen which we recently mounted, the granules are roughly elliptical (short octagons with the angles rounded off), and with polarized light each one presents a series of brilliantly-colored concentric rings, due to the decreasing thickness of the crystal from the centre outwards. No selenite is necessary. Some former specimens, from raisin wine, differ in the irregular shape of the crystalline grains, in consequence of which the ring-systems, in many cases, are fragmentary.

THE MICROSCOPE AT CONVERSAZIONES.—A correspondent of an American journal recently appealed to the opticians to devise some simple means of fixing a microscope-body at a given focus, in order to obviate the damage which often results from the attempts of inexperienced persons to adjust the focus for themselves. Most people who have exhibited at a microscopical conversazione will recognize the existence of this danger; for our own part, we well remember on one occasion exhibiting under a quarter-inch a pet slide containing a very few valves of an exquisite diatom—the five-rayed variety of *Amphitetras ornata*—the only ones which had rewarded our search through a large quantity of material, with the result that one of the visitors speedily brought down the objective with a force that totally crushed the diatoms, and then smilingly informed us that he "couldn't see anything!" since when we have carefully refrained from exhibiting anything which required a higher power than an inch. Visitors to microscopical soirées would scarcely be susceptible to the influence brought to bear by one of Kingsley's heroes, who repressed the inquisitiveness of a too-curious young lady by a hint that his great microscope, if incautiously handled, would be apt to "go off;" while the customary appeal "Please don't touch" (in large Roman letters) has usually the same effect on a large proportion of the visitors that the prohibition regarding the legendary apple is said to have had upon Eve. It appears to us that nothing could be simpler than to have a small screw with a milled head so placed that by screwing it in it would fix the pinion of the coarse adjustment and prevent it from revolving. An ingenious plan, which, we are informed, is in use among microscopists in England, consists of an arrangement by which the milled heads of the rack can be thrown out of gear, so that the amateur may turn them to his heart's content without any risk to the instrument, and probably to his own entire satisfaction.

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CONTENTS:

PRICE--ONE SH

COLLINGWOOD
J. WING, 33 WELLINGTON STREET.
1883.

Definitions of some new Australian Plants,

by Baron Ferd. von Mueller, K.C.M.G., M.D., Ph. D., F.R.S.

[Continued.]

Hicksbeachia.—Flowers bisexual. Petals at first united into a straight tube, soon disconnected, symmetrical. Stamens inserted within the dilated summit of the petals. Anthers longer than the filament, almost cordate; their cells somewhat surpassed in length by the connective. Hypogynous glands four, severed from each other. Style straight. Stigma nearly ellipsoid. Ovary ovate-conical. Ovules two, pendent, oblong, straight. Fruit ovate-roundish, hardly compressed, indehiscent. Pericarp thick, somewhat succulent. Seed solitary, turgid on both sides.

A tree of subtropical eastern Australia, with pinnate leaves, with oblong-lanceolar serrated leaflets decurrent along the rachis, with elongated spike-like allsides flowering racemes, obliterated bracts, paired but connate stalklets, finally deciduous petals, not very long style and outside orange-colored fruits.

On this new genus is bestowed the name of the Right Honorable Sir Michael Hicks-Beach, Bart., P.C., M.A., D.C.L., in appreciation of the encouragements afforded by him to Science during his tenor of office as Her Majesty's Secretary of State for the Colonies; by this dedication his memory will remain closely connected also in Australian vegetation with the names of three of his distinguished predecessors, in remembrance of whose administration of the British Colonial Empire successively three other genera of proteaceous plants became distinguished.

Hicksbeachia differs from Kermadecia in the not diagonally descendent receptacle and not unilateral disk; from Euplassa in the not oblique base of the flowers and in solitary seeds; from Roupala in not bivalvular fruit; from Panopsis and Macadamia in foliage, in almost sessile anthers, in never annular disk, and from the last mentioned genus besides in the pericarp not being separated into a coriaceous unilaterally bursting exocarp and an extremely hard and spherical endocarp, which latter characteristic renders Macadamia strictly monotypic. Many of the racemes of young trees arise from the stem.

Hicksbeachia pinnatifolia.

Euplassa Hicksbeachii (F. v. M.), Coll.

Near the Tweed; C. Fawcett, Esq.

The finder observed, that this tree arises copiously after the clearance of the primeval forest only. Leaves, so far as seen by me, about 2 feet long; leaflets 9-23 in number, sessile, measuring with exception of the abbreviated lowest from 4 to 9 inches in length and 1 to 2 inches in width, nearly glabrous, of rigid texture, with spreading and anastomosing primary veins and reticular veinlets. Racemes 7-11 inches long; their rachis somewhat silky. Pedicels 1-2 lines long. Petals (generally regarded as sepals) soon reflexed, outside slightly silky, about half an inch long. Style not really longer, though soon exserted, only towards the base as well as the ovary velvet-downy. Fruit measuring about one inch in length.

Adenostephanus Bleasdalii is more recently referred by Bentham to Kermadecia, but in the absence of fruit no firm position can be as yet assigned to that plant.

Helipterum Frenchii. — Annual, weak, but erect, except the flowerheads quite glabrous; leaves on long and exceedingly thin stalks, flat, membranous, the lower ovate- or oblong-lanceolar, the upper gradually verging into an almost linear form; flowerheads small, singly terminating very thin peduncular branchlets, very depressed, not radiating; outer bracts nearly as long as the inner, subulate-linear, green; inner bracts cuneate-oblong, scantily woolly, scarious towards the summit; flowers numerous, homogamous; achenes glabrous; pappus consisting of 10-15 slightly plumous bristles.

Near Menilayalya in the vicinity of Shark-Bay; J. Forrest.

The only specimen obtained about one foot high, not much branched. Leaves from $\frac{1}{3}$ to nearly 1 inch long, dark-green on both sides. Leafstalks capillary, not uncommonly as long as the leaves. Flowerheads hardly half an inch in diameter. Inner bracts yellowish towards the upper end. Achenes slightly papillar.

This species vacillates between the genera Helichrysum and Helipterum, but seems best placed near *Helipterum Forrestii.* The specific appellation is to commemorate in botanic science the zealous services rendered by Mr. Charles French to the Field Naturalists' Club, of which he was one of the originators, and which Association had so much support as well from his horticultural experience as from his entomologic studies.

The Parrots of Victoria.

By T. A. F. Leith.

[Read before the Field Naturalists' Club of Victoria 15th January 1883.]

PART IV.

The Chestnut-shouldered or Tourquoisine Parrakeet—(*Euphema pulchella*).—The description of this charming little parrakeet is from a live specimen now in my aviary. The head, cheeks, shoulders, and part of the wings are a most beautiful tourquoisine blue; breast and belly canary yellow; back olive green. On the shoulders, at the insertion of the wings, there is a chestnut red mark. The female I had also alive, but she died some time ago in a fit; there was no chestnut mark visible on her shoulders, nor, in fact, have any I have seen such a mark; they have less blue than the males, with little yellow, and that not so bright as in the former, their plumage generally being less brilliant.

These parrakeets are very scarce in this colony, being migratory birds, a few coming in the spring to South Gippsland, &c., and when seen are generally in pairs, or perhaps three or four together. Ever since the death of his mate the male in my possession has been very reserved in his manners, keeping away from the other birds till night time, when he goes to roost close beside a canary. Length about 8 inches.

The male Tourquoisine is one of our most beautiful parrakeets. The eye is very large and dark, and the shade of the blue on the head and cheeks of the most exquisite tint when the bird is matured and in plumage.

The Blue-banded Grass Parrakeet, Blue-barred Parrakeet, &c.—(*Euphema venusta*).—Is met with in many parts of Victoria, from the Werribee to the Loddon, in the East and West of the colony. The upper surface is dark green, with a band of dark blue on the forehead, the two centre tail feathers green and blue, the rest nearly all yellow; upper wing coverts are olive green, with light blue edgings, and the rest of the flight feathers of the wings a dark blue; breast, &c., brownish green, abdomen yellow. The female is a dull brownish green on the upper surface; otherwise she is like the male, but less brilliant, resembling very much the elegant grass parrakeet. Length about 7¾ inches.

These parrakeets live much in the grass, often in pairs, only together; I shot one on Keilor Plains some years ago, and I dare say they may be met with on any grassy flats. In dry summers they make for the neighbourhood of creeks, and I have seen them on the Werribee, and shot a female there once.

The ELEGANT GRASS PARRAKEET—(*Euphema elegans*).—The elegant grass parrakeet has been rightly named, for without brilliancy of plumage it has extreme elegance of form. This specimen was shot in the Swan Hill district 240 miles from Melbourne; but they are met with at times in various more southerly parts. The general colour is olive brown, much resembling the female of the *Euphema venusta*, and there is very little difference in the sexes. They live much on the ground, eating the grass-seeds.

In size this bird is larger than the Blue-banded, with deeper yellow on the abdomen. When young, however, the Blue-banded, Orange-bellied, and Elegant Grass much resemble each other, but the former is the smallest. Length 8½ inches.

The ORANGE-BELLIED GRASS PARRAKEET—(*Euphema aurantia*).—Has a faint blue band above the beak. Upper surface dark green; shoulders and flight feathers of the wings, mostly blue; rest of upper wing coverts green,—but the distinguishing mark is the deep orange spot on the belly. The female is smaller and the orange spot fainter. The specimens exhibited were shot not a great many miles from Melbourne; but they have been met with in various parts of the colony; they are male and female, and the difference can be perceived in the orange of the belly. Length about 8½ inches, or, as nearly as possible, the same as the elegant Grass Parrakeet; but in the upper surface, as well as the belly, they differ much, the one being green, the other olive brown.

Strange to say, notwithstanding the numbers of green parrakeets to be found in different parts of the world, I never saw two species with the upper surface having the same shade of green: this is one of those exquisitely beautiful arrangements in Nature, where, when necessary, the colours of the fauna will blend or contrast with the flora of the earth.

The WARBLING GRASS PARRAKEET, BUDGERAGAH, SHELL-PARROT, ZEBRA PARRAKEET, LOVE BIRD, &c.—(*Melopsittacus undulatus*).—When these charming little parrakeets were first taken to England, dealers could not supply the demand at £14 14s. per pair. The colour of the crown is yellow, throat and cheeks with some fine blue spots on each; at the top of the beak the male is blue, the female brown. Breast, belly, and rump brilliant grass green. Black bars and crescents on neck, back, shoulders, &c., remainder of the wings and centre tail feathers green and blue; shorter tail feathers blue, with yellow band down the centre. Length 7 inches.

They are now so well known, being captured on the grassy plains of Victoria, New South Wales, and South Australia in large numbers annually for exportation, that a general description is all that is necessary.

I have a pair at present, and the male has deserted his mate for the company of a Java Sparrow, which he plays with and teases alternately all day long, to the extreme disgust of his once much-loved companions. These specimens are male and female, both of which I had alive. I have known these parrakeets to breed in confinement, and one pair that escaped in London over 20 years ago reared a brood of young in the Temple Gardens.

The Ground Parrakeet, Swamp Parrakeet, &c.—(*Pezaporus formosus*).—This bird, that passes most of its life entirely on the ground, has a small red mark at the top of the beak; the general plumage is green and black, the black is in the shape of short streaks on the head and back, and lower spots having yellow bars on them also on the uppermost wing coverts; breast green, with some black spots; belly greenish yellow, barred black.

These parrakeets are, I believe, an exception to the general rule, and lay their eggs on the ground; in flavour they resemble quail, and pointers will stand to them like any other game. When in flight the tail has the appearance of being forked. There is another variety said to inhabit the north-west, and to be nocturnal in its habits. The specimen under notice is a male, and is nearly 11 inches long. The eye is yellowish; they run well on the ground, and do not waddle, like other members of the parrot family: this habit of running instead of flying is the reason they are not oftener seen, unless you come right on them, when they fly low to the next nearest cover, until they suppose themselves out of sight and out of danger.

Oology of Australian Birds.

By A. J. Campbell.

Part ix.—Order—INSESSORS.

Family—*Paradiseidæ*.

279. Chlamydodera maculata—(Spotted Bower-bird). *Locality*—Queensland, New South Wales, Victoria, and interior of South Australia. **Egg*—Very beautiful and most singular in appearance, like a fine piece of porcelain with hand-painted markings. The egg is nicely proportioned, although inclined to oval in shape. Ground-color very light sea-green. There are three distinct characters of markings, firstly light grey blotches, that appear on the inner surface of the shell; secondly, small stripes of light sienna and umber, painted as if with a camel-hair brush, in every shape and size round and round the shell,

Eggs marked thus * not described by Gould, or not previously described.

principally zig-zagged latitudinally, but very often taking longitudinal and other directions; and, lastly, over these markings a few darker and heavier stripes and smudges of umber. Both ends of the egg are comparatively free from markings. Length 1 inch $7\frac{3}{4}$ lines; breadth 1 inch 1 line.

It may not be out of place to mention that I was among the first who discovered the nest and egg of this beautiful spotted Bower-bird, which was in October, 1877, while searching for specimens along a billabong of the River Darling, about three miles from the township of Wentworth. The nest was about 20 feet from the ground, near the top of a sapling in a thick belt of timber. The hen was sitting, and did not fly off until I had climbed within a few feet of her. I did not notice the male bird in the neighborhood. The nest was formed something like the common butcher-bird's (*Cracticus torquatus*), composed of small sticks, and lined with smaller twigs and grass.

Since then two nests, each containing three eggs, were taken near the same locality. The nests were placed a few feet from the ground in very thick prickly bushes, locally known as Needle bushes, but botanically as *Hakea.*

283. MIMETA VIRIDIS—(New South Wales Oriole). *Locality.*—Queensland, New South Wales, and Victoria. *Egg*—Ground-color, varies from a rich cream to a dull white or very light brown, minutely dotted and blotched with umber and blackish brown, and instances with faint lilac spots which appear beneath the surface, all over in some instances, but generally the spots are more numerous at the larger end, where they form an indistinct band; length 1 inch 4 lines; breadth, 11 lines.

285. MIMETA AFFINIS—*Locality*—North Australia and Queensland. *Egg*—Beautiful blueish white, sparingly spotted all over with deep umber brown and bluish grey; the latter color appears as if beneath the surface of the shell; length, 1 inch, $3\frac{3}{4}$ lines; breadth, 11 lines.

FAMILY—?

288. CORCORAX MELANORHAMPUS — (White-winged Corcorax). *Locality*—Australia, except North and West. *Egg*—Yellowish white, boldly blotched all over with olive and purplish brown, the latter tint appearing as if beneath the surface of the shell; length, $1\frac{1}{2}$ inches; breadth, 1 inch 1 line.

289. SRUTHIDEA CINEREA—(Grey Struthidea). *Locality*—New South Wales, North and South Australia. *Egg*—Color, white, sparingly blotched, principally at the larger end, with reddish brown, purplish grey and greenish grey; some of the blotches appearing as if they had been laid on with a soft brush; length, 1 inch 2 lines; breadth, 10 lines.

FAMILY—*Corvidæ.*

290. CORVUS AUSTRALIS—(White-eyed Crow). *Locality*—Australia and Tasmania. *Egg*—Very long form, and of a very pale green color, more or less spotted or smudged all over, but principally at the larger end, with umber brown; length, 1 inch 10 lines; breadth, 1 inch 3 lines.

—. CORVUS CORONOIDES—(Hazel-eyed Crow). *Locality*—Australia and Tasmania. * *Egg*—Beautiful pale green, freckled all over with dark olive or umber. Some specimens are heavily blotched with black; length, 1 inch 9 lines; breadth, 1 inch 3 lines.

Some ornithologists believe these crows to be one and the same species. The following is a memorandum I received from Mr. E. P. Ramsay on the subject:—"Re Crows, *Corvus coronoides* has *white* bases to feathers, *C. australis* base of feathers *dusky* or *blackish brown.*"

FAMILY—*Sturnidæ.*

291. CALORNIS METALLICA.—(Shining Calornis). *Locality*—North Australia. *Egg*—Blueish grey, speckled with reddish pink, chiefly at the larger end; some have scarcely any markings, others a few minute dots only; length, 1 inch; breadth, 9½ lines.

FAMILY—*Crateropodidæ* ?

292. POMATOSTOMUS TEMPORALIS—(Temporal Pomatorhinus). *Locality*—Australia, except West. *Egg*—Buffy-brown, clouded with dark-brown and purple, and streaked with hair-like lines of black, which generally have a tendency to run round the egg; in some instances, however, they take a diagonal direction, and give the surface a marble-like appearance; length, 1 inch 1 line; breadth, 9 lines.

293. POMATOSTOMUS RUBECULUS—(Red-breasted Pomatorhinus). *Locality*—North Australia. *Egg*—Clouded with light purplish grey, over which is streaked hair-like lines of dark brown, similar to those on the egg of *P. temporalis*; length, 1 inch 1¾ line; breadth, 8¾ lines.

294. POMATOSTOMUS SUPERCILIOSUS—(White eye-browed Pomatorhinus). *Locality*—Australia. *Egg*—Very like those of the same genus, the ground color being olive-grey, clouded with purplish brown, and streaked with similar hair-like lines of black; length, 11½ lines; breadth, 8 lines.

Notes of a recent Visit to the Sydney Museum.

By F. G. A. Barnard.

[Read before the Field Naturalists' Club of Victoria 15th January, 1883.]

At the last meeting of this Society I was persuaded to write a short paper on my recent visit to the Sydney Museum. Before entering on my subject you must allow me to account for any inaccuracies or omissions in my notes by the shortness of the time I had at my disposal while in Sydney. My absence from Melbourne amounted to only ten days, two of which were taken up by the overland journey. Two more days and a-half were absorbed by a short visit to the Blue Mountains and Zig-zag, so that what with visiting the numerous places of interest round Sydney, and the other public buildings, the time I spent in the Museum amounted, I suppose, to little over a couple of hours. I was the bearer of a letter of introduction to Mr. Ramsay, the Curator, and on my first visit had a glance round the whole building, but, being with some companions who did not care a bit for Natural History, I did not stay very long. I therefore arranged to spend the following Monday afternoon there; however I was doomed to disappointment, as, on going to the Museum on that day, I found that it is closed on Mondays and opened on Sundays instead. I was thus compelled to put off my second visit until the following afternoon, my last in Sydney, when my visit was necessarily hurried. Not having the slightest idea when there that I should be asked to write this paper, I did not take any notes about the building or contents, so have to trust entirely to memory for the following remarks:—The building, which is very conveniently situated, is remarkably plain outside, in fact it might almost be called ugly. The front part is two storeys high, whilst at the back, at right angles to the front, is a hall with a gallery. On entering, a fine cast of a skeleton of a Megatherium is seen, surrounded by skeletons of other extinct animals. Turning to the left is the skeleton of a whale, but not nearly so large as the one at our Museum. Next comes a collection of well-mounted sharks and other marine monsters, whilst other kinds of fish are preserved in spirits. This room also contains a part of the shell collection. The other side of the front building is occupied by the collection of reptiles, such as alligators, crocodiles, snakes, etc. Up-stairs the rooms are devoted to skeletons of birds, and birds' eggs on one side, and on the other side some geological specimens, and a beautiful collection of the smaller Australian birds well mounted in cases against the walls. The cases of birds' eggs are covered with oil-cloth, so as to prevent the light from causing their delicate colors to fade. I was particularly taken with some beautiful examples of agates and other ornamental stones in this room, and a cross cut out of rock-crystal seemed, if anything, clearer than the whitest glass.

The main hall is, I suppose, about 25ft. by 50ft. and is arranged as follows :—Down the centre is a double row of cases containing the entomological specimens ; on either side is a row of cases of geological specimens, and next, in cases against the walls, between the pillars supporting the gallery, is the collection of stuffed quadrupeds, etc. The gallery is, I think, devoted to birds, but I did not go upstairs, so cannot venture an opinion on its contents. Having so little time at my disposal I spent most of it in looking at the insects. The cases are very conveniently made for inspection or study by visitors, and their contents are protected from too much light by oilcloth covers similar to the birds' eggs. All the orders are represented in the collection of Australian insects, but the Coleoptera are the most numerous, and seemed to have been the most studied. They are arranged in the same order as in Masters' Catalogue, and, where possible, have their names affixed. I at once noticed the large *Onthopagus* we had taken during the Club excursion to the You Yangs a few days before, and as the specimen exhibited was marked as having been taken at Geelong, I presume it is rather local in its occurrence. The collection of Buprestidæ was not so numerous as I think it should be, and several Victorian ones were absent. Curculionidæ were of course numerous, but a great many of them were unnamed. Longicornes were also well represented. Coming to the Hemiptera I found the green and brown Cicadas regarded as distinct species, but the latter was unnamed. The Lepidoptera were not very numerous, but amongst them were some fine Hawk-moths from New South Wales and Queensland.

Among the Orthoptera were some fine specimens of Phasmidæ, some of which must have been fully twelve inches long, whilst other Orthoptera were of the most curious shapes. Of course the foreign insects were very fine, but a great many of them were familiar to me from specimens having been exhibited at our various meetings by Mr. French. Amongst the Lepidoptera I noticed specimens of the butterfly *Vanessa cardui*, or Kershawi, from four or five different parts of the world, and all apparently the same, except, of course, the well-known difference. I regret that being only a local collector, I am unable to particularise and describe any of the insects to you as rarities, but I dare say the Museum has its share of such objects. One case in this part of the building I was particularly pleased with : it contained a collection of sea-anemones modelled in wax, and coloured after nature, and seemed extremely life-like. As my museum notes are so short I will add a few words about the vegetation of New South Wales, which differs in many ways from that of Victoria. Round Sydney a few gum trees are still to be seen, but none of them equal in size to those in our Royal or Yarra Parks. A few miles out, on the Parramatta Railway, the line passes through a quantity of tall thin Eucalypts similar to those seen on our Gippsland line. A few miles up the

Parramatta River the banks are edged with the curious mangrove Trees half growing in the water. The vegetation on the ocean beaches is very different to Victoria. Several pretty shrubs were in flower while I was there. One had a brilliant scarlet bottle-brush flower; another, a heath-like plant, has beautiful flowers, half scarlet and half white. Ferns seemed more numerous near Sydney than Melbourne. I was rather surprised to find growing in the clefts of the rocks at the Heads at least half-a-dozen varieties. *Pteris incisa* was very common, and growing most luxuriantly, also a Doodia, a Gleichenia with a white underside to the fronds, a Todea, (I think), and several other smaller ferns. I brought home three or four plants, and will exhibit them at a future meeting of the Society. When visiting the cliffs at Bondi, I was very much surprised to come across a large quantity of the spines of a small Echinus on the rocks about 100 feet above the sea, and quite out of the way of persons visiting the place. I was very much disappointed in my visit to the Blue Mountains, so far as Natural History is concerned. I had hoped to have brought home some ferns from there, but was prevented from rambling about, as much as I wished, by wet weather. I came across a patch of Blechnums the same as our Victorian species, I think, which looked very pretty on account of the young red fronds; some specimens of *G. flabellata,* with their star-like fronds at least 18 inches or 2ft. across; also Lomarias, Todeas, etc.

Notes on Comets.

By John Tebbutt, F.R.A.S.

Mr. John Tebbut, F.R.A.S., of the private Observatory, Windsor, has kindly supplied us with the following notes:—

Comet III, 1874.—This brilliant comet will long be remembered, more particularly by observers in the northern hemisphere. It was discovered by M. Coggia, at Marseilles, April 17th of that year, and was last observed at Cordoba, in South America, on October 18th. The observations of this body were so numerous that no astronomer has ventured till now to take up the question of its definitive elements. This has at length been done by Dr. J. von Hepperger, of the University Observatory at Vienna. On the 13th July last that astronomer presented the results of his elaborate investigation to the Vienna Academy. It fully discusses all available observations. From the paper, a copy of which the author has kindly forwarded to the writer of these notes, it appears that the total number of positions obtained of the comet is 638; and of these, just 100 have been supplied by the observatories at Cordoba, Melbourne, and Windsor alone. The observations have been divided into 17 groups, for normal positions; and of the 17 normals thus derived, seven depend on the three southern observatories just referred to. Dr. Hepperger finds the most probable period to be 13,708 years, so that the distinction in this case between the parabola and the ellipse is small indeed.

Great Comet of 1882.—It will be in the recollection of some readers that the writer of these notes offered some rather remarkable opinions respecting this exceedingly interesting body in the *Sydney Morning Herald* in the month of Sept. last. The following editorial from the *Observatory*, of Nov. 1, which I am assured will be read with the deepest interest, will show that the opinions and facts then enunciated have been independently put forth by the most distinguished astronomers of the day. I may perhaps premise that the *Observatory* is one of our best semi-popular periodicals, edited by the present Astronomer Royal and Mr. Maunder, one of the permanent staff at Greenwich. It is very seldom that any discovery unites in itself so many and such important points of interest as has been the case with the great comet now engaging so much attention. The report of the discovery by M. Cruls of a new naked-eye comet was in itself enough to arouse a keen degree of interest; for as three such objects had already been observed within the last twelve months, that a fourth should follow in such quick succession was quite an unprecedented event. M. Cruls' discovery had scarcely been published in England before a yet more unusual observation was made. Mr. Common, of Ealing, who, ever since the accidental discovery of the comet Tewfik, during the total eclipse of May 16 last, had persistently examined the neighbourhood of the sun, with what might well have appeared to be the forlorn hope of detecting some comet wandering there, was at length rewarded, on Sunday, September 17th, by the sight of a splendid comet close to the sun, and of which he obtained the following observations:—

H.M.		Value.
10.45 a.m.	Found bright comet S.W. sun	3
10.59 a.m.	Comet precedes sun 6m. 50s. centre to centre	
11.10 a.m.	Comet south sun's limb, 20r. 50d.=18′ 8″	
11.47 a.m.	Comet precedes sun 5m. 48s.	1
11.58 a.m.	Comet south sun's limb, 16r. 60d.—14′ 41″	
12. 0 a.m.	Comet precedes sun 5m. 44s. (good)	3
12. 6 a.m.	Comet south sun's limb, 15r. 55d.=13′ 45″	

The comet was thus evidently approaching the sun; but clouds prevented Mr. Common from being able to follow it up to the limb. The next day Mr. Common looked for it again, but was not able to find it; and a cloudy season set in, which has effectually prevented English astronomers from taking much part in any subsequent observations. In the extreme south of Europe more favourable conditions prevailed, and the comet was seen on

September 18th at a large number of places in Italy, Spain, and Algeria, in full daylight, when only 4° from the sun. And, indeed, Mr. Common was not the only person who was fortunate to see it on September 17, before perihelion; for a despatch from Reus, near Yarragona, announced that there the inhabitants were astonished to see a comet close to the sun, so that, though only 1·5 distant from it, it was bright enough to catch the eye of casual gazers. Indeed it was so bright that it could be seen through light clouds. Its tail could readily be detected by means of an opera glass furnished with a dark glass. On the following day, however, M. Thollon, at Nice, was able to detect some portion of the tail without even this assistance, for he says:—"The coma and part of the tail visible to the naked eye were nearly 20° in length. Their outer contour took the shape of a half-ellipse of eccentricity about 4; and the fairly large and very brilliant nucleus occupied a position intermediate between the apex and the focus." The same cloud bank which baffled English observers on this and the following days covered the north of France likewise; and in despair of its breaking up, M. de Fonvielle resolved to rise above it, and on Friday, September 22, prepared for a balloon ascent. Fearing, however, that his own sight was not sufficiently good, he resigned his place in the car to M. Maurice Mallet, whom he duly instructed as to the observations to be obtained. The small dimensions of the car greatly hampered the adventurous astronomer, who, however, succeeded in making a sketch, and in obtaining a rough estimation of the distance from the sun and position-angle of the comet. The cloudy weather rendered it difficult to obtain sufficient observations to form an orbit; but Mr. S. C. Chandler, jun., of Harvard College, at length succeeded in deducing approximate elements, which showed a remarkable resemblance to those of comet 1, 1880, and 1, 1843:—Per. pass. 1882, September 17, 38 G. M. T.; long. of perihelion, 60° 45′; long. node, 342° 29′; inclination, 140° 17′; log q. 7.54407;—mean equinox, 1882.0.

The resemblance of the orbit of the great comet of 1880 to that of the still finer one of 1843 had attracted the earnest attention of astronomers at the time, and most had been led to consider them one and the same body. And now the appearance of a third magnificent object on the same, or nearly the same, track revived the discussion which took place in 1880. Then three leading theories had been started. The first, of least probability and but little received, saw in the comet of 1843 a return of the comet of 1668, and supposing the comet of 1702 to have been another return of the same object, considered that we had here a comet with a period of about 35 years, which had been apparently slowly increased to one of 37 years. But this theory rested on but very slender foundations; and, if true, it is obvious that our present visitor can claim no identity with his predecessors in the same path. Professor Weiss, of Vienna, holding a somewhat similar view, ascribed to the comet a constant period of about 37 years, and identified it with those of 1106, 1179, 1363, 1511, and 1695, but not with that of 1668. A second theory suggested that the comets of 1843 and 1880 might now be independent comets travelling on the same track, the original parent comet having suffered disruption at some much earlier visit, and the fragments having become so widely separated that an interval of 37 years now takes place between their perihelion passages. In any cases, it was felt that the hypothesis that so brilliant an object could have frequently returned without any observation having been made of it was quite incredible. A third and more popular theory regarded, indeed, the comets of 1668, 1843, and 1880, as one and the same object; but supposed that its period was gradually being shortened through the resistance experienced by the comet whilst passing through the solar atmosphere at perihelion. M. Meyer went further back, and regarded Aristotle's comet, B.C. 371, as the next earlier appearance to that of 1668. This theory seemed to receive strong confirmation by the apparition of the present comet, and further information seemed to lend it greater force. The great comet, which had borne the names of Thollon, Common, and Cruls, who had each in turn discovered it independently, now proved to have been still earlier discovered by Mr. Finlay, first assistant at the Cape Observatory, who remarked it at 5 o'clock in the morning of September 8, and who obtained the following place for it on the following day: Cape mean time, September 8, 17h. 23m. 58s.; R.A., 144° 59′ 51·4″; Decl., 45′ 30·0″. Mr. Finlay had been more fortunate than the subsequent discoverers, not only in thus anticipating them by several days, but in being able to retain his hold on the comet right up to its conjunction with the sun: and Mr. Gill was able to inform the Astronomer Royal that "on Sunday, September 17, the comet was followed by two observers with separate instruments right up to the sun's limb, where it suddenly disappeared at 5h. 50m. 58s. Cape mean time." This observation is wholly unprecedented in the history of astronomy, and proved most valuable, as showing how exceedingly unsubstantial the comet was, for its brilliancy could not, as some have supposed, account for the disappearance. Had it been so bright as to become invisible, neither bright nor dark, in the centre of the disc, it would have appeared as a bright object when seen against the comparatively dull background of the regions near the limb. Had it harmonised with the degree of splendour of the limb it would have looked dark on the disc. There was not, therefore, enough solid matter, or that matter was not sufficiently aggregated for it to appear as a spot or a cloud, bright or dark, whilst in transit. Mr. Hind had meanwhile computed an orbit, given in "Nature" from three excellent observations obtained at Coimbra on September 18, 19, 20, or just after perihelion, but this orbit did not satisfy Mr. Common's observations made just before. A little later Mr Hind, using the observation made on September 18, at Dun-Echt and Coimbra, another made on September 21, at the United States Naval Observatory, Washington, and one made on October 2, at the Collegio Romano, Rome, obtained more satisfactory elements, which compare as follows with those of Mr. Tebbutt obtained for the 1880 comet, and those of Professor Plantamour for the comet of 1843 :—

——	Comet 1843.	Comet 1880.	Comet 1882.	—
Per. Passage ...	...	..	Sept. 17, .2169	
Long. Perihelion	278° 18′ 3.0″	277° 22′ 58·4″	276° 14′ 66″	App. Eq. Sept. 25.
Long. Node ...	0 51 4·1	358 22 48·6	346 6 58	
Inclination ...	35 45 39·0	36 41 41·9	37 58 59	
Per. distance ...	0·005807	0·0067243	0.0080656	
Motion	Retrograde	Retrograde	Retrograde	

Sun's radius, 0·004664 (Sun's mean distance=1.

But this orbit would give the comet's distance from the centre of the Sun at the time of Dr. Gill's remarkable observation on September 17 as only 10′·9; that is to say, it should have been far on the disc, and fully 5′· from the limb at the time when it was actually seen to be only just entering the limb. Mr. Hind cannot think this discrepancy due to faults in the elements, for they represent the middle position within 1′·; and the first observation was taken only 20 hours after the one at the Cape, with which the elements are in so little accord. There is, therefore, strong reason to believe that the comet's speed received considerable alteration whilst in the immediate neighbourhood of the sun, and Mr. Hind suggests the probability of its return in October, 1883. Mr. Chandler, using the above-mentioned Dun-Echt observation with one made at Washington, September 23, and Cambridge, U.S., September 30, found that a parabolic orbit gave considerable deviations in the middle place, and deduced, therefore, the following elliptic elements. The elliptic elements obtained by Professor Plantamour for the comet of 1843, and by M. Meyer for that of 1880, are given for comparison :—

——	Comet 1843.	Comet 1880.	Comet 1882.
Per. Passage	......	......	Sept. 17. .1980,G M.T
Long. Node	355° 46′ 48.4″	356° 16′ 43.2″	346° 51′ 58″
Long. Per.	77 43 57·9	77 53 55.9	71 39 3
Inclination	143 1 31.2	143 7 46.8	142 35 51
Mean Eq.	1880.0	1880.0	1882.0
Long. Per. Dist. ...	7.8394780	7.7720095	7.943316
Eccentricity	0.999117	0.999467	0.997878
Major Axis	7.82165	11.08690	4.17535
Period	21.875 years	36.91 years	8.532 years

A comparison of the orbit with whatever observations were available seemed to Mr. Chandler to confirm the periodical nature of the comet, although further observations will be necessary to fix the period with precision. The physical appearance of the comet, which, like that of 1843, and unlike that of 1880, showed at first a decided nucleus, together with the above intimation of a period very considerably greater than that of the interval from 1880, January 27, the date of perihelion of the 1880 comet, suggests that perhaps the 1843 comet suffered disintegration when at its nearest approach, and that the 1880 comet was a portion of its less condensed material, whilst the body of the comet, with the principal nucleus suffering less retardation than the separated part, has taken two and a-half years longer to perform a revolution. The remarkable discovery made by Professor Schmidt, of Athens, on October 8, of a second comet, only 4· south-west of the great comet, and having the same motion, would seem rather to confirm this view. The spectroscopic observations of the comet have only been less interesting than the questions of its orbit and identity. M. Thollon, who examined its spectrum on September 18 with a Steinheil spectroscope, having one prism of 60° of dense flint, in conjunction with a horizontal telescope of 9 inches aperture, into which the light of the comet was reflected by means of a siderostat, gives the following description of it:—"Although working in full daylight, the spectrum of the comet was very bright; its leading characteristic was the presence of the bright lines of sodium. We at once saw in the field of the instrument a tolerably distinct spectrum, due to the scattered light of our atmosphere in which the dark Fraunhofer lines could be distinguished. Upon the background of this spectrum a narrow and much more brilliant continuous spectrum, given by the nucleus of the comet, was seen clearly detached. From the height of the spectrum we estimated the apparent diameter of the nucleus as about 15". This spectrum stretched very far into the violet. The bright lines of sodium D_1 and D_2 were given at the same time, both by the nucleus and by the neighbouring regions. From their length we estimated the apparent diameter of the part of the comet, which displayed them at 1′·5. They were neither diffused nor broadened, but narrow and perfectly separated, and exceedingly bright, especially in the spectrum of the nucleus. They were nearly of the same brilliancy, however; the most refrangible seemed a little the brighter, and they were, in short, exactly like the lines given by a flame moderately charged with sodium, both in brightness and in their essential characteristics. Of their identity there can be no doubt, for, besides the characteristics which we have just pointed out, we compared their positions with those of the Fraunhofer lines D_1 and D_2, given by the spectrum of the diffused daylight. We ascertained that the bright lines of the comet were not exactly superposed on the Fraunhofer lines, but were both displaced towards the red by a very small amount, the same in each case, equal, perhaps, to one-fourth or one-fifth of the interval between D_1 and D_2. We therefore concluded that the comet was travelling away from the Earth at that moment. We intended to measure this displacement the next day, and prepared a more powerful spectroscope for this purpose; but the state of the sky did not give us the opportunity. No part of the comet showed us the bands of carbon, nor any band or line other than those of sodium, perhaps on account of the diffused light, which would be able to mask bands of small brilliancy. The singular analogy between the spectrum of this comet and that of comet Wells, observed some months ago, will doubtless appear the most remarkable, as preceding comets have never shown the lines of sodium." But as the comet has receded from the Sun the ordinary cometary hydrocarbon bands have made their appearance, and the ordinary yellow, green, and blue bands had become very conspicuous on October 1, whilst the sodium lines were very much fainter. M. Ricco, at Palermo, observing up to October 11, found the spectrum at the tail perfectly continuous, and could trace it right to the end. The three hydro-carbon bands were only given by the nucleus and a region of some 5′ radius around it. These changes in the spectrum, as the comet recedes from perihelion, combined with the reverse changes witnessed in that of comet Wells as it approached it, seem to render it not unlikely that sodium would appear in the spectrum of any comet which should approach the sun sufficiently nearly; that it is, in fact, an indication of excessively high temperature, as the hydro-carbon bands are of one not quite so great. An intermediate spectrum, of which no definite details have yet been supplied, seems to have been observed at Dun Echt and elsewhere. M. Ricco speaks of having seen many lines up to September 27—a band in the red, a line in the yellow near and after D1, two others in the green, and an enlargement of the continuous spectrum in the green and blue—but was able to make no measures. Had determinations of the positions of these lines been possible, we might have had much very interesting information. The tail of the comet has throughout resembled that of the 1843 comet, in being nearly straight and very brilliant. M. Cruls represents it as being about 30° long about ten days after perihelion. M. Ricco gives its breadth as varying on different days from 1° 48′ to 2° 28.′ The southern edge has appeared stronger and brighter than the northern, sometimes remarkably so; and though nearly straight, it is slightly convex towards the south. The nucleus, circular at first, has shown a strong tendency to lengthen; and M. Ricco has observed it as double. Astronomers will continue to seize on every possible opportunity of watching this most remarkable and interesting object as long as it remains within our view, even without the stimulus afforded by the expectation of seeing it plunge into the sun, as it has been confidently prophesied it will shortly do. If it should turn out, as here suggested, that the present is but its second return, in modern times at least, we may have to wait longer for the final catastrophe than is perhaps generally expected; and the present behaviour of the comet would perhaps seem to indicate that its fate will be accomplished rather by a gradual disintegration than by a sudden headlong plunge into the solar orb.

Barnard's Comet, 1882.—Owing to its increased distance from the sun and earth, and its very low altitude, this comet has been observed only twice at Windsor, namely, on the 2nd and 8th instant. The two positions then obtained, although liable to considerable uncertainty from the comet's faintness, are sufficiently accurate to afford a considerable correction to the elements calculated by Herr Karl Zelbr.

PROCEEDINGS OF SOCIETIES.

THE ROYAL SOCIETY OF VICTORIA.

There was no meeting of this Society in January. We, however, give a report of the annual Conversazione, held in October last, together with the President's address, as follows:—

The annual *conversazione* of the Royal Society was held in the rooms of that body, Victoria-street, on Friday, 27th of October. As on previous occasions, there was a large attendance of members and friends, the rooms of the Society being thronged throughout. The *conversazione* was protracted beyond the usual hour, owing to the number and variety of the contributions offered. The exhibits of scientific collections and apparatus were hardly up to the standard of previous years, the council having experienced considerable difficulty in obtaining fresh contributions from the field of science. The Australian Electric Light Company furnished a number of interesting exhibits, prominent amongst which was a beautifully-finished screwmaking machine, made by Messrs. Brown and Sharp, combining a number of the latest mechanical improvements. The same company also displayed a number of the Swan Incandescent Lights, adapted for greenhouse and conservatory purposes, in a pavilion fitted up outside the main hall. The lights were dispersed amongst groups and banks of ferns artistically arranged, and presented a charming appearance. The Harbour Trust exhibited a complete set of the Fleuss diving apparatus, and Messrs. Foster and Martin contributed a number of photographs of the comet, taken early in the present month. Mr. D. Anderson exhibited a contrivance for altering the gauge of wheels on railways and other permanent ways. A number of recent additions to the Technological Museum, consisting of mineralogical specimens, were shown in cabinets, and in an adjoining room Mr. J. F. Bailey, of Swanston-street, exhibited a highly interesting conchological collection, numbering 575 specimens, of the genus cypræa. In the upstair rooms Mr. Goldstein exhibited, through a fine Crouch's "Premier" binocular microscope, several objects of natural history. Mr. E. W. Howitt, hon. secretary of the Society, and Mr. Rudall, also contributed to the entertainment and instruction of visitors by microscopical exhibitions of crystals and rock sections respectively.

At 8 o'clock, the President, Mr. R. L. J, Ellery, read the following

ANNUAL ADDRESS.

"Somewhat more than a year has elapsed since I had last the honour and pleasure of addressing you at a similar meeting. In March last our Society entered upon its twenty-fourth session, which, so far, has been a busy one, and our meetings have all been fully occupied with interesting and important contributions. The affairs of the Society generally are in a satisfactory condition. Our member-roll is steadily increasing, our relations with kindred societies abroad are expanding year by year, the publications of our transactions are almost up to date, and our financial position, although not by any means inflated, is, on the whole, satisfactory. As we have from time to time expended considerable sums of money in building and improvements to our House, your council deemed it desirable to obtain the grant of the land on which it stands from the Government; for you doubtless know the land has hitherto been only permanently reserved for Royal Society purposes, and vested in trustees. Application for the grant has been duly made to the Government, and I believe its issue has been approved, and only now awaits the usual formalities. I am sorry to say that the council has not yet been able to arrange for a series of lectures in each session on subjects of special scientific interest, as was in contemplation, but, nevertheless, I have reason to believe that the proposition will be carried into effect in our next session, if not earlier. In addressing you on occasions similar to the present for many years past, I have usually brought under your notice the most noteworthy facts in connexion with the year's history and progress of our several science or art departments, and of kindred societies in the colony. Not desiring to depart from this time-honoured custom, and at the same time not to weary you with a long address, I refrain from any detailed reference to the affairs of the Society, the most important of which I have no doubt are familiar to you all. Our members will be pleased to know that kindred societies in Melbourne are all flourishing, and actively engaged in contributing to the general stock of knowledge in their particular directions. The Medical Society and the Melbourne branch of the British Medical Association, which now extends its functions all over the British dominions, show by the results of their meetings and their transactions that nothing tending to progress of skill and knowledge in the sciences of medicine or surgery is neglected or overlooked by their members. The Microscopical Society continues to fulfil its functions admirably under its able and veteran president, and has done immense good in spreading a sound knowledge of the use of the microscope, and in investigating the Australian forms of minute animal and vegetable life. The good influence of the Pharmaceutical Society and its administration of the Pharmacy Bill is beginning to be felt in our community already, and the efforts of the board and the society to secure a thorough and scientific training for all who are engaged in the sale and dispensing of medicines, drugs, &c., will, I am sure, be recommended on all sides. Looking generally to the progress in our midst of those branches of knowledge which come more immediately within the province of this Society, our members must have noted a growing desire in the community to become more familiar with the sciences and with the arts. New societies and schools have sprung up, and are flourishing, not only in Melbourne, but also in the country towns. The older societies are expanding, and the working classes are evincing a genuine and earnest desire to obtain the teachings of science as aids to their handicrafts. At our last meeting I spoke of the establishment of a Field Naturalists' Club in Melbourne. This continues to thrive and offers the means, not only of acquiring knowledge in the natural history of our colony, but also of most pleasurable recreation to those members who can join in the periodic excursions in search of specimens of the animal or vegetable kingdom. A new society has lately been started in Ballarat, under the name of "The Ballarat Field Club Science Society," which already contains about 80 members. Although this society is founded for the purpose of investigation and discussion in the natural sciences, it at present confines its attention chiefly to geological and mineralogical subjects. Lectures are delivered, papers read and discussed, and, like our Melbourne Field Naturalists' Club, excursions are periodically made to elucidate special physiographical points or for the collection of specimens. I hear also of a philological society having been formed in Ballarat. Affiliated to the Sandhurst School of Mines a "Science Society" was established some two years ago, of which our talented fellow-member Mr. P. H. MacGillivray, M.A., is President. This society is most effectually fostering study of the natural sciences in that part of the colony by essays, papers, and discussions at the monthly meetings. I am sure we all join in wishing success and good progress to these young societies. At the same time, I may venture to warn them, from my long experience in these matters, that it is only by earnest work and persistent effort on the part of the members that they will make any real progress. Our various training institutions furnish the elementary teaching and much of the most attractive and popular incentives to a little dive into the sciences, but these societies should constitute themselves the arenas for practically applying this teaching to the general advance of science in the community. As regards our public, scientific, and technical institutions, I am able to report satisfactory progress. The Government Botanist, our fellow-member, Baron von Mueller, has been busily engaged in elucidating the botany of Australia and adjacent regions, involving continuous and laborious work, for the most part literary. His valuable work on the eucalypts has advanced another stage, and 120 lithographic illustrations have now been completed. A considerable amount of further information and material from the interior regions of Australia will, however, be required before this great undertaking can be completed. The Baron is now engaged on another extensive work, a complete list of the "Vascular Plants of Australia," with literary, chronological, and geographical annotations, which it is expected will be completed by the end of the year. In this work there will be enumerated about 8,800 species, and it is intended to devote a second volume to the "Evasculares," containing about 4,000 species. The *Fragmenta Phytographiæ Australiæ* was brought to a close last year. Baron von Mueller's work on *Select Plants for Industrial Culture* has been published in German at Cassel, and I am informed arrangements are completed for publishing it in French, in Paris. Our museums are rapidly increasing, and yearly becoming more select and valuable; not only this, but for the last few years they have contributed very largely to museums, collections, and exhibitions in other parts of the world examples and specimens of the natural productions of Australia. The National Museum at the University continues an object of great attraction. All the collections are in excellent preservation, due largely to the freedom from dust enjoyed by the site in which the building is situated. Specimens stuffed over 20 years still appear fresh and in good preservation. There have been some important additions during the year, among which may be noted specimens illustrating the geology of New Guinea and the adjacent islands, Bleeker's famous collection of fish from the Netherlands India coasts, and a fine group of adult orangs to compare with the superb specimens of the gorilla formerly obtained. I am glad also to say that from our Technological and Industrial Museum at the Public Library will be furnished a large suite of specimens to aid in replacing the valuable collection lost by our neighbours in the late Garden

Palace fire. The classes and lectures at the school of technology continue to be well attended, and taking chemistry and metallurgy, engineering, mechanical drawing, and telegraphy, we find 142 students on the rolls. As a practical example of the value of this institution, and the soundness of the training given, I may mention that many of the advanced students have been enabled to take responsible positions in factories, mines, workshops, and public offices. Besides actual technical training, a great deal of valuable experimental work is carried on at this school. One interesting item I am able, from information given me by the director of the school (Mr. Newbery) to refer to. It has been found that the steel-wire rope used for the winding-gear in mines in some instances passes from a tough and safe to a brittle and unsafe stage in a few weeks—a most serious matter, considering the number of lives at stake and the great cost of the ropes. Mr. Newbery now attributes this to a physical change taking place in the steel through the action of the acidulated saline waters of the mine. The prevention Mr. Newbery suggests is to cover the ropes with a good coating of some elastic waterproof material, such as a mixture of grease and tar. Brittle ropes can be toughened by annealing, but as I believe steel rope is made with hempen core to each strand, this would necessarily be destroyed in the process, and probably render the rope less fit for use. Mr. Newbery also states, from results of experiments lately carried out, that wood-work in buildings, such as flooring, shelving, &c., can be rendered practically fireproof in a very economical way by treating it with a mixture of silicate and sulphate of soda in solution. The Botanic Gardens, under the curatorship of Mr. Guilfoyle, become more and more attractive every year, not only as a pleasurable resort, but also as a field for botanical study, where, by careful and scientific arrangement, the botanical student is given access to the vegetation of almost every part of the world, and, in many instances, under circumstances like those which surround the plants in their native habitat. In Ballarat and Sandhurst there have been established for many years "Schools of Mines," really technical colleges, where, by lectures and regular training, students are instructed in both scientific and technical subjects. Take, for instance, the School of Mines at Sandhurst, which has lately considerably extended its functions, and made most substantial progress under the direction of its registrar, Mr. Pitman. Mathematics, surveying, engineering, mechanics, drawing, free-hand drawing, chemistry, and laboratory practice, are all well taught at this school, free lectures are given in chemistry., students are drawn from all classes, and as a rule take excellent positions at the examinations in nearly all the subjects. The School of Mines, Ballarat, the oldest institution of the kind in the colony, has fulfilled most important functions in its district for many years past. It embraces in its lecture courses and practical teaching, practical and theoretical chemistry, geology, mineralogy, metallurgy, mining and mining engineering, and has also a school of telegraphy, and annual examinations are held in all the subjects. The school generally is well attended and popular, and is a most efficient institution. Our members will note with satisfaction that through the munificent offer of the Hon. Francis Ormond, the liberal contributions of the merchants and private individuals of Melbourne, and in no less a degree to the most commendable and earnest efforts of the working men themselves, the sum of £10,000 or over has been gathered for the erection and establishing a working men's college on a practical and liberal basis. Mr. Ormond offered £5,000 if another £5,000 could be collected. The working men collected over £3,000 chiefly among themselves, and the rest has been contributed by donations from others who sympathise with the object, and the Government have granted a very eligible site near the Supreme Court, facing the north side of the Public Library. Plans are now being prepared, and before very long the Working Men's College will be an accomplished fact in Melbourne. One of the most interesting items of the year in connexion with our Observatory is the apparition of three new comets, the last of which is the most remarkable that has appeared since 1843. The first appeared in September last year, and was called "Schaéberle's Comet;" the next appeared here in June this year, and is known as "Wells' Comet;" the present one, which is of unusual interest, is not yet named. It appears to have been first seen in Australia, on September 6th, by Captain Baker, an amateur observer at Goldsborough, who reported its appearance to me on the 8th. It was observed at all the Australian observatories on the 9th, and subsequently. At its first appearance it was of great brilliancy, but of no very great dimensions. It was already near the sun, and visible just before sunrise. It rapidly approached the sun, and increased in brilliancy so much that on the 17th of September it was visible to the naked eye at noon within 3deg. of the sun in a clear sky; it passed its perihelion passage on the morning of the 18th, and so close to the solar surface as to be within the region beyond which the great solar volcanoes of incandescent hydrogen are often seen to extend. The velocity of this body as it rushed half round the sun at this time must have been stupendous beyond conception, for, according to our most recent calculation, it must have made this journey in less than six hours. It increased in grandeur after perihelion, and for the last three weeks has been a magnificent spectacle in the morning sky. As it was thought not improbable that the comet of 1812 would again return to perihelion this year, and "searching ephemerides" had actually been prepared and distributed by some French astronomers (Paris Observatory), it was at first thought possible this might be that comet, but an approximate orbit computed by our vice-president, Mr. White, from some of the earliest observations of the present comet, made any further supposition of this kind altogether untenable. The approximate elements exhibit a remarkable likeness to the great comets of 1843 and 1880. The motions of all three are retrograde; the inclination and longitude of the node very similar, and the perihelion distance of all exceedingly small and nearly like. The apparitions of two large comets in 1880 and 1882, with elements so very much like that of the grand comet of 1843, have of course led to some astronomical speculation on the subject. If any celestial bodies appear successively in similar or nearly similar orbits a supposition that they are one and the same body, or several separate bodies in the same orbit, is quite reasonable. Mr. Tebbutt, our well-known astronomer, of Windsor, N. S. W., has therefore suggested it as quite possible that the comets of 1843, 1880, and 1882 are identical, returning to perihelion at rapidly diminishing periods, and that if this be so, its present excursion must be very short, barely taking it out of our sight before it turns back again towards the sun. One incentive to this suggestion was no doubt the fact that the perihelion distance of the rough orbit first computed was less than that of 1880, while that of 1880 was less than that of 1843. More recent calculations, however, show that the perihelion distance of this comet was greater than at first computed, and rather greater than that of 1880. Whether we can possibly entertain this hypothesis will soon be shown by the recession or the return of the comet. If it disappear for any considerable time, then we must conclude that there are two or more comets in the same orbit. Numerous critical examinations of the physical appearances of this body have been made, both with the great reflector and with the 8in. refractor at the Observatory, and a remarkable character of nucleus has been observed. On the 4th it was first seen to be of a very long oval shape, central in the head, and its long axis parallel with the general length of the tail. On the 6th October it was observed to be inclined by several degrees (5deg. at least) from this parallelism, and to have a very bright, round, and distinct planet-like spot in that part of the nucleus nearest the head of the comet. On the 10th this spot had moved nearer to the centre of the elongated oval nucleus. The closeness of the dawn, and subsequently strong moonlight, were much against spectroscopic observation of its light until the 8th October, when I made a careful examination of the nucleus and other parts of the comet. The spectrum I found to consist of a moderately bright continuous spectrum, crossed by three broad bright bands, the approximate wave lengths of whose centres were 5605, 5070, 4720, respectively. These bands were very bright in the nucleus itself, and could be well seen anywhere near the head of the comet, and traced faintly over a part of the tail for some distance from the head. In the spectrum of

Wells' comet of 1881 several observers saw the well-known D line due to sodium—as far as I know, a unique instance in the case of cometic spectra. I examined carefully for any indication of this line in the present comet, but could discover no trace. A series of observations for the determination of the solar parallax indirectly by Dr. Gallè's method has been made with the 8in. refractor. These observations consist in very elaborate measures of differences of declination between the small planets Victoria and Sappho and certain selected fixed stars near them, taken each night between July 18 and October 18. Similar observations have been arranged for in Europe, America, and at the Cape. A combination of the results will furnish means for computing the parallax of both these planetoids. The periodic times of these bodies being known with great exactitude, it follows, by Kepler's third law, that the solar parallax can thus be indirectly determined. The observations themselves have been carried out on a very elaborate and somewhat novel plan suggested by Mr. Gill, the astronomer at the Cape. The period of observation terminated last Wednesday. So far as Melbourne is concerned the series has not been very successful, owing to the prevalence of cloudy weather throughout the early part of the period. Nevertheless, I think a very valuable set of measures has been secured. The preparations for the transit of Venus, on December 6th, have lately been occupying our attention, and it is now decided that we shall have observing stations at Melbourne, at Sale (in Gippsland), and in or near Hobart. The last phases of the phenomenon occur just after the sun rises in this part of the world; we shall therefore see nothing of the earlier or intermediate phases. In Melbourne the sun will only have arisen about 13deg. above the horizon before the transit is over, and in Hobart only about 15deg. Nevertheless the contacts at egress, the last critical phase, should be well seen at any part of Eastern Australia. As this is the last transit of Venus that will occur for more than 120 years, of course the event is looked forward to with considerable interest. The various national observing parties are already on their road to the several observing points, and I have had the pleasure of seeing several of our English observers here within the last fortnight. One British party goes to Brisbane, another to New Zealand, and there will be an American observing party also in New Zealand. In conjunction with the transit of Venus operations, we are arranging with some of the British observers for the determination of the difference of longitude between Greenwich and the Australian cities, by telegraph. To do this, Lieutenant Darwin, a member of the Brisbane observing party, will, after the transit, proceed to Singapore; at the same time Australia sends an observer with transit instruments and chronometers to Port Darwin. These gentlemen, after setting up their transit instruments and taining correct local time, will commence exchanging a series of time signals between the two places, and thus determine the difference of longitude. The longitude of Singapore having already been determined telegraphically, that of Port Darwin will be found, and hence the longitude of Adelaide, Melbourne, Sydney, Brisbane, &c. A similar series of observations will be made in New Zealand by either the English or American party through the cable to Sydney. We shall, therefore, have the longitudes of all these places from Greenwich ascertained by the most correct and precise method available. The observer for Port Darwin is now training for the work at our Observatory. Our chain of intercolonial meteorology is now almost complete. Western Australia, Tasmania, and Queensland have practically joined in the work, and our daily weather telegrams now cover the coast line of Australia from Geraldtown, north of Perth, in Western Australia, to nearly Cape York; a line across Australia, from Adelaide to Port Darwin; the north and south parts of Tasmania; and New Zealand generally. The consequence is, we are slowly and gradually increasing our knowledge of Australian meteorology, and of the laws which govern the movement of storms along our coast-lines, and the distribution of rainfall over the various climatic regions of the continent. The last few years have forcibly demonstrated the importance of this latter meteorological factor to Australia, and more especially to the southern and central regions. A better knowledge of the laws of deposition of rain, should such exist, would be of incalculable value, as it would show more or less precisely our "assets and liabilities" in moisture. No amount of knowledge will alter the rainfall, but it will show us how far we have to "save up," how much of the water that does fall and now runs into the sea or soaks in the ground must be saved to meet urgent wants. Whether our natural supply will be found sufficient for the purposes of irrigation, except to a very limited extent in certain districts, must, in view of recent discussions on the subject at our meetings, be considered very doubtful, as must also the question of the economics of irrigation in the colony, where the cost of labour is comparatively so high as in Australia generally. A mere glance at the rainfall tables for any month shows us that the greatest precipitation takes place at our highest altitudes; our great coast-range is the gathering ground of rain-producing clouds, and it is the fall on the tops of our mountains and ranges that keeps our creeks and rivers running, by slowly delivering their stored-up water through numerous and often perennial springs. Wherever destruction of the forest has occurred on the ranges, these springs have all seriously diminished, and in very many instances ceased altogether, lessening the annual flow in the chief arteries of the country. Therefore the reckless denuding of our higher forests is absolutely robbing the country of water. Should this destruction continue, a seriously-diminished flow of our rivers, dry creeks, and scarcity of water over formerly well-watered districts will become inevitable. Time will scarcely permit of referring to numerous subjects which mark the year's progress in science generally. There are, nevertheless, one or two matters, which are of somewhat more than passing interest, which may justly claim our attention for a few moments. It has been estimated that about one-seventh of the human race die of tubercular disease, or consumption, as it is called, and further, that of the deaths in middle life fully one-third are caused by this fatal disease. This dreadful scourge has gone on, and still goes on, unhindered, at least to any marked extent, by any human effort, backed up by all the advanced medical science of the day. By hygienic precautions and a more profound knowledge of the disease, there is little doubt that of late years it has been in some small degree more successfully opposed; nevertheless, those who know most of it cannot but acknowledge our comparative helplessness in the face of this enemy. But knowledge is strength. Consumption is now admitted on all hands to be contagious. For the last 20 years the contagiousness or infectiousness of this disease has been suspected, and various experimenters have more or less satisfactorily demonstrated its high probability. Creighton, Burdon-Sanderson, Giboux, Martin, and more recently Klebs, Cohnheim, and others, advanced still another step in the same direction, but it has remained for Professor Koch, of Breslau, now chief of the Imperial Medical Department of Berlin, to demonstrate it as a germ disease, transmissible by inoculation, and that its contagiousness is due to a form of bacillus, one of those low orders of germs which appear to be at the bottom of many diseases to which the human, as well as other animals, are prone. Now, assuming this to be the case, such knowledge gives great strength, for the modes of resisting contagion offer at once a prospect of, in some degree, stemming the onward course of this destroyer. And again if it should be further shown, as we may reasonably hope, that, being a contagious germ disease, it is not a hereditary one, then we may cheerfully anticipate that science will find effective weapons to check the spread of this fatal disease. Speaking of this brings to my memory a brochure published six years ago (1876) by Mr. William Thomson, of South Yarra, entitled, "Histo-Chemistry and Pathogeny of Tubercle," which I referred to in a former address. In this pamphlet he discusses at length the pathogeny of tubercle, and gives his reasons for concluding it to be a purely germ disease. On page 27 he says, "The idea of micrococci being in any way associated with the process of tuberculosis is a recent one; and the explanation of their mode of operation is, at least as far as I am aware, now for the first time in the history of pathology attempted, with what degree of success remains to be seen."

What has now been demonstrated by Koch was undoubtedly indicated as of the highest probability in Thomson's pamphlet of 1876, and reiterated at greater length, and with fuller illustrations, in another pamphlet in 1879, and afterwards by Cohnheim in his work on the Contagiousness of Tubercle, published in 1880, who says, we must look forward to the day when the 'tubercle corpuscle' shall have been discovered in the form of a minute organism." The immense strides made in the applications of electricity to lighting and other economic purposes during the past year is a subject worthy of note and for congratulation. Not so very long ago, I stated that I believed the time when electricity would supersede gas for internal illumination was far distant. I must now recant—the time is here. Electricity has replaced gas in several interiors in Melbourne, and, so far as can yet be seen, with great success. At the Opera House it is pronounced by all a great success and decided improvement; it produces less heat and less headache. Several public places in Melbourne are lit by electricity, and many establishments are about to adopt it. It has been applied to the illumination of the extensive workings of the Ellenborough mine, at Sandhurst. The Harbor Trust Commissioners have adopted it with great success for carrying on their dredging operations at night, and the trustees of the Public Library have decided to light up the library and reading-room with the incandescent electric lamps. This last instance is one in which the new mode of lighting is peculiarly well adapted, inasmuch as the reading-room in the summer months gets intolerably heated with the gas, and the products of combustion slowly but surely destroy the bindings of the books. It is the small amount of heat developed, and, above all, the entire absence of the deleterious products of the combustion of gas, that constitutes its great recommendation. I doubt if electric light by the incandescent lamp method will be as cheap as gas; still the advantages referred to are, I think, worth a larger difference than will probably exist. The arc light, of course, is far the most economical, but it is only well adapted for out-of-door lighting or for very large interiors. The future of electricity as an illuminant, a transferer of mechanical power, or as an agent in metallurgical operations, can scarcely be foretold, but already it is shown to be economical and eminently effective in all these directions, and is now used both in England and Germany for depositing metals from their solutions, and refining copper and other metals. Dr. Siemens, in his address to the British Association in August, stated that as a transmitter for farm work he can, "after two years experience, speak with confidence of its economy and efficiency." Dr. Siemens also mentions an interesting fact concerning the influence of electric light on vegetation. He had wheat, barley, and oats planted, some of which was submitted to the influence of the electric arc light of 4,000 candles placed about 20ft. above the surface of the ground. No difference was observed till mild weather set in after the end of February, when those cereals over which the electric light shone developed so rapidly, that by the "end of May they stood 4ft. and in full bloom, while the others stood 2ft. high, and showed no sign of the ear." For all the advance of electric lighting, I still believe that "gas" will remain in the ascendant, not altogether as an illuminant, but certainly as a fuel. Already it is extensively used as fuel for steam-engines in town, not only for safety and cleanliness, but also for economy; and as time goes on its use in this direction will, I feel sure, greatly increase, and it is to be devoutly desired that it should do so, for not the least good practical result from its universal adoption would be having only one, or at least a few, smoke-producing centres instead of a legion. Hygiene and æsthetics should both clamour for this. Gas, moreover, is fast asserting itself as a fuel for our cooking stoves and kitchens, and although there is still a lurking prejudice against gas-cooked food in some quarters, the exhaustive trials at the Glasgow Gas Fuel Exhibition show conclusively that a properly-constructed and ventilated gas-stove will cook food better, and freer from foreign and undesirable products, than nine-tenths of the coal-cooking ranges. As an economical, easily transmitted, and safe fuel, gas has, I think, its greatest future before it. There is another point, however, which is worthy of note. It has been shown by Dr. Tyndall that coal-gas burnt with intensified currents of air, heated by passing over metal surfaces kept at a high temperature by a special and separate burner, can be so increased in illuminating power as to rival the electric arc. Therefore, though gas and electricity are destined to be rivals, the rivalry will spur on to improvement and achievement redounding to the public advantage, and, as a consequence, the prosperity of the several companies. In conclusion, I would refer to one scientific fact of the year, of great importance, namely, the Arctic Expeditions which have been fitted out by the various European States for concerted and extensive investigations in terrestrial magnetism, auroras, polar meteorology, natural history, and cognate physical science near both poles. There will be 11 or 12 stations surrounding the North Polar regions—one as far north as Franklin Bay, in latitude about 84deg. north. These expeditions will be fitted out by various European Governments. In the south the Germans establish a point at South Georgia Island, the French a station at Cape Horn, and the Italians a station in Patagonia, and so on. These, in connexion with our fixed meteorological station in Melbourne, it is hoped, will furnish a complete and effective chain of observation over the period arranged for the work, namely, from September 1, 1882, to September 1, 1883. It was first hoped by the German Polar Commission that the Australian colonies would probably co-operate by forming serving stations more southerly than Melbourne, but as the intimation of the desirability of such a step reached here too late to take action with any prospect of a practical result, the idea has been abandoned, and the co-operation of the Melbourne Observatory only, in this part of the southern hemisphere, can now possibly be given.

The President was frequently applauded during the delivery of his address, which was received throughout with marked favour. Subsequently Dr. Jamieson read an interesting paper on disease germs, illustrated by diagrams. Mr. Kernot contributed a short lecture on "The Electrical Transmission of Power," in which he advocated the utilisation of river and tidal forces in connexion with the supply of electricity. Mr. Kernot's lecture was very interesting, and his remarks on the storage of electricity were warmly received. Professor Andrew delivered a lecture, in the course of which he explained the history of Foucault's pendulum, generally accepted as the best demonstration of the rotation of the earth. The pendulum experiment was made for the first time in Melbourne, after which the lecturer exhibited Sir William Thomson's method of lowering the melting-point of ice—an experiment which proved highly interesting.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

The first ordinary meeting of members, this year, was held, as usual, at the Royal Society's Hall, Mr. H. Watts presiding; and, although the weather was most unpleasantly warm, there was a good attendance.

A further continuation of his paper on Victorian Parrots was read by Mr. T. A. F. Leith, who interspersed it with many amusing anecdotes of the habits and customs of the species described: these comprised the Chestnut-shouldered Parrakeet, Blue-banded Parrakeet (*Euphema venusta*), Elegant Grass Parrakeet (*E. elegans*), Orange-bellied Grass Parrakeet (*E. auranthea*), Warbling Grass Parrakeet or Love-bird (*Melopsittacus undulatus*), and Ground or Swamp Parrakeet (*Pezoporus formosus*).

Mr. F. G. Barnard gave a short account of a hurried visit to the Sydney Museum, in which he mentioned in high terms the arrangements for exhibiting specimens, and also the facility with which all information is obtained.

Mr. C. French and Mr. D. Best furnished a report of the Club Excursion to the You Yangs on Cup Day (31st October), which included a list of the Coleopterous Insects and Plants to be found in that locality.

The general exhibits comprised recent collections of Hydrozoa, Bryozoa, and Algæ, from Griffiths Point, by Mr. H Watts; 60

species of exotic Longicorn Beetles, including four species of *Lagocheirus* from Chontales, Central America, by Mr. C. French; three Fossil fishes, from Devonian strata, by Mr. T. Worcester; 41 species of Coleoptera and of Lepidoptera, collected since last meeting by Mr. J. E. Dixon; Coleoptera from Trentham, by Mr. A. O. Sayce; Lepidoptera of the month, by Mr. F. Spry and Mr. H. Henderson; and by Mr. J. F. Bailey, rare Fossils from upper Miocene beds, Cheltenham, viz., *Cypræa eximia* (Sowerby), *Cypræa*, new sp., and *Voluta ante scalaris*; also, from upper Eocene beds at Mount Martha, five specimens of *Voluta Hannafordi* (McCoy) and *Harpa* sp., undescribed.

After a pleasant conversazione the meeting separated.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The ordinary monthly meeting of the Microscopical Society of Victoria was held on Thursday, 25th of January, at the rooms in Collins-street. There was a good attendance of members, and Dr. Ralph, the President, occupied the chair for the first time since his return from Europe.

The Secretary acknowledged receipt of the *Quarterly Journal of Microscopical Science* for October, the *American Monthly Microscopical Journal* for September and October, the *Report of the Mining Surveyors and Registrars* for the quarter ending 30th September, *The Fish and Fisheries of New South Wales*, the *Journal de Micrographie* for October, the *Annales de la Société Belge de Microscopie*, Tome VI (1880), and Mr. W. P. Collins' catalogue of microscopical and general scientific works."

The President then gave an interesting account of his visits to the principal Microscopical and other scientific societies in England, particularly the Royal Microscopical Society, the Quekett Club, the Linnean Society, and the Postal Microscopical Society. He also exhibited a number of recently-introduced microscopical accessories, as well as some interesting objects. Among the former were Steinheil's solid eye-pieces, which are constructed for telescopic purposes, but which, applied to the microscope, have been found to give better results than other eye-pieces of the same powers; Wenham's semi-disk illuminator, a small half-disk of polished glass, which is attached with a drop of glycerine to the under surface of the slide, the convex edge downwards, giving an illumination most effective in the resolution of diatom striæ; and simple forms of growing-slide, life-slide, tadpole-slide, and compressorium. Among the objects exhibited were Trichinæ in the flesh of a rabbit, the Bacilli of splenic fever, and some specimens of Thymol, a camphor-like substance obtained from plants of the Labiate order. This material presents, under the polariscope, an appearance not unlike that of some rock-sections, and its crystallization is peculiar and interesting, the newly-forming crystals shooting across the dark field, in square chisel-like points. The President also exhibited his new microscope by Ross, a beautiful instrument made on the latest design, and mounted on upright pillars to allow of the free use of the swinging sub-stage, also objectives by Ross and Zeiss.

The Society's Library was increased by the addition of Brook's "Handbook of Invertebrate Zoology," Bolton's "Portfolios of Microscopical Drawings," and a number of catalogues of optical instruments, mineral specimens, scientific works, etc., presented by Dr. Ralph, and the "Journal of the Postal Microscopical Society," and several parts of the "Journal of the Quekett Club," received through the same gentleman from the respective societies.

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 31st January, the President, C. S. Wilkinson, F.G.S. &c., in the Chair.

The following gentlemen were elected members of the Society: H. B. Guppy, M.B., R.N., Surgeon, H.M.S. "Lark," Sydney; Mr. Matthew, R.N., H.M.S. "Espiegle," Sydney; Dr. Smith, Brisbane, Queensland; Theodore Wood, Esq., Virginia, Maryborough, Queensland; Allison S. L. Wells, Esq., Maryborough, Queensland; W. H. Archer, Esq.

