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THE

VICTORIAN NATURALIST:

THE JOURNAL & MAGAZINE

OF THE

Field Naturalists' Club of Victoria.

VOL. XXV.

MAY, 1908, TO APRIL, 1909.

Hon. Editor: MR. F. G. A. BARNARD.

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

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Ю. Иванов. Берлин

THE VICTORIAN NATURALIST.

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ERRATA.

Page 55, line 9—For "Pseudamycla" read "Pseudoliotia."

Page 75, line 10 from bottom—For "Armoria" read "Amoria."

Page 77, lines 3 and 4—For "Armoria" read "Amoria."

Page 159, line 28—For "Bell-birds, *Oreoica cristata*, Lewin," read "Bell Minahs, *Manorhina melanophrys*, Lath."

The Victorian Naturalist.

Vol. XXV.—No. 1. MAY 7, 1908. No. 293.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 13th April, 1908.

The president, Mr. G. A. Keartland, occupied the chair, and about 75 members and visitors were present.

REPORTS.

Dr. J. C. Kaufmann gave a report on the Club's excursion to Heidelberg on Saturday, 14th March, the object being pond life. Some interesting material was found, and examples taken for closer examination under the microscope.

A report of the geology excursion to Fairfield on Saturday, 28th March, was given by Dr. T. S. Hall. About 12 members attended, who devoted the afternoon to the examination of the geological features of the locality.

Mr. R. W. Armitage, who, in the unavoidable absence of Mr. E. O. Thiele, kindly acted as leader of the juniors' excursion to Beaumaris on Saturday, 4th April, reported that about twenty-five junior members attended. The object of the excursion was fossils, and, notwithstanding a somewhat high tide, a fair collection of the fossils usually met with in the locality was made.

A report of the excursion to Keilor on Saturday, 11th April, was given by the leader, Dr. T. S. Hall, who stated that there had been a large attendance of members, who were greatly interested in the varied geological features of the district, which have already been described in the pages of the *Naturalist* (vol. x., p. 21, and vol xiv., p. 52), in connection with former excursions.

The hon. librarian reported the receipt of the following donations to the library :—"The Ascent of Water in Trees," by A. J. Ewart, D.Sc., Ph.D., F.L.S. (reprint from "Philosophical Transactions of Royal Society, London"), from the author; "Report of Department of Agriculture, Victoria," 1905-1907; *Journal of Agriculture of Victoria*, February and March, 1908, from the Secretary for Agriculture, Melbourne; "Annual Report of Trustees Australian Museum, Sydney," June, 1907, from the Trustees; *Agricultural Gazette of New South Wales*, February and March, 1908, from the Secretary for Agriculture, Sydney; "Proceedings Linnean Society of New South Wales," vol. xxxii., part 4, from the Society; "Transactions Royal Society of South Australia," vol. xxxi., from the Society; "The Development of Nestling Feathers," Laboratory Bulletin No. 13, from the Oberlin College, U.S.A.; *Wilson Bulletin*, Nos. 60 and 61, September

and December, 1907, from the Wilson Ornithological Club, U.S.A. ; "Bulletin of New York Botanical Garden," vol. iv., part 14, from the Director ; *Knowledge*, February, 1908, from the proprietors ; and *Nature Notes*, January and February, 1908, from the Selborne Society, London ; also, "A Guide to the Study of Australian Butterflies," by W. J. Rainbow, F.E.S., purchased.

ELECTION.

On a ballot being taken, Master Frank Coomer, "Corio," Bentstreet, Northcote, was duly elected a junior member of the Club.

GENERAL BUSINESS.

Professor A. J. Ewart took the opportunity of conveying the congratulations of the members to Dr. T. S. Hall on his attaining the degree of D.Sc.

Dr. Hall expressed his thanks and appreciation of the cordial manner in which the members had received the announcement, and mentioned the benefit he had derived from being associated with the Club.

PAPERS.

1. By Mr. G. Lyell, F.E.S., entitled "Lepidoptera of the Victorian Alps ; two New Butterflies for Victoria."

The author gave a very interesting account of a collecting trip to Mts. Hotham and St. Bernard in February last, where, during a stay of twelve days, he succeeded in taking 22 species of butterflies and 86 species of moths. Among these were two species of butterflies and three species of moths new to Victoria, besides many rarities.

Mr. F. G. A. Barnard congratulated the author on the highly successful results of his trip, and expressed the opinion that a collector of Orthoptera would do well in the same localities in the early autumn.

2. By Mr. A. H. E. Mattingley, C.M.Z.S., entitled "Wild Life of the Murray Swamps."

A highly interesting account of the bird life of this favourable locality was given by the author, his remarks being illustrated with a splendid series of lantern slides.

Dr. W. Macgillivray offered some remarks on the paper, and congratulated Mr. Mattingley on the exceedingly fine series of photographs shown.

NATURAL HISTORY NOTES.

Mr. R. W. Armitage gave some particulars regarding his exhibits of modern pottery from the N.E. coast of Papua ; a necklace composed of the thoraces of a species of ant ; and pearl shells from the Trobriand Islands, Papua.

Mr. C. French reported that whilst at Mooroolbark on Saturday,

the 11th inst., a flock of eight or nine parrots was seen high up in a tree. Being unable to determine the species, one was shot, when it proved to be Barnard's Parrakeet, *Barnardius barnardi* Vig. and Horsf., which had probably migrated southward owing to the drought in the interior.

EXHIBITS.

By Mr. R. W. Armitage.—Examples of modern pottery ware from Wanigela, N.E. coast of Papua ; rare necklace, composed of the chitinous coverings of a species of ant ; and single valves of pearl shells, showing how pearl "blisters" and pearls develop on the inside of the shell, from Trobriand Islands, Papua.

By Mr. C. French, jun.—New scale insect, *Aspidiotus cedri*, Green, on cedar logs imported into Victoria from Queensland.

By Mr. F. Pitcher, for the Director of Melbourne Botanic Gardens, blooms of the following acacias now flowering in the Melbourne Botanic Gardens :—*Acacia discolor*, Willd., Sunshine Wattle, Vict., N.S.W., and Tas. ; *A. linifolia*, Willd., Flax-leaved Acacia, Vict., N.S.W., and Q. ; *A. maidenii*, F. v. M., Maiden's Acacia, N.S.W. ; *A. pendula*, A. Cunn., Weeping Myall or Boree, N.S.W. and Q. ; *A. salicina*, Lindley, Murray River Willow, Australia.

After the usual conversazione the meeting terminated.

EXCURSION TO LAUNCHING PLACE.

The usual Foundation Day excursion was this year fixed for Launching Place, a well-known spot on the Upper Yarra, just 40 miles from town. The prevailing heat and dry weather of the present season made it somewhat uncertain as to how the excursion would be patronized, and when the leader met the train at Hawthorn station on Saturday morning, 25th January, and did not see a single face on the look-out for him, he did not feel much encouragement. However, when trains were changed at Lilydale, he was pleased to find one other member of the Club making the journey, but, unfortunately, not to join the excursion. There were still signs of Bursaria in bloom as we passed through Mooroolbark, Wandin, and Woori Yallock, so hopes were entertained that some beetles of the Schizorhina, Stigmodera, and longicorn groups would still be about their favourite flower, if we tried it in the afternoon. The day was dull and overcast, but after lunch cleared up and became decidedly hot. At Launching Place I found a member and his wife who had gone up by the previous night's train, so in the afternoon the male portion of the party decided to work down the Yarra, and try the Bursaria for beetles, and met with a fair amount of success, considering that it was a hot day, and most of the Bursaria was over. The only cetonid seen was the ordinary *Schizorhina punctata*. Of Stig-

modera some twelve species were taken, but not including anything of note. A few specimens of fine Melobasis, displaying beautiful maroon metallic markings on a green metallic background, were secured. Of longicorns, the most attractive was *Ampirrhœ decora*, noted for its thickened femurs or thighs. The little black and red *Obrida fascialis* was fairly common, and, of course, *Stenodorus suturalis*, well known from its tar-like smell, was abundant. A few wasps and bees were seen, but without a net it was almost impossible to capture them. Another member of this group, the Bull-dog Ant, made its presence felt to my companion as he carefully scanned a Bursaria for beetles. Botany was represented by the Loose Strife, *Lythrum salicaria*, in bloom, and the Wild Raspberry, *Rubus parvifolius*, and the Tree Violet, *Hymenanthera Banksii*, in fruit, but the most satisfying fruit we got that afternoon was from a stray tree of *Prunus persica*, growing in a shady bend of the river in company with tree ferns and giant wattles. On returning to tea our landlady was much disappointed at the smallness of the party, considering that a promise of seven or eight had been made, and she had gone to considerable trouble in planning for that number, in addition to other expected visitors, and it was with some misgiving that we went to meet the afternoon train, which brought two more, but there was yet hope, as now a still later train runs to Warburton on Saturdays, and on meeting that we were gratified to find two more on board, so that at last we were seven.

