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THE

VICTORIAN NATURALIST:

THE JOURNAL & MAGAZINE

OF THE

Field Naturalists' Club of Victoria.

VOL. IV.

MAY, 1887, TO APRIL, 1888.

The Author of each Article is responsible for the facts and opinions he records.

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ERRATA.

Note.—No. 1 (May, 1887) should be paged 1 to 16 instead of 173 to 188.

Page 3—for "F. Fimbriatus" read "E. Fimbriatus."

Page 27, line 23—for "Species of Planets" read "Special Planets."

THE

Victorian Naturalist.

Vol. IV.—No. 1. MAY, 1887. No. 41.

THE FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 4th April, 1887.

The president, the Rev. J. J. Halley, occupied the chair, and about fifty-five members and visitors were present.

A letter was read from his Excellency the Governor, thanking the Club for invitation to the annual *conversazione*, and hoping to be able to be present.

The hon. secretary reported that during the month a deputation had waited upon the Acting-Chief Secretary with reference to an annual grant in aid of illustrating the *Naturalist*, and had been favourably received, and that the request would receive due consideration.

The hon. librarian reported the receipt of the following donations to the Club's library:—"The Myoporinous Plants of Australia," Part II., by Baron von Mueller, and "The Key to the System of Victorian Plants," Part II., by Baron von Mueller, from the Government; "Proceedings of Royal Society of Victoria," Vol. XXII., 1885, from society; papers "On the Sound Organs of the Green Cicada," and "On Sections of the Delta of the Yarra at Fisherman's Bend Cutting," by A. H. S. Lucas, M.A., from the author; three papers "On New and Fossil Mollusca of South Australia," by Prof. Tate, F.G.S., from the author; "Annual Report of Ballarat School of Mines," for 1886, from school; "Journal of New York Microscopical Society," July and Nov., 1886, from society; "Journal of Pharmacy," March, 1887.

The hon. secretary read a short account of the excursion to Bunyip on Saturday, 19th March, which was much enjoyed by the members taking part, though few specimens of more than ordinary interest were obtained. Ornithology, entomology, and botany each had its followers. Among the birds obtained were specimens of the bell-bird of Gippsland. The entomologists obtained several specimens of orthopterous insects, mostly belonging to the family Phasmidae; a fine longicorn beetle, *Demonassa sp.*, was also captured.

Flowering plants were somewhat scarce, as might be expected, whilst amongst the ferns noticed was *Pteris tremula.*

Messrs. Charles Brittlebank and H. L. Thompson were elected members of the Club.

The hon. secretary announced that at the annual *conversazione,* to be held on the 28th instant, lecturettes would be given by Messrs. L. Hart and O. A. Sayce.

Messrs. P. H. Anderson and J. E. Prince were elected to audit the accounts of the current year, and nominations were received for office-bearers for the year 1887-88.

PAPERS READ.

1. By Mr. S. H. Wintle, F.L.S., "Observations on the Geology of Melbourne and Suburbs." Part I. This paper was principally introductory, and gave a general idea of the origin of the Australian continent.

2. By Mr. W. A. Sayer (communicated by Mr. C. French, F.L.S.), on "The first ascent of Mount Bellenden-Ker, North Queensland," in which he describes a visit to the falls on the Barron River, which are one of the sights of the world. The fall is one of about 500 feet, and the volume of water is so great that the fall may be heard at a distance of ten miles. He then gave a graphic account of his attempts to reach the top of the Bellenden-Ker range, which were at last crowned with success. Though this range was discovered and named by Flinders in 1803, it had never before been scaled by a European, and the writer, who has had considerable experience in different parts of the tropics, said that for density the jungle on this mountain exceeded anything he had seen.

3. By Mr. C. French, F.L.S., "The Orchids of Victoria," Part XII. This was the concluding paper of the series, and described and exhibited dried specimens of two species of each of the genera Chiloglottis and Glossodia.

The Cryptogamic botanical section also held a meeting, when Mr. F. Reader read a note on the fungus *Hirneola polytricha,* which is edible, and forms an article of export from New Zealand. This fungus also grows in Victoria and other parts of Australia.

The following were the principal exhibits:—By Miss F. Campbell, *Melaleuca nodosa,* from the Whipstick, Bendigo, also *Lecedea Victoriæ, Nephromium sub-lævigatum,* and *Ramalina miniuscula,* unrecorded Victorian lichens; by Mr. E. M. Cornwall, specimens of the oils from the mutton-bird, stingaree-ray, shark, porpoise, and dog-fish, obtained at Westernport; by Mme. A. Friederich, a bush bouquet from the Bunyip excursion; by Mr. C. French, coleoptera, pair of *Mecycognathu*

Damelii, a rare carabus from Cape York, pair of *Calodema regalis*, a rare buprestid from N. Queensland, and *Stigmodera Fortunii*, and *S. vitticollis*, rare Victorian buprestids, also four species of orchids in illustration of paper; by Mr. French, jun., eggs of lyre-bird, silver gull, Mortier's tribonyx, and the black-breasted porphyrio; by Master H. Hill, Victorian insects; by Mr. H. Kennon, conglomerates from Bacchus Marsh and sandstone from Warragul; by Mr. G. A. Keartland, a fine hawk moth, *Chœrocampa* sp., also specimens of Gippsland bell-bird from Bunyip; by Mr. J. N. M'Kibbin, the orchids, *Pterostylis acuminata*, and *P. aphylla*, in bloom; by Mr. F. Reader, calabashes or bottle gourds, and fungus in illustration of paper; and by Mr. H. Watts, micro-fungi.

After the usual *conversazione* the meeting terminated.

ORCHIDEÆ OF VICTORIA.

By C. French, F.L.S., Department of Government Botanist, Melbourne.

Part II.

F. Fimbriatus, (F. von Mueller.)

Glabrous or nearly so, 6 inches to 1 foot high. Leaf sometimes very small and rarely above 1 inch long, ovate-lanceolate or oblong. Darkish green, with purple stripes. Flowers 2 or 3, sometimes 5, rather distant on erect pedicels of ½ to ¾ inch, of a pale brownish yellow. Dorsal sepal oblong-lanceolate. Labellum half as long as the sepals and broader than long, truncate and fringed at the broad end, the disk without any calli.

This somewhat obscure little plant is one in which our club should take special interest, it having been found for the first time in the colony by a member of the club on the occasion of its first excursion, when it was observed in flower growing on the sand-hills behind the Red-Bluff Hotel at Cheltenhan. It is a singular fact that this species had been found but once previously, and then on the Swan-River, West Australia, by Drummond. Baron von Mueller claims to have seen the leaves many years ago on the heath land around Brighton, but the honour of first finding it in flower in Victoria certainly belongs to the Field Naturalists' Club. This orchid you will find in flower in April and in May, when it dies down, the pretty and very distinctly marked leaves remaining for many months above ground. It is easily overlooked when in flower as the dull yellow is somewhat difficult to detect amongst the

dense scrub in which it grows. It cannot be mistaken for any other species, approaching nearer in shape to *Caladenia Menziesii* than to any of our native species. To grow it well, lift the tubers late in the season—say in August—plant in sandy soil, drain well and water freely as soon as the leaves appear above ground. This species is only useful to complete a collection. *Caladenia fimbriata*, *Leptoceras fimbriata*, and *L. pectinata* are identical with this species. Found also in South and West Australia.

Lyperanthus, (R. Brown.)

Dorsal sepal broad, concave, erect or incurved over the column; lateral sepals and petals narrow, erect or spreading, all nearly equal in length. Labellum shorter than the sepals, with a broad erect claw. Column erect or incurved, not winged. Anther terminal, erect, 2-celled, pollen masses granular. A terrestrial sp. with oblong underground tubers. Scapes or stems 2 or more flowered. Mostly with one radical leaf, dark-green, with purplish dots. Bracts usually rather large and leaf-like.

L. nigricans, (R. Brown.)

Stems from a few inches to nearly 1 foot high, rather stout. Radical leaf rather broadly ovate-cordate. Dorsal sepal broad, concave, much incurved, acuminate, 7 to 8 lines long. Column incurved, not winged.

This is one of the most beautiful as well as one of the most singular and distinct of our native orchids, the large fleshy leaves, sometimes 4 or 5 inches across, lying nearly flat on the sandy hills around Brighton, Cheltenham, and throughout the colony, at least near the coast. This plant should be looked for on burnt heath land or in bare patches, it being seldom, if ever, found where the scrub is dense. Such, at least, is my own experience. The flowers, of which there are sometimes 5, are of a pinkish purple, with darker purple markings, the spikes standing very erect above the leaves, and the finest flowers are generally on those plants which have the worst leaves. In the damp soil near the ti-tree scrubs the leaves of this sp. grow very rank and large, although I have never seen one in flower in such positions, the most elevated and exposed places being their favourite haunts. This is a sp. which is easily recognised from all other Victorian orchids, so a lengthy description will be perhaps unnecessary. To grow it well lift very carefully, as the tubers are rather deep in the soil, and are easily detached from the plant; plant several tubers in a shallow pot or pan, in sandy, heathy soil; drain well, and water very sparingly. It is somewhat difficult of cultivation. Flowers from October till end of

November, and sometimes later. *Caladenia nigricans* is a synonym of this sp. Found also in N.S. Wales, S. and W. Australia, and Tasmania. The plant is of little use for the herbarium, as it dries perfectly black, and quite unlike what it is when in a living state.

L. Burnetti, (F. von Mueller.)

Flowering stems 2in. to 4in. high, with several sheathing empty scales, the lower ones short and imbricate. Leaf ovate-lanceolate, about an inch long, but disappearing before the flowering. Sepals and petals about 5 lines long. Flowers 1 to 3, erect but much incurved. Labellum very broad, and sometimes slightly fringed. Column wings like those of a *Caladenia*.

This curious and rare plant was first found in Victoria by Mr. W. H. Wooster, at Narrewarren, near Berwick, to whom I am indebted for the specimen here exhibited. Mr. Wooster informs me that it was found in a very secluded spot, I think about September or October. I have never been so fortunate as to find a specimen myself, and I can only hope that it will fall to the lot of one of our members to find another specimen. The flowers of the specimen which I have are of a brownish yellow or white, and there are 3 on the stem; the tubers seem rather small, although the whole plant is of a somewhat dwarf habit. Its present rarity would prevent its being cultivated in any quantity; I should, however, advise leaf-soil to grow it in, with some sand, and a little shade. *Caladenia cuneata* and *Burnettia cuneata* are identical with this sp. Found also in Tasmania.

Cyrtostylis, (R. Brown.)

Dorsal sepal linear or linear-lanceolate, erect and incurved, concave. Lateral sepals and petals very narrow. Labellum with a short claw, flat, undivided, entire, with 2 calli at the base. Column elongated, incurved, winged upwards. Anther terminal, erect, 2 celled; pollen masses granular. Leaf solitary, at the base of the stem. Scape without any empty bract, usually bearing a raceme of several flowers.

C. reniformis, (R. Brown.)

A small, delicate, glabrous plant. Leaf orbicular-cordate or reniform, radical, sessile. Scape from under two inches high, with four or five pale red flowers. Dorsal sepal, four to five lines long. Labellum nearly as long as the dorsal sepal. Column slender.

This pretty and well-known little orchid is a general favourite amongst collectors. Its easy growth, and other peculiarities, cause it to be much sought after. In the shady ti-tree scrubs

lining the sea-coast at Brighton, Cheltenham, and elsewhere—also far inland, in open forest country—this species is to be found in great numbers; its bright green leaf and pretty reddish transparent flowers being sure to attract the attention of all lovers of our native orchids. It has always been my opinion that there are two species of this plant, the leaf of the one here described being of a light-green, whilst the one which I suppose to be different has a dark glaucous-green leaf much wrinkled, and the whole plant, although often growing in company with the common form, seems of a much more dwarfed and robust nature than *C. reniformis*. The Baron, however, says they are one and the same plant; still I think the matter requires further investigation. To grow Cyrtostylis well use the top soil from under the ti-tree at Brighton Beach, place a number of tubers in a shallow pot or pan, water well, and keep shaded from the direct rays of the sun. This species flowers from August to November, and is found throughout the colony generally. *Caladenia reniformis* is synonymous with this species. Found also in Queensland, New South Wales, South and West Australia, and in Tasmania.

PART 12—*(Conclusion).*

CHILOGLOTTIS, (R. Brown.)

Dorsal sepal erect, incurved, concave, contracted at the base; lateral sepals narrow—linear or terete; petals lanceolate-falcate. Labellum on a very short claw, undivided. Column elongated, incurved, winged. Anther terminal erect, 2 celled; pollen masses granular. Leaves 2, radical or nearly so, scape 1, flowered.

C. GUNNI, (Lindley.)

Leaves nearly 2 inches long, with a somewhat prominent venation. Scape usually short, but in some specimens 7 to 8 inches long. Dorsal sepal 8 to 9 lines long, obvate-oblong. Lateral sepals narrow-linear. Labellum on a very short claw, broadly ovate, calli all thick, either crowded along the centre of the disk or more or less arranged in 2 rows without any of the slender-linear-clavate ones of C. diphylla.

This curious sp., which is sometimes found perched up in the crevices of Tree-Ferns, is one which is not at all uncommon in some parts of Victoria, although somewhat rare near Melbourne. It may be easily recognised from the description given above, also by the singular greenish-brown colour of the flowers, and the somewhat small spherical tubers. In the grassy forest land in the Bullarook district this plant may be found in large patches, the specimens when found in such exposed situations

being very sturdy, both leaves and flowers, whilst those which are found on the Tree-Ferns are mostly long, flabby, and very brittle. A very pretty yellow form was found by my son at Bolwarra, Bullarook, and the tubers of these are, I believe, in the collection which I formed in pots whilst in the Melbourne Botanical Gardens. This is a very pretty sp. and is of easy cultivation, thriving well in pots or pans (the latter preferred), using leaf-soil well drained for the purpose. Flowers in the summer months about November and December. *Caladenia gunni* of Reichenbach is synonymous with this sp. Found also in Tasmania.

C. Diphylla, (R. Brown.)

Radical leaves 2, more pointed than in the former species. Scape from 3 to 6 inches high. Labellum more or less obovate, obtuse or acute. Dorsal sepal cuneate, 5 to 6 lines long, much contracted in the lower half. Column about as long as the petals.

A pretty little orchid, and one which is comparatively uncommon in Victoria. In appearance it is a much more slender plant than the typical form of *C. gunni*, the flower being smaller and more "Caladenia like" than the latter sp. being of a sort of claret colour, not brown or yellow. I have only found this sp. on one or two occasions, viz., in the Dandenong and Marysville Ranges, although it has been found in many other parts by Messrs. C. Walter, G. Coghill, and others, also in the early days at Wilson's Promontory, &c., &c., by Baron von Mueller. I have not had an opportunity of cultivating this sp. myself, so I cannot offer any advice on the matter, further than to remark that I think the treatment recommended for *C. gunni* would also do for the cultivation of this sp. Height from 2 to 4 and even 6 inches; flowers in the summer months. *Caladenia diphylla* and *Epipactis reflexa* are identical with this sp. Found also in New South Wales, Queensland, and in Tasmania.

Glossodia, (R. Brown.)

Sepals and petals nearly equal, spreading. Labellum sessile, undivided, not fringed, without calli or plates on the disk. Column erect, often incurved, two-winged. Anther erect, 2 celled. Pollen masses granular. Leaf solitary, oblong or lanceolate. Flowers 1 to 2, on an erect scape. Flowers erect.

G. major, (R. Brown.)

Hirsute, with long spreading hairs. Tuber ovoid. Scape 6 inches to 1 foot in height. Sepals and petals oblong-lanceolate. Labellum not half so long as the calyx. Column as long as the labellum.

This is one of the most beautiful as well as one of our commonest Victorian orchids, being found in great numbers, principally in heath ground, throughout the colony. It is hardly necessary to describe this well-marked and universal favourite, because it is totally unlike any other orchid in the Victorian bush. The flowers, which are a beautiful mauve-purple, the labellum being purple and white, are very conspicuous, stand very erect and well above ground. This sp. is to be found at Brighton, Frankston, Dandenong, Macedon, Murray, and, in fact, nearly anywhere and everywhere. A beautiful white variety was found by my esteemed friend the late R. Sanderson, a former member of this Club, where it grew on the side of the Kardinia Creek, near Berwick, that rich field for orchid collectors. To grow it well, lift the tubers very carefully, as they are scaly and easily detached from the parent plant. Pot in sandy loam, and keep moist when growing. This is one of the best sp. for pot culture, being easily grown, remaining a long time in bloom; and will dry nearly its natural colour, if care be taken to change the paper and spread the parts carefully out. *Caladenia major* is identical with this sp. Flowers in October and November. Height from 4 to 12 inches. Found in New South Wales, Queensland, Tasmania, and in South Australia.

G. MINOR, (R. Brown.)

Hirsute with long spreading hairs, a much smaller plant than G. major. Stems rarely above 3 or 4 inches high. Leaf lanceolate. Flowers blue, sepals and petals oblong-lanceolate, 5 to 6 lines long. Labellum about ⅓ the length of the sepals. Column nearly as long as the labellum.

A much rarer sp. than the former, and one which is seldom, if ever, found near Melbourne. I have never found this sp. myself, it being partly restricted to such places as I have not had an opportunity of visiting, and I am indebted to Mr. C. Walter for the specimens now exhibited. This sp. would seem to resemble very much the common *G. major*, but the flowers seem smaller and darker, and the two plants might, I think, be easily confounded with each other, excepting a careful examination were made on the spot. The specific differences taken from the "Flora," and given above, would enable this to be done. I should say that similar treatment to that of *G. major* would suit for the cultivation of this sp. Found also in N.S. Wales and Queensland.

And now, Mr. President, ladies, and gentlemen, I have finished. I owe you an apology for the length of time which these papers have occupied your attention. I would, however, wish to remark that the principal reason of this has been an

anxiety on my part not to monopolise too much of the time of the monthly meetings, or to occupy constantly too much of the space of our journal, and I think both the hon. editor and the hon. secretary will give me credit for this part of my statement. I may further remark that it is my intention, if I can possibly do so, to publish these papers on the Ferns and the Orchids of Victoria in handbook form with corrections and additions up to date and glossary of terms used, the latter corrections and additions taken from the valuable census of the plants of Australia; and, finally, I have to thank Baron von Mueller for his kindness in naming such plants as I required, for setting me right when I was often mistaken, and for the temporary loan of certain specimens by which I have been able to illustrate each paper as it was read. My next contribution will be a series of short papers on the destructive insects of Victoria, with some accounts of their life history and doings.

NOTES OF A HOLIDAY TOUR IN RIVERINA AND WESTERN VICTORIA.

By Messrs. C. French, F.L.S., and F. G. A. Barnard.

(Read before the Field Naturalists' Club of Victoria, 13th December, 1886.)

(Concluded.)

After tea we all had a good chat over a cheerful fire on all sorts of natural history topics, and afterwards our hon. secretary sallied out to find out Mr. Jno. Dennant, another member of our club, and a resident of Hamilton, who, it will be remembered, a little time ago commenced a very interesting series of papers on the geology of south-west Victoria. After some little trouble, owing to darkness and wet, his residence was found, and on making himself known his visitor was cordially welcomed. Mr. Dennant has been working for some years at the fossiliferous deposits of Muddy Creek, in conjunction with Professor Tate, F.G.S., of Adelaide, and has now a collection of between five and six hundred species, a great number of which were discovered by him, and many of which are still undetermined. They vary in size from cowries as large as a good-sized cocoanut to shells as small as dust shot. A great many are in a beautiful state of preservation, and still retain the enamelled gloss which they possessed while living, and makes it hard to realise that their occupants have been dead perhaps a million of years. We had some idea of visiting Mount Napier and the Byaduk Caves, about fifteen miles south-west of

Hamilton, on the morrow, but on Mr. Dennant's recommendation determined to go to Muddy Creek instead.

Thursday morning broke fine, and after a stroll round the town, during which we saw some fine Boobialla trees, *Myoporum insulare*, we got our things together, and started on the five-mile walk to Muddy Creek. For the benefit of future excursionists I may say that you leave Hamilton by the Portland Road, but on reaching the valley of the Grangeburn turn off to the right and cross the stream on a foot-bridge; vehicles are provided for by a ford. This stream divides the counties of Dundas and Normanby, in the latter of which we now were. As we mounted the hill on the other side, our friend, Mr. J. B. Wilson, passed us in a pair horse buggy, and soon left us behind. The road lay between farms and grazing paddocks, and towards the valley of the Grangeburn afforded several pretty views. Presently the road branched into two at an acute angle, and it was a question which to follow. We had directions to keep straight on, but examination of the ground showed that the buggy had followed the right-hand road, and, thinking Mr. Wilson's driver should know the road, felt inclined to follow. Fortunately, however, as we were debating some country people came along, and after a lot of questioning we found the buggy had taken the wrong road, so on we went by the other, and after about three miles more came to the end of the road at Mr. Samuel Mason's estate, "Clifton." As we turned in at his gate Mr. Wilson's buggy was seen coming along the road about half a mile behind us, and soon caught up to us again, when we all had a good laugh. On arrival at the house, Mr. Mason received us very hospitably, and after some slight refreshments took us down to the creek, a few hundred yards away, and gave us permission to dig as much as we liked. Near the creek are some magnificent wattle trees, which were then just bursting into bloom. The creek is a very pretty bit of scenery, being well wooded with blackwoods, wattles, bursarias, tea-trees, and other characteristic shrubs, altogether forming a delightful place for picnics and no doubt for the entomologist a little later in the year. The creek has, in the course of ages, cut down through the volcanic lava, etc., into the tertiary strata. This has taken so long to do that the banks are now sloped and rounded off into hills and dales, covered with splendid pasture. In fact, this may be considered a portion of the splendid downs for which the Western district is so famous. In the tertiary strata the banks are more abrupt, and vary from ten to twenty feet, exposing in places bluffs of a cream-coloured limestone, generally crowded with fossil shells, polyzoa, corallines, etc. Some fine shark's teeth and cetotolites have also been found here.

A few hundred yards below, the Muddy Creek joins the Grangeburn, and this latter, after a few miles, joins the Wannon about three miles below the falls mentioned before. Having spent some time fossicking in the various spots, we returned to the house, when Mr. Mason pressed us to lunch with him, which we were not loth to accept, the fine country air having somewhat sharpened our appetites. Our friend, Mr Wilson, having by this time collected a large box of material for examination under the microscope for fossil polyzoa, also thought of returning home, and after a final look at the pretty scene around, a start was made for Hamilton. Round the house the little English daisy, *Bellis perennis*, grew very plentifully, and reminded some of the party of home. The pedestrians were now reduced to two, as one, having gone somewhat lame, did not refuse the offer of a drive home. This was reached by all in due time, though not before the walkers had got a good wetting from a heavy shower. They made a detour to the cemetery on their way, expecting to find a few flowers there, but found that *Bulbine bulbosa* had usurped nearly the whole ground, excluding almost every other flower.

We now packed up our belongings and specimens, when it was found that the greater part of the fossils collected at Muddy Creek had been left behind there, and consequently our exhibit this evening is rather poor. We left Hamilton by the evening train at a quarter past seven for Dunkeld, and we were fortunate in having Mr. Dennant, who was proceeding in the same direction, for a companion; thus the twenty miles seemed to pass very quickly, and Dunkeld was reached about eight.

We took up our quarters at Collins' Hotel, close to the railway station, and though there was a cold wind blowing from the north, and the stars were almost invisible, we hoped that our luck in the way of weather would take a turn, and allow us to explore the district before leaving for town by the midday train on Saturday. However, we were again disappointed, as about two o'clock on Friday morning the wind seemed to increase to a hurricane, and the rain came down in torrents, continuing for several hours; in fact, we could not go out of doors till after ten o'clock, and even then occasional showers of rain and hail swept over. This was a great disappointment to us, but it would never do to go back to town without at least attempting to climb one of the two mounts which form such a grand background to the little township. These are the terminal peaks of the Sierra Range mentioned before, and are generally comprehended under the designation of Grampians. About noon the weather cleared a little, so we lunched early, and made a start for Mount Sturgeon, distant about two miles north of the village, and having got

directions from the local stationmaster and bank manager, both of whom are well acquainted with the mounts, felt pretty confident of reaching the top.

The Victoria Valley road is followed, and the Wannon crossed near the fellmongery. The tourist then turns into the scrub on his left, and has the high rocky wall of Mount Sturgeon close in front of him. The whole of the range is peculiar in having an almost perpendicular face to the east, while the western side slopes in the ordinary way. The formation is sandstone, and if nearer town would be a grand addition to our building stones. These sandstone cliffs greatly resemble those of the Kanimbla and Grose Valleys in the Blue Mountains. For the benefit of future explorers from the F.N.C., we may offer some directions as to the route to be taken. On crossing the Wannon, keep well to the left, and in the rocky wall you will notice two or three gorges. Keep ascending gradually till you reach the foot of the cliffs on the left-hand side of the southernmost gorge. Thence you will find a sort of indistinct track, which, if followed, will take you up the side of the gorge to the crest of the range. One of our party tried the next gorge to the right, and only got up after a hard struggle.

After crossing the Wannon the country entirely changes, being formed by the disintegration of the sandstone, and we soon noticed many plants strange to us. One of the first to attract our attention was *Styphelia Sonderi*, which grows in fair-sized bushes, and bears brilliant crimson flowers three-quarters of an inch long. Mr. D. Sullivan, F.L.S., of Moyston, in his papers on the plants of the Grampians, read before this club, mentions that the emus are very fond of the fruit of this shrub. A beautiful myrtaceous shrub, *Lhotzkya genetylloides*, was now rather plentiful, its branches being a mass of white star-like flowers. This shrub would make a fine addition to our gardens; in fact, at our late wild flower show, sprays of the blossoms were exhibited by Mr. W. R. Guilfoyle, of the Botanical Gardens, from plants obtained by Mr. C. French several years ago at Hall's Gap, near Stawell. As we ascended the mountain, other plants of interest were seen, a fine white Conospermum being abundant, also the curious Dodonaea. *Grevillea ilicifolia*, with its holly-shaped leaves and pink flowers, and *Grevillea dimorpha*, with brilliant crimson flowers and long narrow leaves, with *Correa aemula*, having singular woolly leaves and stems, grew abundantly at the head of the gorge. Among the loose stones on the top of the range the rare *Eriostemon pleurandroides*, bearing fine yellow flowers, was found, Mount Sturgeon being its chief habitat in the Grampians. *Epacris impressa* seemed here to be perfection itself. *Hibbertia*

virgata, several other Styphelias, Pultenaeas, and the curious little *Candollea sobolifera*, engaged our attention for some time. A stunted form of *Eucalyptus capitellata* was very common. On the whole, we can safely recommend any botanist or lover of wild flowers to visit this mountain, where, with favourable weather, a most enjoyable day or so can be spent.

From the top of Mount Sturgeon, 1946 feet above the sea, and about 1100 feet higher than Dunkeld, a fine panoramic view can be obtained. On the occasion of our visit we were quite astonished at the amount of water visible; swamps and lakes dotted the plains everywhere. The windings of the Wannon could be traced for many miles, but, unfortunately for sight-seeing, the weather was still thick and showery, and occasionally we had to retreat under a bush for shelter. Dunkeld lay close at hand, whilst Hamilton could just be made out in the distance. Straight down below us almost was the homestead of Mount Sturgeon Station, looking very comfortable and snug, surrounded with its garden and shrubberies. Looking northwards, the Victoria Range and Victoria Valley—splendid places for the naturalist—could be traced for many miles. The twin mountain Abrupt, about 800 feet higher than our standpoint, shut out most of our view of the rest of the Sierra and Grampian Ranges. The guide books speak warningly about snakes on this mount, but, whether on account of the cold weather or our good fortune, we did not come across any, though we saw the remains of two skins. Before descending, we removed a few seedlings of different plants for cultivation at home. As we descended, we could not but admire the pretty effect of the lichen and moss-covered sandstone cliffs, especially as they glistened with drops of moisture from the passing showers.

Having been so far successful, we returned homewards, casting longing eyes at the higher cliffs of Mount Abrupt, and finally determined to be up early the next morning, and start for it about six o'clock, so as to get back in time for the train.

Next morning, soon after six, we started off on what afterwards proved the most disastrous trip of our holiday. A strong wind was blowing from the north, through the Victoria Pass, as the gap between the mountains is called. There were signs of distant showers, and clouds rested on the tops of the mounts; but we were not to be frightened. We crossed the Wannon Bridge, and, taking the right-hand track, had made considerable progress, when our attention was attracted by numerous grass-trees, *Xanthorrhœa Australis*, bearing their singular flower spikes, three or four feet long. A little farther on a passing shower compelled us to take shelter under a tree. Again we went for-

ward, but the rain again caused us to halt, so we utilised the stoppage by having our breakfast Going on once more, we reached some immense rocks at the foot of the first gorge. The rain now descended in earnest: we were already very wet, and when standing up for shelter, felt the cold striking through us, so we reluctantly decided to turn back. Just here was a small grove of *Eucalyptus alpina*, specimens of which were secured. It was very annoying to have to return when within about a mile of the top of the mount, but further climbing would probably have been slippery and dangerous. As we returned, the rain increased, and the track became a running stream. We soon felt as if we had just crawled out of a river, and could not help laughing at one another's drenched appearance. Fortunately, the wind was blowing hard from behind us, so rather accelerated than impeded our progress. Notwithstanding the rain, we could not pass the grass-trees without stopping to cut specimens of their curious flowering stems to show our town friends. We got back to the hotel all right, and the landlady kindly made up several fires to dry our clothes, every part of which was wringing wet. During twenty years of collecting in Victoria, in all weathers, neither of us ever had such a wetting as we had that morning, and the finish of our outing will not be forgotten for many a day. However, we were so taken with the district and its flora that it is very probable we shall make another excursion to the locality before many seasons pass.

By noon we were once more presentable to the public, and having dined, at half-past one took our seats in the train, and commenced the long journey back to town. This, owing to pleasant companions met with in the train, passed more quickly than we expected, and by 11 p.m. we were once more at Spencer-street Station, apparently none the worse for our adventures, more especially as, during the ten days over which our trips extended, there was only one on which no rain fell.

Baron von Müeller, K. C.M.G., has been kind enough to identify the plants collected during the trip, and which we desire to bring under your notice this evening.

Professor W. Baldwin Spencer, M.A. (Oxon), has commenced his biological lectures at the Melbourne University. As biology is one of the subjects included in the first year of the course in medicine, the lectures are attended by nearly a hundred students. It is quite impossible to provide instruction in practical work for so many with the accommodation at present available, but the students who are entering on the new science course will have all necessary facilities afforded them.

OOLOGY OF AUSTRALIAN BIRDS.

We regret to see that in certain papers recently brought before the Linnean Society of New South Wales, Dr. Ramsay has entirely omitted to notice the work done by Mr. A. J. Campbell in the matter of Australian oology. Mr. Campbell's papers have all been read before the Field Naturalists' Club of Victoria, and have subsequently been published in "Southern Science Record," the "Victorian Naturalist," or "Oology of Australian Birds." It is surely the business of anyone who is working up the continental forms of any group to acquaint himself, not merely with the records already made in his own colony, but also with those made by workers in the sister colonies. Either Dr. Ramsay has culpably neglected to do this, or there is a gross unfairness in his disregard of observations which must in some cases take precedence of his own.

The eggs which Dr. Ramsay re-describes are those of the following:—

Pycnoptilus floccosus, Gould, Proc. L.S. N.S.W., 29th Dec., 1886. The egg was previously described, and figured in Mr. Campbell's "Oology of Australian Birds," 1883. The paper is recorded in the Proceedings F.N.C. in "Southern Science Record," June, 1882.

Eurostopodus albogularis, V. and H., Proc. L.S. N.S.W., 29th December, 1886. The egg described and figured in "Oology Australian Birds," 1883.

Falcunculus frontatus, Lath, Proc. L.S. N.S.W., p. 1146, 29th December, 1886. Egg again described and figured by Campbell, "Oology of Australian Birds," 1883.

In Plate XIX. attached to the same paper figures are given of the eggs of *Chlamydodera maculata* and *Ptilonorhyncus violaceus*, which were also described and figured three years before in Mr, Campbell's book.

ICONOGRAPHY OF AUSTRALIAN SPECIES OF ACACIA.

Baron von Mueller is bringing out, for the Victorian Government, decades of plates of the Australian acacias hitherto unfigured. This work worthily continues the series of illustrated descriptions of the eucalypts and Myoporinæ, which have been so well received by European botanists.

The special objects of the work are to assist horticulturists and others to identify the varieties cultivated for ornamental and useful purposes, and indirectly to restore these quaint-

leaved and profusely-flowering shrubs to the favour which they formerly enjoyed in European conservatories. It is hoped that, by this publication, acacia industries, whether the shrubs be grown for their appearance, their wood, their bark, or their gum, will be fostered, some perhaps created.

Every plant—and the Baron expects to figure some 200 odd species—is completely illustrated for all purposes of identification, *usque ad unguem*—to the very phyllodia-tips. Each plate carries some 12-14 figures, a spray of the shrub, phyllodia, flower-heads, buds and flowers, stamens and pistil, pollen-grains, pods, seeds, and sections of seeds. The drawings (by Mr. Robert Graff) and the execution of the plates are excellent, the objects portrayed standing out with boldness and clearness.

GILDED CHRYSALIDES.

During last year Mr. Edward B. Poulton made an extensive series of experiments on the production of colour in the pupæ (chrysalides) of some of the commoner English butterflies. We append a very brief notice of some of the methods employed, and of the results obtained, from the abstract given in "Nature" of Mr. Poulton's lecture at the Royal Institution in February last:—

(1.) The larvæ (caterpillars) of *Vanessa Io* (the peacock butterfly), which are black, change into pupæ, which in nature are commonly dark-gray, but occasionally and very rarely yellowish-green in colour. Six larvæ placed in a glass cylinder covered with green tissue paper produced six *green* pupæ.

(2.) The pupæ of *Vanessa urticæ* (the small tortoise-shell butterfly) have no green form in nature, but appear in many shades of dark-gray, the lighter ones having golden spots on them, while the extreme forms are almost covered with the golden appearance. These latter are very rarely seen, except when the pupa is diseased. Mr. Poulton obtained over 700 pupæ in his experiments with this species.

Green and orange surroundings had no effect on the colours of the pupæ. Black made them darker; white produced light pupæ, many of them brilliantly golden. This last result suggested the use of gilt surroundings, and these produced an even more brilliantly golden tint. When the black larvæ had been limited for space the influence of proximity was seen in a general darkening of the skin. The pupæ were darker, but not piebald or parti-coloured. It would seem from this and other experiments that the effects are produced through the nervous system (though not through the ocelli), and not by direct influence upon the skin.

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The Annual Conversazione.

The seventh annual *conversazione* of the Club was held at the Masonic Hall, Collins-street East, Melbourne, on Thursday evening, 28th April, 1887, when there was a very large attendance of the members and their friends, at least 750 ladies and gentlemen being present.

Baron von Mueller, patron of the Club, took the chair, and Mr. H. O. Forbes was present as a visitor. His Excellency the Governor wrote regretting his inability to be present.

The greater part of the exhibits were shown in the large hall, a fine room, capable of seating 1000 persons, where they occupied nearly half the floor space. In addition to the exhibits by the members, pot ferns for decorative purposes were kindly lent by Mr. W. D. Allman, of Richmond, and Messrs. Law, Somner and Co., of Cremorne Nursery. The trustees of the Exhibition Building, Carlton Gardens, lent an interesting exhibit of nine cases of Australian insects, illustrating economic entomology; also, a fine collection of Australian snakes, both prepared by Mr. C. French, F.L.S.

The general arrangement of the exhibits was somewhat as follows:—On entering the main hall visitors were at once confronted by a fine pair of "giant clam" shells from Singapore, which weighed about 250lb., shown by Mr. D. Le Souëf; next came the snakes belonging to the Exhibition trustees, then the British fossils and birds' eggs exhibited by the Rev. J. J. Halley, these together forming a line down the centre of portion of the hall. On either side were two parallel tables, each about 30 feet long, those on the right being occupied by shells shown by Mr. E. Bage; snakes, etc. (in spirits), by Mr. D. Le Souëf; fossils, by Mr. W. Jennings and Mr. J. E. Dixon; an alligator 9ft. long, by Mr. A. Coles; insects, by the Masters Hill; birds, etc., by Mr. E. E. Johnson; native bears, by Mr. A. W. Coles; birds and eggs, by Mr. R. Hall; dried plants, etc., by Mr. F. Reader; minerals, etc., by Mr. E. H. Hennell; and smaller exhibits by other members. Along the walls on this side of the

hall were the birds and eggs shown by Mr. E. M. Cornwall; then Mr. Le Souëf's live snakes and lizards; next Mr. A. J. Campbell's exhibit, "a Gippsland gully;" the dried plants by Mr. C. A. Topp, M.A., arranged on stands; then the exhibit of economic entomology from the Exhibition, and some fine walking-stick insects, and lepidoptera, by Mr. C. French, F.L.S. Further along Mr. O. A. Sayce occupied a table with microscopes, showing specimens in illustration of his lecturette. Along the walls on the left-hand side of the entrance were the minerals, etc., by Mr. J. F. Roberts; the animals, birds, and fish, by Mr. A. Coles; the fungi, etc., by Mr. H. T. Tisdall, F.L.S. The centre of the eastern side was occupied by a fine collection of humming birds, shown by Mr. C. French, F.L.S., with that exhibitor's dried Victorian orchids and ferns on stands on either side; next to these was a collection of mounted seaweeds and parasitic fungi, shown by Mr. H. Watts, who occupied two tables close by with microscopes for the exhibition of various specimens. The two long tables on this side of the hall were occupied by shells shown by Mr. T. Worcester; geological specimens, by Mr. S. H. Wintle, F.L.S.; lepidoptera, by Mr. W. Kershaw; Australian beetles, wasps, etc., by Mr. D. Best; shells, fossils, and minerals, by Mr. H. Kennon; shells, seaweeds, etc., by Mrs. Flatow; birds, by Master Hellicar; dried plants, etc., by Mr. J. E. Prince; insects, orchids, etc., by Mr. J. N. M'Kibbin; microscopical preparations, by Mr. D. M'Alpine, F.C.S.; and the exhibits of Messrs, Anderson, G. French, and others.

In the smaller room, used also for the exhibition of diagrams through the oxyhydrogen microscope, were the fungi shown by Miss F. M. Campbell, and the local insects and the pot ferns by Mr. F. G. A. Barnard.

The platform in the main hall was decorated with the pot ferns lent by Messrs. Law, Somner and Co., whilst in front, along with the other ferns lent by Mr. W. D. Allman, was a grand specimen of *Cyathea dealbata*, the silver-backed tree-fern of New Zealand.

The visitors began to arrive about half-past seven, and, after spending a pleasant half-hour among the exhibits, took their seats to hear the Rev. J. J. Halley deliver the presidential address, as follows:—

LADIES AND GENTLEMEN, MEMBERS OF THE FIELD NATURALISTS' CLUB OF VICTORIA.

FOR a third time it falls to my lot to address you from the presidential chair and to thank you for the honour thus conferred upon me.

Our past year has been one of steady work. The papers read have, I think, been of greater interest, and evidenced more of independent research than in any former year. These have been published in our journal, and where all have been so good it would be, perhaps, invidious to mention any. In looking to the future, however, we find that Mr. Wintle promises a series of papers on the geology of Melbourne and its suburbs, and Mr. French on insects injurious to vegetation; these are sure to be both interesting and instructive.

Our excursions have been pleasant to all and profitable to many who have attended them. Your journal, increased to 16 pages under the able editorship of Mr. Lucas, has distributed our gathered knowledge far beyond the confines of our club. Useful as our journal has been not only to the members of our club, but to many outside our ranks, we all feel that it could be made much more useful did our means permit. Many of the papers need the aid of illustrations, and that we may be able to do this we have sought from the Government a modest annual grant, and, in return, are prepared to distribute copies of our journal to all public libraries and mechanics' institutions throughout the colony. If we are enabled to do this, I think that nothing will be more likely to attract that attention to the study of natural science so much desired. That an interest is excited on the questions we study is shown in many ways. The trouble worked by insect plagues has caused those concerned to ask that a Government entomologist may be employed whose duty it shall be to investigate the life history of these troubles and pests, and, if it be possible, to devise remedies. Meanwhile the papers published in our journal, if illustrated, would help very much in this direction. As priests, not of the old science, that was ever veiled, but of the new, on which the beautiful light ever plays, we desire that what little knowledge we have gained should be not a feast to ourselves only, but distributed as widely and as freely as possible.

Another evidence of this growing interest is shown by the fact that, though it is only about a year ago that Baron von Mueller's new and enlarged edition of "Select Plants for Industrial Culture and Naturalisation" was published, with the exception of some copies sent to the Colonial and Indian Exhibition, the whole issue has found a ready sale at the Government Printing Office.

Doubtless, when the Dichotomous key to the plants of Victoria is published, it will find, too, a ready sale. At our last annual gathering I mentioned that that day I had received the first part, and it was hoped that before long the whole work

would be available for our botanical students. Unavoidable causes have led to delay, but I am assured that now, long before spring-time shall gild our forests and stud our plains with living gems, this desired aid will be in our hands.

With much interest we look forward to the Baron's delineation of our acacias, of which there are some 200 species to be figured. The delineation of these ought to be of great use both for artistic and technological purposes.

Our annual show of wild flowers brought as exhibits about 200 species.

Through the representations of the club the Lands Department instituted prosecutions against a number of persons for ruthlessly destroying the native shrubs in Studley Park.

We rejoice that the University have appointed a professor of biology in the person of Mr. Spencer, while two of the members of our club have, by their publications, rendered great help to students—Dr. M'Gillivray, by his list of Victorian polyzoa, and Mr. J. B. Wilson, by his list of algæ from Port Phillip Heads.

My last two addresses from this chair have been pleadings for the study of science. With what words I could I have tried to stir up interest in our own strange and beautiful flora and fauna. And in this my third and last address—for I am, while highly appreciating the honour so long done me, delighted to know that you have permitted me soon to retire, and that one so well fitted to be your leader has been nominated to succeed me as my friend, Mr. Lucas—I desire still to utter my old war cry; and, further, to ask if it would not be possible to engraft more science teaching on to our common school system; whether some knowledge of the forms of life every day to be seen would not be as useful to our every-day boys and girls as what the president of the Linnean Society of New South Wales calls "the pride of the public school, the glory of the department, the analysis of the sentence."

But time is working for us, and the past is the prophecy of the future.

The word Jubilee meets our eyes everywhere—not a newspaper page, advertisement, or otherwise in which it does not occur. In a few weeks we shall light up our cities and wave our banners, and gaily deck our streets and homes in honour of the fifty years' reign of Victoria the true and good. May the sunset of that reign be as resplendent as its dawn and meridian beauty have been! And, doubtless, the contrasts between 1837 and 1887 will be drawn by cultured hands, and the progress of the Victorian era be told by pen and voice. The student of morals will tell with satisfaction the change for good that has taken place, how vastly the customs of society have improved.

The Queen's own virtuous court, as compared with that of the Fourth George or William, concerning which Justin M'Carthy says—"The ordinary manners of the society of the court of either had a full flavour, to put it in the softest way, such as a decent tap-room would hardly exhibit in a time like the present."

The student of constitutional history will trace the progress made from personal to full constitutional government, and the widened liberties of the people. Others will teach how, during this reign, philosophy, art, and literature have been altogether remoulded.

While in its decades the world's past history has been re-learnt in the sculptures that have been disinterred from long buried and almost forgotten cities, and from the hieroglpyhics written by strange men in the misty past read in the daylight of the present. But perhaps there has been no more marked progress made than in the realm of science. Indeed modern science is almost the product of the Victorian era. There is not a department of it that has not advanced with giant strides.

A wondrous picture to paint—the growth of scientific knowledge. A volume might be written on it. To-night I can only broadly outline a partial sketch. Geology has revealed to us new worlds. It was but in 1830 that the first volume of Lyell's "Principles" was published, and at a later date than this a popular work for young people accounted for fossil remains as the result of the Noachean flood. But patient research has revealed to us world after world, and worked out the details, so that what the earth was in the ages that have passed is almost as familiar to us as present lands we only know by description.

We see, for example, in the Paleozoic era, in the youth of the earth, a flora the world has never witnessed since. As Hugh Miller so graphically puts it—"A youth of dark and tangled forests, of huge pines and stately araucarias of the reed-like calamite, the tall tree-fern, the sculptured sigillaria and the hirsute lepidodendron." Amid this luxuriant growth reptile forms—sauroid batrachians—leave their footprints in the unctuous clay.

Again we look. Plants and herbs are there, but less luxuriant and conspicuous. But in this secondary period shapes of animal life how weird and strange. "Great dragons, griffins, laithly worms of medieval legend." Terrible things. "Enormous jaws, bristling with pointed teeth, staring eye-sockets a full foot in diameter. Necks that half equal in length the body of the boa-constrictor stretch out from bodies mounted on fins like fish, and furnished with tails like mammals.

Winged dragons careering through the air on leathern wings like bats. Enormous crocodilian whales, mounted on many-jointed paddles, traverse in quest of prey green depths of sea. Herbivorous lizards, with horn like that of a rhinocerus projecting from the snout, browse amid the dark meadows of the Wealden, twelve feet in length."

Once more we look, and the picture of the tertiary period is before us. A flora similar to our own. The vast, hideous reptiles have disappeared, but mighty beasts stalk over the plains and tear down the forests. Mammoths and mastodons, tigers twice the size of our modern ones, giant elephants, great oxen, lion kangaroos, megatheriums with toes two feet in length. Modern geology has shown us all this, has marshalled a stately procession—armies that in serried rank pass before our bewildered eyes, from the Eozoon canadense up through corals and molluscs, fish and reptiles, birds and beasts, till at last man, intelligent man, appears—all apparently the working out of a great ideal—all an harmonious, orderly, procession.

> From harmony, from heavenly harmony,
> This universal frame began.
> From harmony to harmony
> Through all the compass of the notes it ran—
> The diapason closing full in man.

Within this reign the microscope has been perfected in its present achromatic compound form, and lenses of short focal distance have been made, and with results how strange. If geology has shown us a succession of worlds, microscopy has revealed to us worlds within worlds. It has done much to revolutionise medical science. During this era the cell theory has been discovered and worked out, and on it has been built the modern structure of histology—a word now in everyday use, yet not to be found in Webster's Dictionary of 1852. The discovery of fungoid parasites, and the part they play in the animal economy, is perhaps the most important one, so far as the health of the community is concerned, of modern days. These are the triumphs of the microscope.

Chemistry, as understood now, is certainly the growth of this Victorian era. Amid much that might be spoken I confine myself to one fact—the working out of the atomic theory by Dalton from the chemical law of multiple proportions. The theory of atoms is as old as Democritus, while Lucretius makes them the all-sufficient cause of all things. The theory was held in part, at any rate, by Bacon, Hook, Newton, and Boyle, but the modern period has, through Dalton's discovery, given it a new significance. Sir William Thomson has sought to fix the

limits between which their sizes lie, and Professor Maxwell says—"Natural causes we know are at work which tend to modify, if they do not at length destroy, all the arrangements and dimensions of the earth and the whole solar system. But though in the course of ages catastrophes have occurred, and may yet occur, in the heavens, though ancient systems may be dissolved, and new systems evolved out of their ruins, the molecules out of which these systems are built, the foundation-stones of the material universe, remain unbroken and unworn."

Astronomy has had its triumphs, too. In this science what has struck my mind most has been the discoveries of the spectroscope. In far off times Egyptian and Arab noted well the heavenly orbs and tracked their courses, but, true though it be, it seems incredible that hundreds of millions of miles away we can tell with certainty what gases burn, what metals are in fusion in those far off suns. Concerning this Professor Huxley says in his last address to the Royal Society:—"What an enormous revolution would be made in biology if physics or chemistry could supply the physiologist with a means of making out the molecular structure of living tissues, comparable to that which the spectroscope affords to the inquirer into the nature of the heavenly bodies. At the present moment the constitution of our own bodies are more remote than those of Sirius in this respect."

Brilliant, however, as have been the results attained by the spectroscope, the greatest triumph yet achieved, perhaps, by the human intellect was the almost simultaneous discovery by Leverrier and Adams of the planet Neptune—a discovery that was made by a process of pure deductive reasoning—made by calculation in the study, the telescope being merely directed to the spot in the heavens where the astronomer declared the planet must be.

With respect to light, heat, magnetism, and electricity almost all our present knowledge of them has been acquired since her Majesty ascended the throne.

As for the art of photography, the power to use the magic hand that draws for us, without error, the faces of our friends, sketches the beauties of our mountains and our vales, our forests and our streams, the way to use this power for practical purposes has all been learnt in this same epoch.

Time would fail me to tell of the changes that have taken place in the classification of plants and animals, and the new forms that have been discovered in earth, and air, and sea.

But it is, perhaps, in what has been called the "generalisations of science" that this reign has been so brilliant. Of these generalisations, two, by common accord, are assigned chief

places. They are the doctrines of Evolution and of the Conservation of Energy.

The first of these we owe to the unwearied patience and profound researches of Charles Darwin, who in 1859 published his "Origin of Species," and startled the world alike by the wondrous collection of facts that he brought together, and the deductions drawn from these facts. Like many another new thing, it was received at first with bitter opposition, then with calm consideration, and is to-day, I suppose, accepted by the great bulk of the scientific world; at any rate, if not absolutely proven, yet so far proven as to form a capital theory to work by. Mr. Darwin's theory of variation by natural selection is so well known to all of us that I need not stay to explain it. It works a complete revolution in our ideas of the mode in which succeeding races of plants and animals have appeared on our earth.

Quite as startling as the doctrine of evolution is that of the conservation of energy, concerning which Professor Tyndall says —"A doctrine which exacts from every antecedent its equivalent consequence, and from every consequence its equivalent antecedent, and bringing vital as well as physical phenomena under the dominion of that law of causal connection which, as far as the human understanding has yet pierced, asserts itself everywhere in nature. Long in advance of all definite experiment upon the subject, the constancy and indestructibility of matter had been affirmed, and all subsequent experience justified the affirmation. Later researches extended the attribute of indestructibility to force. This idea, applied in the first instance to inorganic, rapidly embraced organic nature. The vegetable world, though drawing almost all its nutriment from invisible sources, was proved incompetent to generate anew either matter or force. Its matter is for the most part transmuted air, its force transformed solar force. The animal world was proved to be equally uncreative, all its motive energies being referred to the combustion of its food. The activity of each animal as a whole was proved to be the transferred activity of its molecules. The muscles were shown to be stores of mechanical force potential till unlocked by the nerves, and then resulting in muscular contractions. The speed at which messages fly to and fro along the nerves was determined, and found, not as had been previously supposed, equal to that of light or electricity, but less than the speed of a flying eagle."

"Following this work of the physicist came the conquests of the comparative anatomist and physiologist revealing the structure of every animal, and the function of every organ, in the whole biological series, from the lowest zoophyte up to man."

I should travel beyond the bounds of our Society if I tried to show how, on the materials supplied by physicist and physiologist, Herbert Spencer has sought to graft upon this basis a system of psychology.

But I do claim for the Victorian era these, the greatest, as I have said, of generalisations, the doctrines of evolution and conservation of energy.

But more noticeable, perhaps, than anything else during these past 50 years has been the practical achievements of science. Our scientists and natural philosophers have not been dreaming mere idle dreams—living in a world of fancy far removed from the world of action. Dreams there have been that for wondrous imaginings and bold conceptions have soared beyond the poet's piercing eye. But, lo! these dreams of yesterday are the actualities of to-day. The Greeks, in their best day of poetry, were the most practical, and the poetry of the science of this Victorian era has passed from intellectual imaging to be the workman of humanity.

Do you remember that the railway from London to Liverpool was not completed till nearly a year after the Queen's ascension? That man travelled no faster than perhaps Abraham or Pharaoh did? That the first full-powered steamboat had not crossed the Atlantic? That it took a letter days to go from London to Aberdeen, and at a cost of 1s. 3½d? In the early years of the reign, Wheatstone, and Cooke, and Morse were just bringing out their patents for "giving signals and sounding alarms in distant places by means of electric currents transmitted through metallic circuit."

Think of the vast system of railway communication that has sprung up, covering with iron network almost every land; of the fleets of mighty steamers ploughing every ocean, and bringing together the ends of the earth—travel changed from a painful weariness to a luxurious pleasure Think of the telegraph wires, passing over mighty mountains, through fertile valleys, knitting, in a great embrace, classic lands and modern countries; diving into the hidden depths of mysterious seas; circling the world quick as Ariel's girdle—all the product of the scientific thought and industry of the last half century.

Picture, if you can, the ill-drained, ill-ventilated towns and cities, houses cursed with darkness, for a sapient Government had taxed the windows—the first principles of hygiene hardly formulated.

In surgery, anæsthetics unknown, for I well remember one of the leading surgeons of the North of England performing his first operation by the aid of what was then known as "Formic acid."

In medicine, as I have shown, all the knowledge we have of parasitism has been acquired during the period under consideration.

There is no part of human life that has not been blessed by the thought and labour of scientific men. Their work has lightened the burden of human toil, and machines, to a large extent, do man's drudgery. Their investigations have tended to bring light and sweetness into all homes, be they those of peer or peasant. The luxuries of our fathers have been the necessities of our age. In a word, the outcome of the scientific study of the Victorian era has been to save human labour, quicken it and facilitate it—has been to convert, multiply, and serve the riches of the earth. And when we do this, "when we get at the secrets of Nature and expound them, when we lay hold of the powers of Nature and employ them, when we take possession of the riches of Nature and dispose of them, when in the temple of this earth we take our place as priests and ministers, then industry performs its mighty work and fulfils its high destiny, then man is obedient to the primitive commission, 'Have dominion over the earth and subdue it.'"

It has been too much the custom to speak of the practical man as something altogether different from the theorist—that the practical man was the hand working from experience, and without knowing, and not caring about the why or wherefore—but, after all, the hand only does what the head has devised, and the really practical man is he who learns to understand the great laws of Nature, and teaches men to work thereby. In closing, then, this my third address to you, I plead for the study of natural science, not for what the result may fetch in the world's market place—not for what titles, honours, or stars it may win—not even for what pleasure it may give to him who thus finds out the hidden secrets, but because the science of to-day has inter-penetrated all our social life, and is ever adding to the sum of human happiness, and lessening the causes of human sorrow.

Our century draws to its close; it is the age of science; but it will be but the alphabet of what is yet to be. I suppose by nature I am an optimist, and the older I grow I think the more optimistic I become, and so I look forward and believe that the coming years and the twentieth century will see strides made fast and great—a science that shall produce achievements more marvellous than those of our good Queen's reign, blessing by its labours both rich and poor; adding to the health and comfort of the race—a continual process of development. The highest

mountain top has not yet been reached, for, as Tennyson sings :—

> This fine old world of ours is but a child
> Yet in the go-cart. Patience ! give it time
> To learn its limbs ! there is a hand that guides.

Baron F. von Mueller, K.C.M.G., patron of the Club, then proposed a vote of thanks to the president for his eloquent address, and in the course of his remarks observed that great praise was due to the Rev. Mr. Halley for his having so ably and zealously presided over our Club for the last three years, when the rev. gentleman's time was already so severely taxed with the high duties of his ecclesiastic office all the while. The baron further alluded to the lucid retrospective remarks by the retiring president on the scientific achievements of the century, which secular epoch he designated as the greatest of all for biomorphic science, in which the Club was so particularly interested, as during the remaining dozen of years of this century most of the yet undiscovered and undescribed organic forms, whether of vegetable or animal life, would likely be rendered known; whereas the details of their organisations, functions, genetic relations, and various properties remained to be elucidated in future centuries. He alluded also, in connection with the president's remarks on the prediction of species of planets prior to their discovery, to the foreseen combinations of chemical synthesis, and to the preconceiving by calculation of the construction of Helmholtz's ophthalmoscope. Our patron further dwelt on the highly creditable efforts of the Field Naturalists' Club in the past, on its splendid present status, as evinced by the display of the multitudinous objects brought together for the anniversary celebration—not at random, but as the results of earnest and independent studies by many members in different directions; and he prognosticated a glorious future for the Club, especially so as the great Australian continent became gradually traversable through all its regions with ease in as many days as months were required by the original explorers to effect the geographic discoveries. This, he said, gave him an apt opportunity of introducing the distinguished traveller and naturalist, Mr. H. O. Forbes, to the meeting, with an expression of hope that the Government of New Guinea would avail itself of Mr. Forbes' talent and experience to opening up the resources of that great island through many a coming year. In conclusion, he congratulated the Club that so worthy a successor had been found for their esteemed late president in Professor Lucas, whose special learning in the natural sciences, and whose particular aptitude also for field work, augured so well for the future of the Club.

The vote of thanks was carried by acclamation.

THE LECTURETTES.

The first lecturette was then delivered by Mr. O. A. Sayce, who took for the subject of his remarks "The Fertilisation of Flowers." He explained the differences between the two great groups of flowers known as Anemophilous, or those fertilised by the wind bearing the pollen from the male to the female flower, and Entomophilous, or those fertilised by insects, which unconsciously carry the pollen from one flower to another while in search of food. To the former the different kinds of grasses, palms, pines, etc., belong, all bearing inconspicuous and scentless flowers containing no honey. The latter group contain flowers which were all more or less conspicuous in either form, colour, or perfume, and contained food suited for insects. He said that, as a rule, large or highly-coloured flowers were devoid of perfume, while the less attractive were highly scented, the meaning being obvious. He also showed by means of illustrations how some flowers adapt themselves to the visits of insects to secure cross-fertilisation by special contrivances to effect the desired result. This was most marked in the orchids, where most elaborate contrivances existed. He gave it as clearly proved that the colour, perfumes, and even shapes of flowers existed solely for the purpose of attracting insects, so as to secure cross-fertilisation, and not merely for the purpose of pleasing our æsthetic tastes.

On conclusion, the lecturer was heartily applauded.

The second lecturette was given in the smaller hall by Mr. L. Hart, and was entitled "A Peep at Nature through the Oxyhydrogen Microscope." The lecturer, in a few brief remarks, explained the objects represented in a well-prepared series of views thrown on the wall, consisting of such objects as parts of the fly, the silkworm, the flea, the butterfly, and other forms of insect life, and thus fully sustained the interest of his audience for upwards of half-an-hour, receiving much applause on conclusion.

THE EXHIBITS.

The following is a list of the exhibitors, and their more important exhibits :—

Mr. P. H. Anderson, Carlton—Specimens of insect architecture, coleoptera, birds' eggs, seaweeds, British and Australian dried plants, etc.

Mr. E Bage, East St. Kilda—A collection of shells from the Australian coasts, Fiji, etc.

Mr. F. G. A. Barnard, Kew—A pair of flying mice *(Acrobates pygmæa)*, the smallest marsupial known. Six cases of Victorian

insects, mostly taken at Kew, including several scarce species. A number of pot (Victorian) ferns, including *Gleichenia dicarpa*, *G. flabellata*, *Lomaria fluviatilis*, *Asplenium umbrosum*, etc.

Mr. D. Best, Fitzroy—A fine collection of Australian beetles of the various families, and a case of hymenoptera (wasps, etc.).

Mr. C. C. Brittlebank, Springvale—Some excellent water-colour drawings of local butterflies and moths.

Mr. N. J. Caire, South Yarra—Photographs of Gippsland scenery.

Miss F. M. Campbell, South Yarra—A comprehensive collection of Victorian fungi; an extensive series of specimens of fruits, vegetables, and indigenous plants attacked by micro-fungi, illustrative of vegetable pathology; water-colour drawings of fungi.

Mr. A. J. Campbell, Armadale—A large case containing lyre birds, with nests, ground thrush, robins, etc., entitled "An Ornithological Study;" sea birds' eggs, also some aboriginal weapons and implements from the Herbert River tribe, North Queensland.

Mr. G. Coghill, Hawthorn—Orchids in pots, *Eriochilus fimbriatus*, *Pterostylis pedaloglossum*, *P. reflexa*, etc.

Mr. A. Coles, Melbourne—A case of British game birds; a case of Chinese or king quail, with eggs, young, and food; a case of plain plover, with eggs, young, and food; a shade with a rifle-bird, regent-bird, and crimson-shouldered lory; an Australian powerful owl, European owl, pair of lyre birds, with egg. An orang-outang, a red wallaby, a platypus, an alligator. A collection of mounted fish, including the parrot fish, John Dory, silver bream, silk fish, stranger, etc.

Mr. A. W. Coles, South Melbourne—Four native bears, *Phascolarctus cinereus*.

Mr. E. M. Cornwall, South Yarra—Thirty species of Victorian birds, including *Strix tenebricosa*, *Halietus leucogaster*, etc.; thirty species of Queensland birds; two cases of Australian birds' eggs, including those of *Casuarius Australis*, *Ptilotis flava*, *P. cassidix*, *Menura Victoriæ*, etc.; twenty varieties of Australian birds' nests, and native weapons from Queensland.

Mr. J. E. Dixon, Murrumbeena—A case of rare Victorian fossils.

Mrs. Flatow, Carlton—Two cases of shells, a shade of sea-weeds, mounted seaweeds, hydrozons, a sea fan, a sea pen, etc.

Mr. C. French, F.L.S., South Yarra—A collection of Victorian orchids (dried), also of Victorian ferns (dried); a case of humming birds (mounted); a case of Australian and exotic butterflies and moths; a case of walking-stick insects from North Queensland.

Mr. C. French, jun., South Yarra—Victorian fossils and Australian birds' eggs.

Master G. French, South Yarra—A collection of Australian seeds and seed pods.

Mrs. A. Friederich, East Melbourne—Teeth of the red deer (*Cervus elaphus*) from Germany, etc.

Mr. R. Hall, Williamstown—Australian birds and their eggs.

Rev. J. J. Halley, Hawthorn—Collection of English birds' eggs, typical English fossils, Victorian fossils from Mt. Martha, Waurn Ponds, etc., New Zealand limestone fossils.

Master Hellicar, Hawthorn—Mounted Victorian birds, stone plover, satin-bird, and black-cheeked falcon.

Mr. E. H. Hennell, Hawthorn—Collection of minerals; a case of beetles.

Master W. H. F. Hill, Windsor—Six cases of local butterflies and moths.

Master G. E. F. Hill, Windsor—Case of beetles.

Mr. H. W. Hunt, Malvern—Victorian birds' eggs, two humming birds, and some American birds.

Master L. Inglis, Richmond—Birds' eggs.

Mr. W. B. Jennings, Prahran—Collection of Victorian fossils, including a piece of whale's bone weighing 51lb., ear bones of porpoise, shark's teeth, shells, etc., from Cheltenham; shells, teeth, etc., from Waurn Ponds; shells from Corio Bay, etc.

Mr. E. E. Johnson, Northcote—Victorian birds, including Australian snipe, painted snipe, black-cheeked falcon, powerful owl, collared sparrow-hawk, funeral cockatoo, red lory, grebe, bell bird, wedge-tailed eagle, etc.; tiger, brown, and whip snakes, also head of snake dissected, showing poison glands; fossils and mineralogical specimens, New Zealand ferns, a wreath of feathers, etc.