The receipt of a number of donations was announced.

The following papers were read :—

1. "On a new form of Mullet from new Guinea." By William Macleay, F.L.S., &c. This is a description of a very remarkable freshwater fish from the interior of New Guinea, allied to *Mugil*, but constituting a new genus, to which the author gives the name of *Aeschrichthys*.

2. By Mr. J. J. Fletcher, M.A., B.Sc. The second part of his paper upon "The Anatomy of the Urogenital Organs of Females of certain species of Kangaroos," in which he gives an account of his dissection of sixteen specimens of virgin females belonging to the following species :—*Petrogale penicillata*, *Osphranter robustus*, *O. rufus*, *Halmaturus dorsalis*, *H. ruficollis*, *H. ualabatus*, and *Macropus major*. The conclusion at which the author arrives, in addition to those already published, is, that in virgin animals (of *H. ruficollis*, *H. dorsalis*, *O. robustus*, and *O. rufus*) the direct communication does not exist, although in one specimen of *P. penicillata* and one of *H. ualabatus* it was, though incomplete, in process of formation, showing apparently that it is caused not by any rupture but by an involution of the urogenital canal, usually taking place either during pregnancy or parturition.

3. "On remains of an extinct Marsupial." By Chas. W. De Vis, B.A. This is a very careful description of a number of bones found together, and evidently of the same individual, by Mr. Henry Tryon, in Gowrie Creek, Darling Downs. The bones and teeth point to some bilophodont form, showing affinity with *Macropus* and *Palorchestes* on the one hand, and with *Nototherium* and *Diprotodon* on the other.

4. "Contributions to the Ornithology of New Guinea." By E. P. Ramsay, F.L.S., &c. This contained a complete list of the birds recently brought by Mr. Goldie and others from the S.E. part of the island. Among the new birds described were: 1. A Paradise Bird, plumed as in *P. Raggiana*, but with short dark maroon plumes in front of the longer ones, and with various other differences in coloration; for this species he proposed the name of *P. Susannæ.* 2. A species of *Pacilodryas*, to which he gave the specific name of *melanoleuca.* 3. An *Eurostopodus.* 4. A *Sitella*, allied to *S. albata* 5. A *Rhamphomantis*, to which he gave the specific name of *Rollesi.* The nest and eggs of several species were also described, among which were those of *P. Raggiana*, and *Drepanornis d' Albertisi.* The paper was illustrated by a full collection of Birds, Eggs, &c.

5. "On a new species of Tree Kangaroo from New Guinea." By the same author. This differs from *Dendrolagus venustus* in some particulars, and is named after the Marquis Doria. A new Rat (*Hapalotis Papuanus*) was also described.

6. "On some habits of *Pelopæus lætus* and a species of *Larrada.*" By Mr. H. R. Whittell. In this a minute account was given of the construction of the nest of *Pelopæus*, and its store of spiders. This nest is subject to invasion by a species of *Larrada*, which breaks it open and constructs a secondary partition within it, in which it deposits its own egg. When this is hatched, it feeds upon the spiders which had been intended by the original builder for its own progeny.

7. Mr. Whittell also read a short paper "On the voracity of a species of *Heterostoma.*" He had observed one of these centipedes in the act of eating a live lizard. The aggressor, evidently finding his victim too powerful for his unassisted strength, had ingeniously taken a double turn with the posterior portion of his body around a small stem which was found conveniently at hand, and so was enabled to continue his meal without interruption.

Mr. Macleay exhibited a curious horny growth taken from the ear of a sheep at Natal Downs, Queensland. The growth, which seems to have arisen from ear-marking five months previously, was of a long conical shape, resembling horn both in form and texture.

Mr. Brazier exhibited two specimens of a new genus of Shell from New Guinea, for which he proposed the name of

Braziera typica. He intimated that a full description would be given at next meeting.

Mr. Ramsay exhibited two masks, a dagger formed of the spine of a Sting Ray, a knife of Obsidian, and a variety of ornaments, &c., from the Admiralty Islands.

NOTES, MEMORANDA, &c.

Original Researches.—In 1881 the Royal Society of New South Wales offered prizes for communications containing the results of original research or observation upon various subjects. A number of communications have been received in response to the Society's circular, and the followings awards have been made:—No. 1. On the Aborigines of New South Wales, £25; to Mr. John Fraser, B.A., West Maitland. 2. On the Treatment of Auriferous Pyrites, £25; not awarded. 3. On the Forage Plants Indigenous to New South Wales, £25; not awarded. 4. On the Influence of the Australian Climates and pastures upon the growth of wool, £25; to Dr. Andrew Ross, M.L.A., Molong. The Society also invites original researches or communications upon the following subjects:—Series II. To be sent in not later than August 31st, 1883. No. 5. On the Chemistry of the Australian gums and resins, £25; No. 6. On water supply in the interior of New South Wales, £25; No. 7. On the embryology and development of the marsupials, £25; No. 8. On the Infusoria peculiar to Australia, £25. The competition is in no way confined to the members of the Society, nor to residents in Australia, but is open to all without any restriction whatever, excepting that a prize will not be awarded to a member of the council for the time being; neither will an award be made for a mere compilation, however meritorious in its way. The communication to be successful must be either wholly or in part the result of original observation or research on the part of the contributor. The Society is fully sensible thst the money value of the prize will not repay an investigator for the expenditure of his time and labour, but it is hoped that the honour will be regarded as a sufficient inducement and reward. The successful papers will be published in the Society's annual volume. Fifty reprint copies will be furnished to the author free of expense. The Clarke memorial medal has been awarded by the Council to Baron Ferdinand von Mueller, K.C.M.G., F.R.S., &c., Government botanist, Melbourne, for the year 1883.

We observe by an Editorial note in the January number o the New Zealand *Journal of Science* that the support accorde to that journal has not been such as its promoters had hope for, nor as its merit deserves. That this should be so is a matte for regret, and we are somewhat surprised at it, seeing that is evident from the reports of meetings, etc., that there is a goo deal of scientific activity in New Zealand at present. Thoug dealing chiefly with subjects of special importance to New Zealan readers, there is much in the journal that is of general interes and the Australian student will find it well worth while to obtai it. The present number contains papers by Mr. W. A. Haswell M.A., on his mode of preparing the Annelida for study; by M R. M'Lachlan, F.R.S., on marine caddis-flies from New Zealand by Capt. Broun on the New Zealand Coleoptera; by Mr. W M. Maskell on Desmidiæ; by Mr. G. M. Thompson, F.L.S., o Science Teaching in Secondary Schools; a general account o the work done in New Zealand in connection with the Transi of Venus; with the New Zealand Mollusca of the "Challenger Expedition, by the Rev. R. B. Watson, F.L.S., and the usua miscellaneous notes, reports of meetings, &c.

"The Portfolio."—(M. L. Hutchinson, 15 Collins-stree West).—We are glad to welcome this new monthly, publishe in the interests of education. To students for the Civil Service Pharmaceutical, and other public examinations, as well as t teachers themselves, it is a valuable guide. Conducted as it i by scholarly and experienced educationists, the *Portfolio* shoul prove highly useful. We trust that our contemporary's com mercial success will be commensurate with its intrinsic merits.

There are two kinds of entomologists; one kind, now, let u hope, rapidly verging to extinction, sticks a pin through hi specimens, mounts them in a cabinet, gives them systemati names, and then considers that he has performed the whole duty of a man and a naturalist; the other kind, now, let us hope growing more usual every day, goes afield to watch the very life of the creatures themselves at home, and tries to learn their habits and customs in their own native haunts.—*Grant Allen in "Knowledge."*

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THE

Southern Science Record.

AND

MAGAZINE OF NATURAL HISTORY.

CONTENTS:

PRICE--ONE SHILLING.

COLLINGWOOD:
J. WING, 33 WELLINGTON STREET.
1883.

Definitions of some New Australian Plants, by Baron Ferd. von Mueller, K.C.M.G., M.D., Ph. D., F.R.S.

[Continued.]

Hibiscus Haynaldii.—Densely and pale star-hairy; leaves cordate, lobeless, bluntly and irregularly denticulated; stipules linear-filiform, short; peduncles axillary, one-flowered, articulated at the summit; segments of the involucre 6-8, broad- or oblong-linear, from one-third to half the length of the calyx; the latter deeply cleft into semi-lanceolar upwards much narrowed lobes, with no prominent margin; petals pale, about one-third longer than the calyx; staminal column glabrous; filaments longer than the anthers; styles free towards the summit; stigmas capitate; ovary glabrous, with 5-6 ovules in each cell.

At the sources of the Menilyalya towards Sharks-Bay; Hon. J. Forrest, C.M.G., F.L.S., F.R.G.S..

Probably of shrubby growth. Leaves 2-3 inches long, $1\frac{1}{2}$-2 inches broad. Peduncles generally shorter than the flowers. Lobes of the calyx measuring one inch or somewhat less in length. Petals except at their outer edge glabrous. Lower filaments far down on the column. Ovary oval-globular. Ovules smooth. Fruit unknown.

This evidently rare Hibiscus is dedicated to Cardinal Dr. L. Haynald, Archbishop of Kalocsa, in recognition of his Eminence's researches into biblic phytology and of his strenuous endeavors to advance vegetable technology.

From *Hibiscus Pinonianus* our new species is distinguished by the denser vestiture, not lobed leaves, larger and particularly broader segments of the involucre, upwards more attenuated calyx-segments and not velvety ovary: the fruit needs yet comparison.

Verticordia Forrestii.—Leaves small, crowded, somewhat spreading, roundish-oval or some orbicular, often minutely denticulated; flowers situated near the summit of the branchlets, not numerous; their stalklets about as long as the leaves; bracteoles cordate-orbicular, broadly scarious towards the margin, imperfectly fringed; tube of the calyx 5-angular, dotted, glabrous; primary calyx-lobes divided into 7-11 setaceous fringed-plumous lobules, descending at the base into 5 herbaceous semi-orbicular-deltoid repressed appendages; secondary calyx-lobes 5 deflexed, tenderly membranous, renate-orbicular, long-fringed, involving and concealing the whole tube; petals nearly ovate, not conspicuously veined, along their whole margin fringed; sterile stamens linear, acuminate, about as long as the fertile filaments; anthers ovate-oblong, opening in slits; style bearded near the summit; stigma not dilated; ovules few in each ovary-cell.

Near the Gascoyne-River; J. Forrest.

Differs from *V. spicata* in not closely appressed leaves, larger not densely spicate flowers, much ampler secondary calyx-lobes, which leave no part of the tube unprotected; from *V. lepidophylla* in also larger flowers, in long-fringed petals, neither upward dilated nor fimbriolated staminodia.

Verticordia Jamiesonii.—Leaves very short, almost semi-cylindrical, those on the young branchlets closely crowded; flowers few near the summit of the branches, on stalklets three or several times shorter; bracteoles largely reddish, below the summit short- and thick-pointed; tube of the calyx turbinate, glabrous, very finely dotted, naked, longitudinally ten-furrowed; lobes in a single series, consisting of 7-11 plumous bristles; petals nearly white, roundish or deltoid-ovate, very faintly veined, as long as the lobes of the calyx or to one-third shorter, in front lacerated or denticulated, adnate at the base to the staminal tube; fertile and sterile filaments short-hispid, subulate; anthers cordate-ovate, opening in slits, callous at the summit; style very short, near the base hispid, near the summit glabrous; stigma peltate; placenta exceedingly short; ovules 8-10.

Near the Gascoyne-River; J. Forrest.

This species differs from *V. picta* in shorter leaves and flower-stalklets, in the more elongated calyx-tube without conspicuous callous thickening of its upper part but with deep furrows along its lower portion, in more callous anthers and not almost basal placenta; from *V. pennigera* our new plant is readily separated by the less flattened leaves, longer and fewer flowers, ten-furrowed calyx with no herbaceous appendages nor any reflexed segments of the lobes, less or not incised also never prominently streaked petals and somewhat larger number of ovules; from *V. Cunninghamii* in shorter leaves and flower-stalklets, naked more attenuated calyx-tube, not doubly pinnate segments of the calyx-lobes; from all three in the very short style not bearded at the summit but hispid at the base and in wider stigma; while from every one of its congeners it is distinct in the hairiness of the stamens. I bestowed on this new fringe-myrtle the name of Dr. James Jamieson, Lecturer on Obstetric Medicine at the Melbourne University, in recognition of his very zealous professional researches and his persevering advocacy of all other scientific pursuits here among us.

Podolepis Kendallii.

Helipterum Kendallii (F. v. M. Fragm. Phytogr. Austr. VIII, 168).—Branches towards the summit somewhat woolly; leaves finally almost glabrous, the upper linear and at their margin recurved; flowerheads rather large, singly terminating peduncle-like branches, nearly hemispherical; involucre not longer than the corollas; plate of the involucrating bracts almost lanceolar, acuminate, wrinkled, fringed, that of the inner bracts decurrent into their stipes; corolla of the exstaminate flowers at the summit divergently 3-4-lobed; achenes papillous-rough; bristles of the pappus 7-10, free, in their whole length short-plumous.

Near Champion-Bay, Miss Guerin; in the vicinity of the Gascoyne-River, Hon. J. Forrest, C.M.G.

This plant mediates the transit from Helipterum to Podolepis, taking in the latter genus best a position near *P. pallida.*

Oncinocalyx.—Tube of the calyx at first broadly obconical, at last semi-ovate, ten-nerved; lobes equal, subulate, hooked. Corolla hardly exceeding the calyx in length; lower lip trifid, its middle lobe obovate-cuneate; lateral lobes somewhat shorter than the middle one, as well as the lobes of the upper lip oblong-semilanceolar, and equal to them in length. Stamens four, didynamous, shorter than the corolla, or two of them hardly longer; filaments linear-subulate; anthers all dorsifixed, almost renate, unilocular, bivalved. Stigmas subulate, recurved, half as long as the style. Ovary slightly four-lobed at the top, four-celled, with one ovule in each cell. Fruit enclosed in the calyx-tube, quite dry, depressed but hardly lobed at the summit, seceding into four trigonous-ovate fruitlets. Seed solitary, affixed near the middle. Testa pale, membranous. Albumen none or exceedingly scanty. Cotyledons plane-convex, oval; radicle inferior, obverse conical, half as long as the cotyledons.—A herbaceous or perhaps somewhat shrubby plant of rather tall growth, slightly downy; branches quadrangular; leaves opposite, linear, rather long, recurved along the margin; the pairs somewhat distant; flowers very small, usually from 2 to 3 in each axil, on short stalklets; bracteoles linear; calyx-tube not quite so long as the lobes; corolla seemingly pale; fruitlets on the inner side with shallow excavations from the base to beyond the middle.—This genus mediates the transit from Verbenaceae to Labiatae; it differs from Teucridium, to which it is nearest allied, in the bristly and hooked calyx-lobes, in the not long exserted stamens and in the very short style; the generally solitary peduncles of Teucridium offer no safe mark of distinction, as they occur sometimes also twin in that genus, and may bear even occasionally two flowers, thus 5 flowers being placed with one pair of leaves. Ripe fruit of Teucridium is also quite dry and hardly more lobed, and the secondary nerves of the calyx are also sufficiently distinct in that genus.

The character of the calyx-lobes is almost unprecedented both in Verbenaceæ and Labiatæ, although some approach to it is offered by the genera Phryma and Notochæte. In some respects Oncinocalyx is allied to Hyptis, which includes also a few species with similar calyces.

Oncinocalyx Betchei. Near the Namoi; Ernst Betche.

Specimens communicated by Ch. Moore, Esq.

Leaves entire, the majority about one inch long. Corolla hardly $\frac{1}{4}$ inch in length. Fruitlets not fully $\frac{1}{8}$ inch long.

THE PARROTS OF VICTORIA.

BY T. A. F. LEITH.

[Read before the Field Naturalists' Club of Victoria 15th January 1883.]

PART V.

THE BLUE-BELLIED LORIKEET, SWAINSON'S LORIKEET, THE BLUE MOUNTAIN PARROT.—(*Trichoglossus Swainsonii*).—The remaining five parrakeets that I am about to exhibit and describe conclude the list of Victorian Parrots, and all belong to the subfamily Lorinæ, Lories or Lorikeets; and genus Trichoglossus: they are all to a certain extent honey-eaters, and consequently bad cage-birds. First on the list comes Swainson's Lorikeet. This bird, when seen in freedom, in the dazzling beauty of its nuptial plumage, is, in my opinion, unsurpassed by any bird in the world, of its own size. The head, &c., is covered with plum and purple shot feathers; a collar of pale green on the back of the neck; followed by darker green on the back; shot with a few red spots in the upper part, showing more in some specimens than others; rump bright green; upper tail coverts green, under yellow and green; breast red and yellow bars and reflections; belly blue-barred, red at sides, with greenish tints and reflections; upper wing coverts green, under red and yellow band, &c. The female is less rich and brilliant in the depth of colour of the breast and belly, with more yellow, &c. The beaks of these birds, when alive and in health, are red, much the same as the red in the breast.

These Lorikeets are found in many parts of the colony: they abound in the belts near the Grampians, and are plentiful in Gippsland. Length from $13\frac{1}{2}$ to nearly 14 inches.

The SWIFT LORIKEET, SWIFT-FLYING PARRAKEET.—(*Trichoglossus* (*Lathamus*) *discolor*).—A few of these parrakeets may be met with throughout the colony at all seasons, but, as a rule, they are migratory birds, and are said to cross Bass's Straits in large flocks, flying fast and high, steering northwards, some bound to parts of this Colony and some to New South Wales. They have a band of bright red on the forehead, followed by a blue mark; back of head, back, and cheeks a bright green; throat deep red, with one or two round spots on the breast, which is bright yellowish-green, as is also the belly; a red spot on the shoulders, followed also by a blue. Primaries, &c., Prussian blue; rump green; tail feathers very pointed, narrow, and reddish-brown in colour.

The Swift Lorikeet is a beautifully-formed bird, of brilliant plumage, the male being, as usual, the brightest in colouring: they are shy birds; and when disturbed their flight is rapid, and often long-continued. The specimen exhibited is a female, but I think at the time it was shot it must have passed the summer-time of its existence, and have entered upon the sear and yellow leaf-time of life, for it is by no means a bright or representative specimen. Length about 9½ inches.

The Musk Lorikeet, The Musky Parrakeet—(*Trichoglossus concinnus*).—Forehead bright red, continued in a band beyond the eyes; back of the head bluish-green, followed by a large brown patch; wings, rump, and upper tail coverts green, very much the shade of the Eucalyptus leaves they frequent; yellow marks below the shoulders; breast green; belly lighter and brighter green; under tail coverts green. Found in flocks in the spring of the year hanging to the branches of gum-trees in blossom, and sucking the honey or nectar from the flowers. At this season, persons unaccustomed to observe animated Nature in the bush, and whose optic nerves are not strung to the pitch suitable to distinguish where the animal and vegetable kingdoms are joined and blended in colour for the time being, will pass close beneath numbers of them and never suspect their proximity. I have known several freaks of Nature in these birds being shot nearly all yellow, or partially so.

The Musk Lorikeet is found more or less in most parts of the colony. They fly fast when startled, but do not go far, as a rule, making generally for the nearest large tree. The skin of this bird, like most of the Lories, is tough, and they are not good eating, like some other members of the parrot family. Length about the same as the Swift Lorikeet, or 9½ inches.

The Porphyry-crowned Lorikeet.—(*Trichoglossus porphyrocephalus*).—This is a scarce bird in Victoria, but is met with now and then in twos and threes all over the colony, also in South Australia, and in Western Australia is much commoner: I have lately received one from that colony, and seen others that have been sent here. I have known them shot about Tarnagulla, and of their being seen close to Melbourne. Above the bill there is a reddish mark; and on the crown is a bluish-black cap, red marks at the ears, back of the head bright green, followed by a mark of brownish green; rest of back and rump bright green; upper tail coverts darker; throat, breast, and belly French grey, tinged with light blue; bright blue mark on shoulders. Female differs little from the male, being only duller in plumage. Their colors are very bright in the spring of the year, like those of most of the family. Length about 6½ inches.

The LITTLE LORIKEET.—(*Trichoglossus pusillus*).—It might be said of this Lorikeet that it is a reproduction in miniature of the Musk Lorikeet, or nearly so. Forehead and throat Turkey red; back of the head bright green; collar and patch below brownish; back and upper tail coverts green; breast bright green, belly lighter; wings dark green on upper surface, with darker edges, and the female much resembling the male, perhaps a little broader or thicker in the back. Found in most of the wooded parts of the colony, and in southern Gippsland I have seen them abundant; in habits, flight, and manner of feeding they much resemble the Musk Lorikeet, flying in small flocks from tree to tree, and extracting the saccharine matter when the gum-trees are in flower. Length 5½ to 6 inches.

The tongue of the Lorikeets is well adapted for honey-sucking, and the bill is also sufficiently strong to enable them at times to crack pods and extract seeds when other food is not to be had. Since settlers have begun to plant fruit-trees and make orchards, I understand that some of the Lorikeets have become great fruit-consumers, and I know of one orchard in Gippsland last summer where the Blue-bellied Lorikeets were most destructive.

This concludes the list of Victorian Parrots; and if I have not described them so fully as I might have done, I have exhibited to you specimens of those described; and, along with the specimens I have brought to-night, I have also brought the eggs of 16 different varieties of Victorian Parrots. Victoria, as you are well aware, is but a very small corner of this great island continent, yet in this colony are found nearly half the parrots as yet known in Australia proper; which proves that it is a favorite resort of the most beautiful birds, and, let us hope, of some of the finest men,—I mean, in the true sense of the word.

I may here remark, that those who have only seen parrots in cages have seen nothing more than sickly birds: like faded flowers, the glory of their plumage is gone; and the eye has no longer the fire of freedom and health.

Before closing this paper, however, it will not be out of place, I trust, to give a hint or two to those who keep parrots as pets. Don't over-feed them, give them little or no meat, never hang them in the sun in summer without a shade over the cage, and use them to a bath by taking the garden watering-pot, with rose on, and giving them a shower; they soon get to enjoy it, look for it, and go through their toilet with pride, mingled with pleasure, immediately after. If these hints are taken, you may rest assured your pet parrot will live as long as you do, and perhaps longer. This being an age of learning, you may wish your bird to be educated also; if so you must get him young; and the words he hears most often he will soonest learn, so be careful, or he may tell tales, just when you do not want him, and least of all expect it. Of course I have been obliged to condense these papers very much, also my remarks on this family of birds and their distribution, for their range is vast, their numbers very great; in fact the parrot family are an order, or rather part of an order, of birds that it would take years to do justice to, and the anecdotes about their talking powers would alone fill a small volume. It is fortunate that all our tastes do not run in the same groove; or man's knowledge would be still more limited than it is, for to my mind Ornithology is the most fascinating, or one of the most fascinating, of the many branches in the awfully grand and great tree of Natural Science. Many of you will remember the early Spring mornings in the old country, when the woods echoed with the music of the heavenly songsters,—and the words of Byron,—

> " A light broke in upon my soul—
> It was the carol of a bird;
> It ceased —and then it came again,
> The sweetest song ear ever heard."

And those of the poet Ragg are so full of admiration of the beauty and harmony of Nature, I cannot resist the temptation of quoting them—

> " The earth is full of love, albeit the storms
> Of passion mar its influence benign,
> And drown its voice with discords. Every flower
> That to the sun its heaving breast expands,
> Is born of love; and every song of birds,
> That floats mellifluous on the balmy air,
> Is but a love-note."

Most of you know what Isaac Walton said, the first time he heard a nightingale sing, " O Lord if thou sendest such beautiful music to us sinners on earth, what hast thou prepared for the Saints in heaven! But perhaps you will say I am getting off the track, and, as there must be an end to everything, I reluctantly bid the subject farewell for the present; but if these papers have found any favour in your eyes, I shall be happy at some future time to contribute others on some other family of birds, or on something else in Nature:

> " For everywhere breathes Nature's music,
> Grand and tender, deep and low;
> Let us pause at times to listen,
> And catch the harmonies that flow.
>
> Let us love whate'er is lovely,
> Cling to what is pure and true;
> We shall find this earth grow fairer,
> And our lives grow happier, too."

Oology of Australian Birds.

By A. J. Campbell.

[Read before the Field Naturalists' Club of Victoria 12th February, 1883.]

Part x.—Order—INSESSORES.

Family—*Meliphagidæ.*

296. Meliornis novæ-hollandiæ—(New Holland Honey-eater). *Locality*—Queensland, New South Wales, Victoria, South Australia, and Tasmania. *Egg*—Pale buff, thinly spotted and freckled with deep chestnut-brown, particularly at the larger end, where they not unfrequently assume the form of a zone. Length 10 lines; breath 7 lines.

297. Meliornis longirostris—(Long-billed Honey-eater). *Locality*—West Australia. *Egg*—Ground color, delicate buff, with the larger end clouded with reddish buff, and thickly spotted and blotched with chestnut-brown and chestnut-red arranged in the form of a zone. Length 9 lines; breadth 7 lines.

298. Meliornis sericea — (White-cheeked Honey-eater). *Locality* — Queensland, New South Wales, and Victoria (?). * *Egg*—Of a pinky flesh tint, and of a slightly darker shade at the larger end, where also is a zone of pinkish-red and sometimes chestnut-brown spots. Length 9 lines; breadth $6\frac{1}{2}$ lines.

299. Meliornis mystacalis — (Moustached Honey-eater). *Locality*—West Australia. *Egg*—Dull reddish buff, spotted very distinctly with chestnut and reddish brown, interspersed with obscure dashes of purplish grey. Length 9 lines; breadth 7 lines.

300. Meliornis australasiana—(Tasmanian Honey-eater). *Locality* — Queensland, New South Wales, Victoria, South Australia, and Tasmania. **Egg*—Tasmanian specimens. Of a rich flesh color or buff, being of a darker shade at the upper end, where it is also rather boldly blotched and spotted in the form of a zone, with reddish-brown or chestnut and purplish grey, the latter appearing as if under the surface of the shell. Length $9\frac{1}{2}$ lines; breadth 7 lines.

Specimens taken by myself in Victoria are smaller in size and more beautiful and delicate in character, being of a lovely flesh tint, and zoned at the larger end with spots of dark pink and chestnut, also a few violet-like spots appearing under the surface of the shell. Length $8\frac{3}{4}$ lines; breadth $6\frac{1}{2}$ lines.

301. Glyciphila fulvifrons — (Fulvous-fronted Honey-eater). *Locality*—Queensland, New South Wales, Victoria, South Australia, and Tasmania. *Egg*—Large for the size of

Eggs marked thus * not described by Gould, or not previously described.

the bird, and is often of a lengthened form; and sometimes quite white, without the least trace of spots, but they are generally blotched with marks of chestnut-red; occasionally this color is very faint and spread over the surface of the shell as if stained with it; in other instances the marks are very bold and decided, forming a strong contrast to the whiteness of the other part of the surface. Length $10\frac{1}{2}$ lines; breadth $7\frac{1}{2}$ lines.

302. GLYCIPHILA ALBIFRONS—(White-fronted Honey-eater). *Locality*—New South Wales, Victoria, South and West Australia. *Egg*—Ground color delicate buff, clouded with a reddish tint at the larger end, and distinctly spotted with chestnut and purplish grey, thickly disposed at the larger end, but very sparingly over the rest of the surface. Length $9\frac{1}{2}$ lines; breadth 7 lines.

GLYCIPHILA SUBFASCIATA—(Dusky Honey-eater). *Locality*—Queensland. *Egg*—Pure white with a few dots of black sprinkled over the larger end. Length 9 lines; breadth 6 lines.

Mr. Ramsay states, that this is the only bird of the Australian *Meliphaginæ* that has been met with which constructs a dome-shaped nest.

304. STIGMATOPS OCULARIS—(Brown Honey-eater). *Locality*—Queensland and New South Wales. *Egg*—Varies considerably in coloring, some being pure white without a trace of spots or markings, others having a zone round the larger end formed of freckled markings of light reddish-brown; others again are thinly sprinkled with this color over the whole surface. Length $7\frac{3}{4}$ lines; breadth 6 lines.

306. PTILOTIS LEWINII—(Lewin's Honey-eater). *Locality*—Queensland, New South Wales, and Victoria. *Egg*—Pearly white spotted with purplish brown, the spots forming a zone at the larger end. Length $11\frac{1}{2}$ lines; breadth 8 lines.

307. PTILOTIS SONORA—(Singing Honey-eater). *Locality*—Australia. *Egg*—Light yellowish buff, thickly freckled with small indistinct reddish-brown marks; or of a nearly uniform fleshy buff without spots or markings, but a deeper tint at the larger end. Length 11 lines; breadth 8 lines.

310. PTILOTIS FLAVIGULA—(Yellow-throated Honey-eater). *Locality*—New South Wales, Victoria, South Australia, and Tasmania. *Egg*—Most delicate fleshy buff, rather strongly but thinly spotted with small, roundish, prominent dots of chestnut-red, intermingled with which are a few indistinct dots of purplish grey. Length 11 lines; breadth 8 lines.

311. PTILOTIS LEUCOTIS—(White-eared Honey-eater). *Locality*—Queensland, New South Wales, Victoria, South and West Australia. **Egg*—Almost white or of a uniform delicate fleshy tint, with a few indistinct markings of pinkish red at the larger end. Length $10\frac{1}{2}$ lines; breadth $7\frac{3}{4}$ lines.

The nest is generally placed in thick scrub near the ground. It is deep and cup-shaped, and composed of a mixture of bark, grass, and spiders' old nests. The inside is lined with a thick warm layer of cow-hair wonderfully woven together. No doubt before cattle were introduced to Australia, this beautiful Honey-eater used for the lining the hair or fur of the Kangaroo and other indigenous animals.

312. Ptilotis auricomis — (Yellow-tufted Honey-eater). *Locality*—Queensland, New South Wales, and Victoria. *Egg* —Pale flesh-tint, darkest at larger end, where they are also spotted and blotched with markings of a much deeper hue, inclining to salmon color; in some these markings form a zone, in others one irregular patch, with a few dots over the rest of the surface. Length 10 lines; breadth 8 lines.

314. Ptilotis ornata — (Graceful Ptilotis). *Locality* — Victoria, South and West Australia. *Egg*—Deep salmon color, becoming paler at the smaller end, and minutely freckled with reddish-brown, particularly at the larger end. Length 9½ lines; breadth 7 lines,

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Foraminifera of Victoria.

By H. Watts.

[Read before the Field Naturalists' Club of Victoria 12th March, 1883.]

The following list of species is offered as a first contribution to a complete list of Foraminifera found in Victoria. The Eocene species are from the Eocene beds of Mount Martha; the Miocene from quarries at Waurn Ponds, near Geelong; the Pliocene from rocks at Cheltenham and Mordialloc; and the recent species were collected at various times in tide-pools at Cheltenham, Mordialloc, and Griffiths' Point, and also attached to marine Algæ, Bryozoa, &c., from Queenscliff and other localities. The nomenclature is that adopted by Carpenter in his "Introduction to the Study of Foraminifera." References have also been made to the works of Rupert Jones, Parker, Williamson, and other authorities.

Eocene.

1. Cornuspira involvens.
2. Biloculina compressa.
3. Lagena sulcata.
4. ,, lævis.
5. ,, marginata.
6. Dentalina obliqua.
7. Cristellaria rotulata.
8. Globigerina cretacea.
9. Nodosaria longicauda.
10. Pullenia obliqueloculata.
11. Textularia sagittula.
12. Rotalia Beccarii.
13. Miliola seminulum.

Miocene.

1. Trochammina squamata.
2. Biloculina compressa.
3. Triloculina Brongniartii.
4. Triloculina oblonga.
5. Triloculina trigonula
6. Spiroloculina canaliculata.
7. Quinqueloculina bicornis.
8. Globigerina cretacea.
9. Globigerina bulloides.
10. Peneroplis pertusus.
11. Miliola seminulum.
12. Polymorphina lactea.
13. Orbulina adunca.
14. Textularia sagittula.
15. Rotalia Beccarii.
16. Polystomella crispa.
17. Rhabdammina dentalina.
18. Nodosaria longicauda.
19. Nodosaria species.

Pliocene.

1. Spiroloculina canaliculata.
2. Miliola seminulum.
3. Rotalia Beccarii.

Recent.

1. Biloculina compressa.
2. Triloculina oblonga.
3. Miliola seminulum.
4. Spiroloculina canaliculata.
5. Polystomella crispa.
6. Rotalia Beccarii.

On a Fossil Plant Formation in Central Queensland.

By the Rev. J. E. Tenison-Woods, F.G.S., F.L.S., Vice-Pres. Linn. Soc. N.S.W.

[Read before the Royal Society of New South Wales 6th December, 1882.]

I wish to bring under the notice of the Society a fossiliferous formation in Central Queensland, which has recently yielded plant remains which are new to Australia. It is situated on the central line of railway, which runs westward from Rockhampton to the Drummond Range, a distance of about 230 miles from the furthest navigable point of the Fitzroy River, and nearly 300 miles from the sea. It is intended to carry the line far into the plains of the western watershed, but as yet it has not crossed the divide. It is necessary to bear this in mind in considering the relations of the rocks exposed in the railway cuttings. There is no part of the continent where the Dividing Range makes so far a curve inland from the sea. Even when the Drummond Range is cut through, the railway will not be found upon western waters. The valley of the Belyando will be reached, which is a tributary of the Burdekin River. On the further side of this valley will be the real divide. I shall have occasion to refer to this more particularly in the latter part of this paper. In the Drummond Range occurs the fossiliferous formation whose plant remains I am about to describe. After crossing the basaltic plains west of Emerald with the immense tracts of brigalow scrub, a remarkable change occurs in the geology of the country at a place called Zamia Range. This is a mere ridge of moderate elevation, with sandy soil and an open forest of *Eucalyptus melanophlois*. The railway cuttings expose one or two igneous dykes, and some granite, or metamorphic rock of some kind, which is not exposed beyond the weathered portions, and therefore its true character is difficult to determine. It is mingled with a stratified rock, in which no fossils could be detected, but in appearance it seemed like some of the oldest mesozoic rocks in Victoria. It overlies, as it seemed to me, certain dark brown sandstones, which soon rise to the surface and occupy the whole extent of the country around. The rock forms low outliers from the Drummond Range, giving an undulating but not rugged outline to the country. The dip is very regular to the eastward, but the inclination is slight, hardly more than 15°. At about 12 miles from the range an anticlinal axis is crossed, and then the dip is regularly to the westward, with the same, or a less, inclination. As the chain of mountains is approached, it is seen to consist of a series of terraces or escarpments facing to the eastward. The lines of bedding are very visible on all the sides of the valleys, and give the scene a remarkable and characteristic aspect. The sandstone is now and then interrupted by beds of shale of a dark and earthy composition. It weathers into a fair soil in some places, but is generally poor and sandy. A little beyond Bobuntungen, which is the last station on the railway, there is a heavy embankment, and the stones composing it are entirely derived from the sandstone range. At the first glance I was struck with the number of plant impressions they contained, none of them being sufficiently well preserved to admit of their identification. There were some long, linear, narrow, ligulate leaves which strongly resemble the *Cordiates australis* of M'Coy, to which reference will be made presently. It was found afterwards that these leaf-like impressions were in reality stems of Calamites. The discovery of this much, however, encouraged me to a closer and more extended exploration of the rocks around, and soon an immense number of fragments of stems of Lepidodendron, and Stigmaria, with Calamites, were obtained. I spent, in all, a week at Bobuntungen, but, being occupied in other ways, I could not give to the formation all the attention I desired; but I found an active co-operator in Mr. Phillips, the stationmaster, who since my departure has been indefatigable in seeking for well-preserved specimens from the abundance of fossils in the locality. I have lately received from him a small box of fossils which are of the highest interest, and which, together with my own collections, will form the subject of this evening's paper. Before entering into a description of the species, it may be well to give a retrospect of what has been done hitherto by geologists in elucidating the palæozoic plant remains of Queensland. In 1861, the Rev. W. B. Clarke, F.R.S., in a paper read before the Geographical Society of London (see vol. 17, p. 354), speaks of the occurrence of shales and grits charged with plants in Queensland, associated with calcareous beds holding abundance of Carboniferous and Devonian zoological forms. These referred to the Bowen River and other coalfields. In 1872 Mr. Daintree gave to the same Society a sketch of the geology of Queensland (see vol. 28, p. 271), in which were fuller details. He says at p. 288:—"Devonian.—From the southern boundary of Queensland up to lat. 18° south, a series of slates, sandstones, coral limestones, and conglomerates extend to a distance of 200 miles inland. These are sometimes overlaid by coal measures, sometimes by volcanic rocks, and consequently do not crop out on the surface over such districts. . . . . In the higher members of this group, which, from their general analogy to the English group of that name, we will term Devonian, specimens of fossil plants are abundantly met with. Mr. Carruthers, F.R.S., has described and named those from three widely separated localities—Mount Wyatt, Canoona, and the Broken River,—and refers them all to one form," *Lepidodendron nothum*, Unger (not Salter's species of that name). To the same paper Mr. Carruthers added an appendix, in which the fullest details of the plant were given. He states that the collections of Mr. Daintree were so full and complete, and so much more perfect than any previously at the disposal of palæontologists, that he was able to give a description of the whole plant, and clear up every doubtful point of its structure. Before giving details of the species I have recognised, it may perhaps be as well to remind the members of the Society, who may not have access to all the literature of the subject, of the progress that has been made in this portion of palæontology. The plants of the early geological periods differ so completely from anything existing at the present day that they presented very puzzling problems to palæontologists. This is not a matter of wonder when we remember how fragmentary were the specimens submitted to their examination, and how rare it was to find stem, leaves, roots, flowers, and fruits so associated together that they could be recognised as belonging to one plant. To add to the difficulty of the problem it has been found that in these extinct forms of vegetation the various parts of the plant were more differentiated and specialised than they are now. Thus roots of plants in the present day are very uniform and simple organs; in fact so uniform that only slight difference, or no difference, can be traced between those of shrubs or trees widely separated in every other respect. But the roots of coal plants seem to have been very different structures. Stigmaria, for instance, is now known to be the root of trees resembling our club-mosses, called Sigillaria. But these roots were arranged in a regular spiral series. They were swollen fleshy tubers articulating by a joint to the rhizome, having peculiar scars in the bark outside and in the woody tissue underneath. Furthermore they are forked or divided, and terminate in an obtuse apex. No wonder that Sternberg, when he found these rootlets by themselves, compared them to arborescent euphorbiaceous plants. Von Martins referred them to a fleshy composite (Cacalia), or a fig-tree. Brongniart classed them with the Lycopods, but later as roots of such peculiar conifers as, in his view, Stigmaria were. Corda regarded them as plants uniting the characters of houseleek, eurphorbias, cactus, and Zamia. Lindley and Hutton took them for the fleshy leaves of some horizontal subterranean tree entirely different from anything at present known. In the course of time the discovery of true Lepidodendroid trees with upright stems and with roots (Stigmaria) in the ground has manifested the true character of these remains. In like manner different portions of the same plants have been subjects of doubt and controversy until their nature and office was known. The cones, or fruit spikes, of Lepidodendron were called Lepidostrobus; Cyperites was the name given to the leaves, Sternbergia to the pitch, and Knorria to the internal casts to the trunk. Other specific and generic distinctions were built upon the mode of preservation, which was subject to great variation, for the stems of these trees were soft and hollow, or at any rate filled with a soft yielding pith; then, when the entombing rock pressed upon them in the course of time, they became flattened, and the sections of round stems, or the cast of the interior, were thinned at each end, so that the section became like the section of a lentil. All these remarks are necessary to understand the character of the fossils which I exhibit this evening. They have been subjected to great pressure, and they are fragments of all the different portions of the plant. I will begin by describing the species to which most of them must be referred. *Lepidodendron veltheimianum* Sternberg: apparently a moderate-sized tree, with dichotomous branches, covered with a net-work of very narrow leaf-scars; leaves narrowly lanceolate, spreading, slightly incurved; scars of the branches erect rhomboid, close, with an obovate cushion acuminate at the base, keeled, furnished with a transverse rhomboid cicatrix; scars of the trunk oblong rhomboid, apex and base long and acuminate, subinflexed, and after the appearance of the little cushion, fusiform. Sternberg—Flor. d. Vorw. I., part 12, pl. 52, fig. 2. See also Schimper, "Paleontologie Vegetale," vol. 2, p. 29, atlas pl. 59, figs. 6, 7, 8. Schimper gives a large list of references and synonyms, which I need not quote here. See also Feistmantel, Paleozoische und Mesozoische Flora des öestlichen Australiens—Cassel, 1878 and 1879, p. 151, pl. 5, figs. 2 and 3 (though doubtfully referred to this species); pl. 7, fig. 2; pl. 23, fins. 2 and 3. This plant is characteristic in Europe of the lower coal formations, corresponding to the carboniferous limestone. It has been found in many places in Silesia, in the Posidonomya schists at Magdeburg, in the Hartz Mountains, at Nassau, in the valleys of Thann and Niedurburdach; in France, in the Upper Vosges, and in the coals of the Black Forest. This fossil is also, according to M. Geinitz, the same as *Ulodendron arnatissimum.* In the third edition of Clarke's Sedimentary Formations of New South Wales (1875), at p. 17, mention is made of a species named *Lepidodrendron rimosum,* of which in 1878 Feistmantel gave a fig. (loc. cit.), remarking that it seemed more to resemble *L. veltheimianum.* Before this, in 1876, as I shall state subsequently, Professor De Koninck had submitted about 20 plant specimens sent to him by the Rev. W. B. Clarke to the eminent Belgian paleontologist, M. Crepin, of the Brussels Museum. Though the specimens were in a very bad state of preservation, he was able to recognise *L. veltheimianum,* besides *Calamites radiatus* and *C. varians,* all of which we shall see are found in the Drummond Range. Dr. Feistmantel was not aware of Mons. Crepin's determinations at the time he pronounced upon his specimens, so that the independent testimony of two such eminent and experienced authorities gives additional weight to the identification. Mr. Clarke's fossils are quoted by De Koninck as from the quarries of Murree, Russell's Shaft, Glen William, Burragood, and the Ichthyodorulite Range. Dr. Feistmantel's examples came from the strata of Smith's Creek, near Stroud and the Rouchel River. Amongst the numerous examples found in the Drummond Range, there are many compressed branches which have formerly been cylindrical, and instead of having the lozenge-shaped depressed leaf-scars with a raised margin, are marked with impressions of distant narrow-pointed leaf-like scales. They exactly correspond with the figure given by Feistmantel in the above work at plate 23, figs. 2 and 3, and which are lettered Knorriastadium (?) of *Lepidodendron veltheimianum* (?), the doubtful note in both cases being that of Dr. F. They came from Smith's Creek, New South Wales. I think there can be but little doubt, from the mode in which they are associated, that they belong to the same plant. There are also smaller stems, of which I figure one example, which seems to me like the internal casts of the smaller branchlets. The surface is covered with raised cushions, which are closely quincunical. The cushions rise gradually towards the apex, and have an imbricated appearance. In the larger examples the cushions are longer, and very much narrowed. I think we have, in these, internal casts of the branches. If we suppose the external scars to be raised in such a way as to give rise to a corresponding depression in the internal cylinder, then the casts would present the appearance noticed above. Moreover, they are ill defined, and without any leaf-impressions, just as internal depressions would be. The stone is quite fine enough to retain the most delicate marks where they exist. The shape of these casts also confirm this explanation, for they are always more or less cylindrical, or the casts of cylinders which have been compressed. Whenever the exterior of the branches is exhibited, it is on the surface of concave casts.

Cyclostigma, Haughton.—The plants thus distinguished were first brought to the notice of science by Dr. Haughton, in a paper published in the *Annals of Nat. History* for 1860 (3rd ser., vol. v., p. 444), entitled "On Cyclostigma: a new genus of fossil plants from the old red sandstone of Kiltorkan." [Other species have since been described by Herr. Fossil Flora de Burren-Insel, p. 43, pl. XI; by Lesquereux, Geol. Survey of Arkansas, p. 311, pl. 3, fig. 3; and Dawson, Fossil Plants, Geol. Survey of Canada, p. 43, pl. 8, fig. 92 to 96]. *Cyclostigma australe*, Feistmantel, loc. cit. p. 76. A tree trunk with slender terete branches, cushions or raised scars subglobose, pitted, approximate, spirally disposed, impressions oblong-oval, rather deep, situate in the upper portion of the oblong ovate tubercle. This species was found in two places in New South Wales, according to Dr. Feistmantel, namely Goonoo Goonoo Creek, near Tamworth, and at Smith's Creek. Dr. Fiestmantel was of opinion that the species was so near *C. kiltorkanense* that he could see little difference, but lest he should make a false identification in a plant where the details are so few and simple, he preferred to give it another name. He gives figures of a few specimens at pl. 1, fig. 6, a doubtful identifiation, pl. 4, fig. 3, pl. 5, fig. 1, pl. 22, fig. 1. Amongst the Drummond Range, specimens I have only one which can be referred with any probability to this species, and in this case the impressions are so faint and worn that I figure it as a Stigmaria (Cyclostigma?) I quote from the Rev. Dr. Haughton's paper somewhat fully, because his description corresponds so well with the strata of the Drummond Range that, lithologically, they may be said to belong to one formation. The rose pink sandstone in which some of the fossils are embedded, and the golden yellow colour of others, is especially remarkable. "The fossil plants of the yellow sandstone of the county Kilkenny occur, as they do in other parts of Ireland, in the sandstone lying immediately under the great mass of the carboniferous limestone, which constitutes the most important member of our Irish fossiliferous rocks. They are found at Jerpoint, about a mile and a-half south of the Abbey, on the roadside near the corn-mill, on the road to Ballyhale, about 90 feet below the lowest bed of limestone, in rocks composed of red, white, and blue limestone, with triboliths formed of pink quartz, rounded pebbles grooving the hone-stone; and above the plant-beds a remarkable white grit conglomerate is found. The plant-beds, or the same geological horizon, are also found in the railway-cuttings at Ballyhale. They are found, however, in the greatest abundance, and in the best state of preservation, on the top of Kiltorkan Hill, near the railway station of Ballyhale. I believe the plant-beds on the summit of this to form an "outlier," and to occupy the same geological position with respect to the limestone as the beds at Jerpoint and those of the railway cutting. The fossil plants here found have never been described except casually. They consist of remains of a large fern, called *Cyclopteris hibernica* by Professor Forbes, associated with a large bivalve, named by him *Anodon Jukesii*; of undescribed dermal plates of a cartilaginous fish, probably a species of Coccosteus; and numerous unknown plants closely allied to Lepidodendron, and so named by Professor Forbes and M. Brongniart, the latter of whom has named a remarkable species, preserved in the Museum of the Royal Dublin Society, *Lepidodendron Griffithii*. Others of these fossil plants have been named Knorria; and a large undescribed group remains, to which I propose to give the name Cyclostigma, Cyclostigmaceæ. A natural order of fossil plants, found in the lowest beds of the carboniferous system, part of the oldest flora known to have existed on the globe, probably closely allied to the orders described as Knorria, Lepidodendron, and Sigillaria, known only by their leaf-scars and leaves, which were arranged in alternate whorls, plants not jointed at the whorls, the leaf scars perfectly circular, showing in many cases a minute and well-marked dot in the centre, probably coinciding with a central bundle of woody tissue. Many of the larger plants show traces of a thick central woody axis, like that found in Stigmaria; stems much crushed and flattened, as if they were not woody throughout. They approach nearest to Stigmariaceæ, from which they differ in the leaf-whorls being further apart and more distinct. There are many varieties of this remarkable fossil, showing the alternate whorled arrangement of leaf-scars. None of them are perfect stems, but appear to be torn portions of the rind of large plants which have been macerated by floating for a long time in the water. In the quarry of Kiltorkan the Cyclostigma is found in layers different from those in which the *Cyclopteris hibernica* occurs. In some specimens of Cyclostigma the leaf-scars are closer together than in the last, and are somewhat oblique to the transverse line of the stem—this obliquity being due to distortion caused by lateral pressure of the mudstone in which the fossils occur. The whorled arrangement of the leaves, each whorl being alternate to that above and below it, is frequently well shown. Mr. Carruthers, in his appendix on the fossil plants (see Daintree on the Geology of Queensland, loc. cit.), says:—"Among the Devonian fossils presented by the Rev. W. B. Clarke to the Society's museum, there is a fragment of a Lepidodendroid plant which I cannot separate from that found at Kiltorkan, to which Dr. Haughton gave the name of *Sigillaria dichotoma*, and afterwards of *Cyclostigma kiltorkense*, and which, after receiving many other aliases, should be named, I believe, *Syringodendron dichotomum*, it being a species of that genus as amended by Brongniart in his 'Histoire,' and again in his 'Tableau.'"—Crd. Calamiteæ Brongniart. (See Schimper. op. cit. vol. 1, p. 291.) For the convenience of students in Australia, where the works of Schimper, Brongniart, Ettingshausen, &c., are so difficult of access, I give an abridged notice of the literature of the order, and fuller descriptions of its character. This order is distinguished from the Equisetaceæ or horse-tails (to which also belongs our fossil Phyllotheca), by the verticillate leaves, which are entirely free or confluent at their base, and by the sporangiferous spikes being axillary like those of Lycopods. Some of the genera of this order have been named and classified in the early history of paleontology from fragmentary fossils, and as investigation has gone on, and better and more numerous specimens were discovered, just as in the case of the different portions of the Lepidodendron family, they have proved to be different portions of the same plants. Thus Ettingshausen has proved that Asterophyllites are the branches and branchlets of Calamites, and the spikes known under the name of Volkmanniæ are the fruit-bearing portions of the same genus. It is to Mr. Binney, of Manchester, that we owe the knowledge that the capsules enclosed in the spikes are not anthers, but sporangia. Calamites, Suckow, (including Calamites, Equisetites (in part), Asterophyllites, Volkmannia, Bechera, Brunckmannia, Bornia of Sternberg and Goeppart, and the Calamites, Equisetites (part), Calamodendron, Asterophyllites, of Brongniart, Bunbury, Binney, Dawson, and others). Tree-like plants, rising from a subterranean rhizome, stem simple, somewhat conical, jointed and gradually narrowed, branches in whorls, with forked branchlets. Bark smooth, or more or less distinctly sulcate, internodes of varying length, but generally shorter as they descend, Inner lining always sulcate and constricted at the joints. Internal structure similar to Equisetum. Cauline leaves extremely fugacious, wholly unknown but in their place, usually represented by minute, convex, ovate scars on the inner wood. Branch leaves longer and more numerous than the cauline, of equal length, free or confluent at the base, linear or narrowed or slightly dilated above, acuminate, ribbed, entire, sub-erect or reflexed. Sporangiferous spikes, verticillate from the axils of the leaves, disposed in corymbs along the branches or at their extremities, oblong or elongately cylindrical, small for the size of the plant. Bracts, alternating with the sporangia, verticillate lanceolate, erect above, below uniting into a disk. Sporangia, bearing stalks, peltate, and arranged in whorls of six; sporangia four to each stalk, borne on the under side of the peltate leaves; spore cases, with cellular walls; spores, spherical, with thread-like elaters. The fruit-spike or cone bears a very strong resemblance to Equisetum, but in the latter all the leaves of the cone are fruit-bearing, while in Calamites some are fruitful, and others are like the ordinary leaves of the plant. Calamites abound in the carboniferous rocks, and no doubt the great mass of the coal was formed by them. They may be said to have died out at the close of the palæozoic period, though some are still found amongst the lower members of the mesozoic strata. We have only two quoted from Australia, and those are from the lowest group of our coal strata, Smith's Creek, near Stroud. *Calamites* (*Bornia*) *radiatus*, Brongniart, Hist. Veget. Foss., 1. p. 122 (quoted by Schimper as Bornia. vol. 1, p. 335). This species belongs to the subdivision Bornia, distinguished amongst Calamites by its interrupted, non-alternating ribs, its free leaves, which on the branches are once or twice-forked, divided above, ovoid elliptic spikes, scutellæ with a scar on the centre of the external face. It is thus characterised :—Leaves of branches very long linear free, often forked. Cauline leaves much shorter. The fossil is very wide-spread, being found in the lower coal and Devonian rocks of Europe and those of America. (See Dawson's Devonian Plants, Quart. Jour. Geol. Soc., vol. xvii, p. 309; also Schimper, atlas, pl., xxiv, where many figures are given of stem, leaves, and fruit). In Feistmantel's Nachtrag zur Fossilien Flora Australien, already quoted (Australiens Paleontographia, loc. cit. plate vi, vii, xxiv, xxv), there are three figures given of this fossil, representing some leaves and certain portions of the stem. It should be mentioned that, except to an experienced eye, or without some fruit-cones, these fossils might easily be mistaken for *Phyllotheca australis*. It belongs, however, to a much lower horizon, and the leaves will be found to be dichotomous, which is never the case in Phyllotheca. *Calamites varians* is quoted by Feistmantel (loc. cit. p. 145) on the authority of De Koninck. The passage referred to is as follows: —(Recherches sur les Foss. Paleoz de la N. Galles d. Sud, Australie, 3 part, p. 142):—" Before commencing the study of the numerous animal forms belonging to the carboniferous period, I will glance on some contemporary plant remains received at the same time, and often also in the same rocks, from the Rev. W. B. Clarke. I should state, previously, that the specimens sent to me, not above 20 in number, were in such a bad state of preservation that, notwithstanding the immense experience of M. Crepin, who was kind enough to examine them, or the abundant material for comparison which he had at his disposal in the Brussels Museum, he was unable to determine any specimens with certainty. According to him, nevertheless, some specimens came very near to *Lepidodendron Veltheimianum*, Sternberg, others to *Borina radiata*, A. Brog. and others to *Calamites varians*, Germar, and constitute the dominant forms. All these plants are contained either in a hard and compact greyish-yellow or greenish limestone, the other in friable, easily powdered, grey or brownish sandstone. Many are associated with marine animal remains, such as the stems of Crinoids, Productus, Comularia, &c. By their characteristics they cannot be said to belong to the carboniferous formation properly speaking, but to the period which preceded it, being preserved in the rocks on which the carboniferous rocks rest. The principal localities in which these different fragments have been collected are the Murree quarries (Loder's Creek), Russell's Shaft, Glen William, and Burragood." *Calamites varians* Germar (*C. approximatus*, Schlott, of Schimper). This species is distinguished by the very short intervals in the basal part of the trunk becoming suddenly elongated in the upper part. The shoots of the basilar portion were rather stout, and disposed quincunically. The scars are large and round, and the ribs near them converge towards them with their upper and lower extremities. The same thing is seen in the leaf scars, but then the converging ribs are less numerous, and there are never more than three. From the Drummond Range I have a very fine series of these plants, as will be seen from the accompanying specimens and figures, which place the nature of the fossils beyond any doubt. It is the first time that we have any record from Australia of the roots and stems of this characteristic paleozoic coal fossil. They abound in the strata, and there are some portions of the stone which seem to be made up entirely from the stems. Nevertheless, leaves are rarely found associated with them; in fact, none of the more tender plants—such as ferns, or organs of plants—are found in these strata where Lepidodendron abounds. In the neighbourhood of the shales, leaf-impressions and those of ferns may be found; but these I have not as yet been able to examine. It remains to say a word as to the age of these beds. There can be but little doubt that they agree in the fossils with the Smith's Creek beds and those of Gunoo Gunoo. These, again, are identical with the plant remains of the lower coal formation of Europe. These Australian formations, for which I propose the name of Bobuntungen beds, because they are best represented at that place, are distinctly separated in their fossils from the Devonian beds of Gipps land and Queensland, with *Lepidodendron nothum* (Anger), *L. australe* (M'Coy), *Sphenopteris iguanensis* (M'Coy), and *Archopteris Howitii* (M'Coy). They are equally distinguished from the Newcastle beds with Glossopteris, *Phyllotheca australis* (M'Coy), and the well-known flora of our New South Wales coal measures. I think we may also safely say that the Bobuntungen beds should be intercalated between them, which will give one more link in the series which gradually unfolds itself of our Australain coal-bearing strata. Without venturing to give precise horizons to the strata to which the groups belong, I think the time has come when we may very safely rely upon the following order in which they are placed, as marking the relative age of their distinct and well-marked flora:—1. Devonian rocks, with

Lepidodendron australe, L. nothum, Cordaites australis, Sigillaria, Stigmaria, *Archopteris Howitti, Sphenopteris iguanensis.* Victoria: Iguana Creek, Gippsland. New South Wales: Capertee? Mt. Lambie, Nyrang Creek (near Canowindra). Queensland: Mt. Wyatt, Canoona, Broken River, and Gympie. 2. Lower Carboniferous, with *Lepidodendron Veltheimianum, Calamites radiatus, Rhacopteris inæquilatera, Cyclostigma australis.* Victoria: Not known. New South Wales: Smith's Creek, Goonoo Goonoo Creek, Liverpool Plains, Rouchel River, County of Durham. Queensland: Bobuntungen. 3. Upper Paleozoic (according to most authors), with Glossopteris (several species), *Phyllotheca australis, Vertebraria australis, Gangamopteris angustifolia, Noggerathiopsis spathulata.* Victoria: Bacchus Marsh. New South Wales: Newcastle, Greta, Raymond Terrace, Blackman's Swamp, Bowenfels, Mudgee, Illawarra, &c. Queensland: Mackenzie and Dawson Rivers, Bowen River, Pelican Creek (all within the tropics), Cooktown. Tasmania: Don River, Mersey River. 4. Mesozoic Beds.—*Zamites, Alethopteris australis, Equisetum, Thinnfeldia odontopteris, Tæniopteris Daintreeii.* Victoria: Bellerine, Cape Patterson, Wannon River. New South Wales: Mount Victoria, Dubbo. Queensland: Ipswich, Tivoli, Burrum River (near Maryborough), Burnett River (near Bundaberg), Clifton (?) on the Darling Downs. Tasmania: Jerusalem Basin. I must add that I do not think that the identification of the Victorian with the Queensland beds has been satisfactorily worked out. 5. Upper Mesozoic or lower tertiary, with large Equiseta, Ptilophyllum, Sequoia (?), and ferns. Queensland: rosewood, near Rockhampton, and rosewood near Ipswich; but no coal has hitherto been found in them. I may further state that no coal has been found in connection with No. 2, at Smith's Creek. There are beds of impure earthy shale, which will not burn. The same kind of shale I noticed at some of the outcrops at Bobuntungen, but no further examination has been made. It will be necessary to make some alterations with reference to these beds in the geological sketch map of Mr. Daintree, and my own, as published by Messrs. Gordon and Gotch, in "The Australian Handbook." In Daintree's map, the portion of Drummond's Range here referred to is coloured as metamorphic, bordering on the edge of carbonaceous rocks to the eastward. In my map it appears as a granite axis flanked by earlier paleozoic rocks, such as Cambrian and Silurian. It must now be coloured as a granite axis, and in this locality flanked by carboniferous rocks. It is stated in the earlier part of this paper that the Dividing Range here makes a curve to the westward, leaving a larger area between it and the eastern sea than is found at any other portion of its course. The distance of the divide from the sea is at this point nearly 300 miles. In more than one place lower carboniferous marine fossils are found, many of the species being identical with those found in the equivalent beds of Europe. At about 10 miles from Rockhampton, in what is called the agricultural area, careful collections were made by Mr. Charles de Vis, B.A., Curator of the Brisbane Museum. The locality is extremely rich in fossils, and the zeal and industry of the gentleman named were such that a complete series was obtained in excellent preservation. Many of these were kindly submitted to me for examination, and I propose, as soon as my other engagements will permit, to publish the results. I am not as yet able to state the relative positions of these marine fossils and plant-bearing beds. Between them there occurs the Boomer Range, with paleozoic rocks, highly inclined, and of probably Cambrian age. West of this is the basin of the upper tributaries of the Fitzroy, in which newer coal deposits occur. These are the equivalents of the Newcastle beds. They are so overlaid by recent volcanic rocks that it is hopeless to expect to find the relations between them and the strata of the Drummond Range.

A number of fossils were exhibited by the speaker, illustrating the character of the formations he had referred to.

At the conclusion of the paper, Mr. Wilkinson, the Government Geologist, remarked that the fossils were exactly like those found at the Lachlan, in the Forbes district, and the occurrence of this formation in the locality described by Mr. Woods was of especial interest, as showing the wide-spread extent of the lower carboniferous formation. It was found in Smith's Creek and in the Upper Hunter, also west of the dividing range and elsewhere; and the beds were associated with purple, pink, and yellow-coloured sandstone, as described by Mr. Woods. It was important when these rocks were met with, because they were an indication of the formation referred to, in which coal exists in other parts of the world. Some of these were to be seen near Narrandera and Mount Browne. They all, as it were, represented islets of the same formation, the intermediate country being filled up by a newer formation. At Smith's Creek, in the locality of these rocks, coal beds had been seen, but they had proved to be of very little value; still in some of these localities workable and valuable coal might be found, and therefore this subject became one of great importance as the railways extended into the interior of the country.

A vote of thanks was passed to the contributor for his valuable paper.

PROCEEDINGS OF SOCIETIES.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

This Club held its usual monthly meeting on Monday, the 12th ulto., at the Royal Society's Hall, the attendance of members being very good, and the Rev. J. J. Halley, one of the Vice-Presidents, presided.

Two new members, viz., Messrs. H. Kennon and N. P. Caire were added to the roll, after which Mr. C. French announced that Mr. G. Berthoud, of Runnymede, would, at the next meeting, read an account of a recent trip made by him to the Johnstone River, North Queensland.

The papers read were of a very interesting nature, comprising, first, the concluding description of Victorian Parrots, by Mr. T. A. F. Leith, who mentioned that at least one-half of the Parrots known as belonging to Australia proper may be obtained in Victoria, the species described being Swainson's (*Trichoglossus Swainsoni*), Swift (*T. discolor*), Musk (*T. concinnus*), Porphyry-crowned (*T. porphyrocephalus*), and Little Lorikeet (*T. pusillus*); second, a few notes on Australian Foraminifera, by Mr. H. Watts, who exhibited under his microscope 14 species from the Eocene beds at Mt. Martha, 8 from the Miocene at Waurn Ponds, 3 from the Pliocene at Cheltenham, and 14 from Hobson's Bay, Queenscliff, and Griffiths' Point, all of these being mounted in Mr. Watts' usual careful manner, and many of them being also very rare. Mr. Watts, amongst other curious facts, mentioned that species of Foraminifera that had been dredged from the Atlantic, and found also in the English chalk-beds, were identical with some found by him at Mt. Martha and at the Waurn Ponds near Geelong. The last paper was a further contribution from Mr. A. J. Campbell on Australian Oology. This was confined principally to the description of the eggs of the numerous family of the Honey-eaters (*Meliphagidæ*). From Mr. Campbell's statement, it appears that 75 Australian species are known, although the eggs of only 48 have, up to the present, been taken. Of these 48 Mr. Campbell showed 31, and of these it appears 10 are not only not described by Gould, but, so far as the writer is aware, are not elsewhere described. The nests of several were also shown, and, from the different methods and materials employed in their construction, formed a specially attractive part of Mr. Campbell's exhibit. Amongst other exhibits may be noted a fine piece of red coral (*Tubipora musica*) from the Aru Islands, shown by Mr. J. F. Bailey; a case of insects, principally beetles, collected by Mr. A. Goldie at Mt. Astrolabe, in New Guinea, and shown by Mr. C. French; eggs of sixteen varieties of parrots, by Mr. T. A. F. Leith; Coleoptera, Mollusca, &c., by Messrs. G. Coghill, and H. Kennon.

After a pleasant conversazione, during which several members intimated their desire to organise an excursion for the Easter holidays, the meeting separated.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The ordinary monthly meeting of the Microscopical Society was held on Thursday evening, 1st March, the President, Dr. Ralph, occupying the chair.

Mr. Barnard read some notes on the Microscopical Examination of Tea, describing the steps which he had taken to become acquainted with the characteristics of the genuine leaf, and to form a collection of standard types of the various kinds of tea imported into the colony. A number of illustrative slides were exhibited, in which members were much interested.

Mr. M. J. Allan gave an account of his experience in preparing double-stained plant-sections, and showed some very satisfactory specimens. He favored the picric acid and carmine process as more simple and expeditious than double-staining with carmine and green or blue.

Mr. J. F. Bailey exhibited a series of specimens in animal and human histology very beautifully prepared.

THE ROYAL SOCIETY OF VICTORIA.

[No meetings of this Society were held in the months of January and February.]

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 28th February. The President, C. S. Wilkinson, F.G.S., &c., in the Chair.

The following gentlemen were elected members of the Society: James Fallick, Esq., Sydney; James D. Cox, Esq., Mudgee; P. N. Trebeck, Esq.; Spencer Clay Burnell, Esq., 174 Forbes Street, Darlinghurst; Henry Hamilton Onslow, Esq., Mines Department; Frank Meyrick de Meyrick, Esq., Peates Ferry, Hawkesbury River; J. Macdonald, Esq., Mason Brothers, Sydney.

The receipt of a number of donations was announced.

The following papers were read:—

1. "On the Coal Flora of Australia." By the Rev. J. E. Tenison-Woods, F.L.S., F.G.S., &c. This was a complete monograph of all the known fossil-coal plants, including the new

species recently discovered by the author. A diagnosis of each species was given, together with a history of the subject and its literature. The author also added his own views with reference to the classification, in which he regards some of the Newcastle beds as Permian, some as Trias, and the Ipswich beds (Queensland), the Victorian carbonaceous (Bellerine, Cape Otway, Apollo Bay, Colac, and the Wannon), Tasmanian (Jerusalem) and the Hawkesbury sandstone, as Jurassic or Lower Oolite. He expresses a doubt whether the Wianamatta beds can be regarded as a distinct formation, his own opinion being that they are shales distributed at various levels all through the Hawkesbury sandstone. The new species of plants described are—*Phyllotheca concinna*, *Equisetum rotiferum*, *Vertebraria tivoliensis*, *V. towarrensis*, *Sphenopteris (Aneimoides) flabellifolia*, *S. (A.) f.* var. *erecta*, *Trichomanides laxum*, *T. spinifolium*, *Thinnfeldia media*, *T. australis*, *T. falcata*, *Alethopteris currani*, *Tæniopteris carruthersi*, *Gleichenia* (?) *lineata*, *Jeanpaulia bidens*, *Ptilophyllum oligonerum*, *Brachyphyllum crassum* (which the author thinks may be a variety of *B. manidare*), *Sequoiites australis*, *Walchia milneana*, *Cunninghamites australis*. Besides these new species the following Indian or European fossils are new to Australia—*Podozamites lanceolatus*, Lindley and Hutton; *Merianopsis major*, Feist; *Angiopteridium ensis*, Oldham. The monograph is meant to be a complete reference for students on the subject of Australian coal fossils, and is illustrated by six plates of heliographs and two of lithographs.

2. "Further contributions to the Flora of Queensland." By the Rev. B. Scortechini, F.L.S. This paper contains an account of plants, collected by the author in the neighbourhood of Stanthorpe, all of which are new to the Flora of Queensland; one, a variety of *Grevillea ilicifolia*, which Baron von Mueller was at first inclined to consider a distinct species, and a new species of *Bossiæa*, *B. Scortechini*, F. v. M.

3. "Descriptions of two new Fungi." By the Rev. Carl Kalchbrenner. The species described are *Polyporus Pentzkei* and *Paxillus hirtulus*, both from the Daintree River, Queensland.

4. "Notes on the Fructification of the Bunya Bunya in Sydney." By the Hon. James Norton, M.L.C. The author observes that the fertilised seeds require at least eighteen months to come to perfection; and he further notes that *Pinus insignis* is now producing cones freely, which are fertile, although no male catkins have as yet, he believes, been produced. The ovules may probably have been fertilised by pollen from some allied species.

5. "Descriptions of some new Fishes from Port Jackson." By E. P. Ramsay, F.L.S. In this paper Mr. Ramsay describes a species of *Saurida* (*Saurida feroxi*), also new species of *Gengoroge* and *Percis*.

6. The President read some "Notes on the Tuena Gold-Reefs." By M. F. RATE, Mining Engineer. The author gives a description of the workings, and of the mode of occurrence of the gold and the rocks associated with it. He points out the importance of the relations between eruptive and dyke rocks and mineral deposits, and calls attention to the rather unusual fact of the presence of calcite in quartz at the Lucky Hit reef.

The Rev. J. E. TENISON-WOODS exhibited some of the Coal Fossils described in his paper, namely, *Sphenopteris crebra*, *Phyllotheca concinna*, and *Taxites media*. Also a specimen of *Sagenopteris rhoifolia*, the second found in Australia, from the Oolitic plant beds, Darling Downs, Queensland.

Mr. PERCEVAL PEDLEY exhibited specimens of Copper from Mount Hope and Great Central Copper Mines, includieg interesting specimens of malachite, blue carbonate, sulphides, and red oxide of copper, taken from various depths from the surface to 120 feet.

Mr. ALEXANDER MORTON, of the Australian Museum, exhibited a collection of New Guinea Implements, consisting of masks, clubs, stone adzes, belts, nets, drills, shields, ornamented pipes, etc. Many of the stone implements are unique and very interesting; one in particular was formed of a fossiliferous rock. These were portion of a large and valuable collection kindly lent by Mr. Wilson, of Mason Bros.

Mr. H. K. BENNETT exhibited specimens of the Spinifex or Porcupine grass (*Triodia irritans*), from the interior of New South Wales; also the Mallee hen (*Leipoa ocellata*), with the young and eggs; also sand from the nest from which the eggs were taken.