During the evening we had arranged for vehicle and pair to take us to the entrance to Malleson's Glen, five miles away, on the following (Sunday) morning, and for an early breakfast, so that we might have a long day there, but notwithstanding that programme several turned out early, and went to a bend of the river, where there is quite a tangle of vegetation, and secured seed-specimens and young plants of one of our few forest climbers, *Lyonsia straminea*. The pods and the seeds, with their silky pappus, put me very much in mind of the African Strophanthus, which has come greatly into use of late years as a heart tonic, but this was not to be wondered at, as both belong to the same order of plants, Apocyneæ. Some of the stems of Lyonsia were large enough and strong enough to allow one of the party to use them as climbing ropes. The larger Clematis, *Clematis aristata*, also climbed about, and its feathered seeds were just on the point of ripening. The violet fruits of *Hymenanthera Banksii*, the little scarlet fruits of the Native Currant, *Coprosma Billardieri*, and the clear, pale fruits of the Native Elder, *Sambucus Gaudichaudiana*, formed pleasing contrasts. The ground was carpeted with a strong growth of the fern *Polypodium punctatum*, with here and there a Cat-head Fern, *Aspidium aculeatum*. A few specimens of *Drimys aromatica*,

Native Pepper, and *Hedycarya Cunninghamii*, showed that these shrubs are not confined entirely to the higher altitude.

After breakfast our party, increased by a lady and gentleman staying at the hotel, who desired to see the beauties of Malleson's Glen, had to requisition another vehicle, and after packing supplies for lunch, got away about 9.30. Though only five miles, the drive occupied nearly two hours, as after the first mile the road is all on the up-grade, and was rather rutty and dusty. This portion of the trip was dealt with so fully by Mr. A. D. Hardy in his report of the excursion in November, 1903 (*V. N.*, xx., 116), that there is little left for me to say. However, I may just recall the fact that the road is never far from the Don River, as it ascends the range, and as we now and again turn a bend in the road we get glimpses of a delightful valley, now partially cleared, and planted with various crops. Opposite to us on our left is the hill or range known as Toole-be-wong, on which is situated the well-known boarding-house "Nyora." On our right we have the range, the top of which is known as "Ben Cairn Rock," an area of bare rock some eight or ten acres in extent, from which a very fine view of the Yarra valley down to Melbourne is obtainable. This, from its appearance from other parts of the district, must be close on 4,000 feet above sea-level. About 11.30 we reached the bend where the road crosses the Don River and turns westerly towards Healesville. This was our destination, and is, perhaps, 1,500 feet above Launching Place, or 1,800 feet above sea-level. Though early, it was determined to lunch at once, and so save coming back in a short time for that procedure, so while some set out the table and boiled the billy, others started observations in this charming spot. About a hundred yards from the entrance gate, under some spreading tree ferns clothed with the greenest of filmy ferns, mosses, &c., we lunched and enjoyed the murmur of the mountain stream rushing by at our feet. Mr. Hardy in his notes about Malleson's Glen wrote in so poetic a strain that I am compelled to keep to prose, but let me say that Malleson's Glen is to my mind one of the best and easiest of places to which a visitor from another country can be taken to see our mountain vegetation to perfection. Since the last visit of the Club, mainly through the efforts of your committee, about 722 acres here, on both sides of the stream, have been permanently reserved for public purposes, and unless despoiled by bush-fires it is likely to remain in its present state for many years. Timber cutting was stopped just in time, and though there are a number of fine specimens of the so-called Mountain Ash, *Eucalyptus amygdalina*, still I doubt whether it would pay to attempt to get them out. One need not go far up stream to see specimens of that graceful tree, the Native Beech, *Fagus Cunninghamii*, and we were pleased to find along the path several seedlings, which,

as I have mentioned on previous occasions, make very pretty pot plants. The Sassafras, *Atherosperma moschatum*, was in fruit, and specimens were secured. After lunch four of the party set out with the view of getting to the head of the stream if possible, the others exploring round about. The path keeps alongside the stream, and soon becomes only a sign here and there. We closely scanned the vegetation as we ascended, but did not add anything of great interest to our knowledge. *Zieria Smithii*, a rutaceous shrub with strong-smelling leaves; the Native Ash, *Panax sambucifolius*, a stately shrub in its early stages; some of the so-called Kangaroo Apples, *Solanum aviculare*, bearing numbers of large green globular fruits, were fairly common. The day was now rather hot, and though we were sheltered from the north wind, still the pale green fronds of *Aspidium umbrosum* drooped, and showed that it was more than they were accustomed to. This fern, by the way, I consider rewards the grower as much or more than any of our others for trouble taken with it, its chief points being that it recovers quickly from neglect in watering, increases rapidly from the root stock, and is not much troubled with scale or other insect pests. *Lomaria fluviatilis* and *L. lanceolata*, with its pink midrib, both pretty ferns, are here very luxuriant, the latter being much more frequent. Surely *L. alpina* and perhaps *L. Patersoni* should be found higher up if we have time. A look-out was kept for *Pteris comans*—very like the Batswing or Oak Fern, *P. incisa*—and once we thought we had found it, but close examination showed it to be *P. incisa* in fruit. Some fine beeches, with gnarled trunks fully three feet through, occur higher up, and the ground was carpeted with their fallen leaves. We were still climbing, and an examination of the compass showed that we had imperceptibly turned towards the east. At last the faint track seemed to lead us up on the hillside, and we got into a thicket of Hazel, *Pomaderris apetala*, and other vegetation, which was very difficult to get through, so we struck down to the stream, and again found signs of the track. Further on, however, it does lead up along the hillside, and somebody had recently slashed down the vegetation, making it more passable. Hereabouts was a fine growth of the grass *Poa* (*Glyceria*) *dives*, known as "wild oats," and a quantity of the seed was gathered for home cultivation. Again our track led down to the stream and seemed to stop. As we had been tramping for three hours, we decided to return the way we had come. No survey seems to have yet been made of this portion of the country, so any heights and distances I give are merely guesswork, but I estimate that we had traversed about four miles from the road, and ascended another 1,500 feet. I am inclined to think that about another mile would have taken us on to the summit of Ben Cairn Rock. The walk down was done in less than half the time of the ascent,

which shows that we must have covered from three to four miles. After a final snack and cup of tea, we started on the drive home, as one of the party wanted to catch the evening train. A dip in the Yarra was found to be very refreshing, after the hot and dusty drive, as a termination to the day's work.

On Monday we determined to visit a part of the district not yet explored by our Club parties. We started off along the road towards Hoddle's Creek, and in about two miles came to the creek itself, a very small stream, quite a contrast to the sparkling waters of the Don, for its purity was sullied by the sluicing carried on higher up. The vegetation was poor as we went along. The Umbrella or Palm Fern, *Gleichenia flabellata*, grew alongside the bridge, while the Coral or Star Fern, *G. circinata*, grew in quantities further along on the hillsides. A look-out was kept for *G. dicarpa*, but it could not be detected. The large yellow pea flower, *Gompholobium Huegelii*, was found both in flower and in fruit. *Persoonia juniperina*, a small proteaceous shrub, was also in bloom, with *Styphelia scoparia* just in bud. The most attractive object along the road was the stems bearing the splendid turquoise-blue fruits of *Dianella longifolia*, which were rather numerous. After about four miles of walking the road left the valley, and, reaching higher ground, we found ourselves on a different formation, the silurian having been replaced by granite. Close by was Hoddle's Creek P.O., which we made our terminus, and as one of the party knew the proprietor, we were invited into lunch, for, notwithstanding that the leader had provided a bottle of "forced march tabloids," and was anxious to give them a trial, the others thought something more bulky would be acceptable, and he too gave way. For dessert we were told to go down in to the raspberry garden and help ourselves, which we did, and the fruit was very refreshing on the hot day. But signs of a coming change were increasing, so we determined to return homewards, and had almost reached the hotel when rain started; however, it was not very serious. After an early tea, we left by the extra train, and were back in town by 8 p.m., after a very enjoyable outing.