Mr. G. A. Keartland, North Carlton—Victorian birds.

Mr. H. Kennon, South Yarra—Collection of shells, fossils, and minerals.

Mr. W. Kershaw, Balaclava—Two drawers each of Australian and foreign lepidoptera.

Mr. D. Le Souëf, Royal Park—Tiger, copper-head, and diamond snakes (alive); blue-tongued and stump-tailed lizards (alive); a collection of snakes, etc., from the Malay Peninsula; a pair of giant clam shells (*Tridacna gigantea*) from Singapore.

Mr. A. H. S. Lucas, M.A., Trinity College—Victorian crabs, star-fish, and sea-eggs.

Mr. D. M'Alpine, F.C.S., Ormond College—Slides of transverse sections of the petioles of Eucalypts, under microscopes.

Mr. J. N. M'Kibbin, South Yarra—Collection of pot-grown orchids, in bloom, *Pterostylis acuminata*, *P. parviflora*, *P. pedaloglossum*, *P. aphylla*, *P. praecox*, *P. reflexa*, *Eriochilus autumnalis*, *E. fimbriatus*, *Acianthus exsertus;* two cases each of beetles, butterflies, and moths, and one of orthoptera (phasmidæ); lizards with abnormal tails.

Baron F. von Mueller, K.C.M.G., South Yarra—New plants from New South Wales and Queensland.

Mr. J. E. Prince, Windsor—Two volumes of dried flowers from England, the Continent, and America, containing many rare specimens; seeds of various Australian and Polynesian trees and shrubs.

Mr. F. Reader, Richmond—Victorian dried plants, order compositæ, sub-tribe Helichryseæ; Victorian mosses; New Zealand flowering plants; rare New Zealand mosses; rare African and American mosses; foreign micro-fungi; European algæ (mostly fresh-water).

Mr. J. F. Roberts, Kew—Shells, minerals, etc., from New Caledonia.

Mr. G. W. Robinson, Berwick—Flowers and leaves of Cinchona (Peruvian bark) tree, and cork bark, grown at Berwick from plants obtained from Baron F. von Mueller, K.C.M.G.

Mr. O. H. Sayce, Melbourne—Under microscopes, the organs of flowers, showing differences between wind and insect fertilised species; vegetable and animal blights, including the vine plagues, *Phylloxera vastatrix* and *Oidium Tuckeri;* indigenous and introduced scale insects.

Mr. H. T. Tisdall, F.L.S., Albert Park—Portfolio of Gippsland ferns; coloured drawings of Gippsland flowers; Victorian fungi, etc.

Mr. C. A. Topp, M.A., Kew—Dried plants, representative of the Natural Orders of Southern Victoria.

Mr. H. Watts, Collingwood—Collection of Victorian seaweeds (mounted); herbarium specimens of parasitic fungi; under microscopes: fresh-water algæ, desmids, also insects and spiders (mounted whole), etc.

Mr. S. H. Wintle, F.L.S., Fitzroy—Victorian palæozoic and mesozoic fossils; gem stones; cluster of gold crystals from Tasmania; zeolites from Melbourne basaltic quarries.

Mr. T. Worcester, West Melbourne—Six cases of land and marine shells from various countries.

About half-past ten o'clock the visitors began to disperse, having spent a very pleasant and instructive evening.

CORRESPONDENCE.

To the Editor of the Victorian Naturalist.

Sir,—I notice, with much regret, your criticisms on some papers of mine in the Proceedings of the Linnean Society of New South Wales in which I described the eggs of certain Australian birds. If you had referred to the papers in question, I feel certain you would never have allowed such unfair strictures to appear in your magazine. Unlike Mr. Campbell I am *not* writing a general "*Oology of Australian Birds*," nor do I remember ever to have claimed to have been the *first* to describe the egg of any particular species, but, in a humble way, I occasionally offer naturalists at home and in the colonies a few remarks on such as I consider worthy of their attention. I therefore fail to see on what grounds your attack has been made. If you will be good enough to read the heading of the paper in question, a copy of which is enclosed, you will observe that I submit descriptions of such (Eggs) "*as are rare, or, in my own opinion, have been imperfectly or incorrectly described;*" and if you had read my previous notes in the Proceedings of the Linnean Society of New South Wales you would have seen that I *re-described P. violaceus* and several others, to some of which you refer, in the *P. Z. S.*, 1875, *p.* 581, which I had also fully described previously. I feel convinced that any unbiassed person reading the title of my papers in question will fail to see any just reason for your strictures, which are only too liable to breed ill-feeling among the members of the Club, and cause useless discussions. Had I felt obliged "*to notice the work done by Mr. A. J. Campbell in the matter of Australian Oology*," I should also have been obliged to notice the numerous instances in which he describes the eggs of certain species as "*not previously described*," although a little research into such well-known works as the P. Z. S., Lond., the "Ibis," or the publications of the Linnean Society of New South Wales, would, I trust, have prevented him being guilty of the very charges you have thought proper to make against me. To use your own words, "*It is surely the business of anyone who is working up the continental forms of any group to acquaint himself, not merely with the records already made in his own colony, but also with those made by workers in the sister colonies*," and "*either*" *Mr. Campbell* "*has culpably neglected to do this, or there is a gross unfairness in his disregard of observations which must in some*" (I might say in most) "*cases take precedence of his own.*" Moreover, I know for a fact that Mr. Campbell was furnished with a list showing the dates of the descriptions (in 1874-5) of several of the very species of which you complain; but, apart from this, I deny that Mr. Campbell has any right at all to complain. I have a perfect right to *describe* or *re-describe* the eggs of any species if I think I can add to our knowledge of that species by so doing, whether they have been described before or not. I feel I have taken up much more of your space than this paltry subject deserves, but, nevertheless, I must request you to print this reply *in extenso.*

I am, sir, yours truly,

Sydney, 13th May, 1887. ED. P. RAMSAY.

EXCHANGE.

Shells.—Victorian recent or fossil shells desired in exchange for South Australian, etc. Correspondence invited. Wm. Thompson Bednall, Registry Office, Adelaide.

THE

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The seventh annual meeting of the Club was held at the Royal Society's Hall, on Monday evening, 9th May, 1887.

The President, the Rev. J. J. Halley, occupied the chair, and about 70 members and visitors were present.

A letter was read from Mr. D. M'Alpine, F.C.S., withdrawing his name from the nomination for vice-president in favour of Messrs. Topp and French, Mr. M'Alpine's name having been brought forward without his knowledge.

The hon. librarian reported the receipt of the following donations to the library:—"Proceedings of the Field Naturalists' Section of the Royal Society of South Australia for 1885-86" and "Journal of the New York Microscopical Society for December, 1886."

Captain F. C. Rowan and Mr. P. Scott, Albacutya Station, Dimboola, were duly elected members of the Club.

The hon. secretary read the seventh annual report, which will be printed and distributed to the members as soon as possible. It congratulated the members on the progress of the Club. The meetings of the year had been well attended, and the papers and exhibits increasingly numerous and interesting. Subscriptions for the year 1886-7 had been received from 167 persons, of whom 26 were ladies, and 12 juniors. The Club's journal had been enlarged, and had met with fair demand during the year, and members were urged to do more in the way of contributing notes and queries to it.

The balance-sheet showed that the receipts for the year had amounted to £153 18s. 3d., and the expenditure to £149 10s., thus adding £4 8s. 3d. to the credit balance, which now amounts to £40.

Mr. J. F. Roberts moved, and Mr. H. T. Tisdall, F.L.S., seconded, a resolution adopting the report and balance-sheet. Mr. F. Wisewould drew the attention of the chairman to the fact that under the existing rules only persons who had paid their subscriptions for the new year (1887-88) were entitled to speak or vote. The chairman having ruled accordingly, Mr. R. B. Patey moved "That, in order to give all members an opportunity of discussing the report and voting in the election of committee, the business of the annual meeting be postponed

until the next monthly meeting." This was seconded by Mr. R. Hall, and carried.

A hearty vote of thanks was passed to the sub-committee, consisting of Messrs. C. French, F.L.S., D. Le Souëf, O. A. Sayce, and F. G. A. Barnard, who had so successfully carried out the annual *conversazione*.

Several members then brought forward interesting natural history questions.

Rev. C. M. Yelland related a case of cannibalism among mice in confinement.

Mr. S. H. Wintle, F.L.S, read some notes on a piece of limestone, containing fossil shells, said to have been obtained in the Wellington caves, New South Wales, and which furnished a striking example of fossils standing out in prominent relief from the matrix under the action of weathering agencies.

Rev. C. M. Yelland introduced a discussion as to the usefulness or otherwise of the common sparrow, maintaining that it was productive of more good than harm. Messrs. Hunt, Roberts, Coles, M'Kibbin, Wisewould, and others took part in the controversy, but with no definite result, the two views being about equally taken by the various speakers.

Mr. F. G. A. Barnard drew attention to his exhibit of two specimens of the introduced butterfly, *Danais archippus*, which is yearly becoming more plentiful around Melbourne, and is a grand addition to our lepidopterous insects. This butterfly is said to be a native of America, and, for the first time, during the summer of 1885 several specimens were taken in the south of England. It has, however, been known in Australia for many years.

Mr. A. H. S. Lucas, M.A., drew the attention of members to the publication of Mr. Caldwell's embryological work on the "Australian Marsupials and Monotremes," in the Proceedings of the Royal Society, England, and summarised the results of more general interest.

The following were the principal exhibits of the evening:— By Mr. F. G. A. Barnard, butterflies, *Danais Archippus*, taken at Kew. By Miss F. M. Campbell, water-colour drawings of Victorian fungi; also a copy of "Plants injurious to Stock," by F. M. Bailey, F.L.S., Brisbane. By Mr. G. Coghill, orchid, *Pterostylis praecox*, in bloom, pot grown; also coloured drawings of orchids. By Mr. A. Coles, a water-snake, from Fiji. By Mr. P. Campbell, orchid, *Pterostylis vittata*, in bloom. By Mr. C. French, F.L.S., a rare Victorian fern, *Botrychium ternatum*. By Mr. C. French, jun., a wood-boring longicorn beetle, *Uracanthus triangularis*. By Master G. French, orchids, *Acianthus exsertus*, in bloom. By Mr. H. C. Grover, skins of hoary-headed grebe, bronze cuckoo, crested shrike, and spine-billed honey-eater. By Mr. H. Kennon, shells; an American

spiny-oyster, *Spondylus Americanus;* poached-egg cowry, *Ovulum ovum;* an orange cowry, *Cypraea aurantiaca.* By Mr. F. Reader, twenty-four species of European fresh water algae, occurring in Victoria. By Mr. H. L. Thompson, chiton shells, from Williamstown. By Mr. S. H. Wintle, F.L.S., fossiliferous limestone, from New South Wales. By Master C. H. Yelland, fossils from Christmas Island and Mount Wellington, Tasmania.

After the usual *conversazione* the meeting terminated.

The adjourned annual meeting of the Club was held at the Royal Society's Hall on Monday evening, 13th June, 1887.

The president, the Rev. J. J. Halley, occupied the chair, and about sixty members and visitors were present.

A special meeting was first held to consider an addition to Rule 5, moved by Mr. F. G. A. Barnard, that subscriptions must be paid before the first day of August; but the proposal was negatived, and notice was given by Mr. C. A. Topp, M.A., for next meeting, that the word "May," in Rule 16, be altered to "August."

The ordinary business then proceeded, when the hon. librarian reported the receipt of the following donations to the Club's library:—

"Transactions of the Royal Society of Victoria," vol. xxiii., 1886, from the society; "Transactions of the Royal Society of South Australia," vol. ix., 1885-86, from the society; "Proceedings of the Linnean Society of New South Wales," second series, vol. ii., part I., from the society; "Annual Report Bendigo School of Mines," 1886, from the school; "Annual Report Australian Museum, Sydney," 1886, from the museum; "Geological Society of Australasia—Lists of Members," etc., 1885-86 and 1886-87, from the society; "Journal of Pharmacy," May, 1887; "Catalogue of Microscopes," etc., from Swift and Sons, London.

The hon. secretary read a short account of the visit paid by the Club to the collection of the Zoological Society, at Royal Park; also, of the monthly excursion held at Cheltenham, on the Queen's Birthday, which was fairly successful, considering the early period of the wild-flower season. Among the flowers noted were *Persoonia juniperina, Prasophyllum intricatum, Pterostylis pedaloglossum, P. praecox,* and *P. reflexa.*

The following persons were duly elected members of the Club:—Miss L. Dowman, Messrs. F. J. Jones, W. Macgillivray, W. Niven, C. G. W. Officer, Jas. Smith, Edw. Wilson, and S. Wood.

The annual report and balance-sheet for 1886-87, as read at the last meeting, were unanimously adopted, on the motion of Messrs. J. F. Roberts, F.R.H.S., and H. T. Tisdall, F.L.S.

The following office-bearers for 1887-88 were duly elected, there being no opposition, viz.:—President, Mr. A. H. S. Lucas, M.A., B.Sc., F.G.S.; vice-presidents, Mr. C. French, F.L.S., and Mr. C. A. Topp, M.A., LL.B.; hon. treasurer, Mr. E. Tweddell; hon. librarian, Mr. O. A. Sayce; hon. secretary, Mr. F. G. A. Barnard; and hon. assistant-secretary, Mr. G. Coghill.

A ballot was taken for five members of committee, which resulted in Messrs. A. J. Campbell, G. R. Hill, D. Le Souëf, H. T. Tisdall, F.L.S., and F. Wisewould being elected.

Votes of thanks were unanimously accorded to the various office-bearers for their services during the past year, and to Mr. A. H. S. Lucas, M.A., for his services as Editor of the *Victorian Naturalist*.

Mr. S. H. Wintle, F.L.S., read part II. of his paper entitled "Observations on the Geology of Melbourne and Suburbs," in which he described in an interesting manner the geological features of the basin known as the West Melbourne swamp. He had taken advantage of the present excavations and illustrated his remarks with carefully prepared diagrams and specimens.

Several members took part in a discussion which followed on the points touched on in the paper.

The following were the principal exhibits of the evening:—By Mr. P. H. Anderson, bombardier beetles from Everton, Victoria. By Mr. C. H. Brittlebank, water-colour drawings of Victorian insects in their several stages. By Mr. A. J. Campbell, a map of King's Island, showing the locality for the proposed expedition by the members of the Club in November next. By Mr. C. French, F.L.S., birds from North Queensland, viz., *Ptiloris Victoriæ*, Victoria rifle-bird, and *Megapodus tumulus;* also Queensland birds' nests. By Mr. C. French, jun., eggs of panayan tern, noddy tern, sooty tern, nankeen kestrel, great brown kingfisher, and black-backed porphyrio. By Mr. E. H. Hennell, moths, *Cheropteryx Collsii*, with caterpillar, chrysalis, and cocoons of same. By Mr. G. A. Keartland, Victorian parrots, a young hooded-dottrel, and a white crow strike, a *lusus naturae*. By Mr. H. Kennon, a specimen of recent fossilisation of she-oak from Tasmania. By Mr. A. H. S. Lucas, M.A., a photograph of the "Artillery Rocks" at Lorne, taken by S. M. Hawkins, of Wesley College. By Mr. F. Reader, dried plants in illustration of paper, "The Medical Virtues of some of our Notable Weeds," published in *Journal of Pharmacy*, May, 1886. By Mr. H. L. Thompson, shells, *Trochita calyptraeformis*, and *Venus*, from Mentone; also section of limpet showing internal organs. By Mr. S. H. Wintle, F.L.S., fossil ferns from Gippsland coal measures, Moe, *Neuropteris* sp., *Sphenopteris* sp., Zamites; specimen of sand-

stone, turned into quartzite by infiltration of silica, from Moe; graptolites, *Didimograpsus*, *Phyllograpsus*, etc., from Sandhurst; nest of mason wasp from Moe; sponges from Queenscliff and Cheltenham, *Isodictya infundibuliformis*, *I. anastoma*, *I. dichotoma*, *I. fissura*, and *I. palmata* (Bowerbank). By Master A. Yelland, crystals from basalt, Clifton Hill quarries; and by Master C. Yelland, fossils from Tasmania.

After the usual *conversazione* the meeting terminated.

FIRST ASCENT OF MOUNT BELLENDEN-KER.

By W. A. Sayer.

(Communicated by C. French, F.L.S.)

(Read before the Field Naturalists' Club of Victoria, 4th April, 1887.)

Some idea of the grandeur of the scenery of tropical Queensland, and of the hardships and privations which have to be undergone by travellers and pioneer settlers, may be formed by reading a few brief notes made by Mr. W. A. Sayer, who, as a botanical emissary, purposely visited the Barron Falls and the Bellenden-Ker Range, both these places being in the vicinity of Trinity Bay. Mr. Sayer says:—

Being camped on the Barron River, within ten miles of the falls, my companion (Mr. Froggatt), who is under engagement to the Hon. William Macleay, of Sydney, for entomological purposes, accepted my invitation to pay a visit to the falls. On the appearance of fine weather—it having rained for ten days previously very heavily—we made a start, with the usual equipment. The Barron River, owing to recent heavy rains, being unfordable, we had to travel by way of Douglas track, thereby having 16 miles to go instead of 10. The track was very wet and slippery, rising by a succession of steep slopes until the top of the range was reached, about 1200 feet above sea level. Pausing on the summit for a rest, we had an opportunity of seeing something of the country around us. Dense jungles appeared on all sides, and the waters of the Barron, winding along the valley below, in its course to the sea, presented a very picturesque appearance. Starting again, we passed through dense jungles, broken at intervals by patches of fine grassy forest country. Having travelled some 8 or 10 miles, we camped for the night. Next morning we shouldered our loads—which, with the necessary implements of entomologic and botanic collectors, were no light weight—and trudged joyfully on, expecting soon to see the largest waterfall in Australia, and one of the sights of the world. We had still seven miles to go, and after a great deal of slipping and sliding we reached the upper crossing of the Barron River, where we could already hear the

roar of the falling waters in the distance. The noise of these falls can be heard at a distance of 12 miles. The volume of water, therefore, must be something enormous, seeing that, as Mr. Sayer states, the annual rainfall in this locality is probably one of the heaviest in the world.

After another hour had been spent in climbing through the lawyer (calamus, palm) and stinging trees (*Laportea*), we came abreast of the falls. Creeping cautiously on our hands and knees, and looking over the precipice, we beheld the grandest cataract I, at least, had ever seen, excepting Niagara. For fully half a mile occur successions of rapids, until the Big Falls are reached. Then the waters are divided by a huge wedge-shaped rock, and meeting again, are hurled into the gulf below, seething and boiling, and throwing spray hundreds of feet into the air. As viewed from the Cairns-Herberton Railway track, the left channel has three falls, the first being about 15 feet, the second 50 feet; then meeting, as I have stated, the whole mass is precipitated like a solid wall over the enormous precipice into the abyss below, a distance of 500 feet. Flanked as they are by walls of perpendicular rock nearly 1000 feet from the bottom of the gorge, the deafening roar of waters, the curious water-worn cavities, together with a small cascade pouring from the scrub at right angles to the main falls, a distance of 200 feet, form a wild, weird scene not easily forgotten. We slept that night on the rocks within 50 yards of the Big Falls, the spray keeping us pretty moist. Next morning, after an early breakfast, we took off our boots, and, descending to the bottom of the gorge, filled our bags with plants from the rocks. We stayed a couple of hours only, as we had to get to our camp that night, our provisions being all expended. On our return journey we took the survey track, hoping to shorten our journey, but lost a lot of time endeavouring to keep it, as it was overgrown in many places with the lawyer, vine, and stinging tree. We made very little progress, and at five o'clock we found ourselves in a dense jungle. We had followed an old "trial line," and it had "panned out." It being now sunset, we, hungry, wet, and weary, lay down supperless to rest. To add to our misfortunes, the rain fell heavily and steadily all night. Next morning, our efforts to find the track proving futile, we took to the scrub, and after a great deal of climbing and scrambling, during which our clothes were torn to shreds, we made a settler's "humpy," and were very glad of the hospitality of its owner (Mr. O'Connor), and, having been without food for 36 hours, we did ample justice to the repast placed before us. We then made for our camp. Our troubles were soon forgotten, and we both agreed that what we had gone through was more than repaid by the sight of the wonderful Barron Falls.

The principal object of my mission to Queensland being to fulfil a request of Baron von Mueller, to effect, if safely possible, the ascent of Mount Bellenden-Ker, I shifted my camp to the Russell River; Mr. Froggatt having finished on the Barron, accompanied me; we pitched our camp on Harvey's Creek. Leaving the camp in charge of Mr. Froggatt, I proceeded with a kanaka in a flat-bottomed boat up the Russell to prospect for a likely place to ascend the mount. I had proceeded about 14 miles when the boat sank through coming in contact with a partially hidden snag; fortunately we lost nothing, though everything got wet. We raised the boat, patched it up, and went on our way, and on getting half a mile further observed blacks on the river bank. They cleared out on our approach, but sometime after we saw them following the boat under cover of the scrub. I did not like their movements, and as they all had stones in their hands, and knowing them to be particularly savage and treacherous in this locality, I fired a shot from a rifle, and they disappeared. At night we slept in the boat, keeping watch in turns. Getting under way next morning we had not proceeded far when our boat again capsized, and our provisions were lost, therefore we had to return for more to the nearest settlers. The current was running pretty strong, and we did not need to use the oars. On getting to the place where we had previously seen the blacks, we again saw them, but only three in number. One of them was leaning against a tree, and the sharp eyes of the kanaka detected a spear that he was trying to conceal behind him. As the current would take us immediately under the bank on which the myall was standing, I, fearing that he would launch the spear, fired a shot, and he dropped immediately on all fours (no doubt thinking I had taken aim), and crawled into the scrub, while the rest also vanished. We got more stores from the settlers, and I was about to start up the river again when Mango said, "Massa, s'pose you go long ribber to-night, blackfellow kill you altogether," so I took his advice and remained until morning. It was fortunate that I did so, for on reaching the spot where we were threatened, I found the only channel blocked by timber that the blacks had fallen (they are in possession of axes, scrub knives, etc., having killed and plundered a settler about 12 months ago). We dragged the boat around the obstruction, and proceeded on our way; but on heavy rains setting in and the blacks menacing, I thought it advisable to return to camp.

Some time after, Mr. Froggatt volunteering to accompany me, we started with the object of tracing Harvey's Creek, as we had an idea that it took its source from the Bellenden-Ker Ranges, although we were assured by a party (who professed to know) that it did not do so.

We followed up the creek, most of the time up to our waists in water, and on the evening of the second day we came upon a very pretty waterfall about 120 feet high. We camped there that night and were very uncomfortable owing to the very heavy rain. Next morning brought no change in the weather, but we determined to push on, and on proceeding about half a mile further we came to another magnificent fall of water, which, at the lowest computation, must be 270 feet. This fall I named "French's Fall," in honour of my cousin Mr. Charles French, F.L.S., one of the founders of the F. N. C. of Victoria, and an enthusiast in all branches of natural history. It was here that we first saw signs of blacks during our journey, having come upon a fire which had but recently been extinguished, as the embers were both wet and warm. We saw several camps afterwards but they were tenantless. This caused us to keep a sharp look-out, and leaving the creek we took to a likely-looking spur, the approach to which was a climb of nearly 200 feet, and we had to hang on tooth and nail. Here our scrub knives came into requisition, and were in constant use for the remainder of the journey. The rain continued steadily and we passed another uncomfortable night, but, as we were tired and weary, the heavy downpour did not prevent us from sleeping some portion of the night. Morning saw us on our way again, and by noon we had cut about three miles of track and judged our altitude to be about 2000 feet. We tried to determine our position by climbing trees but could discern nothing either above or below us, the mist which hung around obscuring everything at a distance of 50 or 60 yards. At night time of the fourth day three and a half miles of track had been cut, and weary and tired we laid down to rest. This night, like the last, was a soaker, and the leeches caused us much annoyance by getting in our eyes and up our nostrils. In the morning we held a consultation and decided:—First, that as the weather showed no signs of clearing our object must, for the present, be regarded as defeated. Secondly, that if we did not immediately descend one of us would have to carry the other down, as symptoms, arising from an accident of a painful nature began to develop in my companion. We retraced our steps homewards, and after a weary march, camping anywhere we could obtain shelter at night, sometimes under shelving rocks or in the humpys of the blacks (the blacks, of course, being away), we reached our starting point on the evening of the sixth day, with nothing gained but the poor satisfaction of knowing that we were the first two whites who had attained that elevation on Mount Bellenden-Ker.

Some time after our unsuccessful attempt to ascend Mount Bellenden-Ker my plucky companion left me, and I was joined by a young tourist friend from England (Mr. Alexander Davidson). I was about starting on a tour to the

Upper Russell River and he gladly accompanied me. The punt was again in commisssion, her crew consisting of Mr. Davidson, myself, and two hands. Taking six weeks' provisions we started in a light rain, which soon increased to a regular soaker. We collected on our way up, and camping on the banks at night time keeping watch against the myalls who are particularly savage and treacherous in this district. We had great difficulty in navigating the rapids, having to go against the current for 20 miles, and our progress was very slow, all hands having to get out and push the punt through the water. So strong was the current in some places that we only made a quarter of a mile in the hour, the current taking us nearly off our feet. When we had been three weeks out the river, owing to continuous heavy rains, rose 25 feet above its ordinary level so that we could proceed no further, after having come 34 miles. In trying to land that night our punt capsized, and one swag, with 150 rounds of ammunition, was lost, though we succeeded in saving everything in a soaked condition, and made our sunken punt fast.

Next morning we stripped, and went out to our sunken punt by means of a line, and, after two hours' hard work, succeeded in getting it ashore, and loaded her for the return journey. The river was running nearly 20 miles an hour, and we expected a rapid run home. To guard against accidents we remained naked, and getting into the punt I cut the painter. Instantly we were sent with frightful velocity down the stream, and it was with great difficulty we could keep from getting broadside on. For about half an hour we travelled in this way, when, getting into an eddy, we lost all control over the boat, which was hurled against a huge snag, and she immediately filled and sank, taking myself with her, through my leg getting fouled with the remainder of the painter. I was kicking away for dear life, when by some means the boat overturned and came to the surface. Getting free, I clambered on to the bottom, and was carried about a quarter of a mile, when, coming into still water, I left the punt and made for the shore in double-quick time, knowing that the river was infested with alligators. We travelled for three days and nights, without food or clothing, until we reached a settler's, who kindly furnished us with both. We got to camp next day.

After resting for two or three days we again set forth, with the object of attaining the summit of Mount Bellenden-Ker, if possible. After the first day rain again commenced, which increased the difficulties we had to contend with. We travelled eight miles up to our waists in water, and at times had to join hands and form a chain, to keep from being swept away. Leaving the creek at French's Falls, we ascended the opposite bank to the one chosen on our first attempt, as it was impossible

to negotiate a climb of 200 feet with a 60 lb. swag. As it was, we had to climb 70 feet of a solid rock, without a fissure. This was a source of great tribulation to our "two hands," who solemnly vowed never to go exploring again. We had to haul them up. We cut through 12 miles of scrub, and ultimately reached the summit, having been three and a half days without food, and four and a half days before reaching camp. However, we thought little of that, having accomplished our object, and being the first Europeans to top the mountain. The climbing was difficult and dangerous, owing to loose boulders giving way and crashing down into the gorge below, carrying everything before them. Our last 1500 feet was literally hand and knee climbing, and we were quite exhausted on reaching the summit. We spent four hours collecting, and were rewarded by finding *Agapetes Meiniana*, *Dracophyllum Sayeri*, *Hysophylla Halleyana*, and a small ephiphytal fern, *Polypodium Bakeri*. The blacks troubled us only once this trip. At an elevation of 3000 feet we were aroused about 2 o'clock a.m. by the violent barking of our dogs, and sprang up in time to see them in full retreat. A few shots fired by us hastened their flight considerably. On our way back to Cairns we learned that we had been reported lost to the police, who had started to look for us, but learned of our safe arrival when they had got 20 miles on the road.

On reaching Cairns a re-ascent was arranged for. We rested a week, and I returned again with four Kanakas, Mr. Davidson accompanying me. On the ninth day we again reached the summit, and pitched a camp. We remained eight and a half days on the top in a constant rain, it not having ceased since the second day of our journey. The top of the range is razor-backed, and on travelling along the range beyond the spur by which we ascended, I could not see the sides, they being, if anything, hanging over. We tumbled rocks over, but could not hear them fall. It was here that I observed the *Rhodendron Lochae* growing, and asked the Kanaka to get it; but he remarked, "S'pose I fall, I no see daylight any more; I go bung altogether;" so I had to get it myself. About 100 feet lower down the *Spiracanthemum* was found, also the *Dracophyllum*, though I subsequently observed both growing at the highest elevation, the latter being very obstructive, and ranging from 4000 to 5200 feet. The pretty little *Didymocarpus* was found at 5000 feet, growing on some rocks. I was much surprised to find the vegetation increasing in density as the elevation increased, and on gaining the summit it presented the appearance of a mass of entangled wire-work. The palm, *Ptychosperma Loccospadix*, we found very prolific, while the two ferns, *Alsophila Rebeccae*, and *Dicksonia Youngiana*, were also very prolific at from 1500 to 5200 feet. Our provisions

being nearly all expended, we made preparations for returning, so, after naming the highest peak of the range "Mueller's Peak," and cutting our names, date, and height on a large *Elæocarpus*, we started for home. Immediately on our arrival two of the Kanakas went into hospital with fever, while Mr. Davidson and myself suffered intense pain, caused by contraction of the muscles of our legs, through constant wet and over-exertion, and it was nearly a fortnight before we could get about.

To the zoologist this part of tropical Australia would, I fear, be somewhat disappointing, the comparative absence of mammals being very noticeable. Birds are plentiful enough in the scrub, but on the summit of Mount Bellenden-Ker during my eight and a half days' stay I did not notice a single specimen, with the exception of the black cockatoo. The scrub-hen and scrub-turkey are very common in some localities, especially on the Barron River, and at times the stately cassowary (sometimes weighing nearly 200 lb.) makes its appearance. Pigeons, too, are very common, and about December and January countless numbers of that very handsome bird, the Torres Straits pigeon, are to be seen. Herons, cranes, egrets, and hawks, also the white-bellied sea-eagle and the jabiru, are to be seen on the various creeks and at the mouth of rivers. Fish are very plentiful, and in these there remains, no doubt, much to be done. In reptilia, North Queensland is strongly represented, pythons, to the length of 18 feet and more, being not uncommon. A specimen that managed to survive three months' travelling on an empty stomach may be seen at the Royal Park. Venomous snakes are as usual but too plentiful, and, scrub being thick, are very dangerous. Lizards of numerous kinds are in numbers, while alligators of a very large size and capacious stomach are always to be dreaded while swimming in rivers. Insects are both numerous and beautiful as well as troublesome ; Coleoptera, Lepidoptera, and Hymenoptera being well represented. The butterflies—Papilio Ulysses, Ornithoptera, Pronomus, etc., etc.—were to be seen flying, but mostly damaged, possibly owing to the nearly continuous heavy rains. Still in a fine season a good collector who made natural history his sole object could and would be likely to do very well indeed, but for such a collector a robust constitution and a certain amount of enthusiasm is requisite to cope with exposure, fever, natives, etc., etc., and this is necessary in a country which registers nearly 200 inches of rain within the year, and where in one month (January) 28 days' rain was recorded.

The plants mentioned in these notes were named and described by Baron von Mueller, whose kindness and sympathy stimulated the forlorn hope that reached the summit of that

hitherto unascended mountain, Mount Bellenden-Ker, named in 1803, by Capt. Flinders, in honour of Mr. T. Bellenden-Ker, a celebrated botanist of that day. The writer of these brief notes having travelled in North and South America, India, West Africa, and other parts of the world, gives it as his opinion that the rainfall in this part of Queensland is one of the heaviest in the whole globe, and that the jungle, for density at least, will certainly hold its own with that of any other tropical country. Mueller's Peak, on the Bellenden-Ker Range, is the most elevated in tropical Australia, and rises to a height of 5200 feet.

TRIP TO LAKE ALBACUTYA.

By D. Le Souef.

(Read before the Field Naturalists' Club of Victoria, 17th Jan., 1887.)

I left Melbourne by the first train on the morning of the 3rd of December, and arrived at Dimboola at 7.20 p.m. Here I stayed the night. Next morning my friend, Mr. Percy Scott, of Albacutya Station, drove me to Tullyvea, distant about twenty-five miles. The road skirted along dense mallee for some distance, and over several long sand ridges covered with pine, the intervening country being box flats. We called at the Aboriginal Mission Station, and found that about a fortnight previous the blacks had been out collecting lowan birds' eggs, and had returned with a large number, but I need hardly say they had all been eaten long before our arrival. The blacks said they did not intend going out again.

We then visited the distillery at Antwerp, where eucalyptus oil is made from the leaves of the mallee. They seemed very busy, and had apparently no difficulty in getting a good supply of young branches and leaves to keep the mill going. We arrived at Tullyvea at 4 o'clock. The house is nicely situated on the banks of the Wimmera. Snakes are occasionally troublesome here, as they come about the house a good deal, much to the discomfort of the inmates. We saw a small flock of pelicans flying overhead, and also a few cormorants and ducks.

Next morning we started early for Albacutya, distance 53 miles. After driving for some time over open grass country, we came in sight of Lake Hindmarsh, which is a very large shallow sheet of water, and frequently dries up by the end of summer, but the ground thus left affords a luxuriant feeding ground for stock, which is appreciated in this otherwise dry country. We saw a few black swans and ducks on it. Near here a farmer lately ploughed up six death adders when ploughing up new

land, but they are not numerous, and we saw none, although a good look-out was kept, but we found numbers of the "rugged stump-tail lizard" (*Trachydosaurus rugosus*), known up here by the name of "wollops." At the north end of the lake the road follows along the outlet, a dry bed of creek connecting Lake Hindmarsh with Lake Albacutya. Here the timber (red gum) was larger, and we found several nests of the sulphur-crested cockatoo, the Galar cockatoo, Major Mitchell cockatoo, the rock pebble paroquet, or, as it is here known, the smoker or mallee parrot, the grass paroquet, the bronze-wing pigeon, the wedge-tail eagle, and others, but all those found had young birds in. On leaving the outlet, we passed over some sandy country, covered with porcupine grass (*Triodia irritans*). We here saw a few of what appeared to be a species of small bloodsucker (*Grammatophora muricata ?*). On nearing the station, we passed through a gate in a rabbit and wild dog proof fence. The lower part was fine wire, a broader being used in the upper part, and a barbed wire run along the top. It seemed to effectually stop anything getting through or over. We arrived at our destination at 5 o'clock.

Next morning we started early, and drove some 7 miles to a lowan's nest in the mallee. It was about 16 feet in diameter, and about 4 feet high. After scraping the loose sandy soil away, we came on five pink eggs. They were laid in a circle, the first on the outer side, and the last more in the centre. The birds apparently visit the nest every morning, scratch and scrape it out. The male bird seems to assist, as you often see them together on the nest, so that if any young birds are hatching they could be liberated, and also for the purpose of laying their eggs, which they do every fourth day. We took the temperature of the nest, and found it to be 95 deg. F., but I have no doubt opening it lowered the temperature slightly. One egg appeared to have been laid that morning, so I took it to try and hatch it out in the incubator, but I was not successful, and found out that it had been laid about three days before I took it. The only way to get a perfectly fresh egg is to secure it immediately after the bird has laid it. As soon as laid she covers it up, and incubation commences at once. All the eggs are placed erect, the small end being below: this may enable the eggs to resist the weight of the sand above them, as their shells are very fragile and easily broken. Mr. Scott had placed some fine wire netting round the nest to prevent any young ones getting away, but it did not seem to have the desired effect. After covering up the nest again, we drove to another about three miles off. It was some distance in the mallee, so we unharnessed the horses, and leaving them tied up on the road, we proceeded on foot.

The nests about here all seem to be built near small clumps of pine trees, which helped us considerably in finding them again. On opening up the second nest, we found only 3 eggs, and I again took what looked like a fresh one, but found out afterwards that it was not as fresh as anticipated. We found the temperature of this nest to be 96 deg. Proceeding a few hundred yards further on, we came on another very large nest, and found in it 9 pure white eggs, but 5 of them were broken across the top and filled with sand, it evidently having been done accidently by the parent bird when scratching. As we knew of no more nests, we returned to the station.

Rabbits here were numerous, in fact you saw them everywhere, black, white, red, and the common grey ones. It is wonderful what a little suffices to feed them. Large numbers are destroyed in the dry season by placing troughs full of poisoned water for them to drink. But I am sorry to say that numbers of birds are also poisoned as well as the rabbits. As many as 500 have been poisoned on a single night near a large warren by one trough, and they seldom got more than 100 yards away before they died. The breeding season for birds was nearly over, but numerous nests were seen in the pines and bull oaks, and this ought to be a very good country for the egg collector. Eagles and hawks were very plentiful, as also were their nests, but they are not allowed to be shot, as their chief food consists of rabbits.

Next day we again visited the nests and found that the lowans had been before us and carefully scraped the mound together again. At one we heard the bird close to us in the scrub. They make a low, soft sound, somewhat like that of the emu, but the bird kept out of sight. On our return we sighted an emu, but it soon disappeared in the mallee. The evening was spent in coursing rabbits over a dry water-hole, getting them out of a pile of logs close by.

Early next morning three of us drove to the north end of Lake Albacutya to try and shoot some wild cattle, which feed on the dry bed of the lake during the night and camp in the mallee during the day. The track was over very sandy country, covered with pine, and we skirted along the lake for some miles, until we came across the fresh tracks of the cattle, where they had returned to the scrub to camp. Here we unharnessed the horses and tied them up under a shady tree, and then made our way over burnt heath and mallee country, following up the tracks. The day being hot and bright, there was a good deal of glare from the white sand. We saw the fresh footprints of dingoes in abundance, and also those of the black-faced kangaroo (*Macropus melanops*), but saw no sign of any snakes. They seemed very scarce, much to my disappointment. After trudging

through the hot sand for about four miles, straining our eyes and expecting to see the cattle under every clump of timber, we came across them camped among a few green pine trees. Fortunately the wind was favourable, and we saw them before they were aware of our approach, and managed to get a shot at a bull. Immediately on firing there was a stampede of the herd, but the one we had fired at only went about 100 yards, and then pulled up behind some scrub. After some dodging we managed to get another shot, but there being so little shelter for us when he charged, it was some time before we managed to despatch him. The sport was very exciting while it lasted, but too dangerous in that class of country to be pleasant. We then tramped back to the horses, seeing a few stump-tail lizards on our way, but the birds had apparently sought shelter from the sun in the belt of timber bordering the lake.

In the evening we found the bower of the spotted bower-bird, situated close by a fallen pine, with a bagful of old bones, broken glass, and coloured leaves, etc., etc., alongside of it. It must have given the birds a good deal of labour to collect them all together. I brought it down with me complete, and also the bones, and they are now to be seen in the small museum at the Zoological Gardens. The pair of birds were very noisy when they saw their bower being taken away, but I have heard since that they have made another close by the same place, and are busy making another heap of bones, etc.

Next day I had to return to Tullyvea, so we started early. During the drive I got five stump-tail lizards, and came across a few iguanas *(Hydrosaurus varius)*, and also a large fresh-water tortoise crawling along the road in the hot sun several miles from the water. We arrived at our destination about 5 o'clock p.m. I started again next morning at 4 o'clock and reached Dimboola in time to catch the first train to town. On the way down we passed through clouds of grasshoppers, and numbers of them made their way into the carriages. I reached town at 10.30 p.m.

CORRESPONDENCE.

Oology of Australian Birds.

To the Editor of the Victorian Naturalist.

Sir,—In justice to myself, I hope you will concede a line or two, by way of explanation to Dr. Ramsay's letter, which appeared in your last issue. First, I believe your criticism which provoked Dr. Ramsay was perfectly legitimate and wholesome.

In America and Europe, where oology is much studied, honour is attached to the person who discovers or describes eggs new to science, and it would be deemed discourteous to detract from such an one honour so gained. I was under the impression that the rule held good here. Dr. Ramsay does not deny that he has described eggs which were previously described without referring to former authorities. Partly in extenuation, he excuses himself by saying I committed similar errors with regard to himself. Now, two wrongs do not make a right. For my own part, if I have so transgressed, I exceedingly regret it, and hereby make full apology, and I hope Dr. Ramsay will be assured that it was neither "culpable negligence" nor "gross unfairness" towards him, but in perfect innocency, and for the want of the reference to which he alludes. Dr. Ramsay says he knows for a fact I was furnished with a list showing the dates of descriptions (in 1874-75) of certain eggs. Up to the present moment I have not received such a list. The only other list I am aware of was recently compiled by Mr. A. J. North, while in Sydney lately. It was received by the Field Naturalists' Club at its meeting in March last, since which date I have described no eggs. That list, however, according to its own title, is far from complete. For the sake of the science we so much love, I trust that this little "wind puff" will at once blow itself into oblivion.—I am, sir, yours truly, ARCHIBALD J. CAMPBELL.

Armadale, 11th June, 1887.

[We quite admit Dr. Ramsay's right, and shall welcome his exercise of it, to throw any further light he may be able on any forms of Australian vertebrates. We may admit, too, that we paid more attention to the form of his articles than to their titles. But when neither in any of Dr. Ramsay's recent articles, nor in Mr. North's "List of References to Authentic Descriptions of Australian Birds' Eggs," compiled lately in Sydney, has a single reference been made to any of the descriptions of eggs which have been recorded in *The Victorian Naturalist*, we considered it time to put in a claim that Victorian eggs and Victorian descriptions should not be entirely ignored, as lacking "authenticity," in favour of those of the sister colony. But having made our protest, and having published Dr. Ramsay's reply *in extenso*, we shall be glad that the matter should go no further, and must close this correspondence.—ED.]

ERRATUM.—On p. 27, l. 23, "species of planets" should, of course, be "special planets."

EXCHANGE—SHELLS.—Victorian recent or fossil shells desired in exchange for South Australian, etc. WILLIAM THOMPSON BEDNALL, *Register* office, Adelaide.

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 11th July, 1887.

The president, Mr. A. H. S. Lucas, M.A., occupied the chair, and about seventy-five members and visitors were present.

A special meeting was first held to consider a proposed alteration of Rule 16, moved by Mr. C. A. Topp, M.A., whereby the annual meeting of the Club would take place in August instead of May, as at present, and after some little discussion the alteration was carried.

The ordinary business was then proceeded with, when the hon. librarian reported the receipt of the following donation to the Club's library:—"Journal of Pharmacy," June, 1887.

The following persons were duly elected members of the Club:—Master H. Burdett, Messrs. E. Burdett, E. Burke, J. Cootes, W. Morris, Dr. A. A. Parry, Mr. R. B. Pridmore, and Rev. F. R. M. Wilson.

The committee submitted a recommendation that the Commissioner of Trade and Customs should be asked by deputation to increase the number of native birds included under the protection of the Game Act, which, after some slight modifications, was adopted.

Paper read:—The hon. secretary read a paper by the Rev. Dr. Woolls, F.L.S., of Richmond, New South Wales, an honorary member of the Club, entitled "Plants of New South Wales having Medicinal Properties." The author briefly noticed the various native plants which were recorded to have been used medicinally, and gave some account of their properties and uses. He expressed a hope that remedies discovered by accident may be thoroughly tested by qualified persons, and, if found really useful, the facts recorded and made available to the general public.

Several members mentioned interesting natural history items.

The Cryptogamic Botanical Section also held a meeting, when Mr. D. M'Alpine, F.C.S., read a few notes on the objects of the section, which he grouped under three heads:—Firstly,

the collection of the scattered literature on Victorian cryptogamic botany; secondly, the distribution of the different branches of the department to special workers; and thirdly, the providing of works of reference and journalistic literature containing the latest information.

Miss F. M. Campbell exhibited a large number of lichens mounted and named.

The following were the principal exhibits of the evening:—By Mr. C. H. Brittlebank, a case of coleoptera, collected since last meeting; also, water-coloured drawings of beetles and larvae. By Mr. E. M. Cornwall, New Zealand birds, viz., the kea, *Nestor notabilis;* the weka, *Ocydromus Australis;* the kakapo, *Stringops hubroptilus;* the kaka, *Nestor meridionalis;* and the southern tern, *Sternua frontalis*. By Mrs. Flatow, sponges from Queenscliff and Port Phillip Heads. By Mr. C. French, F.L.S., wild flowers; also, rare diurnal moths from North Queensland. By Mr. C. Frost, specimens of the net fungus, *Ileodictyon cibarium*, in various stages, from Kew. By Mr. H. C. Grover, a leveret (mounted). By Mr. E. H. Hennell, reindeer moss, from Sweden; volcanic dust, from recent eruptions at Tarawera, New Zealand; petrified wood, from tree five feet in diameter, found 87 feet below surface at Gembrook. By Mr. A. H. S. Lucas, M.A., British species of genus *Orchis*. By Mr. J. E. Prince, coal, from Moe Coal Company and Narracan Coal Company, Gippsland; also, specimens of the overlying sandstone. By Mr. H. L. Thompson, crab, *Platyonychus bipustulatus*, from Port Phillip. By Mr. H. Watts, 72 specimens of marine Bryozoa, mounted for the microscope. By Mr. J. Wing, gold and golden quartz, from Golden Gate Company, Rushworth. By Mr. S. H. Wintle, F.L.S., plant impressions in shale, and garnetiferous gneiss, from New Zealand; *Mytilus*, coated with fossil polyzoa, from cutting at West Melbourne Swamp; plates of artificially produced *Dendrites*. By Master A. Yelland, crystals from basalt, Clifton Hill quarries.

After the usual *conversazione* the meeting terminated.

THE following notice appears in *Hardwicke's Science Gossip*, No. 269, May, 1887, on a new book by Professor M'Alpine, biological lecturer and member of this club:—"*Life Histories of Plants*, by Professor D. M'Alpine (London: Swan Sonnenschein and Co.) These are a series of careful studies well illustrated, and dealing entirely with the lower life of the vegetable kingdom. The first and most extensive chapter is devoted to the comparative study of plants and animals on a physiological basis; and the book is worth buying for the sake of this chapter alone. The book is beautifully got up."

THE ORCHIDEÆ OF VICTORIA.

Part XI.

By C. French, F.L.S., Government Botanist's Department.

(Read before the Field Naturalists' Club of Victoria, 14th March, 1887.)

Caladenia. (R. Brown.)

Dorsal sepal erect or incurved over the column, usually narrow, erect or spreading. Labellum erect at the base, undivided or 3-lobed. Column erect or incurved, more or less 2-winged in the upper part. Anther erect, 2-celled. Pollen masses granular, terrestrial, usually hairy, with small tubers. Leaf solitary, linear-lanceolate or oblong, from within a scarious sheathing scale close to the ground. Flowers solitary or very few in a loose raceme, on an erect scape.

As in Pterostylis, I have thought it better to divide the species into sections, after Bentham, the first being—

Sect. 1.—Leptoceras.

Sepals acute or rather obtuse, the dorsal one erect or incurved and concave. Petals erect, linear-clavate, longer than the sepals. Disk with 2 to 4 rows of calli. Labellum not fringed.

C. Menziesii. (R. Brown.)

Stem slender, glabrous or slightly hairy, usually 6 to 9 inches high. Leaf ovate-lanceolate, 1 to 2 inches long. Flowers 1 or 2 on long pedicels. Sepals lanceolate, acute, 4 to 5 lines long. Petals much longer than the sepals, erect, linear, sometimes almost filiform, but clavate towards the end, giving the flower a 2-horned aspect. Labellum shorter than the sepals. Column rather broadly winged.

We commence with this pretty little plant, it being a worthy representative of perhaps the finest of the genera of the Victorian orchideæ, the colours ranging from the faintest pink to the most brilliant crimson, yellow, and blue. C. Menziesii may be easily distinguished from any other Vict. sp., principally by its singular horned appearance, also by its colour; the pure white and chocolate purple is, in this respect at least, unlike any of its Victorian congeners. In the hilly country near Berwick this little plant grows to great perfection, and may occasionally be found nearly a foot high. It is very "patchy," and is not scattered like some of the other sp. of the genus. Many years since it was to be found somewhat common near Cheltenham, but it seems to be scarce now in that district. To grow it well use a compost of burnt loam and sand, place a number of tubers in a shallow pot or pan, and keep from the

direct rays of the sun. It is well worthy of a place in every collection of native orchids. Flowers about November, is very generally distributed throughout the colony, and is found also in S. and W. Australia, and in Tasmania. Leptoceras Menziesii, Caladenia macrophylla, Leptoceras macrophylla, and L. oblonga are synonyms of this sp.

Sect. 3.—Calonema.

Sepals acuminate, with long or short points. Labellum inconspicuously veined, the disk with 2 or more rows of calli.

C. Patersoni. (R. Brown.)

More or less hairy, and from under 1 foot to nearly 2 feet high, the upper portion and flowers often minutely glandular-pubescent. Leaf oblong-linear or lanceolate. Flowers 1, 2, sometimes 3. Sepals more or less dilated in the lower part, tapering into a long point. Petals shorter, and not dilated at the base, or rarely as long as the sepals. Labellum rarely half as long as the sepals. Calli numerous, linear or clavate. Column as the erect portion of the labellum, shortly winged at the apex. Anther point usually prominent.

This charming sp., a gem amongst the native orchids, is too well known to need any further description than the excellent one which I have, as usual, abbreviated from Bentham and Mueller's great work. I may, however, say that this is the most variable of the whole of the orchids which I have seen, either Australian or exotic; the shapes differing and the colours ranging from the purest white to the deepest and darkest crimson. I have adopted R. Brown's specific name of Patersoni not because I think it better, or even as good, as that used by Baron von Mueller, viz., pulcherrima—a term which it well deserves—but because I commenced with the Flora Australiensis, and shall finish with it. This orchid has puzzled some of our best botanists, and the one who reduces a number of varieties to one good species certainly deserves the thanks of all, whether they be amateur or professional; and thus the great value of a well-kept herbarium is apparent, as supplying numerous specimens showing the gradations—a source of practical information to the botanist which such a collection alone can supply. This sp. is to be found pretty generally distributed over the whole colony, the larger and more beautiful forms being chiefly found in land bordering on forests. It is known to colonists by the not at all inapt name of the spider-orchid, but as we do not, as a rule, favour common names if absurd, I shall not allude to its numerous peculiarities in this respect. This sp. is of easy cultivation, that is if the tubers (which must be lifted very carefully) are not bruised. Place them in a pot, well drained, in sand or sandy-loam, with a little leaf-mould. Water

sparingly, and keep shaded until they show flower; then they can withstand more exposure. It would be better, if convenient, to keep the varieties as much as possible separate, as the light-coloured ones are mostly taller than the dark ones, and you may by accident place the short ones in the centre of the pot, in which case the symmetrical effect would be spoilt. Flowers from September to December. Found also in New South Wales, Queensland, South and Western Australia, and in Tasmania. C. pulcherrima of F. Mueller is a synonym of the sp.

"Mr. Bentham remarks that the whole species require working up in their native country, where alone it can be ascertained how far hybridism may have contributed to the confusion of different species or sub-species"—Hooker's "Flora Tasmanica."

Sect. 4.—Eucaladenia.

Sepals acute or obscurely acuminate, rarely obtuse, the dorsal one usually erect and concave. Labellum inconspicuously veined, the disk with two or more rows of calli.

C. Latifolia. (R. Brown.)

Hairy, from 2 to 12 inches high. Leaf oblong-lanceolate, 1½ to 4 inches long. Flowers pink or rarely white, usually 2 or 3, rather distant on short pedicels or stalks. Lateral sepals varying in different specimens from 6 to 11 lines long, oblong-lanceolate. Labellum not one-third the length of the sepals. Column shortly and rather broadly winged at the apex. Anthers with a long point.

This very pretty and distinct sp. is to be found common along the sea-coast, where it grows on sandy soil skirting the belts of ti-tree, etc. It may easily be recognised by its very hairy leaf and stem, which is broader, and a much lighter green than in C. Patersoni. The flowers are of a pale, or bright, pink, and the flower stem stands very erect, although the leaves are often very soft and flabby. I have very seldom found it myself far inland, but I have received it from the ranges near Stawell and other places. To grow it well, lift the tubers carefully, as they are like those of the former sp,, easily detached if clumsily handled; use sandy soil and decomposed leaves from the ti-tree (Leptospermum), place in a deep pot and press the soil firmly after putting in the tubers. Water sparingly at first, and if grown well, this makes a very pretty sp. for a group. Flowers from September to end of October, and is found also in New South Wales, South and Western Australia, and in Tasmania. C. mollis and C. elongata are identical with this sp.

C. Suaveolens. (Reichenbach.)

Glabrous and usually 1 foot high or more. Leaf linear or linear-lanceolate, 6 to 8 inches long, and often 2 or 3 empty

sheathing scales on the stem. Flowers 2 to 6, rather distant. Dorsal sepal lanceolate, accuminate, incurved. Labellum not half so long as the sepals. Column broadly winged. Anther with a prominent point.

This singular sp. (for the first sight of which I am indebted to my friend, Mr. D. Best, who was fortunate enough to "spy out" a plant near Berwick) is one of the most distinct of the Victorian sp.—in fact, at first sight I could not make it out, and having no work (the key, for instance) with me to refer to, I had to give it up for a bad job, and ask the Baron, who at once recognised it as an old friend. This orchid, so far as I can see, is nearly always to be found in obscure places, I having hunted about near Berwick for hours, and have only found a very few specimens, and those were all growing in or near the tussocky roots of the dwarf grass-tree X. minor, and thus the plant, being of a dull colour, is easily overlooked by the ordinary observer. It is difficult of removal when found in such situations, because the tubers are easily detached if not lifted carefully. It is a good sp. for cultivation, being very hardy, and is well worthy of a place in a collection. To grow it well, use sandy loam with an abundance of water whilst growing. I believe this sp. is not uncommon about the ranges, and in East Gippsland, but I at least have never been so fortunate as to find it common. Flowers in October and November. Colour of flowers brownish-yellow, and very dull in appearance. Found also in New South Wales and in Tasmania. Lyperanthus suaveolens, Caladenia sulphurea, and Leptoceras sulphurea are synonyms of this sp.

C. Carnea (R. Brown.)

Slender, usually under 1 foot high, hairy or nearly glabrous. Leaf narrow-linear, often long. Flowers 1 to 3, pink in the typical form, often longitudinally veined, and usually with transverse bands of a darker hue on the labellum and column. Sepals 6 to 8 lines long, the dorsal sepal erect, and as well as the petals, rather smaller than the lateral ones. Labellum not above half as long as the lateral sepals. Calli of the disk linear in 2 rows in the typical form. Column narrowly winged.

This very common, pretty, though variable sp. will be found to be generally distributed throughout the colony from the distant mountains to the sea-coast. It has often puzzled me to account for the great difference in colour, habit, and general appearance of this plant, the pretty little digitate-looking pink flowers of the typical form being very different in outward appearance to the more robust and darker coloured forms which are frequently to be found, especially in the ti-tree scrubs which line the coast between Mordialloc and Frankston, where

I have found the latter form nearly 18 inches high, and of a dark brown colour. This sp. seems to be partial to forest lands, where it may be met with in considerable quantities, and is much more plentiful in such situations than when found near the coast; sloping ground near creeks being a favourite place with orchid hunters generally. To grow it well, use good loam, place in a shallow pot or pan, and water sparingly. It is well worthy of cultivation. Flowers from September to November, and in the higher districts up to Christmas. Found also in New South Wales, Queensland, South Australia, and in Tasmania. Arethusa catenata, C. alata, and C. angustata are identical with this sp.

C. Congesta. (R. Brown.)

A slender glandular-pubescent or nearly glabrous species allied to C. carnea, but easily distinguished by the labellum. Stem 9 inches to 1 foot high. Leaf narrow-linear. Flowers 1 or 2, pink. Sepals and petals narrow-lanceolate, acute, $\frac{1}{2}$ to $\frac{3}{4}$ inches long, the dorsal sepal erect, incurved, and concave. Labellum fully half as long as the sepals, narrow, contracted into a claw, 3-lobed, the lateral lobes erect, incurved, and rather long, the middle lobe longer, narrow-lanceolate, recurved, densely covered with thick obtuse calli, either sessile or the lower ones somewhat contracted at the base.

I have never seen this sp. myself, so must be content with the above description, taken from the Flora. Found also in New South Wales and in Tasmania. Culture, I should think, the same as that recommended for the preceding species.

C. Cœrulea. (R. Brown.)

Leaf linear or linear-lanceolate. Stem rarely 6 inches high. Lateral sepals 4 to 5 lines long, oblong-lanceolate, glandular-dotted, dorsal sepal as long, but narrower and shorter. Labellum more than half or nearly as long as the lateral sepals, broad almost from the base; lateral lobes broad, erect, obtuse, with transverse bands of a darker hue. Calli linear-clavate in 2 rows. Column rather narrowly winged almost from the base. Anther point very short. A somewhat rare sp. never or seldom having, as far as I am aware, been found near Melbourne. In general appearance it is not unlike C. deformis, but smaller, and the leaves more glabrous. This is a sp. with which I am not well acquainted, although I found it, I believe, many years ago on Mt. Macedon, and Mr. M'Kibbin also got specimens in the Maryborough district, and I am indebted to that gentleman for some of the specimens exhibited here this evening. Culture similar to that recommended for the following species. Flowers about November, height 4 to 6 inches. Found also in New South Wales and in Tasmania.

C. Deformis. (R. Brown.)

A small species, usually only slightly hairy, and rarely above 6 inches high. Leaf linear, sometimes rather long. Scape with a single blue flower, larger than in C. cœrulea. Sepals and petals nearly equal, 7 to 8 lines long, linear-oblong or lanceolate, rather obtuse, slightly contracted towards the base, the dorsal sepal more erect than the others, and concave. Labellum with an erect linear claw of 2 to 3 lines, the lamina ovate, recurved, more or less fringed on the margin. Calli of the disk oblong-linear or slightly clavate, very numerous and crowded, sometimes covering the whole of the reflexed portion of the lamina, fewer and smaller along the claw. Column narrowly winged the whole length. Point of the anther short.

This charming little sp. is doubtless one of the most beautiful of our native orchids. Blooming in spring time, its rich blue flowers contrast well with the yellows, whites, and other gaily coloured plants of the Victorian heath-grounds and elsewhere, and I know of few prettier sights than when the Caladenias, Glossodias, Thelymitras, and the many different kinds of shrubs are in flower in the Cheltenham and neighbouring districts, which, as collecting grounds, are not, in my opinion, surpassed by any in the colony, or, at least, within easy distance of Melbourne. C. deformis then may be easily recognised by its colour and, for its size, very erect habit. The labellum of this sp. is a study in itself, and the whole plant, though small, is most interesting, being of easy removal and cultivation, remaining a long time in flower, and being perfectly hardy, and drying well, these good qualities causing it to be a general favourite amongst collectors of the native orchideæ. To grow it well, procure a couple of dozen tubers, place them in a shallow pot or pan in black sandy soil, and water well whilst growing. In the Cheltenham, Brighton, Frankston, and other districts, both near the coast and also inland, this sp. may be found growing in great numbers, and generally in small clusters or bunches. It flowers about from September to the end of October, but probably later in the up-country districts. This sp. was formerly known to most of us as C. barbata, but Robert Brown's name is now adopted, the former being with C. unguiculata, given as synonyms Found also in New South Wales, South Australia, and in Tasmania.

Field Club in Sydney.—A meeting of those interested in the formation of a Natural History Association was held in the School of Arts yesterday. Mr. Jas Inglis, M.P. (Minister of Public Instruction), presided. The Rev. Robert Collie, in proposing a resolution in furtherance of the objeet in view, said there was a similar association in Victoria, and it was well supported. If they could enlist the sympathy of the young the society would be a success. —*Sydney telegram from the "Age,' 18th July*, 1887

A LIST OF SOME OF THE SHELLS OF THE MARINE MOLLUSCA

Found upon the Victorian Coast.

Part I.

By J. H. Gatliff.

(Read before Field Naturalists' Club of Victoria, 14th March, 1887.)

The classification followed is that set forth in Tryon's "Structural and Systematic Conchology," 1882.

When any doubt existed as to identification, the specimens have been submitted to Mr. John Brazier, C.M.Z.S., F.L.S., of the Sydney Museum, who has kindly given the valuable result of his long study of the subject, and pointed out many instances of synonyms of shells that had been previously named.

Where names are marked thus = it is to be understood that they are synonyms. All the synonyms are not given, but only those which have been more generally used.

The shells marked thus * were gathered on the beach near Portland, and although their identity is undoubted, and they were found in fairly good condition, as in most instances I only know of one specimen having been found, further research is required before they can be classed as indigenous to the Victorian coast.

Class Gastropoda.