THE ROYAL SOCIETY OF SOUTH AUSTRALIA

In view of the very interesting character of the paper on Hydatids recently read before this Society by Dr. Davies Thomas, we give the report of the discussion which ensued thereon at the meeting held in December last, as follows:—

Professor TATE, in initiating the discussion on Dr. Thomas's papers on Hydatids, said he thought there was something incompatible in the existence of the disease in the South-East, where there were large quantities of water, and he would rather have expected that it would be found most frequently in the North, where the people for the most part got their water from dams, and towards the Wimmera District. He was also disposed to doubt the localisation of the disease by the statistics which had been given, and was rather disposed to think that the reputation of Dr. Jackson, formerly of Mount Gambier Hospital, had something to do with the disproportionate number of cases that had been discovered in the South-East. In fact he thought the Mount Gambier Hospital had drained large districts of Victoria of hydatid cases. Those acquainted with Mount Gambier knew that the water was always running underground and near the surface, so that it could not be contaminated by dogs, and the water used for domestic purposes was for the most part obtained from wells, the swamp water being rarely used. Then the statistics showed that women and children died of this disease in about the same proportion as the men who might be supposed to run greater danger on account of their vocations, clearly indicating that the disease was generated near the homes. For his own part he was disposed to think that the disease was largely communicated by means of the fresh vegetables so generally used in salads while in an uncooked state. More evidence should be obtained on the point whether water was the chief means of conveying the *Tænia Echinococcus* into the intestines of the human subject, as the statistics available had so far failed to prove that. We wanted to know how the disease was contracted, and the circumstances under which it was contracted, how long the eggs would endure submerging in water, and whether they would float or sink, and what was the amount of temperature they would stand without losing their vitality? It was also desirable to ascertain if the eggs when deposited in a swamp and subsequently blown about with the dust when the swamp had dried up would retain their vitality. These important enquiries into the secondary causes of hydatids could not be carried out effectually by private persons. It was a work that should be undertaken by Government, and it would not be out of place for the Society to suggest to the Government the advisableness of having such investigations carried out, as these statistics showed that the disease was a growing one. Another question was—Could we deal with this difficulty from the dog point of view? Could we cure the dogs? If not, all the dogs should be killed and cremated. The disease should be stamped out at all events, for it in a measure involved the life of the nation. Under these circumstances the Government would be very wrong if they did not do something to deal effectively with this disease in its infancy.

Dr. Peel Nesbitt thought there was no doubt that the ova were ingested with uncooked vegetables, and this was probably the reason why the disease was so common in the neighbourhood of Mount Gambier, because it did not exist in the North, where the people drank water obtained from dams and did not often get fresh vegetables to eat. He did not believe, however, that many patients suffering from hydatids came to Mount Gambier Hospital from Victoria, for, although Dr. Jackson had a high reputation, every effort was made to exclude Victorian patients, and consequently there would be some proportion between the various diseases healed. He agreed that something should be done with the dogs if the disease was to be stamped out.

Mr. SMEATON suggested that it might be well to go further back— to the sheeps' livers with which the dogs were fed.

Mr. SMYTH was of opinion that some comparison should be instituted between the livers of the sheep in Adelaide and those of the sheep in the South-East, with the view of ascertaining why the latter contained more hydatids than the former. If the disease was communicated by means of uncooked vegetables it should be very prevalent in and around Adelaide.

Professor TATE asked Dr. Thomas if the water of the South-East had been examined with a view of detecting any eggs of the Tœnia, as this was one link in the chain of research which should be carried out.

Dr. THOMAS was of opinion that this had not been done.

The CHAIRMAN said that there could be no doubt that this was a subject which was of the greatest importance to this colony, because if Dr. Thomas's papers proved anything they proved that hydatids were largely on the increase, that they were spreading from place to place, and that year by year a larger number of people died from them. After complimenting Dr. Thomas on his research, he expressed the opinion that the papers would do a great deal of good in dissipating some of the ignorance that existed amongst people with respect to the causes and development of this disease. He had felt for some time that although scientific men had done a great deal in investigating this subject, they had not quite succeeded in clearing up all the difficult points connected with hydatid disease as it affected man. The *Tœnia Echinococcus*, like the tape-worm, had to pass through two stages—first, as larvæ in the cysts, and then in a developed state after it had obtained entrance into the human subject. The pink tapeworm was caused by eating measly pork. Some portions of this tapeworm having been given to the pig it becomes infected, and through the larvæ the cysts were formed. Then the cysts having been taken from the pig and administered to man eventually result in the tapeworm. There was no doubt that there was a direct connection between the cysts in one animal and the tapeworm in another; and it was also certain that there were different kinds of tapeworms and different kinds of cysts which affected or preferred particular animals. In fact, it was possible to determine from an examination of the cysts to predict the kind of tapeworm that would be produced, and to fix upon the kind of animal that bred it. They found, moreover, that there were certain larvæ in the cow, in the pig, in the sheep, in dogs, and in man which were called hydatids, and, so far as they had been able to tell, there was a great resemblance between the hydatids of the sheep and of man. Up to recent times these had distinct names, but closer observation had led scientific men to the opinion that the hydatids of the sheep and of man were identical that they were both derived from the *Tœnia Echinococcus*. Personally he was satisfied of this identity, but it was only an assumption which might at some future time be overturned. He was strongly of opinion that this question should receive more attention than it had, and this was apparent when they remembered the evidence upon which scientific men had based their conclusion that hydatids come from the Tœnia in the dog. Experiments in dogs had been generally successful in countries where Tœnia were rare; but in this colony, where they were common, such experiments would not be so satisfactory. So far, however, failure had attended all experiments to convey hydatids taken from the human subject to dogs, and this was the weak link in the chain. It had not been demonstrated absolutely and positively that the Tœnia was the cause of hydatids. He would suggest to Dr. Thomas the advisableness of experimenting in this direction, in order to get a satisfactory solution of the problem, and he believed that this end could be attained by an expenditure of time, money, patience, and some little personal risk. And this would be a great gain, because it was the question of questions in regard to the settlement of the origin of hydatid disease. He also thought that a large number of ova obtained from the Tœnia in this colony should be sent to England for experiment in the same direction. He was afraid that he had made a mistake in saying "to England," because if a scientific man caused the same amount of pain to animals, with a view of discovering something that would tend to the saving of human life, as resulted from many so-called sports, he would stand a good chance of seeing the inside of one of Her Majesty's prisons. These ova should be sent to some place where the physiologist and the biologist were not watched by the policeman while they were making their experiments. Physiology was not exactly dead in England, but it was seriously hindered in its investigations by the sentimentality of old women of both sexes. While he could bear testimony to the industry that had characterized Dr. Thomas in the collection of his statistics, he was afraid he could not agree with some of the conclusions that he had drawn. The leading proposition in his second paper was that there were four factors which regulated the spread of hydatid disease in any country—(1) the number of dogs in proportion to the population of the country; (2) the number of sheep and oxen in the country; (3) the opportunities that existed for the dogs to swallow the eggs bred in the sheep; (4) the frequency with which the dog devoured the organs of infected sheep containing hydatids. So far as Australia was concerned, the two last factors would be equal in all the colonies, and the sheep in one colony would be just as liable to get the disease as any other, so that they were reduced to the other two factors. Although there was only one series of figures the conclusions suggested were different from those drawn by Dr. Thomas. In Victoria the number of dogs during the seven years dealt with remained about stationary, viz., one dog to every twenty of the inhabitants, but the death from hydatids had enormously increased. From 1872 to 1877 the number of deaths was 960, but in the next five years they had increased to 1,150. Of course there had been some slight increase in population, which should be taken into consideration, but that should not add more than three or four deaths to the number, but instead of that they had an annual average death-rate of 231 against 182. Then, as to the other factor, the statistics seemed to prove that the greater the number of sheep and oxen the less hydatids. New South Wales had the most stock, but was only fifth on the list of mortality from hydatid disease, while Victoria, with the least stock, had, in proportion to her population, the highest death-rate from hydatids. Queensland, in stock, came close behind New South Wales, and there hydatids were practically unknown, as only six cases of death from that cause had been reported. From these facts he was disposed to think that there was something wrong about Dr. Thomas's figures—there seemed to be a hidden factor somewhere, which had not yet been discovered, but he hoped that Dr. Thomas, during his forthcoming visit to the South-East, would be able to ascertain what it was. With regard to the number of cases of hydatids at Mount Gambier, he was inclined to think that the comparison had not been drawn correctly — that Dr. Thomas had overlooked one fact which vitiated a great part of the conclusion he had come to, that the South-East was, next to Iceland, the country most affected by hydatids. He had taken the experience of the Adelaide Hospital during the past thirty years, and the experience of the Mount Gambier Hospital for seven years, and this was hardly fair. The first death from hydatids in the Adelaide Hospital was reported in 1876, and it was only right to assume that the disease had not been known, or made its appearance, in Australia much before that time. A most equitable comparison would have been to take the results of seven years' experience at both Hospitals, and if this were done he did not think that there would be a very great difference in the proportion of persons suffering from hydatid disease. The practical question we had to deal with was how to arrest the ravages of this enemy, which was rapidly extending in all directions, and, although it might be necessary to call on the Government to assist in making the prolonged enquiries that were necessary, a great deal might be done by the agencies already available. Professor Tate had asked a question with regard to the vitality of the Tænia. He did not know that any evidence existed with regard to that, but Davaine had demonstated the extreme vitality of the pig tape-worm. After the ova had been kept in water for over twelve months, it was found to be living and able to create disease in animals to whom it was administered. Other observers had ascertained that, even after the worms had become rotten and mildewed, the eggs, when taken away and administered to animals, produced cystic disease. There was one satisfactory fact about the matter, however, and it was this—that all observers were agreed that after the eggs became dry they lost their vitality; and bearing this in mind it was easy to realize the vast amount of good done by our hot weather and winds. If there were the requisite determination, he was convinced that the disease could be stamped out in three or four months, because Tœnia were not very long-lived parasites, and came to maturity and fulfilled all their functions in ten or thirteen weeks. If all those interested in the slaughter of sheep, oxen, pigs, and other animals whenever they saw any indication of hydatids in their internal organs cut the affected parts and burned them the disease would be stamped out within four months. Of course there would be still those animals affected with the diseases; but so far as human beings were concerned, the doctors would cure some, the hydatids would kill some, and others again would outlive the hydatids. There was a want of knowledge how to deal with this matter all over the colony; the people were looking everywhere for means to escape from or to cope with this disease, but they had looked in the wrong directions.

Dr. Thomas, in reply to the criticisms and observations made on his papers, referred briefly to the various points involved in the discussion of such a subject, and expressed the opinion that Professor Tate had pointed out the direction in which enquiries should be made. While his statistics were not so complete as was desirable, he believed they were as complete as could be obtained in the colonies. He believed that the tapeworm and Tœnia were conveyed into the dog by means of herbivorous animals, and that at least 40 per-cent. of the stray dogs of the city were affected with this pest. In fact, the specimens of the Tœnia which had been shown under the microscope had been taken from various dogs of that description. He suggested that a lot of pugs or other animals should be obtained and inoculated, and kept for say twelve months, as by this means all the stages of parasite from the larvæ to the secondary cysts might be ascertained. Even if his comparison had been restricted to a seven years' experience of the Adelaide and Mount Gambier Hospitals he did not think that it would alter the fact that the South-East was the worst place after Iceland for hydatids. In referring to the four factors which, in his opinion, regulated the spread of hydatids, he never meant to say that the number of herbivorous animals or dogs decided this question, but that these factors must all work together in a co-ordinate strain. With regard to water being the main medium for the propagation of the disease, Dr. Jackson was distinctly of opinion, before the people of the South-East awoke to the fact, that their water was their poison, that they were very careless in their use of it, but he intended to have the water of the district tested, not only shortly, but also later on in the season. He also intended, if possible, to ascertain what proportion of the sheep and cattle had the hydatid disease. Mr. Chalwin, the veterinary surgeon, had made the statement on good authority that every beast was affected, and also the kangaroos, as he thought the kangaroos were very much affected with hydatids of the liver, and, of course, when the dogs killed them they contracted the disease. With regard to the dogs, he was convinced that if he could not find 40 per cent. unaffected in Adelaide, the percentage would be 60 or 100 in the South-East. Dr. Thomas concluded by urging the imposition of a substantial dog-tax to be strictly enforced; a quarantine for dogs brought out from England, in order that the introduction of hydrophobia might be prevented, for if we once got it here, which was not at all improbable in view of the short passages now made by the steamers, we should never get rid of it; and a central abattoir, from which dogs should be excluded.

NOTES, MEMORANDA, &c.

We have to acknowledge the receipt from the Royal Society of Tasmania, of the Annual Report for the year 1882, and are pleased to observe from it that the Society is in a prosperous condition, and increasing its membership and its usefulness.

We have received from the publishers "McIvor's Farmer's Annual for 1883," the object of which is "to provide the colonial settler with a reliable and popular guide to the farming operations of the year." The volume commences with a scientific but simple description of the organic processes which are involved in the growth of plants, and contains a farm calender, and numerous articles on crops, grasses, and fodder plants; farm pests; sheep husbandry; the soil; the dairy; the veterinarian; and a number of notes on miscellaneous subjects interesting to farmers generally. The Annual seems well calculated to fulfil the object aimed at, and should command an extensive circulation among the class to which it addresses itself.

We have also to acknowledge the receipt from the author (Mr. T. A. F. Leith) of a pamphlet, entitled "The Parrot Family and Parrots of Victoria," which will receive a fuller notice in next issue.

Vol. [illegible] No. 4. April, 1883.

THE

Southern Science Record.

AND

MAGAZINE OF NATURAL HISTORY.

CONTENTS:

PRICE--ONE SHILLING.

COLLINGWOOD:
J. WING, 33 WELLINGTON STREET.
1883.

Definitions of some New Australian Plants, by Baron Ferd. von Mueller, K.C.M.G., M.D., Ph. D., F.R.S.

[Continued.]

Platylobium alternifolium.—Dwarf, prostrate or ascending; leaves on stalks of considerable length, alternate, cordate or some almost orbicular, pointed at the summit, otherwise not angular, strongly net-veined; flowerstalks longer than the calyx, beset with scattered bracts to near the bracteoles; corolla comparatively small; pod on a very short stipe, hardly longer than broad.

On Mount Disappointment, F. v. M.; on Mount Ben Nevis, Ch. Green; on Mount William, Sullivan and Miller.

This evidently rare species differs from *P. formosum* in humbler growth, in generally smaller but proportionately broader leaves, in less extended flower-stalks, in less crowded bracts and in a shorter pod; from all the three known congeners it is moreover separated by its scattered leaves and remarkably elongated leaf-stalks. Therefore it is now seen, that alternate as well as opposite leaves occur in the genus Platylobium like in Bossiæa; indeed the latter could readily be incorporated in the former genus, because the main difference of Bossiæa, that of the pod being devoid of the unilateral plate of Platylobium, is not available in some co-ordinal genera, for instance Cassia. Likewise inconsistently Oxylobium and Gastrolobium are kept out of Chorizema on notes of no generic significance in Jacksonia, while similarly on unreliable grounds Burtonia is left separated from Gompholobium.

Helichrysum MacIvorii.—Annual, slightly papillar-downy; stems simple, generally solitary; leaves linear, pointed, the lower elongated, the upper much abbreviated; involucre large, glabrous, hemispheric and radiating, the outer bracts light-brownish, ovate- or lanceolate-oblong, the innermost bracts consisting of a broad flat stipe and a large yellow oval ligule; all bracts entire; receptacle flat; outer flowers fertile, inner numerous and sterile, all bisexual and pappus-bearing; tube of the corolla downward beset with scattered minute papilles, upwards gradually attenuated, at the base turgid; silky vestiture of the achenes much extending beyond its summit; bristles of the pappus 12-16, serrulate-scabrous, at the top bright-yellow papillar and club-shaped.

In the vicinity of the Gascoyne River; Honorable J. Forrest, C.M.G.

Distinct from *H. subulifolium* and *H. filifolium* in its indument, flatter leaves, much longer and pointed hair of the achenes and also particularly in pappus-bristles with thickened apices, such as occur in *H. roseum* and *H. chlorocephalum*. Besides *H. subulifolium* is a larger plant, and produces more numerous pappus bristles.

This pretty "Everlasting" is dedicated to Ralph W. Emerson MacIvor, Esq., B.Sc., F.I.C., F.C.S., who, as a leader in applying the laws of Chemistry to Australian rural resources, is lastingly advancing the prosperity of these far Southern British Dominions.

Orchids of the Loddon Valley.

By J. N. McKibbin.

[Read before the Field Naturalists' Club of Victoria 11th September, 1882.]

Although Victoria abounds with many varieties of beautiful flowers, none of them surpasses the Orchids. The peculiar form and gorgeous colors of many of the species, combined with the ease with which many of them can be transferred to the conservatory or garden, render them more prized by the florist than most other native plants.

As it is intended, in this paper, to avoid all scientific terms possible, merely giving the name, its proper appellation, which the most casual collector should acquire, for obvious reasons, it may not be out of place to make a few general remarks on the Order.

The genera of Orchideæ are known chiefly by their pollen-masses.

In Sarcochilus, Dendrobium and Dipodium they are waxy; and in Gastrodia granular. In all the other genera they are powdery, so far as the Australian Orchids are concerned.

The flowers of the Order consist of an outer and inner row of sepals; Baron von Mueller now calls them simply calyx-lobes, in conformity with the same organs in Amaryllideæ and allied orders, mostly unequal, much resembling petals, one of the inner sepals (except in Thelymitra) shaped very different from the rest (called lip or labellum); only one stamen, very rarely two, the style forming a one-sided column; one-celled ovary, bursting into three valves and containing numerous, sometimes myriads of minute seeds.

There are only three epiphytal species in this colony, but over seventy well-marked terrestrial Orchideæ, of which, during my sojourn in Maryborough, I succeeded in collecting thirty-three species, one of them (*Thelymitra McKibbinii*), F. v. Mueller, new to science, and others new to Victoria or very rare.

In giving a superficial description of the "Orchideæ of the Loddon Valley," it is intended to deviate from the scientific course by giving them in the order of blooming rather than in their generic order: those desirous of obtaining a fuller knowledge of the order can get such by referring to the sixth volume of "Flora Australiensis," which describes all the known species up to the date of publication.

1. *Caladenia deformis*—(R. Br.).—Five sepals, pale blue, open, equal, length 6 lines, breadth 1 line; labellum 4 lines long, 1 broad, pink at lower half, with white beard, dark purple top, blue beard, much curved; column 3 lines long, hollow, purplish mottled, thick tip, yellow; stem 6 inches, green, with long narrow leaf; flower single, rarely two. *Scattered. 15th August.

2. *C. carnea*—(R. Br.).—Flower pale flesh-color to almost white; 5 sepals, upper one erect over column, the other four projecting, horizontal, equal in size, 3 lines long, less than one line broad; length of labellum $2\frac{1}{2}$ lines, lower half 2 lines broad, narrowing abruptly in a point, curved; 2 rows yellow beard down centre, all over reddish markings; beard column erect, hollow, transverse red lines, top yellow (pollen masses); stem 4 inches, with very narrow leaf; flowers single, rarely two.

3. *C. cærulea*—(R. Br.).—Sepals 5, upper one erect over column, the other four a little broader, 1 line, projecting like *C. carnea*; color blue, labellum 3 lines long; lower half 2 lines broad, clasping the column; 2 rows yellow pointed prominences down centre; lower part purplish, with darker transverse markings; upper part white; column 2 lines long, purplish mottled; under tip yellow; stem reddish, 3 inches, with leaf $1\frac{1}{2}$ inches long, 1 line broad; flower single; rare (not found in Central Victoria before this Spring, 1881). September.

[And here permit me to express my thanks to our worthy Govt. Botanist, Baron von Mueller, for valuable aid, so readily given, respecting this and other orchids, which will be noticed further on; for, as I had no work of reference with me, I was obliged to apply to him oftener than otherwise would have been the case].

4. *C. alata*—(R. Br.).—Somewhat resembling *C. carnea* in flower, but longer stem and from 2 to 6 flowers on each; besides not in bloom for a month after. End of September.

5. *Diuris maculata*—(Smith).—"Double tail." A very neat orchid, with prettily-marked sepals, except the lower two, which are green and narrow, projecting downwards; the others are very unequal, the upper one broad and somewhat oval; two side ones pear-shaped and much longer, two below rather small and oval; all yellow ground, beautifully spotted with dark chocolate unequal markings; labellum rather like upper sepal, but shorter and broader at top; column short, erect, white, with two appendages adjoining; stems 6 or 8 inches long; leaves

narrow, nearly as long as stem; flowers 2 to 8, or more. September (scattered).

6. *D. pedunculata*—(R. Br.).—As in all kinds of Diures, 2 depending green outer sepals, but longer in proportion to inner sepals, which are yellow, with dark lines extending from base upwards; only 3 sepals yellow, nearly equal, over half an inch long; stem 8 to 10 inches, with narrow leaves and bracts; flowers one to four, not many. (September).

7. *D. palustris*—(Lindley).—Somewhat resembling *D. maculata*, but sepals are nearly equal, much darker in color, and the plant seldom exceeds 3 inches in height, with very narrow leaves as long as stem; bracts extend beyond flowers, one to three on stem, very scarce, but found generally with *D. maculata*. A month later in bloom.

8. *Glossodia major*—(Derives name from the tongue-like basal appendage of the labellum).—Five almost equal lilac sepals, nearly $\frac{3}{4}$ inch long, white and lilac at base, labellum tongue-like, $\frac{1}{4}$ inch long, white at base, lilac at tip; column erect, narrow at base, broad near top, and doubling over pollen-masses at base of tongue; stem 8-10 inches, with single leaf not over 2 inches long and $\frac{1}{4}$ inch broad; flowers single, very seldom two on stalk; on hill sides; generally found on the southern shade of trees, which applies with regard to all Orchideæ.

Var. alba.—Merely a white variety of *G. major*, resembling it in all but color, and very seldom met with. September.

9. *Pterostylis mutica*—(The genus so called from the wing-like appendage on upper part of the column). — Sepals 5, very unequal, green and always less or more adhering, thus preventing the inner appendages from being seen; upper sepal, canoe-like, curved over the others; 2 side ones same length ($\frac{1}{4}$ inch), half as broad; two lower ones rather narrower and shorter, adhering, nearly closing with the upper curved one; labellum short and narrowed, and lying on the lower sepals, but upon the least touch, it springs up and stands against the column—a peculiar sensitiveness possessed by the whole genus; column erect and towards the top with two wing-like appendages attached in the middle, and covering the upper gland; stem 4 or 5 inches long, growing out of a ray of leaves (6 or more); bracts $\frac{1}{4}$ inch long, and from two to a dozen flowers, seldom more than two or three together. Widely scattered. (September 3rd).

10. *Caladenia pulcherrima*—(Spider Orchid).—This is one of the prettiest species among the Order, and contains a number of varieties, some of which might be regarded as distinct species, if so many intermediate forms did not occur, for certainly they show a wider difference, especially outwardly, than some species of the Thelymitras or Pterostylis; but we must yield to the superior knowledge of our Government Botanist, who has placed them all under the above species; this orchid, being

of the widest distribution and of greater adaptation to various soil, is more variable than any others of ours; 5 sepals, in some varieties very narrow, others having the lower two half an inch broad and pectinated, but all ending in a thread-like point $1\frac{1}{2}$ inches long, generally white with dark red spots; labellum double the breadth of outer sepals, over $\frac{1}{2}$ inch long, curved, bearded, and varying from spots of chocolate color to being all over same color; column erect, broader near top and doubled, with pollen masses bent over it; stem 8 or 10 inches, with single leaf 2 inches long, varying in breadth; flowers single or scattered, but few. 12th September.

11. *Thelymitra longifolia*—(FORSTER).—In this genus we have the sixth sepal in conformity with the other five: also a cap-like expansion of the column over the stigma, whence its name. Sepals 6, nearly equal, pale blue, long pointed, $\frac{3}{4}$ inch long; column erect, pale blue below, pale yellow at top, hooded-like, from which project two nearly white appendages; stem 8-10 inches, fleshy, from which we get a spike of 6-10 flowers; leaf rather fleshy and narrow. Scattered, but not plentiful, varies rarely with white flowers. Low Hills. 20th September.

12. *T. McKibbinii*—(F. v. M.).—Sepals 6, nearly equal, of violet-color, shorter and less pointed than *T. longifolia*; column pale blue at base, bright yellow at top, the other appendages (anther) nearly white; stem 6 inches long, with very narrow leaf, rather fleshy, sometimes single flowers, generally two; very rare. I have only found it in two places, some miles distant. For a full description see "Chemist and Druggist," Oct., 1881 (F.v.M.). Baron von Mueller has informed me, that the species has lately been discovered in Southern and Western Australia.

13. *T. antennifera*—(J. HOOKER).—Sepals 6, a little smaller than the above, bright-yellow; column pale-yellow, with chocolate-red appendages; stem 4 inches, small, with bract-like leaves up the stalk, which curves or angles; leaf narrow, nearly as long as stem; flowers one to three. Very scarce. 29th September.

14. *T. MacMillanii*—(F. v. M.).—Much like *T. antennifera* in leaf, stem, and bracts, but differs in color, being a dark red, and having much smaller apppendages to column, which is dark in color. Very scarce; only one specimen obtained from Mount Martha in 1865 (F. v. M.). I have only taken six plants in the district. 10th October.

15. *Microtis porrifolia*—(So called from its leek-like leaf, which is often longer than the stem).—This is not a very interesting orchid, being small, of a green color, and the sepals small, nearly equal, and shorter than the ovary. Not at all attractive; column is peculiarly auriculated; stem has many spicate flowers. Widely scattered, and not particular to locality. 10th October.

16. *Prasophyllum patens* — (R. Br.).— So called from its leek-like leaf. This genus is remarkable by having its flowers turned upside down; sepals 5, the 2 under ones narrow, half an inch long, pale green; 2 side ones a little shorter, white, upper one longer and much pointed, but at base boat-like; labellum as long and broader than either, curved, nearly white; column short; stem thick, fleshy, 8-10 inches; leaf longer; flowers spicate, 10-12 or more. Scattered, but scarce. 12th October.

17. *Calochilus Robertsoni* — (Bentham).—Sepals 5, nearly equal, except upper one boat-like and broader, all pale-green; labellum remarkable, and at once distinguishes the genus by its long-bearded form of a purplish color, and $\frac{3}{4}$ inch long; column short, with yellowish white top; stem 8-10 inches, with a leaf as long, and two or three bracts, the upper one extending above the two, or sometimes it bears three flowers. Very scarce on Hills. Perhaps a mere variety of *C. campestris*—(R. Br.). 5th October.

18. *Thelymitra carnea*—This orchid somewhat resembles *T. Macmillanii*, but its color differs, as the name implies, flesh-color; sepals narrower and more pointed; no other difference to a casual observer. Very scarce. Hills. 25th October.

19. *T. ixioides* —(Swartz).—The description given of *T. longifolia* will serve for this, with the following exceptions:—deeper blue; of the lower 3 sepals each has 3 or 4 dark dots; longer bracts, and sepals, possibly a little shorter and rounded at top. Scarce. 25th October.

20. *Prasophyllum fuscum* —(R. Br.).—The description of *P. patens* will serve for this one, only the flower is a little smaller and color green, whereas *P. patens* is white. Scarce. 27th October.

21. *Pterostylis rufa*.—Sepals 5, very unequal, upper one canoe-like, deep, and much curved at top, with half-an-inch of thread-like point; two side-ones half-breadth, ending in point; 2 lower ones narrow at base, widening in middle, and terminating in $\frac{3}{4}$ inch threadlike points; erect; color yellowish-red, with lighter lines; labellum rather short, broad, bent down, but very sensitive to the touch; column erect; broad wings yellowish at top. Scattered, but found singly; stem 6 inches; leaves radical; flowers two on stalk. 5th December.

Although I pursued my pleasurable pastime with equal zeal, I failed to find a new specimen of orchid up to the Autumn (20th April), arising from the parched state of the district, which continued for over three months.

22. *Eriochilus autumnalis* — (R. Br.).—This orchid much resembles *C. carnea* in flower, but quite different in leaf and time of blooming. Sepals 5, upper three of equal length, $\frac{1}{2}$ inch; lower two somewhat longer, narrow at base, and widening towards top, ending in sharp point; pink in color; labellum as

long as lower sepals, and broader at end, prettily marked; column erect, yellowish at top, and showing large pollen masses. 20th April.

23. *Pterostylis parviflora*—(R. Br.).—Stem 4 inches, with single leaf 1 inch long, $\frac{1}{4}$ broad, not appearing till flower is off; single flower. Flower under $\frac{1}{4}$ inch long, and never opening to show inner appendages; sepals 5, adhering, upper one boat-shape; curved at top over two side ones; two lower ones joined nearly to top, where they meet upper one; color green with narrow white lines; labellum short, of a reddish brown color; column very short, but having the wing-like appendages; stem 6 inches, with short bracts; two to six or more flowers on each stem. In patches. 24th April.

24. *Prasophyllum Archerii* — (J. Hooker). — This orchid may easily escape observation, from its stalk being so much like the young grass among which it is found, the stem not much thicker than a pin, about 6 inches long, and the little spicate flowers not a $\frac{1}{4}$ inch long, of a pale yellow to chocolate color. Only one specimen taken before this in Victoria, on Mount Macedon; very scarce and scattered. Hills. 1st May.

25. *Pterostylis acuminata* —(R. Br.). — This is a pretty orchid, and new to Victoria (F. v. M.). Sepals 5, all adhering; upper one double the breadth of the side ones, boat-like, and terminating in a spine $\frac{1}{4}$ inch long; two side ones same length, with spines also; lower two joined half way up, then narrowing to a thread-like spine extending $\frac{3}{4}$ inch above the upper sepal-like horns; labellum rather narrow, $\frac{3}{4}$ inch long, with spur appendage near base, color brownish, upper side greenish; under, dark at top; column erect, $\frac{3}{4}$ inch long; wings large, tips yellowish; stem 6 inches; short bracts, growing direct from tuber, having one flower, rarely two; over an inch in length; light green in color, with white lines down the three upper sepals; lower sepals green. Rare, in patches. 10th May.

26. *P. reflexa*—(R. Br.).—The description given of *P. acuminata* will be sufficient for this one in outward appearance; the only difference is in the labellum, which is much longer and narrower, the color being brown on both sides, and the time of blooming being about the same. Very scarce.

27. *P. præcox*—(Lindley).—The flower of this orchid has much the appearance of the last two described, but is somewhat smaller, and at once distinguished by the large leaf-like bracts nearly an inch long, at right angles from the stem; sepals 5, same as *P. reflexa*, but $\frac{1}{4}$ shorter, and color reverse of it, namely, white with green lines, also lower sepals white with green lines; labellum $\frac{1}{2}$ inch long, upper pale brown, under white, dark near top; column half inch, erect, much thickened in middle; wings large; stem 4 inches, springing from tubers, with one flower. Plentiful, in patches. 18th June.

28. *P. longifolia*—(R. Br.).—Sepals closely adhering, lower two separate or droop a little only from the others when full blown, the upper three forming a perfect boat in appearance; even the spine to form a sprit; less than ½ inch long; labellum length of other sepals, double-pointed, 4 spines, with very perfect appendage, where joined to lower sepals, to make it spring upright when touched; column short, but like all the Pterostylis; stem 4 inches, with different leaves from all others of genus; 4 leaves, lanceolate, 1 inch long, alternate, bract-like, springing from tubers direct; two flowers; dark green. Rare, on hills. 1st July.

29. *Acianthus exsertus*—(R. Br.).—Sepals 5, upper canoe-shape, pointed, not ¼ inch long; side sepals very short and narrow; lower two over ¼ inch, very narrow, greenish; the others pale reddish color; labellum double the breadth of the other sepals, thick, fleshy, smooth, one spine at top; column short, curved at top; stem 2 inches, color of flowers springing from heart-shaped leaf; under side purplish red; from 2 to 6 or more flowers. Scarce here; at Brighton plentiful. 20th May.

30. *P. nana*—(R. Br.).—In outward appearance may be easily mistaken for *P. concinna*, although smaller in flower, and leaf much smaller and differing in form; but the labellum at once shows them to be different species; sepals 5, upper one canoe-shape, half-an-inch long; 2 side ones same length and of equal breadth, ending in a round point, rather longer than upper one; 2 lower ones joined at base, shortly separating and extending in a thread-like form ¼ inch above the other sepals; labellum very short, light color, ending in a single point; column also short; stem 3 inches long, with bracts; single flower. In patches. Scarce. August.

31. *P. barbata*—(Lindley).—This orchid I have not had in bloom, but the leaves are just like the bracts of *P. præcox* before the flower-stalk begins to spring; it is now showing its flower-bud; three upper sepals over ½ inch, narrow, adhering, lower 2 same length, narrow, not adhering; color deep green; labellum ½ inch long, quite narrow and round, covered with hair equally distributed all over; 1 line in length, with very peculiar brown-colored irregular tip to it, unlike any other orchid I know; column short, and has much the appearance of all the others of the genus; stem 4 inches, with large bracts; flowers single. Scarce. September. *

For the information of those interested in orchid collecting, I may state that of the above orchids we have, within a few miles of Melbourne, the following:—*Pterostylis præcox*, *P.*

* This description may prove not quite correct, as I forced open the flower before it was mature, and they often alter materially. I have two or three others, which I have never seen in bloom: I am therefore unable to describe them.

nana, *P. parviflora*, *P. barbata*, *P. longifolia*, *P. vittata*, *P. obtusa*, *P. aphylla*, *Glossodia major*, *Diuris maculata*, *D. pedunculata*, *Caladenia pulcherrima*, *C. carnea*, *C. deformis*, *Microtis porrifolia*, *Eriochilus autumnalis*, *Acianthus exsertus*, *Thelymitra longifolia*, *T. antennifera*. Besides we have *Diuris punctata*, *Eriochilus fimbriatus*, *Caladenia latifolia*, *Pterostylis cucullata*, *P. pedunculata*, *P. curta*, *P. nutans*, *P. concinna*, and many others, all of which I have collected on or around Malvern Hill, (with one exception) *E. fimbriatus*, a specimen of which I obtained from Mr. French.

This ends my "Notes on the Orchids of Maryborough-District;" and although, when taken, they were only intended for my private use, should they prove a stepping-stone to some of our younger orchid-collectors, and induce them to study the higher works on Botany, my aim in reading this paper will be accomplished.

Native Plants of the Grampians and Vicinity.

Arranged generally under the direction of

Baron Ferdinand von Mueller, K.C.M.G., Government Botanist.

By D. Sullivan.

[Read before the Field Naturalists' Club of Victoria 23rd January, 1882.]

(Continued.)

(III). Synpetaleæ Perigynæ.

1. Santalaceæ.
2. Loranthaceæ.
3. Proteaceæ.
4. Thymeleæ.
5. Rubiaceæ.
5. Caprifoliaceæ.
7. Compositæ.
8. Campanulaceæ.
9. Stylideæ.
10. Goodeniaceæ.
11. Lobeliaceæ.

(1). Santalaceæ.

Exocarpus cupressiformis—(Labill).—Very sparingly scattered over the district.

Leptomenia aphylla—(R. Br.).—About the bases and on the lower ridges of the mountains, not abundant.

(2). Loranthaceæ.

Loranthus pendulus—(Sieber).—Mostly on species of Eucalyptus, from the lowlands to lower ridges of the mountains.

Loranthus celastroides—(SIEBER).—Same as the last, but rarer.

linophyllus—(FENZL.).—Of rare occurrence on the blackwood-trees about the mountains.

(3). PROTEACEÆ.

Banksia marginata—(CAVAN.).—Very generally distributed, especially in the vicinity of the mountains. On the heath-grounds it is reduced to the condition of a mere shrub.

ornata—(F. v. M.).—On the summit of Mount William. A shrub 5-7 feet in height.

Hakea acicularis—(R. BR.).—On the heath-grounds and ridges of the mountains, very common.

ulicina—(R. BR.).—On scrub ridges and heath-ground, common.

rostrata—(F. v. M.).—Heath-ground about the ranges, and on scrub-hills in many places.

dactyloides—(CAVAN).—On stony ridges of the mountains, not rare.

Isopogon ceratophyllus—(R. BR.).—Scrub-land, heath-grounds, and on the mountains, to a height of 1500 feet.

Conospermum Mitchelli—(MEISSN.).—From the heath-grounds to the summit of Mount William, common. Height 3-5 feet.

patens—(SCHLECHT).—Now on one sand-hill only near Moyston. Height 3-5 feet.

Grevillea alpina—(LINDLEY).—Throughout all the heath-grounds, and on the mountains to 1200 feet. Height 1-1½ feet. Flowers orange and red.

variabilis—(LINDLEY).—About the bases of the mountains and on the ridges to a height of 1000 feet. The mountain variety has the leaves more deeply pinnatisected, and the habit is completely prostrate, while that at the base of the mountains is a compact shrub 5-7 feet in height.

dimorpha—(F. v. M.).—Pretty common on the Serra Range, especially about Mount Sturgeon and Mount Abrupt, ascending to the summit of the former. Rarer on the other mountains. Height 4-6 feet.

There is a variety, with long, very narrow leaves. This variety is much rarer than the other, and is, as far as I know, confined to the Serra Range.

Grevillea ilicifolia—(R. BR.).—Sandhills and heath-ground, not rare.

Grevillea Australis—(R. Br.).—Rare, on heath-ground about the Grampians and Victoria Range. Height $1\frac{1}{2}$-3 feet.

confertifolia—(F. v. M.).—In this district confined to the summit of Mount William. Habit prostrate.

Persoonia rigida—(R. Br.).—Not rare about the Grampians, especially in Hall's Gap; also on heath-ground near the Black Range; ascends to about 1000 feet. Hight 4-6 feet.

juniperina—(Labill).—On the heath-grounds, common. Height $1\frac{1}{2}$-2 feet.

4. Thymeleæ.

Pimelea linifolia—(Smith).—Common on the heath-grounds at the base of Mount William.

spathulata—(Labill).—Same as last. These two species are not easily distinguished.

phylicoides—(Meiss).—Heath-grounds, common.

humilis—(R. Br.).—Poor sandy soils, very common.

curviflora—(R. Br.).—Here the most common of all the Pimeleæ. There is a shrubby variety on the mountains.

flava—(R. Br.).—On the mountains to a height of 2000 feet.

5. Rubiaceæ.

Opercularia varia—(J. Hooker).—On the heath-grounds, not rare.

ovata—(J. Hook.).—Moist, sandy, sloping ground, rather scarce. Habit prostrate.

Asperula oligantha—(F. v. M.).—Very common, especially on clayey wet soil.

Galium Gaudichaudi—(D. C.).—Very common.

australe—(D. C.)—Low-lying lands, very common.

Coprosma hirtella—(Labill).—In all the gullies of the mountains and among many loose rocks, to a height of 3000 feet.

(6). Caprifoliaceæ.

Sambucus Gaudichaudi—(D. C.).—In the gullies and ravines of the mountains, not common.

(7). Compositæ.

Aster myrsoides—(A. Cunningh.).—Abundant on the Grampians, rarer about the other ranges.

astrotrichus—(F. v. M.).—Gullies of the mountains.

Aster glandulosus—(LABILL).—Banks of streams.

Huegelii—(F. v. M.).—Heath-ground about the Serra-Range and Rose's Gap, rarer elsewhere.

microphyllus—(LABILL).—Scrub-hills, heath-grounds, and on the mountains to a height of 1000 feet, common.

aculeatus—(LABILL).—On the mountains to an altitude of 2000 feet.

stellulatus—(LABILL).—Ravines of Mount William, rare.

Helichrysum apiculatum—(D. C.).—Throughout the district.

semipapposum—(D. C.).—Common.

lucidum—(HENCKEL).—Common on the Grampians about Hall's Gap.

scorpioides—(LABILL).—Common both on the lower mountain slopes and on the heath-grounds; also on scrub hills.

obcordatum—(F. v. M.).—On the mountains to a height of 2000 feet, not very common.

Blandowskii—(STEETZ)—On the heath-grounds, not rare.

obtusifolium—(F. v. M., and SONDER).—Common on the heath-grounds.

Baxteri—(A. CUNNINGH.).—Always restricted to the mountains. Ascends to an altitude of 2000 feet.

ferrugineum—(LESSING).—On the banks of streams about the mountains, not common.

Oology of Australian Birds.

By A. J. Campbell.

[Read before the Field Naturalists' Club of Victoria 12th March, 1883.]

Part xi.—Order—INSESSORES.

Family—*Meliphagidæ.*

315. Ptilotis plumula —(Plumed Ptilotis). *Locality* — South and West Australia. *Egg*—Pale salmon color, with a zone of a deeper tint at the larger end, and the whole freckled with minute spots of a still darker hue. Length 10 lines; breadth 7 lines.

318. Ptilotis penicillata—(White-plumed Honey-eater). *Locality*—Queensland, New South Wales, and South Australia. * *Egg*—Lengthened in form. Ground color light buff or pinkish, sparingly marked with distinct round spots of reddish-brown and chestnut, with a few purplish grey spots appearing under the surface of the shell, all the markings more inclined to congregate towards the larger end. Length 10 lines; breadth 7 lines.

319. Ptilotis fusca—(Fuscous Honey-eater). *Locality*—Queensland, New South Wales, and Victoria. * *Egg*—Of a beautiful rich salmon color, with a few streaky markings, more particularly on the apex, of pinkish-brown or chestnut. Length 9 lines; breadth 6½ lines.

320. Ptilotis chrysops—(Yellow-faced Honey-eater). *Locality*—Queensland, New South Wales, and Victoria. *Egg*—Lengthened in form and of a deep reddish buff, strongly marked at the larger end with deep chestnut-red and purplish grey; the remainder of the surface ornamented with large spots and blotches of the same color somewhat thinly dispersed. Length 10½ lines; breadth 7 lines.

323. Plectorhyncha lanceolata—(Lanceolated Honey-eater). *Locality*—Queensland, New South Wales, and South Australia. *Egg*—Lengthened in form and of a fleshy white, very minutely sprinkled with reddish buff, forming an indistinct zone at the larger end. Length 11½ lines; breadth 8 lines.

324. Meliphaga phrygia —(Warty-faced Honey-eater). *Locality*—Queensland, New South Wales, and Victoria. *Egg*—Deep yellowish buff, marked all over with indistinct spots and irregular blotches of chestnut red and dull purplish grey, particularly at the larger end, where they frequently form a zone. Length 11 lines; breadth 8½ lines.

327. Conopophila albigularis —(White-throated Honey-eater). *Locality*—North Australia. *Egg*— Rather lengthened

Eggs marked thus * not described by Gould, or not previously described.

in form, and not very unlike that of the *Malurus cyaneus* in the color and disposition of markings; ground color being white, thinly freckled all over with bright chustnut-red, particularly at the larger end. Length 9 lines; breadth 6 lines.

328. CONOPOPHILA RUFOGULARIS—(Red-throated Honey-eater). *Locality*—North Australia. *Egg*—Pearly white, rather thickly spotted with bright reddish brown. Length $7\frac{3}{4}$ lines; breadth $5\frac{3}{4}$ lines (Ramsay).

329. ACANTHOGENYS RUFIGULARIS—(Spiny-cheeked Honey-eater). *Locality*—New South Wales, Victoria, South and West Australia. *Egg*—Dull olive buff, sparingly but strongly dotted with umber or chestnut-brown and bluish grey, the markings being most numerous at the larger end. Length 1 inch $1\frac{1}{2}$ lines; breadth 9 lines (large). Length $11\frac{1}{2}$ lines; breadth $8\frac{1}{4}$ lines (small).

330. ANTHOCHÆRA INAURIS—(Wattled Honey-eater). *Locality*—Tasmania. *Egg*—Pale salmon-color, sprinkled all over, but particularly at the larger end, with small specks and blotches of yellowish red, and here and there with grey. Length 1 inch 5 lines; breadth $11\frac{1}{2}$ lines. The egg is very much like that of *A. carunculata*, but is more thickly blotched with yellowish red.

331. ANTHOCHÆRA CARUNCULATA—(Wattled Honey-eater). *Locality*—Queensland, New South Wales, Victoria, South and West Australia. *Egg*—Ground-color reddish buff, very thickly dotted with distinct markings of deep chestnut, umber, and reddish brown, interspersed with a number of indistinct marks of blackish grey, which appear as if beneath the surface of the shell. Length 1 inch 3 lines; breadth $10\frac{1}{2}$ lines.

Eggs taken in New South Wales are somewhat larger than those from Western Australia, and have markings of a blotched rather than of a dotted form, and principally at the larger end.

332. ANELLOBIA MELLIVORA—(Brush Wattle Bird). *Locality*—Australia, except North and West, and Tasmania. *Egg*—Beautiful salmon color, strongly blotched at the larger end, and here and there over the remainder of the surface with deep chestnut-brown. Length 1 inch 1 line; breadth 9 lines.

333. ANELLOBIA LUNULATA—(Lunulated Wattle Bird). *Locality*—West Australia. *Egg*—Ground-color, a full reddish buff, thinly spotted and marked with deep chestnut-brown and chestnut-red, some of the spots and markings appearing as if beneath the surface of the shell, and being most thickly disposed near the larger end. Length 1 inch 2 lines; breadth $9\frac{1}{2}$ lines.

334. TROPIDORHYNCHUS CORNICULATUS—(Friar Bird). *Locality*—Queensland, New South Wales, and Victoria. *Egg*—Pale salmon-color with minute spots of a darker tint, principally about the larger end. Length 1 inch 3 lines; breadth $10\frac{1}{2}$ lines.

335. TROPIDORHYNCHUS BUCEROIDES — (Helmeted Friar Bird). *Locality*—North Australia. * *Egg*—Very much like that of the egg of its more southern representative (*T. corniculatus*), only in shape a little more swollen about the centre. Ground color of a pale or sickly salmon color, with a few indistinct cloudy markings of dull chestnut and purplish grey: the majority of these markings are upon the apex. Length 1 inch 2½ lines; breadth 10¾ lines.

337. TROPIDORHYNCHUS (*Philemon*) CITREOGULARIS — (Yellow-throated Friar Bird). *Locality*—Australia, except South and West. * *Egg*—Easily distinguished from any of the other Honey-eaters' eggs. Ground color is of a uniform deep rich purplish flesh color or purplish buff, smudged over with blotches and patches of pinkish red and greyish-purple, the latter appearing as if on the inner surface of the shell. Over these markings and about the top end are a few blotches of umber of different shades. Length 1 inch 1 line; breadth 9 lines.

339. ACANTHORHYNCHUS TENUIROSTRIS—(Spine-bill). *Locality*—Queensland, New South Wales, Victoria, South Australia, and Tasmania. *Egg*—Lengthened and pointed in form, and of a delicate buffy white, increasing in depth of color towards the larger end; in some instances marked with a zone of reddish chestnut spots shaded with indistinct markings of grey, intermingled with very minute ink-like dots. Length 9 lines; breadth 6 lines.

340. ACANTHORHYNCHUS SUPERCILIOSUS—(White-eyebrowed Spine-bill). *Locality*—West Australia. *Egg*—Ground-color, in some instances is a delicate buff, in others a very delicate bluish white, with a few specks of reddish-brown distributed over the surface, these specks being most numerous at the larger end, where they frequently assume the form of a zone. Length 9 lines; breadth 6½ lines.

341. MYZOMELA SANGUINOLENTO — (Sanguineous Honey-eater). *Locality*—Australia except North and West. * *Egg*—Ground color pearly white, speckled, more particularly at the larger end, with reddish chestnut and a few spots of bluish grey appearing under the surface of the shell. Length 7½ lines; breadth 5¾ lines.

344. MYZOMELA (*Cassomelas*) NIGRA—(Black Honey-eater). *Locality*—Australia. *Egg*—Light brownish buff, encircled at the centre with a band of brown, produced by numerous small blotches of that color, which appear as if beneath the surface of the shell. Length 7 lines; breadth 5½ lines.

346. ENTOMYZA CYANOTIS—(Blue-faced Honey-eater). *Locality*—Queensland, New South Wales, and Victoria. *Egg*—Of a rich salmon-color, irregularly spotted with rust-brown. Length 1 inch 3 or 4 lines; breadth 11 lines.

I can bear testimony to the curious fact respecting the nidification of this bird mentioned by Mr. Gould, namely, that of constructing its nest in the deserted large dome-shaped nest of the *Pomatostomus temporalis*. In the beginning of September 1881, in the Sandhurst district, I took two fresh eggs from the nest of the Honey-eater, which was made of stringy bark and grass, and placed in a depression on the top of an old nest of the *P. temporalis*.

347. MELITHREPTUS VALIDIROSTRIS—(Strong-billed Honey-eater). *Locality*—Tasmania. *Egg*—Ground-color of a lovely pinkish tinge or flesh color, sparingly spotted and blotched, especially about the larger end, with pinkish brown and greyish purple, the latter appearing as if under the surface of the shell. Length $10\frac{1}{2}$ lines; breadth $7\frac{1}{2}$ lines.

I have described this egg from my own specimens, as I failed to reconcile Mr. Gould's description with them.

348. MELITHREPTUS GULARIS—(Black-throated Honey-eater). *Locality*—Australia, except North and West. *Egg*—Of a pale flesh color, sparingly speckled with spots of chestnut, which are inclined to form a cloud at the larger end, and where also appear a few purplish spots under the surface of the shell. Length 9 lines; breadth $6\frac{1}{2}$ lines.

349. MELITHREPTUS LUNULATUS—(Lunulated Honey-eater). *Locality*—Australia, except North and West. *Egg*—Pale buff, dotted all over, but particularly at the larger end, with distinct markings of rich reddish brown and chestnut red, among which are a few clouded markings of bluish grey. Length 9 lines; breadth $6\frac{1}{2}$ lines.

—. MELITHREPTUS BREVIROSTRIS—(Brown-headed Honey-eater). *Locality*—Queensland, New South Wales, and Victoria. * *Egg*—Deep flesh color or pinkish buff, which is of a darker shade at the larger end, where it is also sparingly spotted or splashed with reddish chestnut in the form of a zone, also a few specks appear here and there over the shell. Length $8\frac{1}{2}$ lines; breadth 7 lines.

Hitherto our leading ornithologists did not include Victoria as a habitat of this Honey-eater. In 1880 I noticed it rather abundant in some parts of the Sandhurst district, and in the following year specimens were placed in the Melbourne Museum. I succeeded in obtaining its nest. It contained two eggs, and was suspended to the extreme end of a swaying branch of a box tree (*Eucalyptus viminalis*). The nest was composed of grass thickly woven in and out with wool and hair, which I have seen the bird pull out of the live animals. On one occasion a party of us were out, and were attracted by the lively actions of this curious little Honey-eater on the back of a Native Bear (*Koala*) that had taken up its position in the fork of a tolerably high gum. The bird was clinging on in a very comical manner, and busily plucking the fur off. Wishing to rob the animal of its furry coat we fired a shot, and, although we hit, did not dislodge the bear; the shot merely frightened our feathered friend on to a neighbouring branch, and before we were re-loaded it had commenced operations on the back of the bear again.

350. MELITHREPTUS CHLOROPSIS—(Swan River Honey-eater). *Locality*—West Australia. *Egg*—Deep reddish buff, thinly spotted all over, but particularly at the larger end, with dark reddish brown, some of the spots being indistinct, while others were very conspicuous. Length 9½ lines; breadth 6½ lines.

353. MYZANTHA GARRULA—(Garrulous Honey-eater). *Locality*—Australia except North and West, and Tasmania. *Egg*—Bluish white, marked all over with reddish brown, without any indication of the zone at the larger end so frequently observable in the eggs of the other species. Length 1 inch 1 line; breadth 9½ lines.

354. MYZANTHA OBSCURA—(Sombre Honey-eater). *Localiy*—West Australia. *Egg*—Rich orange buff, obscurely spotted and blotched with a deeper tint, particularly at the larger end. Length 11½ lines; breadth 9 lines.

356. MYZANTHA FLAVIGULA—(Yellow-throated Miner). *Locality*—New South Wales, Victoria, and South Australia. * *Egg*—Ground color of a deep rich pinkish buff or salmon color, minutely freckled and clouded all over with pinkish red, chestnut and purplish spots, these markings being more thickly disposed about the larger end. The purplish markings appear as if under the surface of the shell. Length 12½ lines; breadth 9 lines.

357. MANORHINA MELANOPHRYS—(Bell-bird)' *Locality*—Queensland, New South Wales, and Victoria. * *Egg*—Beautiful rich flesh color, sparingly smudged and spotted with rich chestnut and reddish brown, a few purplish brown markings appearing as if under the shell's surface. Length 10⅓ lines; breadth 7 lines.

Bell-birds are very plentiful along the north shore of Lake King, Gippsland, especially on the slopes of the dark gullies running up from the lake. Here they appear to breed very early. In the middle of October I found all the season's birds fully grown and flying about with their respective parents. I could not find a single nest with eggs, although I found great numbers of old nests, sometimes two or more in a bush. Any site seems to be chosen for the nest, from scrub and bushes, twelve feet high down to the common bracken fern. The nest is the crudest and simplest of all the Honey-eaters I know, being simply constructed of just sufficient grass to ensure the safety of the eggs, and suspended by the rim to some convenient twigs. It is sometimes patched and interwoven with bits of moss and lichen.

Note on a Rare Victorian Prasophyllum.

by Baron Ferd. von Mueller, K.C.M.G., M.D., Ph. D., F.R.S.

[Read before the Field Naturalists' Club of Victoria 12th March, 1883.]

When Mr. McKibbin last year was searching for orchids on the Avoca and in the vicinity of that river, he came across a small species of Prasophyllum of which he secured several tubers, one of which was entrusted to the care of Mr. French, who reared from it the flowering stem, the latter being fully in bloom at the end of February of this year, an unusual time for terrestrial orchids to be in flower here, although so late in the season several of the orchideous plants are only fully out in the higher regions of our alps. Possibly the process of culture may have effected also the anthesis. In endeavouring to bring this Prasophyllum to an exact specific position, I found that it does not tally precisely with the description of any known congener, though verging very closely towards *Prasophyllum intricatum*, so that it ought perhaps to be regarded as a variety of that species. It differs in thinner stem, in green outer lobes of the calyx, as well as in the narrower and unfringed labellum, though the cilia of the genuine Tasmanian plant are also only short, as shown in Mr. Archer's excellent illustration. The differences by which it is separated from *P. Archeri* are still greater, consisting additionally in neither distinctly bilobed nor fringed appendages of the gynostemium. Like many others of our orchids this Prasophyllum is deserving of attentive observation for testing the constancy of its characteristics; and under any circumstances it forms an interesting addition to the records of the Victorian Flora.

Notes on the Genus Voluta.

By J. F. Bailey.

[Read before the Field Naturalists' Club of Victoria 12th March, 1883.]

Generic description.—Shell ovate, oblong, or fusiform, emarginated at the base; spire short and mostly papillary at the apex; whorls smooth or ribbed, sometimes tuberculated at the summit; aperture oblong; columella callous; lower plaits the larger; lip slightly thickened.

The shells of this genus are found principally in tropical seas: not a single species of the genus has yet been found in European or Mediterranean seas; they are prized above all others for their beauty and rarity. The Volutidæ comprise numerous species, both recent and fossil (although the fossil species are much larger than the recent), and may be regarded as one of the most interesting and beautiful families of the spiral testacea whether in regard to the elegance of the shells themselves, or as exhibiting a principle of variation in their structure rarely to be excelled. They are generally smooth, shining, and the colours bright and varied; they differ exceedingly in form and size, some being globular, others oval others turreted, and some with only a very small spire; but though they vary in the figure of the shell and of the aperture, they are recognized by the emargination without a canal which terminates it, and by the oblique plates of the columella. Some of the species (as *imperialis*) have spines at the upper part of each whorl, which form a kind of thorny crown; many are curiously marked with lines and spots, so as to form a kind of resemblance to the lines of printed music, as in *V. musica*; others (as *Elliotii, Turneri, Lorrosii*), are marked with dark lines on white ground. Shells of this genus are found in the East and West Indies, China, New Zealand, and Tasmania, but the most highly-prized varieties are from Australia, where such beautiful shells as *Voluta pulchra, Bednalli, Thatcheri, maculata*, etc., are found. Several species (*mamilla, fusiformis, Angasii, papillosa*) have their habitat in Tasmania. On our coast the genus is represented by several of those identical with the Tasmanian species, but very rare and seldom obtained. The only species peculiar to Victorian waters, and the only new species obtained, is the rare and valuable specimen of *V. Roadknightæ* (McCoy), at present unique, being unlike any known recent species, and closely approximate to our fossil *Voluta Hannafordi* (McCoy).

Following is a list of species obtained by me from Victorian waters:—

Voluta undulata—(Lamk.).—Sorrento, Mordialloc, Queenscliff.
,, *fusiformis*—(Swain.).—Western Port, Hobson's Bay.
,, *mamilla*—(Gray).—Ninety-mile Beach, Gippsland.
,, *papillosa*—(Swain.).—Portland, Griffiths' Point.
,, *Sclateri*—(Cox).—Julia Percy Island.
,, *magnifica*—(Chem.).—Ninety-Mile Beach, Gippsland; found also in New Zealand.
,, *Roadknightæ*—(McCoy).—Portland (Butler), Lakes entrance, Gippsland (Roadknight).
,, *Zebra*—(Leach).—Coast generally.
,, (*Lyria*) *mitræformis*.—Coast generally.

PROCEEDINGS OF SOCIETIES.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

This Club held its usual monthly meeting on Monday evening, 12th March, at the Royal Society's Hall. The attendance of members was large, and Mr. H. Watts presided.

Mr. A. H. S. Lucas, M.A., having been duly elected to membership, and a further nomination received, the reading of papers was proceeded with. These comprised a few Notes, by Baron von Mueller, on "*Prasophyllum intricatum*," a terrestrial Orchid found, for the first time in Victoria, by Mr. J. F. McKibbin, and now exhibited by Mr. C. French. Mr. J. F. Bailey read a short paper on "Shells, genus Voluta," of which he had a very fine collection; and Mr. H. Watts contributed some additional "Notes on Australian Foraminifera," explaining the various deposits in which his specimens were found, some of them being very rare, no less than 19 being from the Waurn Ponds, near Geelong.

Several papers were promised for the next meeting, viz., "Experiences of an Old Net (Entomological subject), by Dr. T. P. Lucas. "A Trip to Mount Vesuvius," by Mr. A. H. S. Lucas; "Notes on some Russian Insects," by Mr. C. French; and "A Trip to the Johnstone River, North Queensland," by Mr. G. Berthoud.

The exhibits comprised new species of Cryptogamma and other Lepidoptera from Dandenong Ranges, by Dr. Lucas; cabinet drawer of Beetles, of the families Cleridæ, Mordellidæ, and Rhipidophoridæ, by Mr. D. Best; a pair of a very fine Butterfly *(Ornithoptera poseidon)* from Borneo, by Mr. C. French; 40 species of Lepidoptera and some Coleoptera, by Mr. J. E. Dixon; Fossils from the old Pliocene strata at Cheltenham, by Mr. A. O. Sayce; Lepidoptera of the month, by Mr. F. Spry; and some Victorian Coleoptera, by Mr. H. Henderson.

It was announced that the Committee had organised an excursion to Lilydale for Good Friday, 20th March, members to meet at Gippsland Station in time for 6·30 a.m. train. Members were also invited to prepare their exhibits for ensuing annual Conversazione, to take place on Wednesday, 25th April; and a very pleasant meeting was brought to a termination.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The ordinary monthly meeting of the above Society was held at the rooms on Thursday, 29th March, the President, Dr. Ralph, occupying the chair.

The Hon. Secretary acknowledged receipt of the following publications, viz.: the "Reports of the Mining Surveyors and Registrars" for the quarter ending 31st December, 1882; "Report of the Ballarat School of Mines" for 1882; Baron von Mueller's "Census of Australian Plants," part I; "The Microscope," by Mrs. Ward; "Report of the Royal Society of South Australia" for 1881-2; "Journal of the Postal Microscopical Society," December, 1882; "Journal de Micrographie," for December, 1882; "American Monthly Microscopical Journal," for November and December, 1882; "Proceedings of the American Society of Microscopists," Elmira meeting; "Northern Microscopist," for August, October, November, and December, 1882; "Microscopical News," for January, 1883; "Quarterly Journal of Microscopical Science," for January, 1883; "Journal of the Royal Microscopical Society," for December, 1882.

There was no formal business on the programme, and the meeting took the form of a conversazione, a number of interesting objects being exhibited, among others a species of *Ixodes*, found on the black snake, and exhibited by Mr. Allen.

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 28th March, the Vice-President, the Rev. J. E. Tenison-Woods, F.L.S., &c., in the Chair.

The following gentlemen were elected members of the Society: J. H. Maiden, Esq., Curator of the Technological Industrial and Sanitary Museum, Sydney; Hon. Charles Stuart Mein, Brisbane, Queensland; W. MacKinny, Esq., Campbelltown; Thomas Keele, Esq., C.E., Menangle.

The CHAIRMAN announced that a mistake had been made in the report of the last meeting, the name of Mr. James Fallick, being incorrectly substituted for that of Mr. Edward C. Fallick, who was then elected a member.

The following papers were read:—

1. Occasional Notes on Plants indigenous in the immediate neighbourhood of Sydney, (No. 3). By EDWIN HAVILAND. This paper refers chiefly to the genus *Lobelia*, its mode of fertilization and its domestication. The author also took the opportunity of drawing the attention of Botanists to a locality in the vicinity of Sydney particularly rich in specimens of the coast flora.

2. "On tooth-marked Bones of extinct Marsupials." By CHAS. W. DE VIS, B.A. A large portion of fossil marsupial bones from the Darling Downs, recently examined by Mr. De Vis, are considered by him to show more or less decided traces of the action of the teeth of carnivorous animals. The tooth-marks are ascribed to the agency partly of the Native Dog,

partly of the *Thylacoleo*, and partly of an extinct species of *Sarcophilus* which was identified by a portion of a tibia.

3. "On *Brachalletes Palmeri*, an extinct Marsupial." By CHAS. W. DE VIS, B.A. A femur from the Darling Downs differs so markedly from that of *Macropus* and *Halmaturus*, in the less prominent character of the great trochanter, that it is considered to belong to a new generic type, proposed to be named *Brachalletes*.

4. On the habits of the "Mallee Hen" *(Leipoa ocellata)*, by K. H. BENNETT. This gives an interesting and detailed account, from the author's own observation, of the nidification and general habits of this very curious bird.

Mr. MACLEAY exhibited a specimen of *Dendrolagus Dorianus*, a new species of Tree Kangaroo from Mount Owen Stanley, New Guinea, described by Mr. E. P. Ramsay at the January meeting of the Society. He pointed out that the hair on the body all turned the wrong way.

Mr. MACLEAY also exhibited some specimens of a Moth, with a fungus upon which their larvæ had fed. He stated that the larvæ were inhabitants of portable cases, like the rest of the *Psychidæ*, to which family they no doubt belonged. The genus and species (*Œcinia Scotti*) were described and figured by Mr. Walker Scott, M.A., in his beautiful but, unfortunately, uncompleted work entitled "*Australian Lepidoptera.*" The specimens exhibited (two females) were the only outcome of a large number of the larvæ collected by Sir John Hay, at Nepean Towers, some months ago.

Mr. MACLEAY also exhibited a very large and beautiful piece of fire-opal, brought by Mr. A. Powell from Queensland.

Mr. F. B. KYNGDON exhibited some specimens of marsh-plants collected by himself and Mr. Whitelegge at Waterloo.

THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

The ordinary meeting of this Society was held on the 6th February. There was a good attendance and the President (Mr. C. Todd, C.M.G.) occupied the chair.

Professor Lamb, M.A., and Messrs. T. Parker, C.E., and J. Haslam, C.E., were elected Fellows of the Society.

The PRESIDENT formally reported that he had been successful in observing the transit of Venus at Wentworth, which was the most extreme western station at which the egress of the planet was observed. He hoped at some future meeting of the Society to place before it the result of his observations, but inasmuch as the weather was very cloudy while he was at Wentworth he was unable to determine the exact position of his stations, so he would have to return to Wentworth in order to find out that fact before his observations would have any astronomical value.

He intended that evening to exchange time signals with Port Darwin, the object of the signals being to determine the exact difference of time between Sydney, Melbourne, Adelaide, Port Darwin, Banjowangie, and Singapore.

The Rev. W. R, Fletcher, M.A., exhibited ironstone spheres, from the Bald Hills, Encounter Bay.

Mr. T. Dixon stated that some years ago, before the fencing of runs had begun and all sheep were shepherded, it was no uncommon thing for as many as 2 per cent. of the hoggets or one-year-old sheep to die from "crankiness" or "turn sick." The symptoms were dullness, ceasing to feed or follow the flock, and then sudden paroxysms of turning rapidly round and round until the unfortunate animal fell, or until, after standing motionless for a time, a sudden rush straight ahead, as if blind, would be followed by another fall, and in time the poor brute would become too emaciated to feed, and would die from the disease unless previously killed by dogs or starvation. On dissecting the head a cyst would be found, occupying the whole of the right or left lobe of the brain, and on the opposite side to that to which the sheep would turn round, or in other cases where the sheep had stood still, nearly the whole of the cerebellum would be replaced by a cyst. After the sheep reached the age of two years a fewer number of them died from the disease, and old sheep were almost free from it. Now-a-days a "cranky" sheep was almost unknown, and the writer attributed that fact to the decrease in the number of dogs kept by the shepherds, as well as the fact that it was no longer the custom of keeping the sheep near the shepherds huts in the evening when the sheep ate feed which had been fouled by dogs.

A short discussion ensued, in which Dr. Whittell and Dr. Gardner said that in the absence of specimens of the cysts they felt inclined to believe that it was not a hydatid cyst, but that of the *Cynurus cerebals.* Mr. Dixon, in reply, stated that the appearance of the cyst agreed with the descriptions of hydatid cysts as given by medical authorities.

A paper, by Mr. F. W. Andrews, on the Night Parrot (*Geopsittacus occsdentalis*), was read. The writer said that "the bird is found in the northern and north-western portions of this colony, and specimens have been procured from Western Australia. During the day it lies concealed in the inside of a tussock or bunch of porcupine grass, the inside being pulled out and a snug retreat formed for its protection. Here also its rough nest is formed and four white eggs laid. When the dark shades of evening have fairly set it comes out to feed, but generally flies direct to the nearest water, which is often at a considerable distance from its nest: in this way I have known them to fly a distance of four or five miles. After drinking and shaking themselves up a little they fly off to feed on the seeds of the porcupine grass, returning to the water several times during the night. The name given to this bird by the aborigines is Myrrlumbing, from the supposed resemblance of their whistling note to the sound of that word. The birds have also a very peculiar croaking note of alarm whilst at the water which much resembles the loud croak of a frog. On one occasion one of these parrots was caught in a hut where it had apparently been attracted by the light of a bush-lamp. It was put into a box with a handful of grass, and on examination next morning the bird could not be seen, it having placed the dry grass in a heap, and had then drawn out the inside straw side by side until it had formed a hole in which it had concealed itself. These birds are pretty generally distributed through the north and north-west of this colony. They come and go according to the nature of the seasons. When the early season is wet the porcupine grass flourishes and bears large quantities of seed, on which many birds feed, but if, on the contrary, the season is a dry one, the porcupine does not seed, and no birds are to be seen. I shot some specimens at Cooper's Creek in 1875, when out as collecting naturalist for the late Mr. J. W. Lewis in his exploration of the country about Lake Eyre. They were, in that district, observed to conceal themselves during the day in the thick bush patches of the samphire on the salt flats bordering on the creeks and on Lake Eyre. The first specimen of this bird brought under notice was forwarded to the late Mr. Gould, from Perth, Western Australia, and was named by him, in consequence, *Geopsittacus occidentalis.* He was not aware, until many years afterwards, that it was a night-bird, and numerous mistakes were made concerning its habits and economy, which I have endeavoured to correct by many years of study and observation. The species is figured in the supplement of Gould's 'Birds of Australia.'" These notes were supplemented by bibliographical facts which had been collected by Professor Tate regarding the bird. The bird was exhibited.

Professor TATE exhibited plants which had recently been discovered in various localities in South Australia. They were as follows:—*Eucalyptus amygdalina*, Nangwary Forest Reserve; Tate; *Mitrasacme pilosa*, between Mounts Burr and McIntyre, South-east, Tate; *Schœnus spærocephalus*, same locality, Tate; *Cladium radula*, same locality, Tate; *Sida lepida*, Finke River, Kempe; *Rhagodia Preisii*, Mundayarra Sandpatch, near Wilson's Bluff, west from Fowler's Bay, Tate; and *Botrychium ternatum*, near Clarendon, Tepper. Professor Tate also spoke regarding the difference of the growth of some of the vegetation of Australia when found in different localities, as, for instance, in the Mount Lofty Ranges and on Kangaroo Island.

A communication from Mr. J. G. O. Tepper, F.L.S., claiming to have discovered twenty plants in districts in which they were previously unknown, was read.

Professor TATE mentioned that he had forwarded to the Hon. W. MacLeay, F.L.S., of New South Wales, three South Australian coleopters which were destructive to vegetation, and had received a reply from that gentleman regarding the habits of the species. The insects were exhibited by Professor Tate, who also read the comments of Mr. MacLeay upon them. The species were:—*Diphucephala splendens*, *Sphæropterus* sp., *Lamprina varians*.

Mr. D. B. ADAMSON then made some experiments in electricity with a Carre's di-electric induction machine, giving at the same time explanatory remarks regarding several improvements he had made with a view of lengthening the spark obtainable from the machine from six to ten inches.

MARCH MEETING.

The usual meeting of the Royal Society was held in the South Australian Institute on Tuesday evening, March 6th, Mr. C. Todd (President) in the chair.

Several donations of books and pamphlets were laid on the table.

The following gentlemen were elected Fellows of the Society: Messrs. Clement Bowyer-Smijth, C.E., H. C. Gell, H. Y. L. Browne, and the Rev. W. Howchin, F.G.S.

The PRESIDENT mentioned that at the retirement of the late Hon. Secretary (Mr. Rutt) the Society had decided to present him with a life-membership, in recognition of his valuable services. Mr. Rutt had written a letter, acknowledging the kindness of the Society, accepting the life-membership, and at the same time stating that he did not wish it to make any difference in his pecuniary relations with the Society, and enclosing a cheque for subscription.

Professor TATE exhibited what he characterised as an almost unique specimen of the animal known as the paper nautilus (*Argonauta tuberculata*) obtained by Mrs. Richards from Flinders Island. Professor Tate also exhibited a living specimen of a plant (*Microstemma tuberosum*) raised by Mr. Mohan from tubers forwarded by Inspector Fœlsche, who in a note said—"I have found a bulb plant the bulb of which is eaten by the natives, and resembles very much a white turnip. The natives eat them raw, or roast the plant, and I have eaten them myself. It grows plentifully in the neighbourhood of Palmerston." The plant belonged to the order Asclepiadeæ, and was originally described by Robert Brown from specimens collected by him on islands in the Gulf of Carpentaria; a half-century later it was found by Baron von Mueller on the Burdekin. The specific name was in allusion to its tuberous underground stem. The tuber, not unlike a potato, had a circular outline much depressed. From the tuber planted by Mr. Mohan, November 28th, there sprung slender simple branches 1[illegible] feet high, with distant pairs of linear-lanceolate leaves terminating in a short raceme of inconspicuous flowers, the last appearing towards the middle of Feburary.