In response to my request, Dr. Sutton has kindly given me a few additional notes on the botany of the trip to Malleson's Glen. He says :—

"Many flowers are not to be expected at the end of January, but from the train *Leptorrhynchos tenuifolius* was observed in abundance in the railway reserve, and *Bursaria spinosa* was frequently seen. The latter, however, was really in its fruiting time, for its flowers were scentless, and would soon be past. About the river *Geranium pilosum*, *Oxalis corniculata*, *Viola hederacea*, *Epilobium glabellum*, *Lythrum salicaria*, *Cynoglossum latifolium*, *Brunella vulgaris*, *Gratiola Peruviana*, *Mentha Aus-*

tralis, and *Solanum nigrum* were in bloom. In a bend of the river near the hotel, where the scrub had been little disturbed, *Lyonsia straminea* was growing abundantly, and fine fruit specimens of it and of *Clematis aristata* were obtained, seedlings of each being also lifted for home cultivation. Here, also, *Hedycarya Cunninghami*, the so-called Native Mulberry, and *Hymenanthera Banksii* were in ripe fruit, with *Lomatia longifolia* in seed, while it was noticed that the seed-cases of *Kunzea pedunculata*, in contrast to the Leptospermums, had already shed their contents. On the way to the Glen were seen in flower *Glycine clandestina*, *Hydrocotyle geranifolia*, *Gnaphalium Japonicum*, *Erythræa spicata*, *Goodenia ovata*, *Senecio vagus*, and the graceful little climber, *Convolvulus marginatus*, from which a quantity of seed was gathered. *Hydrocotyle hirta* was in fruit. Fruiting species seen between the river and the Glen were *Panax sambucifolius*, *Sambucus Gaudichaudiana*, *Coprosma Billardieri*, and on the higher ground *Correa Lawrenciana*, bearing buds, flowers slenderer than usual, and gaping cocci, was met with. Here, too, *Cassinia aculeata* was seen in flower, though past that stage lower down, and *Senecio vagus*. It was interesting to notice how many plants had got a start in life by rooting in the stems of the tree-ferns, particularly when prostrate or inclined at an angle. Quite a number of species are introduced into our suburban gardens in this way, and very lately in Carlton I saw a stem which was the host of four—viz., *Pomaderris apetela*, *Coprosma Billardieri*, *Pittosporum bicolor*, and *Polypodium pustulatum*. Some of the acacias, especially *A. melanoxylon*, as well as *Aster argophyllus*, often owe their origin to the hospitable tree-fern, while the orchid *Chiloglottis Gunnii* is quite at home on its fibrous stem. In the Glen the usual fern gully vegetation was found. *Fagus Cunninghamii* was frequent, and seedlings were easily obtainable. The same could be said of *Atherosperma moschatum* (in fruit), *Hedycarya Cunninghamii*, and *Panax sambucifolius*. The other constituents of the scrub were *Aster argophyllus*, *Prostanthera lasiantha*, and *Pomaderris apetala*, in fruit, with *Zieria Smithii* in bud. A complete ascent of the Glen was not made, for lack of time. Higher up *Senecio velleyoides* and *Poa* (*Glyceria*) *dives*, Wild Oats, standing quite 10 feet high, were the most prominent plants. Mr. Maiden says the latter grows up to 17 feet in height, and deserves cultivation; from it a quantity of seed was gathered. The yellow flowers of the Senecio were visible high up on each side of the valley. Most of the fruits met with were nibbled tentatively. That of the Hedycarya was distinctly unpleasant; the large berries of the Solanum, looking like pale yellow tomatoes, and quite warm from exposure to the hot sun, appeared to be sweet and edible, but not having the sessile

decurrent leaves of Baron von Mueller's *S. vescum*—the real Gunyang—they were considered to be those of *S. aviculare*, described by Bentham as inedible; the flavour characteristic of orris root was noticed in the berries of Hymenanthera and the small fruits of *Rubus parvifolius* were frankly eaten. In connection with the fruits of our indigenous plants, it would be interesting to elicit from members and others, and place on record, as much information as possible as to their edibility and possible culinary uses. Of ferns at least twenty species were noticed, the most noteworthy varieties being *Asplenium umbrosum*, *Lomaria lanceolata*, and *L. fluviatilis*, of all of which fine specimens were seen."

I am indebted to Mr. W. H. A. Roger for some notes on the Lepidoptera of the outing. He says :—"At Malleson's Glen a number of small butterflies were observed flying about, which, on a specimen being captured, proved to be *Xenica kershawi*. A solitary specimen of the handsome Swallow-tail Butterfly, *Papilio macleayanus*, was taken in the Glen, but, being faded and worn, was set at liberty again. On Monday, in a narrow, dry gully extending up the hillside near the hotel, specimens of the Ringed Xenica, *X. achanta*, Klug's Xenica, *X. klugii*, and the female of the common meadow-brown, *Heteronympha merope*, were very plentiful, sheltering amongst the bracken from the strong north wind blowing. A few moths were taken, among them being one of the thorn moths, *Rhinodia rostraria*, and the pretty little black and gold *Termessa læta*."—F. G. A. Barnard.

EXCURSION TO MT. WILLIAM, LANCEFIELD.

The earnest entreaty at our last meeting by Mr. Barnard for as large a party as possible to attend the Club excursion to the aboriginal quarries at Mt. William on 22nd February was responsible for about a dozen members assembling on the Lancefield platform. Some had come up the night before, but most had dared the discomforts of the early morning suburban trains, and felt they had already spent a long day by the time the railway journey of 46 miles was finished. As Mr. Barnard read an interesting account of a visit to the district before this Club a few months ago (*Vict. Nat.*, xxiv., p. 111), and as we covered part of the same ground that he did, his description of the quarries need not be repeated; and for this reason, therefore, he has asked me to supply the usual report. Through Mr. M. E. O'Brien, of the Lancefield State school, we had arranged for a four-horse coach to take us out to the Mount, and we were accompanied by Mr. and Mrs. Brisbane, of Big Hill State school, Mr. J. T. Guthridge, of the *Lancefield Mercury*, and Mr. O'Brien. Our drive was a terribly dusty one, but at last we reached the home

of Mr. G. K. Donaldson, on whose property the quarries are situated. We were sorry to find Mr. Donaldson suffering from the result of a severe riding accident. Mr. E. E. Johnson, a former member of the Club, joined us here. As it was now lunch time, a fire was lighted and tea made. We then visited the quarries, and spent about three hours in examining them and their surroundings. The members were greatly interested in the abundant evidences of the aboriginals' handiwork as displayed in the numerous chipping places, both on the hillsides and in the valleys, and it was hard to realize, from the appearance of the heaps, that more than fifty years had elapsed since the last axes had been shaped there. Several unfinished tomahawks were obtained as mementos of the visit. An attempt was made to photograph some of the stone heaps, but, owing to the unfavourable weather conditions, the results were not very satisfactory. The main party then returned to Lancefield and thence to town, while Mr. Armitage and myself, after photographing some tors, made our way to Mr. Johnson's house, Mr. Johnson having kindly offered to put us up for the night.

Before breakfast on the Sunday morning I went to an adjacent slate quarry in the vain hope of finding graptolites. After breakfast we walked down the valley to the south, and in a couple of miles came to the well-known Lancefield graptolite quarry. Here we found a fairly large party, including Mr. Barnard, who had stayed the night in Lancefield. We spent a long time in the quarry, and everyone secured a few graptolites, though till further opening up takes place not much good collecting can be done. A return was then made to Mr. Johnson's for lunch, and then three of us—Messrs. Barnard, Brisbane, and myself—climbed the 1,000 feet to the top of Mt. William. The cairn marking the trigonometrical station is now so surrounded by trees that nothing can be seen from there. A little to the southward, however, from clear ground, a very extensive view is to be obtained. Mt. Alexander shows through a gap to the north-west, and Mt. Disappointment is seen in the opposite direction, and a series of flat-topped ranges stretches from Mt. Disappointment far to the northward. Unfortunately haze and smoke prevented us from picking out many landmarks, but Kilmore and Lancefield townships were easily seen.

A few notes may be added on the geology of this interesting district. The oldest rocks exposed are the Lancefield shales, the lowest Ordovician that we know in Victoria. They are usually dark blue in colour, and in places are much indurated, sometimes being almost cherty. Near the disused Mt. William railway station very silicified beds are displayed in the cuttings. Near Mr. Johnson's house a road leaves the Pyalong road and runs east across the Mt. William range. On this road the blue

PLATE I.

AT ABORIGINAL STONE QUARRIES, MT. WILLIAM.