Sub-class, *Prosobranchiata;* order, *Pectinibranchiata.*

Genera.	Species.
Family, Muricidiæ.	
Sub Family, Muricinæ.	
Murex	
(Pteronotus)	triformis, *Reeve*
(Chicoreus)	palmiferus, *Sowerby*
* (Phyllonotus)	endivia, *Lam.*
(Ocinebra)	Brazieri, *Angas*
,,	anomola, *Ang.*
Urosalpinx = Adamsia	
	tritoniformis, *Bl.*
	= typica, *Dunker*
	Paivæ, *Crosse*
	umbilicata, *Ten. Wds.*
Trophon	
	Petterdi, *Brazier*
	Brazieri, *Ten. Woods*
	eburnea, *Petterd*
	Goldsteinii, *Ten. Wds.*
Sub Family, Purpurinæ.	
Purpura	
(Polytropa)	succincta, *Mart.*
,,	var. textilosa, *Lam.*
Purpura	
(Polytropa)	Baileyana, *Ten. Woods*
	propinqua, *Ten. Woods*
	humilis, *Crosse*
Ricinula	
	Adelaidensis, *Crosse*
	biconica, *Lam.*
Family, Tritonidæ.	
Triton	
(Cabestoma)	cutaceus, *Lin.*
	= Spengleri, *Chem.*
	= Waterhousei, *Ad. & Ang.*
	Australis, *Lam.*
	Bassi, *Ang.*
	Quoyi, *Reeve.*
	eburneus, *Reeve*
(Epidromus)	Bednalli, *Brazier*
Ranella	
	argus, *Gmel.*
	= vexillum, *Sby.*

Genera.	Species.
Family, Fusidæ.	
Sub Family, Fusinæ.	
Fusus	
	Novæ Hollandiæ, *Reeve*
	pyrulatus, *Reeve*
	ustulatus, *Reeve*
Sub Family, Fasciolariinæ.	
Fasciolaria	
	coronata, *Lam.*
	fusiformis, *Val.*
Family, Buccinidæ.	
Sub Family, Neptuniinæ.	
Siphonalia	
	dilatata, *Quoy*
	fuscozonata, *Ad. & Ang.*
	Clarkei, *Ten. Woods*
Sub Family, Pisaniinæ.	
Pisania	
	reticulata, *A. Ad.*
Sub Family, Buccininæ.	
Cominella	
	costata, *Quoy*
	lineolata, *Lam.*
	,, var. alveolata, *Kin.*
	,, ,, lactea, *Reeve*
Family, Nassidæ.	
Nassa	
(Alectrion)	fasciata, *Lam.*
,,	Jacksoniana, *Kien*
	= Tasmanica, *Ten. Wds*
(Niotha)	pauperata, *Lam.*
(Hima)	tringa, *Sowerby*
	= compacta, *Ang.*
	= rufocincta, *A. Ad.*
Family, Volutidæ.	
Voluta	
	Roadknightæ, *M'Coy*
(Amoria)	undulata, *Lam.*
	,, var. Angasi, *Sby.*
	,, ,, Sclateri, *Cox*
	,, ,, Kingi, *Cox*
	zebra, *Leach*
(Volutella)	papillosa, *Swain.*
	fusiformis, *Swain.*
(Mamillana)	mamilla, *Gray*
	magnifica, *Chem.*
Lyria	
	mitræformis, *Lam.*

Genera.	Species.
Family, Mitridæ.	
Mitra	
	melaniana, *Lam.*
	Australis, *Swain.*
	Badia, *Reeve*
	glabra, *Swain.*
	declivis, *Reeve*
	pica, *Reeve*
Turricula	
	scalariformis. *Ten. Wds.*
	Legrandi, *Ten. Woods*
	Franciscana, *Ten. Woods*
	Teresiæ, *Ten. Woods*
	scita, *Ten Woods*
	Tatei, *Ang.*
Family, Marginellidæ.	
Marginella	
(Glabella)	muscaria, *Lam.*
	Tasmanica, *Ten. Woods*
	volutiformis, *Reeve*
	turbinata, *Sby*
(Cryptospira)	cypræoides, *Ten. Wds.*
Family, Olividæ.	
Sub Family, Olivinæ.	
Oliveila	
	triticea, *Duclos*
	= pardalis, *Ad. & Ang.*
	nymphæ, *Ad. & Ang.*
Sub Family, Ancillarinæ.	
Ancillaria	
	lineata, *Kien.*
	marginata, *Lam.*
Family, Columbellidæ.	
Columbella	
(Mitrella)	semiconvexa, *Lam.*
	Menkeana, *Reeve*
	Tayloriana, *Reeve*
	impolita, *Sby.*
	achatina, *Sby.*
	pulla, *Gaskoin*
	= Badia, *Ten. Woods*
	lincolnensis, *Reeve*
	irrorata, *Reeve*
	miltostoma, *Ten Woods*
	xavierana, *Ten. Woods*
	,, var. roblini, *Ten. Wds*
	,, var. dictua, *Ten. Wds*
	Angasi, *Braz.*
(Anachis)	speciosa, *Ang.*
(Amycla)	lineolata, *Pease*

Genera.	Species.
Family, Cancellariidæ.	
Cancellaria	
	lævigata, *Sby.*
	undulata, *Sby.*
	granosa, *Sby.*
	excavata, *Sby.*
Family, Terebridæ.	
Terebra	
(Abretia)	bicolor, *Ang.*
	ustulata, *Desh.*
	Kieneri, *Desh.*
	Brazieri, *Ang.*
Family, Pleurotomidæ.	
Pleurotoma	
(Drillia)	Phillipineri, *Ten. Woods*
,,	beraudiana, *Crosse*
(Bela)	mitralis, *Ad. & Ang.*
(Clathurella = Defrancia)	
,,	spurca, *Hinds*
	= philomena, *Ten Wds.*
,,	tincta, *Reeve*
,,	modesta, *Ang.*
,,	bicolor, *Ang.*
,,	Letourneuxiana, *Crosse*
(Cithara)	bella, *Ad. & Ang.*
	= gracilina, *Ten. Woods*
,,	compta, *Ad. & Ang.*
,,	Harrisoni, *Ten. Woods*
(Mangelia)	Vincentiana, *Crosse*
,,	cavernosa, *Reeve*
	= Meredithiæ, *Ten. Wds*
,,	lineata, *Rve.*
Family, Conidæ.	
Conus	anemone, *Lam.*
	= Novæ Hollandiæ, *A. Ad.*
	= maculatus, *Sby.*
	= Jukesi. *Reeve*
	rutilus, *Menke*
	= Smithi, *Ang*
	= Macleayana, *Ten. Woods*
	= Tasmanicus *Ten. Woods*
Family, Strombidæ.	
Strombus	
*(Canarium)	floridus, *Lam*
Family, Cypræidæ.	
Cypræa	angustata, *Gmel.*
	,, var. comptoni, *Gray*
	,, ,, declivis, *Sby.*
	,, ,, piperita, *Sol.*
	,, ,, bicolor, *Gask.*

Genera.	Species.
Cypræa	
	umbilicata, *Sby.*
	* annulus, *Lin*
(Trivia)	Australis, *Lam.*
,,	oryza, *Lam.*
Family, Cassidæ.	
Cassis	
(Casmaria)	pyrum, *Lam.*
	achatina, *Lam.*
	semigranosa, *Lam.*
	fimbriata, *Quoy*
Family, Naticidæ.	
Natica	
(Lunatia)	plumbea, *Lam.*
	Incei, *Phil*
	Tasmanica, *Ten. Woods*
(Neverita)	conica, *Lam.*
(Mamilla = Ruma)	
	umbilicata, *Quoy*
Sigaretus	
	zonalis, *Quoy*
Lamellaria	
	oryzata
Family, Calyptræidæ.	
Infundibulum = Trochita	
	calyptræformis, *Lam.*
Crepidula	
(Ianacus)	unguiformis, *Lam.*
Hipponyx = Cochlolepas	
	foliacea, *Quoy*
	subrufa, *Sby.*
(Amalthea)	conica, *Schum.*
Family, Solariidæ	
Solarium	
(Phillippia)	luteum, *Lam.*
Family, Scalaridæ.	
Scalaria	
	Australis, *Lam.*
	granulosa, *Quoy*
	Jukesiana, *Forbes.*
	Phillippinarum, *Sby.*
(Crossea)	concinna, *Ang.*
Family, Ianthinidæ.	
Ianthina	
	Sp. ?
Family, Turritellidæ.	
Turritella	
	Tasmanica, *Reeve*

Genera.	Species.
Family, Vermetidæ.	
Vermetus	
	dentiferus, *Lam.*
Siliquaria	
	Australis, *Quoy*
	Weldii, *Ten. Woods*
Family, Eulimidæ.	
Eulima	
	Cumingii, *A. Ad.*
	mucronata, *Sby.*
Stilifer	
	Sp. ?
Family, Turbonillidæ.	
Turbonilla	
	Angasi, *Ang.*
	festiva, *Ang.*
Aclis	
	tristriata, *Ten. Woods*
Odostomia	
	Sp. ?
Syrnola	
	Sp. ?
Family, Littorinidæ.	
Littorina	
	paludinella, *Ten. Woods*
	Phillippi, *Carp.*
	Mauritiana, *Lam.*
Risella	
	nana, *Lam.*
	melanostoma, *Gm.*
	aurata, *H. & A. Ad.*
	lutea, *Quoy*
	fimbriata, *Phil.*
Fossarus	
(Fossarina)	Petterdi, *Crosse*
Family, Planaxidæ.	
Alaba	
	Sp. ?

Genera.	Species.
Diala	
	monile, *A. Ad.*
	= tesselata, *Ten. Wds.*
	lauta, *A. Ad.*
	= punctata, *Ten. Wds.*
Family, Cerithidæ.	
Cerithium	
	monachus, *Crosse & F.*
	= dubium, *Reeve*
	rhodostoma, *Adams*
(Bittium)	granarium, *Kiener*
,,	turritella. *Quoy*
,,	Lawleyanum, *Crosse*
(Cerithiopsis)	Angasi, *O. Semper*
,,	albosutura, *Ten. Woods*
Triforis	
	Pfeifferi, *Crosse*
	Angasi, *Crosse*
Potamides	
	ebeninum, *Brug.*
(Lampania)	Australis, *Quoy*
Family, Rissoidæ.	
Sub Family, Rissoininæ.	
Rissoina	
	crassa, *Ang.*
	nivea, *Ang*
	d'Orbignyii, *A. Ad.*
	Gertrudis, *Ten. Woods*
Sub Family, Ris[illegible]	
Rissoa	
	Brazieri, *Ten. Woods*
(Anabathron)	contabulata, *Dunk.*
(Cingulina)	Australis, *Ten. Woods*
Family, Truncatellidæ.	
Truncatella	
	scalarina, *Cox.*
	marginata, *Custer.*

NOTES ON THE NESTS OF AUSTRALIAN BIRDS.

By. H. W. Hunt.

(Read before the Field Naturalists' Club of Victoria, 17th January, 1887.)

In my present paper my intention is not to give any general treatise on the style of nidification adopted by the birds of Australia; but rather to point out and describe a few of those nests which are remarkable either for their unusual size, or for their wonderful design and structure, or the peculiarity of the

positions in which they are placed, or for some other feature rendering them particularly worthy of notice.

Commencing at the head of the Australian representatives of the order accipitres or birds of prey we have the wedge-tailed eagle *(Aquila audax)* which corresponds here to the golden-headed eagle of Europe. This bird builds an immense structure, measuring between five and six feet in diameter, and composed of dead boughs and twigs; this it locates in the topmost branches of the highest eucalyptus to be found in the neighbourhood, in the absence of those rocky cliffs in which the golden-headed eagle finds so congenial a home. Another member of this tribe, the nankeen kestrel *(Tinnunculus cenchroides)* often occupies the deserted nest of the crow or other bird in preference to undertaking the more laborious task of building one for itself.

Most of our larger birds use dry twigs as the material for their nests; but the nests vary in structure considerably more than do the birds themselves. On the one hand we have the dome-shaped nest of the lyre-bird placed close to the ground amongst the ferns in some secluded gully, having an opening on one side, into which the female steps backwards, leaving the end of her tail protruding above her head, or again, that of the magpie or crow-shrike, which is cup-shaped in form, and built in tolerably high trees; and on the other, the miserably constructed nest of the podargus (commonly, though probably erroneously, known as the "more-pork"), which consists of a few twigs placed in a horizontal fork, and falls to pieces on any attempt to remove it from its position.

A nest of an entirely different class is that of the New South Wales oriole. This nest is semi-globular in form, and is composed of thin strips of bark carefully interwoven with other fibrous materials and lined with grass, and forms a very compact structure. It is mostly placed amongst the leafy boughs of the eucalyptus sapling, and, as the birds are generally in the vicinity echoing forth their monotonous and peculiar cry, it is easily discovered by the collector.

Another compact and well-made nest is that of the mountain thrush. It is composed of twigs, mosses (principally Lycopodium), and dried grass, with which latter substance it is lined, and is placed in a strong fork of the ti-tree, seldom more than five or six feet from the ground; and as its colour very closely assimilates to the surrounding objects, it is very liable to be passed unnoticed unless the female is seen to dart from close beside you, and to commence those antics common to so many species of the bird tribe, by which she will try to allure you from her nest. Mr. Campbell, in his book on the "Oology of Australian Birds," mentions that he believes this to be the only Australian species which reconstructs and adds to its old nest

season after season, instead of building an entirely new one as all the rest do after rearing a single clutch.

The Australian members of the family muscicapidæ or flycatcher—which, under the recent classification of the British Museum, includes our robins—build nests which are both beautiful and unique. Thus, one of the most common species, the white-shafted *(Rhipidura albiscapa)* builds a nest resembling a wineglass in shape, and composed of the soft inner bark of the stringy-bark or other tree, carefully interwoven, and coated externally with cobwebs, etc., and lined with hair and dried grass. Another species, the black fantail *(Rhipidura tricolor)*, builds an equally beautiful nest, slightly larger than the last, and composed of somewhat coarser materials. A peculiarity of this nest is that it is very often placed in the smaller branches of some fallen bough, in preference to the dead bough still attached to a living tree, resorted to by its ally, the brown flycatcher *(Micræca fascinans)*. Another point worthy of notice is that the hair with which it is lined is often plucked from the back of some cow or horse whilst the bird flutters lightly above it. With reference to the nest of the brown flycatcher, I might mention that it is a most difficult one to find, and, were it not that the birds themselves are, like a great many of the flycatchers, excessively tame, its eggs would be rarities amongst collectors, instead of being tolerably common as they are, for this bird will frequently in your presence go to its nest and proceed with the task of building or sitting in such a confiding manner that you scarcely have the heart to rob it of its eggs.

The robins build nests of stouter structure and materials, and prefer a living fork for their situation. That of the scarlet-breasted (*Petroica multicolor*) may be taken as a type. Strips of bark woven together form the groundwork, and this is coated with cobwebs, lichens, and other soft substances. When this nest is placed, as it frequently is, on a thick fork, some twenty or thirty feet from the ground, it requires a practised eye to distinguish it from the numerous knobs and excrescences which abound on most of the eucalypti.

The members of that large family of birds the honeyeaters—which are as strictly peculiar to Australasia as are the eucalypti themselves—all build cup-shaped nests, although the situations and materials show considerable variety. Thus, we have amongst the larger species the nest of twigs of that noisy inhabitant of our forests, the minah *(Myzantha garrula)*, placed in the smaller branches of the sheoak or other small tree; or the similar nest of the wattle bird *(Anthocæra carunculata)*. Then amongst the smaller species, those of the white-plumed *(Ptilotis penicillata)*, the yellow-faced *(Ptilotis chrysops)*, or the spine-billed *(Acanthorhynchus tenuirostris)*, all of which are

suspended by the rim to two or more thin twigs, and generally well hidden amongst the green leaves. Or, again, that of the New-Holland *(Meliornis Novae-Hollandiae)*, which is composed of dry twigs, lined with the soft seeds of the banksia, and placed in an upright fork within a few feet of the ground.

I think it will not be out of place here (although I am not dealing with eggs generally in this paper) to remark that all of the honeyeaters, a family, as a rule, of very sombre colours, lay eggs of a more or less pink tint, and the eggs of some species are of a most beautiful colour. This, I think, will be found to follow a rule that seems to me to exist amongst birds, that those which are most beautifully coloured do not lay correspondingly beautiful eggs, but rather of a colourless nature; whilst those birds which possess no very gaudy colours very often lay most beautiful eggs. Of the former class the whole parrot tribe may be given as an example in this country. But I am inclined to think that these came under another rule also, which is that birds which build in hollows of trees, or burrow in the ground, or build nests of such a shape as to allow but little light to enter, and nocturnal birds lay white eggs Examples of this rule may be found in the kingfishers *(Alcedinidae)*, some of which build in hollow trees, whilst others bore holes in the ground; the pardalotes, whose habits are similar; the fairy martin, whose retort-shaped nest admits very little light, and its congener, the tree swallow, which lays in the hollows of trees; or the very common instance of the acanthiza (*Geobasileus chryssorrhous*), whose domed nest does not allow much light to enter. And many more examples might be adduced. The obvious reason for this rule seems to me to be that if colour existed in the above cases it would be of no benefit to the species, as it could not be enjoyed by the bird in the absence of light. Another curious fact in connection with this subject is that the bronze cuckoo (*Chalcites plagosus*), which lays eggs of a bronze tint, mostly lays either in dome-shaped nests, such as that of the acanthiza, or else in nests of birds which do not lay very highly coloured eggs, such as the robin's; whilst its congener, the narrow-billed bronze cuckoo (*C. basalis*), which lays eggs of a white ground, spotted with red, very frequently makes the ephthianura, a bird which lays similarly highly-coloured eggs, the foster-parent of its young. This choice of nests, containing similarly coloured eggs, is commented on by Darwin in his "Descent of Man," concerning the English species of the cuckoo family.

Passing now to birds which use mud as the material for their nests we have the familiar instances of two species of swallows in this colony, the welcome swallow which builds its saucer shaped nest under the shade of some verandah, bridge, or outbuilding in preference to the caves and hollows of trees resorted

to by it before this country was inhabited by the white man, and the fairy martin which builds its retort-shaped nest in the colonies mostly on the steep side of a watercourse, but sometimes under the friendly shelter of some buildings. These nests are generally stuck together in groups of four or five, with their funnel-shaped entrances projecting in all directions, and present a most curious spectacle to the observant eye.

Three other species which build mud nests are the magpie lark, the grey struthidea *(Struthidea cinerea)*, and the white-winged chough *(Corcorax melanoramphus)*, and it will be necessary merely to describe one of these as a type. Taking that of the magpie lark, we have a nest bowl-shaped in form, and constructed of moist earth. In building this the bird displays great powers of discrimination, for if the earth used be of a loamy nature, so that it would not hold together well if used alone, it mixes grass and other fibrous substances in with the soil to bind it together; whereas, if the earth used contain a sufficient amount of clay, no other binding materials are used, and it is merely left to dry in the sun.

A very wonderfully-constructed nest is that of the swallow dicaeum. It is purse-shaped, composed of woolly materials, and has the entrance at the side. That of the grass-warbler might also be mentioned. It is somewhat similar in form and material to the above, but is placed in a very different position, the swallow dicaeum building in the acacia and other trees, whilst the cisticola hides its nest in a tuft of grass or a low shrub—so skilfully that it is only by watching the bird that you can discover any trace of it.

With the curious mound-building propensities of the Mallee hen others have sufficiently dealt. I might merely mention that the three species of Australian birds which raise these mounds, and leave their eggs to be hatched by the heat engendered by decaying vegetable matter, are the above-mentioned, the megapode, and the brush turkey. Gould publishes a letter from Gilbert describing the mound of the megapode 150 feet in circumference, and having the eggs buried at a depth of 6 feet from the top, and from 2 to 3 feet from the sides of the mound. Of the natural economy of these three species very little is at present known, owing to the thick and inaccessible country in the interior which these birds usually choose as the situations for their nests.

[Mr. Hunt exhibited specimens of the nests of the greater number of the birds mentioned in his paper.—Ed.]

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OF THE

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The Author of each article is responsible for the facts and opinions he records.

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall, on Monday evening, 8th August, 1887.

The President, Mr. A. H. S. Lucas, M.A., occupied the chair, and about sixty-five members and visitors were present.

The hon. librarian reported the receipt of the following donations to the library:—"Journal of the Royal Society of New South Wales," vol. 21, part I.; and "Journal of Pharmacy," July, 1887.

The hon. secretary read short accounts of the Club excursions to Brighton Beach on 16th July, and Studley Park on 30th July. At the former there was a good attendance, but, though the sea was nominally at low tide, the on-shore wind prevented any examination of rocks usually covered only at high water, consequently the results of the excursion were rather poor. At Studley Park the attendance was smaller, the afternoon being very boisterous. Frequent showers of rain swept across the park and rendered the narrow paths both slippery and dangerous. The most notable objects obtained were a lichen belonging to the genus *Endocarpon*—both the genus and species being new to Victoria—and some fossil casts of Brachiopodous shells from the Upper Silurian rocks, near Dight's Falls. Owing to the early period of the season, flowering plants, except *Clematis microphylla*, were scarce.

The hon. secretary reported that since the last meeting the deputation appointed had waited on the Commissioner of Customs with reference to the protection of native birds, and had been very favourably received, and there was every hope that the Club's recommendations would be carried out. The deputation also asked that the Government steamer *Lady Loch* might convey the exploring party to King's Island in November next; it was promised that inquiries would be made, and a reply given as soon as possible.

The following persons were duly elected members of the Club:—Professor W. Baldwin Spencer, B.A.; Messrs. R. Stewart Browne, John S. Hart, B.A., Thomas S. Hart, and J. M'George.

Mr. J. B. Gregory, LL.M., brought before the meeting the desirability of at once taking steps to secure the permanent reservation of Wilson's Promontory and its preservation in its natural state, and moved—"That it is desirable that steps be taken to secure the vesting of Wilson's Promontory, and the islands and waters adjoining, in a board of Trustees, for the purposes of a national park, for the preservation of the fauna and flora, for the conservation of the fisheries, and for public recreation." Seconded by Mr. H. T. Tisdall, F.L.S., and carried unanimously.

Mr. Gregory then proposed—"That the Royal, Geographical, and Zoological Societies be asked to join in making strong representations to the Ministers of Lands and Customs on the subject; and, if necessary, the president and hon. secretary wait upon the Ministers, in order to more fully explain the Club's views," which was seconded by Mr. G. Coghill, and carried.

PAPERS READ.

1. By Mr. D. Sullivan, F.L.S., entitled, "The Mosses of Victoria," part I.—The writer mentioned that he had collected some two hundred species of mosses in Victoria, principally in the Grampians, the Pyrenees, Gippsland, and the North-eastern district. Of these about thirty were new to science. He then commenced a list of the various species recorded.

2. The Rev. F. R. M. Wilson contributed some "Notes on a Few Additional Victorian Lichens." He introduced the subject with a general description of the *habitats*, etc., of lichens, and the means adopted for their collection and preservation. He mentioned that he had collected nearly 1000 species and varieties in the colony, of which about 150 were named, and exhibited 125 species and varieties mounted and named.

3. Mr. J. F. Roberts, F.R.H.S., read "Some Notes of a Recent Trip to New Caledonia," in which he gave a graphic description of his first impressions of Noumea, and the luxuriant vegetation of the surrounding country, promising to continue his remarks at the next meeting.

Some interesting notes on the habits of a Queensland hornet were contributed by Mr. C. C. Brittlebank.

The following were the principal exhibits of the evening:—By Mr. P. H. Anderson, larvæ of procession moth. By Mr. F. G. A. Barnard, orchid in bloom, *Pterostylis nutans*, grown by exhibitor since November, 1883. By Mr. C. C. Brittlebank, a case of coleoptera collected since last meeting, nests of hymenoptera, and water-colour drawings

of insects. By Miss F. M. Campbell, paintings of Tasmanian fungi. By Mr. A. J. Campbell, egg of the little green fruit-pigeon, *Chalcophaps chrysochlora*. By Mr. G. Coghill, orchid in bloom, *Corysanthes pruinosa*. By Mr. E. M. Cornwall, New Zealand birds, viz., N.Z. pigeon, long-tailed cuckoo, bell-bird, Cape pigeon, minor penguin, dove petrel, and white-faced petrel; also fossil Kauri wood. By Mr. C. French, F.L.S., lepidoptera from North Queensland, *Papilio ulysses*, and *Ornithoptera priamus*. By Mr. H. C. Grover, an allied kite, roller-bird, and black magpie. By Mr. E. H. Hennell, hymenoptera and diptera. By Master G. E. Hill, Victorian birds' eggs. By Master W. H. Hill, Victorian moths. By Mr. D. Le Souëf, granite with polished surface, probably caused by glaciation, from New Zealand. By Mr. W. Jennings, fossil skull of wombat, from near Geelong; fossil whale's earbones, from Cheltenham and Waurn Ponds; minerals, from Teetulpa and Burra, South Australia; and fossil oak, from Nottingham, England. By Mr. W. E. Matthews, mineralogical specimens, from Maldon. By Mr. H. L. Thompson, freshwater shells, from Albert Park Lake. By Mr. H. Watts, 70 species of diptera, mounted for the microscope. By Mr. S. H. Wintle, F.L.S., fossil casts of Brachiopodous shells, from Upper Silurian, Studley Park; bone of marine animal, with polyzoa and shells attached, from new canal cutting, Yarra delta, found 20 feet below surface; parasitic fungus, *Sphœria innominata* (Bentham) on large caterpillar, from Apollo Bay. By Master A. Yelland, crystals from basalt, Clifton Hill.

After the usual *conversazione*, the meeting terminated.

A RAMBLE IN A GIPPSLAND GULLY.

(Read before Field Naturalists' Club of Victoria, 14th Feb., 1887.)

By Henry Thos. Tisdall, F.L.S.

I seldom travel along the Gippsland railway without seeing some of those passengers who get in from, say, Warragul, carrying plants of rooted ferns I remark that the commonest is the *Lomaria discolor*. This fern borders nearly all the streams of North Gippsland. If we examine a plant we may observe that it grows in tufts; all the leaves (or fronds, as they are termed) springing from a centre, and after growing from one to two feet high they bend gracefully towards the ground. Each frond widens out gradually from the dark stem, and then tapers to a point, and is indented to the midrib at each side, giving the leaf the appearance of being composed of green tongues. From the centre of the plant a few very narrow leaves grow quite upright. On examining one of these a mass of dusty, brown matter may be

observed covering the whole underside. This dust is composed of a multitude of tiny spores. or seeds. Now, remark that the broad, outside fronds produce no such spores, and this gives us a ready sign by which we may distinguish the whole tribe of lomarias. I have discovered five species of these ferns in this district, differing more or less in shape, but all agreeing in bearing fruitful and unfruitful fronds. The *lanceolata* is much smaller, and its fronds more slender than the *discolor*. It also inhabits the banks of streams, generally springing from clefts in rocks, bending down towards, and occasionally touching, the sparkling water with the tips of its glossy green fronds.

The *Capensis* bears what are termed simple fronds—that is, their margins are not indented; the leaf is borne on a long, slender stalk. This plant may be called gregarious, for it sometimes completely covers large patches of the river bank. It does not, however, confine itself to the valleys, for I have found it nestling in shady spots many hundreds of feet up the hill-sides. This fern is easily distinguished by the rough feel of its leaves, and the way in which each frond is marked by straight, grooved lines running from the midrib to the edge. The fourth species of *Lomaria* is the *Patersoni*. It abounds in very damp nooks, its long, grass-like fronds beautifying the dark rocks on which it generally grows.

Turning our attention to the shrubs overhead we find a great variety—the musk, native hazel, blanket tree, cassinia, dog wood, and many others vie for mastery; while the beautiful climber, *Clematis aristata*, everywhere basely tries to overtop its supporter in its struggle for light and heat, putting us in mind of Mr. Taylor's theory of the "morality of plants." The clematis bears beautiful, cream-coloured blossoms, which contrast well with the back-ground of green leaves. In the centre of each flower is placed a number of bodies called carpels, which bear the embryo of the future seed, and when these are ripe long, light plumes growing from one end enable the wind to waft them far from the parent plant. The native hazel, which has the long name of *Pomaderris apetala* bestowed upon it, has no coloured leaves to its flowers, so that they are rather inconspicuous, but the beauty thus wanting in the flower is more than made up by the lovely star-shaped hairs, which completely cover the under surface of the leaves. A lens is, however, required to see them properly. In the *Flora Australiensis* this plant is mentioned as sometimes attaining to the height of 6ft., whereas in our mountain gullies it is frequently found 50ft. in height, with a girth of nearly 5ft.

A thin-stemmed shrub with long-pointed leaves and a profusion of small white flowers is very common in the district. The bark is so strong that it will peel off to the very tips of the

branches, and is used by the aboriginals for a curious purpose. In one of the ceremonies attending admittance of their youths to the privilege of manhood, a tooth is taken from each candidate, and these teeth are fastened together by means of this bark. A thoroughly reliable eye-witness gave me the following graphic account of the ceremony :—

In a secluded valley were assembled all the adult males of the tribe, together with many witnesses from other tribes. Three days had already been spent in various mystic rights. It was midnight. The flames from the various fires round the central scene hardly dispelled the darkness, while the feeble glimmer of those fires at a distance just served to bring into relief the dusky forms of the natives, making a striking contrast with the whiteness of the huge gum-trees, by which they were surrounded. The candidates—eight in number—were fine-looking youngsters, ranging from seventeen to twenty-one years of age, but they looked tired, wretched-looking objects after their long fasting and many trials, and now the last scene was to be performed, after which they could lie down and rest. The oldest warrior in the tribe advanced slowly towards the first victim, who was held firmly by two natives in full corroboree dress, which is the same as Mexican full dress, minus the pair of spurs and necktie. In his hand he bore a short truncheon; and, the mouth of the neophyte being kept open by the attendants, he proceeded solemnly to strike out the third tooth from the front by repeated blows from his weapon. Four or five knocks generally effected this object, but sometimes the tooth was so firm that it required eight or nine blows before it came out. Unlike the American Indians, who, we are told, bear the most exquisite tortures in silence, the young aborignals made night hideous with their howling. After the ceremony the chief tied the teeth carefully together with the bark of this plant (*Pimelia axiflora*), and presented the treasure to the chief warrior from another tribe who was present. As the bark of this particular shrub only must be used, the natives have often to travel a considerable distance to obtain it.

Rambling further up our gully, we see here and there huge trunks of trees, which, after falling, slide down from the heights above, and now lie decaying under overhanging verdure. One of these logs is a study in itself. I have counted over twenty different kinds of mosses, ferns, and lichens, and fungi growing on the same trunk. The smaller vegetable forms are particularly interesting, and everyone who wishes to study them ought to be provided with a pocket lens. Take a piece of moss, for instance. If you look carefully you will perceive, growing amongst the green leaves of the plant, a number of elongated, egg-shaped bodies perched on the top of

very slender stalks. Placing one of these under the lens, you will see a kind of cap covering this head. Remove this carefully by pulling it upwards, and an urn-shaped organ will be disclosed, with an opening at the top. This opening is often closed with a lid, and the entrance is surrounded with an array of teeth, their number being so regular that the different species are divided according as they have eight, sixteen, etc. Inside, the urn contains small, roundish bodies—the future seeds. Even the family of the despised toadstool (or fungus, as it is termed) when examined carefully, is found to possess the most beautiful forms. The casual observer would imagine they were nearly all alike, but, as a matter of fact, botanists have divided them into nearly as many species as there are to be found amongst all the flowering plants put together One family alone, called *Agaricus*, contains 2000 species. Some of these fungi would be exceedingly useful to man if he could only be made to distinguish the edible from those that possess poisonous, or even acrid qualities. Many an unfortunate lost traveller has died of hunger whilst he was surrounded by most nutritious food in the shape of these hated toadstools. They vary in size from less than a pin's point to the bulk of a boot-trunk, and they grow in every conceivable locality—mountain, valley, soil, rock, old logs ; even living vegetables and animals are not free from their incursions.

The common musk tree (*Aster argophyllus*) is well worthy of examination, for its flowers place it amongst a class of plants which, in the mother country, never arrive at the dignity of a shrub, while some of our compositæ are fair-sized trees. The daisy and the thistle are familiar examples of this order in Europe.

Generally speaking, flowers are composed of four distinct parts or series. First, the pistil which contains the seed vessels, and occupies the centre. The pistil is surrounded by what are termed stamens. They consist mostly of a long, slender stem, with a kind of box on the top. This box opens when ripe, and the yellow dust contained therein is disseminated either by the wind or by insects to other plants of the same species. When any of this dust falls upon the top of a pistil it fertilises it, so that true seeds are formed. The other series of organs consist of two kinds of envelopes, or coverings, to protect the essential parts just described from injury. The corolla is generally brightly coloured, apparently to attract insects, and is that part which is popularly called the flower It is mostly composed of five leaves. These leaves are at first pressed closely around the organs, and then form the bud. Subsequently, they open into full bloom. The outer covering, or calyx, also consists of five leaves, but they are generally green. The leaves of the calyx are not so delicate as those of the corolla, for they have to protect the young bud from injury during the trying vicissitudes of

spring. When summer comes they retire into the background, and leave the painted corolla in full possession of the field; but woe to the poor bud if the summer is not propitious, for, at the first touch of frost, it finds that its gay protector is an utter failure. So often does this happen that "nipped in the bud" is one of our commonest sayings.

The corolla, however, is not always useless as a protector for the marigold. May weed and many other flowers close in the evening and "ope at dawn of day." But to return to the flower of the musk-tree. Instead of being composed of a single blossom, such as I have described, it has its flower made up of a great number of them placed close together on a fleshy cushion; each little floweret is perfect in all its parts except that the calyx appears in the form of hairs instead of leaves. These hairs are a beautiful provision of nature for scattering the seeds. Every seed when ripe has some hairs fastened evenly all round; so when the wind wafts it away it floats evenly in the air, and is thus carried to an immense distance.

Before we say farewell to our mountain gully I will mention the native mulberry. Its bright, glossy leaves, slightly serrated at the edges, reminds us strongly of the holly, and, as it only grows in the shadiest spots, it serves to lighten up the gloomy aspect of the place, for it seems to have the power of catching every stray ray of light and reflecting it with interest. It also has, or rather, had, its uses before Europeans, with their lucifers and wax vestas, appeared on these scenes. This plant, which bears the euphonious name of *Hedycarya Cunninghamii*, would then have been hunted for eagerly by a native towards sundown; having found it, he would have cut off a small branch, trimmed and pointed it with his stone hatchet, then got a little of the inside bark of the messmate and rubbed it between his hands until it became like tow or curled horsehair; lastly, he would have produced a piece of old, dry wood—without which he never travelled—put the bark just under a notch in the side of the dry wood, and, placing the pointed end of the mulberry stick in the notch, would have grasped the remainder of it between his flattened palms, rubbed them backwards and forwards, so that the stick would revolve quickly, being careful, at the same time, never to remove the pointed end from the notch; the friction thus evolved performed a two-fold operation—first it rubbed small, dusty, particles from the dry wood, and then ignited these particles by the velocity of the motion.

I must confess that, although I have tried this plan various times, I have never succeeded in getting a light, but I suppose only practice makes perfect, for I have it from undoubted authority that within sixty seconds a native can obtain sparks, and a few seconds more suffices to fan the bark into a flame.

NOTES ON THE FLORA OF MOUNT HOTHAM.

By James Stirling, F.G.S., F.L.S.

(Read before the Field Naturalists' Club of Victoria, 14th March, 1887.)

Introductory.—Originally known as "Baldy," owing, probably, to the bare, bleak aspect it presents, this rounded mountain now retains the name of one of the earlier Governors of Victoria, and of late years has become famous. During 1873 Sir George Bowen (the then Governor of Victoria), accompanied by Judge Casey, the Surveyor-General, and the Secretary for Mines, travelled over Mount Hotham from Omeo to Bright. To commemorate the Vice-regal visit, the spring at the source of the Kiewa River, on the north side of the mountain, was named the Diamentina in honour of Lady Bowen. In January, 1885, Sir H. B. Loch, Lady Loch, and suite, with several members of Parliament, camped near the summit of the mountain, on the ridge dividing the Ovens and Kiewa Rivers, and which connects Mount Feathertop and Mount Hotham. To commemorate that event, the first occasion on which a lady representative of Vice-Royalty had penetrated the heart of the Australian Alps, the deep glen to the south of the mountain (forming the source of the Dargo River) was named Loch Glen. At this spot her Ladyship gathered snow, so that Mount Hotham may now be said to have become historical. The main road from Omeo to Bright passes over it near the summit, and this route is now a favourite one for tourists during midsummer. I have been surprised that members of the Field Naturalists' Club have not already organised an excursion to this interesting locality, so rich in floral treasures of an endemic kind, and whose affinities with Tasmanian species are well established. Before the present splendid sideling cuttings were made, the road passed over the summit of the mountain, and in the "olden days" was always a terror to the unwary traveller, owing to the sudden changes of temperature, the dense bewildering fogs, and chilling winds which blow with an almost cyclonic force at these altitudes. Having frequently traversed the mountain when the snow lay two feet thick in the open, with biting wind and blinding, drifting snow, making both horse and rider shudder, and again when a clear, blue sky and cool, summer breeze added delight to the lovely landscape scene, the whole mountain radiant with a verdant sheen, while the lower lands were languishing in excessive dryness, I can, with some confidence, direct attention to the great contrast between winter and summer on these Alpine areas.

Topographical and Geological.—Standing on the summit of the mountain near the Trigonometrical Station (a small cairn of stones), the panorama which bursts into view is singularly

grand and impressive. Away to the north-west the bold granite peaks of the Buffalo Mountains stand sentinel-like against the distant horizon. Intervening lies the deep gorge through which the Ovens River winds its sinuous courses. To the north lies the narrow-crested ridge which culminates in Mount Feathertop, at 6303 feet above sea level, the deeply-sculptured furrows on its eastern slopes plainly visible. Still further to the north-east rises Mount Loch, a notable feature in the landscape (a culminating point on the ridge dividing the Cobungra and Kiewa Rivers), a worthy rival in greatness to its brother, Hotham; in fact, a few feet higher. Just visible between Mount Loch and Mount Feathertop are the clear, rugged escarpments of the Fainter, a noted peak standing at the intersection of the two branches of the Kiewa River. Still further east rise the grassy table-lands known as the Bogong high plains (the highest plateau in Victoria, 6000 feet above sea level); and on its southern margin appears the coned peak, Mount Cope. Away to the east is the valley of the Cobungra, falling towards the undulating country near Omeo; and in the dim distance, in shadowy outlines, the serrated heights of the Cobberas Mountains, some 70 miles distant, are seen. To the south lies the deep gorge of the Dargo River separating Mount Hotham from the Dargo high plains table-land, while to the south-west are a series of bold-wooded ranges and mountain peaks which rise from the main Dividing and its lateral spurs. In closer proximity stands the coned summits of The Twins, while intervening, the crest of the Dividing Range, including Mount Smyth, is plainly visible; and perched on the side of Mount St. Bernard, with the road leading to it, well defined along the ridges and sidelings, is the welcome hospice of William Boustead.

The geological formation of Mount Hotham is silurian slates and sandstone, with some outliers of tertiary basalt on its eastern slopes. The Bogong high plains to the north, the Higinbotham heights to the west, and the Dargo high plains to the south, are all capped by huge deposits of similar basalt, formed by extensive lava flows during miocene times, which sealed up the river valleys of the period, and which now yield characteristic fossil leaves of a tropic facies in their beds of clay and lignite.

Ramifying through the silurian sediments are numerous dioritic dykes; and at the Pulpit, near Mount St. Bernard, is a mass of apparently plutonic rock, whose relation to the adjoining sediments is very peculiar, and requires further examinations to disclose its origin.

The summit of the mountain is above the line of arboreous vegetation, although the dwarfed forms of *Eucalyptus pauciflora* ascend to 5900 feet on its northern slopes.

Flora of the Mountain.—In addition to a census of many of the plants of Mount Hotham, scientifically arranged after the system of our illustrious Nestor of Australian Botany, Baron von Mueller, I now give a general description of the *habitats* of the prevailing species.

If we examine the vegetation on the summit of the mountain during January or February, it will be noted that many of the plants are restricted to these altitudes. Let us examine the lowly forms which blossom on the edge of a small rivulet percolating through the dense sward of snow-grasses. There, irrigated by the melting snow, are some endemic Ranunculi, the lovely white-flowered *Caltha introloba*, and the yellow-flowered *Ranunculus Millani* and *R. Gunnianus;* while on the little flat below us, near the same watercourse, bloomed the luxuriant Anemoneous Ranunculus, or, as it is named, *Ranunculus anemoneus*, the veritable king among the Australian Ranunculi, its lovely white petals frequently attaining a length of two inches. It is to be regretted that this lovely plant is fast disappearing from the summits of our Victorian mountains, owing to inroads made into the native vegetation by stock, as these Alpine areas become increasingly occupied from year to year. These greyish-white patches near us indicate the sites of a minute compositeæ, the endemic *Leontopodium catipes;* while the larger patches of silvery grey and green are also Alpine, the white-flowered *Aster Celmisia*. Those beautiful yellow patches on the lower slopes are fields of *Helichrysum bracteatum*, relieved by the pearly Helipterums, and contrasting pleasantly with the puce flowering *Euphrasia Brownii;* while the small, green, moss-like patches near us are representatives of two orders—the Stackhousieæ and Caryophylleæ. This is *S. pulvinaris*, and that *Scleranthus mniaroides*, both Alpine. Those puce and white daisy-like flowers are Brachycomes. The puce one is *Brachycome nivalis*, and the other is *B. radicans*. There are also several endemic Umbellifers. See that magnificent yellow flowering species, *Aciphylla glacialis*, with its deeply divided sap-green leaves, a very prominent feature in the vegetation, and next to the Helichrysums, Helipterums, and Asters, at once arrests the attention of the tourist. Baron von Mueller suggests that this plant might, through cultivation, become available as an additional culinary esculent; a view which I also share. In contrast with this large and showy umbellifer is the lowly *Oreomyrrhis pulvinifica*, a small but pretty plant, with white flowers, and leaves beset with strong hairs.

Struggling over the rocks on the higher points are decumbent forms of Rutaceæ, the pink-flowering *Boronia algida* and the yellow-flowering *Eriostemon phylicifolius* vieing in loveliness with the myrtaceous *Kunzea Muelleri*, while here and there the lowliest of all the Thymeleæ finds its representative in the pretty

little *Pimelea alpina*, a great contrast with its robust *confrère*, the magnificent *Pimelea ligustrina* of the wooded slopes.

It would be strange if the grand order of plants so universally distributed over the globe—the Leguminosæ—had not its representatives among the herbs or shrubs on this mountain. Yes, here we have patches of a dark-blue and yellowish brown tint, the former made up of *Hovea longifolia* var. *alpina*, and the latter of *Oxylobium alpestre*. It is on the sidelings at lower levels that the Oxylobiums bloom in richest profusion.

Let us now leave the summit of the mountain and follow the sideling cuttings towards Mount St. Bernard. Here close to us are some proteaceous plants, the charming *Orites lancifolia*, restricted to South-east Australia and Tasmania, and the Alpine *Grevillea Australis*. The shrub with white flowers and deep sap-green leaves is a labiate, the Alpine *Prostanthera cuneata*. The spiny shrub with rich amber-coloured flowers is *Daviesia ulicina*, and those orange-tinted flowers near it belong to another of the Oxylobiums—*O. procumbens*. Here is another of the Rutaceæ. This brilliant flowering shrub, with white flowers, and leaves covered with tubercles, which emits so powerful an aroma, is *Eriostemon myoporoides;* and that roundish-leaved shrub, with yellowish, acacia-like flowers, is in reality an acacia—*Acacia alpina*. Let us now diverge from the road and follow this open, grassy gully down to lower levels towards the Dargo. While we are resting near this trickling cold mountain rivulet we will look closer among the snow-grasses for minute plants. Ah! here is a Drosera. It is the Alpine drosera, *O. Arcturi*. It has among its leaves some struggling insects, which it will soon destroy and assimilate to itself its nutrient substance. I know that this phenomena of insect absorption by our Australian Droseras has been questioned by no less an enthusiastic and distinguished member of the Field Naturalists' Club than my friend, Mr. D. Sullivan, F.L.S., of Moyston, but anyone who takes the trouble to place a leaf of the Drosera under the microscope when insects are in process of absorption will observe the peculiar viscid liquid on the points of the tentaculæ acting as a solvent of the insect substance, and the subsequent assimilation by endosmose through the softer cells forming the cuticle of the leaf of such dissolved insect substance. The splendid drawing in Professor M'Alpine's "Atlas of the Phanoragams" illustrates the manner in which insects are captured admirably. The small composite plant near us is *Gnaphalium alpigenum*, and that large, tufted, yellow-flowering herb is *Podolepis acuminata*. You will observe that the (bachelor's buttons) *Craspedia Richea* are larger here than in the low-lands; the leaves are almost white (whitish grey), covered with dense tomentose, and the flower heads (capitulum) are larger and

orange coloured. That pink flower, rising in a terminal spike from grass-like tufts, is *Candollea graminifolia*. The stigma is sensitive, and springs suddenly backward when touched. Those fine, prolifically-flowering plants near it are Gentians —*Gentiana saxosa*. You will observe that the delicate white petals are marked with a bluish grey nervation. Among those shrubs at lower levels, we will notice further endemic species. The glossy-leaved shrub, with the brilliant red flowers, belongs to the Proteaceæ. It is *Grevillea Miqueliana*. The densely foliaged sap-green shrub near it is *Coprosma hirtella*. And those flax-like plants, with the blue flowers and large blue berries, are Liliaceæ, the prolific *Dianella Tasmanica*.

Here are also some of the Epacrids or native heaths (*Styphelia montana*, *S. Macraei*, and others), while that lovely shrub, with such showy blossoms clinging to the rocks above us, is an Epacris, *E. petrophila*. Those yellow-flowering shrubs rising above the beds of sphagnum below us are Callistemons, the Alpine *C. salignus*; and the small yellow flowers on spike-like stems are Richeas—*R. Gunnii*. The tall mosses on the rocks near us are Polytrichums, *P. commune*. Were we to follow the road downward past Boustead's to Harrietville, other shrubs and herbs would be brought constantly into view, many of which are common to other parts of Victoria; but the above species we have together examined may incite your curiosity to examine still closer this interesting area, and, it is hoped, lead to the discovery of many new varieties of endemic forms.

There are numerous other grasses and sedges, but I have only given those previously collected by me on the mountain.

DICOTYLEDONEÆ.

RANUNCULACEÆ.

RANUNCULUS
Millani, *F. v. M.*
anemoneus, *F. v. M.*
Gunnianus, *Hook.*
lappaceus, *Sm.*

CALTHA
introloba *F. v M.*

MAGNOLIACEÆ.

DRIMYS
aromatica, *F. v. M.*

CRUCIFERÆ.

CARDAMINE
dictyosperma, *Hook.*

ERYSIMUM
capsellinum, *F. v M.*

VIOLACEÆ.

VIOLA
Caleyana, *C. Don.*

DICOTYLEDONEÆ.—*Contd.*

DROSERACEÆ.

DROSERA
Arcturi, *Hook.*

POLYGALEÆ.

COMESPERMA
retusum, *Lab.*

RUTACEÆ.

BORONIA
algida, *F. v. M.*

ERIOSTEMON
phylicifolius, *F. v. M.*
myoporoides, *De Candolle*

CORREA
Lawrenciana, *Hook.*

STACKHOUSIEÆ.

STACKHOUSIA
pulvinaris, *F. v. M.*

PORTULACEÆ.

CLAYTONIA
Australasica, *Hook.*

DICOTYLEDONEÆ.—*Contd.*

CARYOPHYLLEÆ.

SCLERANTHUS
biflorus, *J. Hook.*
mniaroides, *F. v. M.*

LEGUMINOSÆ.

DAVIESIA
ulicina, *Sm.*
corymbosa, *Sm.*

PULTENAEA
subumbellata, *Hook.*

BOSSIAEA
foliosa, *A. Cunn.*
bracteosa, *F. v. M.*

HOVEA
longifolia, *R. Br.* var. alpina.

INDIGOFERA
australis, *Willd.*

ACACIA
alpina, *F. v. M.*

ONAGREÆ.

EPILOBIUM
tetragonum, *L.*, var. confertifolium.

MYRTACEÆ.

BAECKEA
Gunniana, *Schauer.*

KUNZEA
Muelleri, *Bent.*

CALLISTEMON
salignus, *D. C.* var. Sieberi.

EUCALYPTUS
Sieberiana, *F. v M.*
pauciflora, *F v. M.*
Gunnii, *Hook.*

UMBELLIFERÆ.

AZORELLA
dichopetala, *Bent.*

ACIPHYLLA
simplicifolia, *F. v. M.*
glacialis, *F. v. M.*

OREOMYRRHIS
andicola, *End*
pulvinifica, *F. v. M.*

PROTEACEÆ.

ORITES
lancifolia, *F. v. M.*

GREVILLEA
alpina, *Lind.*
Miqueliana, *F. v. M.*
australis, *R. Br.*

DICOTYLEDONEÆ.—*Contd.*

PROTEACEÆ.

HAKEA
acicularis, *R. Br.*
microcarpa, *R. Br.*

LOMATIA
longifolia, *R. Br.*

THYMELEÆ

PIMELEA
alpina, *F. v. M.*
ligustrina, *Lab.*
axiflora, *F. v. M.*

RUBIACEÆ.

COPROSMA
hirtella, *Lab.*

COMPOSITÆ.

BRACHYCOME
nivalis, *F. v. M.*
scapigera, *D. C.*

ASTER
megalophyllus, *F. v. M.*
iodochrous, *F. v. M.*
Celmisia, *F v. M.*
florulentus, *F v. M.*

ERIGERON
pappochromus, *Lab.*

GNAPHALIUM
alpigenum, *F. v. M.*

LEONTOPODIUM
catipes, *F. v. M.*

PODOLEPIS
acumenata, *R. Br.*

HELIPTERUM
anthemoides, *D. C.*
incanum, *D. C.*

HELICHRYSUM
bracteatum, *Henckel.*
rosmarinifolium, *Less.*
baccharoides, *F v. M.*

CRASPEDIA
Richea, *Cars.*

SENECIO
pectinatus, *D. C.*
Australis, *A. Rich.*
Bedfordii, *F. v M.*

CAMPANULACEÆ.

WAHLENBERGIA
gracilis, *A. de C.*

CANDOLLEACEÆ.

CANDOLLEA
graminifolia, *Swartz.*

GENTIANEÆ.

GENTIANA
saxosa, *Forst.*

DICOTYLEDONEÆ.—*Contd.*

SCROPHULARINEÆ

VERONICA
perfoliata, *R. Br.*
Derwentia, *Littlejohn.*
serpillifolia, *Linvi.*

EUPHRASIA
Brownii, *F. v. M.*

LABIATEÆ.

PROSTANTHERA
cuneata, *Bent.*

WESTRINGIA
senifolia, *F. v. M.*

EPACRIDEÆ.

STYPHELIA
collina, *Lab.*
montana, *F. v. M.*
Macraei, *F. v. M.*

EPACRIS
petrophila, *Hook.*
microphylla, *R. Br.*

RICHEA
Gunnii, *J. Hook.*

MONOCOTYLEDONEÆ.

LILIACEÆ.

DIANELLA
Tasmanica, *J. Hook.*

RESTIACEÆ.

RESTIO
australis, *R. Br.*

CALOSTROPHUS
lateriflorus, *F. v. M.*

CYPERACEÆ.

CYPERUS
Eragrostis, *Vahl.*

OREOBOLUS
Pumilio, *R. Br.*

CAREX
Pseudo cyperus, *Lin.*

GRAMINEÆ.

TRISETUM
subspicatum, *Pal.*

DANTHONIA
robusta, *F. v. M.*

POA
caespitosa, *Cu. F.*, var. alpina.

INSTINCT SHOWN BY INSECTS IN DEPOSITING THEIR EGGS.

WATER SCORPION.

WE will take as our first example the water scorpion *(Nepa cinerea)*. In some works on entomology the eggs of this insect are described as resembling small seeds, covered with points, and buried in the stalks of aquatic plants.

The manner in which this insect deposits its eggs I will try to explain. It appears it is necessary they should receive a due amount of the sun's heat, and also be near water, so that the larvæ will have no difficulty in reaching it. This is achieved in the following manner:—The female makes a hole in the *floating* leaf of some aquatic plant, in which is deposited an egg, having seven movable arms, which, on coming in contact with moisture, expand and spread out over the hole, and thus prevent the egg slipping into the water. After due time the larva emerges from below into the water, whence, after living at the expense of its aquatic friends and relations, it comes forth a perfect insect. And if a female it lays its eggs in the same manner.

Ichneumons.

In searching for wood-boring insects we sometimes find the larvæ of various wood-boring beetles that have been killed by the Ichneumons. The question may arise as to how an Ichneumon could reach one of these larvæ which are nearly always buried in the wood, or between the bark and wood. It is hardly possible that the Ichneumon laid its eggs on the larva directly it emerged from the egg, as the number of Ichneumon cocoons found inside some of the larvæ is sometimes 15 or more. I noticed a great many Ichneumons of the genus *Pimpla* on "peppermint trees" that had been killed by "ringing." Some of these insects had their ovipositors buried in the bark, and, thinking that they might be depositing their eggs in some of the wood-boring larvæ, I held the fly, and then opened the bark with a knife. In every instance there was a wood-boring larva directly under the ovipositor, and in some the ovipositor had pierced the skin. This may account for the way in which some of these larvæ are attacked.

Anyone who takes an interest in the entomology of Victoria will be well acquainted with the cocoon made by the larva of the moth, *Darotifera vulnerans*. The first thing, perhaps, that strikes the observer is the great number that have been killed by the Ichneumon flies.

Now this seems strange, as the larvæ are protected by eight (?) rays of fine bristles which the larva can raise on being alarmed, and which are capable of inflicting a painful sting. The Ichneumons seem to know this, and wait until the larva spins its cocoon.

On 15th January, 1887, I had the pleasure of seeing one of these Ichneumons flying round, and occasionally settling on the trunk of a tree. I thought at first sight it was a wood-boring insect, but on closer inspection it turned out to be an Ichneumon. It was searching for some larva or cocoon in which to deposit its eggs. It soon found a cocoon of the larva described above, and set to work in the following manner:—Grasping the cocoon with her legs, and more especially with the last pair, she brought her ovipositor to work on the surface of the cocoon, the auger being placed so that it had all the pressure of the last pair of legs directly upon it. In this position it worked for twenty minutes, when it bored through the wall of the cocoon and deposited one egg on the larva, as I found on inspection.

C. C. Brittlebank, Spring Vale.

NOTES.

Victorian Quinine.—At the annual *conversazione* of the Field Club Mr. G. W. Robinson exhibited flowers, leaves, and bark of cinchona, grown by him at Berwick. In the *Australasian Journal of Pharmacy* for July Mr. W. E. Matthews gives an assay of the bark. The sample was taken from a plant of *C. calisaya*, cut from stem at girths of 7 to 10 inches. The fresh green bark dried at 100° C. lost 42·7 per cent. of its weight; the dried product estimated by the process of the "British Pharmacopœia," 1885, gave 5·744 per cent. of quinine and cinchonidine, and 6·62 per cent. of total alkaloids. This is a satisfactory result, as 5 to 6 per cent. of total alkaloids is considered a reasonable standard for pharmaceutical purposes. It would seem that Baron von Müeller was correct when he predicted "that cinchonas would prove quite hardy, and easy of culture in the coast regions around Cape Otway, Western Port, and in southern and eastern Gippsland," in spite of the Government's failure to grow cinchonas on the cold bleak altitude of Mount Macedon. One of the leading quinine manufacturers in London has been led by the notice of the exhibit in our May issue to apply to Mr. Robinson for samples of bark, which will be duly forwarded. Mr. Robinson is to be congratulated on his success.

Note on the Nest of Queen Victoria's Rifle Bird-of-Paradise *(Ptilorhis Victoriæ)*.—As this is Jubilee week, a description of the first authenticated nest of this gorgeous bird bearing our good Queen's name may not be out of place. It is open-mouthed, constructed of a thick (averaging ¾in. throughout) layer of broad, soft, dried leaves of various trees and a few portions of broad grass, somewhat loosely held or bound together by wiry rootlets, spiral tendrils of vines, and a few spiders' cocoons, and loosely lined inside with rootlets. Circumference of whole structure between 15 and 16 inches, or 5in. broad by 5in. deep. Inside dimensions, 2½in. across the mouth by 2½in. deep. It is from the Cardwell scrubs. The female was sitting when the nest was discovered, and is the same that contained the eggs which were described before the Club at the February meeting.—A. J. Campbell, 20th June, 1887. [Lack of space compelled us to hold this note over from our last issues. —Ed.]

A correspondent in the *Field* says:—"A very unusual occurrence took place about 10 a.m. one day last month. A large rookery close to the house was attacked by a flock of starlings, estimated about three hundred in number. The rooks were hatching, and a desperate fight took place. The invaders seemed to adopt good tactics, attacking in two divisions, one fighting and the other looting the eggs, numbers of which were thrown out of the nests to the ground. When I arrived and fired a couple of shots, bringing down five of the robbers, they took flight in a compact body, going in a straight line as far as we could see them."

Field Naturalists' Club of Victoria.

President:

A. H. S. LUCAS, M.A., B.Sc., F.G.S.

THIS Club was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

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The Ordinary Meetings for the reading of papers, and exhibition of specimens, with a short conversazione, are held on the second Monday in each month at the Royal Society's Hall, Victoria-street, Melbourne, at 8 p.m.

The proceedings of the Club are recorded in its journal—the "Victorian Naturalist." Annual subscription, 6s. 6d., post free. (To members free.)

With the view of popularising the study of the Natural History of the Colony, correspondence, notes, and queries relating to this subject are invited for insertion, and should be addressed to the Editor at the Wesley College, Prahran.

Any of the numbers from the commencement, January, 1884, can be obtained from the Hon. Sec., Mr. F. G. A. Barnard, Kew, at sixpence each; or in sets, Vol. I. (1884-85), 16 numbers, 7s. 6d.; Vol. II. (1885-86), 12 numbers, 6s.; Vol. III. (1886-87), 12 numbers, 6s.; each set with title-page and index for binding.

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th September, 1887.

In the absence of the President and Vice-presidents, Mr. D. Best was voted to the chair, and about 70 members and visitors were present.

Letters were read from the Royal and Geographical Societies in support of the Club's proposal with reference to the reservation of Wilson's Promontory, and a sub-committee was appointed to draw up the details of the proposal and submit them to the Minister of Lands.

The hon. librarian reported the receipt of the following donations to the library:—"Prodromus of Zoology of Victoria," Decade XIV., from the Government; "Proceedings of the Linnean Society of New South Wales" (second series), Vol. II., Part 2, from the Society; "Report on King's Island," with map, from Tasmanian Government; "Journal of Pharmacy," August, 1887; and Diggle's "Birds of Australia," purchased.

The hon. secretary read short accounts of the excursions held since last meeting:—

Ringwood, 12th August.—Eighteen members and friends attended, but, owing to rain coming on soon after starting, a retreat had to be made to the station. Flowers were rather scarce. *Drosera Whittakeri* was noticed in abundance. A very robust form of the orchid, *Caladenia carnea*, was obtained, and the orchids, *Pterostylis nutans* and *longifolia*, were also noted. Several new and interesting fungi and lichens were also gathered.

Moonee Ponds, 27th August. — About seven members attended, and, under the guidance of Mr. S. H. Wintle, F.L.S., visited the well-known fossil-bearing cliff some little distance above the old Model Farm. In the way of fossils, the principal objects obtained were casts of Rynchonellas and Orthoceratites.

Attention was called to the fossil ripple-marks plainly visible on the rocks close at hand. Of flowering plants *Myoporum deserti* and *Acacia acinacea* were the principal finds.

Oakleigh, 3rd September.—About eight members took part in this excursion, and, taking a north-easterly direction from the station, crossed some paddocks gay with many leguminaceous flowers, such as Acacias, Kennedyas, Bossiæas, etc. *Pterostylis nutans* was noticed in great quantities, and in another paddock several specimens of the rather rare fern, *Botrychium ternatum*, were noted. Further on, on the shady banks of a creek, *Clematis aristata*, and *Glycine clandestina*, and other spring flowers were seen. On the way back two rather rare lichens, *Cladonia rangiferina*, the reindeer moss of Norway, and *Cladonia retepora*, were obtained.

The following persons were duly elected members of the Club:—Mrs. G. Thomson, Messrs. W. Best, W. Chisholm, E. R. Hammett, G. Thomson, R. Tobin, A. Walker, and M. Waterstrom.

Papers for future meetings were promised by Messrs. A. Coles, H. W. Hunt, and H. Watts.

PAPERS READ.

1. By Mr. J. F. Roberts, F.R.H.S., entitled "Some Notes of a Recent Visit to New Caledonia," Part II. This was a continuation of his former paper on the subject, and gave a most interesting description of the rich tropical scenery to be met with in the island, more especially that of the Cascade Creek and Mount Kogi, where palms, ferns, orchids, etc., grow in the greatest luxuriance and profusion.

2. By Baron F. von Mueller, K.C.M.G., "A Supplementary List of Australian Lichens." This, as it consisted principally of a list of names, was taken as read, and ordered to be printed.

3. By Rev. C. M. Yelland, entitled "Sparrows." The author quoted from various authorities as to the useful qualities of these birds, and expressed the opinion that the destruction they are known to create is more than compensated for by their usefulness. The paper gave rise to considerable discussion, which, on the whole, was unfavourable to the author's conclusions.

The following were the principal exhibits of the evening:—By Mr. D. Best, a fine collection of shells from Phillip Island, forwarded by Mr. J. West. By Mr. C. C. Brittlebank, water-colour drawings of insects. By Miss Campbell, fossil plant, *Cinnamomum polymorphoides*, M'Coy, from Cobungra; also thirty fungi unrecorded for Victoria. By Mr. A. Coles, pouch of native cat showing young attached to teats, pair of young black

swans, and a hybrid duck from Boort. By Master H. B. Coles, Australian parrots, also nest and eggs of reed-warbler from Boort. By Mr. E. M. Cornwall, pair of *Apteryx Australis* from New Zealand, also eggs of Queen Victoria's lyre-bird, *Menura Victoriæ*. By Rev. A. W. Cresswell, M.A., fossil remains of lower jaw and tibia of very large extinct wallaby from limestone at Coimadia, near Bacchus Marsh. By Mrs. J. V. Flatow, specimens of lizard, *Moloch horridus*, from Port Augusta, S.A. By Mr. C. French, jun., eggs of short-tailed tropic bird. By Mr. J. T. Gillespie, eggs of field calamanthus, *Calamanthus campestris*. By Mr. E. H. Hennell, fossil fruit from Haddon, near Ballarat, found 170 feet below surface. By Mr. G. A. Keartland, pair of bower-birds. By Mr. W. MacGillivray, two abnormally coloured (light blue) eggs of bustard from Flinders River, Queensland. By Baron F. von Mueller, K.C.M G., plates illustrating "The Acacias of Australia." By Mr. J. E. Prince, several rare natural history works. By Mr. H. Watts, 108 species of marine bryozoa, mounted for the microscope; also a quantity of seaweeds, polyzoa, etc., dredgings at Port Phillip Heads by Mr. J. Bracebridge Wilson. By Mr. S. H. Wintle, F.L.S., fossil casts of Orthoceratites, embracing *Cyrtoceras* and *Cryoceras*, associated with Rynchonella, *Spirifera pleurotomana*, etc., from Orthoceratite bed, Moonee Ponds; also, through the sciopticon, plates of artificially produced *Dendrites*. By Master A. Yelland, fossils from Tasmania, lava from Sumbawa, picked up in Indian Ocean; stones from Fiji, Tasmania, and Ireland.

After the usual *conversazione*, the meeting terminated.

NOTES ON A FEW VICTORIAN LICHENS.

By Rev. F. R. M. Wilson, Kew.

(Read before the Field Naturalists' Club of Victoria, 8th Aug., 1887.)

In the "Fragmenta Phytographiæ Australiensis," Vol. XI., are published 61 varieties of lichens which have been found in Victoria; and in the *Victorian Naturalist* have been published five by Miss F. M. Campbell, and two or three by Mr. F. Reader. Besides these, there are a number of specimens of Victorian lichens in the Melbourne Botanical Museum which have not yet been published. I believe, also, that a good many have been sent to Europe to be named, and that, when they are returned, the list of known Victorian lichens will be much enlarged.

Meanwhile I exhibit specimens of 126 species and varieties, found by myself in different parts of Victoria, additional to those already published. I lay on the table a classified list for publication.

In the naming of these I have received much assistance from Dr. Knight, of New Zealand, a well-known lichenologist. I have also examined Australian and exotic specimens in the Botanical Museum, and I have consulted Nylander's "Synopsis" and the last edition of Leighton's "Lichen Flora," as well as Tuckerman's "Genera Lichenum," which Baron Von Mueller kindly lent me. I have further gratefully to acknowledge assistance in various ways from Miss F. M. Campbell, who is an indefatigable collector of lichens as well as of other plants, and also the kindness of Mr. French in furnishing me with a list of Australian lichens in the Museum, and in furthering my researches among them. I cannot help expressing my sense of the courtesy of all the officials connected with the Botanical Museum.