Dr. Davies Thomas read a paper containing some further observations on the subject of hydatids in South Australia. From questions put to medical men practising at Kingston, Millicent, and Mount Gambier, he was informed that hydatids were extremely common in their several practices, and it appeared that the part of the country most liable to the disease was, roughly speaking, a triangular district, which was bounded on the north by the line of railway from Kingston to Narracoorte; on the east by a line drawn from Narracoorte to Penola, and thence through Mount Gambier to MacDonnell Bay; and on the west by the coastline. Of course that did not mean that was the only infected part, but merely that in a rough-and-ready way it marked the worst part of the country. It also appeared that kangaroos and domestic animals suffered there more from hydatids than elsewhere. At Benara Station, near Mount Gambier, he examined about half-a-dozen brush kangaroos, and failed to find in any single instance any hydatids either in the lungs or other viscera, and the same applied to some eight brush kangoroos examined on the opposite side of the Victorian frontier at the Punt. That, however, proved but little, for at the Punt there was an abundant supply of good drinking water in the Glenelg River; and, of course, so large a water supply could not suggest contamination. Dr. Jackson, whose opinions were valuable, was of opinion "that the unusual prevalence of hydatid disease in the South-Eastern districts might be fairly attributed to the large number of marsupials and, to a lesser extent, of native dogs, which abounded; also to the peculiar disposition of the water supply, most of which existed in surface water or in swamps." It was probable that kangaroos were much infested by hydatids in that district as a whole, so that much importance could not be attached to his inability to find any in the few specimens he examined. Sportsmen of a scientific turn of mind could render valuable aid in that direction. As regarded sheep, there was no doubt that hydatid infection was very common in them, and that the parasite often co-existed with, and was often mistaken for, fluke. That was not surprising when it was considered that the water-supply was the medium of infection there were in each case. Fifty-four cases of hydatids admitted into the Mount Gambier Hospital from January, 1869, to December, 1882—viz., fourteen years—out of 3,365 admissions of patients duly recorded, so that, in round numbers, about one out of every sixty-two cases admitted during fourteen years was hydatid. It appeared that "all the cases except one were from the South-east, and nearly all from swampy country." Dr. Whittell had objected that the (Dr. Thomas) had omitted to take corresponding years into account when contrasting the proportionate number of cases of the disease treated in the Adelaide and Mount Gambier Hospitals. He had now done so, and the results were as follow:—For the years 1873 and 1880—Mount Gambier Hospital, one hydatid out of 53 patients: Adelaide Hospital, one hydatid out of 144·6 patients; so that hydatids were, in proportion, nearly three times as numerous in the Mount Gambier as in the Adelaide Hospital during the seven years in point. Ten dogs were examined at different places; in all four dogs were actually found to be infected, and a larger proportion might have been. As facts went, it might be said that 40 per cent. of the dogs had *Tœnia echinococcus.* He had now examined twenty dogs in Adelaide, and found eight infected, so that as regarded both Adelaide and the South-east 40 per cent. of the dogs had *Tœnia echinococcus.* That explained the frequency of hydatids in men and animals in this country. Even in Iceland Krabbe found only 28 per cent. of the dogs thus dangerous to man and beast. He had to report that on January 15 and 16 he examined, at the Melbourne University, ten stray dogs: five contained *Tœnia echinococcus*, viz., No. 2 contained hundreds, 3 thousands, 4 only a few, and 9 and 10 a very few; but in all cases of doubt specimens were identified by microscopic examination. Melbourne dogs therefore appeared to be quite as dangerous in that respect as those of Adelaide. During his overland journey to Melbourne he had an opportunity of making some passing observations upon various points connected with the subject. He was informed that hydatids were extremely prevalent in the neighbourhood of Casterton. At Casterton, Coleraine, Hamilton, Ballarat, and Melbourne, it seemed to him that the Victorian Dog Act was practically not in operation. In many of the country towns of Victoria the source of infection of the dogs was evidently the same as in South Australia, viz., access of stray dogs into slaughter-houses and butchers' premises, and the careless habit of throwing offal infected by cysts aside so that dogs might eat it. He was convinced by the returns of the Victorian Government as to registered dogs that a vast number of dogs owned were not recorded. In Victoria the enforcement of the Dog Act was simply entrusted to the various municipal authorities, who did not take extra trouble. The South Australian system was certainly a better one, for here the police authorities did really carry out the Act very efficiently—in many places, at any rate. As regarded the media of conveyance of the tapeworm egg into the body, there could be no doubt that the water supply was the chief one. Any one visiting the South-eastern districts would be struck with the large amount of surface which in winter was covered with water, but where in summer a small pond alone was left. Then, taking the instance of the single dog examined at Penola, that contained many thousands of *Tœnia echinococcus*, and every one of those contained hundreds of eggs, and probably could in succession breed thousands; so that one animal could without doubt, set free myriads of eggs capable of producing that very dangerous disease. In the South-east a large number of sheep, marsupials, &c., served as hosts for the cystic form. A great many useless dogs, through want of knowledge of their owners, were allowed to eat the offal of sheep and the viscera of kangaroos caught in the chase. Finally there were many people not acquainted with, or too indifferent to, the danger of drinking from water-holes. The dangerous draught might be cool, clean-looking, and inviting, and yet contain hydatids. He thought a substantial tax should be placed upon dogs, and stray unknown canines ruthlessly destroyed. People should also be educated up to the danger of drinking impure water. In many cases he believed patients got infection from single visits to the country, where probably infected water was imbibed.

Mr. Todd remarked that in the country towns the people mainly got their water from tanks and wells. Dr. Thomas said the source of infection must be looked for where the water supply was scanty. He did not for a moment suppose that the large swamps could be infected to an appreciable extent. In answer to Professor Tate, Dr. Thomas said as far as could be ascertained the natives did not suffer from hydatids before civilisation came here, and hydatids could not have been introduced by an imported dog, because the parasite only lasted a few days, whereas years ago voyages from England occupied months. The first medium was the sheep or ox, because for many years hydatids would exist in their host. It was not endemic but was introduced. Hydatids were not on the increase in the colony. For the last five years there had not been any more cases of hydatids, either in the Adelaide or the Mount Gambier Hospitals, than in the previous five years.

Diagnoses of a new species of composite *Epaltes Tatei* from South Australia, by Baron von Mueller, was taken as read.

A list of the algæ collected at Hallet's Cove, St. Vincent's Gulf, by Mr. J. G. O. Tepper, F.L.S., and identified for Baron von Mueller by Professor J. Agardh, was presented.

Mr. Todd stated that the difference of longitude between Singapore, Banjoewangie, Java, Adelaide, and Melbourne had been determined.

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Pres. by E. E. Pescott, Esq.

THE

Southern Science Record.

AND

MAGAZINE OF NATURAL HISTORY.

CONTENTS:

PRICE—ONE SHILLING.

COLLINGWOOD:
J. WING, 33 WELLINGTON STREET.
1883.

Definitions of some new Australian Plants,

by Baron Ferd. von Mueller, K.C.M.G., M.D., Ph. D., F.R.S.

[Continued.]

Husemannia.

Sepals nine, in three rows; the three outermost very minute; the three inner considerably longer, ovate-roundish, valvate and slightly induplicate before expansion. Petals exceedingly minute, flat, bilobed at the summit, much contracted at the base. Stamens of male flowers six, free unless at the base; filaments thickened upwards; anthers nearly globular, but somewhat didymous; their cells opening by anterior almost semi-circular slits; the connective narrow and not produced beyond the cells. Ovaries of pistillate flowers six; stigma of each awl-shaped, recurved, undivided, finally becoming nearly basal. Fruitlets on a conspicuous stipe, oblique-ovate, somewhat impressed on both sides, rather acutely margined; pericarp almost coriaceous; internal process erect, thin, flat, extending to somewhat beyond the middle of the cavity. Seed nearly cylindric, conduplicated by hippocrepic curvature; albumen none; integument smooth; cotyledons for the greater part of their length turned dorsally towards the pericarp; radicle extremely short. A tall climber, with large almost ovate somewhat pointed and rather stiff leaves, with spicate-paniculated clusters of very small dark silk-hairy flowers, with short stamens and rather large thinly stipited fruitlets.

This genus of the pachygoneous tribe of Menispermeae differs from Pleogyne in not inflexed petals, ample endocarpal intrusion, longer and more curved cotyledons; from Limacia it is distinguished in less number of sepals, flat and somewhat bilobed petals, very compressed endocarpal process, lobeless stigmas, thinner endocarp without spurious cells, absence of albumen in the seeds and minuteness of the radicle. From the other genera with valvate inner sepals, except perhaps Aristega, namely Tiliacora, Abuta, Triclisia and Synclisia this new genus is still more distinct; if the fruit of the Aristega (which as yet remains unknown) should prove congeneric, then our new plant would receive the name *Aristega Husemannii*; but the glomerulous flowers give a different aspect to the panicle, and the stamens are double in number, which character is however not of constancy in Limacia and a few other co-ordinal genera. The structure of the pericarp and seed is much like that of Chondrodendron, Hyperbæna and Hæmatocarpus, the roughness of the testa of the latter excepted. The disposition of the flowers seems peculiar in the whole order of Menispermeæ. This new genus is dedicated to Dr. Theodor Husemann, Professor of Medicine in the University of Goettingen, who even with lamentably impaired visual power remains a progressive investigator in therapeutics and the chemistry of plants.

Husemannia protensa. On the Daintree-River, Pentzke; on the Endeavour-River, Persieh.

Leaves shaped like those of *Somphoxylon Wulschlaegelii,* attaining a length of 15 inches and a width of 6½ inches, thus the largest in the order, though often not half that size, always glabrous and shining, not much paler beneath, distantly penninerved; the closely reticular veins more prominent underneath. Leafstalks thickened towards the summit and there thinly velvety, varying in length from ½-3 inches. Panicles attaining a length of 15 inches, always thinly velvet-downy. Flowers hardly ⅓ inch long. Sepals inside and petals on both sides glabrous. Fruitlets about ⅔ inch long, thinly brown-velvety, on a stipe of about ⅙ inch.

Cissampelos Pareira has also been found on the Endeavour-River.

Tephrosia sphaerospora.—Herbaceous; grey from appressed hair; leaves on long stalks, forming 2-4 pairs; stipules lanceolate- or subulate linear; leaflets narrow-lanceolar, above very thinly downy, beneath silky-hairy; racemes with few or several flowers; stalklets shorter than the calyx; lobes of the latter upwards much narrowed and acute, the lowest longer than the others; pods septate, broad-linear, moderately compressed; seeds 5-9, small, perfectly spherical, neither angular nor compressed, livid with yellowish brown and blackish spots.

Near the Finke-River; Rev. H. Kempe.

This species differs from *T. remotiflora* in closer vestiture, not angular branches, longer leaf-stalks, acute leaflets and in seeds not orbicular as described by Bentham;—from *T. phæocarpa* it is distinguished by the greater length of the leaves and their stalks, longer inflorescence, distinctly septate pods with more numerous very turgid and not simply brown seeds; from both it may differ also in flowers, as petals, anthers and style are unknown. The quite globular (rarely somewhat oval) seeds characterize this new plant in contrast to any Australian or extra-Australian congener known to me, except *T. sphærosperma* (B. & H.), a species otherwise very different.

Oology of Australian Birds.

By A. J. Campbell.

[Read before the Field Naturalists' Club of Victoria 9th April, 1883.]

Part xii.—Order—INSESSORES.

Family———— ?

360. Zosterops coerulescens—(Grey-backed Zosterops). *Locality*—Australia, except North and West, and Tasmania. *Egg*—Beautiful uniform pale blue. Length 8½ lines; breadth 6 lines.

361. Zosterops gouldi—(Green-backed Zosterops). *Locality*—West Australia. *Egg*—Greenish blue without spots or markings. Length 8 lines; breadth 6 lines.

Family—Certhiadæ.

366. Climacteris scandens—(Brown Tree-creeper). *Locality*—Australia, except North and West. *Egg*—Reddish flesh-color, thickly blotched all over with reddish brown. Length 10½ lines; breadth 8½ lines.

367. Climacteris rufa—(Rufous Tree-creeper). *Locality*—West Australia. *Egg*—Pale salmon color, thickly blotched all over with reddish brown. Length 11 lines; breadth 8½ lines.

371. Climacteris leucophœa—(White-throated Tree-creeper). *Locality*—Australia, except North and West. *Egg*—Dull white, thinly speckled with fine spots of rich brown, and a few larger blotches of the same color. Length 10 lines; breadth 8 lines.

372. Orthonyx spinicaudus—(Spine-tailed Orthonyx). *Locality*—Queensland, New South Wales, and South Australia. *Egg*—White and disproportionately large.

373. Sittella chrysoptera—(Orange-winged Sittella). *Locality*—Australia, except North and West. * *Egg*—Smooth shell and bluish white ground color, mottled all over with slate colored spots and blotches of different shades. Length 8 lines; breadth 6½ lines.

376. Sittella pileata—(Black-capped Sittella). *Locality*—New South Wales, Victoria, South and West Australia. *Egg*—Whitish color, with circular green spots irregularly distributed over the whole surface.

Family—Cuculidæ.

378. Cacomantis pallidus—(Pallid Cuckoo). *Locality*—Australia and Tasmania. **Egg*—Of a uniform pale flesh color

Eggs marked thus * not described by Gould, or not previously described.

with a darker wash of the same tint at the larger end; sometimes a few chestnut spots appear here and there over the shell. Length 11 to 12 lines; breadth 8 to 9 lines.

I am sorry Mr. Gould's description is hardly accurate. Therefore I have adopted my own. He also mentioned that among the foster-parents of this cuckoo are the various *Maluri* and *Acanthizæ*. The egg is never found in these dome-shaped nests, but in open cup-shaped ones, generally of the Honey-eaters. I have taken them in that of *Ptilotis penicillata* (White-plumed Honey-eater) and on one occasion in that of *Mimeta viridis* (Oriole). They have also been found in the *Melithrepti* and other *Ptilotes*, *Anellobia mellivora* (Brush Wattle-bird), *Acanthorhynchus tenuirostris* (Spine-bill), *Myzantha garrula* (Garrulous Honey-eater), and sometimes in Tasmania in the nest of *Amaurodryas vittata* (Dusky Robin).

379. Cacomantis flabelliformis (Fan-tailed Cuckoo). *Locality*—Australia and Tasmania. *Egg*—Inclined to oval in form, of a fleshy white sprinkled all over with fine pinkish red spots, which are blended about the upper quarter so as to form a zone. These markings by age become purplish brown. Length 9 lines; breadth 7½ lines.

It is not on record that an egg of this cuckoo has been taken in Australian, or which are its foster parents. Mr. Gould has mentioned one of the Honey-eaters, but I think that can be proved to be an error. In Tasmania its foster parents are generally *Acanthiza diemenensis* (Tasmanian Acanthiza), but sometimes *Malurus longicaudus* (Superb Warbler) and *Sericornis humulis* (Sombre Sericornis). An interesting question here crops up.—How can this cuckoo, a bird about 9 inches long, including a tail 5 inches, enter or place its eggs in the small dome-shaped nest of the Acanthiza, which structure over all is not more than 4 inches in diameter, with a small side entrance that will hardly admit of one's finger?

It is impossible for the Cuckoo to enter the nest, and nests taken containing its egg have been carefully observed, and the entrance was in no case enlarged.

Therefore, after giving this matter mature consideration, I have come to the conclusion that the cuckoo must lay its egg in some convenient spot, then transfer and deposit it in the Acanthiza's nest with its bill.

And in proof of this assertion I quote the following notes from the diary of my friend Mr. H. T. Hull:—

"6th. Oct., 1877. Found nest of *Acanthiza diemenensis* with egg of *Cuculus cinereus* (now called *Cacomantis flabelliformis.*) The three eggs of the *Acanthiza* were all dented as if the larger eggs had been roughly deposited on the top of them."

"15th. Nov., 1879. Found nest of *Acanthiza diemenensis*, two eggs broken, with young far advanced, but dead; fresh egg of Cuckoo (*Cinereus*)."

Further, my sterling friend Mr. H. A. Smith, of Batesford, informed me that on one occasion he shot a Pallid Cuckoo and actually took its egg from the back of its throat or gape. The egg was fractured by the fall. Evidently the bird had laid the egg and was in the act of conveying it to some suitable nest. In the case of this cuckoo, too, it would be a difficult task to deposit an egg in a small Honey-eater's nest were it delivered in the usual manner. I also venture my opinion, with regard to the smaller Bronze Cuckoos, that a similar performance (that of dropping the egg in the nest with the aid of the bill) occurs. It cannot be otherwise, for instance, when deposited in the dome-shaped nest of the little Gerygone with its small side-entrance.

383. Lamprococcyx plagosus (Bronze Cuckoo). *Locality*—Australia and Tasmania. *Egg*—Clear olive-brown, slightly paler at the smaller end; the olive-brown can be easily removed by wetting, and will reveal a uniform light blueish shell; length $8\frac{1}{4}$ lines; breadth 6 lines.

385. Lamprococcyx basalis—(Narrow-billed Bronze Cuckoo). *Locality*—Australia, except North-West and Tasmania * *Egg*—Oval and fleshy white, speckled all over with fine pinkish red spots, which become darker by age; length $8\frac{1}{4}$ lines; breadth 6 lines.

Mr. Gould remarks, "I leave to the rising ornithologists of Australia the task of investigating the subject, and of informing the scientific world whether there be any difference in the eggs of the two Bronze Cuckoos." From the foregoing descriptions it will be noticed there is a decided difference; the eggs are totally dissimilar except in shape and size. Notwithstanding, the birds bear a great similarity, about the same size and color, only one has a narrower bill and some minor difference on the tail feathers. Now that the eggs are known, it would be of great interest if some oologist could explain the anomaly in their characters; for experience teaches us that in every genus of birds the true typical egg of each species is not without characteristic resemblance.

The foster-parents of the Bronze Cuckoos are generally the *Maluri* and *Acanthizæ*, but I have taken them from the nest of *Petroica multicolor* (Scarlet-breasted Robin), and they also have been taken from *P. Goodenovii* (Red-Capped Robin) and *Gerygone.*

Rarely two species of Cuckoos deposit eggs in the same nest, but the following is a curious fact:—I found the nest of *Acanthiza* (*Geobasileus*) *chrysorrhœa* containing three eggs, besides an egg each of the two Bronze Cuckoos. We are aware that young Cuckoos have the reputation of ousting their foster brothers and sisters, but if these two lively youngsters had been reared in the same nest we are constrained to imagine that "When Greek met Greek then would come the tug of war."

With reference to parasitic Cuckoos ousting the foster chickens.—I do not think this applies in all cases, because if we consider the young Pallid and Fan-tailed Cuckoos, their rapid growth in size as compared with the foster chick, the latter would soon be crushed and starved out of existence; moreover the nest could not contain them all. In any case, there appears an all-wise provision of their Great Creator for the maintenance of their (the cuckoo) species, for it may be conceived that it occupies the whole time of a pair of tiny foster-parents to satiate the rapacious maw of their large foster-chick without being encumbered with a brood of their own off-spring.

386. SCYTHROPS NOVÆ-HOLLANDIÆ—(Channel-Bill). *Locality*—Australia, except South and West. *Egg* (taken from the ovarium)—Light stone color marked all over, but particularly at the larger end, with irregular blotches of reddish brown, many of which were of a darker hue, and appeared as if beneath the surface of the shell; length $1\frac{11}{16}$ inches; breadth $1\frac{1}{4}$ inches.

338. CENTROPUS PHASIANUS—(Pheasant Coucal). *Locality*—North Australia, Queensland, and New South Wales. *Egg*—Nearly round, and of a dirty white, in some instances stained with brown, and with a rather rough surface; length 1 inch 4 lines; breadth 1 inch 2 lines.

EXPERIENCES OF AN "OLD NET."

BY T. P. LUCAS, M.D.

[Read before the Field Naturalists' Club of Victoria 9th April, 1883.]

Time speeds on, but on its wings it bears the proofs of human progress. It is but as yesterday that we told of old coaching-day reminiscences, of adventures dared, of battles won, of victories achieved, of prizes made our own, of a successful trip in the Dandenong Ranges. Those were the good old times, entomologically speaking, before the iron horse disturbed the forest solitudes or sought to impoverish the country, and before the Hawthorn Railway accident had commenced to impoverish the town. Then we could start at 8 o'clock in the morning, and after a good substantial breakfast, mounted on a primitive-fashioned vehicle, survey the grandeurs as we passed. Now we have to be up betimes, and, ere the night has well vanished, to take our seats in an apology for ease and comfort. On we sweep, but slowly, as ever and anon steam seeks to overcome the law of gravitation, and so to make travelling up steep inclines and over bends and curves as if on level plain. All difficulties overcome, all dangers passed, the train draws up at eight o'clock at Lillydale station. Breakfast awaits us, and, having made the best of time and fare, we take our places in the coach for Healesville. Vineyards on the hill-sides form a landscape of the richest green, to the joy and satisfaction of the common but beautiful vine-moth *Agarista glycina.* Here and there, flying in solitary dignity among the Eucalypti, was the allied species *A. Latinus*, known by the one broad sinuous band of white across each fore-wing. In specimens from Queensland the bars are rusty color. In the ditches and in damp hollows another beautiful and allied species is now making its appearance, the *A. Lewinii.* Both these latter are Melbourne species, but sparingly, the uplands being their more natural home. In Melbourne itself I had the good fortune one windy afternoon to take a pair of the rare and delicate *A. Donovani*; they have been taken on the Murray, but appear to be in perfection in New South Wales and South Queensland. The caterpillar of *A. Casuarina* was seen by Mr. Spry.

On trees and fences a very light Zeuzera, the *Z. lineata*, occasionally rewards a diligent search. A larger species of the same family, the *Eudoxylon Eucalypti* occurs, but I think more frequently nearer the sea. I once took a fine pair in the Emerald Hill Park. A smaller species occurs rarely on fences. The *Hyctemera annulata* is a very active day-flyer, fairly common; it feeds on the leaves of the Cape Ivy.

The Ghost Swift Moths are strongly represented. It is yet early for some of the species. About three o'clock, and for a few moments at dusk, we may hope to catch the smaller and middle-sized species, as they rapidly skim over the ground. The *Oxycanus fusco-maculatus* is common. It may be dug up as a chrysalis in garden lawns or taken at light. *Hepialus fasciculatus* is a more gaudy species, but as yet rare. This year I have taken two new species—the one in Gippsland, the other, a solitary but beautifully marked specimen, at Brighton. Some of the allied genera are very large. At Hawthorn I saw what appeared to be a large bat on a fence: on closer inspection it turned out to be a beautiful female of one of these species. With some difficulty I secured and killed it without damaging; but then was the difficulty of a large enough box. Necessity is the mother of invention, and so, having transfixed its body with a large pin, I fastened it securely near the crown of my bell-topper hat. All seemed to go well for a while, until I felt a most remarkable tickling sensation over the cranium. This grew so discomforting that I uncovered my head to ascertain the cause: imagine my surprise when hundreds of minute eggs simply poured off my troubled pate. These eggs were extremely minute, and were literally pouring from the ovipositor of the dying moth. Why should a moth laying so many myriads of eggs be so rare! The expanse of wings in the specimen I caught was seven inches; the eggs were like small dust sand. I was soon after fortunate in obtaining near Lilydale a male specimen. This is very much smaller, the expanse of the wing four inches and a quarter. The markings on the wings are like those of the female, but, instead of being a dingy translucent grey, are a most distinct silken white, making it a most chaste and beautiful object. Why does Nature so favour the gentlemen! Later on in the season another species, almost as large (the female), of a uniform buff brown, is taken among the hills. I do not know the male.

Up hill and down dale, over good roads and over bad roads, on we sped, until at length a sight of Healesville was the reward of patience and perseverance. Here it began to rain, but we hoped for only passing showers. The landlord, to make gloom more dismal, said he was certain, by all the available physical signs, that there would be a downpour of three days' duration. Towards noon it cleared, and, with a passing smile of triumph, we left the landlord to his customers and his cups, and took coach to Fernshawe. The sun burst forth in glory, and hope revived in our anxious breasts. The butterflies met his greeting. At the tops of the lofty gums, *Eucalyptus viminalis*, four, six, eight—oh the glorious beauties! How they sport! Shall we stop the conveyance—shall we alight and walk? 'Tis useless: the tantalizing fairies soaring far beyond our power, our hearts palpitate, but to failure—such a rich white, such a size, as free from care as from danger, too dazzling for the feathered captor, too subtle for earth-bound foes—they are now no more, having failed to share the glorious martyrdom which brings the crown of preservation in an entomological collection. I cannot say positively as to the species; at first I believed they must be beautiful Queensland type moths; perhaps they were, but later in my tour I was fortunate enough to catch three, the same or allied species. These had been allured by the flowers of the common thistle, *Carduus lanceolatus*, and, though not the best of specimens, yet proved the occurrence in our colony of two Queensland species, the *Pieris ega* and the *Pieris scillara*. The former resembles the small Cabbage White of England, the latter is distinguished by a deep black border. I received from Queensland two types of this butterfly, the one with the wings coloured on the under surface with rich orange, the other with bright yellow. Mr. Kershaw believed one of these to be a sex of *P. ega*, but I possess one speimen, having the markings of the male on the upper side, and at the same time the orange of the females on the under side. This, I think, determines the two types to be the sexes of the one species *P. scillara*.

P. Harpaliæ occurred sparingly; I found its pinned remains in almost every house, and on making enquiries was informed that a cloud had passed through, and that such an unusual phenomenon had so attracted the attention of the villagers, as to end in their capturing a quantity, and pinning as I have described: one young man assured me that the main cloud were more than an hour in passing. The Linnean Society of Sydney reports similar migration of species of *Pieris* across the Continent, and at Melbourne such a flight passed over early in the season. These were the *Pieris Zeutonia*, a very common Queensland type, but occurring at Melbourne sparingly. This year I was surprised by seeing continuously for two or three days in the streets of the city a number of black-bordered Whites, with a yellow and black appearance when flying. My boys soon solved the riddle, for, going to Emerald Hill Park, they took 17 specimens before breakfast. Next day I myself went, and there was not one to be seen. On making enquiries in the country I found that swarms of butterflies answering to the description of this *P. Zeutonia* had passed over at the time I noticed their disappearance. They would appear to have gone North, and, I think, in a North-Easterly direction along the Gippsland track of country. The *Pieris Agarippe* this year has been very fine. I am strongly inclined to believe that the beauties I saw high among the gums above Fernshawe were the *P. Argenthona*, but, as I failed to capture, we must wait until further efforts result in well-merited success. Suffice it to say that I believe a large number of the Queensland and New South Wales types will yet be found in our mountain ranges and among our hilly country. As we drove along, we noticed the *Lycæna phœbe* (Common Blue) very abundant. Here and there the beautiful purple blue Hairstreak flitted among theWattle-bushes, while the Painted Lady (*Vanessa Kershawi*), with the *Gleitoneura Klugii*, and other common brown butterflies, played in the woods or over the road-side cuttings.

Shortly after arriving at Fernshawe, the heavens again began to blacken, the wind came along in a rushing volume, and the outcome was terrific. The roaring of the wind among the forest leaves, the downpour of the rain through 250 feet of thickly-timbered forest leaves and branches, the darkness of the night, and the desolate forsaken state of the village (nearly all the people had gone to the Country Ball some miles distant) were anything but pleasant. I hunted through the house so as to while away the time, and to if possible pick up a stray specimen. Two or three longicorn beetles and one specimen of *Ommatoptera diophthalma* were the only occupants I could discover. In despair I feared the Healesville landlord was a true prophet, after all. To add to my discomfort, on retiring to drown disappointment in the unconciousness of sleep, my slumbers were disturbed by the howlings of a pup, which I afterwards learned had been shut up in an adjoining room for safety. But in spite of the angry winds and the raging storm, in spite of the blackness of the darkness, and the howling of the dog, wearied Nature triumphed, and I was soon lost in the charms of hopeful dreams, to awake next morning with a grateful sense of relief upon seeing a comparatively clear sky and the first efforts of the rising sun. All around Nature showed the effects of the fearful deluge deep ruts in the roads, the trees and bushes dripping with wet, the muddy state of the footpaths. Insect life was comparatively still, but after two or three hours what a change. The underscrub is refreshed, the grass is dry and velvety, the butterflies flit from flower to flower.

But enough I must ask you to linger awhile. Suffice it to say the Coleopterists complain of having had a bad season; but while admiring beetles, how much more lovely are the butterflies and moths. Why not collect and study these as well.

My success this year has been beyond expectation. When one catches over 200 good things of an evening, and nearly 2,000 specimens in a week, there is little room to grumble; and when an "Old Net" obtains new or rare species in every walk or detour, then, in the spirit of scientific brotherhood, I would say to the lovers of Nature, Enter into these paths, and with me enjoy the raptures of true pleasure, and with me wear the trophies of unqualified success.

PROCEEDINGS OF SOCIETIES.

THE ROYAL SOCIETY OF VICTORIA.

The ordinary monthly meeting of the Royal Society of Victoria was held on the 12th ult., at their Hall, Victoria-street, Mr. R. L. J. Ellery, the President, occupying the chair.

Mr. William Bage and Mr. C. Bage, M.B., were elected associates of the Society.

The CHAIRMAN announced that Dr. Jamieson would read a paper containing some further remarks on the influence of light on the development of bacteria. Some time ago Dr. Jamieson read a paper on the development of bacteria, and some gentlemen in England, to whose works he referred, had written a letter to the Society here. The letter was from A. Downes, M.D., and T. P. Blunt, M.A., F.C.S., and was as follows:—

"In the proceedings of the Royal Society of London (vol. 26, 1877, p. 488, and vol. 28, 1878, p. 199) we reported the results of an investigation, from which we concluded that light is inimical to the development of bacteria, and probably injurious to 'unprotected' protoplasm generally. Dr. J. Jamieson, in a paper read before the Royal Society of Victoria, attacks our inferences, attributing the observed effects not to light, but to solar heat. We scarcely think that Dr. Jamieson can have seen the text of our papers, or he would have noted that in nearly every experiment of the long series special care was taken to exclude so fundamental an error as that which he attributes to us. Without troubling the Society of Victoria with a long communication, we think that a consideration of two facts alone will show that Dr. Jamieson's criticism cannot be substantiated. In our experiments our usual method of procedure was to place in each of a number of text-tubes a small quantity of a cultivation liquid. The tubes were then plugged with cotton wool, loosely capsuled, and divided into two sets. The one set were encased each tube separately in thin varnished lead-foil (such as paperhangers use for damp walls), so as to thoroughly exclude light. The two sets were exposed side by side to full sunlight. When the isolation was sufficient, the uncovered tubes remained clear for an indefinite period, while the uncased speedily swarmed with bacteria. Now, if Dr. Jamieson will compare the temperature of two tubes—encased and non-encased respectively—exposed to the solar rays he will find that the former becomes slightly the hotter. This in itself disposes of his theory that the germinal matter in the non-encased tubes is destroyed by solar heat ; for, if that heat were sufficient for such a result, it should obviously suffice also for the destruction of the germs contained in the encased cultivation-liquid. Professor Tyndall, in repeating our experiments, is forced to the same conclusion, namely, that the energy which here prevents putrefaction is energy in the radiant form. Secondly, Dr. Jamieson will also find, from the second of the papers of the Royal Society on the subject, details of experiments which distinctly show that the waves of greatest refrangibility are the most active ; in other words, to use the old phraseology, that the effect is associated chiefly with the actinic rays. This fact, which may readily be substantiated by any one who will carefully repeat our experiments, must again prove that Dr. Jamieson's supposition of heat destruction is quite untenable."

The paper which Dr. Jamieson was now about to read had reference to the remarks contained in the letter of Dr. Downes and Mr. Blunt.

Dr. Jamieson explained that he had been induced to prepare his paper in consequence of the Society having received the letter which had just been read. He then read the paper, in which he said that he had felt it incumbent on him to repeat, with variations, the investigations he had previously reported to this Society, and that, though perhaps less disposed than he formerly was to consider light a mere neutral factor, he was still compelled to repeat that bright light, and even direct isolation, need not prevent the development of bacteria in nutritive solutions. He related the particulars of a number of fresh experiments he had made on the subject, and contended that they showed clearly in opposition to the conclusions of Dr. Downes and Mr. Blunt—"1. That the brightest diffused light is not inimical to the development of bacteria. 2. That full exposure to the sun's rays is not destructive to bacteria or their germs when precautions are taken, as by suspension, against exposure to too high degrees of temperature." In conclusion, he stated that he could not add that such exposure to the sun's rays in no way retarded development; but he must express the conviction that retardation might generally, with equal propriety, be ascribed to extremes of temperature associated with the isolation.

A few remarks were made on the paper, and the discussion upon it was then adjourned to a future meeting.

A paper descriptive of the geological features of certain caves perforating marble deposits in Limestone Creek, in the Omeo district, was read by Mr. Stirling.

The PRESIDENT announced that Mr. E. Howitt, one of the hon. secretaries of the Society, had retired from that office after many years of valuable service to the Society. He moved that a vote of thanks be passed to Mr. Howitt for his long-continued and valuable services to the Society.

Mr. KERNOT seconded the motion, which was carried unanimously.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

This Club held its usual monthly meeting on Monday evening, 9th April, at the Royal Society's Hall, Mr. H. Watts presiding, and there was a large attendance of members.

Mr. C. A. TOPP was elected an ordinary member, and Professor F. Mc'Coy, F.R.S., an honorary member of the Club. In accordance with the rules, nominations were made for office-bearers for the ensuing twelve months, and the elections will take place at the annual meeting, to be held in May.

Mr. B. R. PATEY submitted the following notice of motion, viz.: "That juvenile members be admitted on payment of an annual subscription of 5s.," which will be duly considered at the next general meeting.

Dr. T. P. LUCAS read his paper entitled "Experiences of an Old Net," being an account of a recent entomological excursion made by him to the neighbourhood of Marysville.

Mr. A. H. S. LUCAS recounted his impressions of a trip to Mount Vesuvius, and exhibited several of the minerals common in the vicinity, also some large photographs of the mount.

Mr. J. F. Bailey contributed a short history of the eggs, animals, and shells of Helix and Bulimus, also of Ferrusiana, Cyclostoma, and Chionella, showing specimens of these latter recently received from France in a live state, and said to have been without food for 97 days.

The Librarian acknowledged the receipt of "A Systematic Census of Australian Plants" by, and from, Baron F. von Mueller, to whom the thanks of the Club were unanimously accorded for his valuable donation.

The exhibits comprised six large boxes of exotic Longicorn Beetles, including *Titanus giganteus*, from Cayenne, this being the largest known Longicorn beetle; also 28 species of the genus Balocera, by Mr. C. French. Some fine specimens of Ducks, including the Flu-billed and Black Teal from New Zealand, by Mr. T. A. F. Leith; Fossils from the Oligocene beds at Mount Martha, by Mr. J. E. Dixon; Rare Lepidoptera from near Dandenong, also a fine specimen of *Sphinx convolvuli*, by Dr. T. P. Lucas; a curious specimen of the fantastic growth of a root of Bamboo from Japan, by Mr. B. R. Patey; Lepidoptera collected during the month by Mr. H. Henderson; Coleoptera, by Mr. F. G. A. Barnard; and Titaniferous Ore and some small gems, by Mr. G. Coghill.

After the usual conversazione the meeting terminated.

THIRD ANNUAL CONVERSAZIONE.

On Thursday evening, 25th. inst., the Third Annual Conversazione took place at the Royal Society's Hall, at which there was a very large attendance of ladies and gentlemen, the increased number of visitors taxing the accommodation of the building to the fullest extent. A most enjoyable evening was spent, and the liveliest interest in the proceedings was evinced by all present. The Chair was occupied by the President, Professor F. McCoy, who opened the Conversazione by delivering the following

ANNUAL ADDRESS.

"I have great pleasure in once more congratulating the members of the Field Naturalists' Club of Victoria on another most successful year's proceedings, and before handing over the honorable office of president to my worthy successor I will take the opportunity of referring to our present condition and to the works of the past year, as well as to some suggestions for useful lines of labour in the coming year, which will have so auspicious a beginning in the acceptance of the office of president by our distinguished fellow-member, the Hon. Dr. Dobson. In the last year there have been no less than twenty-five new members elected as additions, not merely to our roll of membership, but to the band of excellent observers who have already done so much good work, and whose accession to our ranks is full of promise for an extended sphere of usefulness in adding to those portions of scientific knowledge which it is the special function of a field naturalists' club to elucidate. The total number of our members is now 160. The proposal to establish life memberships for a single payment of £5 has been adopted, and it is in contemplation to reduce the usual fee to one-half in the case of young persons joining under the age of 16. As the young people are often the most acute and most successful observers and collectors, and are themselves specially benefitted by devoting their spare time to such occupations, the proposal when adopted will no doubt add to the good service the Club has already done in fostering and spreading a taste for the study of the natural productions of the colony. It has not been found possible to bring into work the intention announced last year of establishing prizes for pupils in State-schools throughout the country (to which I hopefully referred in my last address), with the object of encouraging habits of observation and study in the young people by awarding these prizes annually to those who furnished the best descriptive essays on the habits and distribution of the natural objects of their neighbourhoods, or furnished the best collections of them. It is hoped that the present difficulty will be overcome by a small Government grant to the Club for this purpose, on the analogy of the grants to horticultural, agricultural, and other societies. The library of the Club is growing rapidly. Donations from Governments and individuals of various scientific publications, and the accumulations of the scientific periodicals to which the Club subscribes, now make up a useful nucleus of a club library. Those members who contribute papers to the foreign scientific periodicals on subjects of Australian Natural History would aid this department of the Club by forwarding copies of them to the Honorary Secretary; and donations of works on any of the branches of Botany or Zoology would be gladly received. The number of members joining in the field excursions of the Club has continued to increase, and valuable observations have been made, and many rare specimens of plants and animals have been collected, on each of those pleasant trips. The plan has been adopted of putting each excursion under the leadership of some member specially familiar either with the locality or the particular branch to be chiefly investigated at the meeting. This gives a definite character to the work of each excursion, which has had the effect of increasing the number of field-workers on those occasions, and greatly saving time otherwise likely to be wasted in desultory wanderings, so that more observations and more specimens are acquired than before. The papers read have been numerous, varied, and interesting. One of the first of the year was by our indefatigable Secretary, Mr. Best, on some beetles collected by Colonel T. B. Hutton, of Dandenong. This is just the type of what our Club should be delighted to welcome. A gentleman living in a locality, having peculiarities, as in this case, of dampness, shade, and peculiar vegetation, differing from much of the colony, takes an interest in the natural productions of his neighbourhood, and, collecting and observing them, sends them in to the Club for an examination and report, which is undertaken by a member conversant with the particular branch illustrated; and in this way the Club will greatly facilitate the records of distribution of species and observations on habits, times of appearance, and other details of field observations at present wanting for most of the species of our colony. Mr. Best notes the Western Australian *Stigmodera roci* being in this collection, but suggests it may have been added to the Dandenong collection by mistake. The majority of the species were common near Melbourne, but this extension of their habitat is an addition to our knowledge. Two suggestive papers by Mr. H. Watts, "On the Weeds in Albert Park Lake" and on the "Conjugation of Zygnema," showed how near at hand a capable observer can find materials for investigating researches. He has also used his microscope to good purpose on the Foraminifera, both recent and fossil—the latter being from the tertiary formations of Waurn Ponds, Mount Martha, and Cheltenham. As suggestive of the Club directing its attention to the important matter of the poisonous effects of some native and imported weeds, Mr. F. C. Christy brought forward a notice of doves at Malvern being poisoned by the berries of the *Solanum nigrum*, the Deadly Night-shade, which he finds rapidly spreading over the colony. It has long been known that many European weeds thrive much better in Australia and New Zealand than in their native habitat, even extirpating the weeds really native of the country. Attention being drawn to the spread of poisonous plants may save much loss. Our distinguished fellow-member, Baron von Mueller, gave us a short paper on the three orchids—*Caladenia fimbriata*, *Pterostylis obtusa*, and *Pterostylis aphylla*—found during field excursions of the Club to Brighton by Mr. C. French, whose activity in scientific investigation and acumen in the field have so often borne good fruit before. We have the suggestive statement that the orchids, above all the other phanerogamous plants, are deserving of the attention of our Field Club, as so many species appear for a brief time only, and then disappear. Mr. J. F. M'Kibbin reports thirty species of orchids from Maryborough alone. Mr. D. Sullivan, of Moyston, has continued his excellent local flora of the native plants of the Grampians, with notes of the habits of each species on a plan which we may hope will be taken as a model for many local floras. That acute observer and collector of tertiary fossils, as well as of living invertebrata, Mr. J. F. Bailey, has followed up my observations on the fossil ear-bones of whales from the Waurn Ponds miocene tertiary quarries, published in the "Decades of the

Palæontology of Victoria," by discoveries of similar remains on the other side of the bay, near Cheltenham, and the recognition of a new species, which I have pleasure in naming after him *C. Baileyi.* This I will gladly figure and describe if the Mining Department should ever find the circumstances of the country would allow of the resumption of the publication of the *Palæontological Decades.* Mr. C. French has brought to a conclusion his useful papers on the Victorian Ferns, and has furnished a number of new habitats, as well as critical observations on the variable species, such as might be expected from a member of the Field Naturalists' Club accustomed to the sight of myriads of individual specimens, leaving a valuable impression of the specific identity of species appearing different to students in the closet having only few examples to form a judgment on. Mr. D. Sullivan's paper on the "Droseraceæ, or Sundews," properly rebukes those writers who apply the terms "sensitive" and "carnivorous" to those plants, and, after detailing his experiments in support of his views, gives the systematic characters of our species, and further states his impression that they are poisonous to various ruminating animals. The carefully prepared specimens described were presented to the herbarium of the Club, which we may hope to see increased by all the botanical members. Mr. C. French has given a paper on the "Victorian species of Lycopodium and Selaginella," with many interesting observations and habitats from field observations. The next botanical paper was on the "Papilionaceæ," by Mr. D. Sullivan, following Mr. Luehmann's on our "Acaciæ, or Wattle Trees;" and, as before, he has presented the preserved specimens to our herbarium. Mr. T. A. F. Leith has read a paper, in several parts, on the most striking family of our native birds—the Parrots—containing many original remarks and observations. Mr. Thomas Harrison has been, I believe, the first in the colony to take up Sir J. Lubbock's methods of observing the habits of our very numerous ants in captivity, and, in a paper read to our Club in October last, gives numerous novel observations and instructions for other observers who may take up this subject, which is essentially one for a field naturalists' club, and which, if prepared for by a study of of Sir. J. Lubbock's charming book, would form a most instructive contribution to the general knowledge of the subject, which would be as much appreciated at home as here. Dr. Lucas has continued his paper on the study of Geology, and given one description of an excursion to Warragul for collecting nocturnal *Lepidoptera.* A paper of great and lasting interest, embodying the results of an enormous amount of personal observation of a most painstaking and accurate kind, has been presented, in several parts, by Mr. A. J. Campbell, on the Eggs of Victorian Birds. In this admirable paper, the size, shape, colour, and measurements of the eggs of nearly all birds are given in systematic order, including even the rarest, and a large number unknown to Mr. Gould and his collectors, and therefore not to be found in his great work on the Birds of Australia. This paper is a perfect model of the sort of continued, careful observation and record of facts which would render this Club famous, as the work, to be of value, requires the field observation of the nidification and the exact identification of the species of bird to which the eggs belong. Two orders have been completed, and we are promised the others in due sequence. Mr. J. R. Goldstein has continued his demonstrations in elementary biology, begun with Amœba, by illustrations of the structure and growth of the common moulds Penicillium and Mucor; and this leads me naturally to speak of our monthly evening meetings, at which Messrs. Goldstein, French, Watts, Bailey, the Rev. Mr. Halley, Dr. Lucas, and many others, have brought forward numerous interesting specimens and subjects for informal discussion, rendering those gatherings instructive and popular, the attendance having steadly increased. On these occasions entomology, conchology, palæontology, and microscopic demonstrations seem to be the most popular subjects with the members. One feature is the regular exhibition of the plants of each month, tending to familiarise the eye with our native flora, and particularly establishing a botanical calendar, showing the times of the year at which each species may be got in perfection. At the March meeting *Volvox globator* and Azolla were exhibited from Heidelberg by Mr. Watts, and Amœba by Mr. Goldstein, alive, under the microscope. At the July meeting Mr. Watts exhibited many Anoplura of Victorian birds, collected and mounted by himself (now in the National Museum). At the September meeting all the stages of the Phylloxera, the formidable destroyer of the vine, were exhibited by Dr. L. L. Smith. At the October meeting, amongst many other interesting objects, Mr. Watts exhibited numerous specimens of those great rarities the freshwater Polyzoa, and many fresh-water Algæ. At the November meeting the number of nests and eggs of Victorian birds, exhibited by Mr. A. J. Campbell, formed the feature of the evening, and proved very interesting. And generally at all the monthly meetings a great display of interesting specimens is contributed by the members, and explained by the exhibitor and others in such a way as to prove a highly popular and useful portion of the influence of the Club for good. I have only referred to illustrations of the Natural History of Victoria in dealing with the proceedings of our Club, although many interesting foreign subjects have also been presented. In reference to the future, as on the last occasion, I ventured to suggest some subjects for investigation last year. I will now, in conclusion, offer a few remarks of the same sort. A subject easily dealt with by field observers every month, and of great interest as not to be ascertained in the closet, is the appearance, in the fresh state of growth and of the natural colours, of all our mushrooms and other fungi, sketched of the natural size, and colored in the field with a box of moist colours so as to ultimately afford illustrations like those of Sowerby's English Fungi, for our colonial species. Another subject for field observation and use of the pencil are the habits, and the forms, and disposition of the webs (where they have them) of our spiders. The Araneæ of the colony are very numerous, but these particulars are as yet unrecorded, for the multitude of species figured and described in Kock's admirable work on the Australian Arachnidæ, or for the additional species characteristic of Victoria. I regret that our excellent microscopists and conchologists have not taken up the subject which naturalists at home had to leave to them, and which I recommended last year, namely the preparation and delineation of the rows of teeth on the tongue of each species of our Gasteropoda; and I again suggest a subject every step in which will be an addition to human knowledge, and taking rank as a discovery. The appearance and habits of the larvæ of all our insects opens another new subject for the field observers, which would greatly aid the proper classification of many of our species, and any observation of which, like the other topics I mentioned, would be gladly welcomed at home. Further observations on the form and colours of the living Polyzoa of the colony would likewise do excellent service, as Victoria is particularly rich in these beautiful little objects, and our observers are bound to distinguish themselves by every observation of the kind published. The Hydroida are also good objects of investigation, as we have so many, and so few are known. Although the mosquitoes of Tasmania have been well described, the much more numerous species of Victoria, with the hours and months in which they successfully appear, are almost unknown, and would form a most interesting contribution to knowledge which may be expected from members of our Society. Similarly the habits and dwellings of the numerous species of ants and gadflies would make excellent and striking subjects of research during the year. A monthly calendar of the times of appearance of our insect fauna, like that published of old by Samouelle for England, should be commenced and carried on in successive years by the Club, and will be a useful monument of the labours of our members. There are a great number of other lines of inquiry as yet untouched which properly belong to the members of this Club to work upon; but I have already detained you too long, and must now, with hearty good wishes for new years of successful labour, bid you adieu."

At the close of the address several lecturettes were given by members of the Club. The first of the members treated on Parrots, in which the author, Mr. T. A. F. Leith, described in concise and appropriate language, the modern varieties of the species, their habits, plumage, etc. Mr. J. F. Bailey chose for the subject of the second lecturette "The Nautilus and

Argonaut," and dealt at length with the construction and peculiarities of the shells and their occupants. The last of the number treated on "Foraminifera," by Mr. Watts. The various papers were heartily applauded.

During the evening a large and valuable collection of natural curiosities were exhibited in the lower hall, and called forth the warm interest of the visitors. Following is the

LIST OF EXHIBITS.

A. J. CAMPBELL, East Prahran — Specimens in Queensland Oology.

A. THIE, South Yarra—Ethnological Collection. Implements used by natives of Fiji, South-Sea Islands, New Zealand, and Port Darwin. Specimens of Conchology from Australia, New Guinea, West Indies, and Fiji. Miscellaneous Reptilia.

J. F. BAILEY,—Shells, Minerals, Victorian Fossils.

B. R. PATEY, Collingwood —Curious artificial training, by the Japanese, of the roots of Japanese Bamboo.

C. FRENCH, South Yarra—9 drawers Australian Longicorns (585 species). 4 ditto Buprestidæ. 1 ditto Cetonias. 2 cases Australian Lepidoptera. 1 ditto Australian and Exotic Lepidoptera. 2 ditto New Guinea Insects. 6 drawers Miscellaneous Australian Coleoptera.

C. FRENCH, Jun.—Case of Victorian Fossils and other Shells.

C. A. GROENER, Government House Domain (on behalf of Mrs. Groener)—Stuffed specimen (in case) of rare Paradise Bird (*Paradisea magnifica*).

D. BEST, Fitzroy — 6 drawers of Australian Coleoptera, viz., families Carabidæ, Elateridæ, Cetoninii, Cleridæ, Rhipidophoridæ, and Rutelini. Young Alligator from Queensland, in spirits.

Dr. LUCAS, Emerald Hill—cases of Entomology and Oology.

D. LE SOUEF, Royal Park -35 bottles snakes, &c., &c., in Alcohol, Miscellaneous Bird-skins from Malacca, &c., (including Argus Pheasant), Cuscus from New Cuinea, 1 case Butterflies, &c., Coral, &c.

F. G. A. BARNARD, Kew—4 cases of Insects collected in and around Kew :—No. 1. Typical specimens of the different orders and families. No. 3. Coleoptera, families Scarabæidæ and Buprestidæ. No. 6. Orthoptera, families Blattidæ, Mantidæ, and Phasmidæ. No. 10. Lepidoptera, Pieridæ, &c. Bottle containing Alligator few days old, from Port Darwin.

F. PITCHER—Album of Australian and Exotic Ferns and Lycopods, of over 250 species.

FIELD NATURALISTS' CLUB—Grampian Plants presented to Club's Herbarium by D. Sullivan (Moyston).

F. DU BOULAY, South Yarra—1 case Australian Lepidoptera. 1 case Australian Coleoptera.

F. SPRY, Emerald Hill.—6 cases of Victorian Lepidoptera, Diurnal and Noctuæ.

F. MILLER—A new trap for small animals and birds.

H. T. TISDALL, Walhalla—Painting of the Wild Flowers of North-West Gippsland.

J. E. DIXON, South Yarra—2 cases of Victorian Fossils. 6 drawers of Victorian Lepidoptera.

J. H. GATLIFFE, Melbourne—28 species of Shells, genus Pecten.

Mr. GROENER, Botanical Domain—One case Victorian Stuffed Fishes (edible).

Mr. PRINCE—Collection of dried ferns (New Zealand).

Mr. COLES, (Melbourne)—1 case, 27 Australian Birds. 1 ditto White Egret and Snow Finch.

N. CAIRE, South Yarra—Photographs of Victorian Vegetation, viz., Views taken at Botanic Gardens, Fernshawe, Cape Otway &c.

O. A. SAYCE, Hawthorn—4 Cases of Victorian Coleoptera, collected since the inauguration of the Club.

T. WORCESTER—2 cases of general Conchology.

T. A. F. LEITH, Emerald Hill—Parakeets of New Zealand, and Parrakeets and Bee-eaters of Australia.

W. KERSHAW, Balaclava—Specimens of rare Birds from New Guinea and Northern Australia.

Mr. H. Watts also exhibited, under several microscopes, living Protozoa, and Protophytes, also specimens of the rarer forms of Bryozoa, Hydrozoa, and Foraminifera, all of Victorian habitat.

The Address and Lecturettes were delivered in the upper Hall, whilst the Microscopes and Exhibits were confined to the lower.

The Living Plants were kindly lent for the occasion by Messrs. Law, Somner and Co.

The exhibits were under the supervision of Messrs. J. F. Bailey, C. French, and T. A. F. Leith, who furnished visitors with every information relating to same.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The monthly meeting of this Society was held on Thursday, 26th April, the President, Dr. Ralph, occupying the chair.

Mr. A. H. S. Lucas, B. Sc., M.A., F.G.S., was nominated a member of the Society.

The Vice-President called attention to the fact that Professor Halford, had recommended to his class at the University a microscope by Nachet, costing £7 or £8, about twenty of which had been imported and sold in consequence of this recommendation. These instruments were without rack adjustment, and were not fitted for use in other than the vertical position; the objectives, moreover, were not of the standard gauge. General regret was expressed at the adoption of some instrument so far inferior to many English microscopes which might be procured at half the cost, and it was pointed out that the absence of any means of inclining the body was doubly prejudicial, inasmuch as it compelled the observer to always use the instrument in the position most injurious to health, namely the vertical, and, further, it prohibited the use of the camera lucida for drawing. It was also remarked that much handier and more useful instruments had been made in the colony at a less cost.

Dr. Ralph gave an account of his experiments of resinous mounting media, and exhibited various specimens which he had prepared. The principal solvents used were Copaiba, Balsam, Santal-wood oil, Rouse, or grass-oil (distilled from an Indian species of Andropogon), and Eucalyptus oil. Various combinations of these solvents were made with Copal, Dammar, Kauri gum, Gum-mastic, and Callitris, or Murray Pine gum. Among these Dammar in Santal oil, and Kauri in Rousé or Santal oil seemed to promise the best results. It was pointed out that in using any of these media the object should first be cleared by immersion in the oil used as a solvent.

The Secretary acknowledged receipt of the "Journal of the Royal Microscopical Society" for February, the "Microscopical News" for February and March, the American Monthly Microscopical Journal" for January and February, the "Annales de la Société Belge de Microscope" for December and January, and the "Proceedings of the Linean Society of New South Wales," vol. viii., part 4.

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 25th April, 1883, the Vice-President, the Rev. J. E. Tenison-Woods, F.L.S., &c., in the Chair.

Mr. H. Deane, M.A., was present as a visitor.

The following gentlemen were duly elected members of the Society:—G. Littlejohn, Esq., Strathmore, Forest Lodge; G. A. Cheeke, Esq., Tusculum, Macleay street; William Neil, Esq., City Bank, Sydney.

The receipt of a number of donations was announced.

The following papers were read :—

1. Notes on a collection of Fishes from the Burdekin and Mary Rivers, Queensland, by WILLIAM MACLEAY, F.L.S., &c. Fifty-two species of fishes are here recorded as having been taken by Mr. Morton, of the Australian Museum, within the mouths of the abovenamed rivers. Of these, Mr. Macleay classes 18 as sea-fishes; 11 as salt-water fishes occasionally entering rivers; 7 as fresh-water fishes occasionally visiting the sea, and 15 entirely fresh-water fishes. The new species described are *Serranus estuarius*, *Therapon fuliginosus* and *parviceps*, *Diagramma labiosum*, *Corvina argentea*, *Caranx compressus*, *Cybium semifasciatum*-*Platycephalus Mortoni*, *Eleotris planiceps*, *Atherinichthys maculatus*, *Mugil Ramsayi*, *Chatoëssus elongatus*, *Anguilla marginipinnis*, and *Tæniura Mortoni*.

2. By J. J. FLETCHER, M.A., B.Sc., "Notes on a Viviparous Lizard." The author's attention had been drawn to the subject during last January, when he obtained at Burrawang several examples of female lizards in an advanced stage of pregnancy. The embryos were from 2 to 3 inches long, enveloped in a thin and transparent chorion quite devoid of the calcareous matter with which it is more or less impregnated in the oviparous species.

3. Notes on a method of obtaining water from *Eucalyptus* roots, as practised by the natives of the country between the Lachlan and Darling Rivers. By K. H. BENNETT, Esq. The author describes the method by which, during times of drought, when cut off from the rivers by fear of the hostile tribes on the banks, the back country natives used to extract their entire supply of water from the roots of certain trees—3 species of *Eucalyptus*, a species of *Hakea*, and a Kurrajong. The roots are dug out, cut into lengths, and the pieces set on end in a water-bag until the water drains out. The water is described as perfectly clear and free from any unpleasant taste or smell.

Professor STEPHENS exhibited a photograph and a sketch forwarded by Mr. C. Jenkins, representing a fossil from the Devonian formation of the Murrumbidgee Valley, near Yass. This very remarkable specimen is the head of some Ganoid fish, evidently belonging to the Devonian period, and characterised by strong bony scales, deeply sculptured, and united by close textures. Two of these are perforated by large sub-circular orbits for the eyes. Other portions of the same specimen had been forwarded to the Australian Museum while Mr. Jenkins was engaged in the exploration of the Covan Caves; and some other fragments have since, it is believed, been recovered. Mr. Jenkins is inclined to refer it to *Asterolepis* (which is closely connected with *Pterichthys*), but chiefly on account of the character of sculpture of the scales. On the same ground, he doubts its relationship to *Cacosteus* or *Cephalaspis*. Professor Stephens added that without the actual specimen before them, with all its collected fragments, it would be premature to determine even the genus of this ancient fish; but pointed out that it appeared to have some points of resemblance to *Macropeta lichthys* of the North American Devonians.

Mr. MACLEAY exhibited specimens of a small Moth (*Tineidae*), the larva of which was at present creating great havoc in the vegetable gardens in and about Sydney, completely eating up the leaves of the cabbages and cauliflowers, and rendering the entire crop utterly useless. The Caterpillar, a number of which were exhibited, is an active, slightly hairy, green worm; the pupa is also green, and is fastened on the under side of the leaf on which it has fed by a cocoon, of beautiful open lace work. The rapidity with which this insect seems to reproduce itself is most astounding, and accounts for the short work it makes of a bed of cabbages The insect was, it is said, first noticed last year, and then not in destructive numbers, so that it will probably be found to be an importation.

Mr. MACLEAY also exhibited the fœtus of *Halmaturus ruficollis*, taken from the pouch of the mother, with the umbilical cord attached, illustrating the extremely early age at which the young leave the uterus.

Mr. H. A. GILLIAT exhibited a collection of cretaceous fossils from the Mount Brown diggings. With reference to this exhibit the Vice-President made a few remarks on its value and interest. He said that the cretaceous formation was known to extend throughout the whole eastern interior of the Continent, and probably through the centre, but not much was known of the fossils. The abundance of *Avicula alata*, Eth., in this collection showed such a wide-spread prevalence of this fossil that he considered it the most characteristic species of the formation. The rock was curiously like the Green-sand of Europe. The collection contained valuable additions to our knowledge of the fauna.

Mr. J. J. FLETCHER exhibited (1.) A specimen of a Giant Earth-worm, 25 in. long, from Burrawang, N.S.W. It probably belongs to Professor M'Coy's genus *Megascolides*, and its existence in this colony is now recorded for the first time. (2.) The plates *Dendrolagus inustus* and *D. ursinus* from Professors Schelegel and Müller's work on the Mammals of the Indian Archipelago, for comparison with the specimen of a new species of *Dendrolagus* exhibited by the Hon. Wm. Macleay at the last meeting. (3.) Specimens of the Lizard referred to in his paper.

Professor STEVENS exhibited a pebble from Casino, containing an included drop of water, which did not entirely fill the space in which it was enclosed. The stone was chalcedony, evidently washed out of a volganic rock, in a cavity of which it had been founded by infiltration of hydrous silica, the process having been in all probability only arrested by the decomposition of the *matrix* and consequent liberation of the nodule. The cavity had been first lined by some (probably) geolitic mineral, forming a mammillary surface, which had been subsequently covered by the inner and harder silicious substance which now enclosed the water accompanied by some gas, The phenomenon is not at all uncommon, but often escapes notice.

He also exhibited a Chrysalis of a *Danais*, secured by a silk line to a leaf of an exotic Pelargonium.

NOTES, MEMORANDA.

At the meeting of the Microscopical Society Baron von Mueller read, translated, the following extract from a letter of the Rev. Adolf Schmidt, of Aschersleben, the well-known author of the Atlas of the Diatomaceæ:—

"Henceforth the Australian Diatomeæ will—so I hope—be more extensively represented in my Atlas. The appearance of this work became interrupted, because the publisher discontinued his business, and is no longer connected with any publishing firm. Now however arrangements have been initiated, which are likely soon to lead to the resumption of the work.

It was pleasing to me to learn, that you, as little as myself, were led by the ingenious hypotheses of Darwin to adopt his descendence theory. Before I could give my adherence to it, it should be proved, if even only in a single case, that one species arose from another.

In the realm of Mollusca we often meet cases in which, to judge from external appearances, Darwin's views seem to be correct; but if we examine the animals themselves anatomically, we notice that—although their shells are deceptively similar—their internal distinctions are evidently constant. For ten years I dissected snails, and as the result of a very extensive experience I was able to state that Nature, with quite unrelenting severity maintains the limits of the once created species, though she clothes the internal exact characteristics externally by a deceptive appearance of numerous transitory forms. Finally, it occurs to me, that you might perhaps like to know, that from Leitz, in Wetzlar, cheap microscopes are obtainable, which accomplish something extraordinary."

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AND

MAGAZINE OF NATURAL HISTORY.

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PRICE--ONE SHILLING.

COLLINGWOOD:

J. WING, 33 WELLINGTON STREET.

1883.

Note on the Occurrence of Hymenophyllum bivalve in Continental Australia;

by Baron Ferd. von Mueller, K.C.M.G., M.D., Ph. D., F.R.S.

A circumspect and zealous fern-collector in New South Wales Mr. W. Baeuerlen, has just sent to the writer of these lines an Hymenophyllum, which undoubtedly is referable to *H. bivalve*, a lovely species, hitherto only recorded from New Zealand. The finder noticed it only in one locality, namely on Broger's Creek, not very far from Illawarra. Sir William Hooker, in his celebrated "Species Filicum," I, 98 (1846), has defined the species well, both descriptively and illustratively (Tab. xxxv., fig. D, by Fitch), and identified it, like Swartz, with *Trichomanes bivalve* of G. Forster (Floral Insul. Austral. 84), doubtless from comparison of original specimens, following Willdenow (spec. pl. v. 523) by adducing Hedwig's *Trichomanes pacificum*, but not repeating the record of locality given as the Society-Islands. Possibly this species may occur also in some of the islands of the Pacific Ocean, but it is not mentioned as a South Sea Island fern by Carruthers in Seemann's Flora Vitiensis; nor do Sir Joseph Hooker (Handbook of the New Zealand Flora, 353) and Baker (Synopsis Flicum, 69) give any localities beyond New Zealand for this fern. The specimens from the Illawarra-District agree completely with those contained in the Melbourne Botanical Museum from New Zealand. This seems an apt opportunity to record new places of growth of some other Australian ferns :—

Ophioglossum pendulum, L.—Johnstone-River, Bertheaud.

Botrychium ternatum, Swartz—Near the Gellibrand-River, Marriner; near the Yarra and King River, F. v. M.; on the Genoa, Reader.

Trichomanes cuspidatum, Willd.—On the Daintree-River, Pentzke.

Trichomanes venosum, R. Br.—Near Towoomba, Hartmann.

Trichomanes rigidum, Sw.—On Fraser's Island, W. Hill.

Trichomanes caudatum, Brak.—On Fraser's Island, W. Hill.

Alsophila Rebeccæ, F. v. M.—On the Daintree-River, there attaining a height of 30 feet, Pentzke.

Alsophila Leichhardtiana, F. v. M.—On Fraser's Island, W. Hill.

Dicksonia davallioides, R. Br.—Near the entrance of the Snowy River, J. Stirling.

Lindsaya trichomanoides, Dryander—On Broger's Creek, Baeuerlen.

Lindsaya microphylla, Sw.—On the Dromedary-Range, Reader.

Adiantum lunulatum, Burm.—On the Endeavour-River, Persieh.

Pteris longifolia, L.—On the coast at Port Jackson, rare, Dr. Woolls.

Pteris ensiformis, Burm.—Near Port Douglas, Pentzke.

Pteris umbrosa, R. Br.—In valleys on the lower Snowy River, F. v. M.

Pteris arguta, Ait.—Near Streaky Bay, Mrs. Richards; near Yallum, Prof. Tate.

Woodwardia caudata, Cav.—Near Port Darwin, Prof. Tate.

Asplenium caudatum, Forst.—On the Dromedary-Range, Reader.

Asplenium furcatum, Thunb.—On the Shannon, Muir; near Geographe Bay, Hon. J. Forrest.

Aspidium unitum, Sw.—Near Gingin, Mrs. Marg. Forrest.

Aspidium hispidum, Sw.—On Broger's Creek, Baeuerlen; in the Dandenong-Ranges, Gesner; on the Upper Yarra, Jefferson; on the Moe, Ch. French; near Macquarie's Harbour, Tasmania, Hon. Judge Dobson.

Polypodium phymatodes, L.—Near Port Darwin, Prof. Tate.

Polypodium verrucosum, Wall.—On the Johnston-River, Bertheaud.

Cheilanthes vellea, F. v. M.—On the Everard-Range, Chambers.

Grammitis Muelleri, Hook.—On Mount Roundback, near Port Denison, Aug. Simson.

Grammitis leptophylla, Sw.—Near Mudgee and Coora, Rev. Dr. Woolls.

Platycerium alcicorne, Desv.—On Mount Dromedary, Miss Bate.

OOLOGY OF AUSTRALIAN BIRDS.

BY A. J. CAMPBELL.

[Read before the Field Naturalists' Club of Victoria 9th April, 1883.]

The preceding paper brings us to the end of the second Order of birds. Taking a retrospective view we have under a few pages the description of more than half (about 220) of the known Australian eggs. This must be a great boon to oologists who subscribe to or are in the way of procuring the SOUTHERN SCIENCE RECORD, saving them time and trouble in hunting up information about some much fancied egg in the Public Library here, or some Mechanics' Institute there; besides, the RECORD has the advantage of many descriptions not previously published.

I now take this opportunity of describing more new and rare species belonging to the two orders mentioned, received subsequent to the publication of the papers and other knowledge acquired elsewhere, and also wish, from having received more authentic information, to partly retrace my steps in two instances.

21. MILVUS AFFINIS—(Allied Kite). *Locality*—Australia. **Egg*—Differs in two ways from those of the general run of *Falconidæ*. First, it is not so round; second, the texture of the shell is finer, although in places a little lumpy on the surface, which is also somewhat glossy. The ground color is of a warm fleshy white, moderately marked and blotched all over, but particularly at the larger end, with reddish or chestnut brown; a few bluish-grey blotches appear as if under the shell's surface. Length 2 inches 3 lines. Breadth 1 inch 7 lines.

(For No. 21, Part I,—Read No. 14. LEUCOSPIZA RAII (New Holland Goshawk).

23. ELANUS AXILLARIS—(Black-shouldered Kite). *Locality*—Australia. *Egg*—Ground color, where visible is of a dull white, but it is mostly obscured by blotches and smears of dark reddish chocolate. Length 1 inch 8 lines. Breadth 1 inch 3 lines. (Ramsay.)

61. DACELO LEACHII — (Leach's Kingfisher). *Locality* — Queensland. **Egg*—Smooth, glossy, and pearly white. Length 1 inch $10\frac{1}{2}$ lines. Breadth 1 inch $5\frac{1}{2}$ lines.

74. ARTAMUS MINOR—(Little Wood Swallow). *Locality* — Queensland and New South Wales. **Egg*—Of a light yellowish white tinge, marked and spotted with umber-brown and purplish grey, the latter color appearing as if under the surface of the shell; the majority of the markings are in the form of a belt about the upper quarter of the egg. Length $8\frac{1}{2}$ lines. Breadth $6\frac{1}{2}$ lines.

82. PARDALOTUS RUBRICATUS — (Red-lored Diamond-Bird). *Locality*—Queensland and New South Wales. *Egg* Pearly white, rather pyriform and more pointed than those of any other species. Length $9\frac{1}{2}$ lines. Breadth 7 lines. (Ramsay.)

86. PARDALOTUS MELANOCEPHALUS—(Black-headed Diamond-Bird). *Locality*—Queensland and New South Wales. **Egg*—Pearly white. Length $8\frac{1}{4}$ lines. Breadth $6\frac{1}{4}$ lines.

87. PARDALOTUS UROPYGIALIS — (Yellow-rumped Diamond-Bird). *Locality*—North Australia. *Egg*—Same as *P. rubricatus*. Length $8\frac{1}{2}$ lines. Breadth $6\frac{1}{2}$ lines. (Ramsay.)

105. GRAUCALUS MENTALIS (Varied Graucalus). *Locality*—Queensland, New South Wales, and Victoria. **Egg*—Ground color of a light olive green marked all over with roundish spots and blotches of reddish brown, dark olive, and purplish grey the latter appears under the shell's surface. Length 1 inch 3 lines. Breadth $10\frac{1}{2}$ lines.

Eggs marked thus * not described by Gould, or not previously described.

(No. 105, Part III,—Should be another variety of egg of No. 108, same Part.)

106. Graucalus hypoleucus—(White-bellied Graucalus). *Locality*—Queensland. **Egg* Somewhat smaller than those of the other species; ground color of a beautiful warmish green, spotted and marked, but more so about the apex, with reddish and chestnut brown, also with some dark purplish markings appearing as if under the surface of the shell. Length 13 lines; breadth $9\frac{1}{2}$ lines.

115. Pachycephala melanura—(Black-tailed Thickhead). *Locality* Queensland. **Egg*—Ground color whiter and markings more pronounced than the known eggs of the same genus; the markings are of a dark olive or umber, and are mostly about the apex, and have the apperance of spots and smudges struck on obliquely or in a downward direction; a few grey markings appear under the shell's surface. Length 10 lines; breadth $7\frac{1}{4}$ lines.

120. Pachycephala gilberti—(Gilbert's Thickhead). *Locality*—Victoria, South and West Australia. **Egg*—Characteristic of the well-known egg of *P. rufiventris*, but lighter in color, being of a sickly olive tint, with a belt of spotted markings, about the upper quarter, of olive and dullish grey, the latter color as usual appearing under the shell's surface. Length $10\frac{1}{4}$ lines; breadth $7\frac{1}{2}$ lines.