Photo. by J. H. HARVEY.

shales rise high on the flanks of Mt. William, and are much indurated. They are then succeeded by diabase or greenstone, which forms the main mass of the range. There can be but little doubt that the Ordovician is older than the diabase, and has been silicified by its intrusion. It may be noted that this diabase outcrop, which is several miles in extent, and includes the aboriginal quarries, is not marked on the geological map. At the site of the aboriginal quarries we found highly inclined platy jointing occurring in the diabase, and it is this jointing which has determined the site of the quarries, as it has facilitated the first shaping of the axes. Hereabout small quartz veins were common in the diabase, and some we saw were over an inch in diameter. Some of the blocks of greenstone were slightly vesicular, though nothing approaching the agglomerates of Photograph Nob at Heathcote were seen. About half a mile north of the quarries the diabase is bounded by granite, and along the contact zone a small amount of mining has been done. From the presence of the quartz veins in the diabase near its junction with the granite, it seems probable that the granite is the younger rock, but further observation is necessary to see if granite veins can be found cutting through the diabase.

The succession, then, seems to be—

Granite
over Diabase (greenstone),
over Ordovician shales, &c.

At Lancefield itself we find modern volcanic rocks extensively developed, and these yield the rich soil of the district. The volcanic rocks cover practically all the country traversed by the railway from here to Melbourne.

All of the party will, I am sure, unite with me in thanking our Lancefield friends for their kindness, for without their guidance we should not have seen one-half of what we did see.—T. S. Hall.

[The illustration given herewith is from a photograph by Mr. J. H. Harvey, taken during the excursion. It shows one of the chipping places, just distinguishable as a heap of small stones on the summit of the hill, with an outcrop of rough stones, from which the tomahawks were shaped, in the foreground. It was to this heap, and the fallen she-oak tree, Mr. Barnard referred in his article on page 115 of the *Naturalist* for November last.—Ed. *Vict. Nat.*]

Botany.—A course of University Extension Lectures on botany by Professor Ewart, D.Sc., Ph., is announced to be given in the Biological School, University. Particulars can be obtained from Miss Jean White, Biological School.

A NIGHT WITH THE BIRDS OF LAWRENCE ROCKS.

By A. H. E. Mattingley, C.M.Z.S.

(*Read before the Field Naturalists' Club of Victoria, 9th March*, 1908.)

Towering aloft, wind swept, and like a grim sentinel guarding the entrance to the beautiful bay at Portland stand the precipitous cliffs of Lawrence Rocks, a mere speck of land buffeting the billows of the Southern Ocean as they ceaselessly fall upon it and smash themselves into spray, roaring meanwhile in their agony. As the dying waves expire they encircle the islet with a girdle of snowy foam, which recedes from the brown, jagged shelves of rocks in hundreds of miniature cascades and waterfalls, scintillating in iridescent colours as the refraction of light forms small rainbows in the sunshine. Situated on the narrow neck which connects the two larger masses of rock is a small area of earthy soil, the detritus washed down from the surrounding volcanic cliffs. On this soil "Pig-face Weed," *Mesembrianthemum æquilaterale*, and the Native Mallow, *Lavatera plebeja*, Sims, one moss, which, not being in fruit, could not be identified, and one lichen find a precarious existence.

This verdure-clad spot, a perfect oasis in the desert of bare rock and wilderness of waves, which no doubt long æons ago was separated from the mainland by some vast volcanic disturbance, is resorted to by several species of sea-roaming birds as a breeding ground, on account of the friableness of the soil, which is readily burrowed into by them when forming a nesting home. Others, however, prefer to nest on top of the barest and most exposed part of the rock.

The sea-birds frequenting this place do so on account of its freedom from ground enemies, such as native cats, foxes, and dingoes, and also because it is in the vicinity of their food supply. Owing to their freedom from molestation for perhaps centuries past, the birds repair to this spot to nest and bring forth their young precisely at the same date each year. Knowing this, I journeyed by train to Portland during my Christmas vacation to enable me to add to my knowledge of the nidification of these birds, and also to obtain a series of photos. of the avine inhabitants of this lonely place. The *Countess*, a well-found vessel of about 12 tons register, was awaiting me, and with a plentiful supply of water and provisions, not forgetting my camera and a "bluey," we set sail on a bright afternoon before Christmas for the rock. The boat, propelled by its engine, supplemented with its sails, danced merrily over the azure-blue waters of Portland bay, and as we rounded a headland away, in the distance to the south Lawrence Rock was discerned like an emerald set in the golden light of the shimmering ocean, with

PLATE 2.

GANNETS FLYING OVER ROOKERY, LAWRENCE ROCKS.

Photo. by A. H. E. MATTINGLEY.

Lady Julia Percy Island like a faint speck on the eastern horizon.

As we approached the rock it was noticed that it was divided into two parts by a narrow passage of surging water. On the smaller section hundreds of Cormorants, *Phalacrocorax gouldi*, were seen sitting on their columnar-shaped nests, and when we passed close to them the brooding birds waddled off their eggs and lined up on the edge of the rocks like a regiment of soldiers, and were ready for instant flight should their leader indicate that it was too dangerous to remain any longer. Sailing further on, our boatmen stopped the oil engine, lowered the sails, and deftly throwing out the anchor on to a little patch of good holding ground, made fast close by the brown kelp-clad edge of the reef. My impedimenta having been safely stowed in the dinghy, we pulled for the reef. This dinghy had been specially built with high smooth sides, and with great beam, for rowing through the broken waters of the surf, in which these hardy and bold fisher-folk, in all weathers, attend to their crayfish pots, sunk in the holes of the submerged reefs. As we approached the edge of the reef many fish were disturbed, and swam hurriedly into the masses of kelp with which the rocks are lined, and which continuously flagellates them as the waves in their onward rush wash them first upwards against the reef then downwards as they recede from it. Now we are but a cable's length from the jagged and savage-looking rocks, and the fishermen forthwith heave over a kedge anchor and row through the joggling water, paying out a stout line as they go. When the prow of the boat is within a foot of the rocks the cable is made fast to prevent the boat bumping, and out some of us spring on to the reef. The packages are then thrown ashore, where they are caught and carried through about a foot of white surf that sweeps across the rocky platform to the higher ground.

After the luggage has been stowed above high water level, we set out to explore, and as we ascend the first land mass the nesting burrows of several Fairy Penguins, *Eudyptula minor*, those grotesque flightless birds, were seen. One burrow contained three white eggs, some others two eggs, all heavily incubated and besmeared with dirt, whilst higher up the rock, amongst the pig-face weed, where there was more earth, most of the penguins' burrows contained two little young ones, which were clothed in a dark velvety fur, or rather down, which is not far removed from the fur of animals. In fact, penguins are a curious mixture of bird, animal, and fish, having some of the characteristics of all three forms, and as such are noteworthy examples of the process of evolution from their presumed reptilian ancestors. Other burrows contained two or three adult birds, some of which were moulting. Penguins, when interfered with,

utter at first a sharp note of anger, and then peck viciously at one, and woe betide the uninitiated who foolishly attempts to stroke them, since they can inflict a nasty wound on one's hand. After a little judicious handling, however, they become quite tame. Interspersed with the homes of the penguins were the rabbit-like burrows of the Short-tailed Petrels, *Puffinus tenuirostris*, or "Mutton-birds," as they are more often called. Their burrows are easily singled out from those of the penguins by having a smaller opening, besides being more deeply excavated. Their holes are usually from 4 feet to 7 feet deep, whereas the penguins' burrows rarely exceed 2 feet 6 inches in depth, but are generally only 18 inches deep, and with an arched and a cave-like opening. On some of our coastal islands penguins nest under the overhanging grass tussocks, also sword-grass and other vegetable growths,* and on rare occasions they utilize a crevice in a rock. Investigation of all the homes of the Mutton-birds revealed the fact that only three burrows were tenanted, and on walking around the rookery the remains of the carcasses of these sombre-coloured birds were seen in every direction. This dire mortality at first puzzled me, but whilst wandering over the summit of the rock later on I disturbed a pair of Black-cheeked Falcons, *Falco melanogenys*, which were feasting on the body of one of these birds. The Mutton-bird lays but one large white egg at the end of its burrow, at which place it excavates a cavity and lines it with but an apology for a nest, and in some instances with no lining at all. Their eggs are excellent eating, and are gathered in thousands upon thousands on the islands of Bass Strait and Phillip Island, for culinary purposes, each nesting season. They are larger than the egg of a domestic duck, and when fresh they are a clean chalky white, and look inviting. When the young birds have grown to a large size in the burrow, the islanders of Bass Strait obtain quantities of oil from them, by holding them by the legs over a barrel, and by squeezing them; all the surplus oil is expressed through their beaks, while the carcass is cured by either salting or smoking, and then forms their staple diet. From the fact that these birds take the place of meat at the table of these simple islanders, they have been christened "Mutton-bird."