The specimens exhibited are pretty fairly representative of the various classes of lichens. Some of them, *e.g.*, Calicia, are truly microscopical, being scarcely visible to the unaided and uneducated eye; while of others, *e.g.*, Stictei, one plant will cover more than a square yard of rock; and some, Usneæ, will hang from tall trees to the length of 60ft. Some, *e.g.*, of the Collemata, are comparatively short-lived, dying in a few months; while others, such as Parmeliæ, attain an unknown age, and are supposed to be hundreds of years old, scarcely altering in size or appearance during a quarter of a century.

A few of the specimens exhibited were gathered from marine rocks under high water mark, others from the summits of lofty mountains, some from the surface of barren rocks, exposed to the full heat of the sun, and others from the trunks of trees in the dense shade of deep, dank gullies. Some lichens I have gathered from well-beaten footpaths, and many from rotten logs; some on mosses, on jungermannias, on ferns, on other lichens, on the growing leaves and on the fallen involucres of phanerogamous plants, on the bark of trees and bushes, on rails and dead wood; even on leather, on iron, and on the dried bones of animals. I have collected them from the slate roofs of houses, from the street gutter near my own door in Kew, and from almost every conceivable situation, except the immediate neighbourhood of Melbourne, for, like true children of nature, they are impatient of the smoke and other impurities of city life. Another characteristic of theirs, unfortunately, is that, where a bush fire has ravaged, it is years before any except the hardier and quicker growing kinds are to be found. Many never return. This peculiarity often leads to disappointment in exploring new fields.

It is just three years since I began the study of lichenology. An old friend and fellow-student whom I visited in Scotland recommended me to turn my attention to the lichens of Victoria, which, he said, had not yet been explored. My state

of health requiring me to relax my studies and to spend a good deal of time in the open air, I followed his advice, and have gathered from a good many places in Victoria. Besides Kew, Bulleen, Doncaster, and Box Hill, in my own neighbourhood, I have visited, to the south-east, Brighton, Cheltenham, Mentone, Mordialloc, Oakleigh, Beaconsfield, Warragul, Glenmaggie, Maffra, and Sale; to the east, Ringwood, Croydon, Lilydale, Fernshaw, Black Spur, and Warburton; to the north, Kilmore and Traawool; to the north-west, Gisborne and Macedon; and to the west, Little River, the You Yangs, Birregurra, Lorne, Lismore, Camperdown, Cobden, Terang, and Warrnambool. My collection from these places numbers, I dare say, ten thousand specimens, which I have classified into about a thousand species and varieties, although I have not yet succeeded in naming more than a hundred and fifty. There are certainly many more species and varieties than a thousand in Victoria—probably as many more—and no doubt many of them will be quite new to science. Here is a field for the exercise of youthful energy and scientific enthusiasm.

Nothing can be simpler than the collection and preservation of lichens. A strong knife to cut them from the trees and dead wood, a hammer and mason's chisel to secure saxicole varieties, a few old newspapers in which to wrap the specimens, and a bag to carry them, slung on the back, leaving the hands free for climbing, are sufficient equipment for the field. The only direction needed for a collector is that whatever shows the slightest difference should be considered meanwhile as a variety, and a good number of specimens should be gathered of each, say, a dozen or more. Most lichens can be gathered at any time of the year. The summer, however, is best. A few, which shrink up when dry, are noticed only in wet weather, and it is well to say that the appearance of most lichens is very much altered by moisture. When the specimens are brought home they need merely releasing from their paper bondage, and fastening, with strong glue, to a slip of writing paper, on which the place and time of collecting can be noted, with room for descriptive remarks and drawings of minute details after examination.

The examination and study of this order of plants is a most fascinating one, and gives scope for the exercise of the keenest perception and the most cautious judgment. It is wise to begin with a typical specimen, having all its parts well developed, especially the circumference of the thallus, or body of the lichen, and the apothecia, or fruit; avoiding monstrosities or abnormal forms until the typical plant is known. Examination is made with the lens, with the microscope, and with chemical re-agents—iodine, hydrate of potash, and chloride of lime.

The constituent parts of lichens are few, and the wonder constantly grows as we examine them how such an immense variety can be produced from such simple and scanty materials. The thallus, composed in even the highest forms of only four layers—cortical, gonidial, medullary, and hypothalline—is yet most surprisingly multiform, and the apothecia are wonderfully diversified. The same may be said of the thecæ or spore bags contained in the apothecia. The spores, too, vary in size, shape, colour, and markings beyond all expectation. Many are most beautiful objects under the microscope. Some are almost visible to the naked eye, and others test the powers of the best object glasses of $\frac{1}{4}$ inch or $\frac{1}{8}$ inch, being smaller than the ten thousandth part of an inch; and the spermatia are even more minute than the spores, and very various in shape.

If there are any members of the Club who would like to prosecute the special study of this branch of botany, I shall be pleased to show them my collection, and to give them any aid in my power; and I will gladly contribute a paper now and then upon this branch of cryptogamic botany, which deserves to be better known than it is.

VICTORIAN LICHENS.

Exhibited in the Field Naturalists' Club, Melbourne, 8th August, 1887, by Rev. F. R. M. Wilson.

Collemacei.

Lichina confinis, *Ach.*
Synalissa micrococca, *Bor. & Nyl.*
Collema furvum, *Ach.*
Synechoblastus nigrescens, *Huds.* (vespertilio, *Lgtft.*)
S. glaucophthalmus, *Nyl.*
Leptogium phyllocarpum, var. dædaleum, *Lin.*
L. Burgesii, *Lgtft.*
L. sinuatum, *Huds.*
L. dactylinum, *Tuck.*
L. tremelloides, var. azureum, *Schw.*

Epiconiodei.

Calicium curtum, *Bor.*
C. trachelinum, *Ach.*
C. Victoriæ, sp. nov., *C. Knight.*
Sphærophoron Australe, *Laur.*

Cladodei.

Bæomyces fungoides, *Ach.*
Thysanothecium hyalinum, *Tayl.*
Pycnothelia papillaria, *Duf.*
Cladonia cenotea, *Ach.*
C. crispata, *Ach.*
C. pungens, *Fl.*
C. fimbriata, *Hffm.*
C. fimbriata, var. tenella, *Mul. Arg.*
C. fimbriata, var. gracilenta, *Nyl.*
C. fimbriata, var. pulverulenta, *Mul. Arg.*
C. fimbriata, var. adspersa.
C. pyxidata, var. marginalis.
C. pyxidata, var. chlorophæa, *Fl.*
C. ochrochlora, var. phyllostrata
C. delicata, var. subsquamosa, *Nyl.*
C. pertricosa, *Krplhb.*
C. fragillima, *Krplhb.*
C. furcata, var. subsquamosa, *J. Mul.*
C. furcata, var. asperata, *J. Mul.*
C. furcata, var. polyphylla, *Fl.*
C. furcata, var. notabilis, *J. Mul.*
C. furcata, var. subulata, *Fl.*
C. furcata, var. recurva, *Fl.*
C. furcata, var. racemosa, *Fl.*
C. cornucopioides, var. pleurota.
C. Floerkiana, *Fr.*
C. digitata, var. macilenta, *Hffm.*
Cladina aggregata, var. inflata.
C. schizopora, *Nyl.*
C. pycnoclada, *Nyl.*

Usnei.

Usnea barbata, var. strigosa, *Ach.*
U. barbata, var. rubiginea, *Ach.*

U. barbata, var. microcarpa, *Pers.*
U. barbata, var. articulata, *Ach.*
U. barbata, var. plicata, *Fr.*
U. barbata, var. scabrosa, *J. Mul.*
U. dasypogoides, *Nyl.*
U. dasypogoides, var. elegans, *Stirt.*
U. dasypogoides, var. substrigosa, *J. Mul.*

RAMALODEI.

Ramalina fraxinea, *Lin.*
R. fraxinea, var. tæniæformis, *Ach.*
R. fraxinea, var. ampliata, *Ach.*
R. fastigiata, *Pers.*

CETRARIEI.

Platysma diffusum, *Web.*
P. aleurites, *Ach.*

HETERODEI.

Heterodea Muelleri, *Nyl.*

PELTIGEREI.

Nephromium cellulosum, *Ach.*
Peltigera pulverulenta, *Tayl.*
P. aphthosa, *Lin.*
P. canina, *Lin.*
P. rufescens, *Hffn.*
P. dolichorhiza, *Nyl.*

PARMELIEI.

Stictina limbata, *Sm.*
S. fuliginosa, *Dicks.*
S. carpoloma, *Del.*
S. crocata, *Lin.*
S. gilva, *Thun.*
S. fragillima, var. dissimilis, *Nyl.*
Sticta physciospora, *Nyl.*
S. Freycinettii, var. fulvo-cinerea, *Mont.*
S. stipitata, sp. nov., *C. Knight.*
Parmelia olivacea, *Lin.*
P. olivacea, var. prolixa, *Ach.*
P. olivacea, var. exasperata, *Ach.*
P. conspersa, var. stenophylla, *Ach.*
P. conspersa, var. isidiosa
P. australiensis
P. australiensis, var. isidiophora
P. tenuirima
P. tenuirima, var. coralloides
P. caperatula, *Nyl.*
P. tiliacea, *Ach.*
P. tiliacea, var. scortea, *Ach.*
P. Borreri, *Tur.*
P. olivetorum, *Ach.*
P. placorhodioides, *Nyl.*
P. molliuscula, *Ach.*
P. angustata, *Pers.*
P. perforata, var. ciliata, *Nyl.*
P. perlata, var. ciliata, *De C.*
P. physodes, var. mundata, *Nyl.*
P. physodes, var. vittata, *Ach.*
P. physodes, var. sublugubris, *Pers.*
P. physodes, var. obscurata, *Ach.*
P. pertusa, *Schr.*
Physcia stellaris, *Lin.*
P. stellaris, var. tenella, *Scop.*
P. stellaris, var. cæsia, *Hffm.*
P. adglutinata, *Fl.*
P. speciosa, var. hypoleuca, f. cæruleo-nigricans, *Nyl.*

LECANOREI.

Psoroma sphinctrinum, *Mnt.*
Pannaria fulvescens, *Mnt.*
P. nigro-cincta, *Mnt.*
P. nigra, *Hud.*
Squamaria gelida, *Lin.*
Placodium vitellinum, *Ach.*
Lecanora sarcopsis, var. obscurata, *Wahl.*
L. atra, *Hud.*
L. parella, var. Turneri, *Sm.*
Pertussaria communis, *De C.*
P. fallax, f. sulphurea, *Schoerer.*
Urceolaria scruposa, var. bryophila, *Ach.*
Thelotrema lepadinum, *Ach.*

LECIDEINEI.

Cœnogonium Linkii.
Biatora coarctata, f. terrestris, *Leight.*
Patellaria grossa, *Pers.*
Lecidea geographica, *Lin.*
Psora decipiens, *Ehrh.*

GRAPHIDEI.

Graphis glaucoderma
Arthonia cinnabarina, *Wall.*

PYRENODEI.

Endocarpon hepaticum, *Ach.*
Verrucaria maura, *Wahl.*

CRANES.—Much discussion having taken place as to the nesting of cranes, I would like to mention that they leave Westernport Bay about 16th November, and return in about three months, yet I have never seen a young crane. R. ROBINSON, Hastings.

LIST OF AUSTRALIAN LICHENS,

INDICATIVE OF ADDITIONAL SPECIES OR OF UNRECORDED LOCALITIES, FROM DR. J. MUELLER'S ELUCIDATIONS,

OFFERED BY BARON VON MUELLER, K.C.M.G., M. & PH.D., F.R.S., ETC.

THE present enumeration was intended to form part of a supplement to the list of the 3516 Australian evascular plants, promulgated in the eleventh volume of the "Fragmenta Phytographiæ Australiæ" six years ago; but as the twelfth volume of that work could not yet be completed—other more urgent literary work needing precedence—it is now thought best, to publish in the pages of the *Victorian Naturalist*, by kind permission of its learned editor, successively the supplemental species found since in various regions of the Australian continent and in Tasmania. A commencement is now made with those Lichens, which have been additionally elaborated by the leading specialist, Dr. Jean Mueller, of Geneva, since 1881, from material furnished by the Botanic Museum of Melbourne. But this enumeration does not comprise the whole addenda, either for new specific records or for additional notes on geographic distribution, inasmuch as the Rev. F. R. M. Wilson gave separate publicity to the result of his own meritorious local researches on our Lichens, as sixty-four additional species, with one augmenting genus—irrespective of many new geographic indications, not obtained by me independently—are shown to occur in Queensland through researches of distinguished British lichenologists, from Mr. F. M. Bailey's collections. But as he has published these species already in his valuable "Synopsis of the Queensland Flora," no necessity exists of reiterating them in this list. The compilation of the present series from Dr. J. Mueller's important memoirs, and from numerous successive manuscript communications, has been aided by Mr. C. French, jun., of the Government Botanist's Office, Melbourne. Now it will be seen, that the number of Lichens from all parts of Australia, rendered known up to the present date, gives a total of 692, including also a few recorded by the Rev. Mr. Crombie from Rob. Brown's collections. The genera and species printed in italics are new for this part of the world, and in many instances for science also.

Lichinia *confinis*, Agardh	..	..	..	..	..	N.S.W.	..
Ephebe pubescens, Fries	..	..	S.A.	..	..	..	..
Collema *furvum*, Acharius	..	..	..	..	V.	..	Q.
implicatum, Nylander	..	..	..	T.	..	..	..
leucocarpum, Taylor	..	..	..	..	..	N.S.W.	..
nigrescens, Acharius	..	..	..	T.	..	..	..
Leptogium *denticulatum*, Nylander ..	..	..	..	..	V.	..	..

Leptogium *glaucopthalmum*, Nylander	..	..	..	..	V.	..	..
hypotrachyum, J. Mueller	..	..	..	..	V.	..	Q.
marginellum, Montagne	..	..	..	..	..	..	Q.
Sphaerophorus australis, Laurer	..	..	..	..	V.	..	..
compressus, Acharius	..	..	..	..	V.	..	..
coralloides, Persoon	..	..	S.A.	..	..	..	..
Calicium globosum, J. Mueller	..	..	..	..	..	N.S.W.	..
hyperellum, Acharius	..	..	..	..	V.	..	..
stictarum, Nylander	..	..	..	..	..	N.S.W.	..
Baeomyces roseus, Persoon	..	..	..	..	V.	..	Q.
rufus, Nylander	..	..	..	..	V.	..	..
Thysanothecium *Hookeri*, Nylander	..	..	..	..	..	N.S.W.	..
hyalinum, Nylander	..	..	..	..	..	N.S.W.	..
Cladonia *acuminata*, Acharius	..	..	S.A.	..	..	..	..
adspersa, Floerke	..	..	S.A.	..	..	..	..
capitellata, Babington	..	..	..	..	V.	..	..
cariosa, Acharius	..	W.A.	..	..	..	..	..
ceratophylla, Eschweiller	..	..	..	T.	..	..	..
cervicornis, Schaerer	..	W.A.	..	..	..	..	..
deformis, Hoffmann	..	..	S.A.	..	..	..	..
elegantula, J. Mueller	..	..	..	..	..	N.S.W.	..
fimbriata, J. Mueller	..	..	S.A.	..	V.	N.S.W.	Q.
Floerkeana, Fries	..	..	..	..	..	N.S.W.	..
lepidula, Krempelhuber	..	..	..	..	..	N.S.W.	Q.
neglecta, Floerke	..	..	..	..	V.	N.S.W.	..
peltactina, Nylander	..	..	..	..	..	N.S.W.	..
pityrea, Floerke	..	..	..	..	..	N.S.W.	Q.
rangiferina, Hoffmann	..	W.A.	..	..	..	..	..
squamosa, Hoffmann	..	W.A.	S.A.	..	..	..	..
Sullivani, J. Mueller	..	..	..	..	V.	..	..
symphycarpa, Acharius	..	W.A.	..	..	V.	..	..
verticillata, Floerke	..	..	S.A.	..	..	..	..
Cladina sylvatica, Crombie	..	..	S.A.	..	..	..	..
Clathrina schizopora, J. Mueller	..	..	..	T.	..	..	..
Heterodea Muelleri, Nylander	..	..	..	..	V.	..	..
Stereocaulon arbascula, Nylander	..	..	..	..	..	..	Q.
nanum, Acharius	..	..	..	..	..	..	Q.
proximum, Nylander	..	..	..	T.	..	N.S.W.	..
Eumitria *ceratina*, Acharius	..	..	..	..	..	N.S.W.	..
elegans, Stirton	..	..	..	..	..	..	Q.
Usnea ceratina, Acharius	..	..	S.A.	..	..	..	..
dasypogoides, Nylander	..	W.A.	S.A.	..	V.	N.S.W.	..
florida, Fries	..	..	..	..	V.	N.S.W.	..
plicata, Hoffmann	..	..	..	..	..	N.S.W.	..
straminea, J. Mueller	..	..	..	T.	..	N.S.W.	..
Roccella Montagnei, Belanger	..	W.A.	S.A.	..	..	..	..
Siphula torulosa, Fries	..	..	S.A.	..	..	..	..
Thamnolia vermicularis, Schaerer	..	..	S.A.	..	..	..	..
Ramalina calicaris, Nylander	..	W A.	S.A.	..	..	..	..
dendriscoides, Nylander	..	..	..	..	V.	..	..
Eckloni, Montagne	..	..	..	..	..	..	..
fraxinea, Acharius	..	..	S.A.	..	..	..	Q.
geniculata, Taylor	..	W.A.	S.A.	T.	..	N.S.W.	Q.
gracilis, Nylander	..	..	..	..	..	N.S.W.	Q.
lacerata, J. Mueller	..	W.A.	..	..	..	..	..
leiodea, Nylander	..	..	..	..	V.	..	..
myrioclada, J. Mueller	..	..	..	..	..	N.S.W.	..
pusilla, Le Prev.	..	W.A.	..	..	..	..	Q.
subgeniculata, Nylander	..	W.A.	S.A.	..	..	..	..

Ramalodium succulentum, Crombie	..	..	..	..	N.S.W.	..
Nephroma *tropicum*, J. Mueller	..	..	..	..	..	Q.
Peltigera polydactyla, Hoffmann	..	W.A.	..	..	..	..
canina, Acharius	..	..	S.A.	..	..	..
Sticta aurata, Acharius	..	..	..	V.	..	..
Billardieri, Delise	..	..	..	V.	N.S.W.	Q.
Camarae, J. Mueller	..	..	..	..	N.S.W.	..
crocata, Acharius	..	W.A.	S.A.	V.	..	..
damaecornis, Babington	..	..	..	..	N.S.W.	..
dichotomoides, Nylander	..	..	..	..	..	Q.
dissimilis, Nylander	..	..	S.A.	T.	N.S.W.	Q.
dissimulata, Nylander	..	..	..	V.	..	Q.
filicina, Nylander	..	..	..	..	..	Q.
Filix, Acharius	..	..	..	..	..	Q.
flavissima, J. Mueller	..	..	..	..	N.S.W.	Q.
Freycineti, Delise	..	..	S.A.	..	..	..
fragillissima, J. Mueller	..	..	..	T.	N.S.W.	Q.
glaucescens, Krempelhuber	..	..	..	..	..	Q.
hypoleuca, J. Mueller	..	..	..	..	..	Q.
Karstenii, J. Mueller	..	..	..	..	..	Q.
multifida, Laurer	..	..	..	..	N.S.W.	..
poculifera, J. Mueller	..	..	..	..	N.S.W.	..
prolificans, Nylander	..	..	..	T.	N.S.W.	..
pulmonacea, Acharius	..	..	..	..	..	Q.
Sayeri, J. Mueller	..	..	..	..	..	Q.
subcaperata, Nylander	..	..	S.A.	..	..	..
subvariabilis, Nylander	..	..	..	T.	..	Q.
sulphurea, Schaerer	..	..	..	..	..	Q.
Urvillei, Nylander	..	..	..	T.	..	..
Stictina brevipes, J. Mueller	..	..	S.A.	..	N.S.W.	..
cinnamonea, Richard	..	..	..	T.	V. N.S.W.	Q.
esorediata, J. Mueller	..	..	..	..	V. N.S.W.	Q.
gilva, Nylander	..	W.A.	..	T.	.. N.S.W.	Q.
lutescens, Taylor	..	..	..	..	..	Q.
macrophylla, Nylander	..	..	..	..	N.S.W.	Q.
marginifera, Minks	..	..	..	..	..	Q.
Montagneana, Nylander	..	..	..	..	V. N.S.W.	Q.
scrobiculata, Acharius	..	..	..	..	V. ..	..
tomentella, Taylor	..	..	..	..	..	Q.
Lobarina scrobiculata, Nylander	..	..	..	..	N.S.W.	..
Ricasolia crenulata, Nylander	..	..	..	..	..	Q.
Hartmanni, J. Mueller	..	..	..	..	..	Q.
hypoleuca, J. Mueller	..	..	..	..	..	Q.
sublaevis, Nylander	..	..	..	..	..	Q.
Parmelia *Australiensis*, Crombie	..	..	S.A.	..	..	..
acneofusca, J. Mueller	..	..	..	V.	..	..
adpressa, Krempelhuber	..	..	..	T.	..	..
angustata, Persoon	..	W.A.	..	T.	.. N.S.W.	..
Borreri, Acharius	..	..	..	..	.. N.S.W.	..
conspersa, Acharius	..	W.A.	S.A.	..	..	..
corallinea, Acharius	..	..	..	V.	N.S.W.	Q.
crinita, Acharius	..	..	..	..	.. N.S.W.	..
dichotoma, J. Mueller	..	..	..	..	.. N.S.W.	..
eciliata, Nylander	..	..	..	..	..	Q.
ferox, J. Mueller	..	..	..	..	N.S.W.	..
furcata, J. Mueller	..	..	..	..	.. N.S.W.	..
hospitans, J. Mueller	..	..	..	V.	N.S.W.	Q.
hypoxantha, J. Mueller	..	..	..	..	.. N.S.W.	..
imitatrix, Taylor	..	W.A.	S.A.	..	..	..

Parmelia laceratula, Nylander	..	..	..	..	..	N.S.W.	..
lanata, L.	..	..	..	S.A.	..	..	..	..
lugubris, Pers.	..	..	..	S.A.	..	..	..	..
meizospora, Nylander	..	..	..	..	..	N.S.W.	..
Mougeotii, Schaerer	..	..	..	..	..	N.S.W.	..
ochroleuca, J. Mueller	..	..	..	S.A.	..	V.	N.S.W	Q.
perforata, Acharius	..	..	W.A.	S.A.	..	..	..	..
perlata, Meyer	..	..	..	..	..	..	N.S.W.	..
pertusa, Schaerer	..	..	..	..	T.	..	..	..
placoroides, Nylander	..	..	..	..	..	V.	N.S.W.	..
platytrema, J. Mueller	..	..	..	..	..	..	N.S.W.	..
proboscidea, J. Mueller	..	..	..	..	..	..	N.S.W.	..
praetervisa, J. Mueller	..	..	..	..	..	..	N.S.W.	..
pruinata, J. Mueller	..	..	..	S.A.	..	..	..	Q.
revoluta, Floerke	..	..	..	S.A.	..	..	..	..
rudecta, Acharius	..	..	..	..	..	..	N.S.W.	..
rutidota, Taylor	..	..	..	..	T.	V.	N.S.W.	Q.
saxatilis, Acharius	..	..	..	S.A.	..	..	..	..
sphaerophora, C. Knight	..	..	..	..	..	..	N.S.W.	..
spinosa, J. Hooker and Taylor	..	..	..	..	..	V.	N.S.W.	..
subcaperatula, Nylander	..	..	..	..	T.	..	..	..
subphysodes, Krempelhuber	..	..	..	..	..	V.	..	..
sulphurata, Nees	..	..	..	..	..	..	..	Q.
tiliacea, Acharius	..	..	..	..	..	..	N.S.W.	..
urceolata, J. Mueller	..	..	..	..	..	..	N.S.W.	Q.
virens, J. Mueller	..	..	..	..	..	..	..	Q.
xanthomelana, J. Mueller	..	..	..	..	..	V.	..	..
Parmeliella nigro-cincta, J. Mueller	..	..	..	..	..	V.	..	..
Bauerleni, J. Mueller	..	..	..	..	..	..	N.S.W.	..
Theloschistes chrysophthalmus, Th. Fries	..	W.A.	S.A.	..	..	..	..	..
flavicans, Norm.	..	..	..	..	T.	..	..	..
parietinus, J. Mueller	..	W.A.	..	..	..	V.	N.S.W.	..
Physcia *comosa*, Nylander	..	..	..	..	T.	..	..	..
Hamiltonii, J. Mueller	..	..	..	..	..	..	N.S.W.	..
intergata, Nylander	..	..	..	..	..	..	..	Q.
obscura, Th. Fries	..	..	..	..	..	..	N.S.W.	..
picta, Nylander	..	..	..	..	T.	..	..	..
speciosa, J. Mueller	..	..	..	S.A.	..	..	..	..
stellaris, Nylander	..	..	..	S.A.	..	..	..	..
subexilis, Nylander	..	..	..	..	T.	..	..	..
sublurida, Nylander	..	..	..	..	..	..	N.S.W.	..
tribacina, J. Mueller	..	..	..	S.A.	..	..	..	..
Gyrophora cylindrica, D. Candolle	..	..	..	S.A.	..		..	..
proboscidea, Acharius	..	..	..	S.A.	..	..	..	..
Pannaria fulvescens, Nylander	..	..	..	..	T.	..	..	..
hypoleuca, C. Knight	..	..	..	..	..	V.	N.S.W.	..
isidoides, J. Mueller	..	..	..	..	..	..	..	Q.
integrata, Nylander	..	..	..	..	..	..	..	Q.
leucosticta, Tuckerman	..	..	..	..	..	..	N.S.W.	..
melantha, C. Knight	..	..	..	..	..	..	N.S.W.	..
Mariana, J. Mueller	..	..	..	..	..	..	..	Q.
nigro-cincta, Nylander	..	..	..	S.A.	..	..	..	..
rubiginosa, Delise	..	..	..	..	T.	..	..	..
Pyxine *retirugella*, Nylander	..	..	..	..	..	..	..	Q.
Psoroma *asperellum*, Krempelhuber	..	..	..	S.A.	..	..	..	..
caesium, J. Mueller and Agardh	..	..	..	..	..	..	N.S.W.	..
Crawfordi, J. Mueller and Agardh	..	..	..	..	..	..	N.S.W.	..
dispersum, Stirton	..	..	..	..	..	..	..	Q.
hypnorum, Hoffmann	..	..	..	S.A.	..	..	..	..

Psoroma *Karstenii*, J. Mueller and Agardh	..	..	..	..	..	Q.
saccatum, Crombie	..	S.A.	..	..	..	..
sphinctrinum, Nylander and Agardh	..	..	..	V.	..	Q.
Patellaria alutacea, J. Mueller	..	..	..	..	..	Q.
Australiensis, J. Mueller	..	..	..	..	..	Q.
Baeuerleni, J. Mueller	..	..	..	..	N.S.W.	..
convexa, J. Mueller	..	..	..	..	N.S.W.	..
domingensis, J. Mueller	..	..	..	..	..	Q.
effugiens, J. Mueller	..	..	..	..	N.S.W.	..
furfurella, J. Mueller	..	..	..	..	..	Q.
grossa, J. Mueller	..	..	T.	V.	..	..
leucoblephara, J. Mueller	..	..	..	..	..	Q.
Ramalinae, J. Mueller	W.A.	..	..	..	..	..
scleroplaca, J. Mueller	..	..	..	..	N.S.W.	..
subintermixta, J. Mueller	..	..	..	V.	..	..
subproposita, J. Mueller	..	..	..	..	..	Q.
ventricosa, J. Mueller	..	..	..	..	..	Q.
Placodium *duplicatum*, J. Mueller	..	..	..	..	N.S.W.	..
Ferdinandi, J. Mueller	..	S.A.	..	..	..	..
nigro-cinctum, J. Mueller	..	..	..	V.	..	..
plurilocellare, J. Mueller	..	..	..	..	..	Q.
xanthophaneum, Nylander	..	..	V.	..	..	..
Amphiloma *gossypinum*, Nylander	..	..	..	..	..	Q.
murorum, Koerber	..	..	T.	V.	..	Q.
Candellaria concolor, J. Mueller	..	..	..	..	N.S.W.	..
vittalma, Koerber	..	..	..	V.	..	..
Rinodinia confragulosa, Nylander	..	..	..	..	N.S.W.	..
thiomela, J. Mueller	..	..	..	..	..	Q.
Coccocarpia *aurantica*, Montagne	..	..	..	..	..	Q.
pellita, J. Mueller	..	..	..	..	..	Q.
Lecanora *albella*, Acharius	..	..	..	..	..	Q.
angulosa, Acharius	..	..	..	..	N.S.W.	..
atra, Acharius	..	..	..	V.	N.S.W.	..
caesio-rubella, Acharius	..	..	..	V.	..	..
conyzaea, Nylander	..	..	..	..	..	Q.
corysta, C. Knight	..	..	..	..	N.S.W.	..
effusa, Th. Fries	..	..	..	..	..	Q.
ferruginea, Hudson	..	..	T.	..	..	..
Hoffmanni, Acharius	..	..	..	V.	..	..
hyalescens, Acharius	..	..	..	..	N.S.W.	..
luteo-alba, Acharius	..	..	..	V.	..	..
pallescens, Acharius	..	..	..	..	N.S.W.	..
phoeocarpa, J. Mueller	..	..	..	..	N.S.W.	..
plumosa, Fries	..	..	..	..	..	Q.
pulverata, Stirton	..	..	..	..	..	Q.
punicea, Acharius	..	..	..	..	N.S.W.	Q.
sarcopsis, Th. Fries	..	..	..	V.	N.S.W.	..
sorediifera, Fee	..	..	..	..	..	Q.
sordida, Fries	..	..	..	V.	N.S.W.	Q.
subpallida, C. Knight	..	..	..	..	N.S.W.	..
symmicta, Acharius	..	..	..	..	N.S.W.	..
umbrina, Acharius	..	..	..	..	N.S.W.	..
vitellina, Nylander	..	..	..	V.	..	..
xanthostigmoides, J. Mueller	..	..	..	V.	N.S.W.	..
Callipisma *aurantiacum*, Nylander	..	..	..	V.	N.S.W.	Q.
Thelotrema lapadinum, Acharius	..	..	..	V.	N.S.W.	..
laceratulum, Acharius	..	..	..	V.	..	..
Pertusaria *communis*, D. Candolle	..	..	..	..	N.S.W.	..
dermatoides, Nylander	..	..	..	..	..	Q.

Pertusaria *chiodectonoides*, Nylander	..	..	..	..	..	N.S.W.	..
gibberosa, J. Mueller	..	..	..	T.	..	..	Q.
glebosa, J. Mueller	..	..	..	..	V.	..	..
Hartmanni, J. Mueller	..	..	..	..	..	N.S.W.	Q.
leucostigma, J. Mueller	..	..	..	..	..	..	Q.
leioplacoides, J. Mueller	..	..	..	..	..	N.S.W.	..
leioplaca, Schaerer	..	..	..	T.	..	N.S.W.	Q.
lutescens, Krempelhuber	..	..	..	..	..	..	Q.
Moffatiana, J. Mueller	..	..	..	..	V.	..	..
melaleuca, Duby	..	..	..	..	..	N.S.W.	Q.
multipunctata, J. Mueller	..	..	..	..	..	N.S.W.	..
pallescens, J. Mueller	..	..	..	..	..	N.S.W.	..
pertusella, J. Mueller	..	..	..	..	..	..	Q.
petrophila, C. Knight	..	..	..	..	..	N.S.W.	..
pustulata, Duby	..	..	S.A.	..	..	..	Q.
Quassiae, Nylander	..	..	..	..	..	N.S.W.	..
subflavens, J. Mueller	..	..	..	..	..	..	Q.
thiospoda, C. Knight	..	..	..	..	..	N.S.W.	..
trypetheliformis, Nylander	..	..	..	..	..	..	Q.
velata, Nylander	..	..	..	..	..	N.S.W.	..
Virginica, J. Mueller	..	..	..	..	..	N.S.W.	..
Woollsiana, J. Mueller	..	..	..	..	..	N.S.W.	..
Arthopyrenia cinerea-pruinosa, Krempelhuber	..	..	..	..	..	..	Q.
gravestella, J. Mueller	..	..	..	..	..	..	Q.
Urceolaria scroposa, Acharius	..	..	..	T.	..	..	..
subocellata, Nylander	..	..	..	T.	..	..	..
Clathroporina eminentior, Nylander	..	..	..	T.	..	..	..
olivacea, J. Mueller	..	..	..	..	..	..	Q.
robusta, J. Mueller	..	..	..	..	..	..	Q.
Ocellularia Bonplandi, Sprengel	..	..	..	..	..	..	Q.
gyrostomoides, J. Mueller	..	..	..	..	..	..	Q.
leucotyla, Nylander	..	..	..	..	..	..	Q.
Lecidea *aurigera*, Stirton	..	..	..	..	..	..	Q.
bacidioides, J. Mueller	..	..	..	..	..	..	Q.
Bulliastrum, J. Mueller	..	..	..	..	..	N.S.W.	..
callispora, C. Knight	..	..	..	..	..	N.S.W.	..
confluens, Fries	..	..	..	..	V.	..	Q.
conspersa, Fee	..	..	..	..	..	..	Q.
conspicua, C. Knight	..	..	..	..	..	N.S.W.	..
crystallifera, Taylor	..	..	..	T.	..	..	..
decipiens, Ehrenberg	..	..	..	T.	..	..	..
diaphaenenta, C. Knight	..	..	..	..	..	N.S.W.	..
disciformis, Fries	..	..	..	..	..	N.S.W.	..
enterophaea, C. Knight	..	..	..	..	..	N.S.W.	..
exigua, Ch.	..	..	..	..	..	..	Q.
enteroleuca, Acharius	..	..	S.A.	..	..	..	..
entodiaphana, C. Knight	..	..	..	..	..	N.S.W.	..
Flindersi, Crombie	..	..	..	T.	..	..	..
grossulina, Stirton	..	..	..	..	V.	..	..
homophylla, C. Knight	..	..	..	..	..	N.S.W.	..
immarginata, Crombie	..	..	..	..	..	N.S.W.	..
inalbescens, Stirton	..	..	..	..	..	..	Q.
ludibunda, J. Mueller	..	..	..	..	..	..	Q.
lutea, Dickson	..	..	..	T.	..	..	..
melaloma, C. Knight	..	..	..	..	..	N.S.W.	..
metaphyrgmia, C. Knight	..	..	..	..	..	N.S.W.	..
microspora, C. Knight	..	..	..	..	..	N.S.W.	..
mutabilis, Fee	..	..	..	..	..	..	Q.
mundula, J. Mueller	..	..	..	..	..	N.S.W.	..

Lecidea *parmeliarum*, Sommerfeldt	..	..	..	..	..	N.S.W.	..
parvifolia, Persoon	..	..	..	..	..	N.S.W.	..
piperis, Sprengel	..	..	..	..	..	..	Q.
plana, Krempelhuber	..	..	..	..	..	N.S.W.	..
pruinosula, J. Mueller	..	..	..	..	..	N.S.W.	..
russula, Nylander	..	..	..	..	..	N.S.W.	..
septosior, Nylander	..	..	..	..	..	N.S.W.	..
subsimilis, Nylander	..	..	..	..	..	..	Q.
tenuilimbata, C. Knight	..	..	..	..	..	N.S.W.	..
versicolor, Fee	..	..	..	..	..	N.S.W.	..
Buellia modesta, Krempelhuber	..	..	..	..	..	N.S.W.	..
parasema, Th. Fries	..	..	..	..	..	..	Q.
recobarina, Mass	..	..	..	..	..	N.S.W.	..
ventricosa, J. Mueller	..	..	..	..	V.	..	..
stellulata, Mudd	..	..	..	..	V.	..	..
Thalloidima tabicinum, Mass	..	..	..	..	..	N.S.W.	..
Heterothecium biferum, Nylander	..	..	..	T.	..	..	..
leucoxanthum, Mass	..	..	..	..	..	..	Q.
Sayeri, J. Mueller	..	..	..	..	..	..	Q.
Rhizocarpum geographicum, Ramond	..	..	..	..	V.	..	..
Graphis *assimilis*, Nylander	..	..	..	..	..	..	Q.
aulacothecia, C. Knight	..	..	..	..	..	N.S.W.	..
crassilabra, J. Mueller	..	..	..	..	..	..	Q.
duplicata, Acharius	..	..	..	..	..	..	Q.
intricata, Fee	..	..	..	..	..	N.S.W.	..
malacodes, Nylander	..	..	..	..	..	..	Q.
oleina, C. Knight	..	..	..	..	..	N.S.W.	..
propinqua, J. Mueller	..	..	..	..	..	..	Q.
rimulosa, Montagne	..	..	..	..	..	..	Q.
Sayeri, J. Mueller	..	..	..	..	..	..	Q.
scripta, Nylander	..	..	..	..	..	..	Q.
sophistica, Nylander	..	..	..	..	..	N.S.W.	..
striatula, Nylander	..	..	..	..	..	..	Q.
subintricata, C. Knight	..	..	..	..	..	N.S.W.	..
subtenella, J. Mueller	..	..	..	..	..	..	Q.
subtricosa, C. Knight	..	..	..	..	..	N.S.W.	..
tenella, Acharius	..	..	..	..	..	..	Q.
vermifera, J. Mueller	..	..	..	..	..	..	Q.
Phaeographis Australiana, J. Mueller	..	..	..	..	..	N.S.W.	..
cinerascens, J. Mueller	..	..	..	..	..	N.S.W.	..
inscripta, J. Mueller	..	..	..	..	..	N.S.W.	..
subcompulsa, J. Mueller	..	..	..	..	..	N.S.W.	..
Opegrapha *Bonplandi*, Fee	..	..	..	..	..	..	Q.
inalbescens, J. Mueller	..	..	..	..	..	..	Q.
megagonidea, C. Knight	..	..	..	..	..	N.S.W.	..
plurilocularis, C. Knight	..	..	..	..	..	N.S.W.	..
Psora *brevisucula*, Nylander	..	..	..	..	..	..	Q.
elegans, J. Mueller	..	..	..	..	..	N.S.W.	..
foliata, J. Mueller	..	..	..	..	..	..	Q.
pachyphylla, J. Mueller	..	..	..	..	V.	..	..
parvifolia, J. Mueller	..	..	..	T.	..	N.S.W.	Q.
subhyalina, Stirton	..	..	..	..	..	..	Q.
Mycoporum sorenocarpum, C. Knight	..	..	..	..	..	N.S.W.	..
Melanographis asteriscus, J. Mueller	..	..	..	..	V.	N.S.W.	..
leucinia, J. Mueller	..	..	..	..	..	..	Q.
microcarpa, J. Mueller	..	..	..	..	..	N.S.W.	..
Stigmatidium heterogenum, C. Knight	..	..	..	..	..	N.S.W.	..
maculatum, C. Knight	..	..	..	..	..	N.S.W.	..
nanocarpum, C. Knight	..	..	..	..	..	N.S.W.	..

Stigmatidium stictothecium, C. Knight	..	..	..	..	N.S.W.	..
velatum, C. Knight	..	..	..	..	N.S.W.	..
Blastonia ferruginea, Krempelhuber	..	..	..	..	..	Q.
Biatorinopsis lutea, J. Mueller ..	..	..	..	V.	..	Q.
Graphina brachyspora, J. Mueller	..	..	..	..	..	Q.
Hartmanni, J. Mueller..	..	..	..	..	..	Q.
polyclades, Krempelhuber	..	..	..	..	..	Q.
Coenogonium *implexum*, Nylander	..	S.A.	T.	V.	..	..
rigidulum, J. Mueller	..	..	..	..	N.S.W.	Q.
Dichonema *irpicinum*, Nylander ..	..	..	..	..	..	Q.
Leptotrema fallax, J. Mueller ..	..	..	..	..	..	Q.
integrum, J. Mueller ..	..	..	..	V.	..	..
Wightii, J. Mueller ..	..	..	..	..	..	Q.
Endocarpon *rodatum*, J. Mueller ..	..	..	..	..	N.S.W.	..
Pyrenula *defossa*, J. Mueller ..	..	..	..	..	..	Q.
convexa, J. Mueller ..	..	..	..	..	..	Q.
Pseudopyrenula sulphurescens, J. Mueller	..	..	..	..	..	Q.
Chiodecton *effusum*, Fee	..	..	..	..	..	Q.
farinaceum, Fee ..	..	..	..	..	N.S.W.	..
perplexum, Nylander ..	..	..	T.	..	..	..
rubro-cinctum, Nylander	..	..	..	..	..	Q.
stromaticum, C. Knight	..	..	..	..	N.S.W.	..
sublaevigatum, Krempelhuber ..	..	..	..	..	..	Q.
Gyrophora corrugata, Acharius ..	..	..	..	V.	..	..
cylindrica, Acharius ..	..	..	..	..	N.S.W.	..
Glyphis favulosa, Acharius ..	..	..	..	..	..	Q.
Kirtoniana, J. Mueller ..	..	..	..	..	N.S.W.	..
Melaspilea opegraphoides, Nylander	..	..	..	..	..	Q.
Arthonia *delicatula*, J. Mueller ..	..	..	..	..	..	Q.
gracilenta, J. Mueller ..	..	..	..	..	..	Q.
gracillima, J. Mueller ..	..	..	..	..	..	Q.
nymphaeoides, C. Knight	..	..	..	..	N.S.W.	..
Thozetiana, J. Mueller ..	..	..	..	..	..	Q.
Verrucaria *rhaphispora*, C. Knight	..	..	..	..	..	Q.
trichospora, C. Knight	..	..	..	..	..	Q.
zostra, C. Knight ..	..	..	..	..	..	Q.
Normandina Jungermanniae, Nylander	..	S.A.	..	..	..	..
Trypethelium cruenatum, Montagne	..	..	..	..	N.S.W.	..
Anthracothecium desquamans, J. Mueller	..	..	..	..	..	Q.
Doleschalli, J. Mueller	..	..	..	..	..	Q.
macrosporum, Hepp	..	..	..	..	..	Q.
strigosporum, J. Mueller	..	..	..	..	..	Q.
Chondropsis semiviridis, F. Mueller	..	S.A.	..	..	..	..
Tremotylium australianum, J. Mueller	..	..	..	..	..	Q.

VICTORIAN FUNGI.

THE following thirty species of fungi, hitherto unrecorded to Victoria, were exhibited by Miss F. M. Campbell at the September meeting of the Field Naturalists' Club of Victoria:—*Agaricus (Pleurotus) Pulmonarius*, Fr.; *A. civilis*, Fr., Broadford; *Panus olivaceo-flavidus*, C. et M., Bunyip; *Leutinus subnudus*, B., Broadford; *Xerotus proximus*, Thomson River; *Boletus luteus*, Fr., Woorwyrite; *Polyporus (Merisma) reteporus*, Cooke, Broadford; *P. compressus*, Berk; *Merulius corium*, Fr.,

Beaconsfield; *Corticium lævе*, Fr., Bunyip; *Lycoperdon dermoxanthum*, Vitt, Broadford; *Diploderma fumosa*, C. et M.; *Licea frangiformis*, Fr., Ringwood; *Phoma Goodeniareum*, C. et M., Brighton; *P. portentosa*, C. et M., Broadford; *Torula mycetophila*, C. et M., Broadford; *Puccinia alyxiae*, C. et M., Broadford; *Uredo spridii*, C. et M., Oakleigh; *Phyllosticta Hardenbergii*, C. et M., Box Hill; *Sphaerostilbe microspora*, C. et M., Oakleigh; *Triblidium cæspitosum*, G. et M., Box Hill; *Gloesporium subglobosum*, C. et M., Brighton; *Sphaerella Alyxiae*, C. et M, Brighton; *Phyllachora Eucalypti*, C. et M., Bunyip; *Leptosphaeria Camelliae*, C. et M.; *Pleospora ducubae*, C. et M.; *Diatrype glomeraria*, B., Oakleigh; *Sacidium Camellae*, C. et M., Brighton; *Coniophora olivacea*, Fr., Oakleigh; *Bovista cervina*, Beenak.

Birds' Nests.—Wanted to exchange birds' nests from Westernport, including those of sea-birds, for nests from northern districts. R. Robinson, Hastings.

Mr. Bracebridge Wilson, F.L.S., of Geelong, who has obtained so many new and rare forms in his dredgings at Port Phillip Heads and at Western Port, reports *Amphioxus* from the South Channel. Mr. Wilson is to be congratulated on this most interesting find.

Mr. W. Ball, of Bourke-street, has been very successful in microphotography. He has succeeded not only in reproducing such objects as parasites, parts of insects, etc., but also in some cases the details of histological mounts. He is directing his attention to Bacteria, and we look for good results from this work, for many valuable records have been obtained in the laboratories of Koch and Pasteur by the aid of photography.

We are hoping soon to have the whole of Baron von Mueller's Dichotomous Key. It is impossible for the Baron to do any botanical work perfunctorily, and we understand that, while the dichotomous method of diagnosis has been strictly adhered to, we are not left entirely at its mercy. The dichotomies will be emphasised by large type, and further information will be, where necessary, appended in smaller tpye. The author thus, by an ingenious plan, secures the advantages without the disadvantages of the method.

Botanists will be glad to know that the natural line of affinity of the orders is not broken. Some of the *natural* orders are represented in Victoria only by aberrant forms, *e.g.*, the *Lauraceæ* (with only *Cassytha*, a climbing genus), the *Anonaceæ* (with only perigynous forms), etc. The Key separates such orders by natural distinctions of world-wide application, but gives the clue to the local representatives in smaller type. The wisdom of this will be seen, even for local purposes, when we consider that the opening up of East Gippsland will most likely add other and conforming genera to our flora.

In some particulars the attention of European botanists is challenged. Five families which have representatives in Europe (the *Plantagineæ*, *Plumbagineæ*, *Nyctagineæ*, *Thymeleæ*, and *Vinifera* have new positions assigned them. Perhaps most unexpected, but of great interest, is the relationship of the *Thymeleæ* to the *Rosaceæ* (through the *Sanguisorbreæ*). There are, we understand, other original features in the work, and we shall hope to review these when the "Key" appears.

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall, on Monday evening, 10th October, 1887.

Mr. C. A. Topp, M.A., LL.B., a vice-president, occupied the chair, and, owing to the inclemency of the weather, only about 35 members and visitors were present.

The hon. librarian reported the receipt of the following donations to the library:—"British Fungi," Cooke, and "British Fungi, Mosses, and Lichens," Holmes and Gray, from a friend; "Abstract of Papers read before Royal Society of Tasmania," from the Society; "Journal of New York Microscopical Society," January and April, 1887, from the Society; and "Journal of Pharmacy," September, 1887, from the Society.

The hon. assistant-secretary read accounts by the leaders of the excursions held since the last meeting, from which are taken the following notes:—

Croydon, 17th September.—Twelve members and friends, including two ladies, attended, and were favoured with a very fine day. One of the first finds of the day was a pretty little fern, *Grammitis leptophylla*, growing under the shelter of some up-rooted stumps. In this locality, also, a specimen of the edible fungus, known as the Morell, *Morchella* sp., was found. The next capture of any note was a land-crab, a creature which is not often found out on the surface of the ground, except after rain. The country was quite gay with various leguminaceous flowers so common at that time of the year. Few ferns were noted, as the party did not approach any creek. About six kinds of orchids were collected, *Pterostylis longifolia* being, perhaps, the rarest. At least half a dozen species of acacias were obtained in bloom, the district being a good locality for the genus. After an enjoyable ramble of about five miles the party again reached the station. During the afternoon about forty species of birds were noticed by one of the party, who devoted himself to ornithology.

Cheltenham, 24th September.—Fourteen members took part in this excursion, which also served as an opportunity for collecting for the exhibition of wild flowers in the following week. Striking across the country towards the Bay, large quantities of *Sprengelia incarnata* were passed, and near a spring the curious little Hepatica, *Symphyogyna rhizoloba*, was obtained. Near here one of the party found a beautiful white variety of the orchid *Glossodia major*, a very rare flower, and shortly after the equally rare variety, a white *Caladenia deformis*, was obtained. During the afternoon about sixty species of plants were collected in bloom. The party returned to town by way of the Sandringham line, very pleased with the outing.

Dandenong Creek, 1st October.—This was a new locality for a club excursion, and was reached by special coach from Oakleigh. Twelve members attended, and spent a very interesting afternoon. About a dozen species of birds were taken, among which were a snipe, a ground thrush, etc. Four varieties of birds' nests were obtained. A few lepidoptera were taken, and a number of flowering plants collected.

The following persons were duly elected members of the Club:—Messrs. Alexander M. Roy, Albert Wiseman, and Arthur Wiseman.

PAPERS READ.

1. By Miss F. M. Campbell, entitled "Vegetable Pathology," in which a number of interesting facts were mentioned, showing the great pecuniary losses inflicted on farmers and others by diseases produced by parasitic fungi and by insects, and advocating the study of fungi, with a view to remedial measures.

The chairman mentioned that in the State of New York an annual report was furnished by the Agricultural Experimental Station on plant diseases.

2. By Mr. D. Sullivan, F.L.S., entitled "The Mosses of Victoria," Part II. This was a continuation of the list of Victorian mosses, together with some useful hints on where to look for and how to collect them.

3. By Mr. A. Coles, entitled "The Protection of the Birds of Australia." The author suggested three ways of better protecting birds—first, by enforcing the present Game Act; secondly, by teaching boys the harm they are doing in robbing the nests; and thirdly, by instructing policemen in the characteristics of the various species of birds, so that they may be able to distinguish the protected ones.

This paper caused considerable discussion, during which Mr. Coles mentioned that the beautiful regent and rifle birds do not attain their full plumage until their fourth year.

An interesting note on the proceedings of some ants was contributed by Mr. E. H. Hennell.

The following were the principal exhibits of the evening :— By Miss F. M. Campbell, 400 specimens of diseased plants. By Mr. A. J. Campbell, first authenticated eggs of the black and white stork, or Australian jaberoo, *Mycteria Australis*, Latham. By Mr. A. Coles, a group of five regent birds, in illustration of paper, showing plumage at from one to four years of age. By Mr. C. French, F.L.S., sixty specimens of Brazilian buprestidæ; a new buprestid, *Trachys Frenchii*, from North Queensland; and some remarkable fungi, *Battaria* sp., from north-west of Lake Albacutya. By Mr. C. French, jun., eggs of wedge-tailed eagle, *Aquila audax*, from Wimmera. By Mr. E. H. Hennell, some ants referred to in his note. By Mr. H. Hughes, some spear heads from Leopold Ranges, West Australia. By Mr. J. E. Prince, two stone tomahawks found at Toorak. By Mr. J. Searle, three snakes from Branxholme, Tasmania; also the water plant, *Azolla filiculoides*, from Heidelberg. By Mr. A. Yelland, shells from Wilson's Promontory, Lisdillon, Tasmania, etc.

After the usual *conversazione*, the meeting terminated.

THE ANNUAL EXHIBITION OF WILD FLOWERS.

The exhibition of fresh specimens of our native flora has now become an annual item in the Club's doings. At first made a special feature at the October meeting, it has increased so much in popularity that this year the Committee felt justified in arranging an extra night to be specially devoted to the purpose. Accordingly, in order to try and escape the drying winds, which have formerly been experienced in the early part of October, Tuesday evening, 27th September, was fixed upon, and fortunately the weather both for collecting and exhibiting was everything that could be desired.

On this occasion more than double the previous accommodation, both for exhibits and visitors, was provided, yet both were taxed to their utmost, and the rooms of the Royal Society presented quite a brilliant spectacle. Rather more than 500 tubes were used for the flowers, and it is estimated that at least 250 persons visited the hall during the evening. The flowers had, in many cases, been brought long distances, as from Echuca, Benalla, Elphinstone, etc., and, though gathered in most cases one or two days before, owing to the care taken in packing they were in very good order. They were arranged in the ordinary show stands, according to the tastes of the several exhibitors, the contrasts of colour in many cases being very pleasing—

such as the bright magenta of *Tetratheca ciliata*, and the pale blue wreaths of *Comesperma volubile;* the various shades from pale yellow to deep orange of the acacias, dillwynias, pultenaeas, etc., and the pure white of *Epacris impressa;* the delicate purple of *Glossodia major*, or the deeper shade of *Kennedya monophylla*, and the brilliant crimson of *K. prostrata;* the delicate shades of pink of *Caladenia carnea*, and the azure blue of *C. deformis;* the pale green of the various *Pterostylis*, with the purple and white of the little violet; the magnificent blue of *Stypandra glauca*, with the crimsons of the various grevilleas, and so on in almost endless variety.

The specimens in nearly every case were labelled with their scientific name, as well as their order, locality, etc. Baron F. von Mueller, K.C.M.G., again kindly placed his services at the disposal of the exhibitors, and gave very valuable assistance in the naming of the specimens

It is estimated that nearly 250 Victorian flowering plants were shown, the following being the principal exhibitors, with brief notes of their exhibits :—Mr. D. Best, about 40 species forwarded from Phillip Island by Miss West, including some splendid specimens of orchids, *Tecoma Australis*, etc. By Mr. F. G. A. Barnard, about 40 species from Oakleigh, Kew, and Croydon, including *Styphelia ericoides*, *Clematis aristata*, *Leeuwenhoekia dubia*, etc. By Mr. C. C. Brittlebank, about 12 species from Mulgrave By Mr. A. J. Campbell, Gippsland flowers. By Miss Campbell, a basket of flowers from various localities. By Mr. G. Coghill, about 130 species from Eltham, Croydon, Ringwood, Box Hill, Benalla, Echuca, Elphinstone, etc , including many beautiful species of acacias, grevilleas, swainsonias, orchids, etc. Mr. E. A. Dombrain exhibited 12 species of orchids from Box Hill. Mr. C. Frost had about 40 species from Kew, Ringwood, etc., including the curious little flower, *Polypompholyx tenella*. Mr. C French, F.L.S., exhibited about 40 species, the results of the club excursion to Cheltenham on the previous Saturday; also a small collection made at Newport. Mrs. Flatow exhibited some nice mosses from Heywood. Mr. J. T. Gillespie had also obtained his exhibit from Heywood, included in which was *Boronia pilosa*. Mr. W. R. Guilfoyle, F.L.S., exhibited a beautiful stand of 45 varieties of native flowers grown at the Botanical Gardens, in order to show that many of our wild plants are worthy of places in our gardens This exhibit included many handsome species, such as *Goodia lotifolia*, *Grevillea ilicifolia*, *Pultenæa subumbellata*, *Prostanthera incisa*, *P. rotundifolia*, *Stypandra glauca*, *Lhotzkya genetylloides*, etc. Miss Halley exhibited wild flowers as table decorations. Master L Inglis had some 25 species from Seymour, including *Templetonia Muelleri*, *Prasophyllum patens*. Mr. W. E. Matthews showed

about 25 species from Maldon. Mr. J. N. M'Kibbon had 18 orchids grown and flowered in pots by himself, among which were *Caladenia latifolia*, *Glossodia major*, *Corysanthes pruinosa*, etc. Mr. F. Pitcher showed 10 species of orchids (freshly mounted) from Mordialloc Mr. G. Sweet exhibited several orchids collected at Cheltenham excursion, among which was a white variety of *Caladenia deformis*. Messrs J. Smith and H. T. Tisdall, F.L.S., showed about 80 species, the result of three days collecting in the Gembrook Ranges, among which were *Bauera rubioides*, *Hakea rostrata*, *Zieria Smithii*, *Pelargonium Rodneyanum*, etc. Mr. C. A. Topp, M.A., had about 80 species from Doncaster, Diamond Creek, etc., including *Tecoma Australis*, *Grevillea rosmarinifolia*, etc. Master Yelland had several species, collected in Studley Park.

Of course there were many duplicates of the various species, and it is almost impossible to enumerate all the species shown; still, the following list, arranged according to Baron von Mueller's "Key to the Victorian Plants," will give some idea of the principal flowers exhibited:—

Natural Order.	Genus and Species.
Ranunculaceæ ..	Clematis aristata; C. microphylla (in fruit).
	Ranunculus lappaceus; R. rivularis.
Dilleniaceæ ..	Hibbertia densiflora; H. stricta; H. fasciculata; H. diffusa.
Lauraceæ ..	Cassytha glabella (in fruit).
Violaceæ ..	Viola betonicifolia; V. hederacea.
	Hymenanthera Banksii.
Pittosporeæ ..	Pittosporum undulatum; P. bicolor.
	Marianthus procumbens.
	Billardiera scandens.
Droseraceæ ..	Drosera Whittakeri; D. Menziesii.
Polygaleæ ..	Comesperma volubile; C. ericinum.
Tremandreæ ..	Tetratheca ciliata.
Rutaceæ ..	Zieria Smithii.
	Boronia pilosa.
	Eriostemon obovalis; E. myoporoides; E. squameus.
	Correa speciosa, and variety.
Lineæ ..	Linum marginale.
Geraniaceæ ..	Pelargonium Rodneyanum.
Malvaceæ ..	Lavatera plebeja.
Sterculiaceæ ..	Lasiopetalum Baueri.
Euphorbiaceæ ..	Poranthera microphylla.
	Ricinocarpus pinifolius.
	Amperea spartioides.
Casuarineæ ..	Casuarina distyla.
Stackhousiaceæ ..	Stackhousia linarifolia.
Caryophylleæ ..	Stellaria pungens.
Amarantaceæ ..	Ptilotus spathulatus.
Polygonaceæ ..	Muehlenbeckia Cunninghamii.
Leguminosæ ..	Sphaerolobium vimineum.
	Daviesia latifolia; D. corymbosa; D. ulicina.
	Aotus villosa.

Natural Order.	Genus and Species.
Leguminosæ ..	Pultenæa Gunnii; P. scabra; P. subumbellata; P. largiflorens; P. villosa; P. tenuifolia; P. obcordata.
	Dillwynia ericifolia, and var.; D. floribunda; D. cinerasceus.
	Platylobium formosum; P. obtusangulum.
	Bossiæa cinerea; B. prostrata.
	Templetonia Muelleri.
	Hovea heterophylla; H. longifolia.
	Goodia lotifolia; G. medicaginea.
	Indigofera australis.
	Swainsonia phacoides; S. plagiotropis; S. procumbens.
	Glycine clandestina.
	Kennedya prostrata; K. monophylla.
	Cassia eremophila.
	Acacia juniperina.
Rosaceæ ..	Acæna ovina.
Saxifrageæ ..	Bauera rubioides.
Myrtaceæ ..	Calycothrix tetragona.
	Lhotzkya genetylloides.
	Leptospermum lævigatum; L. scoparium; L. myrsinoides.
	Melaleuca ericifolia.
Rhamnaceæ ..	Cryptandra Hookeri.
Santalaceæ ..	Exocarpos stricta.
Proteaceæ ..	Isopogon cerataphyllus.
	Grevillea aquifolium; G. ilicifolia; G. alpina; G. rosmarinifolia; G. oleoides (var.); G. confertifolia.
	Hakea eriantha; H. rostrata; H. nodosa; H. ulicina; H. saligna.
	Banksia collina; B. marginata.
Thymeleæ ..	Pimelea ligustrina; P. humilis; P. axiflora; P. curviflora; P. octophylla; P. phylicoides.
Rubiaceæ ..	Asperula oligantha.
	Galium Australe.
Compositæ ..	Brachycome diversifolia; B. cardiocarpa; B. multifida.
	Calotis erinacea.
	Aster stellulatus.
	Podolepis acuminata.
	Leptorrhynchos squamatus.
	Helipterum Cotula; H. corymbiflorum.
	Helichrysum incanum; H. apiculatum; H. ferrugineum H. scorpioides.
	Rutidosis Pumilo.
	Millotia tenuifolia.
	Craspedia Richea; C. globosa.
	Microseris Forsteri.
Campanulaceæ ..	Wahlenbergia gracilis.
Candollaceæ ..	Candollea serrulata.
	Leewenhoekia dubia.
Goodeniaceæ ..	Goodenia ovata; G. geniculata; G. pinnatifida.
	Velleya paradoxa.
Gentianeæ ..	Erythræa Australis.
Solanacea ..	Nicotiana suaveolens.
Scrophularineæ ..	Euphrasia Brownii.
Lentibularineæ ..	Utricularia dichotoma.
	Polypompholyx tenella.
Bignoniaceæ ..	Tecoma Australis.

Natural Order.	Genus and Species.
Asperifoliæ ..	Cynoglossum suaveolens.
Labiatæ ..	Prostanthera incisa; P. rotundifolia.
	Westringia rosmariniformis.
	Ajuga Australis.
Myoporineæ ..	Myoporum Dampieri; M. viscosum.
Epacridæ ..	Styphelia ericoides; S. Richei; S. virgata.
	Epacris impressa; E. obtusifolia.
	Sprengelia incarnata.
Orchideæ ..	Thelymitra antennifera; T. longifolia.
	Diuris maculata; D. pedunculata; D. longifolia.
	Prasophyllum elatum; P. fuscum; P. patens.
	Microtis atrata.
	Corysanthes pruinosa.
	Pterostylis concinna; P. curta; P. nutans; P. pedunculata; P. nana; P. mutica; P. longifolia.
	Cyrtostylis reniformis.
	Lyperanthus nigricans.
	Caladenia Menziesii; C. Patersoni; C. latifolia; C. suaveolens; C. carnea; C. deformis, and white variety.
	Glossodia major, and white variety.
Amaryllideæ ..	Hypoxis glabella.
Liliaceæ ..	Dianella revoluta.
	Wurmbea diocea and variety.
	Burchardia umbellata.
	Bulbine bulbosa.
	Thysanotus Patersoni.
	Chamæscilla corymbosa.
	Stypandra glauca.
	Arthropodium paniculatum; A. laxum; A. strictum.
	Xerotes longifolia; X. Thunbergii.
Fluviales ..	Potamogeton sp.
Restiaceæ ..	Calostrophus fastigiatus.
Cyperaceæ ..	Cladium sp.
	Schænus apogon.
Gramineæ ..	Anthistiria ciliata.
	Bromus arenarius.
	Stipa teretifolia.
	Poa cæspitosa.
Lycopodineæ ..	Phylloglossum Drummondi.

PLANTS OF NEW SOUTH WALES HAVING MEDICINAL PROPERTIES.

Rev. W. Wools, Ph.D., F.L.S.

(Read before the Field Naturalists' Club of Victoria, 11th July, 1887.)