This interesting Thickhead essentially belongs to the West Australian avifauna, although specimens have been procured in South Australia. It was in October last I had the extreme pleasure of further extending its locality to the Western province of Victoria, having shot a pair in the Wimmera District. But the egg above described was taken in Western Australia.

145. Myiagra concinna—(Pretty Flycatcher.) *Locality*—Queensland. **Egg*—Chubby-like, with a very rounded apex, and of a whitish ground color encircled about the centre, with a belt of umber and grey spots and small blotches; the latter color appears as if beneath the surface of the shell. Length $7\frac{3}{4}$ lines; breadth 6 lines.

— Monarcha albiventris—(White-bellied Flycatcher). *Locality*—Queensland. **Egg*—Creamy white, covered with minute rufous dots thinly dispersed over the middle and smaller end, and so thickly at the larger end as to coalesce and form a rufous cap. Length $7\frac{1}{2}$ lines; breadth 6 lines.

173. Drymodes brunneopygia—(Scrub Robin.) *Locality*—Victoria and South Australia. **Egg*—Shell a little glossy; ground color, greenish or greyish white, completely spotted with fine spots of umber and dark grey; the spots have a tendency to enlarge and thicken round the upper quarter of the egg. Length $10\frac{3}{4}$ lines; breadth $8\frac{1}{4}$ lines.

191. MALURUS LAMBERTI—(Lambert's Superb Warbler.) *Locality*—Australia, except North and West. **Egg*—Pinkish white, marked about the apex with coalesced patches of reddish brown. Length $8\frac{1}{4}$ lines; breadth 6 lines.

196. MALURUS MELANOCEPHALUS — (Black-headed Superb Warbler.) *Locality* — Queensland. **Egg* — Roundish, white minutely speckled all over the surface and about the apex in the form of a zone, with pinkish red. Length $6\frac{3}{4}$ lines; breadth $5\frac{1}{4}$ lines.

205. HYLACOLA PYRRHOPYGIA -(Red-rumped Hylacola.) *Locality*—Australia, except North and West. **Egg*—Pinkish white ground, which is nearly hidden by the deep reddish or chocolate brown, spotted and clouded all over the shell, thickening gradually towards the top, where is formed quite a thick band. Length $9\frac{1}{4}$ lines; breadth $6\frac{3}{4}$ lines.

234. XEROPHILA LEUCOPSIS—(White-faced Xerophila.) *Locality*—Australia, except North and West. **Egg*—Pinkish white or fleshy ground color, thickly spotted and smudged all over (more or less) with pinkish or reddish chocolate, sometimes interspersed with deep purplish grey, and in others these markings thicken about the upper quarter of the egg. Length $8\frac{1}{2}$ lines; breadth $6\frac{1}{4}$ lines.

It will be observed that Mr. Gould has described for this the egg of some other bird.

251. STRICTOPTERA BICHENOVII — (Bicheno's Finch.) *Locality*. Australia, except West. **Egg* -Of a uniform soft white color. If the surface of the shell is very closely looked into, like most Finches' eggs, it will be observed to be very minutely pitted. Length 7 lines; breadth 5 lines.

—. PŒPHILA ATROPYGIALIS (Grass Finch.) *Locality* - North Australia. **Egg*—Shell white outside, with a faint greenish tinge inside; length $7\frac{1}{3}$ lines; breadth $5\frac{1}{4}$ lines. (Ramsay.)

—. PITTA MACKLOTTI -(Macklot's Pitta.) *Locality* North Australia. **Egg* -Creamy white, covered all over with small speckles and streaks of a purplish hue, many of which are much paler than others, and appear as if beneath the surface of the shell. In some specimens these markings are less numerous, but in all instances are alike in character. The eggs appear to vary in size, even in the same nest, some being one inch by $\frac{13}{16}$, while others measure $1\frac{1}{8}$ by $\frac{15}{16}$.

PROCEEDINGS OF SOCIETIES.

THE ROYAL SOCIETY OF VICTORIA.

The usual monthly meeting of this Society was held on Thursday, 10th ult., Mr. R. L. J. Ellery (the President) in the chair. There were about 30 members present.

Mr. F. L. Outtrim was elected an associate.

Mr. T. S. Ralph read a paper on "The Occurrence of Bacteria in living Plants." He stated that he had found bacteria in the square cells on the surface of leaves, and that they were confined, as a rule, to the superficial cells. It was most desirable, he argued, that the study of the animal economy should not be dissassociated from the vegetable economy. Bacteria had a very powerful organic force. Whether they belonged to the animal or vegetable kingdom, he could not definitely say; but he was inclined to believe that they were of chemical organic formation, or chemical combinations.

Dr. Jamieson said it would have been more satisfactory if Mr. Ralph had supplied the evidence on which he had come to the conclusion that certain forms found by him were bacteria.

Mr. Ralph said there was no doubt about the movement of the bacteria that he had found. Sometimes they had a slight greenish color.

Mr. P. Behrendt read a paper on "Modern Fireproof and Watertight Building Materials," in which he referred to "traeger wellblech," a corrugated iron plate used by builders in Germany to make walls, floors, and ceilings fireproof. It also made a fireproof curtain for theatres. As to watertight building materials, he spoke highly of asphalt. He described the carton de pierre roof, of which asphalt is an important ingredient. Asphalt plates were used in walls of fortifications and other buildings to prevent percolation of water, and also to keep the floors of brick-kilns dry. Asphalt plates were likewise useful as a layer on the foundation to keep the walls of the superstructure dry. There were also asphalt bricks. He referred to the water which the ordinary brick walls will hold.

The next paper read was by Dr. Ecklund, on "The Germs of Blennorrhagia."

The proceedings then terminated.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The ordinary meeting was held on Thursday, 31st May, the President, Dr. Ralph, occupying the chair.

The SECRETARY acknowledged receipt of the "Report of the Chief Inspector of Mines for 1882," the "Bulletin de la Société Belge de Microscopie," for February, the "Microscopical News," for April, and the "American Monthly Microscopical Journal," for March.

Mr. A. H. S. LUCAS, B.Sc., M.A., F.G.S., was elected a member of the Society, and Dr. MacInerney, M.D., was proposed for election at next meeting.

Dr. RALPH read a paper on Bacteria in living plant tissues, describing his discovery of the existence of Bacteria in the superficial cells of healthy plants of Vallisneria, with some references to the connection between certain bacilli and septic diseases. He inclined to the opinion that the bacilli did not in themselves constitute the poison, but that they were rather the carriers of contagion, having become saturated with chemical poison, which might in some circumstances be gradually eliminated, rendering the bacilli harmless. Dr. Ralph afterwards (with the assistance of Mr. Barnard) exhibited specimens of living Vallisneria, in which the Bacteria were present, also specimens of sputa, containing rod-like bacilli.

Mr. W. W. ALLEN exhibited Swift's "Challenge" Microscope, with Popular Condenser and other accessories, and explained the construction.

Mr. R. E. JOSEPH, by request of the Committee, sent for exhibition an arrangement of the electric light for microscopical purposes. The light was obtained from small incandescent lamps, mounted on brass stands with universal motions (as figured in a recent number of "The Journal of the Royal Microscopical Society"), and supplied by a battery of three Grove cells. The effect was excellent, and the light was much admired by the members present, who accorded a hearty vote of thanks to Mr. Joseph and the gentlemen who attended on his behalf to exhibit and describe the apparatus.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

The third Annual Meeting of the Field Naturalists' Club of Victoria was held at the Royal Society's Hall on Monday evening, 14th May. There was a large attendance of members, and Mr. H. Watts presided.

The Report and Balance-sheet showed the Club to be in a highly satisfactory condition, the number of members showing a steady increase since the last Annual Meeting. The election of office-bearers resulted as follows:—President, the Hon. Dr. F. S. Dobson, M.L.C.; Vice-Presidents, Messrs. T. A. F. Leith, and H. Watts; Hon. Treasurer, E. Howitt; Hon. Secretary, D. Best; Assistant Treasurer and Secretary, J. H. Matthias;

Librarian, J. F. Bailey; Committee, Messrs. C. French, A. O. Sayce, J. H. Gatliff, F. G. A. Barnard, and A. H. S. Lucas.

A new rule was adopted, admitting junior members up to the age of 18 years upon payment of half the usual subscription of 10s. per annum.

Several gentlemen were nominated for membership; and the following papers were promised:—By Mr. J. F. Bailey, "On the Identification of the Miocene Strata at Cheltenham;" by Mr. W. R. Guilfoyle, "A Botanical Trip to the South Sea Islands;" by Mr. A. J. Campbell, continuation of his papers on "Australian Oology, with some curious notes about Cuckoos;" and by Mr. T. Harrison, "Some further Notes of his Observations on the Habits of Ants and Bees."

Owing to the lateness of the hour at which the formal business was concluded, no papers were read, but there was the customary exhibition of specimens. Amongst them were a pair of Ptarmigan or White Grouse (*Lagopus mutus*), by Mr. T. A. F. Leith; collections of New Zealand Orchids, by Mr. C. French; seven stages in the life of one of our common Moths (*Ossorhina nana*), by Mr. F. Spry; Ghost Moth (*Chalepteryx Collesi*), by Mr. J. Stickland; Dried Currants grown at Inglewood, by Mr. J. E. Prince; Native head found at Queenstown, by Mr. J. Andrews; variety of Sponges from Western Port, by Mr. A. Thie; new Land Shell (*Bulimus Rosseteri*) from New Caledonia, by Mr. J. F. Bailey. *

Mr. Bailey also exhibited other forms of Bulimus, showing the special feature of the toothed aperture in the species from New Caledonia.

The meeting was brought to a termination with the usual conversazione.

THE ROYAL SOCIETY OF NEW SOUTH WALES.

The Annual General Meeting of the Members of the Royal Society of New South Wales took place on Wednesday night, 2nd May, at the Society's House, Elizabeth street. Mr. Christopher Rolleston, C.M.G., President, occupied the chair, and there was a large attendance of members.

The minutes of the previous meeting having been read and confirmed, the report of the council for 1882 was submitted, which stated that the affairs of the Society continued in a satisfactory condition. The number of new members elected during the year was 41. The total number of members on the 30th

* This new and interesting species is quite distinct from any other form found in New Caledonia; the aperture is not ear-shaped, and the columella is destitute of any denticulation, which is quite a speciality in the Bulimidæ of New Caledonia.

April, 1883, was 486. During the past year the Society had received 791 volumes and pamphlets as donations; in return it had presented 835 volumes to various kindred societies.

The council had subscribed to 43 scientific journals and publications, and had purchased 573 volumes. The total sum expended upon the library during the past year was £422 12s. 10d. The amount standing to the credit of the building fund in the bank was £189 13s. 11d. The Society's journal, volume 15, for 1881, had been duly distributed to all members entitled to it. During the year the Society had held ten meetings, including two adjourned meetings, at which twelve papers were read, and the medical and microscopical sections had held regular monthly meetings. At the council meeting held 13th December 1882, it was unanimously resolved to award the Clarke Medal for the year 1883 to Baron Ferdinand von Mueller, K.C.M.G., F.R.S., &c., Government Botanist, Melbourne. At the same meeting the council awarded the prize of £25 which had been offered for the best communication on the "Influence of Australian Climates and Pastures upon the growth of Wool," to Dr. Ross, M.L.A., Molong, and the prize for the one upon "The Aborigines of New South Wales," to Mr. John Fraser, B.A., West Maitland.

The financial statement for the past year was then read by the hon. treasurer, Dr. H. G. A. Wright, and it was afterwards adopted, together with the report, on the motion of Mr. H. C. Russell.

A letter was read from Baron von Mueller, K.C.M.G., F.R.S., acknowledging the receipt of the Clarke Medal for the year 1883, which had been awarded him by the Society.

The President announced the fact that M. M. Pasteur, the eminent French scientist, had been elected by the council as an honorary member in connection with the Society, *vice* the late Dr. Charles Darwin.

The number of contributions, consisting of volumes and pamphlets, which had been received since the last meeting was 360. These were laid upon the table for the information of members.

THE PRESIDENT'S ANNUAL ADDRESS.

The President then read the following address:—"Gentlemen, —Combining, as the anniversary meetings of the Royal Society are in the habit of doing, the close of the old year with the opening of a new one, the distinguished honour conferred upon me at our last anniversary as President for the year demands of me, before I vacate the chair, that I should open the present session with the customary address. But before entering on the subject of it I desire to say how sensible I am of my shortcomings, and of the kindly forbearance and support extended to me by the members who have attended our meetings. I would fain hope that my faults, having been rather those of omission than of commission, may not have resulted prejudicially, either to the character or progress of the society. The fact is that in a young community like ours, we are sadly wanting in men of leisure and of culture who have the time to spare and the knowledge to adorn the chair of this Society qualifications which were eminently exemplified in the person of our former Vice-President, the late Rev. W. B. Clarke, the memory of whose services in the cause of geological science in Australia, and in the interests of this Society in particular, will, I venture to think, outlive the lineaments of his person, so happily portrayed on the canvass which adorns our walls. The report of the council which has just been presented gives a favorable account of the progress of the society for the last 12 months, and it would be tedious to attempt to enlarge upon the topics referred to in that report. The most important of the papers read during the session were those contributed by the Rev. J. E. Tenison-Woods, and especially that on "The Geology of the Hawkesbury Sandstone," which, from the novelty of its conception, the variety of facts and observations by which his theory was supported, the clearness with which the facts were set forth, and the masterly ease which characterised the treatment of the theory propounded, is a most interesting and valuable contribution to the Society's transactions. There was also a very interesting and valuable paper on "Tropical Rains," by my highly-respected predecessor in this chair, Mr. H. C. Russell; and also a very remarkable paper by Mr. James Manning, containing curious revelations as to the religious belief of the aborigines of New Holland revelations made to him more than five-and-forty years ago, as he alleges, before the blacks had come in contact with the missionaries or other tamperers with their faith. In casting about for a subject on which to address you this evening, it has seemed to me that I could not better occupy your attention, or discharge the duty imposed on me, than in bringing under review a *resumé* of the life and labours of a distinguished member of our Society, the tidings of whose death reached us subsequent to our last anniversary, and who has left behind him a name and reputation second to none in this age of scientific inquiry. Upon the roll of honorary members of our Society in the year 1879 was placed the name of Charles Robert Darwin; and whilst we did honour to ourselves in enrolling his name amongst the distinguished men to whom a like compliment has been paid, it is gratifying to know that he highly appreciated this recognition of his great services in the field of natural science. In the month of April of last year, within the precincts of the ancient abbey of Westminster, and near the honoured grave of England's greatest philosopher, were appropriately deposited the mortal remains of this eminent naturalist; and whatever might have been the opinion a quarter of a century ago, no one at the presnt day would venture to challenge the claim that the final resting-place of the foremost scientific man of the Victorian era should be alongside the grave of the only other philosopher of the past whose revolutionary effect upon thought can at all be compared with his own. The discoveries of Sir Isaac Newton—the most remarkable mathematician and greatest natural philosopher of his own or any other age—can, I think, alone be brought into competition with those of Darwin, whose faithful, patient and laborious application of the Baconian theory of induction has brought about so complete a revolution in scientific thoughi. We can all remember the fierce theological storm which raged about the head of this earnest inquirer after truth, who, by his "Origin of Species" and theory of "evolution," challenged ancient traditions, and gave a severe shock to time-honoured principles of faith. It was soon, however, discovered that Darwin was rather a patient investigator of facts than a daring theorist, and that, whatever might be his conclusions, the mass of facts he had collected with unparalleled industry and sagacity were no inconsiderable contribution to human knowledge. It is not too much to say that had Darwin's life been cut off a quarter of a century ago no one would have had the temerity to suggest that his memory should have been so conspicuously honored as it has been by giving him a final resting-place among England's greatest worthies. But the panic created by his discoveries has subsided, and Science has at length come to be regarded, not as the enemy but as the handmaid of religion. The greatness of the revolution that has taken place in human thought, and the abatement of honest but unreasonable alarm at modern discoveries, are vividly illustrated by the profound homage paid to the deceased philosopher by the foremost orthodox divines of the day. The "evolution" theory, which a quarter of a century ago was denounced as leading to Materialism, is now recognised as in no way alien to the Christian religion. Darwin had the happiness of living down the clamour created by his grand discoveries, and even where his theories have not been accepted he has long since been recognised as a modest reverent, and earnest searcher after truth. Both in Westminster Abbey and in St. Paul's Cathedral the great preachers of the day testified to the pure and earnest love of truth which characterised the life and labors of Mr. Darwin. Canon Prothero described him as "the greatest man of science of his day, but so entirely a stranger to intellectual pride and arrogance that he stated with the utmost modesty opinions of the truth of which he was himself convinced, but which he was aware could not be universally agreeable or acceptable." Canon Barry referred to Mr. Darwin as a leader of scientific thought, showing that the fruitful doctrine of evolution, with which his name would always be associated, lent itself as readily to the old promise of God as to more modern, but less complete, explanations of the universe. Canon Liddon observed that, when Darwin's books on the "Origin of Species" and on the "Descent of Man" first appeared, they were largely regarded by religious men as containing a theory necessarily hostile to religion, but a closer study had greatly modified any such impression. "It is seen," he said, "that whether the creative activity of God is manifested through catastrophes—as the phrase goes—or in progressive evolution, it is still His creative activity, and the really great questions beyond remain untouched." During 40 years past, living in comparative retirement at his country residence in Kent, Mr. Darwin steadfastly pursued his experimental researches, and from time to time published their results, with those of his profound and comprehensive speculations, till he has gradually won the assent of all well-informed persons to a few grand principles concerning the development of specific forms of organic life. His theory of the origin of species, vegetable and animal, referred them to the operation of a general law of Nature in the universal struggle of living organisms for subsistence, and in the competition for opportunities of reproducing their kind tending to the survival of the fittest types, and to the modification of their progeny, in the course of successive generations, by more and more distinctive peculiarities growing up in those organs or features which aided most effectually in the preservation of the race. Individual types of exceptional vigour, and with particular adaptation to surrounding circumstances, would thus become the progenitors of distinct species. In his famous book, which appeared in 1859, Mr. Darwin formally announced his view of natural history. He says: "I cannot doubt that the theory of descent, with modification, embraces all the members of the same class. I believe that animals have descended from at most only four or five progenitors, and plants from an equal or lesser number." He seems to have looked forward even to a higher generalisation, for he goes on to say that "analogy would lead me one step further, namely, to the belief that all animals and plants have descended from some one prototype; but this inference is chiefly grounded on analogy, and it is immaterial whether or not it be accepted. The case is different with the members of each great class, as the Vertebrata, the Articulata, &c., for here we have distinct evidence that all have descended from a single parent." Darwin concludes his treatise in these impressive words?—"From the war of Nature, from Famine and Death, the most exalted object which we are capable of conceiving—namely, the production of the higher animals—directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been and are being evolved." In his treatise on the "Origin of Species," from which the foregoing quotations are copied, Darwin had not actually expressed his views as to the ancestry of man, though he had left them to be very clearly inferred. He says: "It seemed to me sufficient to indicate that, by this work, light would be thrown on the origin of man and his history," for this implied that man must be included with other organic beings in any general conclusion respecting his manner of appearance on this earth. But in his work on the "Descent of Man and Selection in Relation to Sex," which was published in 1871, Darwin expressly dealt with this most interesting question. He presented man as co-descendant with the catarrhine or "down-nostrilled" monkeys from a hairy quadruped furnished with a tail and pointed ears, and probably a climber of trees. Nay, he traced back the chain of descent until he found, as the progenitor of all the vertebrate animals, some aquatic creature, hermaphrodite, provided with gills, and with brain, heart, and other organs imperfectly developed. The treatise concludes by remarking what are the hopes which the advance of the human race in past ages seems fairly to justify. He says: "We are not, however, concerned with hopes or fears, but only with the truth as far as our reason allows us to discover it." "I have given the evidence to the best of my ability; and we must acknowledge, as it seems to me, that man, with all his noble qualities; with sympathy, which feels for the most debased; with benevolence, which extends not only to other men, but to the humblest living creature; with his god-like intellect, which has penetrated into the movements and constitution of the solar system—with all those exalted powers, man still bears in his bodily frame the indelible stamp of his lowly origin." After the publication of his first great work, Darwin continued to gather evidence tending to strengthen his theory. In 1862 he published his remarkable works on "Fertilisation of Orchids," and in 1867, his "Domesticated Animals and Cultivated Plants." In 1872 Mr. Darwin published "The Expression of the Emotions in Man and Animals;" in 1875, "Insectivorous Plants;" in 1876, "Cross and Self-fertilisation in the Vegetable Kingdom;" and in 1877, "Different Forms of Flowers in Plants of the Same Species." Only last year appeared his work upon Earthworms, in which he traced the operations of worms in gradually covering the surface of the globe with a layer of mould, and showed the wonders produced by the operations of these insignificant creatures. Mr. Darwin, having inherited a good private fortune, engaged in no business or profession, but devoted his whole life to natural science. And here I may mention how it came about that he visited Australia. When a naturalist was to be chosen to accompany the surveying expedition of Her Majesty's ship Beagle in 1831, Darwin was recommended to Captain Fitzroy and the Lords of the Admiralty by the then Professor of Botany at Cambridge. He sailed with that expedition on the 27th of December, 1831, and returned to England in October, 1836, having made a scientific circumnavigation of the globe. On returning to England, Darwin published a "Journal of Researches into the Geology and Natural History" of the various countries he had visited, in addition to numerous papers on various scientific subjects. Mr. Darwin's conclusions as to the future of New South Wales, after crossing the Blue Mountains and going as far as Bathurst, are worth recording, as those of a keen observer who visited the colony nearly half a century ago. He says: "The rapid prosperity and future prospects of this colony are to me, not understanding these subjects, very puzzling. The two main exports are wool and whale oil, and to both of these productions there is a limit. The country is totally unfit for canals, therefore there is a not very distant point beyond which the land carriage of wool will not repay the expense of shearing and tending sheep. Pasture everywhere is so thin that settlers have already pushed far into the interior. Moreover, the country further inland becomes extremely poor. Agriculture on account of the droughts can never succeed on an extended scale; therefore, so far as I can see, Australia must ultimately depend upon being the centre of commerce for the southern hemisphere, and perhaps on her future manufactories. Possessing coal she always has the moving power at hand. From the habitable country extending along the coast, and from her English extraction, she is sure to be a maritime nation. I formerly imagined that Australia would rise to be as grand and powerful a country as North America, but now it appears to me that such future grandeur is rather problematical." Before his lamented death, no doubt, Darwin had seen cause to modify his early impressions, and to recognise the gigantic strides made by Australia towards the achievement of a national greatness second only to the North American Republic to which he referred. As bearing on the interesting theory propounded by the Rev. J. Tenison-Woods, in his paper on the geology of the Hawkesbury sandstone, to which I have alluded, I should like to quote Mr. Darwin's impressions on visiting the remarkable scenes presented to his observation in crossing the Blue Mountains. He says: "The first impression on seeing the correspondence of the horizontal strata on each side of these valleys and great amphitheatrical depressions is that they have been hollowed out, like other valleys, by the action of water; but when one reflects on the enormous amount of stone which on this view must have been removed through mere gorges or chasms, one is led to ask whether these spaces may not have subsided. But considering the form of the irregularly branching valleys, and of the narrow promontories projecting into them from the platforms, we are compelled toabandon this notion. To attribute these hollows to the present alluvial action would be preposterous, nor does the drainage from the summit-level always fall, as is remarked, near the Weatherboard into the head of these valleys, but into one side of their bay-like recesses. Some of the inhabitants remarked to me that they never viewed one of these bay-like recesses with the headlands receding on both hands without being struck with their resemblance to a bold sea-coast. This is certainly the case.

Moreover, on the present coast of New South Wales the numerous fine widely-branching harbours, which are generally connected with the sea by a narrow mouth worn through the sandstone coast cliffs, varying from one mile in width to a quarter of a mile, present a likeness, though on a miniature scale, to the great valleys of the interior. But then immediately occurs the startling difficulty, why has the sea worn out these great though circumscribed depressions on a wide platform, and left mere gorges at the openings, through which the whole vast amount of triturated matter must have been carried away. The only light I can throw upon this enigma is by remarking that banks of the most irregular forms appear to be now forming in some seas, as in parts of the West Indies and in the Red Sea, and that their sides are exceedingly steep. Such banks, I have been led to suppose, have been formed by sediment heaped by strong currents on an irregular bottom. That in some cases the sea, instead of spreading out sediment in a uniform sheet, heaps it round submarine rocks and islands it is hardly possible to doubt after examining the charts of the West Indies; and that the waves have power to form high and precipitous cliffs, even in land-locked harbours, I have noticed in many parts of South America, To apply these ideas to the sandstone platforms of New South Wales, I imagine that the strata were heaped by the action of strong currents, and of the undulations of an open sea on an irregular bottom, and that the valley-like spaces thus left unfilled had their steeply-sloping flanks worn into cliffs during a slow elevation of the land, the worn-down sandstone being removed either at the time when the narrow gorges were cut by the retreating sea, or subsequently by alluvial action." I know not what our friend Mr. Tenison-Woods may think of these impressions. They do not agree with his own theory, and may not stand the test of the advanced geological science of the present day; nevertheless they are interesting as being the early impressions of so celebrated an observer of Nature as Darwin. I will, if you allow me, quote the words with which he closes his chapter on New South Wales: "Farewell, Australia, you are a rising child, and doubtless some day will reign a great princess in the south; but you are too great and ambitious for affection, yet not great enough for respect. I leave your shores without sorrow or regret."

(Conclusion in next issue.)

MICROSCOPICAL SECTION.

The first meeting of this section for the present session was held on Monday evening, May 14th., Mr. G. D. Hirst in the chair.

A letter was received from the Rev. James Jeffries, accompanying a donation of slides of Polyzoa entrusted to him when in England by Dr. Leipner, of Clifton. The merit of these preparations consists in mounting the animals with their tentacles fully expanded, as in life, and the beauty of these slides elicited general approval at the meeting.

Mr. PEDLEY observed that the addition of a few drops of water holding carbonic acid gas, such as sodawater, had an immediate stupefying effect on the most active forms of aquatic life, thereby enabling observers to study and delineate them in a state of rest, whilst on the addition of fresh water they would immediately revive and resume their wonted state of activity.

The Secretary, Mr. F. B. KYNGDON, called attention to several new objectives of the highest power recently received by him from the celebrated maker, Carl Zeiss, and it was arranged to test their performances at the next meeting. One of the most interesting features of the evening was the exhibition of some of the newly-discovered bacteria that are now admitted by the medical faculty to be the specific poison of many of the most widespread and deadly of diseases, Dr. Wright having received from his son in England the undermentioned slides, viz.—*Bacillus anthracis*, a portion of the lung of an animal that died from splenic fever; also a slide of the blood of a man suffering from woolsorters' disease; a slide of typhoid bacilli, present in a section of the mesenteric gland of a person that died of typhoid fever; a slide of tubercle bacillus, stained by Dr. H. Gibbes' method, and derived from the sputum of a person in the last stage of consumption. These minute bacteria need the highest magnifying powers for their discovery, and in all the above slides were particularly well shown by means of the new objectives by Tolles, of Boston, and Zeiss, of Jena. Mr. Pedley also exhibited a bacterium called *Leptothrix buccalis*, that is found generally present in decayed tooth structure, although it is an open question as to whether this bacterium is the source of tooth decay. Mr. Trebeck exhibited a curious sample of brown wool, having several bands of lighter color, and he introduced the question as to the felting properties of wool. Messrs. Hirst and Pedley, having recently investigated the matter, expressed themselves as unable to dissent from the generally received theory that this important quality of wool is due to the rough and serrated notches always present on a felting fibre. Mr. Whitelegge, a visitor, having had practical experience in wool-sorting, and the preparation of felt for hat-making, stated that the manufacturers generally cleanse wool from burrs and seeds by steeping in dilute sulphuric acid, whereby the woody matter is destroyed, and at the same time its felting properties are impaired, although he was unable to detect any alteration in the shape of the "notches;" however, in furs from skins that had been tanned he found the felting properties to be intensified. As a proof that felting depends on the presence and character of the "notches," he instanced the custom of the felt hat manufacturer to select and keep separate the little patch of red fur always present in the neck of a rabbit skin, known in the trade as the "red patch," for the purpose of mixing with other fur and rubbing in over bare patches in a felt, so that what would otherwise be a defect, and render the goods unsaleable, is rendered scarcely discernible even to a practiced eye. He found these "red patch" hairs to be notched to an extraordinary extent. Dr. Mackellar exhibited beneath his microscope some slides of bacteria. Mr. Whitelegge and the Secretary showed some gatherings from the Waterloo marshes singularly rich in many of the most beautiful forms of pond life, including tube-building rotifers, free swimming rotifers, floscularia, several forms of vorticellæ or bell animalcules. All of the above were shown as living specimens.

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 30th May, 1883. The Vice-President, the Rev. J. E. Tenison-Woods, F.L.S., &c., in the chair.

Thomas Whitelegge, Esq., and Henry Deane, Esq., M.A., M.I.C.E., of Gladesville, were duly elected members.

The receipt of several donations was announced.

The following papers were read :—1. Notes on a lower jaw of *Palorchestes Azael* By Charles W. D. Vis, B.A. A fine specimen of the right ramus of the lower jaw of a young *Palorchestes Azael*, now in the Brisbane Museum, was fully described in this paper. Reference was made to Professor Owen's account of an adult jaw of the same species (Foss. Mamm. Aust. Pl. cvi.); and the relations of *Palorchestes* to *Sthenurus*, *Macropus*, *Protemnodon*, &c., discussed as fully as the evidence allowed. The author regards it is a true saltigrade of the Macropod type, closely allied in many respects to *Sthenurus*, though with a premolar of a quite distinct character.

2. Synonymy of Australian and Polynesian Land and Marine Mollusca. By John Brazier, C.M.Z.S., &c. In this paper the author traced the synonymy of *Patella aculeata*, Reeve; *Natica Incei*, Phil., and some others, besides rectifying the identification of *Lucina dentata*, Jay, which has by most authors been confounded with *L. divaricata*. Linn.

3. On some Mesozoic Fossils, from Central Australia. By the Rev. J. E. Tenison-Woods, F.G.S., &c. The author describes the nature of the deposit from qualitative analysis and microscopic examination; noticing the occurrence of various fossils too imperfect for specific identification. The author describes also the two new species, *Trigonia mesembria*, a clearly cretaceous form of the section "Glabræ," and *Pecten psila*, which the author considers may only be a variety of *P. socialis*, Moore.

He also described a *Belemnites*, probably *B. australis*, Phillips, of a very aberrant type of the section "Hastati." In conclusion, he considered that, as many of Moore's Wollumbilla (Jurassic) fossils were found in this formation, there was either a confusion of type, or that the Wollumbilla beds were part of the lower cretaceous formation of Central and N.E. Australia.

4. Contribution to a knowledge of the fishes of New Guinea, No. 4. By William Macleay, F.L.S., &c. One hundred and thirty species of fishes are here recorded, chiefly from the extreme south-east of New Guinea, making with those enumerated in the three previous papers, 409 species in all, collected by Mr. Goldie on the island. One new genus (Tetracentrum) and 33 new species are described, chiefly from fresh water.

5. A second half-century of plants new to South Queensland. By the Rev. B. Scortechini, F.L.S. The author enumerates 50 plants not previously quoted from Southern Queensland, and either belonging to the tropical flora of Northern Australia, or indigenous to the southern and temperate portions of the continent. He also notices some of the changes of nomenclature resulting from the fusion of the genera *Pithecolobium*, *Calliandra*, and *Enterolobium* with *Albizia*.

Mr. MACLEAY exhibited a cast of the right mandible of *Palorchestes Azael*, the fossil, which was the subject of Mr. De Vis' paper.

Dr. M'KELLAR exhibited portions of the liver and lungs of a sheep with large hydatid cysts, and also showed under the microscope specimens of the enclosed embryos. These probably belong to a Tapeworm (*Tœnia echinococcus*), the proscolex stage of which is the cause of hydatids in the human subject, and which is developed as a tape-worm only in the dog: in the hydatid stage these are probably innocuous to the human subject, but further experiments are being carried out with a view of throwing additional light on the life history of this tapeworm.

Professor STEPHENS exhibited a collection of fossils from "Sturt's Stony Desert," close to the Grey Ranges. Among them were specimens of *Ammonites biflexuoides*, *Belemnites* sp., besides other mollusca, all found at a depth of over 100 feet. Also a specimen of petrified wood, part of a tree met with in sinking a well on the Dunlop station, 50 miles north of the Darling, at 300 feet below the surface; Dendrites from Wittabreene, 30 miles north of Mount Brown; Gypsum (selenite) from the Grey Ranges, where high cliffs of this substance occur; fossil wood from the same place; shell breccia from the district between the Paroo and Warrego, found at a very great depth, &c. He also exhibited a rare fungus from Springwood, both in the dry state and by drawings. It was regarded by Mr. Tenison-Woods as probably a species of *Stereum*. Also a specimen of Opal in reniform nodules, obtained by Mr. Gilliatt from a well in the Paroo district. The matrix is understood to have been clay, presumably a deposit from hot springs.

Mr. Whitelegge exhibited a living and vigorous specimen of *Plumatella* obtained in the Botany swamps. It appeared to be identical with *P. repens*, Linn. Also dried specimens of *Nitella gelatinosa* from Randwick, one of the Characeæ which had not been previously recorded from this district.

Mr. Asher exhibited a "holy dollar and several "dumps," as an interesting illustration of the early history of the colony, and read the proclamation of Governor Macquarie, determining their values in the standard currency.

Mr. Macleay read the following letter from Mr. Meyrick relative to the caterpillar exhibited by him (Mr. Macleay) at the last meeting:—

"Warwick House, Armagh-street West,
"Christchurch, N.Z., 21st May, 1883.

"Dear Sir,—I observed in the abstract of proceedings of the last meeting of the Linnean Society, a note by yourself on the injury caused to cabbages by the great numbers of larvæ, of one of the Tineina, and thought you might be interested to know the specific name. The habits of the larva, and your mention of the lace-work cocoon, enable me to say for certain that the species is Plutella cruciferarum, Zeller (family Plutilladæ) which, as you rightly conjecture, is an importation from Europe. It occurs now throughout the whole world from Greenland to New Zealand, and is apparently abundant everywhere, not regarding climate; it is the only known Lepidopterous insect of which this can be said. It swarms in many parts of Australia, especially at Adelaide. It has probably been imported with the cabbage, but will eat almost any Cruciferæ. Its numbers are, I think, principally kept down in the larval state by small birds. The moth, though small and inconspicuous, may be readily recognised by unpractised persons from its habit of projecting its antennæ forward when at rest, as the Trichoptera do.—Believe me, yours truly, "EDWARD MEYRICK.

"Hon. William Macleay, M.L.C."

THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

A meeting of the Royal Society of South Australia was held at the Institute on Tuesday evening, the 3rd April. Mr. C. Todd, C.M.G. (President), occupied the chair.

The President referred to the visit of Lieutenant Darwin, son of the celebrated naturalist, to Australia, to observe the transit of Venus. With regard to the determination of Australian longitudes, in which the Lieutenant had been engaged in conjunction with himself (Mr. Todd), he mentioned the reception of a letter from Lieutenant Darwin, giving a detailed account of his observations. Lieutenant Green, of the United States, was also engaged on this subject, but had not put in at Port Darwin, as intended, as he understood that he (Mr. Todd) was himself going to that place. Lieutenant Green had therefore proceeded to Singapore, and had verified the calculations of longitude between that place and Madras.

Messrs. F. S. Driffield, Herbert Hughes, and J. H. Mohan were elected Fellows of the Society.

A motion was then unanimously carried at the President's instance to the effect that members of the Society should have free access to the library, subject to confirmation at the next annual meeting of the Society.

Professor TATE then brought forward an exhibit of the wings dropped by the white ants, impressed upon a muddy layer upon which they had been blown, the impression being almost as perfect as the wing itself. If another rain had come to wash another thin layer over these wings the fossilised impression of the wings might have been preserved for all time.

The PRESIDENT stated that His Excellency the Governor had accepted with much pleasure the office of Vice-Patron of the Society.

Professor TATE gave a short description of a paper by Baron Sir F. Von Mueller "Diagnosis of a new genus and species of Compositæ (*Achnophora Tatei*)." This new form was not unlike some of the stemless Australian daisies (*Brachycome*) in its characteristics.

Professor TATE also read a paper "On Proteaceæ of the Australian Alps," introduced by notes on the physical features of the region, by Mr. James Stirling, F.L.S.

Mr. H. WHITTELL, M.D., then read a paper on the the "Dissection of a Compound Ascidian," which he believed to be undescribed, and of which he had recently found two specimens near the Glenelg Jetty. Each animal of the composite structure had a separate opening through the external test, and the pharyngeal sac admitted of such easy separation as to afford a perfect view of its structure. A peculiar feature of this sac is that in addition to the usual leaflike expansions at the mouth there are to be seen, just within the cavity, a large number of long curling tentacles, which, like those of polyzoa, are evidently retractile. In a few of the best examples some of these can be seen protruded some distance through the mouth. Within the deeper parts numerous young embryos were found. These all have long tails, which disappear as the animal advances in development. It was explained that in some ascidians the tail remains permanent, and that many naturalists believe that the close resemblance between these forms and some of the lowest types of fish justified the classification of ascidians in the chain of evolution as the connecting link between the invertebrate and vertebrate types. After the reading of the paper microscopical specimens, illustrating the minute details of structure, were exhibited.

MAY MEETING.

A meeting of the Royal Society was held at the Institute on Tuesday evening, 1st May. There was a moderate attendance, and Dr. Whittell (Vice-President) occupied the chair.

Mr. James Stirling, of Omeo, Victoria, was elected a corresponding member, and Messrs. J. Nicholls and A. K. Varley, Fellows of the Society.

Dr. HAACKE, Curator of the South Australian Museum, exhibited twenty-two embryos found inside a common green shark (*Mustelus antarcticus*) which was caught at Port Vincent. They were interesting on account of the external gills, which were only found in the embryos of the shark, and resemble the external gills of the tadpole. They disappeared before birth, and had, therefore, no physiological value, but were interesting in as far as they showed that the ancestors of these sharks had such external gills. Amongst these embryos were nine females and thirteen males, so that this did not account for the scarcity of the male shark in collections. Dr. Haacke also showed a new species of jellyfish, belonging to the order Pseudorhizidæ Medusæ, described in a work recently published by Professor Haeckel, of Jena. He felt nearly sure of this being a new genus. It had four tentacles, and four eyes. He exhibited further some sketches of another Medusa found in the Gulf, and interesting as forming a connecting link between two great subdivisions of the one large order of Medusæ, the Acraspidæ. He also showed some crustaceans taken out of thh so-called "leather jacket" or Monacanthus; also four embryos of a skate species not yet identified; also some other crustaceans of the species *Cryptodromia lateralis*, shown on account of marine animals growing on their backs similar to those found on the backs of crabs.

Professor TATE exhibited a nondescript beetle from Fowler's Bay, which he and the Rev. Mr. Blackburn regarded as unique. Externally it resembled some of the common beetles (*Bruchussp*) met with in this colony, but it had the last segment of the body prolonged into two spines like that of the earwig, and on the under side of the same segment there is a deep pit, guarded by tufts of setæ, which might denote some peculiar adaptations of Nature.

Dr. HAACKE then read a paper, "Observations on a Trachydosaurus," by Miss Tomsett, of the Port Adelaide Museum, with supplementary notes by himself. Observations on the *Trachydosaurus asper*, or sleeping lizard, had shown that the female was ovoviviparous, bearing generally two young, three or four inches long at their birth.

Professor TATE read a paper on "Additions to the Flora of South Australia." These comprised about fifty species, most of them quoted for the Province in Baron Mueller's "Systematic Census." He observed that since the publication of the "Flora Australiensis," about 800 new species had been made known, which made a total of 8,648 for the whole of Australia, and which would form important addenda to that great work.

(*Continuation in next issue.*)

ROYAL SOCIETY OF TASMANIA.

The monthly evening meeting of this Society was held on Tuesday the 8th May, Mr. T. Stephens, Vice President, in the chair.

Mr. Charles Percy Sprent, who had previously been nominated by the Council, was ballotted for, and declared duly elected a Fellow of the Society.

The Hon. Secretary, Mr. Barnard, brought under notice a number of returns received since last meeting.

The Secretary read a paper on "New Species of Tasmanian Antechini and Mus," by Edmund T. Higgins, M.R.C.S., Eng., F.L.S., and William F. Petterd, C.M.Z.S.

The Chairman remarked that some incidental reference had already been made to the proposed establishment of an Australasian Geographical Society, of which some of the Fellows present had seen notices in the *Sydney Morning Herald*, The scheme was first mooted by a Committee of the Royal Society of New South Wales; but it had been thought advisable to found the institution on a wider basis, in order to secure the co-operation of all the Australasian colonies in furtherance of the objects of the new Society. These are briefly stated to be "the advancement of geographical science, and the study of the physical and commercial geography of the world, more especially that of Australasia." The Society would fill up a great gap in the education of the people, and public lectures would be given on all countries, illustrative of their commerce, productions, and industries. He (Mr. Stephens) thought he might say that although it might be premature to discuss the matter until the constitution, objects, and mode of procedure of the Society were more fully defined, there would be no difference of opinion among the Fellows present as to the importance of the subject, and that further information would be gladly received.

Some conversation, in favour of the proposed Society, followed the remarks of the Chairman, reference being made to the prevailing want of geographical knowledge of this group of colonies particularly in the mother country.

Mr. C. H. Grant then moved "That the thanks of the meeting be accorded to the authors of the paper read, and the donors of the various presentations."

Dr. Perkins seconded the motion, and referred to the numerous additions to the Museum, and especially to the varied collection of mineral specimens from New South Wales, presented by Dr. Barnard.

The motion having been unanimously agreed to, the proceedings terminated.

NOTES, MEMORANDA, &c.

The "Procedings of the Linnean Society of New South Wales," part 4 of Vol. vii, contains a large number of valuable and interesting contributions, of which little more than the titles can be noted in the space at our disposal. Mr. E. P. Ramsay, F.L.S., &c., continues his paper on Australian Oology, and furnishes a description of a new species of *Solea* from Port Stephens, and Notes on Birds from the Solomon Islands. Mr. E. Meyrick, B.A., gives a further and very large instalment of his Descriptions of Australian Micro-Lepidoptera, in which the deals with the extensive family of the Oecophoridæ, giving a synopsis of the genera (of which he has had to construct 67 for the reception of Australian forms) and diagnoses of a great many species. Professor Stephens, M.A., supplies Notes on the Geology of the Western Coalfields; and Dr. J. C. Cox, M.D., F.L.S., has a further communication on The Edible Oysters found on the Australian Coasts. Mr. Chas. W. de Vis, B.A., describes a new species of *Belideus* and two new birds, also two new fishes, from Queensland; and the Rev. Carl Kalchbrenner has articles on a new *Agaricus* from West Australia and *Fungi aliquot Australiæ orientalis*. The Rev. J. E. Tenison-Woods, F.G.S., F.L,S., &c., supplies Botanical Notes on Queensland, also a note on a species of *Brachyphyllum* from the Mesozoic Coal Beds of Ipswich, Queensland. Mr. W. A. Haswell, M.A., B.Sc., contributes notes on an Australian species of *Phoronis*, on a curious instance of *Symbiosis*, on the Segmental organs of *Aphrodita*, and on some new Australian tubicolous Annelida, the latter paper illustrated by a plate. The principal remaining articles are "Part III of Contributions to a Knowledge of the Fishes of New Guinea," by Mr. W. MacLeay, F.L.S., &c.; Occasional Notes on Plants indigenous to the immediate neighbourhood of Sydney, No. 2, by Mr. E. Haviland; Species of Eucalypts first known in Europe; by the Rev. Dr. Wools, D.D., F.L.S.; on some points in the Anatomy of the Urogenital Organs in Females of certain species of Kangaroo, Part I, by Mr. J. J. Fletcher, B.A., B.Sc.; Notes on the Cocoa-nut-eating habit of the *Birgus* in the Solomon Group, by Mr. H. B. Guppy, M.B.; and the Annual Address by the President.

Silvered Convex Lenses v. Concave Mirrors.—Mr. C. V. Boys points out that convex lenses silvered at the back make excellent and easily-constructed concave mirrors. Since both surfaces conduce to bring the light to a focus flatter curves may be used than are necessary for a plain concave reflector of the same local length; also since the two surfaces are not parallel false images are not produced, so that the advantages of glass silvered at the back remains without the usual disadvantage.—*Journal of the R. M. Society for October.*

THE WAR WITH INSECTS.—A capital hint has been given in some of the French country districts to schoolmasters in other parts of the world. The instituteurs have been despatching the pupils during the hours of recreation in search of noxious insects, and especially of May bugs, which are said to be particularly prevalent this spring. In some places the invasion has already commenced, and it is confidently anticipated by all the weather prophets and gardeners who pretend to a knowledge of the insect world. The natural history of the May bug appears to be somewhat peculiar, as the lady of the household, after appearing on the leaves of hedges and trees for eight or ten days only, beats a retreat into the ground, where she devotes her attention to the laying of eggs. So important is this business that before it is finished many thousands of eggs are deposited, and out of these are soon hatched an equal number of white grubs. The moment for directing an attack upon the bugs is, therefore, that immediately preceding the retreat into the soil, end it is during these few days that the schoolboys have been sent out on their murderous campaign. They are rewarded for their exertions by a small payment, but it may easily be believed that the desire for killing operates as a stronger inducement to them than the hope of gain. Such a service may also act as a sort of antidote to the passion for birds' nesting, which is as mischievous as the other is beneficial.

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THE

Southern Science Record.

AND

MAGAZINE OF NATURAL HISTORY.

CONTENTS:

PRICE--ONE SHILLING.

COLLINGWOOD:

J. WING, 33 WELLINGTON STREET.

1883.

Definitions of some New Australian Plants,

by Baron Ferd. von Mueller, K.C.M.G., M.D., F.R.S.

[Continued.]

Uvaria Holtzei.—Branchlets somewhat velvety; leaves chartaceous, on very short stalks, lanceolar ovate, rounded at the base, short-acuminate at the upper end, distantly and beneath prominently nerved, on both sides scantily hairy and soon almost glabrous; flowers solitary or two together on short stalks, the latter leaf-opposed; stalklets not so long as the flower; buds globular; expanded calyx almost cupular, only slightly sinuated, as well as the corolla thinly and brownish velvet-hairy; all petals nearly three times as long as the calyx, from oval to orbicular, the outer hardly and the inner only partly imbricated some time before expansion; torus almost hemispheric; stamens glabrous, the outermost of them sterile, linear-spatulate, without anther-cells, the fertile stamens terminated by a flat oval or oftener oblong process of the connective, ovaries narrow, fulvous-silky; stigma depressed.

Near Port Darwin; Maurice Holtze, Esq.

Leaves 2-5 inches long, 1-2 inches broad. Calyx only slightly trilobed. Petals of rather thick consistence, $\frac{1}{3}$-$\frac{1}{2}$ inch long; but flower-buds not seen in an advanced state for tracing the aestivation. Staminodia somewhat larger than the stamens. Fruit unknown.

Hydrocotyle blepharocarpa.—Annual, minute, except the fruit glabrous; stipules lacerated; leaves in outline cordate- or renate-roundish, to the middle or less deeply cleft into three or five lobes, besides somewhat crenated; umbels with several closely crowded very minute flowers; stalk as long as the umbel or extending to thrice its length; involucrating bracts linear-setaceous, as well as the flower-stalklets very short; styles extremely minute; fruits didymous-roundish, much compressed; vallecule between the carinal edge and the semicircular lateral nerve of each mericarp densely fringed; their lateral areole ample, dimidiate-orbicular, smooth or rarely papilligerous, only slightly impressed; carpophore permanently adnate and undivided.

Upper Swan-River; Miss Julia Sewell.

Distinct from all congeners except *H. glochidiata* already in its ciliated fruits, and differing from that species in the leaves not longer than broad, in the torn stipules and in the want of hairiness on the lateral areoles of the fruitlets.

Ventilago ecorollata.—Climbing; branchlets short-hairy; leaves on very short stalks, oval or verging somewhat into a lanceolar form, dark-green above, slightly paler beneath, shining on both sides distantly and minutely crenulated; racemes axillary, short-hairy, not elongated; petals none; fruit surrounded only at the base by the tube of the calyx, its appendage narrowly lanceolar-oblong, glabrous.

Near Rockingham's Bay, Dallachy; on the Endeavour-River, Persieh.

From the only other Australian species hitherto known it differs in the hairiness of the branchlets and inflorescence, in the shape, darker color and more conspicuous lustre of the leaves and in the much less close reticulation of the leaf-veins, also in the somewhat more pointed lobes of the calyx; but it agrees with its Australian congener in the exceptional characteristic of absent petals; among extra-Australian species it approaches *Ventilago Madraspatana*, receding however already in smaller leaves, abbreviated inflorescence and the want of petals.—This plant from flowering specimens only was first placed in the genus Berchemia; but from the fruit, now obtained, it is proved to be a genuine Ventilago. Ripe seeds are as yet unknown.

Native Plants of the Grampians and Vicinity.

Arranged generally under the direction of

Baron Ferdinand von Mueller, K.C.M.G., Government Botanist.

By D. Sullivan.

[Read before the Field Naturalists' Club of Victoria 23rd January, 1882.]

[Continued.]

(7). Compositæ—(*continued*).

Vittadinia australis—(A. Rich).—Gravelly soil.

Calotis anthemoides—(F. v. M.).—Clayey wet soil.

Erigerm linifolius—(Willd.).—Gravelly soil.

Solenogyne vellioides—(Cassini).—Common everywhere.

Isoetopsis graminifolium—(Turczan).—Common.

Craspedia Richea—(Cassini).—Very common.

Rutidosis pumilia—(Benth.).—Everywhere.

Ixodia Achillioides—(R. Br.).—Stony banks of streams, and ridges of the mountains.

Microseris Forsteri—(Hooker).—Common.

Symbonotus Lawsonianus—(Gaudich.).—Common.

Erechites quadridentata—(D. C.).—Gravelly soil.
arguta—(D. C.).—Grampians (Hall's Gap).

Stuartina Muelleri—(SONDER).—Gravelly soil, common.

Millotia tenuifolia—(CASSINI).—Common.

Hyalolepis rhizocephala—(D. C.).—Common in wet places.

Angianthus eriocephalus—(BENTH.).—On sub-saline flats.

Podolepis acuminata—(R. BR.).—Gravelly soils, common.

Cassinia aculeata—(R. BR.).—About streams near the mountains.

Cotula Cunninghami—(D. C.).—Wet places, pretty common.
coronopifolia—(LINN.).—Water-holes, common.
australis—(HOOKER).—Light soils, common.
filifolia—(CASSINI).—Clayey, wet soils.

Celmisia longifolia—(CASSINI).—Summit of Mount William.

Humea elegans—(SMITH).—Gullies of the mountains.

Leptorrhynchus elongatus...(D. C.)....Rare about the Grampians.
squamatus—(LESSING).—Common everywhere.
tenuifolius—(F. v. M.).—Common on the heaths.
medius—(CUNN.).—Gravelly soil, not rare.

Lagenophora Huegelia—(BENTH.).—Sparsely scattered through the district.
Billardieri—(LESSING).—Both on the mountains and lowlands.

Elipterum exiguum—(F. v. M.).—Gravelly soils, not rare.
cotula—(D. C.).—About Mount Ararat.
dimorpholepis—(BENTH.).—Through the whole district.

Gnaphalium japonicum—(THUNBERG).—Common on the mountain ridges and on the lowlands.
indutum—(HOOKER).—Common on sub-saline flats near Mount William.

Calocephalus lacteus—(LESSING).—Throughout the district.
citreus—(LESSING).—Same as last.
Brownii—(F. v. M.).—About brackish streams.

Senecio lautus—(FORSTER).—About the bases of the mountains, and in their ravines.
velleyoides...(A. CUNNINGH.).—In gullies and ridges of the mountains, common.
vagus—(F. v. M.).—Same as the last.
australis—(WILLD.).—Gullies of the mountains.

Brachicome graminea—(F. v. M.).—Wet places, common.
multifida—(D. C.).—About and on the mountains.
diversifolia—(FISCHER).—Light gravelly soils, not rare.
Collina—(BENTH.).—Same as the last.
exilis—(SONDER).—Same as last two species.

Brachicome stricta—(D. C.).—From the bases of the mountains to a height of 3000 feet, not rare.

(8). CAMPANULACEÆ.

Wahlenbergia gracilis—(D. C.).—Common everywhere.

(9). STYLIDEÆ.

Stylidium graminifolium—(SWARTZ).—From the lowlands to the summit of Mount William and all the high peaks of the other mountains.

calcaratum—(R. BR.).—Wet flats near the mountains, not rare.

inundatum—(R. BR.).—Wet places, common.

soboliferum—(F. v. M.).—From the lower slopes of the mountains, generally to an altitude of 2000 feet.

This interesting little plant has spread with wonderful rapidity since 1853, when it was first discovered by Sir F. von Mueller.

Leeuwenhookia dubia—(SONDER).—Common throughout the whole district.

(10). GOODENIACEÆ.

Goodenia ovata—(SMITH).—Very common about mountain streams.

pinnatifida—(SCHLECHT.).—On clayey soil, not rare.

humilis—(HOOKER)—Low-lying lands near the mountains.

elongata—(LABILL.).—On wet heaths, and rarely on the lower ridges of the mountains, rare.

geniculata—(R. BR.).—Common both on mountains and lowlands.

Velleya paradoxa—(R. BR.).—On both gravelly and clayey soils, common.

Scaevola æmula—(R. BR.).—On wet slopes of the Grampians about Hall's Gap, not common.

Selliera radicans—(CAVAN.).—On clayey banks of brackish creeks, common.

(11). LOBELIACEÆ.

Lobelia microsperma—(F. v. M.).

Lobelia simplicicaulis—(R. BR.).—Scrub-hills, heath-grounds, and spurs of the mountains.

anceps—(THUNBERG.).—On the banks of streams.

rhombifolia—(VRIESE).—Lower slopes of the mountains, not common.

pratioides—(BENTH.)—About the bases of the mountains.

Isotoma pluviatilis—(F. v. M.).—Irrigated flats about the ranges.

(IV). SYNPETALEÆ HYPOGYNÆ.

1. Gentianeæ.
2. Loganiaceæ.
3. Plantagineæ.
4. Primulaceæ.
5. Asperifoliæ.
6. Convolvulaceæ.
7. Solanaceæ.
8. Scrophularinæ.
9. Lentibularinæ.
10. Labiatæ.
11. Myoporinæ.
12. Epacrideæ.

(1). GENTIANEÆ.

Sebæa ovata—(R. BR.).—Widely diffused through the district.

albidiflora—(F. v. M.).—Sub-saline flats about Mount William and near the Wannon.

Erythraea australis—(R. BR.).—Sparsely scattered over the district.

Villarsia reniformis—(R. BR.).—Lagoons and creeks about the mountains, common.

(2). LOGANIACEÆ.

Mitrasacme pilosa—(var. ovalifolia)—(LABILL).—Temporarily inundated places, not common.

paradoxa—(R. BR.)—On and about the mountains.

distylis—(F. v. M.).—On the Grampians.

Eritrichum Australasicum—(D. C.).—In temporarily inundated places, not rare.

(3). PLANTAGINEÆ.

Plantago varia—(R. BR.)—Extensively spread over the district.

(4). PRIMULACEÆ.

Samolus repens—(PERSOON).—Wet grass flats, and about heath-swamps, not rare.

(5). ASPERIFOLIÆ.

Cynoglossum suaveolens—(R. BR.).—Sparingly scattered over the district.

australe—(R. BR.)—On the Grampians at Hall's Gap, rare.

Myosotis australis—(R. BR.)—On the mountains to an elevation of 2000 feet, rare on the lowlands.

(6). CONVOLVULACEÆ.

Convolvulus erubescens—(SIMS).—Common.

(7). SOLANACEÆ.

Solanum aviculare—(FORSTER).—Occasionally to be met with about the Serra Range.

(8). SCROPHULARINÆ.

Mimulus repens—(R. BR.)—About brackish creeks on clayey soils.
Veronica calicina—(R. BR.).—About the bases of the mountains.
Derwentia—(LITTLEJOHN).—Rocky gullies of the mountains and about streams.
peregrina—(LINN.). Temporarily inundated places.
gracilis—(R. BR.).—Low-lying lands, especially on clayey soils.
Gratiola Peruviana—(LINNE).—Wet places.
Euphrasia Brownii—(F. v. M.).—About the mountains.
scabra—(R. BR.).—Sandy uplands, rare. Flowers yellow.

PROCEEDINGS OF SOCIETIES.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary as also a special meeting of this Club was held on Monday evening 11th ult. The President (the Hon. Dr. Dobson, M.L.C.) occupied the chair, and there was a large attendance of members.

The special meeting was called to consider a notice of motion to rescind the rule whereby the President and Vice-Presidents could not hold office for more than two consecutive years, and after some discussion the motion was carried by a large majority.

Messrs. F. B. Oldham, E. B. Green, and W. J. E. Wilton were duly elected members, and nine nominations for membership were received.

Two papers were read, the first being Mr. Guilfoyle's entitled "A Botanical Trip to the South Sea Islands, describing the numerous plants, more especially the ornamental-foliaged kinds, such as Crotons, Dracænas, Palms, &c., which the writer met with during a recent trip to those islands; the second was a continuation of Mr. A. J. Campbell's valuable paper on "Australian Oology," the present part being a description of nests and eggs of the Cuckoos, and those of their foster parents, as Robins, Spine-bills, &c. A discussion took place over this paper, and some curious facts relating to Cuckoos were mentioned by Messrs. Campbell and Leith and Dr. Lucas.

The exhibits on the table were numerous, one of the most interesting being some beautifully executed illustrations of the growth of the *Phylloxera vastatrix*, also specimens of diseased vines, all shown by Dr. L. L. Smith. Mr. A. J. Campbell had a fine collection of Birds, Nests, and Eggs, in illustration of his paper, some of the eggs not having been previously described. Mr. C. French had a drawer of Australian Longicorn Beetles, including a series of Petalodes; Miss F. Campbell, a collection of Fungi, mostly named; Mr. J. F. Bailey, specimens of the rare shell *Ornustus solaris* from the Andaman's, and of *Tridacna squamosa* from Singapore; Mr. T. Worcester, seven species of land shells, of the genus Bulimus, from Borneo; Mr. F. G. Barnard, Limestone Fossils collected on recent excursion to Lillydale; and Messrs. O. A. Sayce, T. A. F. Leith, F. Spry, and T. Hyland had collections of Fossils, Ores, Moths, and Beetles. Mr. Hyland had also a specimen of a small and very curious Lizard unknown to any of the members present.

Before the meeting separated attention was called to the Botanical Excursion to Brighton, to take place on Saturday afternoon next, leaving Melbourne by the two o'clock train.

THE ROYAL SOCIETY OF VICTORIA.

The ordinary monthly meeting of the Royal Society was held on Thursday evening, 14th ult., in their hall, Victoria-street, Mr. R. L. J. Ellery, the President, occupying the chair.

Captain C. F. Rowan and Dr. Henry were elected members, Mr. John Naylor was elected a country member, and Mr. W. P. Steane was elected an associate.

Dr. Nield, the honorary Librarian, stated that during the past five months 66 volumes and 154 parts of scientific works had been received. Of the volumes 32 were from Batavia, 6 from the United States, 6 from Germany, 15 from Sweden, and the remainder from various societies with which the Royal Society of Victoria was in communication.

Mr. W. P. Steane read a paper on Hydrology. He stated that his subject was an exhaustive one, but he intended to confine his remarks respecting it to rainfall, and more particularly in reference to the rainfall of Sandhurst, where he had resided and taken observations. After referring to the great variation in the quantities of rainfall in different portions of India, England, Europe, America, New South Wales, and South Australia, he said that no rain was ever recorded at Sandhurst from a South wind, and that most of their heavy rains came with South-west winds. Some years ago he was of opinion there was a specially wet season once every seven years, but continued observation had caused him to give up that view. In Sandhurst the average rainfall for the last 20 years was 21·7 in. The least rainfall in any of those years was 10·95 in. in 1865, and the highest 38·36 in. in 1870. On one day in 1875 half an inch of rain fell in five minutes, and during the 24 hours of one day in 1878, 3·67 in. fell. The value of a knowledge of the rainfall in all its varying phases was of especial use to the engineer, as, by knowing the heaviest monthly, weekly, daily, and hourly rainfall, and also the maximum fall for shorter periods, he was better enabled to calculate the necessary sizes of bridges, culverts, and water conduits. Of course other data were also necessary, such as the nature of the surface and subsoil, the general inclination of the ground, and the state of the surface. The method adopted generally for fixing the dimensions of bridges over large rivers, viz., gauging the velocity, and obtaining numerous cross sections of the largest known floods, would not apply to artificial watercourses, and was, in his opinion, untrustworthy when applied to the partially dried creeks of Australia, for the reason that the channels generally varied very greatly, the sectional area being in some cases very much larger at one spot than at another a short distance away. Information of that kind was certainly necessary, but it was equally necessary that something of the local hydrology should be also known and applied. In his opinion, to estimate the requisite waterway at a certain point, it was necessary to know the area and form of the watershed, next the levels, in order to find the time it would take the first drop of water to travel from the greatest distance to the culvert or bridge; then to know what proportion of the water soaked into the ground and what was held back, and also the amount of the rainfall.

In the course of a short discussion which took place on the paper Mr. Ellery said that our rainfalls were always either in front or rear of a circular or cyclonic movement.

The Chairman exhibited a few new stellar photographs taken by the large telescope at the Melbourne Observatory. He said it was well known and acknowledged that the very best photographs of the moon had been taken by our telescope, and the specimens which he now exhibited were obtained by a new method, in which gelatine was used instead of collodion. The new method was greatly superior to the old one, as it enabled the operator to take photographs in much smaller spaces of time. Another astronomical matter he might say a few words upon was the grand comet which had just gone from our gaze. It was the largest, brightest, most interesting, and wonderful comet of recent times, and was visible for a period of eight or nine months. The last time it was seen in the northern hemisphere was on the 4th April, at Washington, but it was seen here at the Melbourne Observatory on the 25th and 26th April, and was then like a little drop of milk and water in the sky, and scarcely visible. He considered it was now gone from observation altogether. It came towards this earth almost in a straight line, then turned around the sun, and came back towards the earth in a similar straight line, and went from our sight on the same line. There was one other matter which he was asked about at one of the meetings of the Society not long ago, which he would just refer to, namely, the size of the largest telescope. The largest one in use was at Washington. It was 26in. in diameter, and by it were discovered the satellites of Mars. At Newcastle-on Tyne there was one 25in. in diameter. One was being made for Vienna with an object-glass of 27in. in diameter. The Russian astronomer had recommended his Government to obtain a still larger one, and they were now getting one of 30in. in diameter made, the glass now being in course of manufacture in Paris. The Wick Observatory intended to have one made 36in. in diameter, and one could not tell where the extension in size would end. There were, however, some objections to large telescopes. Atmospheric disturbances often prevented the use of a very large telescope, on account of its great diameter admitting too much light, while the same circumstances would not similarly affect small telescopes. It was also a moot question whether astronomers could get very much further in discoveries through increasing the sizes of telescopes. The best microscopic work was now done by microscopes costing only a few pounds each, and the really great work of astronomy was being done by small or moderate sized telescopes of, say, 3, 4, or 5 inches in diameter. Good useful telescopes, indeed, were now becoming very cheap, and he hoped that a number of astronomical observing clubs would be formed amongst the young men in different parts of the colony.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The usual monthly meeting of this Society was held on the 28th ulto., the Rev. J. J. Halley, Vice-President, occupying the chair.

The Secretary acknowledged receipt of the Bulletin des Seances de la Societe Belge de Microscopie, March, 1883; the Journal of the Royal Microscopical Society for April, 1883; and the Proceedings of the Linnean Society of New South Wales, vol. viii, part 3.

Dr. MacInerny, M.D., was duly elected a member of the Society.

Mr. F. Barnard read a paper on "Victorian Diatoms," enumerating some of the principal species which had come under his notice, particularly in the West Melbourne, Talbot, and South Yarra deposits. A large number of slides illustrative of the paper were exhibited by Messrs. Barnard and Bale.

THE ROYAL SOCIETY OF NEW SOUTH WALES.

THE PRESIDENT'S ANNUAL ADDRESS.

[Concluded.]