A few rat-like holes were observed on the outskirts of this small patch of soil, and into one I inserted my arm for about two feet, until I felt something wriggling at the end. My first inclination was to pull my arm out, thinking that it was a venomous reptile, but I was aware that no snakes were to be found on these rocks, so, reassured, I seized hold of the wriggling creature and carefully pulled it from its hole. As it emerged it was seen that it was a Dove-like Prion, *Prion*

* See plate 3, fig. 1.

PLATE 3.

FIG. 1. FAIRY PENGUIN AND YOUNG
(Eudyptula undina, Gld.*)*

FIG. 2. DOVE-LIKE PRION AND YOUNG
(Prion desolatus, Gmel.*)*

Photos. by A. H. E. MATTINGLEY.

desolatus, one of those fragile ocean wanderers known to mariners as "Whale-birds."* When a whaler harpoons a whale and is cutting up the blubber, these sprites of the ocean congregate in thousands and snap up any of the stray pieces that happen to float about. They also suck up any globules of floating oil, of which substance they seem particularly fond. Although there may be only a few Whale-birds in the vicinity when a whale is killed, yet in an incredibly short space of time thousands of these birds come flying in to the banquet. Some may consider this an example of instinct, but one must remember that a bird can see about fifty miles, and should a Whale-bird observe a dead whale, its excited actions, due to the thoughts of a feast, attract the attention of several birds within sight, although they may be ranging over the sea within a radius of thirty miles distant. Other birds, again, which are flying within a radius of sixty miles, observe the actions of those within the thirty miles radius and make for the centre point. The birds roaming the ocean hundreds of miles away are thus informed of the chances of a meal, and so congregate at a given spot on the ocean in large numbers, and as they are powerful fliers it does not take them long to do so.

The Dove-like Prion is vernacularly known at Portland as the "Snow-bird." There were very few of their rat-like burrows in this small area of soil, which was riddled in every direction with Penguin and Mutton-bird holes, and as the Dove-like Prion is a fragile bird, and unable to fight either the Mutton-bird or Penguin for its choice of a nesting site, it has perforce to utilize that portion of the rookery unoccupied by these last-named birds, which is the outer edge of the soil where it meets the rock. As the soil, especially at these parts, is loose and friable, the hurricanes that at times come raging over this exposed islet tear away the edges of the rookery and destroy these unfortunate birds. Evidences of the destructive work of wind and water were plainly visible. All along the extreme edge of the rookery were burrows of the Dove-like Prions, from which the covering of soil had been swept away by the wind, whilst in the nesting cavity at the extremity many broken and a few unbroken eggs were found, one egg comprising a clutch, whilst some of the adult birds had been blocked in their burrows and had been smothered. Most of the burrows of these birds had a turn in them, instead of being excavated straight into the soil. This turn was no doubt made by the birds mainly to prevent the complete choking up of their burrows by particles of wind-driven soil, but in some cases the turn in the tunnelling was due to a hard piece of rock intruding and barring the way, rendering it necessary to turn off in another direction. The burrows measured in depth about two feet, and

* See plate 3, fig. 2.

only about eight or nine of them at the rookery were tenanted by either young ones or adults. Both the cock and hen Prion take their share of the burden of hatching out the young. They often stay at home with their nestling during the daytime, instead of proceeding to sea, over which they flutter, in calm weather, like huge butterflies.

Bishop Mant has well described the various services rendered by one species of petrel to man :—

> Yet may she coast more northern seas,
> Round Hebrid isles and Orcades,
> And Shetland onward, till more far
> Her course the icy mountains bar ;
> And there the kindred Fulmar seek,
> Her nostril broad, and crooked beak
> With yellow nail projecting ; whence,
> Instinctive weapon of defence,
> By nature taught, against his foes
> A stream of liquid oil he throws
> At random, gathered from the sea,
> His floating food ; more plenteously,
> As tending on the harpooner's sail,
> He shares the plunder of the whale.
> How is Nature's kindness shown
> When needed most ! From him alone,
> Free burgher on her common way,
> Himself to man an easy prey,
> By day supplied a grateful feast,
> Their ailments cured, their wounds redrest,
> Their lamp illum'd with evening light,
> With down their couches strewn by night,
> Saint Kilda's simple natives find ;
> Nor less a signal of the wind,
> As by his flittings or repose
> Defined, the aëriel current flows.

Mrs. Meredith, of Tasmania, sings :—

> Where mountain billows roll and loud winds sing,
> The Stormy Petrel, on untiring wing,
> Still skims along the ocean's troubled breast,
> And safely steers above each foaming crest ;
> As the prophetic herald glances by,
> The anxious sailor knows that danger's nigh.

The carcasses of several of these Prions which had been recently killed by the pair of Black-cheeked Falcons aforesaid were scattered about the rookery, in which a peculiar musky odour was noticeable. As it was nearly time for the boatmen to return, we forthwith scrambled up the rocky face of a rough cliff to the Gannet rookery, and on reaching the summit an enchanting picture met our gaze. Crowning the highest part was a living mass of white, composed of some 400 Gannets attending to their young ones. We hurried forward to examine them more closely, and as we did so many of them, rushing face to wind to the edge

of the terrific precipices which surrounded the rookery on three sides, jumped off and majestically flew away.* How beautiful they looked as they circled and recircled, wheeled and rewheeled in their flight over the rookery, or poised in the air as if they contemplated a return to their young ones, and when the soft, yellow light of the setting sun streamed over their snowy plumage and lit up the heavens with an azure blue the effect was extremely weird, and as they came flying back and alighted amongst their young ones they created an impression in one's mind similar to that on viewing a picture of angels descending through space to relieve suffering humanity. But the cackling of the old birds on regaining their young ones, together with the pungent odour of the rookery, rapidly disillusioned one. When approached closely the old birds, in their excitement, vomited up an oily, fishy mass. When sailors catch these birds at sea and place them on the vessel's deck, they eject the contents of their stomach in their excitement. This the sailors erroneously attribute to sea-sickness.

The time had now arrived for the boatmen to return, so we scrambled down the cliff to the dinghy, and with a farewell wave of the hand they departed, leaving me marooned on the islet—a veritable Robinson Crusoe, as it were—a lonely man on a lonely rock. I had now time to revisit the Gannets' rookery, and took the opportunity of observing their habits more closely. Young in all stages of development were found, also a few addled eggs reclining in their mound-shaped nests, which are dished in the centre to receive the single white egg which the Gannet lays. The nest needs to be dished so as to give a purchase to the bird's feet, and it also needs to be firmly fixed to its rocky foundation, since it is built on the most exposed portion of the cliffs, and it is a wonder that the birds are not blown completely off the rookery during the gales that rage along this part of the Southern Ocean. I was privileged to notice how the Gannets hold on during a stiff breeze. This was accomplished by the birds by sitting face to wind so as to offer as little resistance as possible to it, with their webbed feet flattened on the outside declivity of their mound on the side which sloped to windward, whilst their strong, stiff tail feathers were propped against the inside ridge of their saucer-shaped nest, and so an excellent leverage was obtained. Most of the brooding birds' tails were very much worn by using them in this manner, as they held on and protected their young ones with the vent feathers. Whether they adopt this method of holding on whilst sitting on their eggs remains to be ascertained. The nest is composed for the most part of guano, intermingled with a little soil, seaweed, and waste matter, and is patted down into a smooth and solid mass, as if it

* See plate 2.

had been made of stiff clay, and is almost as solid as the rocky foundation on which it rests. Now and then an adult bird would fly in from the ocean, and, regurgitating the contents of its stomach, would discharge the semi-masticated and partly pre-digested material, consisting of an oily, thick paste, into its offspring's throat. Others, again, brought in fish—principally young Barracouta, Garfish, and Pilchards. It was indeed a magnificent sight to watch a hundred or two of the old birds obtaining their food, as they hovered at an altitude of between 30 and 50 feet over a shoal of fish, when, with sudden downward rushes, they plunged headlong into the waves, the impact causing the spray to splash up around the spot to the height of about 8 feet. On emerging, the birds, with a side-shake of their heads, swallowed their prey. The effect of so many birds "taking headers" from aloft was similar to huge flakes of snow falling.