Though New South Wales possesses many valuable remedies from the vegetable kingdom for diseases common in this part of the world, yet the medical botany of the colony is only in its infancy, and little has been done in a scientific way to make known the uses of plants supposed to be efficacious. Few

medical men like to deviate from the remedies indicated in the "Pharmacopœia," and to extemporise such as have not received approval from the faculty. Three medical men, however, with whom I had the happiness to be acquainted—Dr. Campbell, formerly of the Asylum at Gladesville; Dr. Pringle, an eminent physician who practised in Parramatta; and Dr. Stacey, at one time surgeon to the Agricultural Company at Port Stephens—were accustomed sometimes to deviate from the beaten track, and to suggest from native plants simple remedies for diseases. I recollect that Dr. Campbell sent me, many years ago, specimens of *Erythræa australis* (R. Br.) for identification, and he told me that he had learned from some country people that a decoction of it was highly useful in certain stages of dysentery. It was his practice to collect it in the summer, and to keep little bundles ready for use. Our eucalypts, it is well known, have many virtues, and no doubt the species generally possess, in a greater or less degree, the properties attributed to *E. globulus* (Labill). The kino procured from *E. siderophloia* (Benth.) and other allied iron barks has long been known to practitioners, and the volatile oil of *E. piperita* (Sm.) had a reputation in the early days of the colony. The therapeutic properties of some eucalypts, and especially of *E. rostrata* (Schl.), were utilised by the blacks, in all probability, long before the white man appeared amongst them, and the leaves were applied with success to wounds and ulcers. *Smilax australis* (R. Br.), the native sarsaparilla, has been used by many as an alterative and tonic, and the late learned Dr. Greenup, of the Asylum, Parramatta, recommended a beverage made from it. Decoctions of *Mentha australis* (R. Br.), *M. satureoides* (R. Br.), *Gratiola peruviana* (Linn.), *Verbena officinalis* (Linn.), and the bark of *Doryphora sassafras* (Endl.) have all been used as tonics, and I have been assured that, in extreme cases of dysentery, when all ordinary remedies have failed, a decoction of wattle bark (*Acacia decurrens* and some allied species) has proved successful. Several species of the native *Rubus* (particularly *R. parviflorus* (Linn.), seem to differ from their European congeners in possessing astringent properties, and they have been used by country people in cases of diarrhœa. *Alstonia constricta* (F. v. M.), the bitter bark of the interior, is considered by the shepherds and others as a specific for low fever, and it is frequently employed where quinine cannot be procured. *Euphorbia Drummondii* (Boiss.), which is nearly allied to *E. chamæsyce* (Willd.), has the reputation of being poisonous to sheep, but Mr. Stanley, the Government veterinary surgeon, seems to doubt whether it is injurious. Perhaps the different stages of growth and all the surrounding circumstances have not been fully considered, as sheep-farmers regard it with suspicion; and it is known that, although sheep eat the European *E. helioscopia*

(Willd.), they are purged by it, and their flesh acquires a bad taste. Some of the smaller euphorbias are called "Wartworts," from their supposed use in destroying warts. *Myriogyne minuta* (Less.) in decoction has been found useful in cases of ophthalmia, or blight, but careful observation is required to ascertain the proper proportion in which it should be used, and also the best method of application. If the decoction is too strong it occasions much pain, and therefore care is necessary in the preparation of it. It is said that the poisonous tubers of *Colocsia macrorrhiza* (Schott) may be eaten with impunity after due preparation, and it is known that its acrid, milky juice gives instant relief from the pain caused by nettle trees (Bailey), *Duboisia myoporoides* (R. Br.), a tree nearly allied to the now celebrated "pitury," *D. Hopwoodii* (F. v. M.) has also stimulating powers. The late Miss Atkinson called my attention to this fact many years ago (see Cont. to Flora Aust. 1867, p. 206), and assured me that she had acquired her information from the blacks. As large quantities of the leaves of this tree have been transmitted to Europe for experiment, we may hope to hear more of its properties. Without pursuing this subject any further, I would express a hope that the remedies discovered by accident may be tested by persons duly qualified for such inquiries, and that the names of plants really sanatory may be added to the "Pharmacopœia." In remote places, where the ordinary medicines cannot be obtained, some of these simple remedies are very valuable; but, of course, much depends on the way in which they are prepared, and the proportions in which they are taken. Such information, given in terms suited to the capacities of people generally, is much needed, for it appears to be from the want of proper directions that the same plants differ so materially in their operation. In the species mentioned, those of foreign origin (such as *Datura stramonium*, *Ricinus communis*, *Anagallis arvensis*, *Malva rotundifolia*, *Phytolacca octandra*, *Anethum fœniculum*, *Anthemis nobilis*, *Cichorium intybus*, *Taraxacum dens-leonis*, *Marrubium vulgare*, etc.) are not included, as most of them have been tested in other countries, and their uses are pretty well known.

A RARE minute aquatic plant, *Wolffia Micheli* (Schleiden), has been found near Melbourne by Master G French for the first time in the southern part of the colony, its only Victorian *habitat* previously known being lagoons near Mount Elephant. It grows also here, as in Europe, amongst *Lemna minor*, but is a still smaller plant, without any root, but bulges downward, and its anthers are only one-celled. Baron von Mueller, who examined and determined it, attaches great importance to this find.

MOSSES OF VICTORIA, WITH BRIEF NOTES.

By D. Sullivan, F.L.S., Head Teacher State School, Moyston.

(Read before the Field Naturalists' Club of Victoria, 8th August, 1887.)

"At this moment, painful as my reflections were, the extraordinary beauty of a small moss irresistibly caught my eye, and, though the whole plant was not larger than the tip of one of my fingers, I could not contemplate the delicate conformation of the roots, leaves, etc., without admiration. Can that Being, I thought, who planted, watered, and brought to perfection in this obscure part of the world a thing of so small importance, look with unconcern upon the situation and sufferings of creatures formed after His own image? Surely not. Reflections such as these would not allow me to despair. I started up, and, disregarding both hunger and fatigue, travelled forward, assured that relief was at hand, and I was not disappointed."—Mungo Park.

In bringing forward a series of papers on the mosses of Victoria my object is twofold—to endeavour to create an interest in a comparatively neglected though charming class of plants, and to do something—no matter how imperfectly—to forward the interests of the Club of which I have been for some time a useless member.

Mosses appear at first sight, after a few of the leading forms have been selected, to bear a strong family resemblance. But this is more apparent than real, for when examined under the microscope they present variations as appreciable as those characterising the higher forms of phoenogamous plants; while, at the same time, it must be confessed that many of the species, especially of the genera Bryum, Tortula, Bartramia, Dicranum, Grimmia, and Hypnum might advantageously be amalgamated, and the nomenclature might also be much improved. A boy, for instance, brings me a moss which, taken as a whole—roots, stem, fruit, and all—measures about one inch, and I inform him that the botanical name is *Raphidorrhynchum Schwaegrichenianum*. He naturally adds (in an undertone, of course) "etcetera," and resolves to have nothing more to do with such barbarous names. On this account I have taken the very unusual course of explaining the technical terms used in my papers. At the present stage of discovery it would be premature to give even an approximate estimate of the number of species in our colony. My own efforts have been confined to the Grampians, Pyrenees, Gippsland, and the North-Eastern Districts, from which I have gathered above 200 species, 30 of which have proved new to science.

To Baron von Mueller and Dr. C. Mueller I most gratefully acknowledge my indebtedness for the names of a large number of the species.

NATURAL ORDER—Musci. Dillenius, Hedwig.

TRIBES—Bryaceae, Andraeaceae, Sphagna.

TRIBE I.—Bryaceae.

Mosses properly so called, with an operculum separating or persistent, mouth of the sporangium with or without an annulus or ring, naked, or with a simple or double peristome. SUB-TRIBE—Polytricheae. GENUS—Polytrichum. Dillenius. Polytrichum commune. Linné. (British "Hair-Moss."):

Stem long, 3-6 inches, somewhat woody, of uniform thickness.

Leaves rigid, spreading, recurved, linear-lanceolate, serrate, dark-green.

Capsule quadrangular, with a conspicuous apophysis.

Calyptra dimidiate, early deciduous.

Peristome of 64 teeth, covered by a membranous, flat *epiphragm*.

Columella winged.

Australian Alps—F. v. M., Stirling and Sullivan. Tasmania—Gunn, Archer, Bastow.

Polytrichum juniperinum. Hedwig.

Stem stout, erect, short, woody.

Leaves inflexed, lanceolate, entire, decurrent, spreading, dark-green.

Perichaetial leaves erect, appressed, ending in a bristle.

Seta robust, crimson, shining.

Capsule quadrangular, prominently *apophysate*.

Beak of operculum short, bent.

Common on light, gravelly soils, especially about the roots of trees. Ascends to the summits of our highest mountains.

Polytrichum Sullivani. C. Mueller.

Stem 4-5 inches, erect or ascendant.

Leaves spreading, decurrent, serrate.

Perichaetial leaves scarcely differing from the stem leaves.

Calyptra slightly torn at the base.

Apophysis inconspicuous.

Beak of operculum longer than in the preceding species.

Gullies and crevices of rocks of the Grampians and Pyrenees. —Sullivan.

(Read 10th October, 1887.)

GENUS—Atrichum. Beauvois.

Atrichum (Catherinea) Muelleri. C. Mueller and Hampe.

Syn.—*Atrichum ligulatum.* Mitten.

Atrichum angustatum. Bryol.
Polytrichum angustatum. Hooker.

Stem slender, short, almost erect.

Stem leaves lax, spreading, somewhat clasping at the base; *decurrent*, lanceolate, serrate, wavy at the margins, with a narrow, strong nerve.

Perichaetial leaves differing very little from the stem leaves.

Setæ several, or single, on a branched stem; 1½ to 2 inches; reddish brown.

Capsule cylindrical, long, sub-erect.

Calyptra covered with spiny teeth near summit (a good specific distinction).

Habitat—Gippsland, Apollo Bay, Dandenong, Tarwin River, Australian Alps, Grampians.

GENUS—Dawsonia. R. Brown.

Dawsonia superba. Greville.

Stem long, 6-12 inches, woody.

Stem leaves spreading, clasping at the base; linear lanceolate, 4-12 lines long, coarsely serrate.

Perichaetial leaves spreading, much smaller than the *stem leaves*.

Seta short, robust, with a few short, scattered, very minute, scale-like leaves above the perichaetial leaves.

Capsule erect or nodding.

Calyptra small, hairy.

Peristome consisting of numerous, hair-like teeth resembling a miniature brush.

If any advantage is to be derived from the application of English names these mosses may be appropriately described as "Brush Mosses."

Two other genera of the sub-tribe *Polytricheae* are represented in Victoria, but, so far, the species are monotypical.

Pogonatum Austro-alpinum (Cobberas) and Polytrichadelphus Arnoldi (Upper Yarra). Both discovered by Baron von Mueller.

Explanation of Technical Terms.

Polytrichum.—Many hairs. Alludes to the Calyptra.

Theca, Urn, Capsule, Sporangium.—The spore-case, Sporangium, has a restricted meaning, being applied more correctly to the inner lining of the walls of the urn, covering the columella.

Apophysis.—A swelling at the base of the urn.

Epiphragm.—A membranous plate covering the peristome of Polytrichous mosses.

Columella.—A *little column.* The firm centre from which the spore separates.

Calyptra.—The membranous veil or hood covering the capsule while in a young state. It is regarded as a convolute leaf ruptured and carried up by the stalk.

Operculum.—The lid of the capsule. In most mosses it falls off when ripe, leaving the peristome exposed, but in others, which are indehiscent, it never falls off.

Peristome, Peristomium.—The fringe of teeth or hairs which surrounds the mouth of the capsule.

Dimidiate.—Split half way up. Refers to the *Calyptra.*

Perichaetial leaves.—A collection of minute, often membranous, leaves growing round the base of the seta.

Hints to Collectors.

Where to Look for Them.—On and in the crevices of rocks, on logs, about the bases and roots of trees, on banks of watercourses, lakes, lagoons, and waterholes, on the ground, from the low lands to the summits of our highest mountains—both in wet and dry localities, but more especially the former. New species are more likely to be discovered on the low lands than on the high mountains. If you were to ask any gentleman in Melbourne the best locality for mosses he would probably tell you that Gippsland was by far the best place, but this is certainly a mistaken idea. In Gippsland, and in heavily-timbered districts generally, the species are few, but very widely diffused. One gentleman from England lately visiting the colonies has asserted that in the course of one trip through that region he saw no less than 200 species. I have had five trips through Gippsland, making each time a diligent search, and have only succeeded in gathering thirty species, three only of which turned out to be new; while one trip to the Grampians increased my collection by thirty, and

I had the satisfaction of finding that ten of them were new to science. I would recommend Melbourne collectors to search well about the Yarra, Dandenong, You Yangs, Mount Macedon, Riddle's Creek, Lancefield (Deep Creek), Sunbury, Gisborne, etc. September, October, and November are the best months for the dry localities, and December, January, and February for the higher mountains and moist forest country. Mosses may be found in certain localities throughout the year, but in winter, except in rare cases, they are not in a fit state for detailed examination, having lost both the calyptras and operculums parts, which are sometimes of great value in deciding specific distinctions.

How to Collect Them.—A moss, when complete, has roots, stem, leaves, a seta or fruit stalk, sporangium or capsule, operculum, and calyptra. Carry a knife or chisel, and dig them up by the roots. Secure, if possible, specimens in all stages of development. The inflorescence of mosses is polygamous, monœcious, or dicœcious. In such cases specimens of both male and female must, if possible, be secured. The females bear the urns. Have a magnifying glass and plenty of paper. Separate the species on the spot if you can. Some mount the specimens on cardboard; others keep them in nicely-folded papers of a uniform size. I prefer the latter plan. When you wish to examine dried specimens place them in tepid water for two or three minutes, then dry between two sheets of blotting paper. By this means the leaves will expand, and the plant will assume its natural shape as when growing.

DESCRIPTION OF AN HITHERTO UNRECORDED RHODODENDRON FROM NEW GUINEA;

By Baron von Mueller, K.C.M.G., M. & Ph.D., F.R.S. etc.

Rhododendron Carringtoniae.

Tall; leaves moderately large, very firm, almost sessile, mostly in whorls of few, usually obovate, slightly recurved at the margin, dotted particularly on the under-page with minute scalelets, otherwise glabrous; their carinular venule very prominent, the secondary venules somewhat costular and anastomosing with the likewise elevated tertiary venules; flowers few together terminally on short stalklets; bracts clasping, roundish, glabrous, dorsally somewhat beset with minute scalelets, very much shorter than the inflorescence; calyx reduced to an oblique very narrow almost entire membrane; corolla comparatively long, white, outside dotted with scattered scalelets, otherwise glabrous, inside towards the middle and base

copiously beset with short hairlets; its tube very slender, almost cylindrical, somewhat curved ; its lobes five, from obovate to orbicular and slightly cuneate, several times shorter than the tube ; stamens ten, partly attaining the length of the corolla ; filaments much beset with minute hairlets ; anthers linear-cylindrical, slightly clavate, minutely bidenticulated ; style long, towards the middle and base as well as the whole ovulary invested with somewhat spreading hairlets ; stigma short-and blunt-lobed, surrounded by a narrow cover ; disk densely ciliolated around the summit ; fruit rather long, much attenuated into the base, narrowly ellipsoid-cylindrical, but pointed, bluntly five-angular, clothed with copious scalelets and also short hairlets ; appendages at the extremities of the seeds very narrow.

On almost inaccessible declivities of Mount Obree, at elevations from about 6000 to 7000 feet ; Cuthbertson and Sayer.

Height of the plant to about 10 feet. Leaves attaining a length of 3 inches, but often shorter. Tube of the corolla to $2\frac{1}{2}$ inches long, but only about $\frac{1}{3}$ inch broad ; lobes measuring $\frac{1}{3}$—$\frac{1}{2}$ inch in length. Style gaining fully 2 inches in length. Fruit about $1\frac{1}{2}$ inches long, slender.

This quite recently discovered member of a noble genus of plants is dedicated to Lady Carrington in also phytographic appreciation of the interest, evinced by her Ladyship in the floriculture of the colony, over which the Right Honourable Lord Carrington at present exercises vice-regal administration.

Among Papuan species this new one differs from R. Arfakianum in leaves less attenuated towards the base, shorter petioles, flowers fewer together on very short pedicels, calyces not denticulated, corolla of greater length and white colour, proportionately much shorter corolla-lobes, narrower anthers and not almost glabrous style. From R. Hatamense, it is easily distinguished by the much more prominent venulation of the leaves, the whiteness of the corolla, longer corolla-tube, cylindric anthers and not glabrous disk.

Among other congeners the species now recorded approaches as regards the proportionately great length of the corolla-tube to R. longiflorum, which species however has a red corolla, anthers of different shape and a much shorter style. Mr. Sayer brought from Mount Obree another Rhododendron, occurring at an elevation of about 7000 feet ; this plant resembles in disposition as well as form and texture of its leaves the species just described ; but its calyx produces two denticles, the corolla is red and has a much shorter tube, the anthers are broader and of less length, the ovulary is not attenuated towards the base, beset with scalelets only and as well as the style

much shorter, while the disk is glabrous; this Rhododendron is closely allied to R. Lochae, from which it is mainly separated (unless also by its as yet unknown fruits) by shorter petioles, leaves blunt at the base, shorter and proportionately broader bracts, only slightly dotted and somewhat smaller corolla, the lobes of the latter particularly being of less size; from R. Malayanum it is chiefly distinguished by leaves blunt at both ends with more prominent and closer venules, somewhat larger flowers on longer pedicels with a more lobed calyx.

CORRESPONDENTS WANTED.

Ants.—Mr. Kearsey Milford, Rockhampton, Queensland, would be glad to correspond with Victorian collectors of ants, and exchange specimens.

Diptera.—Mr. F. A. A. Skase, the Linnean Hall, Elizabeth Bay, Sydney, is working up the Diptera (two-winged flies) of Australia, and would be glad of assistance with specimens, especially of the *Nemocera*.

On Thursday, the 6th ult., I observed some ants acting in a strange manner—doubling up and tumbling over, as if intoxicated. Upon examination, I found that two of a smaller species (about one-third of their size) had fastened by means of their mandibles on the legs of one, others were attacked by three, and even more, of their small enemies, but in no case was there more than one on any one leg. I found, also, one of the large ones alive, minus its legs and abdomen, which had the appearance of being cut off, presumably by the aggressors. The repeated attacks to which the larger ones were subject seemed to render them helpless, and though the smaller ones seemed in the first instance to prove themselves superior to the others, they did not escape scatheless, for I found numbers of them, which had attached themselves to the others, apparently lifeless. Evidently the larger ones had drawn this attack upon themselves by crossing the path of their small antagonists at this point, and these immediately adopted this method of driving the intruders from their path.—F. H Hennell, South Yarra.

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 14th November, 1887.

The president, Mr. A. H. S. Lucas, M.A., B.Sc., occupied the chair, and above fifty members and visitors were present.

Letters were read from Mr. Kearsey Milford, of Rockhampton, and Mr. F. A. Skuse, of Sydney, desiring to correspond, etc., with members on the subjects of ants and dipterous insects respectively.

The hon. librarian reported the receipt of the following donations to the library :—"Annual Report of Secretary for Mines, 1886 ;" "Mineral Statistics of Victoria, 1886 ;" and "Quarterly Mining Reports," June, 1887, from the Mining Department; "Proceedings of Royal Society of Victoria," Vol. XXIV., Part I., from the society ; "Journal of Royal Society of New South Wales," Vol. XXI., Part II., from the society ; "Journal of New York Microscopical Society," July, 1887, from the society ; "Journal of Pharmacy," October, 1887, from the society.

The hon. secretary read accounts by the leaders of the excursions held since the last meeting, from which are taken the following notes :—

Lilydale, 15th October.—The party for this excursion was very small. Lilydale was reached by the first train, and a start at once made for the ranges. Passing through the paddocks along the Olinda Creek quantities of the orchid, *Diuris longifolia*, were seen. Further on a fine patch of *Leptospermum lævigatum*, in flower, offered great temptations to the coleopterist, but beetles were very scarce, doubtless owing to recent cold weather. Up a steep spur of the range, the orchids *Caladenia carnea* and *C. Menziesii* were found in great abundance, also the little violet, *Viola hederacea*, and *Bossiæa prostrata*. On the top, tree-ferns, musk-trees, asters, etc., formed a dense vegetation, whilst the principal flowering shrubs were *Goodia lotifolia*, *Pimelia axiflora*,

Indigofera Australis. Among other flowers noted may be mentioned *Pultenæa villosa* and *Utricularia dichotoma.* A large number of lichens and fungi were also collected.

Brighton, 29th October.—Only six members met for this excursion, possibly owing to other attractions elsewhere. It was expected that entomology would be the leading feature of the outing, but the afternoon turned dull and cold, and few specimens were taken. Of those captured perhaps the best were the butterfly (*Pieris aganippe*) and some buprestid beetles. Besides these, some fine larvæ, a number of small moths, and a few other beetles were captured. In flowering plants the most worthy of notice was a pultenæa.

Bacchus Marsh, 1st November.—This was the first visit of the Club to this district, but it did not attract a large gathering. However, those who went spent a very interesting day. The plains on the southern side of the Werribee were first tried, where, among other flowers noted, may be mentioned *Swainsonia lessertifolia, Erodium cygnorum,* etc. The fields were almost blue from the number of flowers of *Wahlenbergia gracilis* (blue bell), though some pure white ones were also seen. Descending the steep hill side to the river, *Solanum aviculare, Mesembrianthemum Australe, Zygophyllum* sp., were collected. Proceeding along the river bank a high projecting bluff was reached, on which were found *Cassia eremophila* and *Aster pimeleoides* in flower, also *Callitris verrucosa,* the Murray pine—all three properly belonging to the North-western district of Victoria. *Myoporum deserti* was seen in fruit. Wading across the river, the party made their way across the hills to the Ballan road, obtaining nothing fresh on the way.

Trentham Falls, 9th November.—A larger number of members took part in this outing, and reached Trentham—some sixty-three miles from Melbourne by rail—about 10 a.m. A start was then made for the falls, situated on the Coliban River. Before reaching them, however, rain set in, and after spending some time sheltering behind trees, etc., near the falls, the party was obliged to return without being able to explore what promised to be a very interesting locality. The head teacher of the local State school, Mr. Caverner, M.A., kindly met the members at the train, and acted as guide, and afterwards helped to remove the disappointment of the members by his hospitality.

The following persons were duly elected members of the Club :—Mrs. T. Backhouse, Messrs. T. Backhouse, S. B. Backhouse, LL.B., H. Bullen, C. Chandler, C. Lane, F. Robertson, and C. Synot.

The president reported the progress in the matter of the proposed reservation of Wilson's Promontory as a National Park, and,

together with Mr. J. B. Gregory, LL.M., was authorised to wait upon the Zoological Society and endeavour to secure its co-operation. The hon. secretary acknowledged the receipt of various papers, reports, etc., from the Mining Department of New South Wales, referring to the National Park at Port Hacking, in that colony, which should be most useful to the sub-committee.

PAPERS READ.

1. The president read a paper by Miss J. A. Hood, entitled "A Few Specimens from the Darling Downs." This consisted of short notes about insects, etc., seen during a recent visit to that portion of Queensland.

2. By Mr. C. French, F.L.S., entitled "Notes of a Botanical Trip to the Wimmera." The writer gave an interesting account of a recent collecting trip in the district around Lake Albacutya, and for twenty-five miles in a north-westerly direction. During the outing he collected about 160 species of plants in flower, among them being *Eriostemon capitatus*, new to Victoria. He suggested that a number of the flowering shrubs were well worthy of cultivation in our gardens, and exhibited a large number of dried specimens in illustration of his remarks; also sketches showing the character of the country.

3. By Mr. J. Bracebridge Wilson, M.A., "Shells Dredged at Port Phillip Heads." This, being principally a list of names, was taken as read, and ordered to be printed.

Natural History Notes.—Mr. J. Bracebridge Wilson, M.A., forwarded a note on a new starfish obtained by him in Port Phillip.

Baron F. von Mueller, K.C.M.G., forwarded a copy of a letter from Sir R. Owen on the "Embryology of the Echidna."

The following were the principal exhibits of the evening:—By Mr. P. H. Anderson, specimens of the crustacean, *Apus productus* (?), from Gippsland. By Mr. F. G. A. Barnard, some large Victorian Orthoptera, families Mantidæ and Phasmidæ. By Mr. C. C. Brittlebank, orchids, including *Caleya major;* also drawing of insects and larvæ. By Mr. G. Coghill, orchid in bloom, *Pterostylis rufa*, grown by exhibitor; also *Pterostylis cucullata*, *Diuris punctata*, *D. maculata*, *Microtis porrifolia*, and *Calochilus Robertsoni*. By Mr. C. French, F.L.S., dried plants collected near Lake Albacutya, Wimmera District; also two indian-ink sketches by Miss M. Scott, of Lake Albacutya station, "My Camp Among the Sand-hills," and "Pijick, near Albacutya." By Master G. French, the rare minute water-plant, *Wolffia Michelii*, from South Brighton. By Mr. R. Hall, various specimens from Cheltenham. By Mr. E. H. Hennell, granite from Whittlesea,

porphyry from Healesville. By Master H. Hill, Victorian lepidoptera. By Master G. Hill, coleoptera, also starfish, sea-urchins, etc., from St. Kilda Beach. Mr. J. E. Prince, fossil fruits from the mesozoic coal measures, Ipswich, Queensland. By Mr. J. Searle, coleoptera, lepidoptera, and diptera taken during Bacchus Marsh excursion. By Mr. H. L. Thompson, shells of *Segmentina Australiensis* from Studley Park, *Blanfordia striatula* from Albert Park, and *Bulinus productus*, *Amphipeplæa papyracea*, and *Limnæa Lessoni* from South Yarra.* By Mr. C. Yelland, a wasp's nest from Bright.

After the usual *conversazione*, the meeting terminated.

LIST OF GASTROPODA, LAMELLIBRANCHIATA, AND BRACHIOPODA OBTAINED AT OR NEAR PORT PHILLIP HEADS.

By J. Bracebridge Wilson, F.L.S.

(Read before the Field Naturalists' Club of Victoria, 14th November, 1887.)

In laying before the Club the following list of Mollusca, I have to acknowledge, very gratefully, the kind assistance of Prof. Ralph Tate, of Adelaide University, in the identification of species:—

(The letter "l" in the margin indicates that the shell was found in a living state.)

CLASS—GASTROPODA.

Order—Pectinibranchiata.

Family—Buccinidæ.

Cominella lineolata.
l. C. lineolata v. lineolatæ.
Phos senticosus.
l. Siphonalia maxima.

Calyptræidæ.

Amalthea conica.
l. Crepidula immersa.
l. C. monoxyla.†
l. Hipponyx antiquatus.
H. foliaceus.
Mitrularia equestris.‡
l. Sigapatella calyptræformis.

Cerithiidæ.

l. Bittium granarium.
Lampania australis.
Potamides dubium.

Conidæ.

l. Conus anemone.

Cancellariidæ.

Cancellaria undulata.
C. spirata.

Cypræidæ.

l. Cypræa angustata.
l. C. bicolor.
l. Trivia australis.

Columbellidæ.

Columbella Yorkensis.

Cassididæ.

Semicassis pyrum.
l. S. semi-granosa.

Fusidæ.

l. Fusus australis.
l. F. pyrulatus.

Littorinidæ.

l. Littorina undulata.
l. Risella nana.

Mitridæ.

l. Mitra rosettæ.

Marginellidæ.

Marginella turbinata.

* Determined by Prof. Ralph Tate, of Adelaide. † First occurrence recent in Australia.—R. T. ‡ Not hitherto recorded from Australian seas.—R. T.

May 2, 1918.

Muricidæ.
l. Murex triformis.
l. Purpura textilosa.
Nassidæ.
Nassa fasciata.
N. pauperata.
N. Thersites.
Naticidæ.
Natica ampla.
N. conica.
N. plumbea.
N. umbilicata.
Sigaretus lævigatus.
l. Lamellaria Wilsoni.*
Olividæ.
l. Ancillaria marginata.
Pleurotomidæ.
Mangelia Meredithæ.
Scalaridæ.
Scalaria australis.
S. Jukesi.
Terebridæ.
Terebra albida.
T. ustulata.
Tritonidæ.
l. Triton australis.
l. T. Quoyi.
l. T. Spengleri.
l. T. subdistortus.
T. Waterhousei.
Volutidæ.
Voluta papillosa.
l. V. undulata.
Lyria mitræ-formis.

ORDER—SCUTIBRANCHIATA.

Patellidæ.
Acmæa alticostata.
l. A. flammea.
l. Patella Gealii.
l. P. limbata.
P. radians.
l. P. tramoserica.
Trochidæ.
Clanculus Angeli.
l. C. undatus.
l. Diloma Adelaidæ.
l. Elenchus lineatus.
Euchelus baccatus.
Solariella vitiligna.
l. Trochocochlea constricta.
l. T. striolata.
l. Zizyphinus armillatus.
Fissurellidæ.
l. Emarginula candida.
Fissurella tasmanica.
Fissurellidæ.
F. scutella.
l. Scutus anatinus.
l. Tugalia parmophoidea.
Haliotidæ.
l. Haliotis carinata.
l. H. glabra.
l. H. rugoso-plicata.
Neritidæ.
l. Nerita punctata.
Phasianellidæ.
l. Phasianella bulimoides.
P. ventricosa.
Stomatellidæ.
Stomatella imbricata.
Turbinidæ.
l. Turbo squamiferus.
l. T. undulatus.

ORDER—TECTIBRANCHIATA.

Bullidæ.
l. Bulla australis.
Cylichnidæ.
Cylichna arachis.
Philinidæ.
l. Philine Angasi.

ORDER—BASOMMATOPHORA.

Amphibolidæ.
l. Ampullaria Quoyana.
Auriculidæ.
Marinula patula.
Siphonariidæ.
l. Siphonaria Diemenensis.
S., new species, not yet named.—R. T.

ORDER—POLYPLACOPHORA.

l. Ischnochiton longicymba.
l. Placiphora petholata.

CLASS—LAMELLIBRANCHIATA

SUB-CLASS—PELECYPODA.

ORDER—SIPHONIDA.

Family—Anatinidæ.
Anatina creccina.
l. Myochama anomioides.
Myodora ovata.
Astartidæ.
l. Cardita rosulenta.†
l. Mytilicardia crassicosta.
Cardiidæ.
l. Cardium cygnorum.
l. C. tenuicostatum.
l. Pectunculus flabellatus.
l. P. obliquus.

* Described and figured by Edgar A. Smith in A.N.A., V. series, vol. 18, pp. 270-1. First found by J. Bracebridge Wilson. † Described and figured as a new species by Prof. Tate in the "Transactions of the Royal Society of South Australia," October, 1886.

Chamidæ.
l. Chamostrea albida.
Crassatellidæ.
l. Crassatella Kingicola.
Mactridæ.
. Mactra ɹolita.
Pholadidæ.
Barnea australasiæ.
B. similis.
Myacidæ.
Panopæa australis.
Solenidæ.
l. Solen vaginoides.
Solemyidæ.
l. Solemya australis.
Petricolidæ.
l. Venerupis carditoides.
Tellinidæ.
l. Sanguinolaria vitrea.
l. Soletellina biradiata.
Tellina albinella.
T. decussata.
Veneridæ.
l. Chione gallinula.
C. lamellata.
l. C. strigosa.
l. C. undulosa.
l. Cytherea Diemenensis.
l. Tapes fabagella.
l. T. galactites.

ORDER—ASIPHONIDA.

Family—Aviculidæ.

l. Avicula Georgiana.
l. Vulsella ovata.
Arcidæ.
l. Barbatia laminata.
Arcidæ.
l. B. radula.
B. trapezium.
l. Limopsis Bassii.
l. L. rubricata.*
Limidæ.
l. Lima bullata.
Mytilidæ.
l. Modiola albicosta.
l. M. australis.
l. M. semivestita.
l. Modiolaria Cumingiana.
l. Mytilus Menkeanus.
Ostreidæ.
l. Ostrea Angasi.
O. auriculata.
Pinnidæ.
l. Pinna tasmanica.
Pectinidæ.
l. Pecten asperrimus.
l. P. fumatus.
l. P. Actinos.
l. P. undulatus.
Nuculidæ.
Leda crassa.
Spondylidæ.
Spondylus tenellus.
Trigoniadæ.
l. Trigonia margaritacea.

CLASS—BRACHIOPODA.

ORDER—ARTHROPOMATA.

Family—Terebratulidæ.

l. Megerlia Willemoesii.
l. Terebratulina cancellata.
l. Waldheimia flavescens.

A NEW VICTORIAN STARFISH.

THE following letter has been lately received by one of our members, Mr. J. Bracebridge Wilson, of Geelong, from Prof. F. Jeffrey Bell, of the British Museum of Natural History, and may be of interest to some of our readers:—

BRITISH MUSEUM (NATURAL HISTORY),
Cromwell-road, London, S.W.,
30th September, 1887.

Dear Sir,—Among the valuable specimens which you have been so kind as to send to the British Museum are two examples of a starfish—a true *Asterias*—with the suckers in apparent four, not two, rows, which has no spinous processes

* Described as a new species by Professor Tate in the S.A. Royal Society's Transactions, October, 1886.

on its ossicles, and has a very large development of the small membranous tubes (papulæ) in the spaces on its back. This interesting form—which is, I think, new, and which I propose to call *A. Wilsoni*—lives, I imagine, in places where the water is muddy or thick, or in some other way poor in oxygen, and I presume that the great development of the papulæ (which are of value as respiratory organs) is in correlation with the difficulty of getting oxygen. I should be greatly obliged to you if you could find time to examine into this matter and to put my theory to the test of fact.—Believe me, yours truly,

F. JEFFREY BELL.

J. Bracebridge Wilson, Esq.

MEMO. FROM MR. WILSON.

This starfish was dredged in about twenty feet water *on a rocky bottom*, but not far from the muddy deposit caused by the detritus of the Barwon River.

SIR RICHARD OWEN ON AN EMBRYO OF ORNITHORRHYNCHUS, IN A LETTER TO BARON VON MUELLER.

EAST-SHEEN, 27th September, 1887.

MY DEAR BARON,—I fear, you will think me both indifferent and ungrateful for your most friendly and acceptable transmission of the embryo-ornithorrhynchus,—the wished for since 1832,—and which on my eightieth birthday I concluded would enrich a successor in my line of research;—but I wished to accompany my thanks with evidence of having made use of my much longed-for rarity.

I could not make up my mind, to mutilate the unique specimen,—having confidence in ultimate reception—(life and dissecting ability being spared) of a duplicate-subject for the scalpel.

I trust you to be the expressor of my best thanks also to the Worthy and Reverend Pastor Hagenauer.

The conclusion, which his unique specimen has brought me—at the actual stage of evidence—is that, although skin-shelled eggs have been found in the nests of both Ornithorrhynchus and Echidna, some degree of fœtal development has taken place prior to exclusion, and that the Monotremes—like certain reptiles—are *ovo-viviparous*. To this I have become inclined through the opportunity, kindly offered in my eighty-third year.

Believe me, dear Baron, with every good wish, yours gratefully and most truly,

RICHARD OWEN.

In submitting the letter and printed remarks* from the illustrious Professor, Sir Richard Owen, who during more than half a century advanced our knowledge on the development of the Monotremata by his researches as the leading comparative anatomist of this age,—it may not be inappropriate to observe, that Baron von Mueller held also the view, that the small group of animals, above alluded to, must be regarded as ovo-viviparous, Dr. Nicholson having obtained a soft-shelled egg from an Ornithorrhynchus about 30 years ago near the Ovens-River. When the Reverend Pastor Hagenauer sent so kindly the minute young of an Ornithorrhynchus last year to our Patron, he took the occasion, to point out in one of our public journals, that the supposed nest of the Ornithorrhynchus should be regarded rather as a mere bed, that the softness of the integument of the ovum would not admit of a regular incubation-process, and that therefore the Monotremata could not be classed with the genuine oviparous animals, quite irrespective of the evidence afforded by the rudimentary mammæ and pouch both of Ornithorrhynchus and Trachyglossum. It is worthy of remark that Prof. Blumenbach, when defining in 1800 the genus Ornithorrhynchus was inclined to consider it a transit from Mammals to Reptiles, and that Prof. Shaw in 1799 regarded his genus Platypus as simply Mammalian. The latter name would take precedence, were it not for Herbst's genus Platypus among Coleoptera, established already in 1793. In the *Victorian Field Naturalist* a writer drew attention last year to a much overlooked note, occurring in B. Field's Geographic Memoires of New South Wales, published in 1825, to the effect, that "the Platypus lays eggs"—a fact doubtless then ascertained from aboriginal observations; but that seems the first record about the process of gestation of the Monotremata. As in New Guinea two species of Trachyglossum have been discovered, and other members of this curious tribe of animals may exist there and perhaps also on some of the adjacent islands, now the many zoologic collectors there should be urged, to watch for ova and fœtus of the Trachyglossum likewise. To the latter name preference has been given in recent zoology against Echidna, as the last mentioned appellation was preoccupied by Forster for an ichthyologic genus already in 1778,—Cuvier's monotrematous one being enunciated in 1797; the great French anatomist also considered it simply as one of Mammalia. Much caution is evidently necessary in applying the latest discoveries, regarding the subject, to discussions on the evolution-theory.

F. v. M.

* From the Proceedings of the Royal Society of London, last issued.

NOTE ON THE ARAUCARIA OF NEW GUINEA,

By Baron von Mueller.

Among the plants of striking interest, observed by Messrs. Cuthbertson and Sayer during their ascent of Mount Obree, one of the foremost is the coniferous tall tree, occupying rocky declivities at elevations from 6000 feet upwards. The careful examination of a fruit-bearing branchlet reveals the identity of this "Pine" with the Araucaria Cunninghami of tropical and sub-tropical eastern Australia, so well known here also as one of the noblest of our park- and garden-trees. Dr. Beccari, when ascending Mount Arfak in Dutch New Guinea, came across the same Araucaria, which he likewise pronounced (already in 1877) as not distinct from A. Cunninghami; but he noticed it at heights from about 3000 to 4000 feet, though the Italian explorer reached an altitude of fully 6000 feet. The occurrence of this Araucaria, on mountains so very widely apart in the great Papuan Island, seems to indicate, that much of the highland-country there is likely occupied by this Pine, which fact,—if it could be established,—would be of geologic significance and otherwise also be of physiographic importance. Prof. David Don, so long ago as 1838 (transact. Linn. Soc. of London xviii, 164) considered it not improbable, "that the interior of New Guinea might afford a species of Araucaria," an anticipation now so extensively realised. Mr. Sayer found the branchlets less vaguely spreading and more distichous, than in the ordinary state of this tree in Australia. The Araucaria Balansae from New Caledonia is closely akin to A. Cunninghami, as characterised in Australia and New Guinea; but the seed-bearing rhacheoles are more circular in outline, their terminal portion extending fully across to the lateral membranous expansions, and ending in a less recurved spinular appendage. Here it may aptly further be noted, that Araucaria Rulei became first described in Lindley's Gardeners' Chronicle, for 1861, when also of the typical form a xylographic illustration was furnished already. The staminate and pistillate rhacheoles of Coniferæ are in every respect comparable to those of Cycadeæ. Finally it may be mentioned, that the length of the spinular appendage of the seed-bearing rhacheoles in Araucaria Cunninghami is subject to considerable variation.

THE PROTECTION OF BIRDS.

By A. Coles.

(*Read before the Field Naturalists' Club of Victoria, Oct* 10, 1887.)

Knowing that the Government has recently been requested to place more birds on the Game Act, I think this an opportune time to bring the subject before the Club, hoping that

the discussion which may arise will cause some practical suggestions to be made.

I think all will agree that some of our birds need protection, particularly edible birds, such as turkey, swan, duck, plover, pigeons, quail, etc., otherwise they would be slaughtered all the year round for market, which would soon render them almost extinct.

But a difference of opinion exists in reference to bright-plumaged birds. I may say that I have thought a great deal on this subject of late years, and have come to the conclusion that these bright-plumaged birds are already protected by a law made by the great and wise Creator of all things. These birds are principally sought after by collectors and taxidermists, and to them they are utterly useless until they have reached their fourth year. I have brought specimens to illustrate my meaning. There is the male Rifle Bird, which is one of the most valuable in Australia. Now, during the first three years of its existence it is of a dull brown colour, exactly resembling the female. Consequently, no collector would care about taking it during that time. Then, again, the Regent Bird, Satin Bower Bird, Lyre Bird, King Parrot, Red Lory Parrot, and many others are quite valueless until they are old males. I have, after considerable trouble, procured and brought here to-night four male Regent Birds, ranging from one to four years of age, and from them you will easily see the different stages of the development of their plumage. Now, as these birds are rarely taken until their plumage reaches maturity, and as they commence to breed when twelve months old, you will readily see the protection I refer to. In proof of this, I may mention that 92 Rifle Birds were brought to Melbourne this season by one collector, and amongst them was only one young male. The same thing applies to all the birds I have mentioned, and most of them are here for your inspection.

Our insectivorous birds should certainly be accorded some measure of protection, as they do a very great service to our fruit-growers and farmers, and the only question appears to me to be—what is the best method to adopt? The greatest enemies to all birds are those who are reported to say, "It is a fine day; let us go out and kill something," and indiscriminate collectors of birds' eggs. It is a well-known fact that boys in the country are in the habit of taking every egg they can possibly find, stringing them into skeins, and hanging them about their homes, thus destroying hundreds of birds in order to decorate a room. I saw the result of one small boy's excursions the other day, and amongst them were no less than ninety-six magpies' eggs; and

yet this bird and its eggs are supposed to be protected. The best way to stop this sort of thing would be to bring the matter prominently before the children of the country State schools, showing them the injury they are doing to their parents, and eventually to themselves, by destroying the natural enemies of their insect pests.

Then, again, during holiday times numbers of young men go for what they call a day's sport, and recklessly shoot down every bird and animal they can come across, in many cases leaving them where they fall. This sort of thing should certainly be put a stop to, and perhaps someone here to-night can suggest the means of doing so. Our Game Act, as it at present exists, is almost useless, for we rarely hear of prosecutions under it, although the birds that are on the list are shot very frequently. One reason for this is want of knowledge on natural history on the part of the policemen. I think I am right in stating that very few guardians of the peace know the difference between a Tawny-shouldered Podargus and a Field Grallina, or a Great Brown Kingfisher and a Southern Stone Plover; and yet these are all protected. I have actually seen birds that are protected all the year round hanging exposed for sale in a poulterer's shop in Melbourne. The only plan I can suggest to alter this is to have drawings of the birds posted up at every police station, which would soon render the men familiar with them; or, perhaps, a still better method would be to have specimens of the protected birds stuffed, in place of drawings, which would be still more instructive.

In conclusion, I would draw your attention to one more cause of the increasing scarcity of our birds—that is, the drainage of the swamps and the destruction of the forests. I was recently informed by a gentleman who resides at Cressy, near Lake Corangamite, that adjoining the Strathvean station there were a number of swamps in possession of some selectors. About three or four years ago they were purchased by a squatter, who drained them, and the consequence is that a district that once abounded with birds is now completely deserted by them. This is, of course, a natural result, for if the feeding grounds are destroyed the birds must seek fresh fields and pastures new.

Natural History Association of New South Wales.—This Association has sprung into being under the auspices of the Sydney School of Arts, and is being energetically taken up. Dr. George Bennett is the president, Dr. Ramsay the vice-president, and on the committee appear the well-known names of Messrs. John Brazier, E. Haviland, T. Whitelegge, and C. S. Wilkinson. Under such auspices the Association cannot fail to be a success.

VEGETABLE PATHOLOGY.

By Miss F. M. Campbell.

(Read before the Field Naturalists' Club of Victoria, 10th October, 1887.)

After quoting Berkeley and Balfour on the importance of the subject, the author proceeded to give, as more recent views, those of Mr. Worthington Smith, and alluded to the havoc wrought by fungi on starch-producing plants such as cereals and the potato. She suggested that, as bacteria, *e.g.*, typhoid germs, can be cultivated on potato slices, people cannot be too careful in their selection of vegetables, for plants gathered in a sickly state may be productive of very serious ailments if eaten. Instances were given of fatalities resulting from eating diseased vegetables. Some cattle diseases, such as stringhalt, are perhaps due to this cause.

The author stated that this damp season has been very favourable for these fungus growths. They can be seen in shop windows—in fact, everywhere. Some especially fine-looking seed potatoes seem well supplied with germs for next year, and our onion crops in some districts have suffered severely.

The author referred to the very rapid multiplication of these pests, much more rapid even than that of insects. Much mischief really due to attacks of fungi had been saddled upon insects or other agents. The insects, however, often puncture leaves, etc., and the entophytes make use of these apertures in order to obtain easy ingress to the inner tissues of the plant.

Forest trees suffer greatly through the growth of fungi. Everyone who has travelled through our forests by coach must have noticed how a skilful coach driver, on calm days, watched and listened for falling branches of trees. This is caused principally by a number of species of fungi lumped together as dry rot. In America an experienced woodman avoids felling a tree with what he calls spunk upon it *(Polyporus spumosus)*. This is also found in Victoria. Since the economic value of the timber is lessened by it, sawmill proprietors inquire constantly of those who ought to know how to avoid the great expense of felling and dragging to the sawmill large trees which, when cut up, yield a quantity of perfectly useless timber. The oak tree alone is infested with some 200 species of fungi. The dry rot causes the timber, if used, to very speedily decay, and life and property have repeatedly been sacrificed to this fungus, owing to the unsoundness it produces, especially in the timbers of sailing ships and in the supporting posts of mines.

As a set-off to their pernicious influences, the author adduced

the production of fermentation and of nitrification of decomposing animal matter as instances of the usefulness of the micro-fungi.

The author had for some years been engaged in making careful observations of Victorian fungi, and considered that enough attention has not been paid to the great economic importance of this group of our plants.

THE DARLING DOWNS.

By J. A. H.

I. A Few Spiders.—They swarm, they spin, they crawl everywhere Going over a nursery garden with the proprietor one day, every few steps he took he broke down a web and trod on a spider. "They must go!" he said. "They make such havoc of my Italian bees."

But in the house it is easier said than done. Here the worst intruder is a daddy-long-legs sort of creature which rocks itself to and fro in a mysterious fashion. I have seen the corners thoroughly cleared of cobwebs, but a few minutes after these skeleton spiders were observed calmly walking up the walls, and in an hour or two they had their establishments again in working order, to the dismay of mistress and maid.

My first introduction to spiders in the mass was when some small friends took me to certain grooved crevices in the mantelpieces of the house. We went armed with a pair of scissors, a crochet hook, and a cardboard box, and very soon had a beautiful collection. If only one could preserve the lovely colours; they are wonderfully beautiful. The large mason fly, whose property they were, came behind now and again with an angry buzz, but attempted no rescue.

Some were of the size and colour of a pea, pale green, but marked with white; others, of a delicate grey, had brilliant red facings. Some seemed made of granulated white enamel, others of intricate filigree. One little fellow was most quaint, his back sticking up like a tiny fool's cap made of silver; others again were black and venomous-looking. Then there were sober, little brown, or buff, or tiny white specimens, but it is impossible to describe them, and, though shut in an air-tight box with camphor, they failed to keep.

By and by I was presented with a large grey spider brooding over seventeen balls like moulded cherries, only rounder, strung, and woven together. This one I bottled in spirit, and declined to receive any more.

Toowoomba Gardens are bowered with creeping plants,

rustic bush houses, arches, etc., but I would advise anyone wishing to study astronomy to stand in an open space,

Queensland evenings are proverbially lovely, and sitting on the verandah much affected; but if you stoop unwarily forward to admire the stars, probably you will see, too late, something in the uncertain light like a black crab descending rapidly for the point of your nose; or you may *see* nothing, but hear someone exclaim, "*Oh! a great black spider* on the back of your neck."

The webs of some are very strong—so strong that we used them sometimes to tie up little bouquets of flowers.

The lace-work of others is here, as elsewhere, exquisite. After a wet night I carried away a web on my hat, studded with jewels; and there was such an adhesiveness in it that it lasted while carried about, and stood a good shaking before it lost its beauty.

In our walks we found in the grass and bushes different styles again both of web and spider, and the latter frequently coloured exactly like the flower or leaf it frequented. One very handsome fellow had knobs of polished white on a silver-grey body. I did not see the black spider with red spots so much dreaded in Western Queensland.

II.—Butterflies are very numerous and beautiful near Toowoomba, and netting them a favourite sport. One at first is charmed with the large black and grey varieties, with vermillion and cobalt blue markings. They are, however, so common that after a while the eye hardly rests upon them. There are some brilliant emerald green, rare, I think, though plentiful near Sydney. Little pointed-winged varieties, with a mother-of-pearl sheen, I thought little gems of beauty. But it is impossible to describe butterflies; they must be seen. The moths, too, are of very varied and delicate tints.

Butterflies may be preserved in the simplest fashion, thus:—As it is removed from the net the wings are gently folded up, and the head pressed firmly with the fingers for a minute or so till the insect is dead. It is then laid in a box, the wings carefully spread out and held by scraps of cardboard, with camphor for weights. After a day in the box, or even less, they are *set*, and can be put into a larger box, or arranged in any way preferred. Pins are a mistake if the specimens are to be carried, and so is cotton wool. Tissue paper is, I think, the best packing.

III.—Besides the real, undoubted "centipede," loathsome as ever, the Darling Downs has a spurious sort, said to be harmless. It is glossy, brownish in colour, with a grey sheen on the surface.

On being touched, it folds in its legs, and coils into a ring. On wet days it frequents the passages and bedrooms in a most uncalled-for manner. I was horrified one time by a little chap of three years old coming to me with a "See what I've got for zoo!" His face was beaming with delight, and his two little grubby hands held out, and full of glossy rings, of what I, in my ignorance, took for centipedes. Poor little fellow! He was much disappointed that his efforts in the pursuit of natural history were so little appreciated, and he looked down with a sad and wondering face at the wet mark—all that remains of these creatures after a squeeze with the foot. Herein is an essential difference from the real centipede, which is particularly hard to dispose of.

IV.—Another creature the Northern children delight in is the big green frog, and I have heard little mites of three or four imitate its cry to perfection. Whenever its churk! churk! is heard there is a rush for the spot. Of course a good deal of the pleasure is in putting the slimy gentleman in the bedroom of some one who does not share the children's affection for him. He *is not* a nice companion at night. Even if so obliging as to settle himself on the edge of the water jug, one has an uneasy impression that he may not stay there.

CORRESPONDENCE.

To the Editor of the Victorian Naturalist.

Sir,—I am surprised to learn from the last number of the *Naturalist* that the occurrence of *Wolffia* near Melbourne is now for the first time noted. I used to obtain this plant abundantly about eight or nine years since in a small swamp in Studley Park, opposite Johnston-street. I have seen this swamp covered for half its area on the lee side with a continuous sheet of the *Wolffia*, no *Lemna* being present. For several years I had always more or less of the plants growing in aquaria, where they increased slowly by budding, but finally died off. Specimens were exhibited at meetings of the Microscopical Society, some of which were collected, I believe, by Dr. Ralph, but I am not aware whether these came from the same locality. The swamp to which I allude at that time usually contained a foot or two of water, which abounded in pure water organisms, such as *Volvox globator*, *Conochilus volvox*, etc.; but of late years I have found it either dried up or muddy, and the *Wolffia* seems to have disappeared.

I may mention that I have found a *Riccia* (either *R. natans* or a closely-allied species) growing plentifully, within the last two years at Kew, in a channel between the river and a swamp.

I am, sir, yours truly,

W. M. B.

ENGLISH NOTES.

The hon. secretary received a letter by the last mail from Mr. T. A. Forbes-Leith, formerly a vice-president of the Field Naturalists' Club. He mentions that a pair of Australian nankeen night-herons have been shot at Ashford, in Kent, and have puzzled scientists as to how they got to England, but he thinks they came on the wing, possibly spending six months in Africa *en route*. He noticed a snow-white goatsucker night-jar when in Sussex. Mushrooms have been very plentiful in Wales, and have been selling at 1d. per pound in the streets. He also saw a large number of fungi on Deeside, in the North of Scotland.

EXPEDITION TO KING ISLAND.

Some twenty-six members of the Field Naturalists' Club have made a rapid exploration and examination of King Island. The Government most considerately granted the use of the *Lady Loch* steamer to convey the party to and from the Island. Important scientific work has been done, and the next issue of the *Naturalist* will be devoted to a full account of the expedition and of its results.

CORRESPONDENTS WANTED.

Ants.—Mr. Kearsey Milford, Rockhampton, Queensland, would be glad to correspond with Victorian collectors of ants, and exchange specimens.

Diptera.—Mr. F. A. A. Skuse, the Linnean Hall, Elizabeth Bay, Sydney, is working up the Diptera (two-winged flies) of Australia, and would be glad of assistance with specimens, especially of the *Nemocera*.

Shells.—American land, fresh water, or marine shells, or others, exchanged for good specimens of *Purpura Baileyana* and *P. propinqua*. Other Victorian species also required. W. T. Bednall, Adelaide.

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THE

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OF THE

Field Naturalists' Club of Victoria.

The Author of each article is responsible for the facts and opinions he records.

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THE

Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

Expedition to King Island, November, 1887.

Official Report. By A. J. Campbell.

It is a matter for congratulation to all concerned that the expedition was a complete success. The following are the members who took immediate part, viz.:—Messrs. E. M. Cornwall, C. Chandler, C. Lane, Dr. Llewellin, Messrs. J. N. M'Kibbon, W. Hatton, A. Coles, G. A. Keartland, A. J. Campbell, T. G. Campbell, J. E. Dixon, Sub-Inspector Deasy, Professor Spencer, Messrs. D. Le Souëf, C. Frost, M. Sheppard, H. Hughes, E. Dombrain, L. Hart (represented by Mr. T. Wood), H. W. Hunt, Charles French, jun., F. N. Ingamells, G. Sweet, W. Chisholm, W. A. Sayer, A. Borthwick, jun. (represented by Mr. St. John); in all twenty-six, with Mons. Musika as cook.

On Wednesday, 2nd November, after a little delay, the Government steamer *Lady Loch*, with the expedition on board, departed from the Town Pier, Port Melbourne, at 9.25 p.m. Shortly after midnight the Heads were passed, and Cape Wickham—the most northerly point of King's Island—made about 9.30 in the morning. Passengers and luggage were all safely landed on the Yellow Rock beach, on the north-west corner of the island, by mid-day, by means of the steamer's boats, aided by another from the lighthouse, in charge of the superintendent.

The site chosen for the head-quarters' camp was a clean, well-grassed, mossy flat near the estuary of the Yellow Rock rivulet, in an amphitheatre of ancient sand dunes, clothed with thick scrub. Thus almost complete shelter was secured from prevailing winds and weather; while immediately in front was a horseshoe-shaped billabong of the rivulet, with slightly discoloured water, somewhat sweet, but thoroughly wholesome.

As the camp was some distance from the landing, it was no easy task removing the heavy packages thither, especially as a great majority of the passengers had suffered from the usual *mal de mer* of a rough passage across the straits, and were

weak in consequence. However, by nightfall the camp was pretty secure, and next day, with the assistance of an islander hunter and his two horses, everything was under canvas, the rain notwithstanding.

Saturday, 5th.—Settling down, and short excursions took place. More rain in the afternoon and evening; 89 points were registered at the lighthouse.

Monday, 7th.—The camp formed into sections. First.—One by Professor Spencer, Messrs. Chandler, Cornwall, A. J. Campbell, Frost, Le Souëf, Sayer, Chisholm, and Wood together, with Grave as guide, two horses as packs, and a pack of ten or twelve dogs to hunt wallaby for fresh victuals, left camp shortly after 7 a.m. Crossing the mouth of the Yellow Rock rivulet, the beach was followed. At about two miles turned inland, and coursed slowly in a north-easterly direction, over hummocks fairly grassed and patched with miserable scrubs. Passed several lagoons on the right, the largest rejoicing in the name of Bob's. At about six miles took an easterly course through what is locally known as the Reedy Flats—well named reedy, with seemingly no end of moisture and melaleuca swamps. During the morning snakes were "trumps," no less than eight being killed or captured. Mid-day halt and meal occurred in rain at about ten miles. It rained more or less during the remainder of the day. Course now more southerly. After wading knee-deep through Martha Lavinia Lagoon (the larger), and threading thicker scrubs, the east coast was struck between Boulder and Lavinia Points. Following the beach, and then journeying inland over low, bracken-covered hummocks in a south-westerly direction, at about twenty miles "Bertie" (a hunter's old camp) was made. The small hut, built of parts of many wrecks, held a portion of the party, while the tent was pitched to accommodate the balance. After supper all were rendered as comfortable as circumstances—the rain—would permit for the night.

By morning the rain had cleared. Messrs. Sayer and Chisholm elected to remain at "Bertie," while the remainder explored southward. A good, sandy beach, with low tide, was followed. At about ten miles forded the Sea Elephant River, and lunched; country improving, more forest-like here. At between thirteen and fourteen miles crossed Blow-hole Creek, erroneously indicated on the Admiralty charts as the Fraser River. At about sixteen miles made half a mile inland to another hunter's old camp ("Eldorado") on an ever-flowing creek, which was named Spencer, after Professor Spencer, who unconsciously made himself one of the most popular members of the expedition. With clearing weather, an enjoyable evening's camp was spent, excepting by those members who were violently disturbed by camping upon a bulldog ants' nest.

The Prince of Wales' Birthday was a delightful day. Messrs. Grave and Wood struck inland, and explored the blue-gum forest intermingled with splendid blackwood and sassafras trees, and took "photos" of same, and on return hunted wallaby-venison for supper. Campbell and Frost proceeded south, crossed the Fraser River, and entered a thick forest of bluegums, with ground scrubs of acacia, musk, hazel, etc., enclosing numerous fern gullies. Le Souëf and Spencer proceeded further south, and rounded Point Campbell (hitherto unnamed, but now dedicated to a member of the expedition). At about seven miles from "Eldorado" Camp further progress was rendered impossible by the vertical cliffs that rose from the sea to the heavy forest above. Cornwall and Chandler remained in camp skinning birds and fossicking the locality.

Thursday, 10th.—After a breakfast consisting of soup condensed from eighteen wallaby tails, the tent was struck, and steps retraced to "Bertie" Camp. So joined Messrs. Sayer and Chisholm.

Next day (11th) all returned to west coast. *En route* a fine sheet of water was passed locally and somewhat ambiguously known as the Big Lake. It was called Lake Dobson as a help to perpetuate the name of Dr. Dobson, who once filled the office of president of this club, and who did much to contribute to the success of its expedition to King Island.

Approached the west coast at the hunter's (Grave's) home, and after enjoying an early tea there the party severed. Mr. Chandler "made tracks" for the head-quarters' camp. Mr. Sayer remained at the home, while the rest proceeded to Cape Wickham lighthouse, where they were most hospitably entertained by Mr. R. W. Garraway (the superintendent) and his assistants.

It was a treat to feel once again the touch of civilisation. For one reason, the east coast provisions had given out sooner than was expected. The flour went first. A little bran was mixed, to stay its rapid progress. As the flour became thinner so the bran increased; finally, the last "mash" was all bran. Day's journey, about twenty miles.

Saturday, 12th.—Examined lighthouse and quarters; took photographs of same. After beating through the intervening country in couplets, all arrived safely in head-quarters' camp before sundown. Distance, ten miles. End of the east coast party, after an absence of six days.

(Second.)—Simultaneously on the 7th the west coast party started, consisting of Messrs. Keartland, M'Kibbon, Dixon, Dombrain, Hatton, and Hughes, with hunter Scott as guide, and one pack-horse. Course lay round the Yellow Rock beach, and over the Whistler Point hills, in a southerly direction. Crossed at their mouths Eel Creek and Pass River. At about

thirteen miles turned inland, and, continuing two miles, made Porky Lagoon, and camped. Next morning good work was performed in the neighbourhood of the lagoon. Eastwards is the remains of a singular ancient forest of eucalypts, indicated by blanched, naked tree-barrels. Fire may have been the destroying element; but other opinions exist that insect life or root decay, caused by the local shifting of earth, is at the bottom of the evil. The last theory appears the most feasible, because in a different part of the island was seen a portion of another dead forest standing in a permanent lagoon of about thirty acres of water; thus pointing to movement of land in some direction or other. 2 p.m.—Another start was made. Travelling south-westerly, at about five miles Currie Harbour was made, where the party was hospitably entertained by the superintendent, Mr. Buckpitt.

On the 9th some of the party proceeded further coastwise, and met with more or less success, and next day all this party returned towards head-quarters, breaking the journey for another night's camp at Porky Lagoon, reaching the main camp safely about 2 p.m. the fifth day out.

(Third).—It was necessary to have a home station, which consisted of Sub-inspector Deasy, Dr. Lewellin, Messrs. T. G. Campbell, Lane, Coles, Sheppard, Hunt, French, jun., Ingamells, and St. John, who performed fair work in the neighbourhood of Whistler Point and the inland lagoons, and by making occasional visits to Cape Wickham, where Mr. Sweet conducted dredging operations with little or no success, owing to the unfavourable nature of the ocean bed.

Monday, 14th.—A second party was formed to explore the western side of the island, this time consisting of Professor Spencer, Messrs. Chandler (who proceeded the morning before), Cornwall, A. J. Campbell, Frost, Le Souëf, Wood, French, jun., Sheppard, and Sweet, with Grave and four horses. The route taken was much the same as the previous party, with the exception that as Porky Lagoon had been previously explored it was not visited, and Currie Harbour Lighthouse made the same evening. Distance, about twenty-one miles.

Tuesday, 15th.—All left for southward except Mr. Cornwall, who remained at the harbour. At about seven miles came to the Ettrick River, and camped. Between the harbour and the river is the British Admiral beach, on whose rocky promontories and outlying reefs the noble ship bearing that name was totally wrecked in 1874. The neighbouring sand dunes have been turned into a cemetery in consequence. It might be noticed here that on going round Netherley Point, where a full-rigged ship of that name broke her back in 1866, that the chart showed it as Waterwitch Point, whereas that point is some miles further north, and shown as Netherley Point. The names

have evidently been placed *vice versa* in error. This can be attested to by persons who have worked at both wrecks.

Wednesday, 16th.—Professor Spencer and Mr. Frost pushed on to the Seal Rocks, at a distance of about ten miles (visited by Mr. Chandler the previous day). Rest of the party visited the Dripping Wells—shallow caves on the coast, of curious limestone formation, about a mile and a half below the camp (Ettrick River); and about two and a half miles further still is the cast-iron tablet erected to the memory of the 399 souls who perished on the 4th August, 1845, in the appalling wreck of the *Cataraque*. The tablet is fast corroding into decay. A coat of tar, if supplied yearly from the lighthouse, would have been its salvation. Of the superscription, all that now remains legible is the ship's name, the date of the sad occurrence, and at whose instance the tablet was erected. As the wreck is a matter of historical interest, it may be worth while quoting the original text, line for line, of the tablet, which was as follows :—

Memorial
of the
Total wreck of the emigrant ship,
Cataraque,
From Liverpool to Port Phillip, C. N. Finlay, Master,
on these reefs,
4th August, 1845.
Of four hundred and eight souls on board but nine survived,
The chief mate, Thomas Guthrey, seven sailors, and one emigrant,
Solomon Brown.
This memorial records and deplores the loss of
The master, C. N. Finlay,
Surgeon-Superintendent, C. Carpenter,
Assistant-surgeon, Edward Carpenter,
Twenty-seven officers and men of the ship's company,
Of sixty-two emigrant families, comprising 313 souls,
Of unmarried female emigrants, 33,
Of ,, male ,, 23.
In all 399 souls.
This tablet erected at the instance of the Local Government of Port Phillip,
June, 1846.