"Darwin's hypothesis of evolution has been the subject of much controversy. Its adoption by such a leading scientist as Professor Huxley has led many to assume that it has been scientifically proved. But the evidence for the antiquity of man has, upon reconsideration, had its foundation severely shaken. On Darwin's hypothesis 20,000 years would form but a fraction of the time required to bring about the result which his theory of minute changes demands. It has been argued by many distinguished geologists that the generally admitted glacial and post-glacial condition of the earth, of which the evidences are unmistakeable, have been such as to break the continuity of mammalian life, and so to destroy Darwin's theory. He himself admits, in the 'Origin of Species,' 6th edition, page 330, that there is evidence of every conceivable kind, organic and inorganic, 'that within a very recent geological period Central Europe suffered under an arctic climate, and the ruins of a house burnt by fire do not tell their tale more plainly than do the mountains of Scotland and Wales tell their tale of glaciation.' And in the latest edition of the 'Origin of Species' he says (page 448-50): 'I had hoped to find evidence that the tropics, in some parts of the world, had escaped the chilling effects of the glacial period, and had afforded a safe refuge for the suffering tropical productions.' But all the geological evidence we possess relating to that period points to conditions that would render almost inevitable a break in the continuity of mammalian life. Dr. Page, in his 'Text-Book of Geology,' referring to Britain and the North of Europe, says that 'the large mammalia of the earlier tertiaries disappeared, and the land was submerged to the extent of several thousand feet. Sir Henry de la Beche, Sir Roderick Murchison, and Sir Charles Lyell all agree in the evidences of this glacial epoch, extending over the whole of the Eastern hemisphere. Sir Charles Lyell says, in his 'Principles of Geology,' 11th edition, p. 253, that 'in one part of the glacial period the desert of Sahara was under water between latitude 30 and 20 (a breadth of nearly 700 miles), so that the eastern part of the Mediterranean communicated with that part of the ocean now bounded by the West Coast of Africa.' Any retreat of the mammalia southward on the African continent would thus have been effectually cut off. It has been confidently asserted that man had no existence in pre-glacial times, and that every attempt to prove otherwise has signally failed. Now, if before the glacial epoch man was not, but when it passed away man was there, when did the evolution take place? This is the question that has failed to receive a satisfactory solution. Everything seems to turn upon this one point—that is the simultaneous and universal prevalence of the glacial period. Could that be once firmly established, then, it is admitted, it would indeed be fatal to Darwin's doctrine. But the proof seems to be wanting that the entire globe was involved at one and the same time in such glacial conditions as would be destructive of all terrestrial life. The doctrine of evolution is thus beset with difficulties, and the true attitude of science, according to Darwin, is to accumulate facts which may unravel the mystery by which the question is surrounded. Of all the students of Nature in the present era none came up to Darwin in his patient, earnest enquiry into and collection of facts. The object of his search was truth, and whatever has been true in the life-work of Darwin will live, whilst whatever has been mistaken will die; and I think we may conclude, from all we know of his gentle spirit and honest nature, that no man—as has been well said of him—would more rejoice at the death than would Darwin himself. Gentlemen, I hope you will not think that I am carrying my remarks on the work and character of Darwin to too great a length. I must confess to a deep admiration for the man by the study of his works. His earnestness and his modesty are distinguishing traits in his character. They inspire one with admiring interest, and even if we do not accept his creed, or agree with his inferences, or if they should hereafter prove erroneous, that would not detract in the slightest degree from his fame as a naturalist, nor would it lessen the profound sense of gratitude to which his great discoveries in the field of natural science most justly entitle him. If you would kindly bear with me a little longer, I should much wish to quote to you a few passages collected from the addresses delivered at the meeting of the British Association, held at Southampton last year, expressive of the deep sense entertained by scientific men of the highest eminence as to the loss sustained through Darwin's death. At the meeting of the British Association in Southampton, in the month of August last, the President, in his opening address, spoke of the 'irreparable loss Science had sustained in the person of Charles Darwin, whose bold conceptions, patient labour, and genial mind made him almost a type of unsurpassed excellence.' Professor Gamgee, President of the Biological Section, alluded to Darwin's death in these terms:—'So much has lately been written concerning that veteran in Science, Charles Darwin, who will figure in the history of the human intellect with such men as Socrates and Newton, that I feel no words of mine are needed to add to your sentiments of admiration and respect. He has made for himself an imperishable reputation as one of the subtlest, most patient, and most truthful observers of natural phenomena. His powers as an observer were, however, almost surpassed by his ingenuity as a reasoner and his power to frame the hypotheses most apt to the actual state of Science, to reconcile all the facts which came within the range of his observation. We remember the time when the name of Charles Darwin, and the mention of the theories connected with his name, awakened, on the part of many sentiments of antagonism and of unreasonable opposition. But we have lived to witness what I may term a great reparation. Even those who did not know the man, and the qualities of mind and heart which have endeared him to so many, have come to recognise that in his work he was actuated by a single-hearted desire to discover the truth, and after calm reflection they have conceded that his studies and his views—like all studies and all views which are based upon the truth—not only are not irreconcileable with but add to our conceptions of the dignity and glory of God.' And here I may be allowed to remark that it is impossible to study the writings of Darwin, and especially the one in which he treats of 'The Descent of Man,' without recognising an undercurrent of reverent sentiment, which in one or two places finds expression in words, telling us that man differs from the animal creation, if not in physical characteristics which cannot be bridged over, at least in moral attributes, and in the ennobling belief in God, by his power of forming that conception of the Deity which, to use Darwin's own words, 'is the grand idea of God hating sin and loving righteousness.' Professor Lawson again, who filled the presidential chair in the department of Zoology and Botany at this same meeting, opened his address by observing that, 'Although the President has made eloquent allusion to the great loss which the whole scientific world has sustained in the death of our great countryman, Charles Darwin, still I am sure I shall not be thought to be doing more than is my bounden duty if I, too, from this chair, give some utterance to the deep sense of irretrievable loss which all we in this department must feel has fallen upon us. It was on this platform more than in any other place that the great battle of the doctrine of Evolution, which is so intimately connected with Mr. Darwin's name, was fought. It was on this platform that his friends and coadjutors, Mr. Alfred Wallace, Sir Joseph Hooker, Professor Huxley, and many others, expounded his views, and added by their own researches to the sum of evidence which has finally convinced all the leading scientists of the day of the substantial soundness of his speculations. There are many of us now present who will never forget the intense interest and excitement which attended the discussions which took place in the earlier days of the history of the doctrine of Evolution; nor shall we forget with what bitterness Mr. Darwin's views were met on the occasion of the Association's meetings at Oxford, Cambridge, Norwich, and Exeter; nor how everything that came from his pen was regarded with feelings of suspicion and hatred; and how even his blameless and guileless character was frequently assailed by those who could only see in his works a desire to dethrone all that which they considered sacred. It is also in the recollection of all of us here how he met the attacks which were made upon him by silence, never returning opprobrious declamation or insulting sarcasm by angry or contemptuous answers. Ever conscious that his aim was to search out the truth and that only, he could afford to disregard contumely and misrepresentation. Indeed, so completely was he imbued by the consciousness that his aim was righteous, that the taunts and sneers which were lavished upon him seem to have been powerless even to vex him. Again, you in this department will remember how these attacks year by year grew less frequent and less bitter, how wholesale denunciation gave place to legitimate questionings of particular points, and how even personalities at last gave place to general professions of esteem and respect, till at last, but a few short months ago, we witnessed the burial of his remains in the national mausoleum, and saw his coffin followed not only by scientists and laymen, but by priests of various religious denominations, all of whom sought by their presence to testify to the recognition of his great worth, and perhaps some to atone in a measure for the unjust things which they might have said or thought about him when they were unacquainted with his character, and only half acquainted with the object and nature of his labours. But although our hearts are still sore at the remembrance of our loss, there are many things the reflecting upon which may well console and reconcile us to it. In the first place he had been spared to us till such a time as we were able to walk without further needing the assistance of his guiding hand. In the next place his life, although far from having been free from suffering, had been prolonged to a green old age, and he was able and delighted to work almost to the very day of his death. He had the satisfaction of looking back on a long life happily and worthily spent, and of living to see the doctrines which he had promulgated gradually acknowledged, and finally universally accepted. He was surrounded by devoted friends, and regarded by all naturalists with a reverence and affection such as has fallen to the lot of none since the time of Linnæus.' There is still one further tribute to the beauty of Darwin's character, and to the estimation in which he was held by his contemporaries in Science, which, coming from the lips of the President of the Royal Society of England, should not be omitted. In his address at the anniversary meeting of the Society, on the 30th November last, Dr. Spottiswoode said: 'Of Darwin and his works it is not for me to speak. Others with wider knowledge, after long intercourse and with greater authority, have said what was possible at the moment, and the full story of his life is now being written by faithful hands. But I consider it no common piece of fortune to have lived within an easy distance of his house, to have been able by a short pilgrimage to enjoy his bright welcome, and his genial conversation, and to revive from time to time a mental picture of that, my ideal of a philosophic life.' Such are the evidences collected from amongst many of the estimation in which Darwin was held by men of the highest eminence in the scientific world, and I feel that no apology is needed for introducing them to your notice in this *resume* of this distinguished man's life. It will be remembered that at our monthly meeting in September last a resolution was proposed by your President, and adopted by the members present, expressive of our sympathy with the widow and family in their bereavement, and of the irreparable loss the scientific world had sustained in Darwin's death. The resolution was couched in these terms:- 'The members of the Royal Society of New South Wales having heard with deep regret of the death of Charles Robert Darwin, one of their most distinguished honorary members, desire to express their sense of the loss they, with the whole scientific world, have sustained, and they desire that the expression of their heartfelt sympathy shall be conveyed, through their President, to the widow and family of the late distinguished naturalist.' To his letter conveying this resolution, Professor Liversidge has shown me a reply from Mr. Francis Darwin, in which he says: 'My mother has been very much touched and gratified by the sympathy so abundantly and kindly expressed by societies like yours. The strong sympathy and interest which my father felt in Science in the colonies makes us value your letters especially. I am afraid my formal letter sounds cold and stiff, but I do assure you we all feel grateful for the kind thoughts which dictated the letter to my mother.' I should not wish to close this address without referring to the great calamity which befel this community, and particularly our scientific friends the members of the Linnaean Society in the destruction by fire of the Exhibition Building, commonly known as the Garden Palace, which occurred since our last anniversary. The building had been made the depository, not only of many valuable records belonging to the Government but of the very valuable collection of geological specimens purchased by the country from the representatives of our former friend and distinguished Vice-President the Rev. W. B. Clarke. These, with their accompanying notes, were all consumed in the flames, and with them the entire library of the Linnaean Society, comprising many works of rare excellence difficult to replace. A resolution was passed at our meeting in October last expressing the regret and sympathy of the members of the Royal Society, and was forwarded by your President to the President of the Linnean Society, with an offer of such assistance as the use of our rooms for their meetings might afford. The offer was courteously acknowledged, with the intimation that the accomodation afforded by the Free Public Library was sufficient to satisfy their present wants. It is fitting, moreover, that I should notice the disappointment which attended the efforts of our able and popular Astronomer for the observation of the transit of Venus. Unfavourable weather over the whole colony frustrated his well-laid plans for the observations at each of the stations selected for the purpose; and I believe that the Queensland observers specially appointed from home were equally unfortunate. I am certain that I express the sentiments of every member of the Society when I say that Mr. Russell had the sympathy of every one of them in his disappointment, not only on public but on private grounds; for we know how much time and thought, trouble and anxiety, the preparations cost him, and how keenly he felt the failure of them. Special expeditions for the observation were organised in England for the following places, viz.:—Madagascar, the Cape of Good Hope, Bermuda, Jamaica, Barbadoes, Queensland, and New Zealand. The promise of hearty co-operation by Mr. Russell in New South Wales, and by Mr. Ellery in Victoria, rendered any special assistance from home quite unnecessary in the case of these colonies. The results of the observations that have proved successful have yet (I believe) to be made public. And now, gentlemen, I will detain you no longer than is necessary to reiterate my acknowledgments of the consideration extended to me during the time I have had the honour of filling the presidential chair, and to express a hope that the interest in the work we are engaged in may be sustained, and the progress of the Society as satisfactory for the time to come as it has been in the time that is past. I cannot, however, vacate the chair without placing upon record my sense of the important services rendered to the Society by, and of the obligations we are under to, our Honorary Secretaries. It is not too much to say that to the indefatigable labours of Professor Liversidge and Dr. Leibius are, in a very great measure, owing the progress, the usefulness, and the popularity attained by the Royal Society. Indeed I think I am not exaggerating when I say that the Society is acquiring such a status in the public estimation that we may, without presumption look forward to the time when its advice and assistance on questions of public interest involving scientific inquiry may be sought by the Government of the country. To achieve this high position should be our constant aim, and thus —although at a respectful distance, perhaps—should we be found treading in the steps of our great English prototype. Before I sit down I desire, on behalf of the council, to invite special attention to that clause in their report which refers to the state of the building fund. It seems to the council very desirable that the debt upon the building should no longer form a charge upon the funds of the Society, and it is hoped that, by special efforts on the part of its members, my successor in the chair may be able to announce at our next anniversary that the debt has been wiped out."

At the conclusion of the address Mr. P. G. King moved a vote of thanks to the President, and added his testimony to the great qualities which characterised the life of Mr. Darwin. When he was a young man he had the honour of acquaintance and companionship of the great man, and he could not call to mind that any of those theories which subsequently were enunciated by him had any existence in his mind further than such as he might have inherited from his grandfather, the great Mr. Darwin, whose prophetic poetry in allusion to the future greatness of that country is familiar to all :—

> "Where Sydney Cove her lucid bosom swells,
> Courts her young navies, and the storm repels," &c.

How amply his predictions have been fulfilled it was hardly necessary to point to the city in which they lived or to the scientific assemblage of that night. If there was any one there that night who had had the honour of early association with the great man he would understand his (the speaker's) feelings on hearing so lucid an address on the labours of his old companion.

The motion was carried.

Mr. Cecil B. Stephen, M.A., Mr. J. T. Lingen, M.A., Mr. B. M. Osborne, J. P., and Mr. H. E. Kater were elected ordinary members of the Society. The election of officers and council for the ensuing year resulted as follows :—President, Hon. J. Smith, C.M.G., M.D., M.L.C. ; Vice-Presidents, Mr. Charles Moore, F.L.S., Mr. W. A. Dixson, F.C.S. ; Hon. Treasurer, Dr. H. G. A. Wright, M.R.C.S.E. ; Hon. Secretaries, Professor Liversidge, F.R.S., Dr. Leibius, Ph. D., F.C.S. ; Members of Council, Mr. Robert Hunt, F.G.S., Dr. W. Morris, Mr. F. Poolman, Mr. Christopher Rolleston, C.M.G., Mr. H. C. Russell, B.A., F.R.A.S., Mr. P. R. Pedley.

The proceedings then ended.

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 27th June ; Professor W. J. Stephens, M.A., in the chair.

The following gentlemen were elected members of the Society :—Thomas Richards, Esq., Government Printer, Sydney ; Patrick Hayes, Esq., The Oaks, Neutral Bay ; John Laskey Woolcock, Esq., B A, Grammar School, Brisbane, Queensland.

The receipt of several donations was announced.

The following papers were read :—

1. Descriptions of new genera and species of Fishes by CHARLES W. DE VIS, B.A. Two genera are described, *Dactylophora* of the Family *Cirrhitidæ*, and *Leme* of the Family *Amblyopina*. The new species described are—*Girella carbonaria, Girella neuralis, Dactylophora semimaculata, Platycephalus semermis, Polynemus specularis, Leme mordax, Sphyraena strenua, Trochocopus sanguinolentus, Labrichthys dux, Plagusia notata, Synaptura cinerea* and *Crossorhinus ornatus*.

2. A fourth paper on Plants indigenous in the immediate neighbourhood of Sydney, by Mr. E. HAVILAND. This referred chiefly to the structure of the reproductive organs of the genus *Leptospermum*, and its mode of fertilisation. The author regards cross-fertilisation as being probably the rule in this genus, this being brought about by two means:—First by the difference in the times of maturing of the anthers and stigma, and secondly by changes in their relative positions.

3. Localities of some species of Polynesian recent Mollusca, by JOHN BRAZIER, C.M.Z.S., &c. This Paper gives with some detail all the synonyms of *Pirenopsis costata*, of Quoy and Gaimard, and of *Melania acanthica* Sea. Also the various localities in which they have been found.

Baron MACLAY exhibited some beautifully-preserved specimens of very delicate forms of marine life, such as *Oceania pileata*, *Salpa democratica*, *Alcyonium palmatum*, &c., &c. These were prepared at the Naples Biological Station, under the direction of Dr. Dohrn, and may be obtained there, at a reasonable cost, for study or illustration. Even large specimens of *Rhizostoma* are perfectly and permanently preserved by this process. Baron Maclay also gave an account of various large animal preparations which had been preserved in the Berlin Museum by the Wickersheimer fluid, pointing out that the failures which had attended its use here were due to too protracted immersion in the fluid. The objects, when once well penetrated by the solution, should be withdrawn and kept in a dry state.

Mr. WHITELEGGE exhibited a decayed leaf of some aquatic plant covered with a thick growth of *Plumatella repens*; also a specimen of fresh-water sponge, undetermined—both from a waterhole in Moore Park.

Mr. TREBECK showed the claw of a very large crab, *Pseudocarcinus gigas*, which had been washed ashore in Lane Cove. This species is of common occurrence in Bass' Straits, but is seldom found much to the northward of that district.

Professor STEPHENS exhibited, for the Rev. J. M. Curran, some good specimens of *Sphenopteris*, *Alethopteris*, and *Merianopteris*, as described by the Rev. J. E. Tenison-Woods in his paper, vol. viii., pt. 1. Also of *Thinfeldia odontopteroides*, and a photograph of the male amentum of *Walchia Milneana*, all from Billinore, near Dubbo; also a quantity of Coccus infesting a species of *Casuarina*, from near Warren.

Professor Stephens exhibited, for Mr. J. A. Anderson, of Newstead, near Inverell, several specimens of Leaves and freshwater Molluscs (*Unio*). They were clearly tertiary, were though much fractured by the pick, excellently preserved, and probably all capable of identification. The matrix was was hardened mud, the detritus of basaltic rock mixed with much vegetable *debris*, and dotted with numerous little spheres of pisolitic iron ore. The pool in which this mud was deposited must have been of very still water, and may probably have been formed by a lava stream damming some small rivulet.

Dr. Schuette showed a plaster cast of an impression which Mr. De Vis had previously exhibited. This cast was therefore a model of the original fossil, and was regarded by Baron Maclay as consisting of the Occipital and Parietal bones of a gigantic Wombat, seen from within.

Mr. Deane exhibited a portion of sandstone penetrated by a number of burrows, formed in all probability by some Hymenopterous insect.

After the business of the meeting had been concluded, the Chairman drew the attention of the Members present to the fact that a Special General meeting of the Society had been convened for Wednesday, 4th July, at 4 p.m., to take into consideration the advisability of applying to Parliament for an Act of Incorporation; the meeting to be held at the Free Public Library.

THE

Southern Science Record.

AND

MAGAZINE OF NATURAL HISTORY.

CONTENTS:

PRICE—ONE SHILLING.

COLLINGWOOD:

J. WING, 33 WELLINGTON STREET.

1883.

Notes on some Russian and other Insects from Count Bramston.

By C. French (Botanic Gardens).

[Read before the Field Naturalists' Club of Victoria 9th July, 1883.]

Many are aware that a communication was some time ago received by this Club from the Royal Society of Victoria, together with a letter from Count Bramston, of Ekaterinodar, Russia, in which the writer expressed a desire to open up an exchange correspondence with collectors of entomological specimens in this Colony. It was resolved that the communication be received, and the members of our Club were invited to respond to the letter already alluded to. I undertook to write to Count Bramston, and did so, sending him in addition some particulars of our doings in Victoria, the result being that the small collection of Coleoptera now exhibited was sent to me as a commencement. I have made up a small lot of insects as a return, but having made up my mind to confine my attention more particularly to Australian Entomology, I shall be glad to make known the wishes of Count Bramston to the members of the Club, who may like to carry on the interchange already commenced by myself, and I think I can promise to those who care to undertake it ample return for their trouble. I may mention that the gentleman referred to has a very fine collection, both Coleoptera and Lepidoptera, and can supply rare species of either orders, as the case may be. For the benefit of the younger members of the Club, I may remark that beetles can be sent in tin boxes, packed in sawdust, and butterflies and moths in papers, or, if preferred, pinned up ready for the cabinet; but the former is the safest as well as the cheapest method, the postage being but a few shillings to any part of Europe.

I do not propose further to take up your time than to offer a few brief remarks on the character of the insects now under consideration, and to say that from the Northern parts of Russia, and the Russian possessions in Asia, many of our finest and rarest insects are known, particularly in the Carabidæ and many of the best groups of the Lepidoptera.

Longicorns.

1. Dorcadion Erythropterum (Russia). This species is very much like *D. fulvum.*

2. Dorcadion Caucasicum (Caucasus). A smaller and rather more common species than the former.

3. Dorcadion Murrayi (Mountains of Hungary). A rare and pretty species, although the markings are somewhat indistinct.

4. Dorcadion cruentum—(Crimea).—A remarkable species, the shape being not unlike that of some of the exotic groups of the family Curculionidæ.

5. Dorcadion equestre.—(Crimea).—Another curious species, in shape very like the former one, the markings, however, being quite distinct from that species.

6. Dorcadion symrnense—(Hungary).—A pretty and rare species, and more distinctly marked than many of the other kinds.

I may here remark, that the genus Dorcadion is confined principally, as far as I am aware, to Europe, there being nearly 100 species of the genus known to entomologists, some of which, however, may possibly be reduced with advantage, as in the case of other insects and plants likewise, particularly when other and more perfect specimens are available for scientific examination. In Australia, the Tasmanian genus *Dorcadida* is the nearest approach to the European one.

7. Agapanthia irrorata—(Italy).—A very pretty though not uncommon species. These insects generally frequent hebaceous plants, although they are likewise found in timber. The genus Agapanthia, is unrepresented in Australia as far as we know at present, and, according to Dejean, should precede Stenoderus, an insect which it appears to be widely removed from.

8. Agapanthia asphodeli—(Italy).—A prettily marked and elegant species, and as its specific name would imply, feeds on the well-known herb Asphodelus.

9. Agapanthia suturalis—(France).—A common species, and more distinct in markings and general appearance from the former kinds.

10. Agapanthia cyanea—(France).—This is a very beautiful little Longicorn, and, for this genus, of a most remarkable color. There are about 30 species described, nearly all of which are natives of Europe.

11. Purpuricenus desfontainesii—(Algeria).—This most interesting genus is not at all peculiar to Europe, being found in Africa, Australia, and in the Malayan group of Islands. In Australia we have two species described (I have three in my collection). One peculiarity in this genus is that it varies in color very considerably, as you will see by the specimens exhibited; and although there are a good number of described species, it is just possible that the number requires reducing.

The species No. 11 is one that is not so well known as many others, and I had not got it in my collection, previously to having received the specimen. It is also much smaller than the more common and better-known species.

12. Purpuricenus Budensis—(Hungary)—Also a rare species with different markings, but showing the same red ground color as in most of the kinds with which I am acquainted.

BUPRESTIDÆ.

13. PSILOPTERA TARSATA—(Algeria).—A very pretty species, although rather common in collections. Under a lens, the wing-cases and other parts of this insect look very beautiful. There are about 50 species described, from various parts of the world, and the genus is principally confined to Africa and South America, where some splendid species, as *P. Collaris*, *gloriosa*, and others are found. The genus is unknown in Australia, but according to Dejean, it follows closely on Australian Stigmodera.

14. PŒCILONATA VARIOLOSA — (Crimea). — This genus is closely allied to the former, and is also unknown in Australia, and unlike any of an indigenous species, but preceding Strigoptera, found for the first time at Fernshawe, Victoria, and named after myself by M. H. Deyrolle, of Paris, to whom I sent a specimen.

In Queensland we find the genus Polycesta represented by only a single specimen, *P. Mastersi*, and this approaches very nearly to the genus Pœcilonata. The species now under notice, is not an uncommon insect, being found, I believe, in other parts of Northern Europe.

15. BUPRESTIS OCTO-GUTTATA — (Russia). — A small and plainly marked species of this splendid family, famed alike for the variety of many of the species, and in others for the gorgeous metallic lustre, as in the genera Chalcophora, Sternocera, Chrysochroa, &c., and in many of our Australian species of Stigmodera, Curis, Melobasis, and others.

Australia is particularly rich in Buprestidæ, as many as 500 species being already known, and described, in size ranging from the minute one (the name of which I do not know), found in Victoria, to the gigantic *Stigmodera Solieri*, *Heros*, *Stevensii*, and others of Western Australian celebrity, specimens of which I show you this evening by way of comparison, nor is this disparity in the size and color confined to the Australian species, as the exotic species will show you. I should think that there will be more than 2,000 species known of this fine family.

16. IALODIS ONOPORDI—(Russia).—A very singular genus, most of the species being covered with hair, and following in shape the fine and showy genus Sternocera. This genus is principally confined to Africa and the Northern parts of Asia. We have no representative of this genus in Australia.

CARABIDÆ.

17. CARABUS HISPANICUS.—(Pyrenees).—This is one of the most beautiful of this large, splendid, and important genus, being little less brilliant in color than some of the more showy kinds of the Buprestidæ and Curculionidæ. It is found in the mountains of Southern Europe, and, although not considered rare, it is much coveted by collectors.

18. Carabus rutilans — (Pyrenees).—Another fine insect, even more brilliantly marked than the former species. It will, doubtless, interest many to know that Australia is very rich in this large and important family, and although we cannot boast of our Australian species possessing such brilliant colors as those from other countries, we have, as exceptions, the beautiful Carenums and Eutomas of North and West Australia, the large Hyperion, Catadromus, Mecyeognathus and Homalosoma of Queensland, and the curious little foreign genus Casnonia; and, according to the late Count de Castlenau, a specimen of the remarkable genus Mormolyce has been sent to Europe from Cape York, but I believe that the Count had his doubts about this matter, in which I share, although it is possible that the insect may have been by accident introduced from Amboyna or Java whilst in the larval state.

I am unable to give a correct estimate of the probable number of the Carabidæ known, but I should say certainly not less than from 4000 to 5000 species. In Australia we have, say, 900 described species alone, and no doubt there are as yet half as many more to be brought under scientific investigation. It seems somewhat strange that as yet we have not found in Australia a single species belonging to the true genus Carabus, although we have many of the sub-genera which approach very nearly to the larger genus. I may here state that I have not adopted any systematic rule in my remarks on these few specimens, otherwise I should have commenced with the Carabidæ, which, as many are aware, stand at the head of the Coleoptera, although some authors place it second to the fine group of Cicindelidæ.

I have thus given a brief account of the specimens which I have received from Count Bramtson, and had I time I might have given a much more lengthy, descriptive, and interesting paper, even on the very few specimens which form the subject of this sketch. I trust, however, that some of our members will take the matter up where I have left off, and I sincerely hope that, before long, we may have the pleasure of seeing further specimens of the Entomology of Russia and the Russian possessions in both Europe and Asia; also of listening to a more comprehensive and scientific paper than the very fragmentary one now offered, and for the imperfectness of which I owe an apology.

Definitions of some New Australian Plants,

by Baron Ferd. von Mueller, K.C.M.G., M.D., F.R.S.

[Continued.]

Cymbidium Boweri. — Leaves lax, much elongated, narrow-lanceolar, upwards flat; racemes very long, with numerous flowers; bracts much shorter than the flower-stalklets; calyces large; their lobes outside brownish-green, inside dull dark reddish-brown, at the margin yellowish; the upper of the outer lobes cuneate-obovate; the two lower cuneate-elliptical, the two inner cunate-oblong; labellum about one-third shorter than the other calyx-lobes, in outline almost orbicular, towards the summit divided into three very short lobules, pale yellowish-green, streaked by darker flabellate veins, above towards the base and centre short downy and along its median line up to the centre raised by a prominent narrow two-furrowed plate; the middle lobule almost semi-orbicular, yellow; the lateral lobules nearly semiovate, but little shorter than the middle lobule.

On the island "Mandoliana" of the Solomon-Group; Lieut. Goldfinch.

Height of the whole plant fully 4 feet. Flower-stem rising from the base of an oval pseudo-bulb of about 9 inches length. Leaves to about 2 feet long and to 2 inches broad, streaked by many nerves, channeled towards the base. Racemes bearing 30-40 flowers, continuing for 5 weeks in bloom, inodorous, according to a note of Mr. King; stalklets about an inch long; bracts semilanceolar, 3-4 lines long; tube of the calyx at flowering time hardly thicker than the stalklet; lobes of the calyx nearly an inch long, rather tender, at least not rigid, glabrous; labellum membranous, slightly incurved; about half as long as the calyx-lobes; the middle lobule nearly $\frac{1}{4}$ inch broad; the two double pollinia roundish, somewhat compressed, affixed to a divaricate-bilobed glandular deciduous membrane; fruit unknown.

This species differs already from *Cymbidium canaliculatum* in larger, laxer, less channeled and more chartaceous leaves, in larger and more copious flowers, and in a more downy labellum with very much shorter lobules.

This very conspicuous orchideous plant flowered recently in the conservatory of Arthur King, Esq., who obtained specimens from Lieut. Goldfinch of H.M. ship "Emerald" in 1881, taken from a large tree overspreading the grave of Lieut. Bower of H.M. survey-vessel "Sandfly." The tragic account of the death of that gallant officer under the hands of the savages of Florida-Island is still vividly in our memory here; and a more befitting plant could not be imagined, than this mourning-colored Cymbidium, to grace the grave of the brave but unfortunate young officer as a permanent emblem of sorrow on the lonely but historical spot of his mortal rest.

FURTHER NOTES ON ANTS.

BY THOMAS HARRISON.

[Read before the Field Naturalists' Club of Victoria 9th July, 1883.]

I thought at first of excluding everything that had been treated of elsewhere, but afterwards elected not to do so, since the results arrived at are unexpected, and are original, as far as I am aware, although they have been previously treated of in a public manner. I decided on this course, since it may be as well to have the various phenomena observed properly laid before, and exhaustively discussed by, gentlemen fully able to deal with the subject, some of whom, perchance, will be able to supplement what I shall have to narrate with an account of cognate observations made during their own natural history researches.

Since reading the paper referred to, several circumstances have prevented my pursuing, to any great length, my researches with respect to artificial glass nests. My present remarks will allude more particularly to observations of ants when in a state of nature, and, as the season is now almost at an end, I am afraid whether these remarks may not be the final ones until another Spring dawns upon us.

In beginning—The verandah before my house runs nearly due east and west, having a northerly aspect. Some high trees, at the eastern end, prevent the rays of the early morning sun falling upon the pavement until at about 9 or 10 a.m. At the eastern end in early Spring there was a nest (exactly where I do not know) of sugar ants, but they had instituted a well-defined track which was thronged by them in hundreds. At the western end, I never saw a sugar ant, save as a straggler from the other extremity of the verandah. At the end of the summer, these ants seemed to have altogether deserted their old haunts, and it was only on very rare occasions that I noticed a single ant present. On the 7th of April, I was looking for one to examine with the microscope, but none put in an appearance all the afternoon. I noticed, however, a black ant of about a quarter of an inch in length, and with, apparently, an enormous head, pursuing his way across the tiles until his arrival at a hole in the pavement, into which he vanished. The tremendous apparent dimensions of the head turned out to be deceptive, as the little creature was carrying the body of a fly, which I discovered upon making use of a lens. Still the head was large, and the jaws of rather formidable dimensions. Subsequent examination with a magnifier revealed the fact that this ant was one of the most beautiful species I have yet met with. The head is of a rather peculiar shape. When the jaws are closed the outlines are not unlike a semi-ellipse, two wings or horns projecting backward from either extremity of the transverse diameter. The thorax resembles an isosceles triangle with the angles rounded off. The dorsal part of the thorax is nearly of a dark green color and irridescent. The abdomen is separated into two parts by a deep suture, and as the posterior is somewhat less than the anterior portions, the whole reminds one, as seen from above, of a minute acorn.

I had never taken any notice of one of this species previous to the occasion referred to, and believe, so far as the verandah was concerned, that they were new arrivals. I subsequently found three other nests of the same kind, one at either end of the pavement, the remaining nest just referred to at about midway between the two others. Singular to say, I afterwards discovered that beside each nest of these ants was one of ants of a brownish green color, apparently very delicate, susceptible of heat or cold, and of not more than one-tenth of an inch in length. These ran about and remained perfectly unmolested by their immensely larger *confreres*.

One evening, just before sunset, I noticed a rather remarkable circumstance with respect to the large black ants. Up to that time I had never seen more than two or three on the verandah at once ; but on this occasion some fifty or more were to be seen crowded round the entrance to the central nest. In a short time four ants emerged from the hole, three dragging a fourth, who seemed to be a prisoner. The crowd of ants opened a pathway through which the four were allowed to pass, the lookers-on seeming as if violently gesticulating, and in a state of great excitement. After dragging the prisoner for about 12 inches from the nest, one of the custodians let go his hold and returned. At about 18 inches farther on a second custodian returned, leaving the prisoner in the clutches of the one remaining. There was no struggling on either side after this, and the two proceeded together for a few feet more. Here the prisoner seemed to be set at liberty. There was a due crossing of the antennæ of the two parties. The beforetime prisoner departed in one direction, his late custodian returning to the nest by the shortest cut. On revisiting the nest I found the entire crowd of ants had disappeared.

I have often asked myself the meaning of the strange scene which I had witnessed. The ejected ant was of the same species. I duly ascertained that fact by the aid of the lens. Was it a case of banishment for some real or imagined delinquency? and did the culprit, henceforth, wander about the desert as a scape-goat or an exile —an outcast for ever from antdom and the society of his fellows?

I next tried an experiment that Good Templars will probably protest against. Into a tea-spoonful of honey I dropped a small quantity of pure alcohol, making a streak of the same before the openings of each of the three nests. It was at once attacked by the black ants with avidity, although their taste for pure honey did not appear to be very great. They would go to the latter, partake of it for a minute or so, and then return to the nest or proceed about their business. Having once tasted of the alcoholized honey, however, they evidently went in for a debauch, and, in a short time, the whole of the imbibers seemed to have become intoxicated, reeling about and sometimes fighting with each other with apparent fury.

The honey was placed in position at about four in the afternoon. An hour afterwards it had evidently attracted the attention of the small brownish green species, since they surrounded it in swarms, the entire population of each nest seemed to have come out to partake of the tempting compound. They must, too, have made a night of it, since they were eating or drinking at 11 p.m., and were still feasting in undiminished numbers at half-past five next morning, continuing there until 9 a.m., when they returned to their nests. This took place at the two end nests. At the central one a singular thing had happened. The black ants had excavated a large quantity of earth during the night, and with the same had completely buried the alcoholized honey, although a streak of pure honey had not been so treated. I repeated the experiment next night and with the same result. One can hardly believe that the action was taken with the laudable intention of closing drinking shops. Possibly the majority of the community were annoyed by the smell of the spirits, and sought to get rid of the objectionable odor.

At about 9 o'clock the same morning I was surprised to see that the two end patches of honey were surrounded by an immense number of sugar ants, of whom the original inhabitants of the nests seemed to have a wholesome dread. These continued feasting all day, until just before nightfall, when they suddenly departed, leaving the large black and tiny brownish green ants to issue forth and gorge themselves as before. The central nest, however, where the honey had been covered, was not visited by the invaders, so that the honey may have been hidden lest it should attract unwelcome intruders. It is not a little singular that the alcoholized honey did not seem to intoxicate any save the large species, although I gradually added more and more spirits until the mixture tasted like very stiff toddy.

The manner in which the sugar ants arrived each morning was rather remarkable. None put in an appearance until the sun was well up and shining on the district to be invaded. They then suddenly marched forward in a sort of column, in which were from fifty to a hundred individuals, reminding one not a little of a detachment of soldiers marching from their barracks to relieve guard at a dockyard or an arsenal. This first batch having settled down to the honey, there was an almost continuous stream of reinforcements arriving during the day, unless the weather happened to be wet, cold, or cloudy.

After about a week had elapsed I brought home three salt-jars nearly full of black tree-ants, placing them, together with some of the dirt of their nests, in a corner of the verandah, at about four feet from the track of the sugar ants. There must have been over 2,000 individuals brought home, about a hundred queens, and a great number of pupæ. The first act of these ants was to run about in all directions as if seeking a shelter. This they soon found, in the shape of some small crevices in an adjacent brick wall. Into these crevices they began transporting the pupæ, and dragging the queens. Being desirous of trying whether the sugar ants would molest them, I drew a fresh streak of alcoholized honey. This was soon invaded by the sugar ants, and perhaps some score or so of the newcomers also mixed with the crowd of feasters. This they were allowed to do without being in any way molested. I then drew another streak of honey near where the tree-ants were located, pouring down some water, which the sugar ants were unable to pass. This fresh honey, therefore, the tree-ants had all to themselves. It surprised me, however, to find that it was not visited during the day by more than a dozen ants at a time, the vast majority being actively engaged carrying off the pupæ to a place of safety. On three or four occasions there was a regular stampede among the ants round the honey, the same seeming to result from some ants in authority, who drove the gourmands back to their work. Next day all the pupæ had been carried away and duly stored. The ants which had refused to partake of the honey on the previous day, having done their work, I fancy, attacked the honey in dense crowds. The numbers were so great, in fact, that three streaks of honey half-an-inch wide by six or eight inches in length were successively cleared away in about six hours.

It is not unworthy of note, only a few stragglers of the sugar ants appeared (even after the honey had been placed in position every day for nearly a week), but when a fresh streak was laid down, then the same was attacked by crowds within a few minutes. I am unable to determine whether the presence of the honey is detected by the delicate sense of smell possessed by the ants, or whether the information is conveyed to the nest by some stray forager who has accidentally met with the new supply of the much-relished dainty. My opinion, at present, is that the ants are guided by scent alone, since the straggler who found the honey in the first place seldom seemed to leave it until long after the arrival of his *confreres*.

Wishing to form some natural nests, if possible, I brought home several jars full of three or four different species, whose nests I had dug up in the Government House and Botanical Gardens reserves. Among the nests so dug up was one of the species which, for want of a better title, I spoke of in my last paper as undertakers, owing to the strange habit they have of burying their dead in a decent and systematic manner. The nests of these ants contain a number of individuals of gigantic size, fully double the length of the rest of the community. By covering the dirt of the newly-deposited nest with a bell glass I speedily got the ants to commence burrowing. Singular to say, however, not one of the larger kind assisted in the work which was all done by the smaller members of the community, who toiled with great industry, their larger brethren hiding themselves lazily under stones. Having never met with queens in the nests of these ants, the thought has struck me that possibly these larger kind may be wingless queens, but at present this idea is merely based upon conjecture. So far, too, I have never succeeded in finding pupæ in these nests. This latter circumstance may be explained by the fact that I have always dug up the nests with a small garden trowel. Had a spade been made use of it is probable that by digging deeper both pupæ and queens might have been discovered in some of the lower galleries. It would seem as if all the shafts sunk by these ants communicate with each other by subterranean passages, as smoke blown into one hole shortly afterwards issues from nearly all the rest.

On May the 12th, last, I had an opportunity of trying another experiment, which, like many of the preceding, led to one or two altogether unexpected results. Most of those present who have read Lubbock and others on ants are aware that these small creatures are in the habit of keeping household pets (beetles), and "milch cows" (aphides). These latter are imprisoned and tickled by the ants, and so caused to exude a saccharine fluid greatly relished by the captors. I had never yet witnessed the operation of milking referred to. Finding, however, some twigs of a rose-bush thickly covered with a throng of the well-known pests of the gardener, I duly placed one of the same before each of the ants' nest, previously mentioned, and watched for the result. It must be noted that scarcely any of the so-called sugar ants are visible on the verandah unless some honey is placed out for them. In about five minutes after the placing of the aphides in position, however, some twenty or thirty ants made their appearance at either end of the pavement, whereat I had not seen but one ant for more than an hour. The aphides seemed to attract the visitors, but were passed by unnoticed. I kept a due look out for nearly an hour, and the aphide-covered twig did not receive the notice of a solitary formicarian visitor, although there were at least fifty ants surrounding it at a distance of several inches. I then knocked the aphides off the twig, and they at once commenced crawling with their awkward motion. I then called my juvenile assistant, and, giving him a lens, told him what to look for, and went on with some writing. In about an hour he came to me saying that one of the ants had begun to milk a cow.

On going out to look, I found that one ant and an aphide were in close proximity with each other, but a glance through the lens showed me that the object of the ant was not to milk but to eat the aphide bodily, since the abdomen was nearly removed. The attack of the ant upon his victim was of a peculiar kind. He would alternately leave his prey and renew the attack. This lasted for about ten minutes when the remains of the victim were carried away. I never previously saw an ant attack an insect in this manner. The remaining aphides mingled freely with the ants, but I did not notice any fresh attack, although spreading some score or so of them among their formidable adversaries from time to time during the two next days. To my fancy the ants seemed to rather fear their new and strange comrades, since when an aphide approached an ant, the latter generally ran or backed away.

It is quite possible that the captured aphides may not be of the honey-dew yielding species, or that the time specified was not the season when the same is secreted. I bit one or two with my teeth, but did not notice any trace of sweetness. Still the taste was not a disagreeable one, and I could but wonder why they were not attacked and eaten as would have been any other insect.

On the 18th May last, I noticed what seemed to me to be another remarkable example of instinct in these wonderful insects. I have read somewhere that corrosive sublimate acts in a singular manner upon the formicarian race. To wit: it makes them literally mad. I therefore resolved to try the experiment. I first mixed a saturated solution of the salt with some sugar, until the whole resembled a thick syrup. No ant would touch the compound. I next used honey, and afterwards honey and alcohol, with the same result. Although the pure honey I had wiped away had been surrounded all the morning by a thick fringe of ants, not one would touch that containing the poison. Thinking that the honey was rejected as food simply on account of some disagreeable flavor, I tasted it, and could scarcely perceive more than a trace of the taste of the salt. Having wiped away the objectionable honey, I made a fresh streak of pure honey on the pavement, and as soon as the ants had began to feed upon it added a saturated solution of Glauber salts (sulphate of soda) until the honey, which was previously very thick and viscid seemed almost as thin as water. Still later I tried the same experiment, using Epsom salts and nitre, but in none of these instances was the mixture objected to. I next tried arsenic mixed with the honey, using so large a proportion of the poison that the compound resembled a very thick paste. This was at once visited and eagerly devoured. I do not know the exact results which followed the taking of this poison, as, in all probability, those who had partaken of it in fatal doses went elsewhere to die; and as I did not wish to more than try an experiment, I speedily swept away the honey so poisoned, upon which the disturbed feasters adjourned to the before-mentioned honey mixed with glauber salts. I hope the one proved an antidote to the other.

PROCEEDINGS OF SOCIETIES.

THE ROYAL SOCIETY OF VICTORIA.

The ordinary monthly meeting of this Society was held in their Hall, Victoria-street, on the 12th inst., Professor Kernot occupying the chair.

Mr. C. Rennick was elected a member of the Society, and Mr. Hyde Clarke was elected a corresponding member.

Mr. C. R. Blackett stated that he had to apologise for not having the paper that he had promised to read on Shone's new sewage scheme ready for that evening. The pamphlets on the scheme which had arrived in this colony from the Agent-General were very interesting, and really required more time for consideration than he had thought they would. That circumstance, and the great pressure of other business, had prevented him from having his paper ready for that evening, but he would take care to have it prepared by next meeting.

The reading of a paper by Mr. Newbery, entitled "Notes on Tin Ore Dressing," was also postponed, Mr. Newbery having written to the Secretary, stating that he had not been able to prepare the paper in time for the meeting.

Professor Kernot delivered some "Observations on Iron Girders." He stated that at the University engineering classes experiments had been made on girders constructed of cardboard, wood, and iron. The best test for ascertaining the strength of a bridge built of iron girders, of which bridges were now generally built, would be to break down the bridge by loading it until it had more weight upon it than it could bear, but that mode was impracticable, on account of the expense. At the University classes, however, they had done the next best thing: they had constructed models of iron girders of 1-12th or 1-15th of the actual size of girders, and had tested them until they broke. Before making their tests they had in each instance made a calculation of the weight a girder should carry, and in nearly every instance the actual result had been very close indeed to the calculation. A good deal of attention had been drawn to the strength of the Victoria-street bridge in Collingwood. It was true that the alterations about to be made to that bridge were only to be made to the supports of the girders; but last year a writer in *The Argus* condemned the girders of the bridge as being altogether unscientific. One of the designers of the bridge, however, offered a reward to any designer who could make a stronger girder with 10 per cent. less metal, and no one had yet offered to earn or claim the reward. He exhibited a model girder of the type used in the Victoria-street bridge, and said this girder had been tested and broken down. It was 45in. long, weighed 2lb. 1oz., and carried 1,627lb., or almost exactly 800 times its own weight. A number of models of girders by various eminent authorities, both here and in England, had also been tested at the University, and the Victoria-street girder had turned out so far much the best, the next best girder carrying less than 600 times its own weight. He was positively convinced that those who condemned the Victoria-street bridge girders did not understand them, and that if a consultation of engineers had been called together, and had discussed the question, the money now about to be spent in supporting the bridge would never have been required.

Mr. T. B. Muntz stated he was glad to find the girder of the Victoria-street bridge had turned out so well on being tested; and also in being able to say that the girder was the design of two of the young students who were under the tuition of Professor Kernot at our University,

The meeting then closed.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

This Club held its usual monthly meeting on Monday evening, 9th July, at the Royal Society's Hall. Mr. H. Watts, one of the Vice-presidents, occupied the Chair, and there was a fair attendance of members.

Several new members were elected,—viz., Messrs. J. B. Gregory, F. R. Godfrey, J. Baldwin, W. Detmold, and H. Wertheim, C. French, jun., F. Patey, T. Lucas, and Miss Campbell; and, as Honorary member, Capt. T. Broun, of Howick, New Zealand.

Mr. T. Harrison read a continuation of his paper on the habits of Ants, relating many interesting and curious personal observations of three very common species frequenting the verandah of his house. He was unable, however, to describe them except by names which he himself gave them. The want of a nomenclature of Australian insects is seriously felt at every meeting, and steps are now being taken with a view of having it supplied through the agency of the London Entomological Society or other competent authority.

Mr. C. French read a few notes on some beetles, principally Russian, sent to him by Count Bramston, and drew attention to the curious circumstance that a specimen of the beautiful red and black Longicorn, of the genus Purpuricenus, from Algeria, closely resembles the one common to New South Wales and West and South Australia. Dr. T. P. Lucas continued his notes on "Experiences of an Old Net," detailing the result of a collecting tour to Marysville, principally in search of Lepidoptera, several rare species of which he was very fortunate in securing.

The exhibition of specimens included Beetles and Butterflies, by Dr. Lucas and Mr. C. French, in illustration of the papers read by them; some fine specimens of Native Pigeons, including the Brush and Crested Bronze-wings, and Wonga-Wonga, by Mr. T. A. F. Leith; rare shells (*Chitonellus Gunni* and *Cypræa contusa*) from the Miocene limestone at Cheltenham, by Mr. J. F. Bailey, and a curious tree fungus from near Oakleigh, by Mr. J. E. Prince.

During the conversazione which ensued, attention was drawn to the visit to be paid on Saturday, the 21st inst., to the National Botanical Herbarium. Baron von Mueller has kindly consented to be present, and a large attendance of members is anticipated.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The ordinary meeting of the Microscopical Society of Victoria was held on the 26th July, the Rev. J. J. Halley, Vice-President, occupying the Chair.

The Secretary acknowledged the receipt of a number of Microscopical journals and other publications.

Mr. J. O. Moody was elected a member of the Society.

The SECRETARY read a paper by Mr. C. M. Maplestone on "The Lingual Membrane of the Mollusca," describing the various types of dentition which prevail among the Odontophora, and the divisions which have been founded upon them; also describing the writer's method of preparing the odontophores. In illustration of the paper some figures were exhibited which had been drawn by the author, and published in the Monthly Microscopical Journal for 1872. Mr. BAILEY also brought before the meeting some papers by Professor Hutton, in which the odontophores of a number of New Zealand Mollusca were described and figured; and Mr. BALE exhibited mounted specimens of those of some Australian species. An interesting discussion followed the reading of the paper, in which nearly all the members present took part. Mr. W. W. ALLEN exhibited specimens of crystals under the polariscope, especially the iodosulphate of quinine, or Herepathite, of which he explained the preparation, and distributed specimens.

THE ROYAL SOCIETY OF NEW SOUTH WALES.

The monthly meeting of the Royal Society of New South Wales was held at the Rooms, Elizabeth-street, Sydney, on the evening of the 8th ult. The Hon. Professor J. Smith, M.L.C., occupied the chair.

After the minutes had been read, the chairman expressed his great pleasure at meeting the members of the Society again, after his long absence in England; he also returned his thanks to the members for the honor they had done him in re-electing him President of the Society.

The following gentlemen were balloted for and elected members of the Society:—Messrs. Jas. Barnet, John Fraser, B.A., J. H. Maiden, Frederick Morley, Sutherland Sinclair, T. P. Anderson Stuart, M.B., M.D., T. B. Trebeck, B.A., P. W. Tuxen, W. W. Wardell, C.E., and W. C. Wilkinson, B.A.

A paper on the Wainamatta shales, by the Rev. J. E. Tenison-Woods, was, in the absence of that gentleman, read by Professor Liversidge. After a short discussion on the subject matter of the paper, a vote of thanks to the author was carried by acclamation.

Professor Liversidge then laid on the table a paper on Australian Strophaosiæ, and description of a new species of Ancella from the cretaceous rocks of N. E. Australia, by Mr. R. Etheridge, jun. It was announced that the paper would be printed and illustrated in the records of the Society. A vote of thanks was accorded to the author. Professor Liversidge also called attention to some specimens of tin ore. He explained that most of the tin worked in New South Wales was alluvial tin, though occasionally thin veins of crystallised tin had been met with. The specimens in question, however, were from a vein which had already been proved to be a width of 10 feet, and the full width had not yet been reached. The tin, as could be seen, was disseminated through the feldspar, and the specimen, which came from Stannifer, in New England, closely resembled the ore found in the St. Agnes Mine, in Cornwall, England.

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 25th July, Professor W. J. Stephens, M.A., in the chair.

The Rev. J. Bates, of Auckland, New Zealand, was introduced as a visitor.

The following papers were read :—

1. On the Myology of the Frilled Lizard *(Chlamydosaurus Kingii)* by Charles De Vis, B.A. The author does not find there is any special muscular mechanism connected with the reptile's habit of elevating the frill and of occasionally assuming the erect attitude. The function of the frill he regards as being partly to frighten assailants, partly to aid in the collection and concentration of the waves of sound.

2. Descriptions of Australian *Microlepidoptera,* No. 9, by E. Meyrick, B.A. The paper continues the description of the *Œcophoridæ,* bringing the number of Australian species of the family up to 179.

3. Some remarks on the action of Tannin on Infusoria by Harry Gilliatt. Mr. Gilliatt points out, with reference to a paper by Mr. H. J. Waddington, that the effect of the tannic acid on *Paramæcium aurelia* is to cause the elongation and discharge of the trichocysts, which form a dense fringe of slender rods all around the body.

Mr. Haswell exhibited a series of anatomical and Zoological preparations.

Mr. Deane exhibited a small collection of rocks, chiefly igneous, from the railway between Gunnedah and Narrabri.

Mr. Pedley exhibited a specimen of what is called Copper Grass at Cobar, and is regarded as a sure indication of that metal, growing only, it is said, upon the outcrop of a lode. Mr. Haviland suggested that it might be a species of *Xerotes.*

Mr. Macleay exhibited a living specimen of *Trachydosaurus asper,* brought by the Hon. P. G. King from the Narran country.

With respect to this Lizard, Professor Stephens read the following account written by Dampier, in 1699 (Voyages, vol. iii. p. 122, Ed. 1703) :—" A sort of Guanas are also found at Shark's Bay of the same shape and size with other guanas (described vol. i., p. 57), but differing from them in three remarkable particulars; for these had a larger and uglier head, and had no tail ; and at the rump, instead of the tail there, they had a stump of a tail, which appeared like another head, but not really such, being without mouth or eyes ; yet this creature seemed by this means to have a head at each end ; and (which may be reckoned a fourth difference) the legs also seemed, all four of them, to be fore-legs, being all alike in shape and length, and seeming by the joints and bending to be made as if they were to go indifferently either head or tail foremost. They were speckled black and yellow, like toads, and had scales or knobs on their backs like those of crocodiles, plated on to the skin, or stuck into it as part of the skin. They are very slow in motion, and when a man comes nigh them they will stand still and hiss, not endeavoring to get away. Their livers are also spotted black and yellow, and the body when opened hath a very unsavoury smell. I did never see such ugly creatures anywhere but here" (at Shark's Bay). "The guanas I have observed to be very good meat, and I have often eaten of them with pleasure. But though I have eaten of snakes, crocodiles, and alligators, and many creatures that look frightfully enough—and there are but few that I should have been afraid to eat of if pressed by hunger,—yet my stomach would scarce have served to venture upon these New Holland guanas, both the looks and the smell of them being so offensive." The description of the lizard is accurate and picturesque, and the old buccaneer's estimate of its flesh is much the same as that of the Murrumbidgee aborigines, who look with extreme contempt upon those natives of the dry plains who, for want of better food, are obliged to "patter kurraggaly."

Mr. Macleay also exhibited a specimen of *Strophura spinigera* (Gray), a small lizard found in the pine scrubs of the interior, and reputed to be venomous. When irritated it ejects from pores in the tail an acrid fluid, which, immediately on exposure to the air, becomes viscid.

Mr. Brazier, for Mr. J. F. Bailey, of Victoria, exhibited a specimen of *Bulimus acutus* (Muller) taken, July 22nd, in a garden at Collingwood. This species has been introduced from France.

Mr. Fletcher exhibited specimens of a parasite, *Filaria macropi majoris*, or *F. Websteri*, according to Cobbold, which is often to be met with inclosed in cysts about the distal end of the thigh bone, sometimes extending some way down the shank bone. Out of thirteen specimens, three male and one female showed these parasites. They are referred to in vol. II, page 293, of Dr. Bennett's "Wanderings in New South Wales." So far, they do not seem to have been met with in any species of kangaroo but M. *Major*.

Professor Stephens exhibited a block of tertiary limestone, picked up at Belmont, Lake Macquarie, but in all probability brought from the Southern Coast of Victoria or South Australia. It was composed almost entirely of shells and fragments of shells, some of which were imperfectly mineralized. Bryozoa of two or three kinds were also distinguishable.

Also a piece of sandstone, composed directly from the *debris* of a gigantic rock, found in the same place, but evidently not in its original locality

Also a chert flake, resembling exactly a Palæolithic implement, but probably not a century old, from Coal Point, Lake Macquarie.

Also some specimens of silicious sinter, obtained by H. R. Labatt, Esq., from the gorge of the Cataract River, a few miles beyond Appin. There was a large quantity of this mineral encrusting the rocks at a considerable height above the river bed. It is evidently the deposit from the waters of a hot spring charged with silicious matter, and derived probably from the great mass of basalt which lies about the head of this river. There is also, however, a very long and occasionally wide dyke of the same rock crossing the Coal Cliff and the Bulli Roads, at about eight and a-half miles from Appin, and appearing at the other side of the Cataract River in a large patch on the Mount Keira Road, and this may have been the real origin of the deposit here illustrated. Most of the specimens consist of pure, dense, fibrous, hydrated silica, but one much more open and cellular than the rest contains also a good deal of carbonate of lime.

Also specimens of the conglomerate and pebbles forming the hills in the Narran District, known as the Murillas. They are rounded masses of no great elevation rising out of the wide levels between the Darling and Bokhara Rivers, which are recognised as tertiary, and appear to rest upon the Cretaceous or Jurassic beds which form the country on the right bank of the latter river. It is evident that they are wrecks of an older formation (possibly Daintree's desert sandstone), and it seems probable that they represent in reality an upper member of the Cretaceous system. But no information has been obtained as to the beds which directly underlie them. The conglomerate is composed of pebbles of milky quartz, imbedded in a mass of rounded pellets and grains of rock crystal, firmly compacted by a siliceous cement into a hard, coarse-grained quartzite. This, however, is more soluble than the materials which it holds together, so that under atmospheric wear and tear it is forced to release them once more, covering the ground with sheets of white pebbles, which at a little distance may be mistaken for snow. The specimens were brought to Sydney by the Hon. P. G. King, M.L.C.

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PRICE--ONE SHILLING.

COLLINGWOOD:

J. WING, 33 WELLINGTON STREET.

1883.

Notes on Instinct as illustrated by the Habits of Bees and Ants.

By Thomas Harrison.

[Read before the Field Naturalists' Club of Victoria 9th July, 1883.]

I must freely confess that I am by no means a convert to the especially brilliant, even if untenable, theory of the "Origin of Species," as advanced by England's late accomplished and talented naturalist. That theory, however, will not be dealt with on the present occasion. This course adopted has been resolved upon for two very weighty reasons—(1) Time will not admit of such a subject being even cursorily dealt with; and (2) my modesty, possibly discretional temerity, will scarcely allow me to cross swords with so redoubtable a champion.

My object is to call your attention for a short time to one particular subject dealt with by Mr. Darwin, viz., that wonderful (so-called) instinct which is displayed by the well-known honey-bee in the construction of its comb. You will remember that the main object of the comb is to provide suitable receptacles for the honey, while it is especially desirable to be as economical as possible in the use of the material, the wax, employed in the building up of the various cells. Mathematicians will tell you that the most economical form of cell would be a cylinder perfectly circular in section, since a circular periphery of a given length will enclose a larger area than will the boundary line or lines of similar length surrounding any other plane figure. It happens, however, that something in addition has to be considered. The cells do not stand isolated, but in immediate juxtaposition with each other. I have here a diagram, by a reference to which you will at once see what would be the result of circular cells so arranged side by side. You will notice that each particular circle touches one or other of the adjacent circles at one point only. Between that tangental point and the next one on either side thereof there is necessarily an interstice that must either be filled up with wax or left vacant, to the great weakening of the entire fabric of the comb. There are, in fact, only three geometrical figures, the triangle, the rectangle, and the hexagon, in using which all interstices can be avoided. On the same sheet imaginary combs with cells having sections of these figures, are shown. Triangles and squares are evidently unsuitable, while the hexagon, capable of being built up as required, still sufficiently resembles the circle to admit of great economy being displayed in the construction of the boundary walls or septa. The universal employment of such a form of cell by bees has led many persons to designate them as Heaven-born geometers, since long before Archimedes, Aristotle, and Euclid had studied their wonderful science, nay, long before the grand old gardener and his wife had severally delved and spun in Eden, the industrious little workers referred to were constructing their tiny store-houses with a skill, precision of outline, and a nobility of form that could scarcely have been excelled had Newton been the designer, leaving it to the most experienced of handicraft-men to carry out the idea. Mr. Darwin proceeds to demolish the old and time-honored belief that the bee is in any way to be commended for the possession of architectural talents, not even for being impelled by inherited instinct; but charges him with carrying on his work in a way purely mechanical and of necessity.

The sum of the argument, put forward with the author's well-known lucidity and praiseworthy modesty, is, in substance, nearly as follows :—Bees really set about working from centres, and, in a community, these centres are a little less than two *radii* of the circles actually intended to be described apart. The result is, that the several circles would not touch a neighboring circle tangentally, but would overlap each other to some trifling extent, but With most praiseworthy courtesy the separate workers agree to compromise matters, and instead of crossing the peripheries they severally resolve to draw a straight line. *A honey-bee has to give and take* in this manner from six bees that are adjacent: the necessary consequence is, that the hexagonal shape of cell is adopted by each independent builder. Did this fact stand alone the case would seem to be made out satisfactorily. *All depends upon working in company and the natural propensity of bees to draw circles*—which, by the way, are regular geometrical figures. If, therefore, examples of other naturally-taught architects, not working in concert, are found to produce similar regular forms, the reasoning of Mr. Darwin is considerably weakened; since almost as much exactness and symmetry results under entirely different circumstances from those supposed.

Let us take, as an example, the singular instinct apparently displayed by spiders. In doing so we might allude to the custom of Arachnideans constructing diving bells, so that they may, while still breathing air, live safely beneath the water; the disposition of some to turn circumnavigators, using rafts with which they sail round ponds and lagoons, or of still others who provide their subterranean dwelling-places with skilfully-arranged trap-doors, which close automatically. We will, however, pass over these, and instance more particularly the manner in which spiders design their webs, and the lairs in which, cunningly concealed, they await their expected prey. Ordinarily the owner of a web lies in ambush completely outside his airy fortalice. This, however, is not always the position selected. The would-be snarer, however, remains as much concealed as ever, although his domicile is nearly centrally situated. There is a species of spider very common by the banks of the Yarra, near the Botanical Gardens, which invariably adopts this method of procedure. His residence and citadel consists of a dried leaf curled up longitudinally, the tube formed being open at both ends and securely suspended from the threads composing the net-work of the web. My first impression upon seeing a leaf so situated was, that the same had been blown thither by the wind, and had become entangled in the meshes. When one was removed, however, a spider was invariably met with inside the shelter so provided. I was still only partially convinced, and labored under the impression that the position of the leaf was accidental, but that it had been duly appropriated. This theory failed as had the previous one. The webs so furnished are often so placed that it would have been almost impossible to believe in such an accident having occurred, the only solution of the problem being that the required leaf had been brought from a distance, or at least hauled up from the ground, made to curl up by some unknown means, and then utilized as described.

Again the *Epeira diadema* constructs a web as symmetrically and artfully formed as are the comb-cells of the bee. Furthermore, on some of the narrow-leaved Eucalypti, at about the fall of the leaf, may be found a spider, the behaviour of which in providing a home for the winter season is not a little remarkable. The home constructed is a tetrahedron pyramid—that is, if the extraneous portions of the leaf should be cut away, the whole would be found to have an equilateral triangular base and three similarly-shaped sides. I have here an enlarged drawing of a leaf, the lines crossing it diagonally being the positions in which the leaf is bent and folded up, so that when the various edges are subsequently glued together the pyramid will be found as before stated. What I particularly wish to be noticed is the circumstance that the three lines named actually form together with the two edges of the leaf a couple of equilateral triangles, the middle line being a side common to both regular figures, and that this particular spider, as well as all the other spiders named, does not work in concert with fellow-laborers. No necessity of circumstances, therefore, controls them in the least. Nevertheless the last spider named proves, although designing and laboring on alone, quite as good a geometrician as the bee. In my humble opinion, humanly speaking, a pair of compasses and a ruler are as much required to describe a three-sided equilateral triangle as to draw correctly a regular hexagon. If an arborigal spider, who never until lately, perhaps, saw any one more civilized than a native, is able to design in this fashion, why may not the bee also, whose ancestors, perhaps, were numbered among the swarm that are said to have hovered round the face of Plato, anxious to gather the honey from his lips, be fully equal to the achievement of a similar feat, not as mere automata, but as creatures endowed with a modicum of reason or an instinct provided for them by their Creator.

I may add that some time since, I forwarded to a neighbor and enthusiastic admirer of Mr. Darwin, himself a good and devoted amateur investigator, some of the nests, together with a request that they might be shown to the great naturalist, with a view of obtaining his opinion respecting them. My correspondent wrote to say that the fact was a strange one, and that he did not know what to make of it, but he whose opinions were sought had passed away and reposed quietly, after a long life of useful toil, in the old Abbey at Westminster.—a fitting mausoleum for one who, whatever his theological views, had by his kindness, urbanity, modesty, and courage, won the golden opinions of all who knew him. He rests there from his labors, but, being dead, yet speaketh.

Native Plants of the Grampians and Vicinity.

Arranged generally under the direction of

Baron Ferdinand von Mueller, K.C.M.G., Government Botanist.

By D. Sullivan.

[Read before the Field Naturalists' Club of Victoria 23rd January, 1882.]

[Continued.]

(9). Lentibularinæ.

Utricularia dichotoma—(Labill.).—In wet places about and on the mountains. Ascends to the summit of Mount William.

There is a small variety (Uniflora) about swamps.

lateriflora—(R. Br.).—Irrigated rocks on Mount William, not common.

(10). Labiatæ.

Mentha laxiflora—(Benth.).—Gullies of the mountains, not rare.

australis—(R. Br.).—River banks.

satureoides—(R. Br.).—Clayey banks of brackish creeks, rare.

gracilis—(R. Br.).—About creeks near Mount William; also about the Wannon.

Prostanthera lasianthos—(Labill.).—About streams around the mountains and on the summit of Mount William.

hirtella—(F. v. M.).—About streams at the base of the Grampians.

rotundifolia—(R. Br.).—On the spurs of the Grampians and on the Black range.

Prostanthera debilis—(F. v. M.).—On the lower ridges of the Grampians, especially about Hall's Gap. Height 1½-2½ feet.

mellissifolia—(F. v. M.).—Streams between the mountains, rare.

spinosa—(F. v. M.).—On the slopes of the mountains, rare.

Ajuga australis—(R. Br.).—On pastures throughout the district.

Teucrium corymbosum—(R. Br.).—About the base of the Black Range.

(11). Myoporinæ.

Myoporum viscosum—(R. Br.).—Among granite rocks on Mount Ararat and granite ridges near Mount William.

(12). Epacrideæ.

Styphelia Sonderi—(F. v. M.).—Heaths and scrub-hills, not rare. Height 1-2 feet. Flowers red.

thymifolia—(F. v. M.).—From about the middle to the summit of Mount William, rarer on the other mountains. Height 12-18 inches. Flowers white.

neurophylla—(F. v. M.).—Summit of Mount William, to which it appears to be restricted. Height 1½-3 feet. Flowers white.

adscendens—(R. Br.).—Heaths, and on the mountain to a height of 1200 feet. Ripe fruit pale green, and larger than any of the others. Height 1-2 feet. Flowers white.

pinifolia—(Sprengel).—On the summit of Mount William, and lower down on the other mountains. Flowers yellow. Habit prostrate.

ericoides—(Labill.).—Heath-ground and ridges of the mountains. Height 2-3 feet. Flowers white.

apiculata—(Labill.).—From the heath-grounds to the summit of Mount William, common. Height 12-18 inches. Flowers white.

virgata—(Labill.).—Heath ground and scrub-hills, not common. Height 12-18 inches. Flowers white.

humifusa—(Labill.).—Scrub-hills and heath-grounds, common. Habit prostrate. Flowers red.

rufa (*var. albiflora*)—(F. v. M.).—On the ridges of the mountains, not common. Height 2-3 feet.

australis—(R. Br.).—Rarely to be seen on the Victoria and Serra Ranges.

glacialis—(F. v. M.). On the heaths; also on the summit of Mount William. Height 12-18 inches. Flowers white.

Styphelia serrulata—(Labill.).—On the heaths and lower ridges of the mountains.

Brachyloma daphnoides—(Benth.).—Sand and scrub-hills. Height $2\frac{1}{2}$-4 feet.

depressum—(Benth.).—On the rocky slopes of the ranges, especially Mount William.

ciliatum—(Benth).—Scrub-hills, sand-hills, heath-ground, and on the lower mountain slopes. Height 5-7 inches.

strigosa—(Smith).—Scrub-hills, not rare. Height 1-2 feet.

Epacris impressa—(Labill.).—From the heath-grounds to the summit of Mount William this charming plant abounds in all its varied shades of color. Several double-flowering varieties have lately been discovered. Height 3-6 feet.

obtusifolia—(Smith).—Swampy heath-ground at the base of Mount William. Height 9-15 inches. Flowers white.

Sprengelia incarnata—(Smith).—Mountain streams and heath-swamps, common about all the mountains. Height 4-6 feet. Flowers pink.

(V). Apetaleæ Gymnospermeæ.

(1). Coniferæ.

Callitris pyramidalis—(Ser.).—On the ridges of all the mountains from about an altitude of 1000 feet to 2000 feet. Height 9-15 feet.

II.—Monocotyledonous Plants.

(I). Calyceæ Perigynæ.

1. Orchideæ.
2. Irideæ.
3. Hydrocharideæ.
4. Amaryllideæ.

(1). Orchideæ.

Dipodium punctatum—(R. Br.).—Sand-hills, and among loose stones near base of Mount William. It also reaches to nearly the summit of that mount.

Gastrodia sesamoides—(R. Br.).—On heath-ground at the base of the mountains, rare.

Calochilus campestris—(R. Br.).—On scrub-hills near Mount William, not common.

Glossodia major—(R. Br.).—Very common on the heath-grounds generally.

Corysanthes pruinosa—(CUNN.).—Grassy slopes and wet flats near Mount William.

Thelymitra aristata—(LINDLEY).—Scrub-hills, sparsely scattered over the district.

longifolia—(FORST.).—Same as the last and following, but more abundant.

ixioides—(SW.).—On the base of the ranges.

antennifera—(J. HOOKER).—Gravelly and sandy soils, common.

flexuosa—(ENDLICHER).—Heathy ground, more up the Grampians.

Microtis porrifolia—(SPRENGEL).—Common.

nigrita—(LINDLEY).—Wet heath ground, by no means rare.

Diuris pedunculata—(R. BR.).—Very common.

maculata—(SMITH).—Scrub-land and heath-grounds, not rare.

longifolia—(R. BR.).—Scrub-lands, heath-grounds, and lower mountain ridges.

sulphurea—(R. BR.).—Very sparingly scattered over the heath-grounds.

punctata—(SMITH).—Grass-flats near Mount William, rare.

Pterostylis mutica—(R. BR.).—Common.

semirubra—(F. v. M.).—Rare on Mount William.

concinna—(R. BR.).—Fern-hills (Brake) near Mount William; also near the Wannon.

curta—(R. BR.).—Same localities as the last.

Mitchelli—(LINDLEY).—Rare about the base of the Grampians.

longifolia—(R. BR.)—In crevices of rocks at a height of 1000 feet on the Grampians, and among rubbish and loose stones in gullies of Mount William, not common.

barbata—(LINDLEY).—Very rare on scrub-land about Mount William.

acuminata—(R. BR.).—Rare on the lower ridges of Mount William.

Caleana major—(R. BR.).—Heath-ground about the mountains, not common.

Eriochilus autumnalis—(R. BR.).—Throughout the district up to the mountains.

Lyperanthus nigricans—(R. BR.).—Sand-hills; also about the mountains, common.

Cyrtostylis reniformis—(R. BR.).—Sandy scrub-land, not very common.

Caladenia Patersonii—(R. BR.).—Gravelly scrub land, pretty widely diffused. There are about 6 varieties differing in color and other minor particulars.

Oology of Australian Birds.

By A. J. Campbell.

[Read before the Field Naturalists' Club of Victoria 11th June, 1883.]

Part xii.—Order—SCANSORES.

Family—Cacatuidæ.

391. Cacatua galerita—(Great Sulphur-crested Cockatoo). *Locality*—Australia, Tasmania, and New Guinea. *Egg*—Pure white, oval, somewhat pointed at the smaller end. Length, 1 inch 7 lines; breadth, 1 inch 2½ lines.

392. Cacatua (*Lophochroa*) leadbeateri — (Leadbeater's Cockatoo). *Locality*—New South Wales, Victoria, South and West Australia. * *Egg*—Pure white, glossy, inclined to oval. Length, 1 inch 6 lines; breadth, 1 inch 1 line.

394. Cacatua (*Eolophus*) roseicapilla — (Rose - breasted Cockatoo). *Locality*—New South Wales, Victoria, North and South Australia. **Egg*—White, oval. Length, 1 inch 5 lines; breadth, 1 inch.

395. Licmetis tenuirostris (*nasicus*)—(Long-billed Cockatoo) *Locality*—New South Wales, Victoria, and South Australia. **Egg*—White, oval, some specimens rather pointed at each end. Length, 1 inch 5 lines; breadth, 1 inch ½ line.

399. Calyptorhynchus naso—(Western Black Cockatoo). *Locality*—West Australia. *Egg*—White. Length, 1 inch 8 lines; breadth, 1 inch 4 lines.

400. Calyptorhynchus leachii (*Solandri*)—Leach's Cockatoo). *Locality*—Australia, except West. * *Egg*—White, somewhat of a dumpy oval in form, and rounded alike at either end. Length, 1 inch 7 lines; breadth, 1 inch 3 lines.

401. Calyptorhynchus funereus — (Funereal Cockatoo). *Locality*—Australia, except North and West. *Egg*—White. Length, 1 inch 7½ lines; breadth, 1 inch 4½ lines.

402. Calyptorhynchus xanthonotus—(Yellow-eared Black Cockatoo). *Locality*—South Australia (?) and Tasmania. *Egg*—White. Shell of somewhat fine texture. Length, 1 inch 8 lines; breadth, 1 inch 4 lines.

403. Calyptorhynchus baudinii—(Baudin's Cockatoo). *Locality*—West Australia. *Egg*—White. Length, 1 inch 9 lines; breadth, 1 inch 4½ lines.

404. Microglossus aterrimum—(Great Palm Black Cockatoo). *Locality*—Cape York and New Guinea. *Egg*—White, pointed at the thin end, rounded at the thicker end. Length, 2 inches; breadth, 1 inch 4¾ lines. (Ramsay).

Eggs marked thus not described by Gould, or not previously described.

Family—PSITTACIDÆ.

406. POLYTELIS BARRABANDI — (Barraband's Parrakeet). *Locality*—New South Wales and Victoria. **Egg*—White, and not so round as Parrakeets' generally are, but more the shape of Cockatoos'. Length, 1 inch $2\frac{1}{4}$ lines; breadth, 11 lines.

409. APROSMICTUS SCAPULATUS (*cyanopygius*) — (King Lory). *Locality*—Queensland, New South Wales, and Victoria. * *Egg*—Round and white. Length, 1 inch 2 lines; breadth, 1 inch.

I expected to find this egg larger, but it is described from a thoroughly authenticated specimen received from Mr. C. W. De Vis, of the Queensland Museum.

410. PTISTES (*Aprosmictus*) ERYTHROPTERUS—(Red-winged Lory). *Locality*—Queensland. *Egg*—White. Length, 1 inch $1\frac{1}{2}$ lines; breadth, $10\frac{1}{2}$ lines.

415. PLATYCERCUS PENNANTII—(Pennant's Parrakeet). *Locality*—New South Wales, Victoria, and South Australia. *Egg*—White. Length, 1 inch 2 lines; breadth, $11\frac{1}{2}$ lines.

417. PLATYCERCUS FLAVIVENTRIS—(Yellow-bellied Parrakeet). *Locality*—Tasmania. *Egg*—Pure white. Length, 1 inch 2 lines; breadth, $11\frac{1}{2}$ lines.

419. PLATYCERCUS PALLIDICEPS—(Pale-headed Parrakeet). *Locality*—Queensland and New South Wales. **Egg*—Round oval, white. Length, 1 inch $\frac{3}{4}$ line; breadth, $10\frac{3}{4}$ lines.

422. PLATYCERCUS EXIMIUS—(Rose-bill Parrakeet). *Locality*—Australia, except North and West, and Tasmania. *Egg*—Beautiful white. Length, 1 inch $1\frac{1}{2}$ lines; breadth, 11 lines.

424. PLATYCERCUS ICTEROTIS—(Yellow-cheeked Parrakeet). *Locality*—South (?) and West Australia. *Egg*—White. Length, 11 lines; breadth, $9\frac{1}{2}$ lines.

425. PURPUREICEPHALUS PILEATUS (*spurius*)—(Red-capped Parrakeet). *Locality* — West Australia. *Egg* — Milk-white. Length, 1 inch $1\frac{1}{2}$ lines; breadth, $10\frac{1}{2}$ lines.

431. PSEPHOTUS HÆMATONOTUS—(Red-rumped Parrakeet). *Locality*—Australia, except North and West. *Egg*—White. Length, 11 lines; breadth, $8\frac{1}{2}$ lines.