Gannets are specially adapted for diving in this manner, since they are provided with a liberal supply of feathers, especially on the crown and neck, which is thick and strong, whilst their bills are pointed like a stiletto, and offer very little resistance to the water. They are also provided with a special apparatus in the shape of a series of small air-sacs, which lie immediately beneath the skin of the breast. These air-vessels can be inflated at will, and thus form a pneumatic cushion, as it were, which enables the bird to soften the concussion caused by meeting the water after their headlong descent; besides, they also facilitate the bird's return to the surface more easily on account of this added buoyancy. Just before the Gannet enters the water in its headlong plunge it neatly claps its wings to its side and holds them there rigidly, otherwise, if they were left open or loose, they would probably be broken; besides, they would offer too much resistance to the water, and by retarding the progress of the bird its prey would escape. The tip of the wing of the Gannet whilst in flight covers an angle of 175 degrees. Were a line drawn vertically through the centre of its body the tip of the wing would almost touch it above and below in its sweep of nearly half a circle. The Gannet's fish-like goggle eyes are also specially adapted for sighting its finny prey under water; whilst their subcylindrical bill, being serrated along the inner edge like the teeth of a saw, helps them to hold their slippery prey more effectually, especially since the serrations point backwards, and they no doubt assist them to partly mince their food. These serrated processes on the Gannet's bill are probably the present day counterparts of the teeth possessed by their ancestors in prehistoric times. Such is the almost incredible change which has been wrought in this bird in nature's workshop, where it has been subjected to a hammering on the anvil of time by its environment until we find the teeth which were embedded

in the plastic gum of its progenitors moulded into one solid piece of mechanism. The Gannet is a bird that is apparently indissolubly linked up with the past. Not only do we find the evidences in the serrations of its beak, but we also find that its young in their immature state, when the wings, being devoid of feathers, are covered with skin like our hands, crawl about on all fours, using both legs, wings, and beak to propel themselves along. They are also known as Solan or Solent Geese, and were it not for the shape of its beak one might readily mistake it for a goose, since they are about the same size and shape. Generically they are known to science as Sula, to which genus the boobies belong. The Gannet is a booby *par excellence*, since the brooding birds will let one approach close to them, and even capture them, as they sit on their nests. One can walk through a rookery amongst these birds, but not altogether with impunity, because one has to be careful of their powerful beak, since they peck at a person if approached too closely. It is indeed a pretty sight to walk through the brooding birds and observe the long, well-defined line of black of the primaries or large outer feathers of the wings, sharply though pleasantly contrasting with their snow-white plumage, whilst the delicate ochreous-buff colour of the head and nape, blending with the greenish-coloured soft parts adjoining the bill, with its bluish edgings, make a charming picture. How loving, too, they are to one another! What gentle affection is shown when one of the birds returns home from a fishing trip. Watch how they cuddle up their necks and utter subdued cackling love notes as they caress each other. But, loving as they are by nature, they resent any intrusion of their neighbours, and by vigorously pecking any other Gannet that comes within reach of their beak they intimate to them that they must keep in their own back yard. As their nests are built very close to one another this contingency frequently happens. However, the adult birds are very kind to the young ones, and should a nestling wander to an adjoining nest the old Gannet occupying it will nestle down over it together with its own offspring. It is not unusual to find two, and sometimes three, of the smaller nestlings that have gone astray under one old bird, which seems quite pleased with the addition to its family. The larvæ of a blowfly were found swarming in the mouth and throat of two of the living young Gannets. These unfortunate mites, as yet unfeathered, would have been destroyed very soon had I not washed these parasites out with sea water. The absence of their parents had evidently given the blowfly an opportunity to lay its eggs in the mouths of these helpless creatures.

Well-defined tracks, consisting of nodules or excrescences on the skin, denote the beginning of the feather forests, or pterylæ, as they are called, in the immature birds. Feathers do not grow

everywhere on a bird's body in a haphazard fashion, as one would naturally expect judging by their appearance on a fully feathered bird, but they have well-defined areas, which differ in pattern in most of the species. The other parts of the surface of the bird's skin being covered with the overlapping feathers that grow in these feather forests makes it appear as if its feathers were growing from every part of its body. Herewith is a terse description of the phases of plumage of *Sula serrator* from the most immature form upwards :—

(1.) The young of the Gannet, when first hatched, is blind and naked, the colour of its skin being a deep chocolate-black, whilst its weight is about 2 or 2½ ozs.

(2.) Almost devoid of any covering except for a light patch of white on crown of head; fore-neck, interscapulary region, lower back, rump and flanks, hinder crown, nape, hind neck, breast, and along the wing in region of humeral feathers showing a faint growth of down. Auricular region, lores, chin, throat and lower throat bare, the skin being brownish-black. Bill 1 inch long, and the total length about 8½ inches. Irides dark, with a yellowish spot or streak on skin beneath the eyes. Note.—All the series that are feathered have this yellowish spot. Tips of wings in 3, 4, 5 series almost bare; this enables them to use both their wings and legs as a means of propulsion, and it is a remarkable fact that the immature young Gannets "walk" about on all fours, so to speak.

(3.) Sparsely covered with white down. Throat and region around the eye bare. Length of bill, $1\frac{1}{16}$ inches. Length, about 9 inches.

(4.) Body covered with thick white down, except upper back and nape, which is sparsely covered. Hinder crown, region around the eyes, chin, throat, and lower throat bare, whilst there is a scanty growth on the crown. Length, about 12 inches. Bill, 1⅛ inches.

(5.) Covered with white down, excepting upper back, which is thinly covered. Hinder crown almost bare. Forehead, region around the eye, chin, throat and lower throat bare. Bill, 1½ inches. Length of bird, about 13½ inches. The growth of down in this specimen is now found starting at the sides of lower throat.

(6.) Covered with thick white down; forehead, region around eye, chin, and throat bare. Lower throat showing faint growth of down. Crown with distinct tuft of down standing up like a casque, evidently a special adaptation to soften the concussion in its adult stage when it strikes the water in its headlong descent. Bill of this specimen measured 2¼ inches. Length of bird, about 16½ inches.

(7.) Same as No. 5, only having the growth of down more

developed on side of lower throat. Length of bird, about 19¼ inches. Bill 2⅜ inches in length. In Nos. 5, 6, and 7 the top joint of wing is covered with down, whilst in all the series under review the irides are dark and the yellowish-coloured spot or streak is found beneath the eye.

(8.) Centre of throat, lores, and region beneath the eye bare. Tuft of down more prominent on the crown. Forehead covered with whitish feathers flecked with brownish-black spots. All other parts covered with thick white down; primaries, secondaries, wing coverts, and mantle feathers, being dark grey, each feather being tipped with a white spot, whilst the shaft of the tail feathers is white, upper tail coverts almost white, whilst some nearer the rump are tipped with white only. Length, 26 inches. Bill, 3⅜ inches. No under tail coverts have as yet appeared. At this stage of the bird's development it gets its wing and tail feathers, whilst the other parts of the bird's body still retain the down. It is evident that the development of these feathers before the others has a relationship with the feathers that are moulted first, since it is the tail and wing feathers that disappear earliest. A noticeable fact is that at this stage the head, excepting the lores and centre of throat, is covered with down, whilst the patches that are bare remain naked in the adult.

The shades of night approaching, I descended the cliff and reached the rookery of the petrels and penguins, and waited there to observe the home-coming of its inhabitants. At 8.45 p.m. the pair of Black-cheeked Falcons still hovered around in the semi-darkness, uttering angry notes at my continued presence, which evidently prevented them from attacking the home-coming petrels. At about 9 o'clock p.m. a solitary Mutton-bird arrived, and descended noiselessly into its burrow; then a couple of Snow-birds, or Prions, flew quietly in, and after flying up and down the rookery to take up the bearings of their nest, they flickered over their burrows like large butterflies and descended to their young ones beneath, after having cleared away the loose material that had been blown into the mouth of the burrow with a few vigorous backward kicks of their webbed feet. A faint "coo-coo-coo" of welcome made by the adult bird could be heard, as it invited its offspring to open its mouth whilst it regurgitated the contents of its stomach, consisting of a thick greenish, oily paste, and ejected it into the open gape of its progeny. The young of the Dove-Petrels, or Prions, like most of the petrel family, resemble a ball of slaty-grey fluffy down, in their earliest immature state. They have a pair of little beady black eyes, which peep out of the down from just behind a slender black beak, which is surmounted by the tube nostrils peculiar to the petrel family. Leading an indolent life in the burrow, where they are protected from wind, heat, and rain, they wax exceedingly fat on the teaspoonful of oily fish paste with which they are fed nightly.

Owing to the young petrels being simply balls of oily fat, the natives in some parts of the South Seas utilize them to light up their huts. This is accomplished by passing a rush up through their bodies, which serves as a wick, and so an excellent candle is formed. After a time, when its feathers have developed sufficiently, the burrowling is deserted by its parents and left to itself. Each night the young bird takes to wandering and flapping around the rookery, prompted by the pangs of hunger, and after about a week of this life, during which time it assimilates its heavy lining of fat, it grows lighter, and gains both confidence and muscular development, until one night it takes wing with the adult birds, who no doubt guide and assist it at sea until it is able to help itself. These birds derived their name from the Apostle Peter, because, when ranging the ocean, they go tripping along over the billows, using their feet as well as their wings to propel themselves forward. This action makes them appear as if they were walking on the water, after the manner of the Apostle, as related in the Bible.