R. Langlands and Co.,
P. P. Foundry.

In the evening all had returned to the lighthouse quarters, and the morning following moved towards head-quarters, some going coastwise, others inland, *via* Porky Lagoon. In the Currie Harbour and Porky River districts there is some of the best country seen on the island. It would have well repaid a few days' additional exploring and collecting, had time permitted. Thus ended second west coast trip. Time occupied, four days. During that period the home party had again not been idle, having been to and around Cape Wickham to the eastward.

Friday and Saturday (18th and 19th) specimens were securely packed for exportation to Melbourne, and short excursions

undertaken to the adjacent scrubs. The evenings were occupied in fishing for scientific purposes and for food.

Sunday (20th) Captain Anderson, Mr. Borthwick, and Mr. Robertson (reporter) visited the camp, the *Lady Loch* having arrived off New Year Islands the evening before. As the weather was freshening, the captain deemed it advisable to take the expedition off at once, consequently the camp was struck, and in three hours everything was snug on board the steamer. She was then brought to an anchorage under the New Year Islands, which form a large crescent, extending out from Whistler Point. The remaining daylight was utilised by parties roaming over both islands, which are rarely trodden by human beings. They are iron-bound, so to speak, for the most part with granite boulders, and thickly clothed with tussocky grass, pig-face weed, and short, close salt and other bushes, in places so thick that one could walk on the tops of them without difficulty.

Punctually at 4 o'clock in the morning anchor was weighed. When abreast of the lighthouse the superintendent placed the expedition's dredges and some despatches on board, and a course was shaped for Apollo Bay, where the steamer, by appointment, had to pick up some Government officials. An exceedingly fine passage to Williamstown brought the expedition to a termination at 9 o'clock at night, after an absence of nineteen days.

Owing to a slight alteration in the original plans a little disappointment was felt at the steamer not touching at Sea Elephant Rock, an isolated islet on the east coast, where, no doubt, many interesting specimens and photographs would have been taken from the sea-fowl nurseries known to exist there; likewise samples from guano deposits. However, one and all enjoyed themselves thoroughly, and many valuable lessons have been learnt, which will be a guide to future expeditions. Such excursions should undoubtedly be annual, as they tend to do much good, and assist to keep the club alive.

All members who have assisted this expedition, it is hoped, will be amply satisfied with the work performed, as set forth on the subjoined appendices, especially when it is recollected how large the island is—about forty miles long by ten to thirteen broad—and the time occupied for actual work only fourteen days. The tracks of the party on land are estimated approximately at about 160 to 170 miles, and by no means easily travelling, for the greater part was either along heavy beaches, over rocky headlands, through thick, stubborn scrubs or boggy swamps. It may also be mentioned that rain fell to the amount of over 2in. during the first week.

This report cannot be closed without special mention being made of those who, outside of the club, have lent invaluable aid

to the expedition—viz :—The lighthouse-keepers, King Island (with the sanction of the Marine Board, Hobart); the Hon. the Commissioner of Trade and Customs, Melbourne; Captain Anderson, officers, and crew of s.s. *Lady Loch;* and the Defence Department for the loan of such serviceable tents.

PHOTOGRAPHS taken—total 34—viz.

Four Groups of Expedition.
Four Head-quarters' Camp Scenes.
Landed on Yellow Rock Beach.
Landing—Yellow Rock Beach.
Fording Mouth of Sea Elephant River.
Sea Elephant River Camp.
Starting Off—"Bertie Camp"—East Coast.
Wreck of *Abeona*, Sea Elephant Bay, Point Campbell in distance.
Mouth of Fraser River.
Eldorado Camp, on Spencer Creek.
Blow-hole Creek.
Martha Lavinia Lagoon (the lesser).
Lake Dobson.
Cape Wickham Lighthouse.
Cape Wickham Lighthouse and Quarters.
Hunter and his Load.
Hunter's Home.
Wreck of the *Ocean Bride*—New Year Islands in distance.
Wreck of the *Arrow*.
Currie Harbour.
Currie Harbour Lighthouse.
Currie Harbour Lighthouse and Quarters.
Headstone—British Admiral Beach.
Cataraque Tablet.
Fitzmaurice Bay, Cataraque Point in distance.
Dripping Wells.
Lady Loch off New Year Islands.
A Head-quarters' Tent.
In the Blackwood Forest—East Coast.

FAUNA OF KING ISLAND.

MAMMALIA.

RODENT—*Mus* sp., rat. Tasmanian form.
MARSUPIALS—
Halmaturus Billardieri, red-bellied or stump-tailed wallaby. T. and V.
Halmaturus Bennettii, Bennett's wallaby or brush kangaroo. T. and V., especially T.

T. Tasmania. V. Victoria.

MARSUPIALS—

Phalangista canina, short-eared "opossum." T. and V.

,, *viverrina*, ring-tailed "opossum." T. and V.

Dasyurus maculatus, tiger cat. T. and V.

MONOTREMES—

Ornithorhynchus paradoxus, platypus. T. and V.

Echidna setosa, brown "porcupine." T.

In the adjoining seas were noticed—

Euotaria cinerea, Australian sea-bear or fur-seal. Coasts of T. and V.

Delphinus Nova Zealandiæ, yellow-sided dolphin. Southern Ocean.

Both the Bennett's wallaby and the red-bellied wallaby were very numerous, the latter especially so It is nearly always to be found in any dense patch of scrub. The wallabies are the principal food on which the large number of dogs kept by the hunters subsist.

Both the short-eared and ring-tailed opossums are numerous, especially on the west coast. The latter seemed rather darker in colour than the Victorian variety.

It is a curious fact that the tiger cat is found on the island, while the native cat (*Dasyurus viverrinus*), apparently, is not.

Only one platypus was seen, and that one in the Etterick River. We were unable to secure it as a specimen. The brown *Echidna* was plentiful, and we captured several specimens. They seemed to be slightly more hairy than the Tasmanian ones, but otherwise were identical

We saw but one sea-bear, and that on Seal Rock, at the south end of the island, much to the consternation of one of our members. The yellow-sided dolphin was abundant, and was seen principally on the west coast, probably because that was more rocky. They often came very close to the shore. A rat indigenous to the island and Tasmania was very numerous, especially along the coast, where they could obtain most food. The hunters said that there was a species of kangaroo-rat on the island, and we often saw what we took to be their tracks on the sand, but none of the animals themselves were seen. Wild domestic cats and imported mice were very numerous.

BIRDS.

BY A. J. CAMPBELL.

Birds identified.—Scientific names adopted from "Systematic List of Tasmanian Birds," by Col. W. V. Legge, R.A., F.Z S., etc.

BIRDS ALREADY RECORDED AS TASMANIAN.

Circus approximans, Bonap. Allied Harrier. T. and V.

Astur novæ-hollandiæ, Gmelin. White Goshawk. T. and V.

T. Tasmania. V. Victoria.

Uroætus audax, Latham. Wedge-tailed Eagle. T. and V.
* † Haliætus leucogaster, Gmelin. White-bellied Sea-Eagle. T. and V.
* Hieracidea orientalis, Schlegel. Brown Hawk. T. and V.
† Ninox maculata, Vig. and Horsf. Spotted Owl. T. and V.
Plictolophus galeritus, Latham. White Cockatoo. T. and V.
Calyptorhynchus xanthonotus, Gld. Black Cockatoo. T.
† Callocephalon galeatum, Latham. Gang-Gang Cockatoo. T. and V.
† Platycercus flaviventris, Temm. Yellow-bellied Parrakeet. T.
Euphema venusta, Temm. Blue-banded Grass Parrakeet. T. and V.
† Cuculus pallidus, Lath. Pallid Cuckoo. T. and V.
† Cuculus flabelliformis, Lath. Fan-tailed Cuckoo. T. and V.
* † Cuculus plagosus, Lath. Bronze Cuckoo. T. and V.
† Halcyon sanatus, Vig. and Horsf. Sacred Kingfisher. T. and V.
Corone australis, Gould. White-eyed Crow. T. and V.
* † Strepera fuliginosa, Gould. Sooty Crow-Shrike. T.
† Graucalus parvirostris, (?) Gould. Tasmanian Cuckoo-Shrike. T.
† Collyriocincla rectirostris, Jard. and Selby. Selby's Shrike-Thrush. T.
† Pachycephala olivacea, Vig. & Horsf. Olivaceous Thickhead. T. and V.
† Rhipidura saturata, Sharpe. Tasmanian Fantail. T.
* † Petrœca phœnicea, Gould. Flame-breasted Robin. T. and V.
Petrœca rhodinogaster, Drapier. Pink-breasted Wood Robin. T. and V.
* † Petrœca vittata, Quoy et Gaimard. Dusky Robin. T.
* † Malurus gouldi, Sharpe. Long-tailed Superb-Warbler. T. and V.
Geocichla (probably macrorhyncha, Gould.) Ground Thrush. T.
† Sericornis humilis, Gould. Sombre-coloured Scrub-Tit. T. and V.
* † Acanthiza diemenensis, Gould. Tasmanian Warbler. T.
† Acanthorhynchus tenuirostris, Lath. Spine-billed Honey-eater. T. and V.
† Melithreptus validirostris, Gould. Strong-billed Honey-eater. T.
† Melithreptus melanocephalus, Gould. Black-capped Honey-eater. T.
* † Ptilotis flavigula, Gould. Yellow-throated Honey-eater. T.
† Meliornis novæ-hollandiæ, Lath. New Holland Honey-eater. T. and V.
* † Meliornis australasiana, Shaw. Tasmanian Honey-eater. T. and V.
† Acanthochœra inauris, Gould. Wattled Honey-eater. T.
* † Zosterops caerulescens, Lath. White-eye. T. and V.
† Pardalotus affinis, Gould. Allied Diamond Bird. T. and V.
† Pardalotus quadragintus, Gould. Forty-spotted Diamond Bird. T.
* † Hirundo neoxena, Gould. Welcome Swallow. T. and V.
Petrochelidon nigricans, Vieill. Tree Swallow. T. and V.
* † Anthus australis, Vig. and Horsf. Australian Pipit. T. and. V.
† Artamus sordidus, Lath. Wood Swallow. T. and V.
Phaps elegans, Temmick. Brush Bronzewing. T. and V.
* Turnix varius, Latham. Varied Turnix or Painted Quail. T. and V.
Hypotœnidia brachypus, Swainson. Lewin's Rail. T. and V.
Numenius cyanopus, Vieill. Australian Curlew. T. and V.
* † Ægialitis monacha, Geoffroy. Hooded Dottrel. T. and V.
* † Ægialitis ruficapilla, Temm. Red-capped Dottrel. T. and V.
† Lobivanellus lobatus, Lath. Wattled Plover. T. and V.
* † Hæmatopus longirostris, Vieill. Pied Oyster-catcher. T. and V.
* † Hæmatopus unicolor, Wagler. Sooty Oyster-catcher. T. and V.
* † Sterna caspia, Pallas. Caspian Tern. T. and V.
Sterna polioceria, Gould. Bass' Straits Tern. T. and V.
* † Larus pacificus, Latham. Pacific Gull. T. and V.
* † Larus novæ-hollandiæ, Stephens. Silver Gull. T. and V.
* † Puffinus brevicaudus, Brandt. Short-tailed Petrel (Mutton Bird). T. and V.
† Prion turtur, Banks. Dove-like Blue Petrel. T. and V.

* Eggs. † Skins obtained. T. Tasmania. V. Victoria.

Procellaria fregata, Linn. White-faced Storm Petrel. T and V.
Sula serrator, Banks. Australian Gannet. T. and V.
Phalacrocorax carbo, Linn. Australian Cormorant. T. and V.
† Phalacrocorax leucogaster, Gld. White-breasted Cormorant. T. and V.
† Cygnus atratus, Latham. Black Swan. T. and V.
† Anas superciliosa, Gmelin. Wild Duck. T. and V.
† Anas castanea, Eyton. Chestnut-breasted Teal. T. and V.
Biziura lobata, Shaw. Musk Duck. T. and V.
† Catarractes chrysocome, Lath. Crested Penguin. T. and V.
† Eudyptula minor, Forster. Little Penguin. T. and V.

Additional Species.

† Cisticola exilis (ruficeps), Vig. and Horsf. Exile Grass Warbler. V.
Frequently observed.
Puffinus nugax (assimilis), Sol. Allied Petrel. V.
Several observed about eight miles north of Cape Wickham.

Observations.—A total of 69 species were identified. 53 are common to both Victoria and Tasmania; 14 peculiar to Tasmania as against 2 to Victoria. Skins were secured of 48 species, and nests and eggs observed of 22.

With regard to the two additions to the Tasmanian avi-fauna, it is not at all remarkable that the Grass Warbler *(Cisticola)* should have been discovered on King Island, considering it is such a wanderer, its habitat not only extending over Australia, but through the intermediate islands to Southern Asia.

The Petrel *(Puffinus nugax)* may be considered as only restored to the Tasmanian catalogue because, although it does not appear on Tasmania's latest list, it was mentioned in an old list of Dr. Ramsay's.

An extensive underground Mutton Bird or Sooty Petrel's *(Puffinus brevicaudus)* nursery exists on the New Year Islands, principally on the southern end of the outer island. A few eggs were gathered on the 20th November. The majority of these birds would lay five or six days later.

On the inner island of New Year's was a Pacific Gull's *(Larus pacificus)* nursery. The majority of the clutches contained three eggs. The nest was a thick ply of dead pig-face weed *(Mesembryanthemum)*, sheltered by rocks or salt-bush.

Of the Silver Gulls *(Larus novæ-hollandiæ)*, fair-sized nurseries exist on Sea-gull Rock, in Currie Harbour, and on a large rock near the Etterick River. In the cases of both species of gulls incubation was far advanced; indeed many young birds were captured. Evidently both birds commence to lay about the middle of October.

Nearly all the land birds' eggs taken were fresh.

Reptilia.

Snakes—
Hoplocephalus superbus, copper-head snake. T. and V.
,, *curtus*, var. tiger snake. T. and V.

† Skins obtained. T. Tasmania. V. Victoria.

Hoplocephalus coronoides, Tasmanian whip snake. T. and V.
Diemenia superciliosa, brown snake. V.

Lizards—

Cyclodus nigro-luteus, blue-tongued lizard. T. and V.
Hinulia (?), two species.

Of the above the copper-head snake was very abundant. Several were secured over four feet in length. One or two were very dark in colour, and were mistaken on first sight for black snakes. Only one specimen of the brown snake was taken at the Ettrick River. One tiger snake was captured on one of the New Year Islands, and another on King Island, near the Seal Rock, both of which were unusually dark, so much so that their bands were hardly discernible. Two other varieties of the tiger snake were also found on King Island. They were of a light greenish colour, with very faint bands. I have not seen any specimens of a similar colour on the mainland, and consider that both are local varieties. No others were taken. The whip snakes were fairly plentiful, and are of an olive green colour, and generally about a foot in length. Another snake of a reddish colour was seen by one of our members. It is called the "red water snake" by the local inhabitants, and the specimen referred to, when seen, was sunning itself on the banks of the Yellow Rock River, but, on being disturbed, at once made for the water and escaped, so that we were unable to determine its species. Numerous specimens of the blue-tongued lizard were seen, and also two species of small lizards, which were very plentiful.

D. Le Souef.

Amphibia.

Ranoidea aurea, golden bell frog. T. and V.
Lymnodynastes Tasmaniensis. T. and V.
Hyla sp., tree frog.

Insects.

The following Coleoptera were taken on the island :—

Carabidæ : Calosoma Schayeri, Philophlæus sp., Harpalus sp., Clavina clivinoides.

Scarabæidæ : Trox Australasiæ, Scitala prunosa, Heteronyx dimidiata, Bolboceras proboscideus, Heteronychus interpunctus.

Scaritidæ : Scaraphites sp.

Tenebrionidæ : Adelium calosmoides, Chileone Deyrollii, Meneristes servulus, Sphargyrus physodes, Titæna columbina.

Cleridæ : Natatis porcata, Scrobiga sp., Entilus apochilus, Eleale sp.

Curculionidæ : Cossonus ephippiger, Amycterus sp.

Cerambycidæ : Phoracantha recurva, Callidiopsis scutellatus.

Elateridæ : Crepidonemus sp., C. tænianus.

Eucnemidæ : Galbodema sp.

Chrysomelidæ : Paropsis sp.
Silphidæ : Creophilus lachrymosus.
Staphylinidæ : Staphylinus, 4 sp.
Buprestidæ : Melobasis superba, Stigmodera (a Tasmanian species).
Histeridæ : Saprinus latus.
Malacodermidæ : Dryocora sp., Telephorus pulchellus.
Haticidæ : Graphoda australis.
Coccinellidæ : Coccinella conformis.

FLORA OF KING ISLAND.

List of Plants Collected on King Island.

Named by Baron von Mueller, K.C.M.G., F.R.S., M. and Ph.D., etc., etc.

Ranunculaceæ.

Clematis aristata, R. Brown. T. and V.
,, microphylla, Candolle. T. and V.
Ranunculus parviflorus, Linné. T. and V.

Dilleniaceæ.

Hibbertia fasciculata, R. Brown. T. and V.

Monimieæ.

Atherosperma moschatum, Labillardiére. T. and V.

Laurineæ.

Cassytha pubescens, R. Brown. T. and V.

Cruciferæ.

Cardamine parviflora, Linné. T. and V.
[The specific name somewhat more recent than that of C. hirsuta, but the latter not applicable to the generality of Australian forms of this species.—F. v. M.]
Lepidium foliosum, Desvaux. T. and V.
Cakile maritima, Scopoli. T. and V.

Violaceæ.

Viola hederacea, Labillardiére. T. and V.

Pittosporeæ.

Pittosporum bicolor, Hooker. T. and V.
Billardiera longiflora, Labillardiére. T. and V.
Bursaria spinosa, Cavanilles.

Droseraceæ.

Drosera pygmaea, Candolle. T. and V.
,, auriculata, Backhouse. T. and V.
,, peltata, Smith. T. and V.
,, binata, Lab. T. and V.

Polygaleæ.

Comesperma volubile, Labillardiére. T. and V.

Rutaceæ.

Zieria Smithii, Andrews. T. and V.

Rutaceæ.

Boronia polygalifolia, Smith. T. and V.
Correa speciosa, Andrews. T. and V.

Geraniaceæ.

Geranium pilosum, Solander. T. and V.
Pelargonium Australe, Willdenow. T. and V.

Tiliaceæ.

Elaeocarpus reticulatus, Smith.

Euphorbiaceæ.

Beyeria viscosa, Miquel. T. and V.
Phyllanthus Gunnii, Hooker. T. and V.
Amperea spartioides, Brogniart. T. and V.

Urticaceæ.

Urtica incisa, Poiret. T. and V.

Casuarineæ.

Casuarina distyla, Ventenat. T. and V.

Sapindaceæ.

Dodonæa viscosa, Linné. T. and V.

Stackhousieæ.

Stackhousia linarifolia, Cunningham. T. and V.

Caryophylleæ.

Stellaria pungens, Brogniart. T. and V.
,, multiflora, Hooker. T. and V.
Scleranthus biflorus, J. Hooker. T. and V.
Sagina procumbens, Linné. T. and V.
,, apetala, Linné. T and V.
Colobanthus Billardiéri, Fenzl. T. and V.

Salsolaceæ.

Rhagodia Billardieri, R. Brown. T. and V.
Atriplex cinereum, Poiret. T. and V.
,, crystallinum, Hooker. T. and V.
Salicornia Australis, Solander. T. and V.
,, arbuscula, R. Brown. T. and V.

Ficoideæ.

Mesembrianthemum aequilaterale, Haworth. T. and V.
,, Australe, Solander. T. and V.
Tetragonia implexicoma, Hooker. T. and V.

Polygonaceæ.

Muehlenbeckia adpressa, Meissner. T. and V.

Leguminosæ.

Pultenæa juniperina, Labillardiére. T. and V.
Dillwynia ericifolia, Smith. T. and V.
Swainsonia lessertifolia, Candolle. T. and V.
Kennedya prostrata, R. Brown. T. and V.
Acacia sophoræ, R. Brown (A. longifolia, W. var). T. and V.
,, oxycedrus, Sieber. T. and V.
,, verticillata, Willdenow. T. and V.
Aotus villosa, Smith. T. and V.

Rosaceæ.

Acæna ovina, Cunningham. T. and V.
,, Sanguisorbæ, Vahl. T. and V.

Saxifrageæ.

Bauera rubioides, Andrews. T. and V.

Crassulaceæ.

Tillæa verticillaris, Candolle. T. and V.
,, macrantha, J. Hooker. T. and V.

Myrtaceæ.

Calycothrix tetragona, Labillardiére. T. and V.
Leptospermum lævigatum, F. v. Mueller. T. and V.
,, lanigerum, Smith. T. and V.
,, scoparium, R. and G. Forster. T. and V.
Melaleuca squarrosa, Don. T. and V.
,, ericifolia, Smith. T. and V.
Eucalyptus Globulus, Labillardiére. T. and V.
,, viminalis, Labillardiére. T. and V.
,, amygdalina, Labillardiére. T. and V.

Onagreæ.

Epilobium tetragonum, Linné.
[The plant collected on King Island is not exactly identical with the typical European plant; thus, the name E. glabellum, Forster, would best serve for it.—F. von M.]

Rhamnaceæ.

Pomaderris apetala, Labillardiére. T. and V.

Umbelliferæ.

Daucus brachiatus, Sieber. T. and V.
Apium prostratum, Lab. T. and V.

Proteaceæ.

Banksia marginata, Cavanilles. T. and V.
Persoonia juniperina, Labillardiére. T. and V.

Thymeleæ.

Pimelea ligustrina, Labillardiére. T. and V.
,, linifolia, Smith. T. and V.
,, serpillifolia, R. Brown. T. and V.
,, curviflora, R. Brown. T. and V.

Caprifoliaceæ.

Sambucus Gaudichaudiana, Candolle. T. and V

Compositæ.

Aster argophyllus, Labillardiére. T. and V.
,, stellulatus, Labillardiére. T. and V.
,, glutescens, F. von. Mueller. T. and V.
,, lepidophyllus, Persoon. T. and V.
,, axillaris, F. von Mueller. T. and V.
,, ramulosus, Labillardiére. T. and V.
Lagenophora Billardieri, Cassini. T. and V.
Gnaphalium indutum, J. Hooker. T. and V.
,, Japonicum, Thunberg. T. and V.

Compositæ.

Podosperma angustifolium, Labillardiére. T. and V.
Helichrysum apiculatum, Candolle. T. and V.
,, cinereum, F. von. Mueller. T. and V.
Nablonium calyceroides, Cassini. T.
Craspedia Richei, Cassini. T. and V.
Cotula filifolia, Thunberg. T. and V.
,, coronopifolia, Linné, T. and V.
Senecio odoratus, Hornemann. T. and V.
,, spathulatus, A. Richard. T. and V.
,, lautus, Solander. T. and V.
Erechtites arguta, Candolle. T. and V.
,, quadridentata, De Candolle. T. and V
Cassinia aculeata, R. Brown T. and V.
Calocephalus Brownii, F. von Mueller.

Campanulaceæ.

Wahlenbergia gracilis, Candolle. T. and V.

Candolleaceæ.

Candollea despecta, R. Brown. T. and V.

Goodeniaceæ.

Scaevola suaveolens, R. Brown. V.
,, Hookeri, Hooker. T. and V.
Selliera radicans, Cavanilles, T. and V.

Gentianeæ.

Sebæa ovata, R. Brown. T. and V.

Plantagineæ.

Plantago varia, R. Brown. T. and V.

Primulaceæ.

Samolus repens, Persoon. T. and V.

Apocyneæ.

Alyxia buxifolia, R. Brown. T. and V.

Solanaceæ.

Solanum aviculare, G. Forster. T. and V.

Scrophularineæ.

Mimulus repens, R. Brown. T. and V.
Mazus Pumilio, R. Brown. T. and V.
Veronica calycina, R. Brown. T. and V.
Euphrasia Brownii, F. von Mueller. T. and V.

Asperifoliæ.

Myosotis Australis, R. Brown. T. and V.
Cynoglossum Australe, R. Brown. T. and V.

Labiatæ.

Ajuga Australis, R. Brown. T. and V.
Mentha gracilis, R. Brown. T. and V.

Myoporineæ.

Myoporum insulare, R. Brown. T. and V.

Epacrideæ.

Styphelia Australis, F. v. Mueller. T. and V.

Epacrideæ.

Styphelia ericoides, Smith. T. and V.
„ Richea, Labillardiére. T. and V.
„ elliptica, Smith. T. and V.
Epacris lanuginosa, Labillardiére. T. and V.
„ impressa, Labillardiére. T. and V.
Sprengelia incarnata, Smith. T. and V.

Orchideæ.

Thelymitra aristata, Lindley. T. and V.
„ longifolia, R. and G. Forster. T. and V.
Diuris pedunculata, R. Brown. T. and V.
Calochilus Robertsoni, Bentham. T. and V.
Cryptostylis longifolia, R. Brown. T. and V.
Microtis porrifolia, R. Brown. T. and V.
Pterostylis cucullata, R. Brown. T. and V.
„ barbata, Lindley. T. and V.
Cyrtostylis reniformis, R. Brown. T. and V.
Lyperanthus Burnetti, F. von Mueller. T. and V.
Caladenia Menziesii, R. Brown. T. and V.
„ latifolia, R. Brown. T. and V.
„ carnea, R. Brown. T. and V.

Irideæ.

Patersonia glauca, R. Brown. T. and V.

Liliaceæ.

Dianella longifolia, R. Brown. T. and V.

Lemnaceæ.

Lemna minor, Linné. T. and V.

Fluviales.

Potamogeton polygonifolius, Pourret.
Cymodocea zosterifolia, F. von Mueller. T. and V.

Junceæ.

Juncus pallidus, R. Brown. T. and V.
„ communis, E. Meyer. T. and V.
Luzula campestris, Candolle. T. and V.

Restiaceæ.

Restio tetraphyllus, Labillardiére. T. and V.
Centrolepis hispida, Roemer and Schultes. T. and V.

Cyperaceæ.

Heleocharis acuta, R. Brown. T. and V.
Scirpus nodosus, Rottboell. T. and V.
„ riparius, Sprengel. T. and V.
Lepidosperma gladiatum, Labillardiére. T. and V.
Carex paniculata, Linné. T. and V.
„ pumila, Thunberg. T. and V.
„ pseudo-cyperus, Linné. T. and V.
Cladium psittacorum, F. von Mueller. T. and V.

Gramineæ.

Spinifex hirsutus, Labillardiére. T. and V.
Danthonia penicillata, F. von Mueller. T. and V.
Stipa diplachne, Stendel. T. and V.
„ flavescens, R. Brown. T. and V.
Agrostis Solandri, F. von Mueller. T. and V.
„ venusta, Trinius. T. and V.
Festuca litoralis, Labillardiére. T. and V.
„ bromoides, Linné.
Distichilis maritima, Rafinesque. T. and V.
Zoysia pungens, Willdenow. T. and V.
Poa cæspitosa, E Forster. T. and V.

Lycopodiaceæ.

Selaginella uliginosa, Sprengel. T. and V.
Lycopodium laterale, R. Brown. T. and V.
„ densum, Labillardiére. T. and V.

Filices.

Ophioglossum vulgatum, C. Bauhin. T. and V.
Schizaea fistulosa. Labillardiére. T. and V.
Dicksonia Billardiéri, F. von Mueller. T. and V.
Alsophila Australis, R. Brown. T. and V.
Gleichenia circinata, Swartz. T. and V.
Pteris arguta, Aiton. T. and V.
„ aquilina, Linné. T. and V.
„ falcata, R. Brown. T. and V.
„ incisa, Thunberg. T. and V.
Lomaria capensis, Willdenow. T. and V.
Asplenium marinum, Linné. T. and V.
Aspidium aculeatum, Swartz. T. and V.
„ capense, Willdenow. T. and V.
Polypodium pustulatum, G. Forster. T. and V.

Introduced Weeds.

Ranunculus muricatus, Linné.
Capsella Bursa-pastoris, Linné.
Lepidium ruderale, Linné.
Papaver aculeatum, Thunberg.
Fumaria officinalis, Linné.
Lavatera hispida, Desfontaines.
Silene Gallica, Linné.
Polycarpon tetraphyllum, Linné, f.
Cerastium vulgatum, Linné.
Melilotus parviflora, Desfontaines.
Hypochaeris glabra, Linné.
Gnaphalium luteo-album, Linné.
Anagallis arvensis, Linné.
Solanum nigrum, Linné.
Bartsia latifolia, Smith.
Poa dura, Scopoli.

Messrs. M'Kibbon, Sayer, and C. French, jun., chiefly collected the plants.

It is of interest to know that Robert Brown and F. Bauer collected plants on King Island as early as 1802. Our list includes all the plants obtained by them, as well as by Messrs. M'Gowan and Neate, who have also made collections in later years.

NARRATIVE OF THE EXPEDITION.*

King Island lies half way between Victoria and Tasmania. Its most northerly point is some fifty miles distant from Cape Otway on the mainland of Australia, whilst the same distance separates its most southerly point from Cape Grimm in Tasmania. In the latter case, however, various rocks and small islands—the Reid, Black Pyramid, and Bell Rocks, Hunter, Barren, and Three Hummocks Islands—form, as it were, stepping-stones from the one to the other.

The meridian of 144 deg. E. longitude passes through the island from north to south, whilst the parallel of 40 deg. S. latitude cuts across the southern part of the island. Its greatest length from north to south is thirty-five miles; its greatest breadth from east to west is thirteen miles.

The island received its name from Captain (afterwards Governor) G. P. King, of New South Wales. Approaching the island from the north the coast-line presents the appearance of a series of low-lying cliffs, formed of granite and gneiss, with sunken rocks around their bases, their rounded tops rising somewhat inland and being covered with grass. One of the highest points is surmounted by the Wickham light-house, from which, in clear weather, the Otway light is visible. A little further to the south the nature of the coast changes, and in place of the dark rocks are seen a long series of white sand-hills, covered with low scrub. Further inland rises a low range of hills, with scattered patches of gums standing out against the sky.

Mr. Garraway, the superintendent of the Wickham light-house, had come out to meet us in his boat, and kindly volunteered to accompany us to the Yellow Rock, which had been chosen as our main camping ground, and assist in landing our stores. Unfortunately, owing to the nature of the coast, we had to be landed a mile and a half to the south of the Yellow Rock rivulet, and over this distance it was necessary to carry all our luggage. At two o'clock we bade adieu to the *Lady Loch*, and, by dint of hard work, had all important stores under shelter and tents up before dark. Our camp was by the side of the Yellow Rock Creek, which, just before entering the sea, takes in its course amongst the sand dunes a curious horse-

* Prepared from records made by Prof. W. Baldwin Spencer and Messrs. Campbell and Cornwall.

shoe-shaped curve. It would have been difficult to have chosen a more sheltered or a prettier spot for a camp.

The evening brought with it rain, and the next morning broke dull and threatening, with a cold, easterly wind. The remaining stores, with the assistance of one of the kangaroo-hunters and two pack horses, were brought into camp, and despite the unfavourable circumstances a certain amount of collecting was done.

The nature of that part of the island in which our camp was situated was characteristic of large tracts. The sea-shore was sandy and shelving, with here and there jagged granite masses breaking through, and running out to form reefs only visible at low water, but on which the surf always beats heavily. Along the coast ran a long series of sand-hills, arranged in three or four roughly parallel rows, the lowest of which faced the sea. The sand is bound together by means of the intertwined and wiry roots of the grass, *Spinifex hirsutus*, and the hills are covered largely with salt, oily, and currant bushes; whilst frequently, and sometimes extending over large spaces, especially where the rock comes near to the surface, is seen the "pig face" (*Mesembryanthemum*), with its bright red flowers. Immediately behind these sand-hills, in the region of the Yellow Rock, lay a large tract of marshy land, through which meanders the river. The whole is now above water, and its soil, somewhat sandy in nature but very dark—almost black coloured, owing to the great amount of decayed vegetable matter which it contains—grows at the present time a luxuriant crop of trefoil, reaching often a height of four feet. In some parts the underlying granite rock comes to the surface, and in others are small lagoons, filled largely with the swamp ti-tree (*Melaleuca ericifolia*), and being the haunt of the black swan, the wild duck, and the Australian teal.

Further inland, again, rise hills which run down the centre of the island, gradually increasing in height as they pass southward, until they culminate in the south-east part in Mount Stanley, the highest hill in King Island (700 feet.) These hills are covered with scrub, often extremely dense, and consisting principally of the mountain ti-tree (*Leptospermum scoparium*), of various acacias, banksias, native currant (*Styphelia Richea*), and boobyalla (*Myoporum insulare*). In part they are covered with forests of gums (esp. *Eucalyptus globulus*), and in the woods abound the native hazel (*Pomaderris apetala*), musk (*Aster argophilus*), sassafras (*Atherosperma moschatum*), and in parts blackwood. Over large tracts fires have destroyed the larger trees, leaving only their gaunt, charred trunks, which now give a weird appearance to the landscape, their place being taken either by scrub or a dense growth of bracken fern.

The first two or three days were occupied, between intervals of pouring rain, in making short excursions for some few miles

into the surrounding country, and a good number of birds were secured, amongst them being the sombre-coloured scrub-tit, the black-capped honey-eater, the yellow-throated honey-eater, the long-tailed superb warbler, the Tasmanian warbler, and the hill crow-shrike.

After three days spent in and about the main camp, the party separated—some to go right across the island to the east coast, others to go down the west coast, others to go north to Wickham, and others to remain in camp and explore still further its immediate neighbourhood. A record of the various parties and their respective routes is given elsewhere. The following is an account of the principal features of the island, so far as it was seen by the different parties:—

(1.) North, Western, and Eastern Parts of the Island.—In King Island swamps and lagoons abound, and a wet season, such as unfortunately the party seemed to have fallen in with, renders many parts impassable, so that to reach the east side it was necessary to go, first of all, some few miles to the north of the Yellow Rock before striking across country. Yellow Rock receives its name from the colour given by lichen to the granite rocks, not far south of the mouth of the creek. The water of the latter is of a dark brown colour, and in this it agrees with most of the very numerous streams on the island, all of which owe their deep colour to the boggy nature of the land through which they pass. North from the creek the coast sweeps for eight miles round the shores of a wide, open bay, extending from Wickham in the north to Whistler's Point in the south. In the former part it is fringed by a long series of sand-hills, the highest of which reaches, perhaps, the height of 150 feet. All are covered with the usual scrub. The sandy shore itself shelves with remarkable steepness into the sea, and is devoid of animal life save remnants of lamellibranch shells, and the common sand-hoppers *(Talitrus)*. This absence of even shells here and in other parts of the island is to be accounted for by the want of rocks either on or very near the shore, to which gastropods, etc., could cling, together with the action of the heavy surf which continually beats upon the sand. Along the latter are strewn many logs cast up from wrecks—and now just above high-water mark—and, turning them over, a curious assortment of sea and land forms is found—beetles, centipedes, sand-hoppers, and earth worms living together, where not unfrequently they must all be drenched with salt water. Along the shore is a miniature, but interesting sand-cliff, extending for perhaps some forty or fifty yards. Its greatest height is only some six or eight feet, and at either end it gradually falls away till the level of the base of the sand dunes is reached. At the present time it is being worn away by the sea; and its face, cut in sections, shows at intervals beds of comminuted

lamellibranch shells, exactly similar to those now found on the shore. The highest of these beds will now be some six feet above high-water mark. The same feature is seen on the east coast in one or two parts, and here there is, in the north part of Sea Elephant Bay, a raised, flat, sandy beach, covering a space of one hundred yards between the sea and the sand-hills. At one time the shells must have lain upon the sea-shore, and each layer of them in the small sand-cliffs represents a distinct shore line of times past.

Turning inland on the west coast, about four miles north of the creek, the track, after passing across the sand-hills, lies over a series of low-lying scrubby ridges, merging into grassy hills, topped with patches of ti-tree, and valleys which looked all that could be desired for a sheep station, but, unfortunately, what is known as the "poisonous tare" (*Swainsonia lessertifolia*), with its beautiful purple flower, is plentiful, and seems to render sheep grazing impossible. The hunter pointed out one small hollow locally known as "the Cemetery," and said that in that small spot some hundreds of sheep were killed about three years ago through eating the plant.

Leaving the grassy valleys and hills, the country becomes open, and lies at a lower level. Away to the right is a large swamp ground known as "Egg Lagoon," and a little further on the track passes on to slightly higher gound, still open, with here and there clumps of small gum and ti-trees, in which one or two wild cats were killed. The bracken fern is very abundant, and there is plenty of tussocky grass, with patches of swampy ground, in which the copper-head snake abounds. The ground in parts is covered with liverwort, and a small violet (*Viola hederacea*) flourishes everywhere. In this part the little rufous-headed grass warbler (*Cisticola exilis*) was secured, remarkable as being the only bird found on the island which is peculiar to Victoria as opposed to Tasmania. All other birds captured were either common to both countries, or else peculiar to Tasmania.

From the reedy flats the track led across rising ground known as Fern Hill, covered, as its name indicates, with *Pteris aquilina*, and from the summit of which a characteristic view of the island was to be obtained. From a picturesque point of view the scenery of King Island in its northern parts is decidedly uninteresting. Away to the north as seen from Fern Hill, stretches undulating ground covered with scrub, tussocky grass, fern, patches of ti-tree in blossom, with perhaps a few small gums, here and there a small wood of larger gums, and not unfrequently the charred trunks of still older ones standing out gaunt against the sky. Eastwards lay swamp and undulating scrub land; westwards was the track towards the sea, over grassy downs and sand-hills; southwards lay swamp land, with

the large Egg Lagoon, and behind this, again, rising ground, fringed with woods of blue gum.

East of Fern Hill the land becomes very swampy, the track being beneath water and the grass long and tussocky, rendering walking fatiguing. Large clumps of swamp ti-tree are plentiful. After a short distance the country changes, as the track passes on to somewhat higher ground, covered with white heath. The scrub becomes more dense, composed of ti-tree, acacia, with banksias, she-oak, and hazel. The white heath is abundant, so is *Stackhousia* (*S. linarifolia*) and the little orchid, *Caladenia latifolia*; whilst in some parts, over large areas, the ground is white with a curious lichen, just as if it were snow-covered. This undulating ground continues for four or five miles until, in a hollow, shut in by low-lying hills well covered with wood, the Martha Lavinia Lagoon is reached. This is a large sheet of water, named after a vessel wrecked on the coast, and is about a mile in length and the third of a mile in width. Its waters, supplied by numerous streams from the surrounding hills, are of the usual deep brown colour, whilst its shores are fringed for long distances by dazzling white sand-banks, which form a strong contrast to the deep brown of the water and the dark green of the trees. Around its margin are tufts of cutting grass and mia-mia reeds. In wet seasons, such as the present one, the lagoon is of considerable size, and the track lies completely under water, rendering walking somewhat difficult and uncomfortable.

To the east of the lagoon is rising ground, and at the distance of about a mile is the lesser Martha Lavinia Lagoon, a very pretty small sheet of water, fringed by mia-mia reeds and hemmed in by hills covered with gum trees. From its shores the track leads over steeply rising ground, perhaps 200 feet in height, covered with a dense growth of bracken fern, and then descends suddenly over sand-hills to the shore on the east side of the island. Throughout the whole journey across the island there was scarcely seen any sign of life whatever, this being, doubtless, due in a large part to the unfavourable state of the weather, as for the last six or eight miles there had been a steady downpour of rain.

The shore on the east coast, from Boulder Point in the north, southwards to the Fraser River, is flat and sandy. Reference to the map shows at once that it is remarkably free from indentations, thus forming a contrast to the west coast south of Yellow Rock. This is associated with the absence of any outcrop of rock on the sea-shore, and the consequent ease and regularity with which the water carves out the outline of the land. Only in one part (Lavinia Point) is there an outcrop of granite, and here, owing to its superior hardness, the land projects. A similar projection exists just to the south of the mouth of the Sea Elephant River.

This may be due to the presence off the land of Sea Elephant Islands and a considerable number of reefs of hard granite rock around it, which break the face of the waves in rough weather, and, to a certain extent, protect the shore. The river itself is of considerable size, being the largest on the island, and spreads out at its mouth so as to cover a large extent of ground. It deposits, when its current thus becomes slower and a mixture of fresh and salt water takes place, a great amount of material, brought down from the upland districts, and in this way has served to counteract the denuding action of the sea.

Between Boulder and Lavinia Points a range of hills from two hundred to three hundred feet in height runs along parallel to the coast. South of this the coast-line becomes much lower. There are small, raised beaches similar to the one already described on the west coast, and the usual lines of sand-hills run parallel to the coast. Passing inland the country is dull and very uninteresting. For miles there is nothing but undulating land covered with heath and bracken, ti-tree, banksia, prickly acacia, and stunted gums. This scrub land is the home of great quantities both of the Tasmanian wallaby (*Halmaturus Billardieri*) and of the so-called brush-kangaroo of Tasmania (*H. Bennettii*). There are plenty of swampy pieces of ground filled with rushes, and travelling was rendered extremely uncomfortable by the rain, which fell in torrents, until the hunter's hut, known as Bertie Camp, was reached. Here a halt was made, a huge camp-fire lighted, the tent put up, and ti-tree boughs laid down to sleep upon, as the ground was soaking wet. Owing to the bad weather, very few specimens had been secured during the march, but in the course of the evening a mopoke (*Ninox maculata*) was lured to its doom by the imitative powers of two members of the party. In the hut and tent the skin-eating beetle (*Creophilus lachrymosus*) was plentiful, and one or two scorpions were captured, together with various coleoptera.

Early next morning a start was made, two members of the party staying at Bertie—one being too unwell to proceed, and the other very considerately remaining behind to keep him company. West of the camp were thick scrubs of ti-tree and white gums, but between the camp and the coast lay the usual undulating country, with ground which appeared in parts dark coloured and rich, and in others swampy, covered with bracken ferns. The coast is low, with sand-ridges clothed with rough grass, and currant and oily bushes, and pig-face in abundance. This character is continued southward as far as the mouth of Sea Elephant River. All along this district the beach is of considerable width, then comes a low ridge of sand-hills, then a long valley, then another higher ridge parallel to the first, then a second long valley and a third ridge, and then a broad,

low-lying plain, often marshy, stretching away to a series of hills some miles inland, of which the highest is known as Sea Elephant Hill. Through the plain wanders the Sea Elephant River, the largest stream of water on the island. Along the shore the shells of pinna were extremely abundant at high-water mark, and amongst those just cast up two or three containing the living animal were to be found. Haliotes was abundant, together with oyster-shells, the presence of the latter being due to the existence some distance out of an oyster-bed. The shore was thickly strewn with kelp, though this was not so plentiful as on the west coast, and a species of echinus was especially abundant. In addition to those mentioned a few other shore lamellibranchs were to be found, but there was a marked absence along this whole coast of gastropods, except on the shore just opposite to Sea Elephant Island, in which part the dead shells of turbo were abundant. Along the sand the hooded dottrell was everywhere to be seen, and, being the breeding season, its nest, a little ho low of sand, near high-water mark, was frequently found, containing one, two, or three eggs. The Pacific and silver gulls were plentiful, together with the pied and sooty oyster-catchers. The sand above high-water mark also was lined with a great variety of the skeletons of horny sponges, varying from a few inches to a yard in length.

Striking across the sand-banks we came on to the broad plain bef e mentioned, covered with heath, and bracken fern, and low scrub. It looks very much as if it had been once the bed of a large lagoon, and, in fact, the Sea Elephant River now broadens out at its mouth into a wide, shallow estuary. A rise of two feet in the river would put a large tract of ground under water. We followed up the river for some distance, and found large flocks of black swans, two of which were shot and served us for dinner, cooked in the hunter's hut, which we reached after fording the stream on horseback.

The bed of the estuary, which was bare when we crossed, is covered by an innumerable quantity of small black gastropods,* crawling about in all directions, and the river channel near the mouth and its sandy banks were simply one large cockle (as the shell is called) bed. It was curious to find these molluscs living when alternately they are bathed in salt and fresh water —salt at high, and fresh at low, tide. Not only this, but along the coast there was nothing at all comparable to this large, crowded bed of molluscs in the estuary sand, and it was easy to realise how a sudden flood, bringing down mud from the land, would at once cover and kill the molluscs, and how, in course of time, a highly fossiliferous stratum would be formed just in this particular spot. In all the surrounding parts of similar age no such fossils would be found, and, in fact, very few of any

* *Ophicardelus cornea.*

kind, as along the open shore all shells are rapidly broken up by the strong surf.

At the mouth of the river the Caspian tern (*Sterna Caspia*) was secured, with its nest, on a sandy knoll, containing three eggs.

It was too swampy to take the inland track, which was partly under water, and for some miles further the way lay along the coast. In the kelp were a considerable number of forms of Alcyonarians, the most interesting of which has a long stalk attached to some such object as a shell, whilst its distal end is swollen out, and has the polypes arranged longitudinally in rows. The whole, when living, has a lovely cream, or pink, or heliotrope tint. Others, again, of a reddy purple colour, formed masses resembling such a coral as *Mœandrina*, only devoid of any calcareous skeleton. It is interesting to note this same form of regular lateral budding taking place in members of the closely allied groups of Alcyonaria and Zoantharia. The ordinary sea-pen was abundant, and at times a large, white holothurian was met with.

Passing over the sand-hills and surmounting a ridge about one hundred feet high, the country is open, and in many parts grass-covered, and appears easily capable of cultivation. Our camp for the night was on the top of a high hill overlooking Sea Elephant Bay. Inland lay a lagoon surrounded by dense swamp ti-tree; immediately beneath us was a small creek of beautiful water, which had carved out for itself a very definite gully, through which, after meandering in the upland plain, it crossed the ridge before referred to, and then, running behind the sand-hills, entered the sea. Out to the north-east was Sea Elephant Island, which, together with the bay, owes its name to the former prevalence of these animals, though the only trace we could discover of them lay in one ancient, battered skull. This island, though very small, is now the home of cormorants, seagulls, and mutton-birds, all of which have their rookeries upon it, and afford a plentiful supply of guano, which it was once, though unsuccessfully, attempted to work. To the south lay Fraser River and a dense forest of blue-gum and blackwood, though our time was too short to allow us to penetrate this almost impenetrable district, much though we should have liked to have done so, and well though it would doubtless have repaid us. All that we could do was to divide ourselves into small parties—some to go inland, some to go south across Fraser River into the woods, and some to go further south still, to the Wall. Near Fraser River we caught four Echidnas, interesting as being the hairy, Tasmanian variety (*E. setosa*), and not the Victorian form. These creatures—half reptilian, half mammal—are, perhaps, the most interesting amongst the many connecting links which the work of the century has revealed to us. They have a wonderful power of burrowing, first sticking their long, pointed snout down into the

ground, the whole head forming apparently a wedge structure, which forces a hole in the ground before the fore feet are brought into play. Then with its claws the animal can burrow at great speed, and is quickly lost to sight. Not only this, but its spines fall back smoothly when burrowing, but if the animal be pulled back the spines project, and a surprising amount of force is necessary to draw the beast out of the earth. The animal has also the power of squeezing itself through wonderfully small apertures, its skin being very loose. Four Echidnas were caught on the sea-shore, one close to the water's edge, to which it was walking down from the shelter of the shrubs.

Fraser River runs through a winding gorge, having cut its way through rocks of upper silurian sandstone*, which in this part of the island have become altered by contact, doubtless, with the great mass of eruptive rocks near at hand. At the mouth of the river is a curious bed—also met with further north, in Sea Elephant Bay—of extremely fine sand, compact and perfectly black in colour. When examined minutely it is seen to consist simply of very minute particles of quartz embedded in a matrix of carbonaceous material. Possibly, the origin of this curious formation may be somewhat as follows:—The finer particles of sand have been gathered together and separated from the coarser ones by the well-known action of wind. By some means or other this æolian formation has come in contact with boggy water, dark coloured, as is most of the water on the island at the present time; the fine sand has acted as a filter, with the result that the carbonaceous material (nearly pure carbon, apparently) now forms a matrix binding the quartz particles together.

The Fraser River forms a boundary between two kinds of country. To the north lies, more or less, open, undulating land; to the south are dense forests stretching westward fully half-way across the island, and southward as far as Mount Stanley. Birds, apparently, were rather scarce. The principal ones captured in this part of the island were the allied diamond bird, the New Holland and Tasmanian honey-eaters, the spine-billed honey-eater, the black-capped honey-eater, the welcome swallow, the Tasmanian cuckoo-shrike, the yellow-bellied paroquet, the pallid and fan-tailed cuckoos, and the white-bellied sea-eagle. In the woods the white cockatoo was seen, but not secured. The forest is comprised most largely of blue-gum, with coast ti-tree immediately on the shore, and more inland blackwood, musk, sassafras, and hazel.

Going still further southwards along the shore, the nature of the coast changes completely. The sandy beach gives place to outcrops of hard rock, worn jagged by the action of wind and water. The forest comes down to the water's edge until after

* The mineralogical specimens have very kindly been identified by Mr. Rule, of the Technological Museum.

a point three miles south of Sea Elephant Bay is reached further progress is quite impossible. Even at low tide there is no passage between the sea and the rocks, against which the surf beats heavily, and above the rocks is impenetrable forest. On the rocks were a large number of white-bellied cormorants. This is the part of the coast to which the name of "The Wall" is given, and only once, and then with great difficulty and considerable expenditure of time, has anyone been along it.

Some of the party meanwhile had been exploring the black-wood forest and fern gullies to the west of the camp, and others had been busy collecting in its immediate neighbourhood. Eighteen wallabies were brought in during the day, and the live stock included five Echidnas and one brush kangaroo.

Provisions were running short. Bran was gradually taking the place of flour, and regretfully we had to leave the best part of the island almost untouched. On the return journey we were favoured with good weather, and walking was more pleasant The wind had been blowing freshly from the south-east, and it was curious to note how, when travelling south-wards, the dark colour of the water along the beach indicated our proximity to a river mouth. The approach to every creek and river, when walking along the shore, could be foretold in this way, the wind seeming to drive the fresh water along the shore before it mixed with the sea water. Further on there was another point of interest. Along certain tracts on the shore a great amount of froth was cast up, but the presence of this was confined to certain parts, and these corresponded exactly with those in which the fresh water creeks entered the sea, and where the fresh and salt waters came in contact with one another. This was especially well seen in connection with the large streams—Fraser River, Sea Elephant River, and Blowhole Creek.

Retracing our steps we reached Bertie Camp, and the next day struck westwards across the island, having again to wade along the shores of the Martha Lavinia Lagoon. Instead of returning to Yellow Rock directly we took a more northerly track leading across hill country, with a rich crop of grass and trefoil, until we came in sight of a large sheet of water—the biggest lagoon on the island—which we named Dobson Lake. It is surrounded by the usual swamp ti-tree, and has a depth of thirty feet. The waters—as those of most other lagoons on the island—percolate through the intervening hills to the sea-shore, where they issue as a series of springs. One of the striking features of the island is the great amount of fresh water obtain-able in all parts. Large tracts are marshy, and the lagoons are numberless. These are frequently arranged in a series, running parallel to the shore, inside the outermost line of sand-hills, through which their waters percolate, and then trickle down over the sand into the sea. Creeks of all sizes, from the tiniest

rivulet to the broad river, such as Sea Elephant, are everywhere met with; and, as a general rule, the dark colour of their waters give evidence of the nature of the land through which they pass. Invariably they contain plenty of fish, especially the eel, the native trout, the spotted trout, and near the mouth a species of mullet.

Near Lake Dobson, in a sheltered spot, is the home of the hunter (Grave) who acted as our guide over the island: the little homestead, with its small, cultivated enclosure and its garden gay with old English flowers—sweet-william, lad's love, heart's-ease, hollyhocks, and roses—looked like an oasis in the uncultivated wilds of the island.

North of Wickham lighthouse the coast-line is formed by jagged outcrops of gneiss, and granite, and quartzite. The hills inland, rising without any trace of sand-hills directly from the shore, reach the height of from two to three hundred feet, and are covered with coarse grass and trefoil, except within the large enclosure around the lighthouse, where imported grasses flourish.

The lighthouse itself is placed on a cliff, its summit being 280 feet above sea-level. Both on this and on other occasions the members of the party were made welcome and hospitably entertained by the superintendent and Mrs. Garraway.

On the summit of the cliff, which in the main consists of hornblendie granite, lies a deposit of tertiary limestone, which also appears to cap some of the hills in the neighbourhood, though none is visible in sections on the sea-shore, which in this part is formed simply of granite which frequently passes into gneiss. In one part, about three miles south of Wickham, is an outcrop of quartzite.

About five miles to the east of Wickham was found, by one of the botanists of the party, the composite plant *Nablonium calyceroides*, growing in damp ground near to the coast—interesting as being the only plant as yet known from King Island which is not found on the mainland of Victoria, but occurs in Tasmania.

(2.) Western Parts of the Island.—Two miles to the south of the Yellow Rock the sand-hills bordering the coast cease, and are succeeded by a stretch of three-quarters of a mile of low, swampy land, with small lagoons choked up with a luxuriant growth of chara, the leaves and stem of which seem to contain more than the usual amount of mineral deposit. Only a low bank of sand, about a foot in height, and overgrown with grass, separates the lagoons at high tide from the sea. Numerous outcrops of granite occur, forming low rocks, completely covered at high tide, to which cling limpets, chitons, haliotes, gastropods of various kinds (especially a species of turbo), anemonies (only a deep red coloured variety, as far as could be seen), and numerous sponges; with plenty of oligo-

chæte worms and polyzoa, and some few tunicates. It is curious to note that all along the western shore there was a marked absence of the alcyonarians present in such quantities on the east coast of the island.

At Whistler Point the hills come down to the sea, and for the distance of a mile or two the shore is rocky and broken. Kelp is heaped up in great quantities, and forms large, wretchedly stinking masses, perhaps a hundred yards in length, along the shores of the numerous small bays between successive jutting granite promontories. Anyone walking on this has to be very careful not to sink suddenly up to the middle in the decaying vegetable matter, which seems to afford endless enjoyment to the flocks of sooty crow-shrikes which abound in the island.

On the rocks lay the skeleton of a seal, and in various parts different bones of this animal were met with. Leaving the shore, the track passes over hill country with coarse grass and bracken fern, until the scrub is entered, consisting largely of coast ti-tree. This continues for some distance, good views of the sea out to the west being obtained, with New Year Islands near at hand, until after some four miles the track passes close to the sea-shore. Here on the sand-hills is a luxuriant growth of pig-face. Its bright red flowers, with the light yellow—almost white—sand, and the curious, whitey-blue green of the smoke-bush, gave a strange aspect to the scene. The track first touches the shore again at the mouth of the Pass River, which was, as yet, the only clear-water stream of any size seen on the island. Its mouth is by the side of an outcrop of very coarsely-grained grey granite. In the rocky pools were numerous specimens of chitonellus and some curious planarian worms, an inch or an inch and a half in length, with round bodies one-eighth of an inch in diameter, marked by alternate bands of green and white. Near this promontory a teal was met, with two young ones. The mother, to distract attention from her young, at once feigned a damaged leg, and made off along the shore, followed by one of our party, whilst the two little ones ran for the water. Being chased the young ones both dived instantly, though the water was not more than a foot deep. It was curious to see this instinct so strongly developed in exceedingly young birds, as they were yet unfledged and covered only with down. They lay perfectly still under the water, and it was difficult to distinguish them from the stones, which they closely resemble in colour.

All along the coast hooded dottrels, pied and sooty oyster-catchers, silver and Pacific gulls are plentiful, whilst inland, amongst the scrub, perhaps the most plentiful birds are the sooty crow-shrikes and the superb warbler *(Malurus gouldi)*, whose lovely bright blue colour is everywhere to be seen. Near Whistler Point large flocks of wild duck are met with.

Beyond the Pass River the track lies through a dense growth

of what is known as native tobacco, and then passes for a few miles on to the sea-shore, which is here skirted by sand-hills. A mile to the south of the river is an outcrop of limestone on the shore, but so covered with sand that only very small portions of it can be seen, and similar to that already mentioned as occurring at Wickham. In this part also are found the calcified remains of tree roots, matted together and projecting from the side of the sand-hills in close proximity to the limestone from which the material giving rise to them has first of all been dissolved by percolating water. The limestone, so far as could be discerned, is deposited in almost horizontal beds. Sand-hills, covered with smoke-bush, pig-face, oily bush, and currant bush, extend as far south as Porky Creek—a river of clear water, some twenty yards wide at its mouth, which has received its name owing to a former prevalence on its banks and the district through which it passes, of porcupines, of which only one specimen was secured from this part of the island.

Inland about four miles is Porky Lagoon—a sheet of water covering twenty acres, and lying to the north of the creek. Its south-eastern bank is covered with tall swamp ti-tree ; its north and west is timbered with white gums, a few blackwoods, and boobyalla *(Myoporum)*. Around the lagoon are outcrops of limestone. In its water eels are abundant, and it is frequented largely by wild duck and teal. In the gum woods some of the best insects captured on the island were taken. The wattled honey-eater of Tasmania and the spine-billed honey-eater were secured here.

Between the lagoon and the shore is good grassy country, comparatively open and hilly. Eastward the land is good, dark coloured and loamy, with a considerabe amount of large timber. Large tracts have been burned, the charred trunks alone remaining. In the centre of the island are large, open, heathy, and grassy plains. These flat tracks are impassible in wet weather, and are, doubtless, the origin of the numerous streams running east and west. Southwards from Porky the land is hilly, and covered simply with a great growth of long, wiry grass; then comes better land in a large district known as Man Trap. It received this curious name owing to a vessel's hatch falling down upon the hunter who had set it up for shelter in stormy weather. Cultivation has once been attempted here, but in only a rude manner, and the land is certainly rich enough to give very good crops if properly dealt with.

Passing further south still, fern land and then dense scrub is reached, of ti-tree and acacia. The ground, very dark coloured, is often swampy, and the track under water. Holes of the boring astacus are frequent, though, probably owing to the very slight amount of traffic, very few real crab-holes are seen, and only the small, round openings and characteristic castings indicate the presence of this land crustacean, which has taken on such a

curious habit. Here, too, sundews are plentiful (*Drosera pygmea* and *D. auriculata*), and the fern *Schizœa bifida*, and the orchid *Calochilus Robertsoni* were secured. In small, open patches the ground is covered with the little *Viola hederacea* and the small purple flower of *Magus pumilio*, and frequent amongst these is the orchid *Caladenia carnea*.

Unfortunately, the season was too early for the great majority of insects. Turning over old rotten logs, the curious yellow planarian worm, so commonly met with in Gippsland, with often two dark bands of colour, one down each side, is not infrequent. Here, as elsewhere on the island, the great green frog keeps up an incessant croaking in the water. On land is found a smaller and darker coloured variety, and in shady parts, as on rocky sides covered with ferns, or under the peeling bark of a gum-tree, a climbing frog is met with.

Lizards are abundant—the large blue-tongued *Cyclodus gigantea* and smaller ones (*Hinulia ?*) scudding about in all directions in the warm parts. Of birds, amongst others, the forty-spotted diamond bird, various honey-eaters, and the nest and eggs of the painted quail were secured. Of mammals, the wallaby and brush kangaroo and the opossums are to be found, but, taking it altogether, there is really a lack of animal life. This is very noticeable in regard to insects. In Gippsland, for example, it would be impossible at this time of year to turn back the bark of a gum-tree or split open a decaying or fallen log without seeing an immense number of insects, etc., of various kinds. Here scarcely even a cockroach puts in its appearance, and not a trace of a centipede or coleopteran is to be seen. Very occasionally we came across a scorpion, but even these were rare, and usually found during the night in the tent.

Near Currie a small wood of gum-trees is entered, then the track leads through a valley cleared of trees, and with a rich growth of trefoil, and then, mounting a ridge, the little harbour is seen dotted with rocks and alive with sea birds. On its southern side is the lighthouse, and here, as at Wickham, all members of the expedition were hospitably entertained.

Currie Harbour is fit only to shelter small craft, as its entrance is very rocky. Its shores are covered in part with kelp, and in part with dense growth of water-cress (imported). The light-house is more modern than that at Wickham. The chamber containing the light itself is supported on four iron pillars, with a tube containing the spiral stair-case in the middle. The light is 150 feet above the surface of the sea, and flashes five times in the minute, thus being distinguishable from the Otway light, which flashes once each minute. It is seen from Fitzmaurice Bluff on the south to New Year Islands on the north when the Wickham light is taken up. The Currie light-house was built soon after the loss of the *British Admiral*, and it is satisfactory to find that,

though there were twenty-two wrecks recorded in the twenty years previous to the erection of the lighthouses on the island, not a single one has occurred since they were built.

The enclosure around Currie is covered with a rich growth of imported grasses and lucerne. The shore is very rocky, being here composed of gneiss, which about 200 yards to the south passes into granite. Facing the open sea is a large shingle beach, or, rather, there are two such—one more inland, slightly the higher and older, and another newer one. The former stretches back for some thirty yards, and is now covered with a growth of pig-face, grass, lucerne, wild geranium *(Pelargonium Australe)*, currant-bush, etc. The latter is about ten yards wide, quite bare, and slopes very suddenly and steeply down into the sea. It is composed wholly of rounded, water-worn fragments of gneiss and granite, varying in length from four inches to a foot. In some of the granitic rocks in this part of the coast the constituent parts—hornblende, mica, etc.—are very clearly marked. For at least a mile and a half to two miles inland run high sand-hills, frequently of a perfectly conical, sugar-loaf shape (one of the highest has received the name of "Sugar-loaf"), covered with coarse grass and the usual scrub. One of these hills, 150 to 200 feet in height, presents a most striking appearance. It has the form of a truncated cone, its perfectly horizontal top being a hundred yards or so in length. All the surface, save its southern side, which slopes at a very sharp angle, is covered with grass, etc., but this one face is perfectly bare, and the whole hill being formed of dazzling white sand a most curious effect is produced when the hill is seen standing out against a deep blue sky, and with a foreground of dark-green foliage it resembles more than anything else a snow-field.

On the coast, some two miles south of Currie, is a small limestone terrace; a diminutive cliff, about four feet high and fifteen yards long, has been formed in times past by deposition of lime from the waters of a stream flowing over the granite into the sea. Curiously, the stream still flows, but there is not the slightest trace now of any deposit taking place, and the sea is gradually wearing away the face of the little cliff. A little further on British Admiral Bay is reached, named after the ill-fated ship which struck upon one of the dangerous sunken reefs which line the shore some distance out to sea, and upon which, even on the quietest days, the surf beats heavily. Wreckage, consisting of hard lumps of teak, with cedar and pinewood, still strew the rocks on the shore, and the graves of some of those who were drowned are still to be seen, though fast falling into decay. They would, in some cases, have already been lost were it not for the thoughtfulness of the hunters.

To the south of British Admiral Bay, on a projecting outcrop of granite, which can be reached on foot at low tide, is a seagull

rookery, where eggs and young ones of the silver and Pacific gulls were secured. Some eight miles to the south of Currie the Ettrick River enters the sea, and here a halt was made and advantage taken of an old broken-down hunter's hut, overgrown with trees, to form a camp for the night. Nine of us slept in the small hut, and were, perhaps, more crowded than comfortable.