The female of this graceful Parrakeet appears solely to perform the task of incubation. I have watched her mate feeding her in or near the nest-hole. He performs the operation, something after the manner of a common pigeon feeding its young, by connecting beaks and discharging at intervals the contents of his crop into her mouth, with spasmodic jerks, while she keeps up a continual or hissing noise.

432. EUPHEMA CHRYSOSTOMA (*venusta*)—(Blue-banded Grass-Parrakeet). *Locality*—New South Wales, Victoria, South

Australia, and Tasmania. * *Egg*—Round, white. Length, 10 lines ; breadth, 8¾ lines.

433. Euphema elegans—(Elegant Grass-Parrakeet). *Locality*—Australia, except North. *Egg*—Pure white. Length, 10 lines ; breadth, 8½ lines.

434. Euphema aurantia (*chrysogaster*)—(Orange-bellied Grass-Parrakeet). *Locality*—New South Wales, Victoria, South Australia, and Tasmania. **Egg*—White ; texture of shell very fine. Length, 10¾ lines ; breadth, 9 lines.

436. Euphema pulchella—(Chestnut-shouldered Grass-Parrakeet). *Locality*—Australia, except North and West. ** *Egg*—White. Length, 11 lines ; breadth, 9 lines.

438. Euphema bourkii—(Bourke's Grass-Parrakeet). *Locality*—New South Wales, Victoria, and South Australia. *Egg*—Roundish, and similar to the foregoing species. In common with the other members of the same genus, the male assists in the task of incubation.

439. Melopsittacus undulatus—(Warbling Grass-Parrakeet). *Locality*—New South Wales, Victoria, South and West Australia. *Egg*—Pure white. Length, 8½ lines; breadth, 6¾ lines.

440. Calopsittacus novæ-hollandiæ—(Cockatoo-Parrakeet). *Locality*—Australia. *Egg*—Chalky white. Length, 12 lines; breadth, 9 lines.

443. Lathamus (*Nanodes*) discolor—(Swift Lorikeet). *Locality*—Australia, except North and West, and Tasmania. * *Egg*—White. Length, 11½ lines ; breadth, 10 lines.

444. Trichoglossus multicolor (*Novæ-Hollandiæ*)—(Blue-bellied Lorikeet). *Locality*—Australia and Tasmania. —*Egg*—Roundish-oval, white. Length, 13½ lines ; breadth, 10½ lines.

448. Glossopsitta australis (*concinnus*)—(Musk-Lorikeet). *Locality*—Australia, except West and Tasmania. *Egg*—Dirty white, round in form, and somewhat coarse shell. Length, 11¾ lines ; breadth, 9 lines. (Gould, 1 x ⅞ inches.)

450. Glossopsitta pusilla—(Little Lorikeet). *Locality*—Australia, except West, and Tasmania. *Egg*—Round-oval, white. Length, 9¼ lines ; breadth, 7¼ lines.

ORDER IV—COLUMBÆ.

Family—Columbidæ.

453. Lamprotreron superbus—(Superb Fruit Pigeon). *Locality*—North Australia and New Guinea. *Egg*—White-oval, slightly swollen in the centre. Length, 1 inch $2\frac{1}{2}$ lines; breadth, $10\frac{1}{2}$ lines. (Ramsay).

461. Leucosarcia picata—(Wonga-Wonga Pigeon). *Locality*—Queensland, New South Wales, and Victoria. * *Egg*—Pure white, oval, and of the usual glossy appearance. Length, 1 inch 6 lines; breadth, 1 inch 1 line.

462. Phaps chalcoptera—(Common Bronze-wing). *Locality*—Australia and Tasmania. *Egg*—White. Length, 1 inch $4\frac{1}{2}$ lines; breadth, 1 inch.

I have seen the Bronze-wing breeding in Victoria in July. Sometimes when they possess young they will endeavor to allure you by fluttering on the ground just out of reach, feigning a broken leg or wing, and continue doing so until they have drawn you a considerable distance from the nest.

463. Phaps elegans—(Brush Bronze-wing). *Locality*—Australia and Tasmania. *Egg*—White. Length, 1 inch 3 lines; breadth, 11 lines.

465. Geophaps scripta—(Partridge Bronze-wing). *Locality*—Australia, except North and West. * *Egg*—Glossy-white, with a faint greenish tinge. Length, 1 inch $2\frac{3}{4}$ lines; breadth, $10\frac{1}{2}$ lines.

466. Geophaps smithii—(Smith's Partridge Bronze-wing). *Locality*—North Australia. *Egg*—Greenish white. Length, 1 inch 3 lines; breadth, $10\frac{1}{2}$ lines.

469. Ocyphaps lophotes—(Crested Bronze-wing). *Locality*—New South Wales, Victoria, North and South Australia. *Egg*—White. Length, 1 inch 4 lines; breadth, 1 inch.

471. Erythrauchena humeralis—(Barred-shouldered Dove). *Locality*—North Australia, Queensland, New South Wales, and New Guinea. * *Egg*—Oval, delicate white. Length, 11 lines; breadth, 8 lines.

472. Geopelia tranquilla—(Peaceful Dove). *Locality*—Australia, except West. * *Egg*—Oval, white. Length, $9\frac{1}{2}$ lines; breadth, 7 lines.

474. Stictopelia cuneata—(Little Turtle-Dove). *Locality*—New South Wales, Victoria, South and West Australia. *Egg*—White. Length, $8\frac{1}{2}$ lines; breadth, $5\frac{1}{2}$ lines.

ORDER V—GALLINÆ.

Family—MEGAPODIDÆ.

476. TALEGULLUS LATHAMI—(Wattle Talegullus). *Locality*—Queensland and New South Wales. *Egg*—Perfectly white, long oval form, very thin fragile shell. Length, 3⅝ inches; breadth, 2⅜ inches.

477. LEIPOA OCELLATA—(Ocellated Leipoa). *Locality*—New South Wales, Victoria, South and West Australia. *Egg*—Light pink, the color being brightest and most uniform when freshly laid. Shell, very thin and brittle. Length, 3⅝ inches; breadth, 2⅜ inches.

478. MEGAPODIUS TUMULUS—(Australian Megapode). *Locality*—North Australia. *Egg*—Color reddish brown, sometimes dirty yellowish white: the true shell is white, but the coloring is influenced by the composition of the mound in which it is found. Length, 3¼ inches; breadth, 2⅛ inches.

Family—TURNICIDÆ.

479. TURNIX MELANOGASTER—(Black-breasted Turnix). *Locality*—Queensland. * *Egg*—Whitish ground color, finely and thickly speckled all over with light brown; over this is sparingly distributed large heavy well-defined blotches of dark brown and dark indigo or black, a few bluish-grey blotches also appearing as if under the surface of the shell. Length, 1 inch 1 line; breadth, 10½ lines.

480. TURNIX VARIUS—(Varied Turnix). *Locality*—Australia and Tasmania. *Egg*—Pale buff, very minutely and thickly spotted and freckled with reddish brown, chestnut, and purplish grey. Length, 1 inch 2 lines; breadth, 11 lines.

483. TURNIX VELOX—(Swift-flying Turnix). *Locality*—Australia, except North. *Egg*—Dirty white, very thickly blotched all over with markings of chestnut: specimens from West Australia are much lighter in color and chestnut blotchings more minute. Length, 11½ lines; breadth, 9 lines.

485. PEDIONOMUS TORQUATUS—(Collared Plain-Wanderer). *Locality*—New South Wales, Victoria, and South Australia. *Egg*—Shape, pyriform. Some, in suddenly contracting towards the smaller end, have a lengthened point or neck, which gives them quite a pear-like shape. Ground color yellowish-white, speckled and blotched all over, particularly at the larger end, with olive, umber, and grey markings, the last color appearing as if under the surface of the shell. When the shells are empty and rubbed against each other, a peculiar sound is produced,

like that caused by the grating of fractured pieces of fine china-ware. Average dimensions of a clutch of three,—length, 1 inch 4 lines ; breadth, 1 inch.

Family—PERDICIDÆ.

486. COTURNIX PECTORALIS—(Pectoral Quail). *Locality*—Australia and Tasmania. *Egg*—Much variation exists in the coloring, some being largely blotched all over with brown on a straw-white ground, while from this to a finely-spotted marking every variety occurs. Length, 1 inch 3 lines ; breadth, 11½ lines.

487. SYNOICUS AUSTRALIS—(Swamp-Quail). *Locality*—Australia and Tasmania. *Egg*—Sometimes uniform bluish white, but more frequently minutely freckled all over with buff. Length, 1 inch 2½ lines ; breadth, 11½ lines.

488. SYNOICUS DIEMENENSIS—(Tasmanian Swamp-Quail). *Locality*—Victoria and Tasmania. * *Egg*—More greenish than that of *S. Australis*, and is thickly sprinkled all over with minute spots of brown. Length, 1 inch 3¼ lines ; breadth, 1 inch 1 line.

490. SYNOICUS CERVINUS—(Northern Swamp-Quail). *Locality*—North Australia. *Egg*—Cream-white, without markings of any kind. Length, 1 inch ¾ lines ; breadth, 10½ lines.

491. EXCALFATORIA AUSTRALIS—(Least Swamp-Quail). *Locality*—Australia, except North and West. * *Egg*—Dirty yellow or straw-colored, completely speckled and marked all over with small gummy shiny-looking spots of brown ; character of shell, thick. Length, 11½ lines ; breadth, 9 lines.

ORDER VI—STRUTHIONES.

Family—STRUTHIONIDÆ.

492. DROMAIUS NOVÆ-HOLLANDIÆ—(Emu). *Locality*—Australia, except West. *Egg*—Beautiful dark green, resembling shagreen in appearance. Length, 5½ inches ; breadth, 3¾ inches.

Six or seven eggs are placed in a cavity scooped in the ground. The task of incubating them, which occurs in July or August, devolves upon the male.

ORDER VII—GRALLÆ.

Family—OTIDIDÆ.

495. CHORIOTIS AUSTRALIS—(Australian Bustard). *Locality*—Australia. *Egg*—Olive-color, stained with longitudinal dashes of brown. The clutch of two eggs is usually deposited on the bare ground. Length, $3\frac{1}{8}$ inches; breadth, $2\frac{1}{4}$ inches.

Family—CHARADRIADÆ.

496. ŒDICNEMUS (*Burhinus*) GRALLARIUS—(Southern Stone Plover). *Locality*—Australia, except West. *Egg*—Varies considerably in color as well as in form of markings; the usual ground-color is pale buff, thickly blotched all over with umber-brown. Length, 2 inches 3 lines; breadth, 1 inch $7\frac{1}{2}$ lines.

498. HÆMATOPUS LONGIROSTRIS—(White-breasted Oyster-catcher). *Locality*—Australia, Tasmania, and New Guinea. *Egg*—Buff stone color, marked all over with irregular blotches of dark chestnut brown, approaching to black. Length, 2 inches 3 lines; breadth, 1 inch $7\frac{1}{2}$ lines.

499. HÆMATOPUS (*Melanibyx*) FULIGINOSUS—(Sooty Oyster-catcher). *Locality*—Australia and Tasmania. *Egg*—Similar to *H. longirostris*, of a light stone color, blotched all over with large irregular markings of dark brown, some of which appear as if beneath the surface, and of a purplish hue. Length, 2 inches 8 lines; breadth, 1 inch 9 lines.

500. LOBIVANELLUS LOBATUS—(Wattled Plover). *Locality*—Australia, except North and West, and Tasmania. * *Egg*—Elegantly shaped, contracted towards the smaller end, ground color of a rich warmish green, boldly splashed and blotched all over with markings of a darker shade and olive. Length, 2 inches; breadth, 1 inch 5 lines.

501. LOBIVANELLUS PERSONATUS—(Masked Plover). *Locality*—North Australia and New Guinea. *Egg*—Dull olive yellow, dashed all over with spots and markings of blackish brown and dark olive brown, particularly at the larger end, in shape somewhat pointed at the smaller end. Length, 1 inch $7\frac{1}{2}$ lines; breadth, 1 inch $2\frac{1}{4}$ lines.

502. SARCIOPHORUS PECTORALIS—(Black-breasted Plover). *Locality*—Australia, except North and West, and Tasmania. *Egg*—Ground color light olive grey, very thickly blotched and stained with brown, so as nearly to cover the surface, particularly at the larger end. Length, 1 inch 9 lines; breadth, 1 inch 3 lines.

503. Squatarola helvetica—(Grey Plover). *Locality*—Australia and Tasmania. *Egg*—Greyish or yellowish stone color, blotched and clouded boldly on the larger half, and chiefly round the end, with irregular-edged blotches of blackish sepia, running mostly in a longitudinal direction; the markings are smaller near the minor end, and beneath the dark coloring are smears and traces of bluish grey. In shape some eggs are rather pointed, and others slightly rounded at the small end. Average length, 2 inches ¾ line; breadth, 1 inch 5 lines. (Legge).

Until about three years ago the breeding haunts of the Grey Plover remained undiscovered. In a letter from Mr. Ernest Gibson, of Buenos Ayres (who, by the way, is performing work of lasting interest in working up notes of the birds of his adopted country), informs me that an intimate friend of his—Mr. Harvie-Brown, together with Mr. Seebohm, were the first to take eggs of the Grey Plover on the shores of the Arctic Ocean at the mouth of the Petchora River.

505. Eudromais australis—(Australian Dottrel). *Locality*—New South Wales, Victoria, and South Australia. *Egg*—In form rather less pointed than the usual pyriform shape of Plovers' eggs; the ground color is of a deep rich cream or buff, sparingly sprinkled all over with irregular spots and some elongated crooked markings of chocolate black, with a few minute dots and dashes of a lighter kind; the markings look black in certain lights, but of a chocolate tint in others. Length, 1 inch 5½ lines; breadth, 1 inch. (Ramsay).

507. Ægialites hiaticula—(Ring Dottrel). *Locality*—New South Wales (occasional) and New Guinea. * *Egg*—(From Europe)—Somewhat pyriform, apex very round and smaller end sharply contracted; ground color dirty white or stone grey, spotted and blotched with round markings of dark brown, black, and dull grey, the last appearing as if under the shell's surface; the markings are rather sparingly distributed, but thicken towards the apex. Length, 1 inch 4 lines; breadth, 1 inch.

508. Ægialites monacha—(Hooded Dottrel). *Locality*—Australia, except North and Tasmania. *Egg*—Pale stone color, sprinkled all over with numerous small irregularly-shaped marks of brownish black. Length, 1 inch 4½ lines; breadth, 1 inch ½ line.

509. Ægialites nigrifrons—(Black-fronted Dottrel). *Locality*—Australia, except North and West. *Egg*—In form resembles the eggs of other Dottrels, being considerably pointed at the smaller end, of a pale stone or dirty yellowish buff color, very numerously but minutely speckled with dark brown. Length, 1 inch 2 lines; breadth, 10 lines.

510. Ægialophilus ruficapillus—(Red-capped Dottrel). *Locality*—Australia, Tasmania, and New Guinea. *Egg*—Pale

stone color, sprinkled all over with irregular blotches of brownish black. Length, 1 inch 3 lines; breadth, 11 lines.

513. ERYTHROGONYS CINCTUS—(Red-kneed Dottrel). *Lo-*
white, which is nearly obscured by the numerous streaks,
cality—Australia, except West. *Egg*—Ground color yellowish
blotches, and patches of very dark olive brown, approaching black, which are marbled promiscuously over the whole of the surface. Length, 1 inch 2 lines; breadth, 10½ lines.

514. ACTITURUS (*Bartramia*) BARTRAMIUS—(Bartram's Sandpiper). *Locality*—New South Wales (accidental). *Egg*—(From Europe)—Not unlike in color and markings that of the Common Sandpiper (*Actitis*), but of course proportionally larger, also being pyriform, but more obtuse at the smaller end; ground color warm stone grey with a pinkish tinge, sprinkled all over, but more particularly on the apex, with spots and small blotches of brown and reddish brown, and some obscured markings appear as if under the surface of the shell. Length, 1 inch 9 lines; breadth, 1 inch 3 lines.

PROCEEDINGS OF SOCIETIES.

THE FIELD NATURALISTS CLUB OF VICTORIA.

The August monthly meeting of the Field Naturalists' Club of Victoria was held in the Royal Society's Hall, on Monday evening, the 18th ultimo, there being a large attendance, and Mr. T. A. F. Leith, one of the Vice-Presidents, presided. The following gentlemen were elected to membership:—Messrs. H. S. Turner, F. S. B. Skinner, J. C. Nicholson, W. M. Wischer, and C. Schafer.

Papers were promised for next meeting by Mr. F. Tisdall, on "Botanical Excursions in North Gippsland;" by Mr. C. French, on "The Orchids of Victoria;" by Mr. T. Harrison, "Life on an Old Pile" (Zoological subject); and by Mr. A. H. S Lucas, on "The position of Sponges in the Animal Kingdom. The papers read last night comprised one on "A trip to Macedon in search of Freshwater Algæ," by Mr. H. Watts, who described the several species collected by him, the two rarest being Oscillaria, and Gomphonema; and one on the genus Pecten, by Mr. J. H. Gatliff, who gave some very interesting particulars relative to their habits, notably their powers of motion. Mr. Gatliff also stated that about 180 existing species are known and named, these being usually found in from 3 to 40 fathoms of water, while of fossil fully 450 are known. Mr. A. J. Campbell read the concluding portion of his papers on "The Oology of Australian

Birds." A large number of eggs were described by him, some of them being rare, such as those of Leadbeater's, the long-billed, and Leache's Cockatoos, and several Parrakeets, bronze-winged Partridges, &c. Mr. F. Harrison, who has on several occasions contributed papers on the Habits and Instinct of Ants, read one "On Bees and Spiders," detailing the results of his observations, and expressing his opinion strongly as to the possession of intelligence by the latter.

In the general exhibition of specimens there was a fine case of Pectens, comprising 35 recent and three fossil species, some of them being of beautiful colors, shown by Mr. J. Gatliff. Mr. J. F. Bailey exhibited fossils from the Swanston-street and St. Kilda road Cuttings, and Cetotolites from the Miocene shale at Cheltenham. Mr. J. E. Dixon also showed fossils from Cheltenham, and the aboriginal stone tomahawks recently found near Melbourne. Mr. F. Spry showed Lepidoptera; Mr. J. W. Robinson, chrysalids of the beautiful butterfly *Pieris aganippe*; Mr. T. A. F. Leith, various birds; and Mr. C. French, exotic Longicorn and Curculio beetles.

During the evening a letter was read from the Royal Society, inviting the co-operation of the Club at its conversazione to be held on 14th September.

THE ROYAL SOCIETY OF VICTORIA.

The ordinary monthly meeting of the Royal Society of Victoria was held in their hall last night, the president (Mr. R. L. J. Ellery) occupying the chair.

Messrs. R. E. Fletcher and G. Smibert were elected associates of the Society.

The President stated that a number of students of engineering in the Melbourne University were desirous of joining the Society as associates, with the object of resuscitating the engineering section of the Society. It was considered advisable to elect them at once, and dispense with the usual nomination, but to enable that to be done the standing orders must be suspended.

The standing orders were then suspended, and on the motion of Professor Kernot 22 students of the University, whose names he submitted, were elected associates.

Mr. C. R. Blackett read a paper on Shone's new sewage scheme. In it he stated that he considered Mr. Shone had invented a scientific system of sewerage and drainage which would be effective, and at the same time utilise all the valuable ingredients of sewage. The agent-general, Mr. Murray Smith, had, at the request of the Central Board of Health, forwarded all the pamphlets necessary to explain the system, and had expressed a high opinion of it. The automatic appliances of the system had been worked satisfactorily in many places, and the system had passed the experimental stage. It was in full operation at Eastbourne, and had received the highest commendation from engineers and authorities. The death-rate in Eastbourne since its adoption had fallen to 13 per 1,000, which was very low indeed in comparison with the rest of England and this colony. The constant prevalence of typhoid and other fevers in Melbourne was a clear intimation that sanitary laws were neglected here. It was now generally admitted that no system of sewage disposal could be considered worthy of adoption which did not provide for—1. A perfect separation of sewage from storm water and drainage. 2. That all sewage should be so arranged that all matters carried away in it should be allowed to remain impounded and become decomposed. 3. The collection or distribution of the sewage matter; so preventing the pollution of streams and harbours, and utilising waste products for manurial purposes. Shone's system was contemplated to do those things. Under it a town was divided into districts, the sewers and pipes in each district being laid at a good gradient to promote the rapid flow of the sewage. Each district drained into its Shone ejectors, placed below the levels of the lowest sewer in the district. In some convenient position there were erected engines, air compressors, and compressed air receivers, and from those receivers the compressed air was conducted in pipes to the various ejector stations. The ejectors, which were made of various sizes according to requirements, received the sewage, and when full an automatic arrangement came into play—admitting the compressed air, which closed the inlet sewage valve, whilst opening the exit valve—and drove the sewage out of the ejector to any required elevation. The ejectors worked automatically, and could be placed under a public road or wherever required. A great advantage connected with them consisted in the means for ejecting the sewage not being brought into play until the ejector was full, so that there was no waste of the compressed air in discharging a small quantity of sewage only. The ejectors at Eastbourne consisted of iron cylinders, each 4ft. 6in. in internal diameter, and having each a discharging capacity of 500gal. per stroke, the guaranteed maximum discharge from the three ejectors in the town being equal to 1,500gal. per minute. Here Mr. Blackett described the system by means of a diagram, and stated that, as Mr. Murray Smith had said, it was very suitable for a city like Melbourne, there was no doubt whatever that Melbourne would never be perfectly drained until it had a system of underground drainage. It was a city with bad gradients for drainage purposes in the low-lying parts, and therefore the system of Mr. Shone could be applied to it with great advantage. By that system all difficulties with respect to drainage and sewerage could be easily surmounted, and the evils which at present were so oppressive could be removed, the valuable but disagreeable waste products of the organisms removed unseen before decomposition, and the thoroughfares and habitations relieved of the indescribable odours which were often the carriers of disease and death. Instead of little rivulets of diluted sewage in the streets of Melbourne, hurrying their way to the river and bay, there would be clean and wholesome thoroughfares. Shone's system, he understood, was now being adopted at Brighton in England. It was previously believed they had adopted a perfect system of drainage at Brighton, but it was now considered necessary to supplement it by Shone's system. He (Mr. Blackett) stated that he had four pamphlets respecting the system, which had been sent out, and he would lend them to the members of the Society who took an interest in the subject. The system had been in operation two years at Eastbourne, and the Duke of Devonshire gave £40,000 towards the expense of applying it to Eastbourne.

The discussion on the paper was adjourned until a future meeting.

Mr. Cosmo Newbery read a paper entitled "Notes on Ore-dressing." He stated that during the past five years numerous tin-bearing lodes had been discovered in this and the other Australasian colonies. Mines had been opened and expensive machinery erected, but the results in many instances had been disappointing to the investors. A great many samples of the ores had been passed through his hands for assay and report, and he had come to the conclusion that in part, at any rate, the disappointment had been due to the want of proper consideration of the question of how best to extract the ore from the gangue, or associated mineral matter. That was especially the case where the gangue was a hard quartzose or granitic rock. According to general custom, these ores were reduced to fine sand in an ordinary stamping battery, such as was used to reduce our Victorian auriferous ores. The latter, of course, required to be crushed very fine, so that the small particles of gold might be beaten out and separated from the quartz; but in the case of the tin ores the fine crushing reduced the brittle tin stone to a slime, while the hard tough rock with which it was associated was being converted into sand. With that result the separation of the tin ore became a matter of very great difficulty, the cardinal principle of tin ore-dressing—that the ore should not be broken finer than was absolutely necessary to separate the rich mineral from the gangue or accompanying rock—having been forgotten. He referred to the general principles of tin ore dressing, and then said the treatment he proposed for the hard ores he had referred to was—1. Calcination in heaps or kilns; 2, crushing in an ore-breaker or stone-breaker; 3, disintegration; 4, classification of disintegrated ore by a series of sieves; 5, concentration of the classified ore. He described the results of an experiment of the process he proposed, which was carried out with respect to half-a-ton of Tasmanian ore. The half-ton of stone was calcined without previous breaking in a kiln belonging to the Victorian Patent Freestone Company, and was found to be rendered very friable,—even the finest ores could be easily separated from the quartz and other minerals. The ore was then passed through one of Hope's stone-breaking machines, the time occupied being about five minutes. The result was 56 per cent. of coarse roughly-broken ore, and 44 per cent. in sizes of from $\frac{1}{4}$ to 1-60th of an inch. The 44 per cent. gave 12·98 per cent. of clean tin, which, on assay, returned 69 per cent. of pure tin. The whole of the ore, however, was sent to the disintegrators, and the final result was 10·98 per cent. of pure tin. The average assay of the ore was 11 per cent., so that the total return of 10·98 per cent. of tin showed the separation to have been almost perfect. The process was not suited to clayey ores or ores associated with hydrous minerals, such as brown iron ore. He (Mr. Newbery), however, had no doubt that with quartzose or granitic ores it would be found to return more and better dressed ore than could be obtained by the ordinary crushing and dressing plants, and also a higher yield of metal.

The discussion on the paper was adjourned until the next meeting.

Mr. M'Gillivray read a paper on "Polyzoa," in continuation of others which he had previously contributed to the Society. The information contained in the paper had been gathered by personal observations from dredgings made principally at Queenscliff. He described several new species of Retopora, and gave a list of the Victorian species. A large number of interesting specimens were exhibited by him in lithographic illustrations and under the microscope.

The President exhibited a new apparatus for the determination of absolute personal equation, which had been made at the Melbourne Observatory from a design of his own. He said it had been found by long experience that in observing phenomena where exact time was specially required, no observers gave the same time for the occurrence. In observing, for instance, the transit of a star across the wires of an astronomical telescope, some observers made the time of occurrence to be earlier or later than others did. To correct that error the usual plan had been to get a mean result from a number of observers, and then from that mean to correct the observations generally. The difference between the mean observer and the individual was called personal equation. The instrument he now exhibited was really an apparatus to record automatically by the electric current the exact instant at which an artificial star crossed the wires of a small telescope It automatically recorded the time absolutely, and at the same time the observer who used it, by means of a telegraphic key, also recorded the instant at which he observed the artificial star cross the telescope. The difference between the record of the instrument and of the observer furnished any observer with the personal equation. The instrument he now exhibited was principally valuable for determining longitude and matters of that kind.

The meeting then adjourned.

THE

Southern Science Record

AND

MAGAZNE OF NATURAL HISTORY

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PRICE--ONE SHILLING.

COLLINGWOOD:
J. WING, 33 W ELLINGON SREE.
1883.

THE PECTEN.

BY J H. GATLIFF.

[Read before the Field Naturalists' Club of Victoria 10th August, 1883.]

The Pecten, or, as it is commonly called, the Scallop, is a marine bivalve belonging to the family Ostreidæ: it derives its name Pecten—(Latin for a comb)—from the supposed resemblance of the spines upon it to a comb; it has the advantage over its near relation the Oyster in being not only a beautiful shell, but also more esteemed by gastronomists for the table, as it is considered a great delicacy.

Generally the shell is of a circular form, and at the top of each valve are two projections named auricles, or ears, the front ones being the largest: from a groove named the byssal sinus formed at the junction of these two the byssus of the animal finds its way, and *Pecten niveus* moors itself by this to the fronds of the tangle. The hinge has no teeth, and is united by a narrow ligament; the cartilage is internal and very strong, and is inserted in a pit. The valves are not pearly on the inside, and on the outside are usually covered with radiating ribs in the commonest species found on the coasts of Victoria (*P. Australis*): these ribs are very numerous, there being as many as twenty-four or twenty-five, and each main rib has smaller ones beside it. Both valves are convex, the shell when at rest lying on the right one. In the subgenus Vola (Klein) the left valve is almost flat, our other common species (*P. luticostatus*) is an example. In subgenus Pleuronectiæ the valves are convex, without ribs and almost exactly circular; they do not shut closely, have very small ears, and the right valve is colorless. In sub-genus Dentipecten (Ruppell) the valves are deep and dentated at the edge. The impression of the adductor muscle is often imperceptible; sometimes it may be plainly observed on both valves near the centre of the shell.

The Pectens are very variable in color, even in the same species; they have been called by Cuvier "the butterflies of the ocean," and are deserving of the name as the colors are often so brilliant and vivid and the markings are so varied. Woodward thus describes the animal:—

> "Animal with the mantle quite open, its margins double, the inner pendent like a curtain finely fringed; at its base a row of conspicuous round black eyes (ocelli) surrounded by tentacular filaments: gills exceedingly delicate, crescent-shaped, quite disconnected posteriorly, having separate excurrent canals; lips foliaceous; palpi truncated, plain outside, striated within; foot finger-like, grooved; byssiferous in the young."

Respecting these eyes, it is uncertain whether they are organs of sight, and it seems strange, if they are, that an animal without head or brain should have so many of them. It is hermaphrodite the sexes being mixed.

The Pectens can swim about rapidly by opening and shutting their valves. Goldsmith writes:—

"When the animal finds itself deserted by the tide, it makes very remarkable efforts to regain the water, moving towards the sea in a most singular manner. It first gapes with its shell as widely as it can, the edges being often an inch asunder; then it shuts them with a jerk, and by this means the whole animal rises five or six inches from the ground. It thus tumbles anyhow forward, and then renews the operation until it has obtained its journey's end."

If this is correct it is certainly a sagacious and clever bivalve. Say, the eminent American naturalist, remarks:—

"Mr. Lesson immersed a basket of Pectens in the water of the sea within about six inches of its brim; the individuals that formed the superior layer, constrained in their movements by those that were beneath, after many fruitless efforts, succeeded in leaping from their prison; in this way all the contents of the basket disappeared within fifteen minutes."

Many of the English nobility bear the Scallop-shell on their coats-of-arms, and it often denotes that their ancestors had been pilgrims to the Holy Shrine or elsewhere.

Pecten Jacobæus, or St. James Shell, was used as a badge by pslgrims to the Shrine of St. James of Compostella, and some of the Popes granted the Archbishop of Compostella a faculty to excommunicate all who sold these shells elsewhere than in the City of Compostella.

The practice of wearing the Pecten shell as a badge of pilgrimage is, strange to say, also adopted by the Japanese, as Sir Rutherford Alcock mentions their use on the sleeves of many of the Japanese pilgrims to the Cone of Fusiyama.

The hollow valve of *P. maximus* was used in olden times as a drinking-cup.

There are about 180 known and named recent species, and they are found in water ranging from 3 to 40 fathoms in depth; their distribution is world-wide. There are about 450 fossil species, some of them so beautifully preserved as to retain traces of their color and marking.

On the shores of Victoria three species are found—*Pecten bifrons* (Lamark). Vol. 7, p. 131.

"A depressed oblique shell, variable in form, it has a few radiating main plaits upon the valves, which are thickly lined with fine radiating riblets. The surface is finely shagreened in a reticulate manner, and the insides of the valves are deeply saturated with violet purple; the ribs vary very much; sometimes they are few and like flattened keels.

Pecten Australis (Sowerby). Thes: con. I, p. 76.
,, *asperrimus* (Lamark). Vol. 7, p. 145.
,, *rubra*, &c., &c.

Shell orbicular, sometimes rather ventricose, scarcely equilateral, equivalve, valves ranged with twenty-four ribs which are peculiarly three-divided and densely finely serrated, blackish violet, or orange rose, unspotted, ears unequal. (Reeve).

Pecten (Vola) *fumatus*. Lin. Syst. Nat. p. 1144.
„ „ *laticostatus* (Gray) Dieff. N.Z.; p. 160.
„ „ *Novæ Zealandiæ* (Reeve). Con: I con., f 36.

Thick, with 14 to 18 smooth radiating ribs, the larger ones sometimes depressed with one or two interrupted longitudinal grooves; flat valve with the ribs distant and narrower; reddish brown to purplish white, interior white or brownish. (Hutton).

The paper was illustrated by the exhibition of 35 species, comprising 89 specimens.

Oology of Australian Birds.

By A. J. Campbell.

[Read before the Field Naturalists' Club of Victoria 11th June, 1883.]

Part xiii.—Order—GRALLÆ (*continued*)

Family—Glareolidæ.—Prantincoles.

515. Glareola grallaria—(Australian Prantincole). *Locality*—North Australia and New South Wales. * *Egg*—At first sight not unlike that of *Ægialites nigrifrons* (Black-fronted Dottrel), with the exception of being proportionally larger and not so pyriform in shape; ground color of a yellowish buffy-stone, lightly speckled and streaked all over with a light shade of umber and faint greyish markings. Length, 1 inch 3 lines; breadth, 11 lines. This rare inland bird's egg was taken in the Darling District, and kindly lent by Mr. H. H. Peck.

516. Glareola orientalis—(Oriental Pratincole). *Locality*—North Australia (occasional). * *Egg*—Assimilates in shape to that of the foregoing, inclined to oval, and a little swollen about the bilge. Ground color where visible yellowish buff, thickly marbled and blotched all over with olive, form a light shade to almost black, and intermingled with a few greyish markings. Length, 1 inch 3 lines; breadth, 11½ lines.

Family—Himantopodidæ.—Stilts.

517. Himantopus leucocephalus—(White-headed Stilt). *Locality*—Australia and Tasmania. *Egg*—Pyriform, pale yellow brown, spotted and blotched with umber and black, the black spots running together and forming large patches on the thick end. Length, 1 inch 6 lines; breadth, 1 inch 1½ lines. (Ramsay).

518. Cladorhynchus pectoralis—(Banded Stilt). *Locality*—New South Wales, Victoria, South and West Australia,

and Tasmania. * *Egg*—Yellowish olive ground color, heavily blotched and spotted, especially on the apex, with dark brown and black. Length, 1 inch 9 lines; breadth, 1 inch 3 lines.

Family—Recurvirostridæ.—Avocets.

519. Recurvirostra rubricollis—(Red-necked Avocet). *Locality*—Australia and Tasmania. *Egg*—The ground color varies from light stone color to creamy yellow, some of the former tints have a faint olive green shade, some are heavily blotched towards the thicker end, others sparingly covered with spots, dots, and freckles of dark umber brown and black, with a few absolute spots of slate grey. Length, 1 inch $4\frac{3}{4}$ lines; breadth, nearly 1 inch. (Ramsay).

Family—Tringidæ.—Sandpipers, &c.

523. Ancylochilus subarquatus—(Curlew Sandpiper). *Locality*—Australia, Tasmania, and New Guinea. ** *Egg*—Somewhat pyriform in shape; ground color of a dull yellowish olive or buff stone, fairly marked all over with round well defined spots of umber of different shades varying from very light to very dark. Length, 1 inch $2\frac{1}{2}$ lines; breadth, 11 lines.

527. Terekia cinerea—(Terek Sandpiper). *Locality*—Queensland and New South Wales. * *Egg*—Pear-shaped; ground color of a stony grey with a perceptible greenish tinge, blotched, spotted, and streaked all over with rich umber or reddish brown, some lighter markings appearing under the surface of the shell. The egg is not unlike that of the Marsh Sandpiper, only the markings are more numerous and smaller. Length, 1 inch $5\frac{3}{4}$ lines; breadth, $12\frac{1}{2}$ lines.

528. Actitis hypoleucos—(Common Sandpiper). *Locality*—Australia and New Guinea. * *Egg*—Ground color warm stony grey or creamy color, sparingly marked, but closer about the apex, with roundish spots and blotches of umber, reddish brown, and obscure grey, the last color appearing under the surface of the shell. Length, 1 inch $5\frac{1}{4}$ lines; breadth, $12\frac{1}{2}$ lines.

529. Glottis glottoides—(Greenshank). *Locality*—Australia. * *Egg*—Pear-shaped, apex rounded, the smaller end nipping sharply off. Rich buff stone color, mediumly daubed and blotched with rich umber and reddish brown; the usual number of purplish grey markings appear under the shell's surface. In other specimens the ground color has a faint greenish tinge, with the markings less numerous and more speckled in form. Length, 2 inches; breadth, 1 inch 4 lines.

530. Totanus stagnatilis—(Marsh Sandpiper). *Locality*—Queensland, New South Wales, and New Guinea. * *Egg*—Pear-shaped, of a rich buffy stone color, mediumly daubed and

blotched all over with rich umber or reddish brown and dull grey; the last color appears under the shell's surface. Length, 1 inch 6 lines; breadth, 12½ lines.

532. STREPSILAS INTERPRES—(Turnstone). *Locality*—Australia, Tasmania, and New Guinea. * *Egg*—Large for the size of the bird, pear-shaped. Ground color of a pale olive or warmish green, daubed and smudged with large and small patches of umber; the larger markings are about the thicker end, where some have the appearance of having been wiped on obliquely with a brush. Altogether this interesting egg presents a singular appearance. Length, 1 inch 7 lines; breadth, 1 inch 1½ lines.

Family—SCOLOPACIDÆ.—Snipe.

533. GALLINAGO AUSTRALIS—(New Holland Snipe). *Locality*—Australia and Tasmania. * *Egg*—This very interesting species, in shape and ground color, is not unlike a miniature Oyster-catcher's, only more heavily blotched. Ground color is of a light yellowish buff or stone, heavily marked all over with large well-defined patches of very dark olive, approaching Chinese ink color; these patches, some of which cover the area of half a three-penny bit, assume fanciful figures, and are conjoined with other smaller and streaky markings. Where the ground color is visible, a few light greyish markings appear as if under the shell's surface. Length, 1 inch 4½ lines; breadth, 1 inch 1 line.

The following is a letter of mine that appeared in *The Australasian*, 6th Oct., 1883, which may be considered *apropos* to my subject:—

"An excellent and most interesting article, by 'Groundbait,' appeared in your columns on the 8th ult. But some portions of it were misleading, and behind the ornithological and oological knowledge of the present day as regards the Australian Snipe (*Gallinago Australis*).

"In reference to the migration. It has been proved beyond all doubt that Snipe migrate from the interior of the continent and arrive simultaneously in Tasmania and Southern parts of Australia by night about the period of the full moon nearest the end of August or beginning of September. In January they return northward by degrees, in time for the wet season in the interior, and for the purpose of breeding there. Therefore, the conclusions put forward by 'Groundbait' cannot be entertained, viz.: That 'the Snipe make their way to the Indian Archipelago, or to India itself, where Snipe are numerous,' but not of the same species, or that "they go south to some cold lands far south of Tasmania.

"It has been proved that Snipe incubate or breed in the interior during the wet season, about April or May. I saw a clutch of three eggs which were taken in the Darling district, near Bourke. I am in possession of one of these eggs, which I exhibited at the annual conversazione of the Field Naturalists' Club, in April, 1882, and which I subsequently described."

(Here follows the description of egg as given above).

"The nest of these remarkable eggs was simply the bare earth, slightly hollowed, under tufts of grass. I also saw another clutch of similar eggs in the Australian Museum, Sydney, which was afterwards described by the curator. Mr. E. P. Ramsay, before the Linnean Society of New South Wales, in January, 1882. Travellers between the Upper Darling and the Cooper have informed me that they have observed young Snipe running and hiding in the grass. 'Groundbait' says:—'Neither Burke nor Wills, nor, as far as I can learn, any other explorer has mentioned his meeting with Snipe in either the interior of this continent or on its northern shores.' Captain Stuart informs us that he met with a few in the interior, but with great numbers breeding in the valley of Mypunga, South Australia, and Gilbert, the able coadjutor of the celebrated naturalist Gould, mentions having met with the birds in the country about Port Darwin."

Family—Tantalidæ.—Ibises and Spoonbills.

539. Threskiornis strictipennis—(White Ibis). *Locality*—Australia, except West. ***Egg*—Similar to the better-known Spoonbill's; long, oval in form, white; surface of shell somewhat rough, being minutely pitted all over, also sometimes stained by dirt of the nest. Length, $2\frac{5}{8}$ inches; breadth, $1\frac{11}{16}$ inches.

White Ibises breed in the reed-beds in the neighborhood of the Murray, in November, laying sometimes nine eggs.

540. Falcinellus igneus—(Glossy Ibis). *Locality*—Australia, except West. **Egg*—Surface slightly rough, of a uniform cold bluish green. Length, 2 inches $1\frac{1}{4}$ lines; breadth, 1 inch 5 lines.

542. Platibis flavipes—(Yellow-legged Spoonbill). *Locality*—Australia, except North West. **Egg*—White, long, tapering towards the smaller end; surface of shell rough and minutely indented all over. Length, $2\frac{13}{16}$ inches; breadth, $1\frac{13}{16}$ inches.

Family—Gruidæ.—Cranes.

543. Grus australasianus—(Australian Crane). *Locality*—Australia, except West. *Egg*—Cream color, blotched all over, particularly at the larger end, with chestnut and purplish brown, the latter color appearing as if beneath the surface of the shell. Clutch, two eggs, deposited on the bare ground on plains. Length, $3\frac{3}{4}$ inches; breadth, $2\frac{1}{2}$ inches.

At times, these birds fight desperately to defend their eggs against intruders, and woe-betide the person that comes in contact with their sharp bills.

Family—Ardeidæ.—Herons.

545. Ardea cinerea—(Common Heron). *Locality*—New South Wales and South Australia. **Egg*—Of a uniform light green; surface minutely spotted or otherwise marked with lime. Length, $2\frac{1}{2}$ inches; breadth, $1\frac{3}{4}$ inches.

547. Ardea pacifica—(Pacific Heron). *Locality*—Australia. **Egg*—Oval, surface a little rough, of a light bluish green. Length, 2 inches $2\frac{1}{2}$ lines; breadth, 1 inch 6 lines.

548. ARDEA (*Demigretta*) NOVÆ-HOLLANDIÆ—(White-fronted Heron) *Locality*—Australia, and Tasmania. *Egg*—Pale bluish green. Length, 1 inch 10½ lines; breadth, 1 inch 3½ lines. This common Heron is a persistent breeder. I heard of five clutches of five eggs each having been taken from one nest, and, notwithstanding, the bird succeeded in rearing a brood before the season expired.

549. HERODIAS ALBA—(Australian Egret). *Locality*—Australia and Tasmania. ** *Egg*—Long, oval, light bluish green. Length, 2 inches 1 line; breadth, 1 inch 5 lines.

550. HERODIAS EGETTOIDES (*intermedia*)—(Plumed Egret). *Locality*—Australia, except West and New Guinea. *Egg*—Regular oval, texture smooth, color pale sea green. Average length, 1 inch 11 lines; breadth, 1 inch 4 lines. (Legge).

552. HERODIUS GARZETTA.—(Little Egret). *Locality*—Queensland. ** *Egg*—Very light greenish tinge or bluish white. Length, 1 inch 8 lines; breadth, 1 inch 3 lines.

555. DEMIEGRETTA JUGULARIS (*sacra*)—(Blue Reef Heron). *Locality*—North Australia. *Egg*—Pale bluish white. Length, 1 inch 10½ lines; breadth, 1 inch 3 lines.

557. NYCTICORAX (*Nyctiaradea*) CALEDONICUS—(Nankeen Night Heron). *Locality*—Australia, Tasmania, and New Guinea. *Egg*—Pale green. The longer dimension of Mr. Gould's is at variance by over half-an-inch with Mr. Ramsay's. The measurement of a pair of these eggs in my collection nearly corresponds to Mr. Gould's, which is no doubt that of the typical egg, viz., 2⅝ by 1½ inches.

558. BOTAURUS POICILOPTILUS—(Australian Bittern). *Locality*—Australia, except West and Tasmania. * *Egg*—Rather corpulent and smaller end nipping sharply off, of a uniform light dull olive color; on examining the surface of the shell numerous pin-point-like indents will be observed as if struck ongitudinally. Length, 2 inches; breadth, 1½ inches.

559. BUTOROIDES FLAVICOLLIS—(Yellow-necked Mangrove Bittern). *Locality*—Australia, except Victoria and New Guinea. *Egg*—Of a much paler bluish green, and more rounded form, than those of any other species of the group. Length, 1 inch 6 lines; breadth, 1 inch 1½ lines.

This description is Gould's. But I have received an authenticated egg of this species from Queensland, which is white of a bluish milky tinge. Length, 1 inch 10 lines; breadth, 1 inch 4 lines.

560. BUTOROIDES MACRORHYNCHA—(Thick-billed Mangrove-Bittern). *Locality*—Queensland and New South Wales. *Egg*—Pale bluish green. Length, 1 inch 8½ lines; breadth, 1 inch 2¼ lines. (Ramsay).

561. Butoroides jananica—(Little Mangrove Bittern). *Locality*—North Australia, Queensland, and New South Wales. *Egg*--Elongated oval, pointed at both ends, color very pale green. Length, 1 inch $7\frac{1}{2}$ lines; breadth, 1 inch 3 lines.

Family--Rallidæ.--Rails, &c.

563. Porphyrio melanotus—(Black-backed Porphyrio). *Locality*--Australia, except West, and Tasmania. * *Egg*—Ground color light brownish buff, but sometimes of a sagy green tinge, mediumly marked with irregular-sized spots and blotches of reddish brown or sienna and greyish purple, also minutely freckled with the same colors. The surface of some shells is somewhat lustrous, that of others is not. Size varies considerably; average about 2 inches by $1\frac{1}{2}$ inches.

565. Tribonyx mortierii—(Mortier's Tribonyx). *Locality*—Tasmania. *Egg*--Stone color, marked all over with thinly-dispersed, irregular-shaped, and various-sized spots and blotches of dark chestnut brown, also very minutely freckled with the same color. Length, $2\frac{1}{4}$ inches; breadth, $1\frac{1}{2}$ inches.

566. Tribonyx ventralis (Black-tailed Tribonyx). *Locality*--Australia. * *Egg*--Greenish ground color, very minutely freckled all over with reddish brown specks, with a few large blotches here and there over the shell. Length, 1 inch $8\frac{1}{2}$ lines; breadth, 1 inch $2\frac{1}{2}$ lines.

This description is from thoroughly authenticated specimens. I believe the late Mr. Gould has described for this species some other egg (probably the following). Nevertheless, considering his limited sojourn on our continent, it is surprising what a quantity of information he amassed, and what few errors have crept into it. Speaking for the whole of his oological memoranda, only two or three exceptions can be taken.

567. Gallinula tenebrosa--(Sombre Gallinule). *Locality*--Australia, except West. ** *Egg*--More resembles that of the Coot (*Fulica*) in shape, color, and character of markings than any other of the family. Ground color dull white, with a very faint greenish tinge mediumly marked with round spots of pinkish red and purple, also very minutely speckled all over with the same colors. Length, 1 inch 10 lines; breadth, 1 inch 4 lines.

These eggs above described were taken in Bancroft's Bay, Gippsland Lakes, where I have seen and shot the birds. Typical eggs of true *Gallinulæ* are always beautifully proportioned oblongs, not "rounded and swollen in form," as Mr. Ramsay described the Sombre Gallinule's; moreover, his dimensions (1.55 x 1.2 inches) are less than those of the British Gallinule's egg, although the Australian representative is a much larger bird

568. FULICA AUSTRALIS—(Australian Coot). *Locality*—Australia and Tasmania. ** *Egg*—Large for the size of the bird; dull white, ground color marked all over with freckles and small roundish spots of dark purplish brown. Length, 2 inches 1 line; breadth, 1 inch 5 lines.

569. PARRA (*Hydralector*) GALLINACEA (*cristata*)—(Comb-creasted Parra). *Locality*—North Australia, Queensland, and New South Wales. *Egg*—Ground color dark, shiny, raw sienna tint, over which is traced in various directions a series of broad and fine hair-like contorted lines of brownish black, which, by occasionally uniting laterally and crossing each other, form here and there large blotches. Although the markings are of the same character on each egg, they are somewhat differently distributed; thus, on one specimen they are more numerous at the larger end and absent at the smaller, while in another they are more abundant at the smaller and less at the larger extremity. The egg is, moreover, rendered remarkably conspicuous by the singular pointed form of the smaller end, and by their small size as compared with that of the bird, but, above all, by the form and disposition of the markings, which are as if traced by the hand of a person who had amused himself by attempting to cover the surface with fantastic streaks, blotches, and contorted curves from end to end. Length, 1 inch $1\frac{1}{2}$ lines; breadth, $10\frac{1}{2}$ lines.

570. HYPOTÆNIDIA PHILLIPENSIS—(Pectoral Rail). *Locality* Australia and Tasmania. *Egg*—Cream color, with numerous large irregular blotches of dark chestnut red at the larger end, and a few smaller ones distributed over the remainder of the surface. Length, 1 inch $5\frac{1}{2}$ lines; breadth, 1 inch $1\frac{1}{2}$ lines.

571. RALLUS (*Lewinia*) BRACHIPUS—(Lewin's Water-Rail). *Locality*—Australia, except North and Tasmania. *Egg*—Pale olive color, blotched all over, but particularly at the larger end, with reddish and dark brown. Length, 1 inch 3 lines; breadth, $10\frac{1}{2}$ lines.

572. EULABEORNIS CASTANEIVENTRIS—(Chestnut-bellied Rail). *Locality*—North Australia and New Guinea. *Egg*—Rather lengthened in form, of a pale pinkish white, dotted all over with reddish chestnut, the spots being thinly dispersed, and some of them appearing as if beneath the surface of the shell, giving them a darker tint. Length, 2 inches $1\frac{1}{2}$ lines; breadth, 1 inch $7\frac{1}{2}$ lines.

574. PORZANA PALUSTRIS—(Little Water-Crake). *Locality*—Australia, except North and Tasmania. *Egg*—Nearly uniform brownish olive. Length, $12\frac{1}{2}$ lines; breadth, $9\frac{1}{4}$ lines.

575. PORZANA (*Zapornia*) TABUENSIS—(Tabuan Water-Crake). *Locality*—Australia and Tasmania. ** *Egg*—In shape obtuse, ground color dirty white, streaked and mottled all over with very light brown and light chestnut. Length, 1 inch 2 lines; breadth, 11 lines.

ORDER VIII—NATATORES.—SWIMMERS.

Family—ANATIDÆ.—Geese, Ducks, &c.

577. CHENOPIS ATRATA—(Black Swan). *Locality*—Australia and Tasmania. *Egg*—Pale green, stained all over with buffy brown. Length, $4\frac{1}{4}$ inches; breadth, $2\frac{3}{4}$ inches.

578. CEREOPSIS NOVÆ-HOLLANDIÆ—(Cereopsis Goose). *Locality*—New South Wales, Victoria, South Australia, and Tasmania. *Egg*—Smooth, creamy white. In shape both ends nearly alike, with a good bilge; shell a little limey. Length, $3\frac{1}{4}$ inches; breadth, $2\frac{1}{4}$ inches.

579. ANSERANAS MELANOLEUCA—Semipalmated Goose). *Locality*—Australia, except West. ** *Egg*—Brownish white. Length, $3\frac{3}{16}$ inches (long), $2\frac{15}{16}$ inches (round); breadth, $2\frac{2}{16}$ inches (long), $2\frac{5}{16}$ inches (round).

580. CHLAMYDOCHEN JUBATA—(Maned Goose). *Locality*—Australia and Tasmania. ** *Egg*—Light creamy white. Length, $2\frac{5}{15}$ inches; breadth, $1\frac{5}{8}$ inches.

581. NETTAPUS (*Anseneua*) PULCHELLUS—(Green Pygmy Goose). *Locality*—North Australia and New Guinea. *Egg*—White. Length, 1 inch $10\frac{1}{2}$ lines; breadth, 1 inch $4\frac{1}{2}$ lines.

582. NETTAPUS (*Anseneua*) ALBIPENNIS—(White-quilled Pygmy Goose). *Locality*—Queensland and New South Wales. ** *Egg*—Whitish color. Length, 1 inch $11\frac{1}{2}$ lines; breadth, 1 inch $4\frac{1}{2}$ lines.

584. CASARCA TADORNOIDES—(Chestnut-colored Shieldrake). *Locality*—New South Wales, Victoria, South and West Australia, and Tasmania. * *Egg*—Very smooth to the touch, and light creamy white; the dimensions of two eggs from a clutch of five taken from a hollow spout of a tree in a forest near Ballan are—Length, $2\frac{3}{4}$ inches; breadth, nearly 2 inches.

585. ANAS SUPERCILIOSA—(Australian Wild Duck). *Locality*—Australia and Tasmania. *Egg*—Smooth, white, with a faint greasy tinge. Length, 2 inches 4 lines; breadth, 1 inch $7\frac{1}{2}$ lines.

586. ANAS (*Marecna*) PUNCTATA—(Australian Teal). *Locality*—Australia, Tasmania, and New Guinea. ** *Egg*—Oval, smooth, and of a rich cream or light stone color. Length, 2 inches; breadth, 1 inch 5 lines.

Although the Teal may be considered a common bird, it is rarely that males in full nuptial plumage are obtained. I had the good fortune to secure an egg last season from a clutch from which a Teal, in full nuptial livery, was flushed. The dimensions of the egg were, $\frac{1}{2}$ a line over 2 inches by $1\frac{1}{2}$ inches. Some sportsmen and bushmen erroneously call these beautiful plumaged birds Mountain Teal, supposing them to be a variety of the Common Teal. Now, scientific egg-collectors collect and preserve the down from all Ducks' nests. If the down of the so-called Mountain Teal's nest were examined with that of the common Teal's nest, I have no doubt both would be proved to be identical.

587. STICTONETTA NÆVOSA—(Freckled Duck). *Locality*—Victoria, South and West Australia. ** *Egg*—Longish in shape, slightly swollen about the upper quarter, and both ends nearly alike; surface smooth or greasy; color of a greenish white tinge. Length, 2 inches $6\frac{1}{2}$ lines; breadth, 1 inch 8 lines.

588. SPARTULA RHYNCHOTIS—(Australian Shoveller). *Locality*—Australia, except North, and Tasmania. * *Egg*—Smooth, of a light creamy white, with a very faint greenish tinge. In October, 1880, on Phillip Island, Western Port, I flushed a Shoveller from its nest in some tussocky grass, away from, although in, the immediate neighborhood of swamps. The nest contained nine eggs, which appeared to be the complement, as they were half-hatched; I only took two, which measured—Length, 2 inches $1\frac{1}{2}$ lines; breadth, 1 inch 6 lines.

589. SPARTULA CLYPEATA—(European Shoveller). *Locality*—New South Wales (accidental). * *Egg* (from Europe)—Light creamy white. Length, 2 inches; breadth, 1 inch $5\frac{1}{2}$ lines.

590. MALACORHYNCHUS MEMBRANACEUS—(Pink-eye-browed Duck). *Locality*—Australia and Tasmania. *Egg*—A rather pointed oval of a rich light cream color. Length, 1 inch 10 lines; breadth, 1 inch $3\frac{1}{2}$ lines. (Ramsay).

Mr. Ramsay described a beautiful nest of this Duck taken from a deserted White-fronted Heron's nest. He says:—"The structure consisted of a platform of sticks, which formed the nest of the Heron, being thickly covered with dark stately grey down, which formed a rim four inches in height, a large quantity of down was worked in among the sticks and covered the greater part of the sides; it closed over the eggs above in an elastic mass, quite hiding them." I have heard of other Ducks similarly selecting old Crows' or Magpies' nests. Some of the members of this genus are certainly very unique in their habits—for instance, the Wild Duck: if the first part of a clutch be laid and meddled with by a stranger, the bird will indignantly break the eggs, and throw them out of the nest. Here is a "nut to crack" for some of the good folk who look upon oologists as a parcel of cruel beings, and say that it hurts a bird to rob it of its eggs. Take the case of the Wild Duck: how little it cares for its own eggs, if it scatters them out of the nest like so many live coals upon being simply touched by any person.

591. DENDROCYGNA GOULDI (*vagans*)—(Whistling Tree-Duck). *Locality*—North Australia, Queensland, New South Wales, and

New Guinea. *Egg*—Creamy white. Length, 1 inch $10\frac{1}{2}$ lines; breadth, 1 inch 6 lines.

593. Nyroca australis—(White-eyed Duck). *Locality*—Australia and Tasmania. * *Egg*—Apex rather pointed and both ends almost alike; smooth and cream-colored. Length, nearly $2\frac{7}{16}$ inches; breadth, nearly $1\frac{11}{15}$ inches.

594. Erismatura australis—(Blue-billed Duck). *Locality*—Victoria, South and West Australia. *Egg*—Uniform bluish white, with a very rough surface. Length, $2\frac{5}{8}$ inches; breadth, 2 inches.

595. Biziura lobata—(Musk Duck). *Locality*—New South Wales, Victoria, South and West Australia, and Tasmania. *Egg*—Large for the size of the bird, unlike other ducks eggs, being coarsely grained, and of a uniform pale olive. Length, $3\frac{1}{4}$ inches; breadth, $2\frac{1}{8}$ inches.

PROCEEDINGS OF SOCIETIES.

THE FIELD NATURALISTS CLUB OF VICTORIA.

The September monthly meeting of the Field Naturalists' Club of Victoria was held in the Royal Society's Hall on Monday evening, the 10th ulto, there being a good attendance of members. Mr. H. Watts, one of the Vice-Presidents, occupied the chair.

Mr. H. W. Tisdall was elected a member of the Club.

Papers for ensuing meetings were promised by Mr. T. A. F. Leith, on "Notes and Anecdotes about Phocidæ or Seal family;" and by Mr. Watts, on "The Microscopic Examination of the Silt of the River Yarra.

The Chairman congratulated the Club upon the many high-class awards obtained by members at the Amsterdam Exhibition. He also drew attention to the recent death of Mr. D. Kershaw, one of the original members of the Club, and a most enthusiastic naturalist.

The papers read were—By Mr. C. French, entitled "Orchids of Victoria; their habits, and cultural notes." This was the first part of an intended series of papers, and after drawing attention to the attractiveness of the beautiful order of plants, Mr. French described the species of Dendrobium to be found in the Colony. By Mr. A. H. S. Lucas, on the position of Sponges in the animal kingdom. The writer explained their structure, and quoting from various authors, such as Carter and Kent, came to the conclusion that Sponges should be placed between the Protozoa and Hydrozoa. He exhibited numerous specimens in illustration of his remarks.

By Mr. H. T. Tisdall, of Walalla, on Botanical Excursion in North Gipps Land, describing the numerous plants found in a trip from Walhalla to Mount Useful.

The Exhibits were—Foreigh Coleoptera, by Mr. P. Dattari; Victorian Buprestidae, by Mr. Best; Fossils from South Yarra Railway Cutting, by Mr. H. Kennon; Marine Specimens from Fiji, by Miss Cambell; Sponges, by Mr. A. H. S. Lucas; Fossils from South Yarra, by Mr. C. French, jnr.; Eggs of Sea-birds and new species of white-winged Petrel, by D. Lucas; Orchid (*Pterostylis peduculata*) from Doncaster, and Fern (*Gleichenia* sp.), from Sydney Heads, by Mr. G. A. Barnard; Miocene Fossils, including *Pericosmus Nelsonii*, from Waurn Ponds, by Mr. O. A. Sayce; New Zealand Birds, by Mr. T. A. F. Leith.

The meeting then terminated with the usual conversazione.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The usual monthly meeting was held on the 30th Aug. The President (Dr. Ralph) occupying the chair.

The Secretary acknowledged the receipt of a number of magazines and books, including the latest addition of Prctchard's "Infusoria," and 12 volumes of the Monthly Microscopical Journal, completing the set.

In the absence of any original communications, the Secretary read from the Journal of the Royal Microscopical Society the Presidential Address of Professor Martin Duncan, delivered at the annual meeting of that society.

Baron von Mueller read some extracts from a letter lately received by him from Rev. Adolf Schmidt, of Aschersleben, in which, among other interesting matter, it was mentioned that the publication of the Atlas of the Diatomaceæ would, in all probability, shortly be resumed.

The ordinary meeting was held on the 27th Sept., 1883, Dr. Ralph in the chair.

Mr. Jos. Ellis Baker was elected a member of the Society, and Mr. P. E. Petherick was nominated for membership. Resignations were received from Dr. Porter and Mr. H. J. Miller.

Mr. C. R. Blackett read "Notes on the use of the Microscope in Pharmacy," and undertook to have the paper published in the "Chemist and Druggist."

Dr. Ralph read a note on the occurence of radiating acicular crystals in the leaf-cells of *Protea mellifera*, when heated in the water, and exhibited illustrative specimens.

Mr. W. W. Allen exhibited winged parasites of the Cockatoo, male and female.

Nominations for Officers and Committee were received, and the meeting terminated.

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 26th September, 1883. Dr. James C. Cox, F.L.S., &c., in the chair.

Mr. W. H. Caldwell, Fellow of Caius College, Cambridge, was introduced as a visitor.

Arthur W. Stephens, Esq., of Sydney, and the Reverend Mr. Manning, of Waterloo, were duly elected members of the Society.

The receipt of a number of donations was announced.

The following papers were read:—

1. On a very dolichocephalic skull of an Australian aboriginal. By Baron N. de Miklouho Maclay. The cephalic index of this skull, which was found in the interior of Queensland, was only 58·9, calculated on the ophrio-occipital length, and 58-3, calculated by the glabello-occipital length, an index lower probably than that of any skull hitherto described. The skull was not a deformed one in the ordinary sense, but was a fair example of the so-called roof-shaped type of cranium.

2. On a fossil humerus. By Mr. C. W. De Vis. The humerus which Owen described as belonging to *Nototherium* is regarded by Mr. De Vis, as being too nearly related in the arrangement of its muscular ridges to the fossorial humerus of *Phascolmys* to be referable to the former genus; and he puts forward the suggestion that a humerus recently obtained from the Darling Downs is the true arm-bone of *Nototherium*.

3. Notices of some undescribed species of Coleoptera from the Brisbane Museum. By William Macleay, F.L.S., &c. The species described are a few unnamed Coleoptera occurring in a large collection sent by Mr. De Vis to the author for identification. Their names are:—*Pamborus viridiaureus, Catascopus laticollis, Eutoma ponctipenne, Carenum terræ-reginæ, C. ianthinum, C. De Visii, C. pusillum, Tibarisus robustus, Pœcilus lævis, Diphucephala hirtipennis, D. cærulea, D. latipennis*, and *Liparetrus, convexiusculus*.

Baron Maclay exhibited a sketch of a new species of *Heterodontus*, recently received at the Australian Museum from Japan, and pointed out the marked differences between it and *Heterodontus Phillippi*, the species with which the Japan fish had hitherto been confounded. He suggested for it the specific name of *japonicus*, and said that he would give a detailed description of it at the next meeting of the Society.

Mr. Macleay exhibited in illustration of Mr. De Vis's paper, casts of a gigantic humerus of a *Diprotodon*, and a smaller humerus, probably of *Nototherium*. The fossils were both from Darling Downs.

Mr. Thomas Whitelegge exhibited under the microscope a living specimen of the species of *Fredericella*, one of the fresh-water Bryozoa which had not previously been noticed in New South Wales. It appeared to be identical with the European *F. sultana*, of Blumenbach.

Mr. Whittell exhibited specimens of a caterpillar of the fomily *Cossidæ* found at Mount Wingen, in which the original tissues of the animal had become replaced by the mycelium of a species of *Sphæria*.

Professor Stephens also exhibited two specimens of *Pennatulidæ* from Burrard's Inlet, Victoria, British Columbia. These were brought to Sydney by Captain Barnes, of the "Pacific Slope," who had obtained them from the native. They are said to bear their polypiferous heads just at the surface of the water. One of the specimens was 7¾, the other 5 feet in length, but as they consisted of little more than the slender and cylindrical rachis, curiously like a dry osier twig peeled ready for the basket-maker, it is not possible to identify them with any described form. This exhibit was due to the kindness of A. A. Smith, Esq.

Mr. H. Rawes Whittell exhibited some specimens of *Tacionia Exonensis*, showing the manner in which the honey is extracted by the Spine-billed Honey-eater—*Acanthorhynchus tenuirostris* (Lath). He stated that W. T. Campbell, Esq., of Gladesville, to whose kindness he was indebted for this exhibit, informed him that he had often seen this bird engaged in the operation of extracting the honey. He had also frequently seen it devouring large numbers of the common white ant. The flower is a hybrid raised in England, and first imported to this colony by Mr. Campbell.

Mr. J. G. Griffin, C.E., exhibited two samples of gravel used as ballast on the Deniliquin and Moama Railway. No. 1 was taken from the bed of the Edwards River, and consisted chiefly of fine subangular drift, while No. 2 obtained from a pit 12 miles South from Deniliquin, and at a depth of from 12 to 30 feet, contained, in addition to fine drift, some waterworn pebbles of quartz, 1½ inches in diameter. Professor STEPHENS considered that the occurrence of such coarse pebbles in the finer drift might be accidental, and that they may have been dropped from the roots of the trees which were swept over this country during floods. Mr. MACLEAY thought that that this country had gradually risen, and referred to the great deposits of coarse gravel on the Murrumbidgee and elsewhere as evidence of the powerful transporting currents in past ages. Mr. WILKINSON said these extensive deposits probably corresponded in geologic age with those of the glacial period of the northern hemisphere. At that time there must have been heavier rainfall in the southern hemisphere than we have at the present day, and the material derived from the valleys then eroded in the higher lands spread over the low-lying country and formed the plans. Some of the pebbles resembled those found in the Devonian conglomerate beds of the Hanging Rock, between Urona and Wagga. Mr. WHITTELL remarked that similar drifts had been met with in some wells sunk in the level country to the west of the Darling River.

The President exhibited some specimens of fossil insects found in the tin-bearing tertiary deep leads near Vegetable Creek, New England. This is the second discovery of fossil insects in Australia, and the specimens show the impression of larvæ and pupæ of *ephemera* or "*May fly.*"

A fossil coral (*Cyatnophyllum* sp.), from the carboniferous rocks, near Jervis Bay, was exhibited on behalf of the Hon. JAS. NORTON.

Notes on some Plants from New Guinea,

By Baron Ferd. von Mueller, K.C.M.G., M.D., Ph.D., F.R.S.

Quite recently a Dendrobium has been flowering in the Garden of the Queensland Acclimatisation-Society, from whence a specimen was communicated to me by Mr. F. M. Bailey. This plant is referable to *D. Macfarlanei*, described from imperfect material eight years ago (Papuan plants p. 29). From an undried specimen now a few additional notes can be offered; the stems are several, from a flat procumbent rooting base, much attenuated far downward, dilated towards the middle fully to ⅜ of an inch and there compressed-quadrangular; the leaves in a fresh state are carnulent, and then show neither a prominent median line nor streaks of veins; they attain a width of half-an-inch; the flowers are placed racemously but rather distantly; they occur pale as well as pinkish in color, and are inserted much above their middle to the pedicel; the labellum is terminated by three very short roundish-blunt lobules, the middle one not particularly papillular-thickened, but from a subterminal slight callosity 3 tender median lines decur.

Tall specimens with rather long racemes were also brought by James Orkney, Esq., M.L.A., from New Guinea some years ago.

Dendrobium Lawesii (F. v. M. in Melb. "Chemist," June, 1884) is evidently allied to *D. trichostomum* (G. Reichenbach in "Journ. Linnean Soc. 1875, p. 49), with which it needs further comparison; the prolongation of the calyx is not slit, and the labellum arises not from the extremity of the prolongation; the remarkable terminal inflexion of the labellum occurs also in *D. Mohlianum* from Fiji. Concerning Papuan orchids it may further be remarked, that *D. Johnsoniæ* (F. v. M. in Wing's "S. Sc. Record," May, 1882) should perhaps be referred to Phalænopsis, although the gibbous protuberance of the flowers is more developed than in the typic species of that genus, the labellum of other congeners being also not cirrhiferous; pollinia were not available for examination.

D. arachnostachyum from New Guinea was described by Professor G. Reichenbach in the "Gardeners Chronicle" 1877, p. 334.

Doubtless a rich harvest of evascular plants could be reaped also in the S.E. part of New Guinea, the exuberance of Mosses, Lichens and Fungs in the North-western portion of the great island having been demonstrated already by Dr. Beccari. Here it may incidentally be remarked, that *Stereum lobatum* (Kunze) was brought from the Owen Stanley Range by Mr. Chalmers,

also *Rhizogonium spiniforme* (Bridel), as identified by Dr. Cooke and Geheeb, while a Papuan Entodon has been defined as *E. Lawesii* by Dr. C. Mueller.

A few weeks before his lamented almost sudden death, Dr. W. Sonder of Hamburg named specimens of the following algæ, sent to him, as a leading expert, from New Guinea through my Department:—

Sargassum decurrens, Ag.
Cystophyllum muricatum, J. Ag.
Turbinaria vulgaris, Ag.
Chnoospora obtusangula, Sond.
Hydroclathrus cancellatus, Bory.
Vidalia pumila, Sond.
Amansia glomerata, Ag.
Acanthophora dendroides. Harv.
Desmia ambigua, Harv.
Gracilaria lichenoides, J. Ag.
Sarcodia palmata, Sond. (an aberrant form).
Hypnea hamulosa, Kuetz.
Hypnea seticulosa, J. Ag.
Phycoseris reticulata, Kuetz.
Chætomorpha valida, J. Hook and Harv.

This list, short as it is, indicates a very close alliance of the marine flora of New Guinea to that of North-eastern Australia, the species thus far being in most cases identical.

Life on an Old Pile.

By T. Harrison.

[Read before the Field Naturalists' Club of Victoria 8th October, 1883.]

Only an old pile, gentlemen—one that has had its day—one that has done its duty in the past—has borne the brunt of many a tempest—has served as a support of a pier that has had landed upon it more wealth, in the shape of merchandise, than would buy a Spanish argosy, though valued at a thousand times its worth. But this old pile has done its work. It is bored with teredos, and is rotten to the core. If I mistake not it is fractured almost half-way of its length, and so, for the good of the community, and for the safety of the structure of which it formed a part, this same venerable piece of timber had to be replaced by new, itself to be split up for firewood, the only use to which it can be applied, save one, ere it is handed over to the axe of the splitter and the grate of the housewife. To a couple of wandering and quasi naturalists it affords an hour or so of investigation, and I think that what we saw may furnish the means of whiling away a few minutes of our Club-gathering to night.