Whilst I had been taking observations at the petrelry, the Gannets had been keeping up an incessant cackling on the heights above, but as the moon rose higher and higher their stridulations gradually ceased, and as the moonlight glinted on the plumage of the now silent birds they formed, as they squatted in one huge mass on the crown of Lawrence Rock, a veritable night-cap, gleaming white in the pale rays of the moonbeams as the rock slumbered for a while in the hush that followed. "When you are in Rome do as the Romans do" is an old but apt saying; being a stranger to Lawrence Rock, and desiring to be respectful to its ways, I decided to conform with its habits, so I looked for a spot whereon I could lie down to slumber also. The only flat place available that was covered with sufficient soil to soften the rocks, and where one could lie down without rolling, was a narrow track close to the penguin rookery. Wrapping myself in my "bluey," I lay down in the open, and was lulled to sleep by the steady roar of the ocean. Just as I was dozing off I had a sensation of creeping and crawling all over me. It appears that I had camped on a sea-bird track, and the place was alive with lice which infest sea-birds, and which drop from them and find a home in the loose soil until they can find a host again. It was no use trying to rid oneself of them, since there were plenty more to take their place, and as I was badly in need of some sleep I decided to lie down again and allow these obnoxious creatures to please themselves.

Presently I heard a noise as if someone was singing on the rocks below. Since I was situated high up and could see all over the side of the rock, as well as the surrounding sea, which was lit up by the bright moonlight, I carefully scanned the place, but could not discern any other human being. Could it be the

song of the mermaids? I soliloquized. Could it be the sirens that tried to lure Ulysses to destruction? Impossible! They were myths pure and simple. What could it be? Bent on investigation, I scrambled down the cliff and discovered that the sound, when divested of part of the accompanying roar of the ocean, which the overtowering cliffs here deadened, resolved itself into the psalm of the penguins on their return home. When they had effected a landing on the rock, which was accomplished by allowing the waves to sweep them on to it through the broken surf, they emitted short, subdued barking quacks of pleasure, which, blending with the roar of the ocean as it ascended and drifted over the cliffs, seemed like the rhythm of human music. Fully satisfied, I climbed back once more to my rocky couch, and rolling myself in my blanket, which was now wet with dew, I essayed another journey to dreamland, and having reached its sublime portals I was rudely awakened by a feeling that something had walked over my head. Sitting up quickly to ascertain what it was, I upset a penguin that had calmly walked on to my head and had wandered down along my body to my legs. Emitting a squawk of fright at being so unceremoniously disturbed, it waddled off. All around were its companions scrambling up the lower parts of the cliffs towards me, and to my chagrin I found that I had camped on the track along which they travel from the sea to their rookery. This was the only place where they could get up the steep cliffs, and I had chosen the worst place on the rock on which to camp. Having no choice of another spot, I made up my mind to stay where I was and allow the Penguins to walk over me, which they did when I covered over my face and remained still under my "bluey." Otherwise, when I left my face uncovered, they waddled up within a foot or so and stupidly stared at me for an indefinite time.

I had excellent opportunities, as I peeped out from under my blanket, to observe how the penguins scrambled up the rocks, and when, by losing their foothold, they tumbled down some two or three feet in places, they adopted the old adage "If you don't succeed at first, try, try, try again." Some succeeded; others had, after repeated efforts, to try to ascend at another spot in the track, and at one of the most difficult points, where the rocks were jagged and cut the penguins' feet, a trail of blood marked their course. In no instance was I able to discern them using their flightless wings as auxiliaries to assist in their locomotion. The main body of the penguins, in their march upwards to their rookery, selected an easier place by which to ascend, which led them to an eminence about two feet above me, and when they reached this spot they jumped down, and usually landed upon my head. Under these circumstances sleep was impossible, so I wandered over the islet during the balance of the night.

Just before dawn I noticed the petrels leave the rock and fly seawards. The Prions seemed to have no difficulty in rising off their rookery, but the Mutton-birds had to leap off the cliff ere they could get their wings into motion sufficiently to suspend them in the air. The penguins, tumbling and waddling, descended the cliffs and departed also. Some, however, preferred to camp for the rest of the day under huge boulders close to the water's edge, where it was damp and cool. Then the pale grey of the approaching day kissed the horizon, and after dawn the gleaming shafts of light from the rising sun shot up through the hideous darkness of the night, stabbing it to death, and then a new day was born—the day before Christmas. Refreshed by a dip in a pool of clear sea-water and by an early breakfast, I set out for the rookeries, and secured some good photographs of Lawrence Rock's avine inhabitants, although there was a stiff breeze blowing, necessitating the camera being tied down to prevent it being blown over the cliffs. Out in the offing the snow-white sails of the *Countess* once again hove in sight. As she bore down to the islet in the face of a rising sea, her cut-water made the waves spurt out in a continuous shower of spray on either side.

The boat's arrival was exceedingly welcome, since I desired to get to the Cormorants' rookery on the other section of the islet, separated from the main mass of Lawrence Rocks by a deep, treacherous, surf-swept channel. With great difficulty the dinghy was brought close in to the edge of the reef, over which the surf was now breaking in an alarming manner, the white foam swirling knee-deep as the luggage was carried across, and was thrown to the boatmen, who had to be very careful that the backwash did not swamp their small craft. With a run and a leap I once more landed in the dinghy, then the rope attached to the kedge anchor was hauled upon, and the dinghy, battling her way through the rough seas, which momentarily threatened to engulph her, was drawn out to the *Countess*, which was labouring heavily on her anchor line. As we rose on the crest of the wave, first one then the other sprang into her. The boatmen informed me that the pilot of Portland, under whose fatherly care I had placed myself, had given orders that we were to return to the port immediately, as heavy weather was approaching. In such a contingency it would probably be impossible to get me off the rocks, and I would more than likely have to remain on them several days. Besides, it was clearly impossible to land me at the Cormorants' rookery through the waves that were now dashing upon it. So reluctantly I acquiesced, and the prow of the *Countess* was turned for home, and with a strong breeze behind us the sheltered waters of Portland were safely reached.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 11th May, 1908.

The president, Mr. G. A. Keartland, occupied the chair, and about 75 members and visitors were present.

REPORTS.

A report of the Easter excursion to Stony Point, Western Port, which extended from Friday, 17th, to Monday, 20th April, was read by the leader, Mr. J. Gabriel, who gave an interesting account of the trip. The research work was confined chiefly to dredging, the results of which were most gratifying. In molluscs alone 220 species were taken, including a number of very rare species, examples of which were exhibited at the meeting. Many interesting species of bryozoa, hydrozoa, and crustacea were also taken. A good deal of time was to some extent lost owing to unfavourable weather, but, notwithstanding this, the trip proved a most enjoyable one.

A report of the excursion to Maribyrnong on Saturday, 9th May, was given by the leader, Mr. R. W. Armitage, who stated that eighteen members attended, and spent an instructive afternoon examining the geological features of the locality, which consist chiefly of the older and newer basalts, with some tertiary sandstones.

A report of the junior excursion to Kilby Lagoon, East Kew, held on Saturday, 2nd May, was submittted by the leader, Mr. J. A. Leach, M.Sc. Fifty-three junior members and their friends and four adult members attended. The object of the excursion was water action, interesting examples of which are well shown in this locality. These were pointed out and explained in an interesting way by the leader. Various objects of interest encountered on the way were also noted, and served to occupy the attention of the party during the rather long walk of two miles from the tram terminus. The occurrence of the Nardoo plant, *Marsilea quadrifolia*, in the fruiting stage, was particularly interesting, and excited much attention.

The hon. librarian acknowledged the receipt of the following donations to the library :—" Memoirs of the National Museum, Melbourne, No. 2 : a Monograph of Silurian Bivalved Mollusca of Victoria," by F. Chapman, A.L.S., F.R.M.S., Palæontologist, from the Trustees ; *Journal of Agriculture of Victoria*, April and May, 1908, from the Secretary for Agriculture, Melbourne ;

"Memoirs of the Geological Survey of Victoria, No. 6: The Buffalo Mountains," by E. J. Dunn, F.G.S., Director, from the Department of Mines, Melbourne; "Proceedings of Royal Society of Victoria," n.s., vol. xx., part 2, from the Society; "Annual Report for 1907 of Department of Mines, New South Wales," "Memoirs of Geological Survey, New South Wales: Palæontology," Nos. 10 and 13, and "Problems of the Artesian Water Supply of Australia," by E. F. Pittman, A.R.S.M., from the Department of Mines, Sydney; "Records of Australian Museum, Sydney," vol. vi., No. 6, and vol. vii., No. 1, from the Trustees; *Agricultural Gazette of New South Wales*, April and May, 1908, from the Department of Agriculture, Sydney; "Proceedings Hawaiian Entomological Society," vol. i., part 4, October, 1907, from the Society; *Nature Notes*, April, 1908, from the Selborne Society, London; *Knowledge*, April, 1908, from the proprietors.