The Ettrick River runs in a kind of gorge, which it has hollowed out for itself in hard upper silurian sandstone. On the other side of the island is the Fraser River, which also runs in a gorge, and it is interesting to note that in both cases the rock is of the same nature, and it appears as if a band of upper silurian sandstone ran right across the island from the mouth of the Etterick to the Fraser River. On the east side of the island the sandstone which is found between the mouth of the Fraser and Campbell Point has become altered and modified—a result, doubtless, due to its proximity to the large mass of eruptive rocks (gabbro) forming the Wall.

The waters of the Ettrick are dark-coloured, and though we searched hard for platypus, which occurs here, not a single one was to be found. The country all round is rich in wallaby and brush kangaroo, and plenty were caught in the open land stretching inland to the south of the river.

The land rises somewhat abruptly from the sea, and then gradually rises again inland, towards the centre of the island, culminating in Mount Stanley, the highest point (700 feet). For some miles inland it is open with grass, or fern, and low-lying scrub, or lightly-timbered forest, and frequently bears rich crops of lucerne. To the east are the remains of a burnt forest of gums. This open country extends for some miles, and passes out westwards on to Fitzmaurice Bluff. Its surface, where there is an outcrop of rock, is formed of tertiary limestone. It is impossible to say how great an extent of ground is covered with this, but it must be a very considerable one, as the streams running down to the sea in this district are surcharged with carbonate of lime, which they deposit on evaporation. About a mile and a half south of Ettrick River is a curious formation, known as "Dripping Wells." Water charged with carbonate of lime from the uplands comes down, and, passing over the granite, evaporates and deposits the lime. The latter has gradually accumulated until a small cliff has been formed on the shore, over the edge of which the water trickles, producing an overhanging part. A small cave facing the sea has thus been formed, and the water dropping from its roof and evaporating has given rise to stalactites, with corresponding stalagmites growing upwards from the floor. The whole formation is about 20 or 25 feet in height, and about 100 yards in length.

Two miles to the south of the "Dripping Wells" is the monument—almost illegible now—erected to the memory of the 399

who perished in the wreck of the *Cataraque* in 1845. The coast line is rocky, and exposed to the west winds, the surf breaking on the shore and on the reefs out to sea. Eight miles to the south of the Ettrick a bold bluff of land—Fitzmaurice Bluff—runs out to sea. It is formed of gneiss and granite. Its rocks are very jagged, and every now and then are found patches of large, rounded, boulder stones. Its lower parts immediately above the rocks are covered with dense scrub, but above this lies open grass land. Every nook in the rocks is occupied by a luxuriant growth of the wild geranium (*Pelargonium Australe*), and in damp, sheltered spots the fern *Asplenium marinum* flourishes. From the top of the Bluff a fine view is obtained of the coast to the south—the wildest scenery upon the island. The granite cliffs rise directly from the sea, and the strong wind forces all the scrub to lie down, as it were, flat against the side of the hills, though it appears to be only able to grow in the valleys by the side of the creeks. Numerous solitary granite masses stand out in the sea, and clouds of spray dash themselves high up against the face of the cliffs. Seal Rock, so named from the presence of these animals, and lying some distance to the south of Fitzmaurice Bay, was the most southerly point reached upon the island.

On the return journey a few hours were spent on New Year Islands. These are the granitic masses apparently continuous (by sunken reefs) with the granite of Whistler Point, and lie between four and five miles to the west of the latter. They are covered with low-lying scrub and herbage, and are principally interesting for containing extensive rookeries of Pacific gulls and the sooty petrel, or mutton-bird. Our visit was unfortunately made two or three days too early (20th November), for the mutton-birds arrive with wonderful regularity between 22nd and 25th November. The nests consist of long burrows in the sandy ground, a large tract being simply riddled with these holes, out of which the bird is drawn by means of a stick, with a piece of hoop-iron projecting at right angles from one end. The mutton-birds arrive in great numbers—their advent is said to be heralded by a storm, known as the "mutton-bird gale"—and the rookery, perfectly quiet before their coming, is immediately the scene of wonderful life and activity. It is curious to note that not a single mutton-bird is to be found on King Island itself, though on Sea Elephant Rock, some four miles from the east coast, there is another rookery.

GENERAL RESULTS.

By Professor Spencer.

The following is a short account of the general results of the expedition:—

It was unfortunate that no geologist was able to go, but the shortness of the time spent upon the island rendered it very difficult to do much in this line, as it was impossible to stay long in one place, and very few natural sections of rock could be

found. The predominant formations are undoubtedly eruptive in nature, and consist, in the main, of granite and gneiss. These formations are widely spread over the whole island. In the very north, at Wickham, the cliffs are formed of granite. Passing south the granite on both sides of the island is hidden beneath sand-hills, but comes to the surface inland, near the Yellow Rock River and on the east coast at Lavinia Point. All along the west part of the island it lies on the surface—passing frequently into gneiss—until the Ettrick River is reached, and forming also numerous reefs sunken beneath the surface of the sea. The New Year Islands, off the west coast, seem to be merely a continuation of the granite in the neighbourhood of Whistler Point. They are both formed simply of granite.

On the east side no eruptive rocks come to the surface, so far as observed, between Lavinia Point and the south of Fraser River, where they are very strongly developed, just as is the case on the west side south of the Ettrick River. In the former they assume the form of a fine grained gabbro, in which on the surface the diallage is breaking down into chlorite. This rock is extremely hard, and forms the most impassable part of the coast, giving place to granite further south again. In the west all the country south of the Ettrick River is at the base granitic and gneissic, and the outline of the island is, in consequence, bold and rugged; great cliffs and numberless low-lying reefs being formed.

On the north bank of the Ettrick, in the west, occurs a well-marked and extensive outcrop of an upper silurian sandstone, which extends for some distance inland, bearing away towards the north-east. On the east side, again, immediately south of the Fraser River, is an outcrop of what is evidently the same rock, much modified by contact, doubtless, with the eruptive rocks—the gabbro—close to which it lies. There can be no doubt that this bed extends right across the island from west to east, though its thickness could not be ascertained.

There is no trace whatever, so far as could be seen, of any secondary formation.

In many parts of the island a tertiary limestone is found. It lies directly upon the granite, and is widely distributed. Thus it was cut through (though the depth of the bed was not recorded) in laying the foundation for the Wickham lighthouse before the grey granite was reached. Again an outcrop occurs half way from here to Yellow Rock, and on the east coast one a little south of Lavinia Point, and another at the Blow-hole Creek. On the west it is well marked on the coast between the Pass and Ettrick Rivers, inland near Porky Lagoon, and again forms an extensive formation on the surface inland from Fitzmaurice Bay.

With regard to the botany, specimens of the plants existing in the part of the island passed through by the party were brought back, and have since been submitted to the Baron von Mueller, who kindly promised to name them for the Club. The list* which follows the official record contains the names of these, together with others previously collected upon the island, and thus includes all the plants as yet recorded from the island, though, when the southern parts—especially the dense forest land near the "Wall"—is explored, the list will, doubtless, be increased. So far as it goes at present, the list is seen to contain 204 species, of which 16 are imported weeds, leaving 187 common to Victoria and Tasmania, and one found in Tasmania, and not in Victoria. The Baron von Mueller has been good enough to write the following note, with regard to one or two points of interest:—

"Amongst the most interesting plants brought by the expedition of the Club is the *Nablonium calyceroides*. As long ago as 1825 it was named and described by Cassini from a specimen gathered in King Island; only much later it was also found by Mr. Gunn near Macquarie Harbour, in Tasmania. In all probability this remarkable plant will yet be found near the sea-shores of Victoria. This specimen was collected about five miles east of Cape Wickham, in very wet ground bordering on the coast, where a constant stream of fresh water oozes from black loam between high sand-banks. It grew in society of *Polypompholyx* (no specimen secured), *Scleranthus biflorus*, and *Distichlis maritima*. The samples afforded me the opportunity to note the pure whiteness of the corolla and the violet tinge of the anthers.

"Specimens of *Samolus repens*, an exceedingly dwarf and small-leaved, but copiously flowering variety, were brought with somewhat rosy corollas, the plant, as a whole, reminding one of *Glaux maritima*. It does not seem that mistletoes have been noticed by the party, the genus *Loranthus*, though represented by more than one species quite to the southern extremities of the Australian continent, having never yet been traced to Tasmania. The whole of the vascular plants now known from King Island fall short of 200 species, but it may be assumed that this number will be doubled when, by renewed visits to the island, for which purpose the regular steam navigation between Victoria and Tasmania affords so much facility, all the dense scrubs and the many inland recesses shall have become penetrated by naturalists."

The fauna is of considerably greater interest than the flora, and shows the island to be Tasmanian rather than Victorian, a view which may, perhaps, receive further support when the list of the flora is more complete than it is at present.

With regard to mammals the evidence is both negative and positive. In the lowest forms, the Monotremes, the platypus was not captured, but the Echidna is most distinctly the hairy variety (*E. setosa*) of Tasmania. There are two varieties—a light,

* *Phyllocladus rhomboidalis* has been inadvertently omitted from this list. One of the Tasmanian surveyors, who some years ago was exploring in King Island, noted the occurrence there of the "celery-leaved pine" in his report.

and a dark; but in both, in the region of the back, the spines are short and the hairs very long.

In the marsupials the evidence is negative in the absence of numerous forms found in Victoria, and positive in the presence of the wallaby (*Halmaturus Billardieri*) and the brush kangaroo (*H. Bennettii*) of Tasmania. Certainly, both these forms are found on the mainland, but never, apparently, further south than the Ranges and northward from these into New South Wales. They do not occur in all the lower lying districts of Victoria (that is the part nearest to King Island), but are characteristic again of Tasmania. There is no true kangaroo upon the island, and in this and the presence of these two wallabies it agrees with Tasmania and differs from the part of the mainland nearest to which it lies.

In the birds the evidence is more striking. So far, 69 species have been identified, of which 54 are common to Tasmania and Victoria, 14 are peculiar to Tasmania, and only 1 to Victoria, the petrel (*Puffinus nugax*) had previously, in a list of Dr. Ramsay's, been noted as Tasmanian, though its name does not appear in the recent "Systematic list of Tasmanian Birds," by Col. W. V. Legge. The one peculiar to the mainland is the grass warbler (*Cisticola*), of which it has been already said that "it is not at all remarkable that it should have been discovered in King Island, considering it is such a wanderer; its habitat not only extending over Australia, but through the intermediate islands to Southern Asia." There are in all some 21 species of birds peculiar to Tasmania as opposed to the mainland, and out of these 14 are now known from King Island, while only one species is known which has hitherto been supposed to be confined to the mainland.

In reptiles the snakes and lizards were forms common to Tasmania and Victoria, with the exception of a local variety of the tiger snake.[2]

The fresh-water fish included *Anguilla Australis*, *Agonostoma Diemensis*, *A. lacustris*, *Galaxias ocellatus*, *G. delicatulus*, *G. truttaceus*, and *G. attennatus*, of which the two latter are considerably more common in Tasmania than Victoria.

The list of invertebrate forms cannot, as yet, be completed, but there is little doubt from the above evidence, negative and positive, that King Island is allied naturally as well as politically to Tasmania. Zoologically, the differences between the mainland and Tasmania are not very great, consisting in the presence of a certain number of different species of mammals and birds peculiar to Tasmania, in the presence of the Thylacinus and Sarcophilus (both, of course, recently extinct on the mainland), and more especially, perhaps, in its zoological poverty as compared with the mainland. As might be expected from its small size, King Island is still poorer, zoologically, than Tasmania, there being no trace of Thylacinus or Sarcophilus, whilst even the presence of a bandicoot is very doubtful; but in its peculiar species, as already seen, it resembles Tasmania.

Lying, as it does, half way between the mainland and the latter, there is, *à priori*, scarcely any reason why it should more resemble the one than the other, more especially in its birds, for though certainly outlying islands very close to the north-west point of Tasmania render the sea passage to the latter somewhat shorter than that between King Island and Cape Otway, still it must be remembered that even this is only fifty miles. There are, however, two points of importance to be noticed which have influenced the distribution of animals upon the island.

In the first place, the prevailing winds are southerly in direction—that is, they blow from the region of Tasmania, and are hence serviceable in carrying birds across the fifty miles of water in which, moreover, Hunter Island, Reid and Black Pyramid Rocks form, as it were, natural stepping stones. Right in the very north of the island is the Wickham lighthouse, from which, on a very clear day, the Otway light can be discerned on the mainland. On questioning the superintendent, he stated that scarcely a single bird ever came to the light, and that the very rare ones ever noticed by him had been ducks approaching from the landward side.

The second point is one of interest in connection with the distribution of land forms upon King Island. A line of soundings (as given in the Admiralty charts) between King Island and Tasmania gives an average of something like 32 fathoms. The lowest is 20, the highest 44, and the great majority range between 30 and 35 fathoms. A line between King Island and Cape Otway averages more nearly 48 fathoms. The lowest is 39; the highest 55. This fact—the greater depth of the channel between King Island and Otway—shows what is otherwise indicated and confirmed by the distribution of land forms, that King Island was in connection with Tasmania after it had become separated from the mainland. Possibly, as the land sank and an arm of the sea intervened between the Cape Otway district and the land to the south there was still a communication between the latter and the continent by a belt of high ground, only the highest summits of which now exist as a series of islands and rocks leading across from the north-west point of Tasmania to Wilson's Promontory. Certainly, the chain of soundings here shows considerably shallower water than that between King Island and Otway. The hilly country of the Promontory leads inland to the ranges, and thus Tasmania would finally be in connection with the part in which now exists its characteristic wallabies.

Lastly, even this connection with the mainland was lost, and further sinking of the land resulted in the separation of a series of larger and smaller islands to the north of Tasmania. One of these is King Island.

[2] Professor M'Coy has been kind enough to name this, together with the specimens of fresh-water fish brought back from the island.

Field Naturalists' Club of Victoria.

President:

A. H. S. LUCAS, M.A., B.Sc., F.G.S.

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With the view of popularising the study of the Natural History of the Colony, correspondence, notes, and queries relating to this subject are invited for insertion, and should be addressed to the Editor at the Wesley College, Prahran.

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OF THE

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The Author of each article is responsible for the facts and opinions he records.

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th December, 1887.

The president, Mr. A. H. S. Lucas, M.A., B.Sc., occupied the chair, and about seventy-five members and visitors were present.

The hon. librarian reported the receipt of the following donations to the library:—"Iconography of the Acacias of Australasia," decades 2, 3, and 4, from the Government; "Proceedings of the Linnean Society of New South Wales," second series, Vol. II., part 3, from the society; "A Descriptive Catalogue of the Medusæ of the Australian Seas," by Dr. R. von Lendenfeld, from the Australian Museum, Sydney; "Transactions of the Edinburgh Geological Society," from the society; "Journal of Pharmacy," November, 1887; and "Journal of Comparative Medicine and Surgery (New York)," from the editor.

The following persons were duly elected members of the Club:—Master P. V. Bevan, Mr. M. K. Dahle, Mr. F. N. Ingamells, and Dr. Lewellin.

There were no papers down on the notice paper for the evening, the meeting being devoted to the reception of reports from the members of the recent expedition to King Island, which were as follows:—

1. Mr. A. J. Campbell, as leader of the party, read the official report of the trip, giving particulars of the sub-parties organised, and the routes taken by them, etc., which were demonstrated on a large map of the island, presented by Mr. J. J. Shillinglaw, F.R.G.S.

2. Mr. D. Le Souëf read a list of the mammals, reptiles, and fish observed by the several parties, with short notes of interesting points

3. Mr. A. J. Campbell contributed a list of the birds and birds' eggs, noted or taken, and read some notes on the more striking species.

4. Baron F. von. Mueller, K.C.M.G., contributed a list of the plants collected by the members of the party.

5. Professor W. Baldwin Spencer, B.A., briefly summarised the scientific results of the expedition as tending to show that King

Island was separated from Tasmania at a date subsequent to its separation from the Australian mainland.

The exhibits of the evening consisted of the specimens collected at King Island, and were displayed in the lower rooms of the building, and consisted of animals, birds (mounted and skins), reptiles, including live snakes and lizards, insects, shells, marine objects, plants, etc. These were contributed by Professor Spencer, Messrs. Campbell, Cornwall, Chander, Dixon, French, Le Souëf, M'Kibbon, and others. A fine series of photographic views of the camps, notable spots, scenery, etc., were shown by Mr. L. Hart.

After a very pleasant *conversazione* the meeting terminated.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 16th January, 1888.

The president, Mr. A. H. S. Lucas, M.A., occupied the chair, and about forty members and visitors were present.

The hon. librarian reported the receipt of the following donations to the library:—"Prodromus of Zoology of Victoria," decade 15, from the Government; "Proceedings of Royal Society of New South Wales," Vol. XX., 1886, from the society; "Journal of New York Microscopical Society," Vol. III., No. 4, from the society; "Journal of Natural History Society" (Brunswick, Germany), from the society; "Papers on Ornithology of the Caroline Islands and Diego Garcia," by Dr. Otto Finsch, from the author; and "Journal of Pharmacy," December, 1887, from the society.

The hon. secretary read an account by the leader (Mr. C. French, F.L.S.) of the Club excursion to Berwick on Saturday, 19th November, who reported that insects were, as a rule, scarce. Of beetles, about twelve species of buprestidæ were taken, but none of them particularly rare. Among the other beetles obtained, the best was *Chrosis trisulcata*, a fine member of the Elateridæ. A specimen of the handsome butterfly *(Hipparchia abroma)* was almost the only lepidopterous insect taken. Of flowering plants, the pretty *Aster adenophorus*, the white iris *(Diplarrhena Moræa)*, the white variety of *Bauera rubioides*, *Gompholobium Huegelii*, *Pimelea flava*, and *Grevillea alpina*, and the orchids *(Diuris oculata* and *Dipodium punctatum)* were the most noticeable obtained. Specimens of the fern, *Gleichenia dicarpa*, were obtained for cultivation.

An interesting account of the Club excursion to the Plenty River, at Bundoora, on Saturday, 17th December, was read by Mr. D. Best, the leader of the party. This locality, which is about 12 miles from town, is noted for the many and rare species of coleoptera to be obtained there, and on this occasion the members were fairly successful. The leptospermum scrub

was in full bloom and quite alive with various insects. Among the beetles taken may be mentioned the longicornes, *Macrones exilis*, *Eroschema Poweri*, *Amphirrhoe decora*, *Hesthesis cingulata*, *H. plorata*, *Uracanthus biritta*, *Tritocosmia Roei*, *T. paradoxa*, *Psilomorpha* sp., *Pempsamacra dispersa*, *P. pygmæa*, and *P. vestita*; of buprestidæ about 20 species were obtained, also many representatives of the other families. Cicadas were, of course, plentiful, while some good lepidoptera, hymenoptera, and diptera were also taken. A fine specimen of the orchid *Dipodium punctatum* in full bloom was noted, and the pretty blue "pincushion" flower *(Brunonia Australis)* was very plentiful. Some fine specimens of the native cherry *(Exocarpos* sp.,*)* were noticed in full fruit. Unfortunately, the river was rather high, and the usual crossing places being covered, prevented the eastern bank from being thoroughly worked.

The following persons were duly elected members of the Club:—Mrs. M. H. Davies, Master Davies, Miss M'Gowan, and the Rev. G. Hay, M.A.

The president announced that Mr. C. A. Topp, M.A., one of the vice-presidents of the Club, had been elected a Fellow of the Linnean Society of London.

The president laid on the table, for the information of the members, an advance proof of the greater portion of part 1 of Baron von Mueller's "Key to the System of Victorian Plants," and remarked that the work would be a very great help to Victorian botanists, and as a local flora would probably be unequalled in the world. His remarks were endorsed by Messrs. C. A. Topp, F.L.S., and J. E. Prince.

PAPERS READ.

1. By Mr. H. W. Hunt, on "The Coloration of Birds' Eggs." The author advanced three general rules for the colour exhibited by the eggs of various species of birds. Firstly, that eggs laid in dark situations or by nocturnal birds are, as a rule, white; secondly, that eggs laid on the bare ground or in exposed situations are usually coloured like their surroundings; and thirdly, that eggs laid in open nests are generally conspicuously coloured. He also made the suggestion that birds may have a love of the beautiful, and therefore make the power of laying of variously coloured eggs a point in the selection of their mates. The paper was well illustrated with specimens, and gave rise to an interesting discussion, in which Prof. Spencer, Messrs. Lucas, Topp, and others took part.

2. By Mr. H. T. Tisdall, F.L.S., "The Fungi of Victoria," part 1. The author pointed out several differences in the different groups of fungi, and gave a more detailed account of the structure of the genus *Agaricus*, and submitted a list of species mostly collected by himself in various parts of the colony. The paper was illustrated with dried specimens.

Mr. D. M'Alpine, F.C.S., drew attention to a paragraph in a recent number of *Nature*, urging the attention of botanists to the closer study of the life histories of the common plants around them.

Professor Spencer read some particulars of an interesting fossil—a portion of the cranium of a *Physeter*—recently found by Mr. S. H. Wintle, F.L.S., at Cheltenham.

The following were the principal exhibits of the evening:—By Mr. F. G. A. Barnard, coleoptera and other insects collected at Berwick, Narre Worran, Bundoora, aud Kew during December; also a specimen of turf-plate, a German substitute for cork for entomologists. By Mr. D. Best, coleoptera taken at Bundoora excursion. By Mr. A. J. Campbell, eggs of spotted emu (*Dromaius irroratus*), white-winged butcher-bird (*Cracticus leucopterus*), and Australian dottrel (*Eudromius Australis*), all from Western Australia; also descriptions of eggs of the long-legged tern (*Sterna anglica*). By Mr. C. French, jun., eggs of black-throated grebe, hoary-headed grebe, Australian tippet grebe, little cormorant, and spotted bower-bird. By Mr. F. R. Godfrey, the long-legged tern (*Sterna anglica*) and eggs, the marsh tern (*Hydrochelidon hybrida*), and the Australian pratincole (*Glareola gallana*), from Pevensey, near Hay, New South Wales. By Mr. W. R. Guilfoyle, F.L.S., flowers of seven varieties of *Eucalyptus ficifolia* (F. v. M.), the scarlet-flowered gum of Western Australia, grown at the Botanical Gardens. By Mr. W. Hatton, silver ore from Broken Hill, N.S.W., and from Penguin River, Tasmania; also tin ore from Mount Bischoff, Tasmania. By Mr. E. H. Hennell, beetles, etc., taken at Bundoora excursion. By Mr. H. W. Hunt, eggs, in illustration of paper. By Mr. D. Le Souëf, mounted specimens of an albino laughing jackass (*Dacelo gigas*) and an albino brindle nail-tailed kangaroo (*Onychogalea frænata*), from Queensland. By Baron von Mueller, K.C.M.G., specimen of *Wahlenbergia gracilis* (blue-bell), with double flowers, from East Gippsland. By Mr. G. Renner, mineralogical specimens from Richmond quarries, etc. By Mr. J. Seale, 200 specimens of coleoptera, etc., taken at Bundoora excursion. By Mr. Percy Scott, a live specimen of a rare lizard, the broad-banded cyclodus (*Cyclodus occipitalis*), from the Wimmera district. By Prof. Spencer, geological specimens, etc., forwarded by Mr. S. H. Wintle, F.L.S., comprising portion of cranium of *Physeter*, from Cheltenham; examples of *Phyllograpsus* and *Didymograpsus*, and a small portion of a doleritic basalt boulder, weighing half a hundred-weight, found in centre of coal seam, Moe Company's mine, one side of which was planed; fossil fruit from coal measures, Ipswich, Queensland. By Mr. H. T. Tisdall, F.L.S., specimens of fungi, in illustration of paper.

After the usual *conversazione*, the meeting terminated.

BOTANICAL TRIP TO THE WIMMERA.

By C. French, F.L.S.

(Department of Government Botanist.)

(Read before the Field Naturalists' Club of Victoria, 14th November, 1887.)

Baron von Mueller being anxious to trace out and fix the geographical limits of certain plants, also to procure, if possible, (for the "Key") additional species from the north-western portion of the colony, suggested to me that I should spend my annual leave of three weeks in the Wimmera district for that purpose. This I at once agreed to do, as the district was strange to me, and I was desirous of seeing the singular country of which I had heard so much.

I left Melbourne on the 29th of August by the 6.30 a.m. train, and, after a long and somewhat dreary ride, reached Dimboola (250 miles from Melbourne) at about 7.20 p.m. of the same day. The night was cold, wet, and as dark as pitch. I had, however, some useful hints from Mr. D. Le Souef, and had but little difficulty in finding the hotel, the proprietor of which (Mr. M'Lellan), being a bit of a naturalist himself, made me very comfortable, and we were soon on very good terms.

Shortly after my arrival at the hotel I found a very kind letter from Mr. Percy Scott, of the Albacutya Station, proffering assistance in enabling me to get into the back country, as the Baron was desirous that I should proceed, so far as time would permit, towards the Murray River.

I had not been long in Dimboola before I found that I had come a day too late for the mailman, with whom I proposed to drive to Albacutya. I had, therefore, to wait three days before I could make a fair start, so I resolved to go on to the Aboriginal Mission Station, situated about ten or twelve miles from Dimboola.

Having some time to spare, I went for a stroll around the town, and was somewhat surprised at the number of shops of all kinds; Dimboola, as you are aware, is situated on the Wimmera River, and is one of the oldest settlements in the colony.

After seeing the sights of Dimboola, I obtained a conveyance and drove out to the Mission Station, and, having an introduction to the pastor (the Rev. Mr. Kramer), I was most hospitably received by himself and his wife, Mr. Kramer having just finished the marriage service on the occasion of the first European wedding which had taken place since the establishment of the mission.

The natives here seemed very happy and contented, the little black children running to and fro being to me quite a novelty.

They are, so Mr. Kramer informs me, very delicate, especially the girls, who, from some sad cause, die when they are about two years of age. The boys are, as a rule, more robust, although the past winter has carried off many of the old people.

Mr. Kramer is one of the pious and hard-working Moravian missionaries, and, from what I could see, spared neither time nor trouble upon his little flock. He is to them the true type of the "Village Schoolmaster" of Goldsmith.

I stayed here with my kind friends for two days, and, having in the meanwhile made some few arrangements with the natives for collecting zoological specimens, I left at 9 a.m. for Albacutya Station, having secured a seat in the mailman's buggy.

The road to the station, the residence of Mr. Arthur Scott, having so recently been described in such a pleasant manner by Mr. D. Le Souef, I shall but briefly touch upon the subject.

Shortly after starting our road lay through box flats, and then between dense mallee, the smaller species of gum *(Eucalyptus uncinata)* being, so far as I could see, the commonest kind, the variety of *E. crassifolia* (commonly known as *E. dumosa*) being also very plentiful. We saw several waggons loading the leaves of these mallee gums for the Eucalyptus Oil Factory, at Antwerp, which, by the way, we had just passed.

The common, though very pretty, "Virgin's Bower" *(Clematis microphylla)* was just out of flower, it having in some places completely covered the mallee, whilst the beautiful aster *(A. pimelioides)* was in full bloom, and could be seen nearly a mile away.

Small flowers, with the exception of *Menkea Australis* (which covered the ground for miles with its pretty Alyssum-like flowers), *Toxanthus Muelleri*, and *perpusillus*, were very poorly represented.

I had almost forgotten to mention the very terrible storm which came on whilst I was at the Mission Station, and from the effects of which houses in Dimboola were partly unroofed, and along the track huge pines, bull oaks, and gums lay scattered on the ground in all directions, many having been completely uprooted.

After a pleasant, though somewhat cold drive, we came in sight of Lake Hindmarsh Station, where we had to make a detour to "Tullyrea," the former residence of Mr. Scott, and here the Wimmera had to be crossed in a boat, the Tullyrea homestead being beautifully situated on an eminence on a steep bank of the river.

The tree-tobacco *(Nicotiana glauca)* grows here in great luxuriance, some of the plants being nearly thirty feet high, it being an introduction, and I was, on the whole, much impressed with the great number of introduced weeds which I had seen on the way up from Dimboola.

The river having been safely forded the "traps" were carried up the steep bank, when, after having had a very acceptable pannikin of tea from the person in charge of the homestead, we again started for Albacutya.

The rain now came down in torrents, and, with a strong, biting wind in our faces, driving was not the most pleasurable of occupations, and we were glad when we reached the mail-man's house, where we had an excellent luncheon. Our road lay to the left of Lake Hindmarsh, which was, by reason of the mist, but very indistinctly seen.

The lake itself is a magnificent sheet of water, the area being about 30,000 acres. It has a sandy beach, on which grows a belt, in some places nearly 100 yards wide, of red gum (*Eucalyptus rostrata*); some of which had, I noticed, been cut down for various purposes.

As the Baron had desired me not to collect on this side of the lake—he having in 1853 been there himself—I took but little notice of the plants which were growing in the vicinity.

As it was now getting late in the day, we pushed along at a good speed, passing through dense mallee scrubs, deep sand, and box flats. No sand-hills were seen on the way up.

We were by this time getting within an easy distance of the station, and before coming to the rabbit and dog-proof fence we were hailed by a most remarkable-looking old man, who emerged from some scrub, and whose face and hands were besmeared with blood, whilst in his belt he carried a huge and most sanguinary-looking knife, and altogether he was not the kind of person whom one would like to meet in the dark. I afterwards learned that he was an inoffensive rabbit-trapper, who lives alone in these solitudes.

The dog and rabbit-proof fence extends, I am informed, from near Swan Hill to the Adelaide border, a distance of 226 miles, enclosing an area of 8,000,000 acres, the cost of erection being about £98 per mile. It is said to be a great success.

It was now nearly dark, and, as the moon had not yet made its appearance, it was no easy matter dodging (with a pair of horses) the prostrate Murray pines, etc., amongst which the effects of the late storm here also worked great havoc. The slip-panel of the horse paddock was now announced, and in a very short time we heard the barking of the dogs, and the lights from the men's huts were plainly visible.

Having alighted from the buggy I was met by Mr. Percy Scott, and, having washed and made myself somewhat presentable, I was introduced to Mr. and Mrs. Scott and their family. I was most kindly received, and I take this opportunity of publicly thanking them, one and all, for their kindness and attention, without which my mission to the north-west would have been an undoubted failure, instead of, at least, a partial success.

I arrived at Albacuyta Station late on Saturday night, and, after having refreshed the "inner man," Mr. Scott was good enough to suggest a plan by which I was enabled to enter upon my work without loss of time; and as the dray was going out to a camp situated about eleven miles north-west of the station, I gladly accepted the proposal to go with it, and thus my first real collecting work was about to be commenced.

We left the station shortly after noon on Sunday, and reached Paul's Camp—which is pitched in a very romantic spot, as the very truthful sketch (kindly made for me by Miss Mabel Scott) will show—at about sunset; and whilst the men were rigging up my little tent, and preparing supper, I took a stroll to see what the district produced in the way of plants.

I have said that the country was quite new to me, and the desire to explore a huge sand-hill, about 300 feet high, was more than I could resist, so I determined, although nearly dark, to go to the top, if possible, that night. I reached the summit after a pretty hard climb, the sand being loose and as white as the beach at St. Kilda.

After fossicking about for a few minutes I saw, under a solitary Murray pine, a most curious-looking object, which completely puzzled me, but on closer inspection I found it to be a most remarkable fungus, belonging (the Baron informs me) to the genus Battarea, and approaching *B. phalloides*, a single specimen of which has recently been found at the Murchison River, Western Australia, and is now in the Botanical Museum collections.

It was by this time dark, so I had to beat a hasty retreat towards the camp, which, owing partly to the large and cheerful fire burning, I had no difficulty in finding, leaving the prospecting of these singular-looking sand-hills until morning.

Lake Albacutya is now quite dry, and is covered over with a very dense growth of herbage. Many valuable fodder-plants are here on the lake, which is a most valuable adjunct to this large sheep-run, comprising, as it does, about 600 square miles of country. The lake forms a most conspicuous object, and affords an excellent land-mark for travellers.

I saw no tracks of wild cattle, it being too early in the season for them. I felt quite contented at their absence, and agree with Mr. Le Souef when he says that the sport of hunting them is more dangerous than pleasant. Mr. P. Scott, however, holds a different opinion.

It was now "supper" time, so, having partaken of an excellent meal, served up on the family (tin) plates, we sat around the fire and chatted until bedtime, I anxiously looking forward to the morning, when I hoped to be early amongst the sand hills.

The rain during the night poured in torrents (the wind on the previous night having blown the tents down), and, as the water was making some inroads under my bed, I had to turn out and dig a trench, my previous experience of life under canvas and under drays during 1853-4, between Melbourne and the "diggings," having many times been of great use to me.

As the day broke, I looked at my watch and found that it was 5.30, so I turned out, and started for the steep sand-hill which I had visited on the previous evening, and on which I had found the fungus. I got to the top with less difficulty than before, the rain having made the sand more firm and the ascent easier. I was very pleased to find a fine "patch" of the Battarea, the only one seen during my trip, although I scoured the country for miles in every direction.

These fungi grow in pure sand, some of the specimens, when pulled up, being twenty-two inches in length, but have now shrivelled. It belongs to the puff-ball section of the order, and I should have much liked to have seen it in its earlier stages. The specimens of this and of many others of my plants are here this evening for your inspection.

Gathering up my prizes, I got back to the camp, breakfasted, and started out for the back country, Mr. Scott having kindly sent a man out with me for the first day, so as to enable me to get the position and "lay" of the country to the north-west of the camp.

We again crossed the big sand-hills and came to a beautiful flat, forming quite an amphitheatre between the hills. I found here some very pretty plants, such as *Baecka Behrii*, *Thryptomene ericœa*, *Anthocercis myosotidea*, *Adriana tomentosa*, and many others, most of which I had only previously seen as herbarium specimens.

As we ascended sand-hill after sand-hill (some nearly 400 feet high) I found many plants of interest, among them being a very beautiful bright-blue aster, *A. Huegeli*, *Cryptandra tomentosa*, and *Bertya oleifolia*. Huge tufts of the porcupine grass *(Triodia irritans)* were seen, which, although curious enough, makes locomotion somewhat unpleasant.

Ascending a huge sand-hill, we could see, as far as the telescope would help us, miles of these singular hillocks of sand, reaching, so I am informed, for over 100 miles, and woe to the unlucky traveller who gets lost here, for there is no water to be had, excepting from a few artificial wells, which would never be found by anyone who was not thoroughly acquainted with the district.

The whole country about here is covered with a dwarf species of Casuarina, or "she-oak," probably a variety of *C. distyla*, and on this plant sheep are said to thrive admirably.

We now come to a large belt of mallee, the first seen since leaving the station, and in this was found a very curious plant which I had not seen before—viz., *Didymotheca pleiococca*, a plant belonging to the order Phytolacceæ. I was somewhat puzzled with this plant at first, but, having the "Key" with me, I soon made it out.

The acacias in this district are very beautiful, *A. Calamifolia* and six or eight others being at the time of my visit in full bloom, the air being quite perfumed by them.

A few stunted plants of the bitter quandang (*Santalum persicarium*) was found on the dry hard levels, and in the vicinity the edible one (*S. acuminatum*) was just beginning to ripen its singular fruit.

The day, up till 1 or 2 o'clock, had been fairly fine, but heavy clouds now having made their appearance, with every indication of a heavy downpour of rain, we made "tracks" for the camp, distance about seven miles, which was reached just in time, as the rain now fell very heavily.

The next days I was out alone, and made a pretty complete search of the country north and north-west for miles, where I found many plants of interest. I had to leave for the station to write my letters, and post specimens of what I had collected to the Baron. I found I had between 70 and 80 species of flowering plants, not a bad lot, considering that, partly on account of the great heat which I had expected in this part of the colony, I had started fully a month too early.

Having reached the station I posted my letters and parcels, and in the morning made an early start for Paul's Camp again, being anxious to do as much as possible before I left the district; and having a good pair of horses I was not long in reaching my former camp. I went across the sand-hills in a northerly direction, where I found *Hybanthus floribundus*, *Baeckea crassifolia* and many others, some of which will be well worthy of cultivation; and I append a list of a few of the plants which I consider it would be advisable to try to secure for this purpose.

The next few days were spent in collecting the smaller plants, as lichens, mosses, and fungi—a good many being found; the lichens in this district being mostly terrestrial, although the common Usnea ascends to the tops of the highest Murray pines, the latter tree, between the sand-hills, being of a very large size, and is invaluable for fencing, etc., etc.

A few days after this a trip was arranged to Mud-brim Spring, distance about fifteen to eighteen miles, and here was found a pink-flowered variety of Eucalyptus, named, the Baron says, many years ago by Cunningham as *E. bicolor*. In and around the spring was found *Limosella aquatica*, Lemna, and other moisture-loving plants.

A curious black fungus grew on the sand-hills near here, it looking like little black sticks stuck into the white sand. I think it must belong near to the genus Sphaeria, (?) but of this I am not certain.

Correa speciosa (the scarlet and orange variety) grew here in profusion. Also, I found for the (for me) first time *Eriostemon pungens*, a plant which I had not seen before in a living state. *Ophioglossum vulgatum*, the little adder-tongue fern, grew here, there, and everywhere, but I was too early to get it in fruit, the *sporecases* being just visible. The spring is fenced in, and a very large nest of the wedge-tailed eagle has been built in a fork of a red-gum tree. The nest can be seen for a considerable distance.

In a large saline flat, which extends for several miles, grew an immense number of plants (very scraggy) of *Lycium Australe*, the partly dead stems of which are thickly covered with a pretty, though very common, scarlet lichen *(Thelochistes)*, and which, when the sun is shining brightly, can be seen for miles, the effect being very singular and pretty, the whole flat being covered with an undergrowth of *Capsella elliptica*, with a common moss *(Funaria hygrometrica)*. Here was found *Glossostigma Drummondi*, a plant new to Victoria.

Near this flat, on the slopes of a range of low hills, occur a series of subterranean springs, which have here and there "outlets," the latter being very dangerous to travellers who are unacquainted with the district. The whole of the flats are covered with a magnesia crust. This locality is very picturesque, and is near the beautiful Rainbow Rises, the country being undulating, interspersed with belts of mallee and box *(Eucalyptus largiflorens)* flats, the Murray pine being very common everywhere.

My stay was now drawing to a close, so a more extended trip was arranged for, and we started (three of us) for a place called Chinaman's Flat, situated about 25 miles north-west from the station. We passed through large belts of mallee, well grassed, and soon came to "Pijick," a country of sand-hills. (I am again indebted to Miss M. Scott, who rode out from the station on purpose to make this sketch for me.) We camped here, boiled the billy, had lunch, and again started. We reached the camp about three o'clock, where we camped for the night, there being a very sharp frost.

Near here a splendid well has been sunk by Mr. Scott, the output of good water being very considerable. It is worked by horse power, and is about 100ft. deep; a most valuable auxiliary in such a dry country. In sinking this well there were found some very interesting fossil marine shells, and these were obtained at the 80ft. level. (I have a few specimens to show you this evening.) Another, to me, strange fact is the existence of the

common ti-tree *(Leptospermum laevigatum)*, which lines our coasts from St. Kilda to Cape Schank, and onward. It is a very small-leaved variety.

This place I found to be a very good one for plants, and having collected *Lasiopetalum Behrii*, *Daviesia brevifolia* (a beautiful sp.), *Prostanthera coccinea*, and a number of other handsome shrubs, we started early next morning for a camp ten miles further on, and it was here that I found *Eriostemon capitatus* (it being new to Victoria), *Halgania lavandulacea* (one of the handsomest plants found during the trip), *Eriostemon difformis*, *E. sediflorus*, *Westringia rigida*, *Boronia coerulescens*, and others, all of which are well worthy of cultivation. This place is about 125 miles north-west of Dimboola.

The timber in this district is very scarce, we having had to "grub up" the mallee roots for the purpose of firewood. We reached the station on the evening of the third day, well pleased with our trip, the country over which we had travelled being very interesting, and most diversified. Timber is, as a rule, not large in the north-west, although the red-gum and box grow to a good size. There are about seven or eight kinds of eucalypts to be found between Dimboola and Albacutya; perhaps more, but, if so, I did not see them.

The Nardoo *(Marsilea)* is common in all the waterholes about Albacutya, and the common "silver grass" *(Festuca bromoides)* (introduced) is too well known to need description here.

The time had now arrived when I had to say good-bye to my kind and hospitable friends. What time I had to spare had been spent in the most pleasant manner with Mr. Scott, Mrs. Scott, and the young people. I shall not readily forget my trip to Albacuyta, for, although I did not find many plants of special interest, I have seen the country, and we know now what it contains in the way of plants—at least, so far as the season at which time I was there is concerned. Zoological notes were not neglected, and may, on some future occasion, be used as a "stop-gap" when we are short of papers for our monthly meetings.

I left Albacutya early in the morning, in company with a Mr. Evans, of Bedooba Station, New South Wales, a most agreeable companion, who had been visiting the district, and who was one of our party to Chinaman's Flat, etc., Mr. P. Scott being the other. We lunched with Mr. Binns, manager of Lake Hindmarsh Station, and afterwards made a short detour for the purpose of saying farewell to the good folks at the Mission Station, and to get some zoological specimens which the blacks had collected for me during my absence.

My last day was spent in the neighbourhood of Dimboola. We made an early start, and scoured the country around for

some eight or ten miles. About three or four miles from Dimboola there is a very singular forest of dwarf stringy-bark (*Eucalyptus largiflorens*). The country is mostly sandy, fearfully dry, and in many places is covered with low banksia scrub, some of the thickets being so dense that it is no easy matter to push ahead through them. We drove from the forest towards the Wimmera, when we rested the horses and lunched. I was surprised to find so little on the banks of the river, which, I was informed, had only recently been running very rapidly, and was a banker; so, doubtless, the smaller plants were covered up with mud. There were no signs of aquatic plants in the river, although I looked for them very carefully. Near the river was a fine patch of *Drosera glanduligera*, a charming scarlet flower sp., which grows also at Brighton, etc. After a rest—the day being very hot—we harnessed up the horses, and steered away towards the outer skirts of Stringybark Forest, where I found the beautiful *Zieria veronicea*, a pink flower sp., with a peculiar scent, and well worthy of cultivation. This sp., I found, invariably grew in the tussocks of the spinifex, so that it had to be collected under difficulties. *Styphelia sonderi* and *Eriostemon sediflorus*, the latter a charming yellow-flowered sp., grew here in great profusion. The tall spikes of *Epacris impressa*, I noticed, attained a height of over six feet, and the flower is much stouter and of more substance than the common Brighton form. The country about here is a very dangerous one to drive or ride through, it being thickly covered with rabbit-burrows, and more than once the horses were nearly down.

It was now getting late, so we had to make tracks for Dimboola, and in passing through a most dismal-looking part of the forest, we were surprised to hear the sound of an axe. On getting out of the buggy and going towards where I heard the sound, a most hideous-looking old Chinaman emerged from behind a bush, he being on a bark marauding expedition, and, evidently mistaking me for a myrmidon of the law, he quickly informed me that he was "welly poor," although we afterwards came across his horse and cart—quite a respectable turn-out—and these were hidden in some thick scrub, it being against the law to strip the trees of their bark. I afterwards found out that this "welly poor" and "unwashed" gentleman had had considerable experience in the bark-stealing line.

The farms in the Dimboola district looked really well, they having had, so I was informed, a most favourable season; but when the heat sets in I fear that the lives of these farmers is not of the most pleasant kind.

I left Dimboola by the train, which leaves at midnight, and reached Melbourne at a quarter to ten o'clock on the following morning, having been away exactly three weeks.

I have finally to thank Baron von Mueller for his kindness in naming my plants for me, also for his encouraging letters, received when the prospects of collecting did not look particularly bright.

Appended is a list of the flowering plants, which I think it would be desirable to cultivate; also a complete list of the species collected during the trip—the latter, owing to limited space in the journal, being for the present omitted, and this remark will also apply to the Cryptogams collected, and which number a good many kinds.

CHAS. FRENCH.

12th November, 1887.

PLANTS FROM NORTH-WEST OF LAKE ALBACUTYA, CONSIDERED BY ME TO BE WORTHY OF CULTIVATION.

	Colour.	Height.
Acacia spinescens	Yellow ..	3 feet.
,, brachybotrya	,, ..	12 ,,
,, hakeoides	,, ..	8 ,,
,, rigens	,, ..	4 ,,
Aster Huegeli	Blue ..	2 ,,
,, pimeloides	White ..	6 ,,
Anthocercis myosotidea	,, ..	3 ,,
Baeckea crassifolia	Pink ..	2 ,,
,, Behrii	White ..	2 ,,
Boronia coerulescens .. .	Lilac ..	2 ,,
Cassia Eremophila	Yellow ..	12 ,,
Daviesia brevifolia	Crimson..	2 ,,
Didymotheca pleiococca	Red ..	2 ,,
Eriostemon capitatus	Yellow ..	3 ,,
,, pungens	White ..	2 ,,
,, difformis	Pink ..	2 ,,
,, lepidotus-var. stenophyllus	Yellow ..	6 ,,
Eucalyptus bicolor	Pink ..	50 ,,
Grevillea Huegeli	White (?)	5 ,,
,, pterosperma	Red (?) ..	5 ,,
Halgania lavandulacea	Blue ..	2 ,,
Hybanthus floribundus	,, ..	3 ,,
Kunzea pomifera	? ..	5 ,,
Phyllota pleurandroides	? ..	3 ,,
Prostanthera coccinea	Scarlet ..	3 ,,
Styphelia cordata	? ...	6 ,,
,, costata	White ..	2 ,,
Thryptomene ericæa	,, ...	2 ,,
Westringia rigida	White and pink (?)	2 ,,
Zieria veronicea	Pink ..	2 ,,

REVIEW.

We have received advance proofs of the greater part of Baron von Mueller's "Key to the System of Victorian Plants," Part I., undertaken at the instance of the Field Naturalists' Club, and especially on the suggestion of the Hon. Dr. Dobson.

It will be remembered that Part II. of the Key was published rather more than two years ago. With the portion of Part I. already in print, it is possible to arrive at a tolerably complete idea of the nature, scope, and quality of the work. The conclusion we have come to is that the members of the Field Naturalists' Club, and workers in Victorian botany in general, have acquired a working "flora" of the colony of exceptional value.

Part I. commences with the essential feature of the book—the gradual differentiation of the plant forms in successive dichotomies. These are given under four chief headings. First, there are the main divisions; secondly, the dichotomies of the orders; thirdly, those of the genera; and, fourthly, those of the species. The dichotomous method is faithfully adhered to throughout. But we are not left to bare alternatives, so that a correct diagnosis of the order, genus, or species we are inquiring about does not merely and solely depend upon our having always taken the right turn at each of the many points at which the road forks. Two important checks are provided. Each order, genus, or species has, when reached by the prescribed method, a short, pithy diagnosis appended in a smaller type. And by a triumph of art, which could only have been achieved by a master in botany, the artificial differentiations have been made to follow so closely the lines of the natural differentiations that allied orders appear, as in an ordinary flora, side by side, and so with allied genera and allied species. We have not detected an instance in which the exigencies of the system have forced a plant to an unnatural distance from its congeners.

In nature we have variation of the freest, and plants were not created for genera, but genera for plants; so that when a natural group is characterised by an assemblage of features, it is often found that all members of the group do not possess all the features, but that all possess most of the features. It often happens then that not a single feature of importance is actually found in all the members. In any method of classification there will be, in consequence, exceptions in the larger groups. These are indicated in the Key in the early stages, and the reader put on his guard accordingly.

Some of the natural orders are represented in Victoria only by aberrant forms, *e.g.*, the *Lauraceæ* (with only *Cassytha*, a twining genus), the *Anonaceæ* (with only perigynous forms), etc. The key separates such orders by natural distinctions of world-wide application, but gives the clue to the local representatives

in smaller type. The wisdom of this will be seen, even for local purposes, when we consider that the opening up of East Gippsland will most likely add other and conforming genera to our flora.

We notice a new departure of importance. For years botanists have been content to use many zoological terms, occasionally in quite foreign senses, for various structures in plants. For instance, the food supply for the young plant in the seed, which often chiefly consists of starchy or oily substances, is termed albumen. The Baron avoids the *suggestio falsi* by coining the word "albument," which, as it always appears in "albument of the seed," and sufficiently resembles the standard term, is not likely to be at all misleading. So, instead of ovary, appropriated already by the zoologists, the Baron proposes ovulary, which is unexceptionable, and no longer ambiguous. Similarly we have placentary for placenta. The principle is carried out rigorously, so that even such terms as heads (in Compositæ, etc.), hairs, bristles, veins, etc., are discarded, and the diminutives—headlets, hairlets, bristlets, venules, etc., are used instead. Of course this is revolutionary, and we shall be interested to note how this proposal to move forward is greeted by the scientific world. There will be difficulty, we imagine, in eliminating or modifying terms which are similarly derived from zoology, and are fixed in names of genera or species. *Labiatæ* may easily become *Lamiaceæ*, but will the Baron be disposed to alter *hirsutus*, *barbatus*, *caudatus?*

We understand that, in addition to the very valuable table of geographical distribution and the woodcuts of 150 plants with their anatomy, in Part II., the Key will be furnished with a map of Victoria, and with a number of lists in Part I., which will give further aid to students. There will be a list of our maritime plants; of our aquatic, parasitic, etc., plants; of plants with brightly-coloured calyx or corolla; of unisexual forms, etc., etc. All these matters will render the work of great practical utility, and, moreover, exhibit the great care and labour which the author has bestowed upon it. The difficulties of arranging 1700 species (and 60 have been added to the Victorian flora during the preparation of the Key) in a dichotomous system, so as not to break up the natural alliances, must have been enormous, and we heartily congratulate the Baron on having produced for Victoria one of the handiest, simplest, and most useful floras in the world.

It may interest some of our botanists to know that *Spiranthes Australis* was found in flower in January, the plants growing abundantly in a grassy paddock close to the township of Lilydale, also in swampy ground near the Olinda Creek, half a mile south of Lilydale.—C. A. Topp.

Field Naturalists' Club of Victoria.

President:

A. H. S. LUCAS, M.A., B.Sc., F.G.S.

THIS Club was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

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The proceedings of the Club are recorded in its journal—the "Victorian Naturalist." Annual subscription, 6s. 6d., post free. (To members free.)

With the view of popularising the study of the Natural History of the Colony, correspondence, notes, and queries relating to this subject are invited for insertion, and should be addressed to the Editor at the Wesley College, Prahran.

Any of the numbers from the commencement, January, 1884, can be obtained from the Hon. Sec., Mr. F. G. A. Barnard, Kew, at sixpence each; or in sets, Vol. I (1884-85), 16 numbers, 7s. 6d.; Vol. II. (1885-86), 12 numbers, 6s.; Vol. III. (1886-87), 12 numbers, 6s.; each set with title-page and index for binding.

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OF THE

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The Author of each article is responsible for the facts and opinions he records.

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 13th February, 1888.

The president, Mr. A. H. S. Lucas, M.A., B.Sc., occupied the chair, and about sixty members and visitors were present.

A letter was read from Mr. J. D. Stocks, Lakes' Entrance, with reference to the wholesale slaughter of sea-gulls on the Gippsland Lakes, and was referred to the sub-committee on the protection of birds.

The hon. librarian reported the receipt of the following donations to the library:—"Iconography of the Acacias of Australasia," Decades 5, 6, 7, and 8, from the Government; and the "Journal of the Royal Geographical Society of Australasia," Vol. V., Part 2, from the society.

The hon. secretary read a short account of the Club excursion to Alphington on Saturday, 4th February, which was poorly attended, owing to the threatening weather. The members present devoted themselves to entomology, and worked along the River Yarra, above the Darebin Creek, but, rain setting in, the outing was soon rendered very unpleasant. However, about twenty-five species of beetles were obtained, also some hymenoptera, diptera, and orthoptera; among the latter may be mentioned two fine specimens of the family phasmidæ (*Cyphocrania* sp. (?), each measuring over 7in. in length.

Mr. J. T. Raw was duly elected a member of the Club.

A visitor ("Bush Naturalist," of the *Queenslander*) was introduced to the meeting, and gave an interesting account of the Queensland alligators.

PAPERS READ.

1. By Rev. F. R. M. Wilson, entitled "Notes on Lichens." The author addressed his remarks principally to young beginners, referring to the proper methods of studying lichens. He gave an account of the books obtainable and useful for this branch of botany.

2. By Mr. A. J. Campbell, on "The Oology of Australian Birds," being supplement, Part 4 (for 1887), to his original list.

The author described the eggs of sixteen species of Australian birds, recorded for the first time in 1887, and exhibited specimens of most of them.

3. By Mr. H. Watts, entitled "Recent Additions to Microscopical Natural History," in which he mentioned the finding, by himself, of ten new species of animal and other parasites, and the addition of seventeen new species of fresh-water algæ to the Victorian list of these plants.

Several interesting natural history notes were contributed by members.

The following were the principal exhibits of the evening:—By Mr. F. G. A. Barnard, a growing specimen of the Victorian fern, *Lomaria alpina;* also a beetle, *Schizorhina frontalis*, from Seymour. By Mr. A. J. Campbell, eggs of Australian birds in illustration of his paper; also a sponge, of good commercial value, from King Island. By Mr. E. M. Cornwall, sponges collected at King Island. By Mr. J. E. Dixon, orchid in bloom, *Chiloglottis diphylla*, var., from Oakleigh. By Mrs. Flatow, a large echinus; also a fan-shaped sponge from Queenscliff. By Mr. C. French, F.L.S., 200 species of New Zealand coleoptera, fifty of which are new to science. By Mr. C. French, jun., eggs of Western brown hawk, square-tailed kite, allied harrier, and nankeen kestrel. By Mr. W. R. Guilfoyle, F.L.S., nests and eggs of "tailor bird," *Orthotomus Bennettii*, from India, and nest of "weaver bird," *Ploceus Baya*, from India. By Mr. G. A. Keartland, a letter-winged kite, *Elanus scriptus*, also ring snakes from Port Darwin. By Mr. D. M'Alpine, F.C.S., a mason wasp's nest. By Mrs. Simson, fossil fruits, etc. By Mr. J. Searle, insects taken at Alphington excursion, also from Studley Park.

After the usual *conversazione* the meeting terminated.

OOLOGY OF AUSTRALIAN BIRDS.

By A. J. Campbell.

(Read before the Field Naturalists' Club of Victoria, 13th February, 1888.)

SUPPLEMENT.—PART IV.

Another year of grace is past, which brought with it considerable developments regarding our knowledge of Australian Oology.

In the first place, since my last supplementary sheets we shall have to acknowledge descriptions of new eggs, by Dr. E. P. Ramsay, of *Falco subniger* (Black Falcon), *Strix candida* (Grass Owl), *Amytis striatus* (Striated Wren), *Pœcilodryas superciliosa* (White-eyebrowed Robin), *Malurus melanotus* (Black-backed Superb Warbler), *Malurus callainus* (Turquoisine Superb Warbler), *Donacola castaneothorax* (Chestnut-breasted Finch), *Pœphila gouldiæ* (Gouldian Grass-Finch), *Sittella tenuirostris*, *Climacteris erythrops* (Red-eyebrowed Tree-Creeper), *Ptilotis notata* (Yellow-spotted Honey-eater), and *Sericulus melinus* (Regent-Bird). [*Vide* Vol. I. (Series 2nd) of the "Proceedings of the Linnean Society of New South Wales."] Also description, by Mr. A. J. North, of *Strepera melanoptera*, *Strepera intermedia*, *Artamus melanops* (Black-faced Wood Swallow), *Malurus cyanochlanys*, *Acanthiza uropygialis* (Chestnut-rumped Warbler), *Pœphila acuticauda* (Long-tailed Grass-Finch), *Acanthorhynchus dubius*, *Zosterops flavogularis*, *Meşaloprepia assimilis* (Allied Fruit Pigeon), *Rhipidura diemenensis* (Tasmanian Fantail), *Gallinula rufivirssa* (Rufous-vented Gallinule), *Tadorna radjah* (Radjah Shieldrake), *Melanodryas picata* (Pied Robin), and *Eudynamis cyanocephala* (Australian Koel). [*Vide* Vol. II. (Series 2nd) of the "Proceedings of the Linnean Society of New South Wales."]

But the eggs of *Strepera melanoptera*, *S. intermedia*, and *Rhipidura diemenensis* are already well known in our collections under more familiar synonyms, while the Spine-bill of Tasmania (*Acanthorhynchus dubius*) is certainly a very doubtful species, because some of those birds noticed by the Club's recent expeditions in an intermediate locality like King Island apparently did not differ from the Victorian variety (*A. tenuirostris*).

I need not here give the descriptions of all the above-mentioned, because I understand they are likely shortly to appear in a more substantial and acceptable form. However, it is with much pleasure I now beg the Club to accept the following descriptions of other new eggs :—

15. Astur Novæ-Hollandiæ—(White Goshawk). *Locality*—Queensland, New South Wales, Victoria, South Australia, and Tasmania. *Egg*—Beautiful bluish white, with a few large smudges, and specks of purplish brown, some of each appearing beneath the shell's surface; the inner shell greenish. Length, 2 inches; breadth, 1½ inches.

For the description of this beautiful Hawk's egg I am indebted to Mr. Arthur E. Brent, of Roseneath, Tasmania. He further adds—"Nest composed of very fine, dry sticks, broken freshly from the extreme ends of dry branches, very flat, with a few green peppermint gum-leaves forming the receptacle for the

eggs, which were two. Tree, stringy-bark, and nest about 70 feet from the ground. The bird being very aggressive, I had to use my left hand to keep her off. I could feel the wind on my face from her wings as she flew past, and on more than one occasion her wing feathers touched my hand, she uttering a piercing cry the while. The eggs were taken on 9th of October. Locality—A dark gully on Mount Falkiner."

The first White Goshawk's nest reported to me was from South Gippsland in 1884, but it contained young.

It will be noticed that the White Goshawk's eggs resemble exactly in character and size those of the Grey or New Holland Goshawk *(Astur cinereus)* previously described by me. The birds are closely allied. Some persons believe one to be the albino variety of the other, which idea, however, is erroneous.

70. ALCYONE DIEMENENSIS—(Tasmanian Kingfisher). *Locality*—Tasmania. *Egg*—Beautiful, polished white; form, somewhat round; texture of shell, very fine. Length, 11¼ lines; breadth, 9½ lines.

This is from an egg of three taken on the authority of Mr. E. D. Atkinson, of this Club, from a hole drilled into the bank of the Rubicon River, on the north-west coast of Tasmania. The other two eggs measured each 11 x 9 lines.

101. CRACTICUS LEUCOPTERUS — (White-winged Crow Shrike). *Locality*—West Australia. *Egg*—Similar to but slightly smaller than *C. torquatus* and *C. cinereus*; of a warm, greenish, stone-coloured ground, speckled and lightly blotched with reddish and purplish brown, thickest about the upper quarter where the colours co-mingle and form the usual zone. Dimensions of a clutch—(1) 1 inch 3 lines x 10¼ lines; (2) 1 inch 1¾ lines x 10½ lines; and (3) 1 inch 2 lines x 9¾ lines.

408. POLYTELIS MELANURA—(Blacked-tailed Parrakeet). *Locality*—New South Wales, Victoria, South and West Australia, and Interior. *Egg*—Comparatively large for the size of the bird, stout oval in form, of a soft white colour, with surface of shell very finely granulated. Length, 1 inch 2½ to 2¾ lines; breadth, 11¾ lines.

This lovely Parrot is sometimes vulgarly known as the "Smoker" as well as "Rock Pebble," and is frequently found breeding in company with other Parrots in hollow trees overhanging the Wimmera, Avoca, and other rivers.

414. PLATYCERCUS ZONARIUS—(Banded Parrakeet). *Locality*—Victoria, Interior, and South Australia. *Egg*—White, round in form. Length, 1 inch 1½ lines; breadth, 10½ lines.

416. PLATYCERCUS ADELAIDENSIS—(Adelaide Parrakeet). *Locality*—Interior and South Australia. *Egg*—White, somewhat round in shape, shell thin, surface slightly granulated. Length, 1 inch 1 line; breadth, 11 lines.

Through the courtesy of Mr. George Beazley, I am enabled to describe this and the foregoing beautiful Parrakeet's eggs from the Adelaide Museum collection. The eggs were collected by the late Mr. F. W. Andrews.

430. PSEPHOTUS MULTICOLOR—(Varied Parrakeet). *Locality*—Queensland, New South Wales, Victoria, Interior, and South Australia. *Egg*—White, oval in form, surface vrye slightly granulated. Length, 11¼ to 11¾ lines; breadth, 8¼ to 9 lines.

A set is generally five eggs, which are deposited in a hole of a tree during the months of September and October. Mr. James G. M'Dougall kindly forwarded me examples of this species. He is recording carefully the oological notes of Yorke Peninsula, South Australia. If persons so situated were to emulate Mr. M'Dougall by working up in their respective districts the breeding habits of birds we should very shortly possess a complete Australian Oology.

459. CHALCOPHAPS CHRYSOCHLORA—(Little Green Fruit Pigeon). *Locality*—North Australia, Queensland, New South Wales, Victoria, and New Guinea. *Egg*—Cream colour, or of a stoney tinge; a stout oval, both ends almost alike. Length, 1 inch ¾ line; breadth, 9½ lines.

By the kind permission of Mr. George Barnard, Queensland, I describe the Little Green Pigeon's egg from his collection. The eggs, two in number, were taken from a stick-made nest at "Coomooboolaroo," about the beginning of February, 1887, one of which was exhibited here on 8th August following.

471. ERYTHRAUCHENA HUMERALIS — (Barred-shouldered Dove). *Locality*—North Australia, Queensland, New South Wales, and New Guinea. *Egg*—Pure white, roundish oval in shape, texture of shell fine, with surface somewhat slightly polished. Dimensions in lines of a clutch of two give—(1) 12¼ x 9¾; (2) 12 x 9¾. (This cancels my previous description, dimensions of which were scarcely accurate.)

The eggs now described were taken by me, 4th August, 1885, near Cardwell township, Northern Queensland. The nest, upon which the female was sitting at the time, was constructed of twigs, and was situated about eight or ten feet from the ground, in a bushy tree not far from the beach.

493. DROMAIUS IRRORATUS—(Spotted Emu). *Locality*—West Australia. *Egg*—Of the usual elliptical form, both ends being alike, and superficially in appearance like shagreen or rough American cloth. General colour of a beautiful dark green, but, if examined closely, the raised, rough particles of shell only will be found to be dark green, and which, at certain angles of light, assume a very dark indigo, while the interstices are of a light green. Average dimensions of a clutch of seven—5⅛ x 3⅝ inches.

There really appears no tangible difference between the eggs of the western and eastern varieties of the Emu except that the former are a little smaller in size.

544. MYCTERIA AUSTRALIS—(Jabiru or Black-necked Stork). *Locality*—North Australia, Queensland, New South Wales, and New Guinea. *Egg*—Round oval in shape; colour, dull white; shell, somewhat coarse, as if porous or pitted with pin points, especially at both ends. A pair of eggs exhibited by me on 10th October last were in length 2 inches 11 lines; breadth, 2 inches 1½ to 2 lines.