I had heard of this old pile, but heard thereof a little too late. Most of the organisms thereon had famished and died of drought and sunlight: nearly all were either dessiccated skeletons or lifeless corpses. The whole was a sort of maritime type of the valley of dry bones, some of which would never live again. In fact, only one organism was still living. It eventually appeared that there were two. I tore off what was, as I then thought, the sole survivor—a large Modiola. Placing this in a jar of sea-water the shell floated, and I naturally judged that the animal therein had become defunct. On arriving home, however, I noticed that the whole had sunk, and from the ejection of streams of water hoped that my find would live. Nevertheless, two days afterwards the shell was found to be gaping, and life had evidently departed. The strangest thing I noticed, however, was a small crab, also dead. I knew that no crab had been placed in the jar, and the fact a few years ago would have puzzled me exceedingly. But I had once learned that this species of crab are in the habit of taking up their residence within the shells of bivalves—such as the mussel, the pinna, and even the oyster and the cockle. They derive their name (*Pinnatheses pisum*) from the circumstance that they were first met with in association with the pinna of the Mediterranean. What part they actually play in the life economy of their host is not yet explained. That they should themselves select such a domicile is not to be wondered at, as their shell is soft, and they need protection. Still it is difficult to see what benefit the pinna, mussel, &c., derive from their presence. Their feet and claws must render them irritating, to an unprotected mollusc. It is said they live on the juices, &c., of their involuntary entertainer. This is very likely, while it is quite possible that they devour spat and eggs also. If this is correct, their presence in great numbers—and I have met with three large ones within a single shell—will be likely to render them the veritable Malthusians with respect to one branch of the animal kingdom.

The most noteworthy of my discoveries on the old pile was what to me was an altogether new species of crab. It is, without exception, the dirtiest and most disreputable-looking example of the crustacean race that has come under my notice. The whole aspect of the little creature is that of a shockingly bad example: one would be more likely to consider it allied to a chimney-sweep who never took a bath than to a jack-in-the-water, living constantly in the aqueous element. The general form, however, is, perhaps, worthy of a little consideration. The shape of the thorax, together with the folded-up abdomen is, as will be seen, globular. The claws are peculiarly shaped.

The parts adjoining the body are somewhat robust, but the forceps are by no means well-developed. They resemble a man's hand, possessed of only a rudimentary thumb, and remind one of a sort of talon, like that of a cat or tiger, only that they are not retractile. Similar talons are affixed to the end of each leg, and are suggestive of the idea that possibly they are used for climbing purposes, for which they would seem to be admirably suited. This view, that this is their use, is substantiated by the fact that this crab must have a great deal of climbing to do during his predatory excursions over the piece of rotten timber on which he lives. The forceps and the talons, it may be remarked, are nearly white—at least at the points. The most curious feature of this crab, however, is found in the arrangement and structure of the legs. It is, as are most large crustaceans, a decapod; that is, it has ten feet, the claws counting as two. These legs, however, vary greatly in size and strength. The anterior and post-anterior pair are especially strong and muscular. The ante-posterior pair are short, weak, and must be useless for ordinary locomotion, while the extreme posterior pair are actually situated on, and in the specimen are seen to be folded on, the carapace. The reason for this extraordinary arrangement is not easily arrived at. One solution of the mystery, however, suggests itself. This crab appears to be in the habit of burrowing beneath loose pieces of Flustra and other incrustations: all the specimens were found to have so burrowed, and when the animal was dug out, portions of the Flustra came away with it and appeared as if adherent to the shell. The thought, therefore, has struck me, that the posterior limbs, useless for locomotion, may be of service in burrowing, probably in holding on to foreign materials, thus leading to protection or concealment. This view is somewhat strengthened by the fact that Mr. Kershaw informs me he has met with larger species covered, in the carapace, with pieces of sponge.

Another singularly formed crustacean was met with in the shape of a shrimp, not unlike one of the ordinary species with respect to the formation of thorax, antennæ, and abdomen, but armed with a claw of enormous dimensions as compared with the size of the rest of the body. This claw, too, is singular with respect to its color being of a greenish blue tint. If I may hazard a rough guess, this crustacean is a species of the genus Alpheus, of which there are several examples exhibited at the National Museum, all of which, however, differ materially, both as to form and size, from the present specimen. Two other kinds of crab were also met with, but do not seem to demand any special notice, and are, in all probability, well known to those who have explored habitats such as those now being attended to.

Of radiata, two, if not three, very small kinds were met with.

These are of the class in general known as Ophiuridæ, or brittle-stars. The body, or central portion of the animal, as will be seen from the specimens, is pentagonal, the serpent-like arms being five in number. In one or two instances small dots are found near the angles of the pentagon, and may probably serve the little animal as eyes. The old pile, as we found and explored it, as before stated, was viewed under unfavorable circumstances. It remained, in fact, as little better than a kind of sepulchral ground, the dead remaining still unburied. Life, however, as evidence went to show, had once revelled thereon in abundance. Innumerable threads of byssus told us, plainly enough, of a thickly-gathered covering of edible mussels, subsequently removed, we may imagine, for culinary purposes. One shell, however, remained belonging to the large black species, about which hangs a tale. This mussel is not indigenous to these waters, and is not met with, we believe, abroad nearer to us than the Red Sea, the first of the Australian race having been brought hither, as is supposed, while adhering to the hull of some steamer that had aforetime anchored at Suez or Aden. This is a sort of assisted emigration that may gladden the hearts of naturalists, but which does not always prove a matter for congratulation on the part of wooden ship-builders and owners, since a similar mode of transit was availed of by the teredos, or ship-worm of the East, until the piles of the dykes in Holland, and of the piers of nearly all Europe, are infested with the nuisance. If you will allow me to be fanciful for a moment, and admit that this particular creature, the mussel, has traditions and a history, the family narrative must be an interesting one. Not long since a batch of cousins may have been transported to Magdala as a tit-bit for the late King Theodore. Ages ago some ancestors of these may have been picked up and eaten by the Israelites halting on the shore, with the army of the Egyptian monarch thundering behind them. Yet others may have found themselves left high and dry as a result of the marvellous ebb-tide which, occuring at the present day, would prove a God-send to conchologists. If any trace of this event is to be met with in the legends of the Mytillian race, believers in the story may have a better chance of refuting sceptics than is in our own possession, since who knows but survivors of the present day may be able to confound doubters by showing them the veritable wheels of Pharaoh's chariot, which some remote progenitor of the mussel family may have seen submerged in the past.

This, gentlemen, is, however, all moonshine; only it was one of the thoughts that struck me in tearing off this same shell of the large black mussel, found still moored by a score of tough cables to the then dried-up surface of one old pile.

Various specimens were exhibited by Mr. Harrison in illustration of his paper.

A Trip to Mount Macedon in search of Fresh-water Algæ.

By H. Watts.

[Read before the Field Naturalists' Club of Victoria 11th June, 1883.]

Having become tolerably well acquainted with the Fresh-water Algæ of the country around Melbourne, I have for some time past been waiting for an opportunity of visiting some of the higher country in Victoria, easily accessible, where possibly other species of Algæ might be collected, and to notice the difference, if any, between the microscopic vegetation of the low country around Melbourne and that of the more elevated parts of the Colony. With this object in view, I resolved to utilize the holiday on the Queen's birthday, last, for this purpose. I went to Macedon by the previous evening's train, so as to be in time for work early in the morning. Nothing particular happened on my journey to Macedon, and on arrival I took up my quarters at the Victorian Alps Hotel. The night was very dark, which prevented my taking a walk, so after listening to the persuasive eloquence of the landlady I partook of some slight refreshment and retired to rest, though I did not sleep very well that night—whether in consequence of the rarity of the mountain air, or other cause I am unable to say. At any rate, morning came in due course, and getting out of bed and drawing aside the curtains, Mount Macedon in her Winter garb was before me. The trees were bare, and it seemed as if they were dead. Although the massiveness of the Mount impressed me, still a feeling of sadness overcame me at the appearance of the country. But it was not the time for soliloquising, so I got ready for the day's explorations. I took a preliminary walk before breakfast, and afterwards set out for a mountain stream, in one part of which I was informed a waterfall was to be seen. I made my way clearly enough, by a bush-track, to about two miles from Macedon to the stream, which I followed up as far as time permitted, observing what kind of Algæ was growing, and my first impressions were very unfavourable. Almost every stick or leaf that happened to be in the water was covered with a brown scum, and on the banks of the stream were patches of green slimy vegetation, so apparent in different places round Melbourne, near to stagnant waters, or water in which decaying vegetable matter was lying. The slimy vegetation-covered stones in the water, which I did not expect to meet at the Mount, were very slippery to walk upon, and I only escaped a wetting by mere accident. Having proceeded up stream as far as I thought desirable, and observing no change in the vegetable growth, I turned back and began to collect. Here it is necessary to point out that the microscopist is at some disadvantage in collecting. The Entomologist or Botanist can generally tell at sight whether the insect or plant is what he wants for his cabinet. The Microscopist would be in the same position if he had his microscope with him, but this is not always practicable. He has, then, no alternative but to collect everything he can, and make his examination on returning home. It may be several days before he has determined the results of his day's collecting, especially on a new collecting ground, where it was necessary to take notes of all the different appearances, so that the habitat of each specimen might be faithfully recorded. Having thus intimated the kind of work attending the study of microscopy, I now take my journey down stream, and will endeavour to point out the various objects that are of interest to the microscopical naturalist.

The slippery vegetation before alluded to consists of a species of *Oscillaria*, a family of plants which flourish almost in every situation in which fresh water is to be found. "The purest springs are not always free from their presence, although they occur most abundantly in stagnant waters, where animal or vegetable matters are undergoing decay. When viewed in mass, floating upon some foul pool, or, as in this instance, growing upon the banks of the stream few objects in the vegetable world are better calculated to excite disgust. A dark, slimy scum, reeking with its putrescent surroundings, they seem to offer nothing of pleasure or interest. But when brought home to the table of the microscopist and placed beneath his object-glass, they startle the observer by the wonders of their life-history. Living rods, writhing, twisting, bending, curling, creeping, gliding hither and thither; incessant apparently causeless motion, occuring, too, in what to most minds is the very type of fixity and passivity—a plant. No marvel, then, that they are so famous." I had not previously gathered this identical species, but I have two or three species of the same genus in my collection, gathered in low-lying or badly-drained places around Melbourne, on the banks of the river Yarra, and even in the streets of several of our suburban boroughs, such as Collingwood, Richmond, and Sandridge.

It is astonishing with what rapidity these plants will cover a damp surface. I have seen a place swept by a scavenger, and in three days afterwards it has been covered with a dense green scum, which considered solely of a species of one of these plants. Another reason why this plant is interesting to the microscopical observer is, that always in association with it are to be found numerous examples of Infusoria, generally of a simple type, such as Monads, Euglena, and sometimes Vorticella. In this Macedon collection, however, only Monads were found. Amongst these were numerous specimens of that remarkable creature Amœba, which is the simplest form of animal life with which we are acquainted. This creature presents no definite or constant figure, so that it is almost impossible to describe it. "Generally speaking, it resembles a lump of jelly-looking matter, at others a mere transparent gelatinous film, with numerous out-stretched processes slowly protruded at one part and withdrawn into the general mass at another, but so acted upon as to serve to produce a very slow outward movement." In one locality, where the stream spread out and formed a basin, one species of Spirogyra was growing, but as it was not in fruit the species could not be determined. You will recollect that on a former occasion I pointed out some peculiarities of this family of plants, and indicated the method of reproduction, viz., that of conjugation. At last I came to the edge of the falls, near to which a fine species of Vaucheria was growing. I here paused to drink, and was much surprised at the earthy odour and taste of the water. I then felt that the performance of only a part of my proposed day's work was possible. Whence this mountain stream obtained its peculiar flavour I am unable to say. A journey higher up stream would be necessary to ascertain the reason. The water could not by any means be considered good. I then took a circuitous course to get to the foot of the falls, immediately under which had accumulated a large quantity of branches of trees, all of which, as well as the stones, were covered with a chocolate-coloured mud. On going as near the falls as I possibly could I found a small cup-shaped crevice in the rocks full of this brown mud, which had probably been accumulating for years. It is also probable that I was the first person who had ever emptied this crevice. This brown mud was found to consist almost solely of Diatoms, of the genera Pinnularia (two species), Navicula, Nitzschia, and others. I then followed the stream untill I came to a large water-hole, and on the roots of grass and small sticks was a covering of light flocculent matter, which was found to consist of the beautiful *Gomphonema geminatum*, one of the stipitate forms of Diatomaceæ. In this pool was also found six species of Desmids, viz.:—*Closterium Leibleini*, *lineatum*, *setaceum*, and *Striolatum*, *Pleurotænium baculum*, *Cosmarium tetraopthalmum*.

Near the township of Macedon there is a brick-field, and near it is a small stream in which Chara was growing thickly. I made a diligent search for algæ, but was unsuccessful. The water, however, contained abundance of Monads, Vibrios, and Bacteria. It was dinner-time when I reached Macedon. So after appeasing an appetite rendered keen by the bracing air, I spent the afternoon at the State Nursery, where there is a large reservoir of water, retained for Railway purposes. This reservoir, the water of which was clean and soft, did not show any large masses of confervoid algæ. There was, too, an absence of rank weed, and there were very few sedges growing on the edge of the water. After careful examination amongst the sedges, and on some shallow parts of the water, I succeeded in collecting eleven species of Desmidiæ, a much larger number of species than I have ever collected in one place before. Their names are as follow:—*Closterium Leibleini, Closterium Jenneri, Closterium acerosum, Pleurotænium baculum, Pleurotænium clavatum, Staurastrum paradoxum, Staurastrum tricorne, Straurastrum vestitum, Micrasterium pinnatifida, Cosmarium tetraopthalmum, Cosmarium Ralfsii*, and also those beautiful specimens of unicellular algæ—*Scenedesmus acutus, Scenedesmus dimorphus*, and *Pediastrum Ehrenbergii.*

With regard to the results of my day's work I can only say that the species of Oscillaria and Gomphonema are the only ones added to my collection. All the rest I have met with in various places near to Melbourne, and have only added another locality as the habitat of the various species in Victoria.

Oology of Australian Birds.

By A. J. Campbell.

[Read before the Field Naturalists' Club of Victoria 11th June, 1883.]

Part ix.—Order—NATATORES.

Family—Laridæ.

599. Larus (*Gabianus*) pacificus—(Pacific Gull). *Locality*—Australia, except North and Tasmania. *Egg*—Clear olive, marked all over with blotches of blackish and umber brown, some of the markings appearing as if beneath the surface of the shell. Length, 3 inches; breadth, 2⅛ inches.

597. Bruchigavia (*Gelastes*) jamesonii (*Novæ-Hollandiæ*)—(Silver Gull). *Locality*—Australia, except North and West, and Tasmania. *Egg*—Ground color varying from pale greenish to dark brownish olive; in some instances slightly, in others largely, blotched and streaked with blackish brown; they also vary in shape, some being shorter and thicker than others. Average length, 2⅛ inches; breadth, 1½ inches.

599. Stercorarius (*Megalestris*) catarrhactes—(Great Skua). *Locality*—Australia, except North and Tasmania. * *Egg*—One taken on Campbell's Island, south of New Zealand, has a somewhat rough shell, ground color light olive, irregularly blotched, with a few markings of olive, a greater number of larger markings, of various shades of grey and brownish purple, appearing as if under the surface of the shell. Length 2¾ inches; breadth, 2 inches. Another, taken from the Northern Hemisphere, has the ground color of a much darker shade of olive, and the markings more inclined to a reddish olive. Length, 2¾ inches; breadth 1⅞ inches. The difference in the sizes of the eggs may be accounted for by the following remarks by Mr.

Gould:—"I may mention that all specimens (of the above bird) from the Southern Hemisphere are rather darker in color, and somewhat larger in size, than those from the Northern."

While on the topic of Skuas, it is with pleasure I embrace this opportunity of placing on record an addition to the avifauna of Australia, viz:—Richardson's Skua—*Lestris Richardsoni* (*parasiticus*). When steaming up Port Philip Bay last October, I observed numbers of these birds hovering over our wake near the vessel.

The following is extracted from the "Catalogue of the Birds of New Zealand," by Mr. F. W. Hutton, which appears to tally with the description of the new bird under notice:—"No. 107., *Lestris parasiticus*; *Temm*—Skua Gull. Back and wing coverts, brownish cinereous; top of the head, brown, varied with white; neck and breast, white; abdomen, dusky; quills and tail, black; two long narrow plumes from the tail (immature). L., 15.5; W., 11.2; B., 1.8; T., 1.65. Although only in immature plumage, I have very little hesitation in referring the bird to *L parasiticus*, no doubt identical with *spinicauda*, *Bp.*, which is not uncommon at the Cape of Good Hope."

600. SYLOCHELIDON (*Thalasseus*) CASPIA—(Caspian Tern). *Locality*—Australia, except West and Tasmania. *Egg*—Stone-grey color, marked all over with large and small blotches of umber-brown, a great portion of which appears as if beneath the surface of the shell. Length, 2⅝ inches; breadth, 1¾ inches.

601. THALASSEUS CRISTATUS—(Torres' Straits Tern). *Locality*—North Australia and New Guinea. *Egg*—Ground color is generally stone-grey, in some instances thickly speckled and blotched with black; others are marked with irregular waved streaks and minute spots of dark brown; others again with scattered irregular streaks and spots of black; some are thickly blotched, especially at the larger end, with reddish, and others are finely blotched and streaked with dark-red, on a light pinkish grey ground. Average length, 2¾ inches; breadth, 1¾ inches.

602. THALASSEUS POLIOCERCUS (*Novæ-Hollandiæ*)—Bass's Straits Tern). *Locality*—Australia, except North and Tasmania, *Egg*—Varies considerably in color, some being of a stone-grey, others of a buffy hue, all more or less marked with brown, the markings in some being large and irregular blotches, in others streaks and spots, in others in the form of Chinese or Hindustanee characters; and some have the markings so thick at the larger end that they blend into each and form a broad zone. Length, $2\frac{2}{8}$ inches; breadth, 1½ inches.

Some ornithologists believe that this and the foregoing species are identical. However, their manners of nidification are different. The former breeds in the tropical seas in May and June, and the latter in the colder regions of Tasmania and Southern Australia in November and December.

603. THALASSEUS BENGALENSIS (*media*) (Indian Tern). *Locality*—North Australia. * *Egg*—Of a soft pinky-white tinge, moderately spotted and freckled all over with markings of pinkish or reddish brown, softened at the edges into a paler tint, also greyish spots appearing under the shell's surface. Length, 2 inches; breadth, $1\frac{6}{16}$ to $1\frac{1}{2}$ inches.

604. STERNA MELANORHYNCHA (*frontalis*)—(Southern Tern). *Locality*—Australia, except West and Tasmania. *Egg*—Ground color olive-brown, blotched and marked all over, but particularly at the larger end, with rich umber intermingled with obscure markings of grey, the latter appearing as if beneath the surface of the shell. Length, 1 inch 10 lines; breadth, 1 inch $4\frac{1}{2}$ lines.

605. STERNA GRACILIS (Graceful Tern). *Locality*—Queensland. * *Egg*—Of the usual shape; ground-color, warm stone grey, spotted and blotched with dark sepia, also obscured greyish markings underlying as if appearing under the surface of the shell. Length, 1 inch 8 lines; breadth, 1 inch 2 lines.

606. STERNA (*Sternula*) MELANAUCHEN—(Black-naped Tern). *Locality*—North Australia, New South Wales, and New Guinea. * *Egg*—Ground color, rich yellowish white, spotted and streaked with brown of various shades up to nearly black, a few grey markings, appear under the shell's surface, all the markings are thicker near the top. Length, 1 inch 8 lines; breadth, 1 inch $1\frac{1}{2}$ lines.

607. STERNULA NEREIS (*minuta*)—(Ternlet.) *Locality*—Victoria, South and West Australia, and Tasmania. *Egg*—Pale stone-color, in some instances marked all over, but more thickly at the larger end, with dark umber brown; in others very largely blotched with the same color. Length, 1 inch 5 lines; breadth 1 inch.

—. STERNULA PLACENS—(White-shafted Ternlet). *Locality*—North Australia, Queensland, and New Guinea. * *Egg*—Ground color delicate stone-grey, moderately marked all over with spots and small markings of dark sepia or umber and bluish-black, the latter color underlying or appearing as if beneath the surface of the shell. Length, 1 inch $4\frac{1}{2}$ lines; breadth, 1 inch $\frac{1}{2}$ line.

Through the extreme kindness of Mr. E. L. Layard, Her Britannic Majesty's Consul, New Caledonia, the eggs of this lovely Ternlet have removed a great desideratum in my collection. Mr. Layard is an ardent and devoted disciple of Natural Science, and his name is a household authority in many of its departments.

608. GELOCHELIDON MACROTARSA—(Long-legged Tern). *Locality*—Queensland, New South Wales, and Victoria. *Egg*—Prevailing tint, brownish buff or pale stoney-grey, marked with large clouds of brownish red, softening occasionally into purplish brown, and mingled with underlying blotches of purplish grey. Length, 1 inch 10 lines; breadth, 1 inch 4 lines. (Legge).

610. HYDROCHELIDON LEUCOPAREIA (*fluviatilis*)—(Marsh-Tern). *Locality*—Australia. * *Egg*—Similar to that of the European variety, being of a beautiful warmish green, fairly distributed all over, but particularly around the upper quarter, with spots and blotches of umber, also some lighter markings appearing under the shell's surface. Length, 1 inch 6 lines; breadth, 1 inch 1½ lines.

Marsh Terns inhabit inland waters, and construct nests among the rushes. The eggs here described were taken in the reedy lagoons bordering the Murray.

611. ONYCHOPRION (*Haliplana*) FULIGINOSA—(Sooty Tern). *Locality*—Australia and New Guinea. *Egg*—Ground-color creamy white, in some very pale, in others very rich, blotched all over with irregular-sized markings of chestnut and dark brown, the latter hue appearing as if beneath the surface; the light-colored eggs have these markings much smaller and more thinly dispersed, except at the larger end. Length, 2 inches 1½ lines; breadth, 1 inch 6 lines.

612. ONYCHOPRION (*Haliplana*) PANAYENSIS (*anæstheta*)—(Panayan Tern). *Locality*—Australia and New Guinea. *Egg*—So similar in color to that of the Sooty Tern that the description of one will answer for both, but it is considerably smaller in size. Average length, 1 inch 9½ lines; breadth, 1 inch 3½ lines.

613. ANOUS STOLIDUS—(Noddy Tern). *Localily*—Australia. *Egg*—Considerable variation is found to exist in the markings of the eggs; the greater number are of a cream color, thinly sprinkled all over, except at the larger end, where they become more numerous and form an irregular zone, with blotches of chestnut red and dark brown, the latter color appearing as if beneath the surface of the shell; but examples occur in which the markings are more numerous, and almost equally distributed over the surface, while others are nearly pure white. Length, 2 inches; breadth, 1 inch 5 lines.

614. ANOUS MELANOPS—(Lesser Noddy). *Locality*—Australia and New Guinea. *Egg*—Pale stone or cream color, marked all over with large, irregular-shaped blotches of dull chestnut-red and dark brown, the latter appearing as if beneath the surface of the shell; the blotches are thinly dispersed, except at the larger end, where they are largest and more numerous. Length, 1 inch 9 lines; breadth, 1 inch 3¾ lines.

615. ANOUS LEUCOCAPILLAS—(White-capped Noddy). *Locality*—North Australia, Queensland, and New Guinea. * *Egg*—Large for the size of the bird, and hardly to be distinguished from that of the Sooty Tern or other Noddies. Ground-color warm pinkish white, blotched all over with irregular-sized markings of pinkish and purplish red, the latter color underlying. Some specimens are more thickly spotted, in others the markings appear smeared. Eggs from Mr. Layard's collection were taken

on Norfolk Island. Length, 2 inches 2 lines; breadth, 1 inch 5 lines.

616. PROCELSTERNA ALBIVITTA—(Grey Noddy). *Locality*—North Australia and New South Wales. *Egg*—Cream-colored, sparingly spotted, and dashed with reddish-brown and grey markings, the latter appearing to be beneath the surface. Length, 1 inch 7½ lines; breadth, 1 inch 3 lines.

DOUBLE STAINING OF VEGETABLE TISSUES.

BY M. J ALLAN.

[Read before the Collingwood Microscopical Society, October 11th, 1883].

There appeared in "Science Gossip," some time since, an article upon the Double Staining of Vegetable Tissues. Our President made some important modification of this method, read a paper before the Microscopical Society of Victoria, and exhibited some slides he had prepared, which were much admired and had the effect of stimulating me to try my hand at the work.

Having followed the method described in Dr. Porter's papers, and finding it to be slow, I resolved to try some experiments, with a view to simplify the process and save time, and with results that are most satisfactory. The best results of the former method can be obtained—and in some instances even better—with a saving of much time and trouble, fully one half. My method is as follows:—Make choice of the young wood, cutting thin and clean with a sharp razor or cutting instrument. The sections are then bleached in a solution made as follows:—Take two ounces of chloride of lime, and dissolve in one pint of water, and three ounces of washing soda and dissolve in one pint of water: add these together. When settled pour off the clear fluid and keep for use in a well-stoppered bottle, and in a dark place. The sections are to be kept in this solution untill bleached. This will require a greater or less time, according to the thickness of the sections and the density of the tissues. It is desirable not to keep the sections too long in the solution, lest the tissues become dissolved in parts: a little attention will show when the process is complete. The bleaching accomplished, the next thing will be to wash the sections in order to remove all the bleaching fluid; this will be best done by pouring off the fluid and washing several times in clean warm water; then place the section in the green dye, which is made thus:—Take of green aniline crystals five grains, methylated spirits one ounce, dissolve with a gentle heat, place the sections in enough of the dye to cover them well, and allow to remain for eight or ten hours: then remove and lightly wash in methylated spirits to free from superfluous dye. The sections are now put into the picric acid stain made as follows:—1. Carmine two grains, liquor ammoniæ half-teaspoonful. 2. Water two tea-spoonsfull, picric acid eight grains, methylated spirits two table-spoonsfull. Put the carmine into a two-ounce bottle, pour in the liquor ammoniæ, and shake occasionally untill the carmine is dissolved; then add the water; dissolve No. 2 in a test-tube with a gentle heat and add to No. 1; place the green-stained sections in this solution for ten minutes and they are ready for mounting. It will be well to avoid heat in mounting, as the colour is fugitive, although less so than when prepared by the old method, which has a mordant prescribed to fix the color. The use of the picric acid stain renders this unnecessary, as it fixes the colour effectually. If this paper be the means of assisting some of my fellow-workers with the microscope I shall feel amply repaid for any trouble I have taken.

A number of prepared sections were exhibited in illustration of the paper.

PROCEEDINGS OF SOCIETIES.

THE ROYAL SOCIETY OF VICTORIA.

The ordinary monthly meeting of this Society was held on Thursday evening. Mr. R. L. J. Ellery (President) occupied the chair, and there were about 40 members present.

Messrs. H. J. Tisdall and N. H. Gregson were elected members, and Mr. A. Schaefer was elected an associate.

Mr. R. E. Joseph read a paper on the subject of electric lighting for mines. He said that although at first sight the work of lighting a mine and its workings, both above and below, might appear to be a comparatively easy matter, yet a careful examination as to the conditions required for its successful maintenance in working order would show that it was not so. A system which might prove satisfactory in ordinary places might be extremely unsuitable for mining purposes. Most of our mines required artificial light on the surface-works all night, and for the underground workings both day and night with scarcely any cessation. Where gas was available it had been used to a certain extent for mining purposes. Oil and kerosene lamps required constant attention. Candles were easily managed, but the light they afforded was too feeble for surface work. Twelve months' experience of the working of the electric light at one of the Sandhurst mines has proved conclusively that the incandescent lamp was the most economical and reliable, and afforded a better illumination than any other available method. The dynamo machines were of a special type. Running constantly both day and night, the working parts required to be durable and the speed not too high. All the lights were enclosed in outer globes of thick glass, the dirt and dust of the mine necessitating a covering which could be handled roughly for cleaning. The whole connecting system was waterproof, and the lights would burn even though the mine should be flooded, and the conductors and lamps under water. Another important use for the electric light was at the brace, where the light was exposed to the weather. In the case of kerosene lamps, on a stormy night it was very difficult to keep them alight, and then only at the expense of several chimneys.

Mr. Ellery exhibited and explained a new form of dark field illumination micrometer for astronomical purposes, which was manufactured at the Melbourne observatory.

It was announced that a Committee had been appointed to inquire into the feasibility of the proposed amalgamation of the smaller scientific bodies of Melbourne with the Royal Society.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

The October meeting of this Club was held at the Royal Society's Hall on Monday evening, the 8th inst., there being a large attendance of members, and Mr. H. Watts, one of the Vice-Presidents, being in the chair.

Papers for the ensuing meeting were promised by Mr. D. Best on "A Trip to Berwick in search of Orchids," and Mr. D. Sullivan on "The Grampian Plants."

The Hon. Librarian acknowledged the receipt, through Mr. Bailey, of three years' reports of the Ballarat School of Mines, and from Mr. T. A. F. Leith his papers on the Parrots of Victoria, published in book form.

In response to an invitation from the Dandenong Agricultural and Horticultural Society, several members intimated their willingness to send exhibits to that Society's Show, to be held on November 9th.

Mr. A. H. S. Lucas moved, "That steps be taken to compile and publish lists of the Victorian species of Animals and Plants." This motion was, after some little discussion, duly carried.

A paper was read by Mr. T. Harrison, entitled "Life on an Old Pile," which recounted the numerous and varied forms of animal life the writer had observed on a pile recently thrown up on the beach.

Several members contributed notes on Natural History subjects: among these may be mentioned one by Mr. J. F. Bailey, relating the fact that he had caught a white Owl (*Strix flamea*) in the act of stealing chickens, the general idea being that they do not feed on birds. Mr. H. Kennon related the fact of a Wombat having been dug up in a garden in South Yarra, and Mr. D. Best read a short account of the method adopted by the natives of South America in inducing the growth of feathers of a different color to those which the bird had originally produced.

The following were the exhibits shown:—By Mr. J. F. Bailey, cube of Cornelian from basalt at Richmond, being the first specimen found in Victoria, also stuffed specimen of the delicate Owl (*Strix flamea*). By Mr. J. A. Lawrence, Shells. By Mr. F. G. A. Barnard, a pot of the Orchid *Caladenia carnea*, grown by exhibitor. By Mr. H. Kennon, amber containing ants from South Africa. By Mr. T. Worcester, seven species of bivalve Mollusca. By Mr. J. E. Dixon, large fish palate from Cheltenham fossil beds, also lava, etc., from Mount Leura, Camperdown. By Mr. A. J. North, the black-capped Sitella (*Sitella pileata*), with nest and eggs. By Mr. P. Dattari, Australian Buprestidæ. By Mr. C. French, Coleoptera from South-West Australia, also Orchid in flower (*Caladenia suaveolens*), found at Berwick on 6th inst. by Mr. D. Best, being, according to Baron von Mueller, the second instance of its being found in the colony, the former being by Mr. C. Walter in East Gipps Land.

The meeting terminated with the usual conversazione.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The Annual General Meeting of the Microscopical Society of Victoria was held on Thursday, 25th October, the President, Dr. Ralph, occupying the Chair.

The Hon. Secretary acknowledged receipt of a number of books and journals.

The following gentlemen were declared elected as officers for the ensuing year, there being no other nominations, namely—Dr. Ralph, President; the Rev. J. J. Halley, Vice-President; Mr. R. Haig, Treasurer; and Mr. W. M. Bale, Secretary. Messrs. W. W. Allen, F. Barnard, C. R. Blackett, and A. H. S. Lucas were elected to fill the vacancies on the Committee.

The Annual Report and Balance-Sheet were read by the Hon. Secretary, and adopted.

The President then read the Annual Address, in which he dealt especially with various methods of staining used in the elucidation of vegetable tissues, and noticed the recent investigations into the life-histories of the Bacteria.

THE LINNEAN SOCIETY OF NEW SOUTH WALES.

The monthly meeting of this Society was held on Wednesday evening, 26th September, 1883. Dr. James C. Cox. F.L.S., &c., in the chair.

Mr. W. H. Caldwell, Fellow of Caius College, Cambridge, was introduced as a visitor.

Arthur W. Stephens, Esq., of Sydney, and the Reverend Mr. Manning, of Waterloo, were duly elected members of the Society.

The receipt of a number of donations was announced.

The following papers were read:—

1. On a very dolichocephalic skull of an Australian aboriginal. By Baron N. de Miklouho Maclay. The cephalic index of this skull, which was found in the interior of Queensland, was only 58·9, calculated on the ophrio-occipital length, and 58·3, calculated by the glabello-occipital length, an index lower probably than that of any skull hitherto described. The skull was not a deformed one in the ordinary sense, but was a fair example of the so-called roof-shaped type of cranium.

2. On a fossil humerus. By Mr. C. W. De Vis. The humerus which Owen described as belonging to *Nototherium* is regarded by Mr. De Vis as being too nearly related in the arrangement of its muscular ridges to the fossorial humerus of *Phascolomys* to be referable to the former genus; and he puts forward the suggestion that a humerus recently obtained from the Darling Downs is the true arm-bone of *Nototherium*.

3. Notices of some undescribed species of Coleoptera from the Brisbane Museum. By William Macleay, F.L.S., &c. The species described are a few unnamed Coleoptera occurring in a large collection sent by Mr. De Vis to the author for identification. Their names are:—*Pamborus viridiaureus, Catascopus laticollis, Eutoma punctipenne, Carenum terræ-reginæ, C. ianthinum, C. De Visii, C. pusillum, Tibarisus robustus, Pœcilus lævis, Diphucephala hirtipennis, D. cærulea, D. latipennis*, and *Liparetrus convexiusculus*.

Baron MACLAY exhibited a sketch of a new species of *Heterodontus,* recently received at the Australian Museum from Japan, and pointed out the marked differences between it and *Heterodontus Phillippi,* the species with which the Japan fish had hitherto been confounded. He suggested for it the specific name of *japonicus,* and said that he would give a detailed description of it at the next meeting of the Society.

Mr. MACLEAY exhibited in illustration of Mr. De Vis's paper, casts of a gigantic humerus of a *Diprotodon,* and a smaller humerus, probably of *Nototherium.* The fossils were both from Darling Downs.

Mr. THOMAS WHITELEGGE exhibited under the microscope a living specimen of the species of *Fredericella,* one of the fresh-water Bryozoa which had not previously been noticed in New South Wales. It appeared to be identical with the European *F. sultana,* of Blumenbach.

Mr. WHITTELL exhibited specimens of a caterpillar of the fomily *Cossidæ* found at Mount Wingen, in which the original tissues of the animal had become replaced by the mycelium of a species of *Sphæria.*

Mr. LITTLEJOHN exhibited a large specimen of *Gastrotokeus biaculeatus* from Torres Straits.

Dr. Cox exhibited a large nodule of ironstone with a remarkably polished surface, and stated that large numbers of similar appearances were observed scattered over the surface of the ground in the Liverpool Plains district. They seemed to be hard concretionary nodules freed by the weathering away of the softer rock matrix in which they had been originally enclosed.

Dr. Cox also exhibited a remarkable blenny of the genus *Cristiceps* from Broken Bay.

Vol. III.—No. 12. Pres. by E. E. Pescott. December, 1883.

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PRICE—ONE SHILLING.

COLLINGWOOD:
J. WING, 33 WELLINGTON STR T.
1883.

Record of an undescribed Phajus from New Caledonia

By Baron von Mueller, K.C.M.G., M.D., Ph.D., F.R.S.

Phajus Robertsii.—Caulescent; leaves several, alternately scattered, long-stalked, ovate- or elongate-lanceolar, decurrent at the base, acuminated at the summit; raceme lateral, from near the lowest of the leaves, bearing about six flowers; bracts lanceolate-linear, reaching to near the summit of the calyx-tube; outer lobes of the calyx narrow-lanceolar, outside and inside pale brownish-yellow, somewhat reddish-streaked; inner lobes (petals) lanceolate-linear, acute, nearly as long as the outer and similarly colored; labial lobe (labellum) almost equalling the others in length, spurless, its basal prolongation completely adnate to the straight gynostemium, its main portion upwards membranous, ovate-orbicular in outline, undivided, apiculated, above the middle waved, towards the margin from pink to whitish, towards the middle and base marked with red pectinate streaks, towards the axis on both sides yellowish, along the axis raised by a callous and lightly-furrowed broad-linear plate, over the whole surface except near the margin villous-downy; gynostemium upwards dilated into an almost oval form, towards the summit somewhat membranous, distinctly extended beyond the anther, in front below the middle short-downy; anther outside much beset with very short hair. Stem jointed, 1–1½ foot high, bearing bract-like large pointed and tightly clasping scales towards the base. Rhizom creeping, emitting fibres and such also descending from the lower not pseudo-bulbous joints of the stem. Leaves 4–9 inches long, 1–2½ inches broad. Flower-stalk 3–4 inches long, beset with three lanceolate-cylindric bracts of ¾ 1½ inches length, supported at the base by an enlarged leaflike bract. Bracts about ⅔ of an inch long. Flowers resupinate through twisting of their stalklets. Outer calyx-lobes varying in length from somewhat less than one inch to fully 1½ inches, together with the inner dropping soon. Indication of lobules of the labellum only faint by notches, its surface-hair tender, colorless, intricate; adnate basal portion somewhat turgid, hardly ⅙ of an inch long, not turned outward, but corresponding to the spur-like prolongation of other congeners. This last-mentioned characteristic together with that of the extension of the gynostemium beyond the anther distinguishes this species from most others of the genus. Fruit drooping, obliquely narrow-ellipsoid, nearly 1½ inches long, rather deeply furrowed; it is freely produced in the conservatory; thus this plant needs not the aid of insects for fertilisation. The pollen-masses are not quite waxy, but somewhat granular, though well defined.

This lovely Orchid was discovered in New Caledonia by Consul Layard, C.M.G., who during a long and arduous official career maintained a love for natural history in all its branches. He noticed this plant on one locality only, from whence it came under the horticultural care of Mr. James Roberts, F.R.H.S., in whose conservatory and under whose skillful attention it has lately been blooming here. It was not mentioned by Professor Dr. G. Reichenbach in Garke's Linnæa XLI (1876) on the occasion, when the endemic Orchideæ of New Caledonia to the extent of 31 became described. We have, however, the well-known and somewhat variable *Phajus grandifolius* also from that island. Blume (Orchidées de l'archipel Indien p. B) remarks, that in *P. pauciflorus* the labellum-spur is sometimes almost absent, though normally this organ becomes well-developed; furthermore he has shown (Museum botanicum Lugdunense II, 181), that in the few Mascarene-species hitherto known the spur is always reduced to a mere gibbosity; therefore the new congener, just described, might also be referred to the section Gastrorchis (B. and H. gen. pl. III 513), should—as likely will be the case—the suppression of a free spur-like prolongation prove normal.

From *P. Amboinensis*, which has also its spur almost obliterated and its genital columella upwards dilated, our new species differs in smaller leaves, in shorter racemes, in neither white nor blunt calyx-lobes, in the not glabrous nor trilobuled nor simply yellow labellum and in the partly velvety gynostemium;—from *P. Graeffei* (G. Rchb. otia 52), which shows an approach by the very diminutive spur, *P. Robertsii* is separated by its acute calyx-lobes, the inner of which narrower, and by the not papillular-rough labellum and gynostemium;—the two latter organs are however hairy in *P. flavus*, but that species has the flowering stalk distinct from the leaves-bearing stem, irrespective of other differences.

Latour's and Bick's drawings of *P. callosus* and *P. flavus* show also resupinated flowers.

Oology of Australian Birds.

By A. J. Campbell.

[Read before the Field Naturalists' Club of Victoria 11th June, 1883.]

Part x.—Order—NATATORES.

Family—Procellaridæ.

617. Diomedea exulans (Wandering Albatross). *Locality*—New South Wales, Victoria, South and West Australia, and Tasmania. *Egg*—Pure white and of the ordinary shape. Length, $4\frac{3}{4}$ to 5 inches; breadth, $3\frac{1}{4}$ inches.

623. Phœbetria fuliginosa—(Sooty Albatross). *Locality*—New South Wales, Victoria, South and West Australia, and Tasmania. *Egg*—White. Length, $4\frac{3}{16}$ inches; breadth, 2 inches. (Layard.)

624. Ossifraga gigantea—(Giant Petrel). *Locality*—New South Wales, Victoria, South and West Australia, and Tasmania. *Egg*—Dirty white, rough. Length, $4\frac{1}{4}$ inches; breadth, $2\frac{11}{16}$ inches. (Layard.)

630. Æstrelata leucocephala (*Lessoni*)—(White-headed Petrel). *Locality*—Australia, except North, and Tasmania. * *Egg*—Pure white, nearly oval in shape, lower portion slightly compressed. Texture of shell, fine and somewhat thin. Length, $2\frac{1}{2}$ inches; breadth, $1\frac{5}{8}$ inches.

631. Æstrelata mollis—(Soft-plumage Petrel). *Locality*—East Coast of Australia (occasionally). * *Egg*—Pure white, in shape inclined to oval, apex rounded, smaller end pointed; although pitted all over with slight indentations the surface of the shell is smooth to the touch. Length, $2\frac{3}{8}$ inches; breadth, $1\frac{11}{16}$ inches.

For the addition to my collection of this and the foregoing exceeding rare Petrels' eggs I am indebted to Mr. Layard. The former was taken on Uen Island, the latter on Mount Moa, New Caledonia.

635. Puffinus nugax (*assimilis*)—(Allied Petrel). *Locality*—Queensland, New South Wales, Victoria, and South Australia. *Egg*—Snow white. Length, 2 inches; breadth, $1\frac{1}{4}$ inches.

636. Nectris (?) brevicaudus—(Short-tailed Petrel). *Locality*—Australia, except North and Tasmania. *Egg*—Snow-white, and large for the size of the bird. Length, $2\frac{3}{4}$ inches; breath, $1\frac{7}{8}$ inches.

637. Nectris (*Puffinus*) carneipes—(Fleshy-footed Petrel). *Locality*—West Australia and New Guinea. *Egg*—White, Length, $2\frac{7}{8}$ inches; breadth, nearly 2 inches.

Eggs marked thus * not described by Gould, or not previously described.

638. PUFFINUS SPHENURUS—(Wedge-tailed Petrel). *Locality*—Australia, except North. *Egg*—White. Length, $2\frac{3}{4}$ inches; breadth, $1\frac{3}{4}$ inches.

644. PRION VITTATUS—(Broad-billed Prion). *Locality*—Australia, except North, and Tasmania. *Egg*—Pure white, somewhat lengthened in form. Length, 2 inches; breadth, $1\frac{1}{2}$ inches.

645. PROCELLARIA NEREIS—(Grey-backed Storm Petrel). *Locality*—Australia, except North, and Tasmania. * *Egg*—White, somewhat oval, and, like most Petrels' eggs, of an oily smell. Length, 1 inch $4\frac{1}{2}$ lines; breadth, 1 inch $\frac{1}{2}$ line.

This and the succeeding Storm Petrels' eggs were taken in burrows on small islands off the Victoria coast.

647. FREGETTA MELANOGASTER—(Black-bellied Storm Petrel). *Locality*—Australia, except North, and Tasmania. * *Egg*—White. Length, 1 inch 6 lines; breadth, 1 inch 3 lines.

649. PELAGODROMA FREGATA—(White-faced Storm Petrel). *Locality*—Victoria, South and West Australia. *Egg*—Pure white. Length, 1 inch 6 lines; breadth, 1 inch $1\frac{1}{2}$ lines.

— . MAJAQUEUS PARKONSONI. *Locality*—East Coast of Australia. *Egg*—White. Length, 2 inches $10\frac{1}{4}$ lines; breadth, 2 inches. (Hutton.)

Family—PELECANDIÆ.

651. PELECANUS (*Catoptropeticanus*) CONSPICILLATUS—(Australian Pelican). *Locality*—Australia, Tasmania, and New Guinea. Dirty *Egg*—Yellowish-white; surface of shell, limey. Length, $3\frac{3}{4}$ inches; breadth $2\frac{3}{8}$ inches.

652. PHALACROCORAX (*Graculus*) NOVÆ-HOLLANDIÆ—(Australian Cormorant). *Locality*—Australia and Tasmania. *Egg*—Bluish-white, limey surface. Length, $2\frac{1}{2}$ inches; breadth, $1\frac{3}{4}$ inches.

653. PHALACROCORAX (*Hypoleucus*) VARIUS—(Pied Cormorant). *Locality*—Australia, except North. *Egg*—Bluish-white, with a light coating of lime. Length, $2\frac{1}{2}$ inches; breadth, $1\frac{1}{2}$ inches.

654. PHALACROCORAX (*Hypoleucus*) LEUCOGASTER—White-breasted Cormorant.) *Locality*—Australia, except North and West, and Tasmania. * *Egg*—Specimens taken from a nursery on Waterhouse Island, off the Tasmanian coast, were oval, coated with lime, and dimensions about $2\frac{3}{8}$ by $1\frac{1}{2}$ inches.

655. PHALACROCORAX (*Microcarbo*) MELANOLEUCUS—Little Cormorant). *Locality*—Australia, except North, and Tasmania. * *Egg*—Long oval, bluish white, and coated with lime. Length, 1 inch 11 lines; breadth, 1 inch 3 lines.

656. PHALACROCORAX (*Microcarbo*) STICTOCEPHALUS—Little Black Cormorant.) *Locality*—Australia, except North. * *Egg*

—Bluish-white, with a light coating of lime. Length, 2 inches 2 lines; breadth, 1 inch $5\frac{1}{2}$ lines.

657. Plotus novae-hollandiæ.—(New Holland Darter). *Locality*—Australia and New Guinea. *Egg*—Dirty-white, limey shell, lining membrane bluish-grey. Length, $2\frac{1}{2}$ inches; breadth, $1\frac{1}{2}$ inches.

658. Tachypetes (*Atagen*) aquila—(Great Frigate-bird). *Locality*—North Australia and New Guinea. * *Egg*—Rather oval, and both ends nearly alike in shape, pure chalky white, thin shell. Length, $2\frac{6}{8}$ inches; breadth, $1\frac{7}{8}$ inches.

659. Tachypetes (*Atagen*) minor—(Small Frigate-bird). *Locality*—North Australia, Queensland, and New Guinea. * *Egg*—Of similar character and shape to *T. aquila*. Length, $2\frac{3}{8}$ inches; breadth, $1\frac{5}{8}$ inches.

661. Sula australis (*serrator*)—(Australian Gannet). *Locality*—Australia and Tasmania. * *Egg*—Long in shape, shell bluish-white, coarse, and heavily coated with lime, which is frequently stained with dirt. Length, 3 inches; breadth, $1\frac{7}{8}$ inches.

662. Sula cyanops—(Masked Gannet). *Locality*—Australia, except West. *Egg*—Rather lengthened in form, dirty-white, stained or clouded all over with reddish-brown. Length, $2\frac{5}{8}$ inches; breadth, $1\frac{3}{4}$ inches

663. Sula fiber—(Brown Gannet). *Locality*—North Australia and New Guinea. *Egg*—White, and sometimes stained with dirt, thickly coated with lime, which on being scraped off reveals a bluish-white shell. The size varies considerably. Length in inches, $2\frac{8}{12}$ (largest), $2\frac{0}{24}$ (smallest), $2\frac{1}{2}$ (average); breadth in inches $1\frac{7}{12}$ (largest), $1\frac{15}{24}$ (smallest), $1\frac{3}{4}$ (average).

664. Sula (*Piscatrix*) piscator—(Red-legged Gannet). *Locality*—North Australia and New Guinea * *Egg*—An ellipse in shape, dirt-stained, white, coated with lime. Length, $2\frac{3}{4}$ inches; breadth, $2\frac{7}{8}$ inches.

Family—Phaetontidæ.

— . Phaeton (*Phœnicurus*) æthereus—(White-tailed Tropic-bird). *Locality*—North Australia, Queensland, and New Guinea. * *Egg*—Shell rough in texture, moderately marked with roundish spots and blotches of purplish brown on a whitish ground. Length, $2\frac{3}{4}$ inches; breadth, $1\frac{7}{8}$ inches.

660. Phaeton (*Phœnicurus*) rubricauda — Red-tailed Tropic-bird). *Locality*—North Australia, Queensland, New South Wales, and New Guinea. *Egg*—Ground-color, pinkish-grey, mottled or marbled (like a Falcon's egg) over the whole of the surface with purplish or pinkish red. Length, $2\frac{3}{4}$ inches; breadth, $1\frac{3}{4}$ inches.

Family—PODICIPIDÆ.

665. PODICEPS AUSTRALIS—(Australian Tippet Grebe). *Locality*—Australia, except North and West, and Tasmania. *Egg*—At first, greenish-white, then yellowish-brown. Length, nearly $2\frac{3}{8}$ inches; breadth, $1\frac{5}{8}$ inches. (Hutton).

666. PODICEPS (*Poliocephalus*) NESTOR—(Hoary-headed Grebe). *Locality*—Australia, except North and West, and Tasmania. * *Egg*—Dirty greenish white, surface lumpy and irregular. Length, 1 inch 7 lines; breadth, 1 inch 1 line.

667. PODICEPS (*Sylbeocyclus*) GULARIS (*Novæ Hollandiæ*)—(Black-throated Grebe). *Locality*—Australia, except West, and Tasmania. * *Egg*—Bluish-white, but often uniformly stained over with a shiny raw sienna color, and sometimes with umber. Length, 1 inch 5 lines; breadth, 1 inch.

Family—SPHENISCIDÆ.

669. EUDYPTULA MINOR—(Little Penguin). *Locality*—New South Wales, Victoria, South Australia, and Tasmania. *Egg*—White, dumpy in form, smaller end somewhat short. Length, 2 inches 3 lines; breadth, 1 inch 9 lines.

670. EUDYPTULA UNDINA.—(Fairy Penguin). *Locality*—Victoria and Tasmania. * *Egg*—White, similar in form to *E. minor*. Length, 2 inches $1\frac{1}{4}$ lines; breadth, 1 inch $7\frac{1}{4}$ lines.

ON THE HABITS OF CERTAIN SPIDERS.

BY THOMAS HARRISON.

[Read before the Field Naturalists' Club of Victoria 12th November, 1883.]

Some time since I had the honor to read before the Club a short paper on "Instinct as illustrated by the habits of Bees and Spiders." On the present occasion I shall deal especially with some of the habits of the last-named insects. It may happen that I have elsewhere related some of the facts that will be now brought forward. I, however, repeat them in the present instance, so that as complete a series of observations as possible may be brought under your notice, with a view of eliciting, if I can do so, an account of what has been noticed by other members of the Club with regard to these extraordinary spiders, weavers, burrowers, belligerents, and cannibals—for many of them unite all these proclivities in one and the same individual. Not a few of those of the softer sex, too, indulge in the same habit, their spouses being the victims. This is a species of divorce unheard of among civilized and even savage nations. Hindoos render it incumbent upon the wives of dead notabilities to burn themselves on the funeral pyres of their defunct lords and masters, and there is no doubt whatever but that some of the South Sea islanders occasionally convert their better halves into savory stews and hashes. Feminine spiders, however, improve upon the practice and reverse the process. This is an instance of the assertion of female rights,—and with a vengeance.

Some forty years since, a spider—I believe it was the same individual—used to visit, every autumn, an old and unused water-but standing at the rear of the house wherein I resided. It was an extraordinary specimen of the Arachnidean race, such as I have never seen since. The abdomen was about as thick as a slender straw, about $\frac{3}{8}$ of an inch in length, and almost perfectly cylindrical. The principal features of the creature, however, were its large mandibles and skeleton-like legs. The latter were knotted at the joints and of considerable length. It was one of my amusements to feed the occupant of the cask with flies and other insects: these, if small enough, were rushed upon and destroyed furiously. A wasp or a bee, however, was at once released and allowed to go about its business. Spiders of any other species were vigorously attacked. One day I placed a monstrous *Epeira diadema* on the web: the occupant thereof, without hesitation, cut some of the threads, and the intruder would have fallen into the water beneath only that he had the presence of mind to suspend himself by one of his own threads specially spun for the occasion. This thread, too, was cut by the holder of the fortalice, and the interloper found himself taking a most unwelcome bath. The conduct of the victor, so far, was remarkable, but it surprised me not a little to see him drop down suspended by a web where he hung directly over his antagonist for nearly two hours. By this time the unfortunate individual in the water was nearly drowned, and, being in that condition, was straightway attacked without mercy, drawn up into the web, and eaten.

The pugnacity of spiders is well known. Some years since, I had an immense *Epeira* (Australian) confined within a glass case or insectorium. I one day placed within the same receptacle a nest of leaves occupied by what seemed to be a small species of Tarantula. Going to the case next day I found that the two spiders had literally eaten each other. It was not a repetition of the Kilkenny cat episode, since it was the tails, or rather the abdomens, of both that had been devoured, yet with these necessary appendages removed the two combatants severally maintained their remarkably deadly grip of each other, holding on with their mandibles and such legs as had not been torn away.

I once placed some half a dozen of the pale buff-colored spiders found under the loose bark of the Eucalyptus, subsequently introducing a bull-dog ant. These spiders have large and pointed mandibles, but the abdomen is very soft. The ant took advantage of the circumstance, avoided the former and attacked the latter, and within a few minutes all the spiders present, save one, a very large specimen, were *in extremis.* I waited with some anxiety to see the fight, which would in all probability leave the ant master of the field. The last encounter, however, resulted quite differently from what was anticipated. The spider did not face, but retreated before, his adversary. Doing so, however, he played a sort of Parthian trick, throwing out not an arrow but some half a dozen threads of web. These adhered to and entrammeled the ant as in a sort of net, and on his turning to free himself the spider rushed forward biting his opponent vigorously on the petiole, a portion of the body joining the thorax with the abdomen. The ant was, as may be supposed, altogether disabled: victory had been snatched away from him, not by strength or valour, but simply by stratagem.

Spiders are often exceedingly brave, and are remarkable for their perseverance. Still these qualities do not always manifest themselves. If a large Tarantula is placed upon an ant-hill, he generally curls up his legs, and surrenders to his fate as soon as attacked. He acts in a somewhat similar way if assailed by one of the large black and orange-banded wasps or hornets. In this case submission seems to be inevitable. The wasp always attacks the Tarantula on the back, holding on and stinging vigorously. As a matter of course, neither mandibles nor web could be brought to bear upon an assailant so situated, whilst escape from an insect provided with wings, and of extraordinary activity, was equally out of the question. It was evidently more dignified to die like Cæsar than to fly ignominiously, or struggle against such odds with no chance whatever of a final victory, or even a cleverly-managed retreat.

It is not all spiders, however, that find themselves thus powerless in the midst of their foes the ants. Several species of the mygalæ will walk boldly over an ant-hill which they may be placed upon, nipping and disabling any troublesome assailants as they proceed.

The webs of spiders are exceedingly interesting objects. The polygonal and irregular shape adopted by the *Epeira*, however, is not always adhered to. Many spiders arrange the threads of their webs in an irregular manner, which makes the structure resemble the rigging of a full-rigged ship. In other cases the web is not suspended but formed upon some flat surface, such as a door or a wall. The threads are evidently covered with some sticky substance, which retains any unfortunate insect settling upon them. In some instances all the threads do not radiate from a centre, or, at any rate, only a few of them do so, the spaces between the main and radiating lines being occupied by short ones, so that the net-work is formed of a series of squares, the entire web resembling a Greek bordering.

A spider very common in dwelling-houses where the broom is not used has some very peculiar habits. If touched by the finger or the point of a pencil they immediately commence to swing themselves violently to and fro, or in a kind of circle, continuing the motion for one or two minutes. The late Mr. Darwin supposes that they do this to render themselves invisible. They are not so, however, to human eyes; the movement on the other hand, rather attracts the attention of the observer.

This same kind of spider, too, never attacks a victim until it has been duly wound round with a thread of web. The spider, in order to do this, pulls out the web with its hind legs, the motion adopted being like that of a sailor who is paying out a rope. The spiders who construct their webs on doors and walls also wind a thread round their prey before attacking it. To do this they affix the end of the thread at some particular point, and wind up the captive by running quickly round the outside of the web.

If one of the vibrating spiders—if I may be allowed to use the term—is placed in the bottom of an inverted wine-glass, standing on a plate filled with water, on finding that escape is impossible, the prisoner at once commences to pay out his web until the further end of the same adheres to some distant object. The other end of the web is then nipped off and affixed to the glass. A sort of aerial suspension-bridge is thus formed, by aid of which the spider generally reaches a place of safety.

I have several times thrown one of the buff-colored spiders found under the loose bark of the Eucalyptus into the Yarra, or an adjacent pool of water. In this case the spider would have been speedily devoured only that, erecting the abdomen, it threw out a number of threads, which, being wafted by the wind, adhered to some tree or plant on shore: this being done the spider promptly hauled itself to dry land.

I was, some twenty years since, checking some documents at the old Registrar-General's Office in Bourke-street with Mr. Gibbs, the present Registrar of Titles. As that gentleman was called away the work was stopped for about a quarter of an hour, when I noticed a small spider running across a sheet of paper lying on the table. Wishing to examine it with a lens I drew a wide circle of ink around it, so that escape was out of the question. Soon afterwards Mr. Gibbs returned. I pointed out the spider to him, and in a few minutes he exclaimed, "Look where that spider is going." Sure enough the spider was hauling itself up by a thread which, in some mysterious way, it had succeeded in affixing to the ceiling of the room, about ten feet in height. So exactly perpendicular over the spider was the spot to which the thread was attached that, on cutting it with a pair of wetted scissors, the spider fell back into the circle, which was not four inches in diameter.

The Gossamer Spider, although wingless, is known to fly by throwing out a web that acts as a kind of balloon. I have seldom seen more than one of these species at a time, and then after long intervals. It happened, however, in the autumn season, about twelve years since, that I found the wooden and earth causeways leading across the Emerald Hill flats thronged with Gossamers. They must have numbered tens of thousands, and, climbing the posts, they rested on the top rail, where, erecting their abdomens, they ejected a web, floating by means of which they were wafted away.

On one occasion, about eight years ago, I was passing down Swanston-street while a gentle North wind was blowing, when my attention was arrested by a swarm of flies (over a hundred) who were hovering about and keeping almost all together. Watching them for some moments I saw what I thought was one of their number alight on the pavement. It proved, however, to be a Gossamer. In a few seconds it took flight again, the flies following until their arrival at the fence of the Public Library grounds, when the eddying current caused the spider to rise,—and, the flies accompanying him, I saw no more of this singular sight. Nothing of the kind ever previously came under my notice, nor have I seen anything like it since. It is by no means an uncommon thing for small birds to fly round and tantalise a sparrow-hawk, but it seems strange if flies are possessed of a similar instinct.

INAUGURATION OF A FIELD NATURASISTS' CLUB IN ADELAIDE, SOUTH AUSTRALIA.

[From the "S. A. Register," Nov. 8, 1883.]

On Wednesday night a lecture was delivered to a large and interested audience in the Banqueting-room of the Town Hall, under the auspices of the Royal Society, on the objects of the Field Naturalists' Section of the Royal Society. The chair was occupied by Mr. H. T. Whittell, M.D., who, on introducing the lecturer, said that for some time a desire had existed among studiously-disposed people to take up the study of the science of Natural History from a more elementary point than that pursued by the Royal Society, and the establishment of this section was the outcome of that wish. The lecture was intended mainly for the members of the various Young Men's Societies in and around Adelaide, who had been specially invited to be present. Professor Tate, who, as every one knew, was a hard-working man in his profession, had generously undertaken to lend his valuable assistance to the promotion of a scheme which was intended to particularly benefit the members of such societies who were anxious to engage in the study of the natural history of their colony.

Professor TATE began by asking the audience "Have you a hobby?" and went on to explain that by a hobby he meant some pursuit to which one's moments of leisure were devoted, something in which delight was taken after the toils and labors of the day were over. Young Men's Societies fostered many of the good "hobbies;" but there was one which they had not developed, and that meeting was intended to inaugurate a system of instruction new to this country, and one which did not interfere with existing institutions. The hobby to which he alluded was cheap, interesting, and easy to acquire—it was the out-door study of Nature. (Applause.) Intellectually, the study of Natural History expanded and helped the mental faculties; it begot habits of order and close observation. He could refer to many interesting examples to prove that the study of Nature was of substantial practical value. Neither the social position nor the barriers of caste could arrest or retard advancement in the pathway of Science. In a cotton-mill in Lancashire he had met a philosopher in humble life, who, under most difficult circumstances, had made himself practically and thoroughly acquainted with the geology of the district in which he resided, and who, by his own unaided efforts, raised himself to a high position in the ranks of Science, and earned for himself distinction as the discoverer of new and important facts. Societies for the promotion and encouragement of the out-door study of Natural History, usually denominated Field Clubs, had been very popular in the United Kingdom for the last quarter of a century. The first Field Club established was that in Berwickshire, founded in 1831, in the pleasant reunions of which, some twenty years later, he had the good fortune to be a participator — though in the humble capacity of bag and hammer carrier to his uncle. (Laughter.) The lecturer said he had founded one of the most flourishing Field Clubs in the United Kingdom, established in Belfast in 1863, now in its 21st year; and from his early connection with it he claimed to have some knowledge of organization, and of the methods of keeping alive the interest in the working of a Club. Moreover, they had another gentleman equally competent in these directions. He referred to Mr. W. E. Pickles, who was the prime mover in this attempt to found a Field Club in Adelaide, and who was an old member of one of the largest Field Clubs in England. The Rev. W. Howchin, too, was a geologist of high repute, and a member of the Tyneside Club—a Club which had brought out so many distinguished naturalists. With so much organizing power—which, however, by no means exhausted the resources of the Royal Society—the successful establishment of the section might be regarded as assured. The Royal Society did not seek pecuniary profit by its patronage, but offered to the members of the section various privileges, which as an independent Society they could not hope to secure. The section would consist of Fellows and Associates of the Royal Society, and any of the outside public, ladies and gentlemen, who chose to offer themselves as members and pay an annual subscription of five shillings; and every encouragement would be offered to the section by the Royal Society to place itself on a satisfactory footing. (Applause). The Professor then proceeded to indicate the object of the Association, which he stated was the practical study of Natural History as an intellectual recreation, by means of excursions at regular intervals during the proper season, and by evening meetings for the purpose of instruction through informal lectures and demonstrations. Professor Tate then explained how the section proposed to carry on its work, and for the purposes of illustration took his hearers on an imaginary excursion to Hallet's Cove, and shewed the whole details of the expedition from start to finish. The lecturer, in conclusion, stated that it was by no means desired to exclude from the ranks of the section those who might seek in these excursions solely pleasant companionship and agreeable change. Ladies were especially welcome—their company was desired, and their presence would never impede the purpose that the few ardent students might have set before themselves. (Loud applause.) The evening lectures should be conversational rather than of the customary formal character, and should deal with subjects alike entertaining and interesting. At the evening meetings a chief feature would be the microscope. He hoped that those present would do their utmost to promote the study of Natural History.

Mr. W. H. Selway, jun., proposed a vote of thanks to the Professor for his lecture, and, in stating that he was a representative of the Young Men's Society, remarked that he had anticipated an abstrusely scientific lecture, but had been agreeably surprised in finding that the lecturer had dealt with his subject in such a pleasant conversational way. The proposition, after having been seconded and supported, was carried by acclamation, and a vote of thanks to the Chairman terminated the proceedings.

Dr. Whittell announced that those who were desirous of being enrolled as foundation members should forward their names to the Hon. Secretary, Mr. W. E. Pickles, F.R.M.S.

PROCEEDINGS OF SOCIETIES.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

The November meeting of this Club was held on the 12th inst. There was a fair attendance of members, and Mr. T. A. F. Leith, one of the vice-presidents, occupied the chair. Two ladies and several gentlemen were proposed for election as members at the next meeting, and the Rev. D. Woolls and Mr. R. D. Fitzgerald were proposed as honorary members.

Attention was called to the forthcoming Social Evening, on the 26th inst., and a full attendance of members invited.

The hon. Librarian acknowledged the receipt from Baron von Mueller of "The Geological Survey of Victoria."

A paper was read by Mr. T. A. F. Leith, on "Anecdotes of the Phocidæ or Seal Family," in which he related several of his own and others' experiences relative to the peculiar attractiveness music has for Seals, and also of their singular foresight in apprehending danger. He also described the various kinds of Seals and their habitats.

A paper on "A Microscopic Examination of the Silt of the River Yarra" was contributed and read by Mr. H. Watts. He stated that the silt is of two descriptions—one clayey in character, and the other of a more or less chalky nature. In the latter Foraminifera are to be found, but he had detected only two species, viz., *Cristellaria* sp. and *Rotalia* sp. Of Diatomaceæ he had found *Actinocyclus Barklyi* and *Campylodiscus* sp., the former having been only twice previously found near Melbourne, viz., by Dr. Coates, at South Yarra, and then considered a new species, and afterwards when digging the drain at the West Melbourne Swamp.

Mr. Harrison read some notes on "The habits of certain Spiders," in which he related his further experience of the instinct displayed by these interesting creatures, especially in their often successful attempts to escape from their enemies when attacked. Considerable discussion took place on the paper, also as to whether any of the Victorian species were poisonous, but only one appeared to be known, viz., a small black one, with a red band on the abdomen, generally found under logs, stones, etc., and several instances were related of serious injury inflicted by it.

The second part of a paper on "The Victorian Orchids and their habitats" was read by Mr. C. French. This described the genera Sarchochilus, Dipodium, Gastrodia, Spiranthes, Calochilus, and portion of Thelymitra.

Mr. A. J. Campbell read a very interesting paper entitled, "A month amongst the Tasmanian Birds." During his month's holiday he had succeeded in identifying 75 species, and was fortunate enough to secure a specimen of *Acanthiza magna*, being the second specimen which has been taken, the first being the one from which Gould took his description over twenty years ago.

The following exhibits were shown:—By Mr. A. J. Campbell, birds and eggs, peculiar to Tasmania, secured during his recent trip, including *Acanthiza magna*; by Mr. J. E. Dixon, fossils from the Eocene beds at Mount Martha; by Mr. T. A. F. Leith, tusks of Walrus (*Trichecus Rosinaus*), the Azure Kingfisher (*Alcyone Azurea*), the Sacred Kingfisher, male and female (*Halcyon sanctus*), and the Little Kingfisher from the Amazon; by Mr. J. F. Bailey, a fine box of the beautiful Orchid *Diuris elongatus*, in flower; by Mr. C. French, Australian and Exotic Insects; by Mr. D. Best, a drawer of Australian Buprestis Beetles; by Mr. H. Watts, Foraminifera and Diatoms from the silt of the river Yarra; by Messrs. F. G. A. Barnard and J. E. Prince, Coleoptera collected during Club excursion at Dandenong.

The usual conversazione terminated the proceedings.

THE MICROSCOPICAL SOCIETY OF VICTORIA.

The usual monthly meeting of the Microscopical Society of Victoria was held on the 29th November, the President, Dr. Ralph, occupying the Chair.

The Hon. Secretary acknowledged the receipt of a number of books, journals, and microscopic objects.

Mr. F. Barnard was nominated as a Vice-President of the Society.

Mr. A. H. S. Lucas gave an account of the characters used in the optical detection of the mineral constituents of rocks, and exhibited in illustration a series of carefully-executed drawings, and a large number of specimens, both in the rough state and in the form of mounted sections.

THE ROYAL SOCIETY OF TASMANIA.

The monthly evening meeting of this Society was held on Monday, 8th October, Mr. C. H. Grant in the chair.

The hon. Secretary (Mr. Barnard) brought forward a number of returns for the month of September.

A variety of presentations were made to the museum.

Mr. Stephens exhibited some fine specimens of precious opal from the borders of Queensland and New South Wales, found chiefly in very hard boulders derived from a volcanic formation.

Mr. R. M. Johnston read a paper entitled, "Some further additions to the list of the known fishes of Tasmania."

In introducing this paper Mr. Johnston remarked that the two species now described by him (*Chilodactylus carponemus*, Parkinson, the "Old Man Perch," and *Sphyræna Nova-Hollandiæ*, Gunther, "The Port Phillip Pike") were not embraced in his original catalogue of the fishes of Tasmania (1882). Dr. Richardson, nearly forty years ago, referred to the first mentioned species as inhabiting the waters in the neighbourhood of Port Arthur, but as the original description was defective, and as there was no record of its capture in Tasmanian waters since that time, it was inferred that the reference to Tasmania was erroneous. The fortunate capture of two fine specimens, one of them 29 inches in length, in 26 fathoms of water, 14 miles off Tasman Island, now satisfactorily disposes of all doubt, and enables us to amend the defects of the original description, which was taken from a specimen preserved in spirits. The other species described has not hitherto been recorded as inhabiting Tasmanian waters, although common enough in those of the neighbourhood of the Victorian coast. The specimen now described was captured in Sandy Bay. It is allied to the common "Tasmanian Jack, or Pike," but is rounder, more slender, and elongate. The list of known Tasmanian fishes by these additions is raised to 197 species. Mr. Johnston also, in the course of his remarks, suggested the desirableness of having a good representation of our fishes, suitably preserved, and exhibited in the Society's Museum.

Mr. Stephens gave some particulars of the alterations now nearly completed in the large room upstairs, and remarked that Mr. Robin would soon find plenty of employment for volunteers able and willing to help in arranging the specimens in the new cases. After quoting from the report of a debate in Parliament some remarks on the official duties of the Chief Inspector of Schools, and his supposed devotion to the Royal Society, which caused some amusement, he went on to say that he regretted very much that the want of spare time had of late years prevented him from doing anything worth mentioning for the Royal Society, but he hoped that the good work already being done by other members would be rather increased than lessened in the future.

The proceedings terminated with a vote of thanks to Mr. Johnston for his paper, and to the donors of presentations.

NOTICE TO SUBSCRIBERS AND OTHERS.

It is intended to discontinue the publication of the Southern Science Record with this month (December, 1883). Arrangements are, however, in progress with a view to a continuation of the work in the promotion of which we have hitherto devoted so much of our means and time. In January, 1885, we propose to publish a new series, under the style and title of "The Southern Naturalist and Journal of Science."

Notwithstanding that—owing to the expense of production—our enterprise in the past has resulted in pecuniary loss, we have resolved to continue the publication of our journal, in the interests of Science and in the confident anticipation of educating the public up to a practical and efficient support of our efforts to provide a thoroughly comprehensive record of the progress of Natural Science throughout Australasia.

We cannot conclude this notice without placing on record the valuable aid—both literary and financial—which has always been readily extended to us by the Field Naturalists' Club of Victoria, and trust that their action will in the future be emulated by the kindred associations of this and neighboring colonies.

We invite new subscribers to rally to our support. We also invite useful papers for the forthcoming issue of the new series of our journal.

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