These, the first recorded eggs of Australia's only Stork, were taken in the Clarence district, New South Wales, about the end of August, 1887, from a huge stick nest, lined with grass and other material, and situated in a large tree in the centre of a swamp. The nest was fully 12 feet in circumference, with a considerable cavity, and so enormous that in taking the eggs a man-hole had to be made from underneath, through which one of the eggs (of which there were three) unfortunately fell into the water and was lost. The full complement would have been probably four eggs.

571. HYPOTÆNIDIA BRACHIPUS—(Lewin's Water Rail). *Locality*—Queensland, New South Wales, Victoria, South and West Australia, and Tasmania. *Egg*—Oval in form, shell fine, and surface slightly lustrous. Ground colour of a beautiful pinkish white, fairly marked with spots and blotches of chestnut, pinkish red, and dull purple, the last colour appearing as if beneath the shell's surface. Length, 1 inch 3½ to 4¼ lines; breadth, 1 inch.

Having received the eggs of this pretty Rail from different quarters, I have deemed it necessary to describe them, because in none can I discern the "pale olive" ground colour mentioned in Gould and elsewhere, and which is probably referable to the eggs of the Tabuan Water Crake *(Porzana tabuensis)*.

Lewin's Rail constructs a nest of very fine grasses among the rushes of a swamp. The top of the nest is about six inches above the surface of the water, and generally has a singular stage or ladder leading down from it. Clutch of eggs, from four to six in number.

580. BRANTA *(Chlamydochen)* JUBATA—(Maned Goose or Wood Duck). *Locality*—Australia, except North, and Tasmania. *Egg*—Light cream colour, surface a little smooth or greasy, nearly oval in form. Two eggs from a clutch taken in Queensland measured—(1) 2 inches 3 lines x 1 inch 7¼ lines; (2) 2 inches 2¾ lines x 1 inch 7 lines.

Last season a Wood Duck's nest was taken from a dead redgum-tree standing in a lagoon near Sale, Gippsland. The nest, which was composed of a considerable abundance of light-coloured down, was three or four feet in from the

entrance of a hollow spout. Clutch, nine eggs, two of which were slightly darker in colour to the Queensland examples, and measured—(1) 2 inches 1½ lines x 1 inch 6½ lines; (2) 2 inches 1 line x 1 inch 6½ lines.

A single example only of the egg of this Goose has been previously described by me.

643. PRION BANKSII—(Bank's Blue Petrel). *Locality*—Queensland, New South Wales, Victoria, South and West Australia, and Tasmania. An egg from Macquarie Island is somewhat round; colour, soft white; shell, slightly granulated; length, 1 inch 10½ lines; breadth, 1 inch 5½ lines.

608. STERNA ANGLICA—(Long-legged Tern). *Locality*—North Australia, Queensland, New South Wales, and Victoria. *Egg*—Ground colour, usually light grey, but sometimes a yellowish stone, heavily and irregularly smudged with umber (light and dark). In some specimens a few of the heavier smudges appear to hang about the upper quarter, otherwise the markings are fairly diffused. Some of the darker specimens resemble in shape and colour the better known eggs of the Silver Gull *(Larus novæ-hollandiæ)*. Of all the Australian Terns the eggs are next smallest, in point of size, to the Bass' Straits Tern *(Sterna poliocercus)*. Average dimensions of six—Length, 2 inches ½ line x 1 inch 5½ lines.

According to Legge, the average dimensions of the eggs of this Tern, taken in Asia, are 1 inch 10 lines x 1 inch 4 lines, and in America 1 inch 11 lines x 1 inch 4 lines. Therefore, it would appear that the Australian examples are much larger, which may really tend to prove that Gould was right in recognising the Australian bird as another variety which, for obvious reasons, he named *Gelochelidon macrotarsa*, or Long-legged Tern.

I am indebted to our estimable member, Mr. F. R. Godfrey, for the eggs of this inland Tern, which were exhibited at our last meeting. They were taken at his station, "Pevensey," about 13 miles from Hay, New South Wales. I possess examples in my collection from "Ulonga," near the same locality, taken in 1879, but was unable to identify them before. Eggs were also taken this season in the Maryborough district, Victoria.

Mr. Godfrey furnishes the following interesting note:—"In November there were large numbers of these birds (Long-legged Terns) seen every day skimming in hawk-like fashion over the salt-bush plains, generally about 12 or more in company, about 10 or 12 feet above the ground, watching most keenly, with head turned down, for insects or small reptiles; and on discovering one they darted down and carried it up into the air, then dropped it, and caught it while falling. The prey

they seemed to be in pursuit of—which was found in the stomach of those shot—consisted of small lizards and centipedes; one specimen having two lizards, each about three inches long, and three very large centipedes, of about the same length, in its stomach. These birds make their nests—which consist of a few bits of dry grass, or stems of cane grass—on a small piece of ground surrounded by water, and generally close to each other; as many as 10 or 12 nests being found on one small patch of about six feet in diameter. The eggs are generally three or four in number."

609. GYGIS CANDIDA—(White Tern). *Locality*—North Australia, Queensland, New South Wales, and New Guinea. *Egg*—Beautiful, and remarkable in shape, being a stout oval, with both ends exactly alike; texture of shell fine. Colour, in different examples, varies from a light grey to a yellowish stoney colour. Markings are in umber, and in the form of irregular-sized smudges or hair-like streaks, or both. In some specimens the heavier smudges and streaks are inclined to congregate about the upper quarter. Clouds of light ink colour also appear underlying the shell's surface. One singularly beautiful specimen is almost completely clouded with purplish grey, and interlaced with streaks of umber, after the fashion of the Bower-Bird *(Chlamydodera)*.

Measurement of three eggs is exactly 1 inch 9 lines each in length, by a breadth varying from 1 inch $3\frac{1}{4}$ to $3\frac{3}{4}$ lines.

The White Tern breeds on Norfolk Island in November, in trees at a height of about 20 to 60 feet, and principally in valleys. There is no nest. A single egg is merely deposited on the bare bark, not even in a fork, as a rule. The birds do not breed in colonies, but one or two on adjacent trees, or even one alone in a valley. Gould also mentions the single egg being deposited on horizontal branches of trees.

This paper, although describing new and highly-interesting species of eggs, is also marked with much indebtedness to others. One, whatever his attainments may be, cannot work out the forms of any great continent without sympathetic assistance, and cannot knowingly afford, for his very work's sake, to ignore that previously performed by others, however trifling, but all of which, when collated, aids to build up a great heap of scientific and instructive knowledge—the object we should all have in view.

And now I have to thank the Rev. F. M. Nobbs for eggs and data of this rare and lovely snow-white Tern gathered on his far-off salubrious island. Mr. Nobbs is well qualified to give a description of the breeding habits of the Tern (as well as other sea birds), being acquainted with it not only at Norfolk, but on that historic island—Pitcairn, his birthplace.

THE COLOURATION OF BIRDS' EGGS.

By H. W. Hunt.

(Read before the Field Naturalists' Club of Victoria, 16th January, 1888.)

In a paper previously read before this society I suggested that the colouration of eggs would be found to bear some relation to that of the birds laying them, and stated two rules which, I believed, would be found of general application. The one—that highly-coloured birds do not lay correspondingly highly-coloured eggs, whilst birds of sombre plumage very often lay most beautiful eggs; the other—that birds which build in hollows of trees, or burrow in the ground, or build nests of such a shape as to permit the entrance of little light, and nocturnal birds, lay white eggs. I will now proceed to examine the colouration of the eggs of the various families and tribes in connection with the above rules, and also in order to see whether other rules may not be found which the colouring of the eggs of some families will follow. Before proceeding with such examination, I will attempt to show that the above two rules may be merged, or, rather, that the former may be merged in the latter, for it will, I think, be found that it is, as a rule, those birds which are conspicuously coloured that build in the manner and localities I have mentioned. That is, conspicuously-coloured birds build concealed nests, or lay their eggs in concealed situations.

In support of this proposition, I may refer to Darwin's argument on the proposition laid down by Mr. Wallace that, when both sexes are coloured in a strikingly conspicuous manner, the nest is of such a nature as to conceal the sitting bird; but when there is a marked contrast of colour between the sexes—the male being gay, and the female dull-coloured—the nest is open, and exposes the sitting bird to view. He further goes on to quote M. Audubon to the effect that with many birds which build open nests the males sit on the eggs and aid in feeding the young as well as the females, and to state that in England there is no close and general relation between the colours of the female and the nature of the nest constructed by her. But, after a close examination of the birds of the world, he comes to the conclusion summed up in these words:—"Notwithstanding the foregoing objections, I cannot doubt, after reading Mr. Wallace's excellent essay, that, looking to the birds of the world, a large majority of the species in which the females are conspicuously coloured (and in this case the males, with rare exceptions, are equally conspicuous), build concealed nests for the sake of protection." In opposition to

Mr. Wallace's views that the colours were acquired by the male, and being transmitted to the female, were not eliminated by natural selection owing to the protection which they already enjoyed from the manner of their nidification, he says :—"It seems to me much more probable that in most cases, as the females were gradually rendered more and more brilliant from partaking the colours of the male, they were gradually led to change their instincts (supposing that they originally built open nests), and to seek protection by building concealed nests." And further—"It is not necessary to suppose that each species has had its nidifying instincts modified, but only that the early progenitors of each group were led to build domed or concealed nests, and that thus sexual selection, together with equal or nearly equal inheritance by both sexes, has indirectly determined the manner of nidification of whole groups of birds."

I have quoted Darwin's opinions at length, in order to show that this system of natural selection going on with the birds sends them to the hollows and other concealed situations to build, and so affects the colouring of the eggs as it operates to modify the colours of the birds themselves, and this I will attempt to prove; but in the first place I will now state definitely the rules which I think govern egg colourations. These are : Firstly—Eggs laid in dark situations, or by nocturnal birds, are white. Secondly—Eggs laid on the bare ground, or in other similarly exposed situations, are very frequently coloured so as to resemble surrounding objects. Thirdly—Eggs laid in open nests are very often, though by no means invariably, beautifully and conspicuously coloured.

With regard to the first division, those laying white eggs—firstly, nocturnal birds—for example, the owls of Europe, Canada, India, and Australia, and the podargi of the latter country, all, without exception, lay white eggs, and as some of these—for instance, the podargi—do not build in hollows, I think that they form a distinct section. Secondly, of those laying in holes, in trees, or in the ground, the large families of kingfishers, parrots, and woodpeckers, also the following :—Tree-creepers (*Certhiadæ*), some species only; bee-eaters (*Meropidæ*), petrels (all lay white eggs, some in holes in the ground), rollers (*Coracidæ*), and diamond birds (*Pardalotus*) may be taken as examples. The swallows also furnish us with good illustrations of this rule, for those species which build saucer nests exposed to the light lay eggs more or less coloured with reddish brown, whilst those building in holes, such as our tree swallows (*Hylochelidon nigricans*), or far down chimneys, such as the rufus swallow of Europe, lay perfectly white eggs. A seeming exception is found in some genera of the *Certhiadæ*, for if we look at the egg of our own common tree-creeper (*Climacteris scandens*), which builds its nest

far down hollow stumps and branches, according to Mr. Campbell, we find that it is one of our most highly-coloured eggs, being "a reddish flesh colour, thickly blotched all over with reddish-brown," but, taking Darwin's view as the correct one (though this bird is not a highly-coloured one, and so must have sought the hollow for protection against the elements, or against enemies to its eggs), that the bird first built an open nest, and subsequently resorted to the hollow bough, I think it is quite possible that the eggs are only now undergoing the process of change (which would necessarily be a slow one), and if we look to the other species of this genus we find this view borne out by the facts. For the eggs show a gradation very marked, from the above highly-coloured species to those of the white-throated *Climacteris leucoplioea*), which are "dull-white, thinly speckled, with fine spots of rich brown and a few large blotches of the same colour," whilst the egg of the nearly-allied *Orthonyx spinicaudus* is perfectly white. The same gradation is found with the European genus (*Certhia*), but none of the eggs of the latter are so highly coloured as the above, nor, indeed, have any of them more than a few fine spots of brown on the white ground.

We now proceed to those building domed or concealed nests, and here I cannot do better than refer to the able paper on the above subject read before the Royal Society of Victoria on the 12th May last by our learned president (to which I shall have occasion to refer later), in which he says:—"In many families it is noteworthy that those kinds of eggs which are quite concealed are white, while those which are exposed are speckled or freckled."

Illustrations of this rule will be found in the finches of Australia, the domed nest of which almost completely shuts out the light. This Mr. Lucas takes to be the preservation of the ancestral type, but if the above theory be correct, and birds sought the domed nest for protection, it would rather seem to be one of reversion to the original white. The fairy martin *(Lageno-plastes Ariel)*, whose eggs are mostly of a pure white, but sometimes slightly flecked with red, the yellow-rumped acanthiza *(Geobasileus chysorrhous)*, with its congener, *G. reguloides*, and the rock-warbler *(Origmes rubricata)* are the only members of the family *Luscinidæ* which lay white eggs; those of the first-named being sometimes slightly speckled—another piece of evidence that the egg was once coloured, and that the colouration has died out since the change in the bird's habits; and their three nests are deeper than that of any other species—the latter being, in addition, built in caves, which are in themselves dark.

The English long-tailed titmouse is mentioned by Mr. Lucas as possessing similar habits, the nest being deep and the

eggs white, whilst those of the other species are coloured. The eggs of numbers of aquatic birds—notably ducks and geese—and those of pigeons and doves are white, but are not laid in any of the above situations. Those of aquatic birds I take to be simply the original type, those of the pigeons I will mention later. The eggs of the night-jars *(Aegotheles Novæ-Hollandiæ)*, with the exception of the owlet, might, perhaps, be taken as an exception to the above rules; but if we inquire into the cause of variation we find that the bird is not of nearly such a sleepy disposition as the owls and podargi, and that the eggs, being laid on the ground, need protective colouring.

We now come to those families which lay eggs coloured so as to resemble surrounding objects, for the sake of protection. Those mentioned by Mr. Lucas as laying eggs of protective colour on the bare ground are sandpipers, dottrels, grouse, quail, rail, night-jars, plovers, terns, oyster-catchers, and gulls. The eggs of the above, as he says, "exhibit different shades of the soil or of the rocks, with an appropriate ornamentation of spots, blotches, and smears." To these we may add the Australian prantincoles, stilts and avocets, the snipe, and some species of the lark family, notably the English skylark and our own pipit *(Anthus Australis)*.

Coming to those which lay very highly-coloured eggs, we have those of the honey-eaters, all of which build open nests and lay eggs varying from a "rich salmon-red" ground tint to a "buffy-white," all more or less spotted or blotched with reddish markings, the English hedge-sparrow and its congener (the mountain accentor of Europe), the buntings of the same country, the reed warblers (amongst whose eggs we find the colours lilac, yellow, green and brick-red), the bullfinch (whose eggs are of a lively blue-green), thrush, wheatear, and lesser-redpole, with the Australian cranes, *zosterops cinclorampha*, a genus of the lark family, the yellow and dusky robins, and the coach-whip bird and wedge-bill.

The eggs of all the above are laid in open nests, but I may observe that where the nest is sufficiently shallow we find brightly-coloured eggs in domed nests; such are those of the little *Chthonicola* (allied to the *Sericornes*), the *Cisticola* or grass-warbler, and several others of the same family. And now let us inquire into the reason for the colouration of the first and third classes of the above (or, rather, it will be the non-colouration of the first class); those of the second class, having protective tints, explain themselves. With Mr. Lucas' explanation of the origin of the colour in eggs generally—viz., that it is copied by the bird from surrounding objects—I quite agree; for I do not suppose a bird capable of imagining and transmitting to its eggs a colour which it had never, or rarely, seen. But I think that he has totally failed to account for the above

brilliant colours in eggs which are fully exposed to view in a shallow nest. Though his explanation of white eggs of the pigeon family—viz., that as the nest is composed of twigs very slightly put together, the white eggs are less likely to be seen from below, may possibly account for this exception to the general rule—I would point out that even this is doubtful, for, as Mr. Lucas himself observes, other birds are by no means least amongst the list of egg-robbers, and these would, of course, have the benefit of a "bird's-eye view" of the situation. With regard to the theory of eggs in cup-shaped nests, being coloured for the sake of protection, I may point out that the nest itself is, in some cases, at least a most conspicuous object. Such is that of the white-winged corcorax, whose nest is a huge mud structure, which can be seen at a distance of at least a hundred yards; whereas in others the colouring is by no means protective. The white ground colour of the egg of the shrike-thrush, even though it be broken up with dark spots, can hardly be said to be protective when it is laid in a nest of dead sticks. The flesh-coloured egg of the two miners (*M. garrula* and *flavigula*) are both laid in twig nests, whilst those of the other members of the honey-eater family (which, as stated, contained a large amount of red and yellow colouring), are laid amongst the green leaves; whereas those of the yellow and dusky robins (which are green) are laid in a nest placed in the thick upright forks of ti-tree or gum-sapling amongst the dead underwood. Those of the *Cinclo-ramphi*, which are laid on the ground, are of a pinkish tinge, with pinkish-red and purplish spots; this could hardly be termed a protective colour. The eggs of the crows, magpies, crow-shrikes, and *Graucalus* are enumerated by Mr. Lucas as being protectively coloured. Now, considering that the three former are the very birds who steal their neighbours' belongings, I fail to see that protection is in this case necessary (the nests being quite out of reach of lizards and snakes, and native cats only appearing at night, when the colour cannot be distinguished), whilst the *Graucalus* places its eggs on a horizontal fork, so that the greenish tint usually met can hardly be protective, though the wood-brown sometimes, though more rarely found, may be so.

For the above reasons I think we must look elsewhere for the cause of colouration where it appears, and of the absence of colour in other eggs. This, I think, will be found to be the exceedingly simple one of love of beauty. The bright plumage of birds, together with their musical notes, prove them to have a love for the beautiful perhaps unequalled in the animal kingdom. This fact does not appear to have influenced Mr. Lucas in his decision as to the appearance of colour, and his suggestion that bright colours have a deterrent effect on the

nest-robbers is not, I think, borne out by the facts. For instance, Mr. Campbell, singularly enough, relates an instance in which the eggs of the coach-whip bird disappeared from a nest he had found building, when he was convinced that no human being had forestalled him, and another where the bright flesh-coloured eggs of the wattle-bird (*Anthocœra carunculata*) were rudely broken. The fracture, he says, bore distinct impressions of the bill of a larger bird, probably that of a crow, as they are notorious nest-robbers, so that it will be seen, as, I think might be expected (for, as I understand protective colouration in insects, it is that the bright colour resembles that of other inedible species) that bright colours have no deterrent effect, at least, on some of the birds' enemies; probably there is no such effect on any of them.

What could be more beautiful colouring for an egg than deep flesh colour or azure blue, or the beautiful painted markings on the egg of the spotted bower-bird (which is, nevertheless, quite exposed in an open nest), or the pale bluish tint of the herons? Or, again, what, for an egg that is to be viewed in the dark, could be a more appropriate colour than the pure immaculate and glossy white of so many of the birds first enumerated? So that, taking all the above facts into consideration, I think it will be seen that natural selection has only operated to any marked extent on those eggs which are exposed on the bare ground or rocks, and that birds have, from sheer love of the beautiful, retained bright colours in their eggs, as they have in their own plumage, even though it may expose them to greater dangers than would be met by less bright and more sombre hues. If this be so, we would expect to find sexual selections at work counteracting the effect which would otherwise be produced by natural selection, and it is somewhat difficult to perceive where the opening presents itself through which such operation may take place.

My only answer to this question—and I merely offer it as a suggestion which may or may not be accepted as the solution of the problem—is that it is quite possible, if not even probable, that the nest-building and egg-laying proclivities of individuals, especially such as construct open and exposed nests, may be known amongst the other members of the same species in the locality, and that thus the laying of highly-coloured eggs might possibly affect the choice by the male of a mate in the same way that his gay-coloured plumage influences the female in her choice of a husband; thus perpetuating amongst the species the laying of highly-coloured eggs.

In support of the above view, I may refer to Mr. Romanes' work,* in which he describes the closeness with which the

* Animal Intelligence, p. 323. (Ed. 1882.)

different members of a rookery watch each other's proceedings, and the respect which is paid to a female as soon as her eggs are laid. He says:—"From the instant the female begins to lay all hostilities are at an end. Not one of the whole group, that a little before treated her so rudely, will now venture to molest her."

That their intelligence, powers of observation, and memory are quite equal to the task of noticing and remembering each other's individual habits will clearly appear by a glance at the chapter, by the same author, on birds generally, in the same work.

In conclusion, I may point out that it is those birds whose habits are, to a certain extent, social, though not gregarious, and which exhibit, in other respects, the most refined love of the beautiful, whose eggs are most highly coloured. Instances of this will be found in the starlings, zosterops, Australian miners (*Myzantha* or *Manorhina*), and spotted bower-birds, whilst others less marked might be brought forward. On the other hand, it is those birds which, in their general habits, exhibit no such love in any marked degree whose eggs remain still of the original white, or else have been varied to resemble surrounding objects by natural selection. The principal instances of this, besides the ducks and geese, are enumerated under the foregoing rule of protective colouring, and I need not repeat them here; but, turning to that list, we will observe that they are seemingly, as a whole, wanting in any marked idea of beauty, for their notes, from the wail of the stone plover to the quack of the wild duck, cannot be regarded as expressing any such æsthetic emotions, whilst the ungainly movements and slovenly habits of some of the species prove them to be greatly in want of any such qualities.

The difference is more readily observed when we compare the above traits of character with the song of the blackbird, the playful and æsthetic instincts of the bower-bird, and the graceful movements of the honey-eater, which are so marked as in one case to supply the specific appellation graceful *Ptilotis ornata*; but it is quite a general characteristic of the family.

For the above reasons I conceive that love of beauty forms by far the largest factor amongst the causes of colouration in birds' eggs.

WOLFFIA AND LEMNA.

In a communication from Baron von Mueller it appears that Wolffia had not been contributed from the metropolitan area to the National Herbarium until collected last year by C. French, jun. As it was exhibited at the Microscopical Society some

years before, and noticed by W. M. B. in Studley Park, the moral may be drawn that minute floating plants may be easily overlooked, and that naturalists may be in possession of rare or new captures without securing a permanent record. The Baron adds that Wolffia was first found in Australia by himself in 1873, near Mount Emu. It was at once recorded, and, attention having been drawn to the find, Rev. Dr. Woolls soon detected examples near Port Jackson. It is probable that this tiny plant will be found in the Melbourne district, and it is to be hoped that the find will be duly recorded.

Another small and closely-allied plant, also, is to be looked for. In 1847 Baron von Mueller recognised a Lemna at Adelaide as a new form, and proposed the name *L. pleiorhiza* for it. The plant was not described, as he could not find specimens of the tiny flower or fruit, which, as in Wolffia, is so rarely developed. Dr. Kurz, many years afterwards, discovered the same species in India, and, unaware of previous observation, named it *L. oligorhiza*. The *fruit* of this species is still *unknown*, and, in order to stimulate search for it, that comparisons may be made with *L. minor* and *L. polyrhiza*, the subject was brought a few months ago before the Linnean Society of New South Wales. It may perhaps fall to the lot of some of our botanical readers to come across this little plant by closer searching in their rambles. If so, it is earnestly to be desired that they will communicate with the Baron on the subject.

Mr. H. Watts also writes that he "found Riccia five or six years ago at one of our Club's excursions, near Frankston," and has "repeatedly seen it on the heathy places between Cheltenham and Brighton."

CORRESPONDENCE.

PRESERVATION OF COLOURS IN SPIDERS.

To the Editor of the Victorian Naturalist.

Sir,—In the course of "J. A. H.'s" communication in your number, she regrets that it is not possible to preserve spiders so as to retain their colours. If "J. A. H." had been at our last general *conversazione* she would have seen nearly 100 spiders, each with their colours fully preserved. The specimens still retain their colours, and, if "J. A. H." should visit Melbourne, I shall be happy to show her that spiders can be preserved with all their colours, if they have any.—I remain, your obedient servant,

HENRY WATTS.

12 Wellington-street, Collingwood.

Field Naturalists' Club of Victoria.

President:

A. H. S. LUCAS, M.A., B.Sc., F.G.S.

This Club was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

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With the view of popularising the study of the Natural History of the Colony, correspondence, notes, and queries relating to this subject are invited for insertion, and should be addressed to the Editor at the Wesley College, Prahran.

Any of the numbers from the commencement, January, 1884, can be obtained from the Hon. Sec., Mr. F. G. A. Barnard, Kew, at sixpence each; or in sets, Vol. I (1884-85), 16 numbers, 7s. 6d.; Vol. II. (1885-86), 12 numbers, 6s.; Vol. III. (1886-87), 12 numbers, 6s.; each set with title-page and index for binding.

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OF THE

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The Author of each article is responsible for the facts and opinions he records.

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THE

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THE FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th March, 1888.

The president, Mr. A. H. S. Lucas, M.A., B.Sc., occupied the chair, and about fifty members and visitors were present.

The hon. librarian reported the receipt of the following donations to the library:—"Geology and Physical Geography of Victoria," also "Quarterly Mining Reports," December, 1887, from the Mining Department; "Annual Report of Ballarat School of Mines" for 1887, from the School; "Journal of New York Microscopical Society," vol. IV., No. 1, from the Society; and "Journal of Pharmacy," February, 1888.

The hon. secretary reported that the excursion to Cheltenham on 18th February had been fairly attended. The following plants were noted in bloom:—*Utricularia dichotoma*, *Correa speciosa*, *Comesperma calymega*, *Gompholobium Huegelii*, and the rare orchid *Spiranthes Australis*, this being the nearest locality in which it has yet been found to Melbourne. At the fossil beds several shark's teeth, pieces of whale's bone, the small sea-urchins, *Lovenia Forbesi*, were obtained, also a fine specimen of the rather rare fossil sea-urchin, *Monostychia Australis*.

The president reported that the excursion to Williamstown Back Beach, on 3rd March, had been altered to a dredging expedition, but, owing to a change in the weather, the party were unable to do much in that direction, and had to return shorewards.

The hon. secretary reported that the joint deputation from the Club, the Royal and Geographical Societies, and the Academy of Arts, had waited on the Minister of Lands with reference to the proposed national park at Wilson's Promontory,

and had been very favourably received, and there was every probability that the greater part of the peninsula would be reserved.

On a ballot being taken, Mr. W. Errington, Rev. A. F. Hagenauer, Mr. James Kershaw, and Mr. Walter Poole were duly elected members of the Club.

Mr. F. G. A. Barnard mentioned the danger likely to ensue on the introduction of chicken cholera into the colony, and moved —"That the Field Naturalists' Club of Victoria views with alarm the proposed introduction of chicken cholera into Australia as a means of destroying rabbits, believing that such an introduction cannot be confined to rabbits alone, and will lead to the extermination of native and domesticated animals and birds, and trusts that the Governments of the Australian colonies will not allow the proposed introduction without extended experiments under competent persons." The resolution was seconded by Mr. J. E. Prince, and carried unanimously, and ordered to be forwarded to the Chief Secretary.

PAPER READ.

The hon. secretary read a paper by Mr. R. H. Nancarrow, entitled " Notes on the Nidification of *Acanthiza uropygialis*," in which he gave some interesting particulars as to the finding of nests of this little bird in various positions in the Whipstick scrub, near Neilborough, and exhibited a nest built in a tubular piece of bark, together with an egg.

Mr. H. Watts made some remarks in explanation of his notes on animal parasites, read at the last meeting, and also related his experiences in reducing the number of vine moths, *Agorista glycine*, and their larvæ, in his garden. Natural history notes were also contributed by other members.

The following were the principal exhibits of the evening :— By Mr. F. G. A. Barnard, two fine *phasmidæ* from Alphington. By Mr. C. C. Brittlebank, three stages of *Agorista glycine ;* also water-colour drawings of metamorphoses of several insects. By Mr. A. W. Coles, tiger snake, with twenty-five young ones. By Mr. C. French, jun,, fossils from Cheltenham, including *Monostychia Australis*. By Mr. R. Hall, a frigate bird, *Tachypetes* (*Atagen*) sp., from Maldon Island. By Mr. W. Jennings, a large shark's tooth, whale ear-bones, and piece of jaw-bone, with tooth attached, from Waurn Ponds; whale ear-bone from Cheltenham. By Mr. R. H. Nancarrow, nest and egg of *Acanthiza uropygialis*, in illustration of his paper, from the Whipstick. By Mr. J. Searle, Victorian birds' eggs and coleoptera ; also foreign coleoptera. By Mr. F. Spry, Victorian lepidoptera, family Nymphalidæ. By Mr. C. Yelland, five black snakes.

After the usual *conversazione* the meeting terminated.

NOTES ON LICHENS.

No. 2.

By Rev. F. R. M. Wilson, Kew.

(Read before the Field Naturalists' Club of Victoria, 13th February, 1888.)

In the paper which I read before the Club last August I gave a few hints which I thought might be useful to those who should wish to collect and study lichens. I will now suppose that the student has gone out into the country and has collected a few of the commoner kinds, and has fastened them, as I suggested, with strong glue on a piece of writing paper, on which he has written a note of the particulars of collection. He wishes now to know their names. Well, I think there is something more important than this. To name them is to give a beginner no knowledge whatever. He needs to have some acquaintance with the differences of the genera in order to understand what is meant by the generic name. And the specific name serves only to identify our specimens with species previously collected and described by others. Let us examine the specimens and compare them with one another and note their differences, with a view to their classification. This will give real knowledge.

When I began to collect lichens, with the help of "Leighton's Lichen Flora," I classified my specimens according to their general appearance, which I found was modified by the way in which they attach themselves to the rock, or tree, or earth on which they grow—1. Those that are lengthened out, like shoots of trees. 2. Those that are flattened out, like leaves. 3. Those that cling closely—so closely often as to seem to be mere weather stains. I made three receptacles, therefore, which I labelled "shoot-like," "leaf-like," and "stain-like," and divided my specimens accordingly. This was my first rough classification, which had, of course, to be afterwards supplemented and modified as my knowledge of lichens increased. But I found it to be a good working classification for a beginner.

As I went on collecting, I found I had further to distinguish:—1. Firstly, among those that are lengthened out, between the upright, shoot-like lichens, that grow chiefly on the ground, and the hanging, branch-like ones, that grow chiefly on rocks and trees. Lichenologists dignify these families by the name *Cladodei*, shoot-like, from the Greek *clados*, a shoot, and *eidos*, like; and *Ramalodei*, branch-like, from the Latin *ramale*, a branch. 2. Then, secondly, among those that are flattened out I found some which were very noticeably gelatinous. This was most marked when they were wet. And by this gelatinous character, which allies them to the algæ,

they are separated into a distinct family which lichenologists call *Collemacei*, from the Greek *colla*, glue or gelatine. The rest of the flattened lichens are called *Phyllodei*, leaf-like, from the Greek *phyllos*, a leaf. 3. Thirdly, among the close-clinging lichens, a large number are distinguished by the apothecium, or fruit, being enveloped in a sort of minute nut, more or less immersed in the thallus; on account of which lichenologists separate them into a family, under the name of *Pyrenodei*, kernel-like, from the Greek *pyren*, a kernel. The rest of the close-clinging lichens are gathered into a family called *Placodei*, plate-like or flat, from the Greek *plax*, a plate. Besides these six families, there are a number of lichens whose apothecia thrust out their ripe spore vessels like black dust on to the surface of the fruit. I remember being much puzzled and astonished when I first gathered one of this family. The profusion of black dust which came from its lacerated bag-like apothecia made me think at first that I had come upon some strange fungus. This family is called *Epiconiodei*, from the Greek *epi*, upon, *conios*, dust.

These families are arranged by Dr. Nylander, the greatest modern lichenologist, according to their relation to the algæ on the one hand and to the fungi on the other, in the following order :—

1. Collemacei, gelatinous.
2. Epiconiodei, dust fruited.
3. Cladodei, shoot-like.
4. Ramalodei, branch-like.
5. Phyllodei, leaf-like.
6. Placodei, plate-like.
7. Pyrenodei, kernel fruited.

We need only, in order to complete Dr. Nylander's classification, to separate the first of these into a distinct family, and insert between it and the rest a strange family, of which only two species are known, called by him *Myriangiacei*, from the Greek *myrios*, many, and *angeion*, a vase or vessel. The remainder he classes together under the family *Lichenacei*, or lichens proper.

The beginner must not imagine that this classification is so distinct that he can always see at a glance what family of lichens his specimen belongs to. Nature shows very imperceptible gradations between species, or genera, or families—particularly, I think, among lichens. And each genus has its relation to others so close as to necessitate in many cases careful and minute examination to come to a sure conclusion. And, indeed, we often cannot come to a sure conclusion at all. Every lichenologist has many specimens laid apart for further examination, which he cannot yet refer to any

species, or even any genus. One lesson taught us by our study of nature is that we should be humble in our judgments, and always ready, on the production of new facts, to re-consider the terms of any conclusion to which we have come, however cautiously we may have arrived at it. All scientific knowledge is tentative. I would, therefore, urge the student not to be afraid of humbly exercising his own judgment, and not to be disheartened if he find that he has to modify his conclusions again and again. A case occurred lately within my knowledge in which a number of specimens of a Victorian lichen were submitted to a lichenologist of no mean repute; but the specimens were all sterile. They were decided by him to be a new species, which was named accordingly. Some time afterwards further specimens were received, but with the fruit on them, which showed clearly that the supposed new species had long been known as a European and American lichen; and the lichenologist frankly said—"The name I gave seems now, in presence of the perfect specimen, to be very wide of the mark." Although the beginner ought not to attempt the naming of a lichen which is imperfect, yet, with a typical and complete specimen before him, he should exercise his own powers of observation and discrimination upon it before he submits it to another person to be named.

If there is any doubt whether a plant be a lichen or not, this question can be, in nearly all cases, very readily and decidedly answered. Take a minute portion of the youngest part of the thallus and put it on a microscopical slide with a drop of water. Then, with a knife, bruise down the piece of lichen till it is all apparently dissolved. Put a thin glass cover on it, and submit it to the 275th power of a microscope. If it be a lichen there will be seen numerous green or yellowish spheroids, either simple—when they are called *granula gonima*—or enveloped in a tunic—when they are called *gonidia*. These are peculiar to lichens, and their presence is decisive of the plant in question being a lichen.

The classification which I have given in this paper will enable the student to decide, in most cases without difficulty, as to the family to which a specimen belongs. To determine the tribe and genus will require more careful and minute examination; and to fix the species will often take some time and close comparison with well-named specimens, such as those in the Melbourne Botanic Museum which bear the signature *Mull. Arg.*

This work will also require the aid of some book giving a descriptive classification of lichens. I am sorry to say that there is absolutely no descriptive list of Victorian lichens. There is a book which has been published by Dr. William

Nylander, of Paris, entitled *Synopsis Methodica Lichenum, omnium huc-usque cognitorum*. The first volume was issued 1858-1860, and part of the second appeared subsequently. And these instalments of a universal lichen manual are so excellent as to cause exceeding regret that, from the very advanced age of that eminent lichenologist, we cannot hope to have them continued by him. This book is, however, out of print, and so rare that it is sold in England for its weight in silver.

In Hooker's "New Zealand Flora," a copy of which is in the Melbourne Public Library, there is a short chaper on lichens, with descriptions of many New Zealand species. And from this book the student can get some help, for there is much similarity between the lichen floras of Victoria and New Zealand. But even the lichens of New Zealand, although far better known than those of Victoria, have not as yet been very thoroughly explored.

Mr. F. M. Bailey, the Government botanist of Queensland, has published a synopsis of the Queensland flora, in which he gives descriptions, by Dr. Chas. Knight, of the new species found in Queensland, some of which are found also in Victoria.

But the most useful book for our purpose is Leighton's "British Lichen Flora." Although it gives only those lichens which are found in Great Britain, Ireland, and the Channel Islands, it will prove a great help to the Victorian lichenologist, from the fact that very many lichens are common to Victoria and the British Isles. This book can be obtained only from the author, Rev. W. A. Leighton, Shrewsbury, England. Both Leighton's and Hooker's books are written in English. In Nylander's and Bailey's books the descriptions of the lichens are in Latin.

If the student find that he is unable to name all his specimens himself, as is sure to be the case, it will be utterly useless for him to submit them to anyone but a specialist. And, unfortunately, there are, at this present time, very few skilful lichenologists in the world in active work. There are none in Australia. This is the more to be regretted because lichens ought to be studied while growing. As a rule, new species cannot be thoroughly understood unless they are examined *in situ*. As the Rev. Mr. Babington says, "the more difficult species of the southern hemisphere, even of the higher genera (*e.g.*, *Stictei*), will never be properly elucidated till they have been described and limited by someone who is familiar with them in a living state." I trust, therefore, that some of our Victorian youth may be stirred up to devote their leisure to the vigorous and persevering pursuit of this study, so that in time we may have Victorian lichenology redeemed from the inglorious obscurity in which it is at present involved.

VICTORIAN AGARICS.

By H. T. Tisdall, F.L.S.

(Read before the Field Naturalists' Club of Victoria, 16th January, 1888.)

Agaricus.—Gills membranaceous, persistent, edge acute. Fleshy putrescent fungi.

Sub-Genus Amanita.—Veil universal, distinct from the cuticle of the pileus. Hymenophorum distinct from the stem.

A vaginatus.—Under trees, Toongabbie. Pileus 4in. broad, nearly flat, white. Volva distinct and loose. Stem hollow, long, and thin. No ring. Gills free and white.

A. vernus, Bull.—Under trees on hills about Walhalla. Pileus flattish and depressed, white. Stem hollow. Ring very distinct. Gills free.

Sub-Genus Lepiota.—Veil universal, concrete with cuticle of pileus. Hymenophorum distinct from stem.

A. Clypeolarus, Bull.—In Fern Tree Gully, Walhalla. Pileus convex, 3in. broad, light brown. Stem 3in. high, thick, nearly hollow. Gills free, but close, whitish yellow.

A. excoriatus.—Found in Victoria, but I have not been fortunate enough to get one.

A. Mariæ, Klot.—In garden, Glenmaggie. Short, thick stem. Rusty coloured.

A. mesoporphus.—Under trees, with a slender stem and thin, yellow pileus.

A. procerus.—In grass, Glenmaggie. Pileus yellowish, thin, and obtuse, umbonate, 6in. tall.

Sub-Genus Ormillaria.—Veil partial annular. Hymenophorum confluent with stem.

A. melleus.—Underside of logs, Walhalla. Pileus pale greenish yellow, depressed in centre. Stem hollow, light yellow. Ring swollen.

Sub-Genus Tricholoma.—Stem fleshy. Gills with sinus behind. Veil wanting, or just appearing as floccose threads on margin of pileus.

A. nudus.—Under trees in Albert Park. Pileus thin, purplish, and obtuse. Stem 3in. high, stuffed.

Sub-Genus Clitocybe.—Stem elastic with fibrous outer coat. Gills decurrent, or acutely adnate.

A. inversus.—In Albert Park. Pileus greatly depressed, of a dull red. Stem hollow.

A. laccatus.—Under trees, Toongabbie. Pileus very thin, plain, depressed at centre, rough. Stem thick, stuffed, 3in. high, dirty yellow.

Sub-Genus Collybia.—Stem cartilaginous externally. Margin of pileus at first involute. Gills not decurrent.

A. esculentus.—Solitary, in the grass, Glenmaggie. Very small. Pileus dirty yellow. Stem 1in. long and thin, with a long root.

A. nummularis.—In scrub, Walhalla. Pileus 1in. wide, white, with patches of yellow, plain. Stem 4in. long, hollow. Gills free and white.

A. ozes.—Near road, Moe. Pileus grey, or dusky, 3in. high.

A. radicatus.—On old log, Walhalla. Pileus dusky olive, 4in. high. Stem stuffed.

A. xanthopus.—Amongst rotten leaves, Walhalla. Three inches high.

Sub-Genus Mycena.—Stem cartilaginous externally. Margin of pileus at first straight and pressed to stem (mostly campanulate).

A. capillaris.—In rotten leaves under Baw Baw. Very small, 1in. high, shining white.

A. debilis.—In scrub, Walhalla. Flesh coloured, convex, 3 inches high.

A. galericulatus.—On rotten log, Walhalla. Cœspitose, brown and shining.

A. polygrammis.—On old log, Walhalla. Pileus 1in. wide, light yellow, campanulate, 4in. high.

A. umbelliferus.—Walhalla, under trees hill top. Pileus very small, grey, umbonate. Stem fistulose, 2in. high.

Sub-Genus Omphalia.—Stem cartilaginous. Gills truly decurrent.

A. gracillimus.—Walhalla. Very white, tiny, membraneous, growing on decayed branches.

A. pyxidatus.—Thompson River. Dusky red, watery looking skin, 1in. high. Stem hollow. Pileus infundibuliform.

A. umbratilus.—In grass, Toongabbie. Campanulate, 1in. high, dark coloured. Stem stuffed.

A. fibula.—In grass. Very small, orange, watery looking. Stem hair like.

Sub-Genus Pleurotus.—Stem eccentric, lateral or wanting. Mostly growing on wood.

A. ostreatus.—On trees, spreading out one layer over another, separated. Pileus 4in. broad, pale yellow.

Series Hyperhodu.—With salmon or pink spores.

Sub-Genus Volvaria.—Veil universal, distinct from cuticle. Hymenophorum distinct from stem.

A. Taylorii, B.—In grass, Walhalla. Pileus 1in. broad, livid, campanulate. Stem 2in. long, solid, bulbous at base, volva brown. Gills broad, thinning off behind.

Sub-Genus Pluteus.—Veil none. Hymenophorum distinct from stem.

A. cervinus.—Pileus 3in. broad, campanulate, soft, white. Stem 3in. long, white, solid. Gills separate from stems, flesh-coloured. On old logs, Walhalla.

Sub-Genus Clitophilus.—Hymenophorum confluent with stem. Gills decurrent.

A. cancrinus.—Pileus 1in. broad, white, smooth. Stem 1in. long, thick, white, stuffed. Gills decurrent. In grass, Glenmaggie.

Sub-Genus Pholiota.—Stem furnished with ring.

A. pudicus.—On old trunks, Toongabbie. Pileus fleshy, convex, dry. Stem solid. Ring persistent. Gills tawny.

Sub-Genus Hebeloma.—Veil, if present, floccose, not inter woven. Stem fleshy. Gills sinuated.

A. mesopheus.—On ground, Albert Park. Pileus 1in. broad, whitish yellow, convex. Stem 3in. long, hollow, tough. Gills emarginate, rusty coloured.

Sub-Order Flammula.—Stem fleshy. Gills adnate or decurrent.

A. hybridus.—In Albert Park, on half-rotted branch. Pileus yellowish tawny, convex, 2in. broad. Stem 2in. Hollow or partly stuffed, whitish, attenuated upwards. Gills adnate, light yellow, growing in bunches.

A. sapineus.—In Albert Park. Pileus bright tawny yellow, convex. Stem short, thick, and solid. Gills adnate, cœspitose.

Sub-Order Tubaria.—Stem somewhat cartilaginous, fistulose. Gills somewhat decurrent.

A. furfuraceus, Pers.—Walhalla, in musk gullies on rotten twigs. Pileus pale brown, rough, convex. Stem 1in. high, hollow. Gills partly decurrent.

Sub-Order Naucoria.—Stem cartilaginous externally, convex. Pileus inflexed.

A. pediades, Fr.—Moe road, in grass. Pileus yellow, 2in. broad, plano convex. Stem 3in. high, stuffed, tough. Gills adnexed.

Sub-Order Galera.—Stem cartilaginous externally. Pileus campanulate. Margin straight.

A. hypnorum.—Latrobe River, amongst moss. Very small, pale yellow, campanulate. Stem 2in. high, hollow and rigid. Gills adnate.

Sub-Order Crepidotus.—Pileus eccentric, thin, with soft flesh. Spores distinctly rusty coloured.

A. alveolus.—In Long Tunnel Mine, Walhalla, on old timber. White, with olive margin. No proper stem. Gills not decurrent, but end abruptly, very broad.

Series IV.—Pratellæ.—With brown or purple brown spores.

Sub-Order Psalliota.—Veil fixed to the stem, forming a ring.

A. campestris.—This is the common mushroom of commerce.

Sub-Order Stropharia (*A. semiglobatus*).—On dung, University reserve, Melbourne. Very small, light yellow, hemispherical. Stem, 3in. high, thin, straight, and hollow. Gills adnate, dark, but purplish.

Sub-Order Hypholoma.—Veil woven into a fugaceous web, which adheres to margin of pileus.

A. dispersus.—Toongabbie, amongst grass. Pileus very small, yellow, convex, dotted. Stem, 1in. high, hollow. Ring plain. Gills adnate, whitish.

Sub-Order Psilocybe.—Veil, if present, not forming a ring. Margin of pileus at first incurved.

A. spadiceus.—Ostler's Creek, Gippsland, on old stump. Pileus 3in. broad, brown, convex; the surface broken into cracks. Stem 4in. long, thick and firm, hollow. Gills adnexed.

Series V.—Coprinaria.—With black spores.

Sub-Order Panœolus.—Veil interwoven. Pileus fleshy, no striæ. Margin at first extending beyond the clouded gills.

A. papilionaceus.—University Gardens, Melbourne, on dung. Pileus hemispherical, whitish, smooth. Stem 3in. high, equal. Gills very deep and adnate to stem.

Sub-Order Psathyrella.—Veil not interwoven. Pileus membraneous, margin not extending beyond the gills.

A. trepidus.—Tangil River, Gippsland, on boggy ground. Pileus 1in. broad, brown, campanulate, very fragile. Stem 3in. high, thin, straight, hollow. Gills adnate.

NOTE ON THE NIDIFICATION OF THE CHESTNUT-RUMPED ACANTHIZA (*ACANTHIZA UROPYGIALIS*).

By R. H. Nancarrow.

(*Read before the Field Naturalists' Club of Victoria, 12th March*, 1888.)

About twenty years ago I used to do a good deal of nest-hunting in the Whipstick, an isolated tract of mallee scrub, commencing near the municipal boundary of Eaglehawk, and extending in a northerly direction for more than twenty miles, by a breadth, in some parts, of five or six miles. In and around the scrub I met with several species of birds, respecting the nidification of which Gould's recently-published handbook furnished little or no information. To search for their nests was, therefore, a very pleasurable task.

Among those that principally engaged my attention were the cautious Hylacola *(Hylacola cauta)*, Lambert's Malurus *(Malurus Lamberti)*, the Red-capped Robin *(Petroica goodenovii)*, the Red-rumped Acanthiza *(Acanthiza pyrrhopygia)*, and the Chestnut-rumped Acanthiza *(A. uropygialis)*. I found the nests of all, except *Acanthiza uropygialis*.

Of the Hylacola I obtained only one nest containing eggs, and I sent the nest and an egg to the National Museum, and there they are still, no doubt, stowed away somewhere along with hundreds of other valuable things that cannot be displayed for want of space.

Several nests of the Red-capped Robin were discovered, and nearly all of them contained either an egg or young of the Narrow-billed Bronze Cuckoo *(Lamprococcyx basalis)*.

The Red-rumped Acanthiza's nests that I met with were built in low bushes, or in tangled bunches of scrub-creeper, and I naturally expected to find nests of its congener in similar situations. More than once, on discovering a partly-built nest where a pair of Chestnut-rumps were flitting about, I recorded in my notes the finding of the much-coveted prize, but, to my chagrin, subsequent visits invariably proved the nest to belong to some other species; and, notwithstanding many long hours of patient watching, the nidification of this little bird remained a mystery to me until the summer of 1881.

In October of that year I was watching a pair, and, from their actions, I felt sure their nest could not be far from where I was standing. Presently I heard a faint "cheeping" behind me, and on turning round was delighted to see one of the birds feeding its young in the nest. Now I could see how I had hitherto been baffled, for the nest, instead of being placed among foliage, as one would expect an Acanthiza's nest to be, was actually built in the *cleft of a hollow tree.*

In this case the nest was about 7ft. from the ground, in a dead, hollow sapling, which was cleft on one side from top to bottom.

The cleft gave access to the interior, where the nest—a neat, little domed structure, formed of strips of bark and grass, and lined with feathers and fur—was built.

A few days after I saw another pair on the edge of the scrub, and, now that I had the clue, I had not much difficulty in discovering their nest. After watching them for a time, I saw one of the birds clinging to a piece of bark that was hanging from a half-burnt sapling, about six feet from the ground, and there, sure enough, was the nest, containing three eggs. The bark formed a "pipe," with an opening on one side.

This nest and one of the eggs I send herewith.

Since then I have found three other nests. One was built in

a hollow stump, split open on one side, and the nest was scarcely two feet above the ground. It contained three young birds. The second was built in a hollow, dead branch, nearly fifty feet from the ground. This also contained young.

The third I found this summer, and, as in the preceding instance, it was placed in an upright, dead branch, access to the interior of which was afforded by a vertical rift. The nest was fully ninety feet from the ground, and, of course, I could not get at it, but I frequently saw the old birds carrying up food for their brood, and entering the narrow opening.

I do not know any other bird that builds at elevations varying from two feet to nearly one hundred.

The Red-rumped Acanthiza is confined to the scrub, but the Chestnut rumped species is frequently met with at considerable distances from it in the surrounding forest.

Description of egg of *Acanthiza uropygialis*:—Egg about 7½ x 5¾ lines; white, with light chocolate blotches, the latter forming a zone about ⅛ inch broad round the larger end.

Neilborough, 8th March, 1888. R. H. NANCARROW.

CORRESPONDENCE.

SPIRANTHES AUSTRALIS.

To the Editor of the Victorian Naturalist.

DEAR SIR,—Will you kindly announce in your next issue that *Spiranthes Australis* (nearly out of flower) was found at Cheltenham on Saturday last by C. French, jun., this being the nearest recorded locality to Melbourne where it has been found. About three years since, Dr. Lucas found it near Healesville, and now it has lately been found by Mr. Topp near Lilydale. I also found it at Frankston.—I am, yours truly,

C. FRENCH.

Botanical Museum, 21st February, 1888.

To the Editor of the Victorian Naturalist.

DEAR SIR,—The orchid I found at Oakleigh, and exhibited at the February meeting of the Club, is *Chiloglottis diphylla* (R.B.), according to the Baron. He said it has only been found twice before—at the Ovens River and Wilson's Promontory, never before near Melbourne. It is growing in thousands on the banks of the creeks to the left of Oakleigh. The plants are going out of flower very quick. I send you this, thinking it would be an interesting note for the *Naturalist*.—Yours respectfully,

J. E. DIXON.

Main-street, Oakleigh, 29th February, 1888.

Field Naturalists' Club of Victoria.

President:

A. H. S. LUCAS, M.A., B.Sc., F.G.S.

THIS Club was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

No Entrance Fee. Annual Subscription, including copy of proceedings, 15s., dating from 1st May.

The Ordinary Meetings for the reading of papers, and exhibition of specimens, with a short conversazione, are held on the second Monday in each month at the Royal Society's Hall, Victoria-street, Melbourne, at 8 p.m.

The proceedings of the Club are recorded in its journal—the "Victorian Naturalist." Annual subscription, 6s. 6d., post free. (To members free.)

With the view of popularising the study of the Natural History of the Colony, correspondence, notes, and queries relating to this subject are invited for insertion, and should be addressed to the Editor at the Wesley College, Prahran.

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Copies of the Annual Report and List of Members for 1886-87, with Rules, etc. can be obtained on application to the Hon. Sec.

A. COLES,

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BECKS' "STAR" MONOCULAR MICROSCOPE, with rack and pinion coarse adjustment, iris diaphragm, double mirror, fine adjustment by screw, 1 eye-piece, 1in. and ¼in. objective, in case, £4 12s. 6d.

BECKS' "ECONOMIC" MICROSCOPES, from £7 6s. to £11 11s.

BECKS' "POPULAR" MICROSCOPES, from £12 5s. to £27 5s.

BECKS' "NATIONAL" MICROSCOPES, from £12 5s. to £38 10s.

Particulars of various other Microscopes, by best English and Foreign Makers, may be had on application.

MELBOURNE: 31 & 33 FLINDERS LANE WEST.

Field Naturalists' Club of Victoria.

PRESIDENT: A. H. S. LUCAS, ESQ., M.A., B.SC., F.G.S.

DEAR SIR,

The next Ordinary Monthly Meeting of the Club, will be held at the Royal Society's Hall, corner of Victoria and Stephen Streets, Melbourne, on Monday evening, 12th inst., at 8 o'clock.

Members are at liberty to introduce a friend at each meeting, and are invited to contribute specimens of interest for exhibition during the conversazione, with which the meetings terminate.

Yours truly,

F. G. A. BARNARD,

HON. SECRETARY.

Kew, 8th September, 1887.

P.T.O.

BUSINESS:

1. Correspondence and Reports.

2. Election of Members.

The following persons have been duly nominated for election at this meeting:—

	Proposer.	Seconder.
Mr. Wm. Best, Branxholme.	J. Dennant, F.G.S.	F. G. A. Barnard.
„ W. Chisholm, Prahran.	C. French, F.L.S.	O. A. Sayce.
„ E. R. Hammett, Alexandra.	„	„
„ G. Thomson, L.D.S.	E. E. Johnson	H. W. Hunt.
Mrs. G. Thomson, Collins St. E.	„	„
Mr. R. Tobin, Northcote.	„	„
„ Alfd. Walker, Northcote.	O. A. Sayce	C. French, F.L.S.
„ M. Waterstrom, West Melbourne.	F. G. A. Barnard	A. H. S. Lucas, M.A.

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to the Hon. Sec.

4. General Business.

5. Reading of Papers and Discussions thereon.

(*a*) By Mr. J. F. Roberts, F.R.H.S.—"Some Notes of a Recent Trip to New Caledonia." Part II.

(*b*) „ Baron F. von Mueller, K.C.M.G.—"A Supplementary List of Australian Lichens."

(*c*) „ Rev. C. M. Yelland—"Sparrows."

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

7. Exhibition of Specimens and Conversazione.

Members exhibiting specimens are requested to furnish the Hon. Sec. with written particulars of their Exhibits for record in the minutes and "Naturalist."

The Exhibits at this meeting will be under the supervision of Messrs. Campbell and Wisewould, and are not to be removed without their consent.

The Exhibits must not be touched without the consent of the Exhibitor.

EXCURSIONS.

SATURDAY, SEPTEMBER 17th—CROYDON—By 11.45 a.m train from Prince's Bridge Station. For Botany, under Mr. F. G. A. Barnard.

SATURDAY, SEPTEMBER 24th—CHELTENHAM—By 12.15 p.m. train from Prince's Bridge Station. For Botany. under Mr. C. French, F.L.S.

SATURDAY, OCTOBER 1st—DANDENONG CREEK, viâ Oakleigh. By 1 p.m. train from Prince's Bridge Station. For Ornithology, Botany, Entomology, etc., under Mr. A. J. Campbell.

As vehicles have to be arranged for, members intending to take part must hand in their names at the Ordinary Meeting.

Programmes of the Excursions for the year 1887-8 can be obtained on application to the Hon. Sec.

THE PROPOSED TRIP TO KING'S ISLAND.

Members wishing to join the King's Island Expedition in November will please register their names with Mr. A. J. Campbell, Armadale, from whom particulars may be obtained. Passage money to and from the Island by a First-class Steamship Company will be £5 per member.

EXHIBITION OF WILD FLOWERS.

It has been decided to hold an Exhibition of Wild Flowers, at the Royal Society's Hall, on Tuesday Evening, September 27th, and members are requested to do their utmost to make the meeting a success.

The flowers should be gathered as late as possible, and the stems well wrapped in wet rags, and if forwarded from the country, enclosed in tightly-closed tin-boxes, or American oil-cloth.

Exhibitors are requested to have their exhibits at the Hall not later than 2 p.m. on Tuesday afternoon.

Printed labels can be obtained from the Hon. Sec. at the ordinary meeting, and exhibitors are requested to name their specimens beforehand, if possible.

Exhibits of growing Victorian Plants are also invited.

LIBRARY NOTICE.

Owing to the increasing use of the Library, members are requested not to keep the books borrowed longer than one month, otherwise fines will be inflicted according to the Library Rules.

MEMO. Your subs'n for year P.T.O.

1887-8 was due on May 1st.

ARREARS.

FIELD NATURALISTS' CLUB OF VICTORIA.

PATRON: Baron F. von Mueller, K.C.M.G., M. & Ph.D., F.R.S., etc.

OFFICE-BEARERS, 1887-8

PRESIDENT: Mr. A. H. S. Lucas, M.A., B.Sc., F.G.S.

VICE-PRESIDENTS:

Mr. C. French, F.L.S. Mr. C. A. Topp, M.A., LL.B.

HON. TREASURER: Mr. E. Tweddell.

HON. LIBRARIAN: Mr. O. A. Sayce.

HON. SECRETARY: Mr. F. G. A. Barnard, Kew.

HON. ASSIST. SECRETARY: Mr. G. Coghill.

COMMITTEE:

Mr. A. J. Campbell. Mr. G. R. Hill. Mr. D. LeSouëf.
Mr. H. T. Tisdall, F.L.S. Mr. F. Wisewould.

OBJECTS.

THIS CLUB was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

EXTRACT FROM THE RULES.

4. . . . . Ordinary members shall pay an annual subscription of fifteen shillings, which shall also entitle them to a copy of the Club's journal monthly.

5. All subscriptions shall become due on the first day of May in each year.

6. Candidates for admission must be proposed and seconded by two members at one meeting, and balloted for at the ensuing meeting, one black ball in six to exclude; but no person, who has been elected, shall be entitled to the privileges of a member until his subscription shall have been paid, or while his subscription is in arrears.

Copies of the Annual Report and List of Members for 1886-7, with Rules, etc., can be obtained on application to the Hon. Sec.

Field Naturalists' Club of Victoria.

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DEAR SIR,

The next Ordinary Monthly Meeting of the Club will be held at the Royal Society's Hall, corner of Victoria and Stephen Streets, Melbourne, on Monday evening, 13th inst., at 8 o'clock.

Members are at liberty to introduce a friend at each meeting, and are invited to contribute specimens of interest for exhibition during the conversazione, with which the meetings terminate.

Yours truly,

F. G. A. BARNARD,

HON. SECRETARY.

Kew, 9th February, 1888.

P.T.O.

BUSINESS:

1. Correspondence and Reports.

2. Election of Members.

The following persons have been duly nominated for election at this meeting:—

	Proposer.	Seconder
Mr. J. T. Raw ... Broadmeadows.	A. Coles ...	F. G. A. Barnard.

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to the Hon. Sec.

4 General Business.

5. Reading of Papers and Discussions thereon.

(*a*) By Rev. F. R. M. Wilson—"Notes on Lichens."

(*b*) „ Mr. A. J. Campbell—"Australian Oology." Supplement Part IV, 1887.

(*c*) „ Mr. H. Watts—"Additions to Microscopical Natural History.

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ANNUAL CONVERSAZIONE.

Members are reminded that the Annual Conversazione will be held about the middle of April, and are desired to bear in mind the preparation of Exhibits.

EXCURSIONS.

Programmes of the Excursions for the year 1887–8 can be obtained on application to the Hon. Sec.

SATURDAY, FEBRUARY 18th—CHELTENHAM. Leaving Prince's Bridge Station by 12.15 p.m. train. For Entomology and Geology.

SATURDAY, MARCH 3rd—WILLIAMSTOWN, BACK BEACH. Leaving Spencer Street Station at 2 p.m. For Marine Zoology and Botany, under Mr. A. H. S. Lucas, M.A.

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SPECIAL NOTICE.

Members who have not yet paid their subscriptions for the current year, ending April 30th, 1888, are requested to do so as soon as possible.

P.T.O.

FIELD NATURALISTS' CLUB OF VICTORIA.

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OFFICE-BEARERS, 1887-8

President: Mr. A. H. S. Lucas, M.A., B.Sc., F.G.S.

Vice-Presidents:

Mr. C. French, F.L.S. Mr. C. A. Topp, M.A., LL.B.,

Hon. Treasurer: Mr. E. Tweddell.

Hon. Librarian Mr. O. A. Sayce.

Hon. Secretary: Mr. F. G. A. Barnard, Kew.

Hon. Assist. Secretary: Mr. G. Coghill.

Committee:

Mr. A. J. Campbell. Mr. G. R. Hill. Mr. D. LeSouëf. Mr. H. T. Tisdall, F.L.S. Mr. F. Wisewould.

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Yours truly,

F. G. A. BARNARD,

HON. SECRETARY.

Kew, 8th March, 1888.

P.T.O.

BUSINESS:

1. Correspondence and Reports.

2. Election of Members.

The following persons have been duly nominated for election at this meeting:—

	Proposer.	Seconder.
Mr. W. Errington ... South Yarra.	C. French, F.L.S. ...	D. Best.
Rev. A. F. Hagenauer ... Ramahyuck.	D. LeSouëf ...	A. H. S. Lucas, M.A.
Mr. Jas. Kershaw ... National Museum.	C. French, F.L.S. ...	D. Best.
Mr. Walt. Poole ... Brunswick.	A. J. Campbell ...	A. Borthwick.

3. Nominations for Membership.

Members making nominations will oblige by handing the full name and address to the Hon. Sec.

4 General Business.

5. Reading of Papers and Discussions thereon.

(*a*) By Mr. R. H. Nancarrow—"Note on the Nidification of *Acanthiza uropygialis*."

(*b*) „ Mr. C. French, junr.—"Notes of a Trip to the Upper Murray."

(*c*) „ Mr. H. Watts—"Notes on the Classification of some Animal Parasites; and on the Vine Moth *Agarista glycine*.

6. Reading of Natural History Notes.

Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

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EXCURSIONS.

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SATURDAY, MARCH 17th—NATIONAL MUSEUM.
Meet at the Museum at 2.30 p.m.

If thought desirable an Easter Excursion can be arranged at the monthly meeting.

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MEMO. Your subs'n 15s for year 1887-8 was due on May 1st. Kindly remit.

FIELD NATURALISTS' CLUB OF VICTORIA.

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OFFICE-BEARERS, 1887-8

President: Mr. A. H. S. Lucas, M.A., B.Sc., F.G.S.

Vice-Presidents:

Mr. C. French, F.L.S. Mr. C. A. Topp, M.A., LL.B.,

Hon. Treasurer: Mr. E. Tweddell.

Hon. Librarian Mr. O. A. Sayce.

Hon. Secretary: Mr. F. G. A. Barnard, Kew.

Hon. Assist. Secretary: Mr. G. Coghill.

Committee:

Mr. A. J. Campbell. Mr. G. R. Hill. Mr. D. LeSouëf.
Mr. H. T. Tisdall, F.L.S. Mr. F. Wisewould.

OBJECTS.

This Club was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

EXTRACT FROM THE RULES.

4. . . . . Ordinary members shall pay an annual subscription of fifteen shillings, which shall also entitle them to a copy of the Club's journal monthly.

5. All subscriptions shall become due on the first day of May in each year.

6. Candidates for admission must be proposed and seconded by two members at one meeting, and balloted for at the ensuing meeting, one black ball in six to exclude; but no person, who has been elected, shall be entitled to the privileges of a member until his subscription shall have been paid, or while his subscription is in arrears.

Copies of the Annual Report and List of Members for 1886-7, with Rules, etc., can be obtained on application to the Hon. Sec.

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