ELECTIONS.

On a ballot being taken, the following were duly elected members of the Club:—As ordinary members—Mr. Arthur E. Tutton, 22 Merri-street, Brunswick; Mrs. E. L. Brownell, "Rosebank," Clarendon-street, East Melbourne; Mr. A. George, 190 Keele-street, Collingwood; Mr. E. Joshua, St. James's Buildings, William-street, Melbourne. As junior members—Miss Audrey Ursula Sutton, Miss Sylvia Sutton; Master George Allan Vasey, Mont Albert-road, Canterbury; Master J. Smith, "Earlscourt," Glenferrie-road, Hawthorn.

GENERAL BUSINESS.

Nominations for office-bearers for 1908–9 were received, and Messrs. D. Best and J. Shepherd were elected to audit the accounts for the past year.

PAPER.

By Messrs. T. S. Hall, M.A., D.Sc., and J. H. Harvey, entitled "Illustrations of the Geology of the Victorian Coast." A large series of lantern views, illustrating the geology of various parts of the Victorian coast, were shown and explained in an interesting manner by Dr. T. S. Hall.

NATURAL HISTORY NOTE.

Mottled Cup Moth.—Mr. J. S. Kitson read a note on the occurrence of an unusually large number of the larvæ of the Mottled Cup Moth, *Limacodes longerans*. He stated that during a visit to the North-East (Benalla district) at Easter strong evidences were seen of what was a veritable plague. On the Mokoan Ranges, for a distance of some miles along their sides and summit, almost every tree had been stripped of its leaves, in many cases not even the mid-rib being left. When approaching the

hills from a distance the leafless trees gave one the impression that a bush fire had recently passed along, for the trees all appeared brown. There was no evidence that the caterpillars had been on the flat country. The favourite food seemed to be the leaves of the Stringy-bark, *Eucalyptus macrorrhyncha*, as scarcely a leaf was left on any of these trees. A noticeable feature was that, although many of the leafless trees were covered with mistletoe (Loranthus), not one of the latter had been attacked. A resident stated that the caterpillars had even attacked apple, pear, and plum trees in some orchards. The larvæ had at that time all disappeared, but, although they had been in such myriads, none of their cocoons could be found. Where had they all gone to pupate? For a short time before the ground was in some places literally covered with the larvæ when they were moving from tree to tree.

EXHIBITS.

By Mr. C. F. Cole.—Fern, from the Grantville district, showing proliferous growth of frond, apparently constant. The plant was not in fruit, and does not tally exactly in vegetative characters with any Victorian fern.

By Mr. J. Gabriel.—Large series of marine shells, &c., obtained during the Easter excursion to Stony Point.

By Mr. J. S. Kitson.—A living example of the Common Phalanger, *Trichosurus vulpecula*, captured at Tungamah, Victoria. The specimen has been living in captivity about 2½ months.

By Mr. A. H. E. Mattingley, C.M.Z.S.—Mounted specimen of Gunn's Bandicoot, *Perameles gunnii*, Gray, captured by U. Ramsay, Esq., at Winchelsea, Victoria.

After the usual conversazione the meeting terminated.

KOONUNGA CURSOR, SAYCE.—We are pleased to notice that Mr. O. A. Sayce's paper on the new crustacean found near Ringwood, read before the Field Naturalists' Club of Victoria in October last, has been reprinted in the *Annals and Magazine of Natural History* for April, 1908. It is accompanied by a note from Dr. W. T. Calman, the distinguished carcinologist, who says:—"By the kindness of Mr. Sayce the British Museum has now received specimens of the very remarkable crustacean described above. From an examination of these I am able to bear witness to the accuracy, in all essential parts, of his description. I believe, however, that the difference from Anaspides in the flexure of the thoracic legs will prove to be more apparent than real, and I do not think that the alterations now necessary in the diagnosis of the Syncarida in any way impair the status of that group as a natural division of the Malacostraca. A discussion of these and similar points must, however, be deferred until the appearance of Mr. Sayce's promised memoir."

NOTES ON THE QUEENSLAND FIREFLY BEETLE, *LUCIOLA FLAVICOLLIS*.

By R. W. Armitage.

(*Read before the Field Naturalists' Club of Victoria, 9th March*, 1908.)

At Kuranda, some 20 miles inland from Cairns, North Queensland, the rainfall for the fortnight previous to the 6th January last, the date of my arrival there, totalled 36 inches, or just one yard measure of rain, while on the night of 7th January, ten (10) inches of rain fell in as many hours. As a result of these copious tropical downpours, fireflies were plentiful, and I was enabled to make some observations on their habits. The opinion is very general that the light of the firefly is due to phosphorescence, but I doubt whether this generally assigned cause for the production of the light or glow is the correct one.

The larva of this firefly is caterpillar-like, and of a brownish colour. It measures ¼ to ⅓-inch in length. The two last segments of its body are whitish-coloured. It lives close to the ground at the base of grass-stems, &c., and is rather inactive. It does not bear any resemblance to "glow-worms" from damp parts of Victoria—as, *e.g.*, Gippsland—these latter being small earthworms. Nor does the glowing of the Firefly Beetle larva resemble that of the Victorian glow-worm.

The firefly larva emits light from the two posterior segments of its body. This light distinctly waxes and wanes, but does not attain very great brilliancy, nor does it die out entirely. The glow cannot be removed unless the two segments referred to come away with it. In such case the glowing will rapidly diminish and cease, while on the larva being killed, the emission of light ceases immediately. On the other hand, in the case of the Gippsland glowing earthworms, a phosphorescent skin or scum can be removed by rubbing or merely touching them with the fingers, and the phosphorescence will remain after the death of the worms.

The Queensland Firefly Beetle belongs to the family Telephoridæ, and the imago or perfect adult insect is about ¼ inch long, with soft, black elytra, reddish-brown thorax, and fairly large compound eyes. The ventral surface of the two posterior abdominal segments is of a whitish colour.

As soon as the short twilight of the tropics is over, these beetles may be noticed crawling up blades of grass preparatory to taking their evening flight. While walking on grass stems or on shrubs, they give out light intermittently bright and dull. Occasionally a flash will be brighter than ordinarily. Then the flashes will become less and less bright, eventually dying quite away, to be followed shortly after by another series of flashes.

During flight the flashes will recur at intervals of a second or two, with very little light, or even none, in between. Occasionally no light at all will be emitted for a few seconds. Such, in general, is the normal occurrence of the light when the insect is not interfered with in any way.

When a firefly is touched by a stick or one's finger the flashes become more brilliant, and recur more rapidly than usual, while the interval between flashes is filled by a stronger light than is generally to be seen. As the beetle flies through the air after being touched in this way it gives out a continuous stream of light, punctuated by quickly recurring brilliant flashes. On attempting to capture a firefly which is not flashing rapidly or brilliantly, failure is often turned into success by the fact that the emission of light increases by interference with the freedom of the insect, thus enabling one to follow easily the course of the fugitive. When one imprisons a firefly in a glass tube, flash will follow flash in quick succession for some ten or fifteen minutes after, the firefly meanwhile being busily engaged in trying to escape from the tube. Without difficulty, ordinary handwriting in a letter can be read by the light from three or four of such captives. After some time, when the beetle becomes less excitable, and apparently realizes the futility of its endeavours to escape, it will emit very little light, only occasionally giving a feeble flash. On the firefly being released from captivity, the light will again increase in brightness, only to decrease again on the re-imprisonment of the agent.

A close examination of the Firefly Beetle shows that the light is emitted from the ventral surface of the two posterior segments of the abdomen. When the flash begins a small circular patch on the last segment glows more and more brightly. Immediately after the beginning of this flash, and while it is becoming more intense, a circular patch on the middle of the second last segment glows, followed by a lighting up of two lateral circular patches. These three areas of light increase in size until they fuse into one another. Then from the whole of the ventral surface of the two posterior segments of the abdomen an emission of extremely bright and beautiful glowing light occurs. The light dies away from both segments simultaneously. When a firefly dies slowly, the light becomes less and less distinct, failing utterly at death. The sudden death of the insect will cause an abrupt cessation of the light.

The foregoing observations seem to me to lead distinctly to the conclusion that the glowing of the firefly larva, and the brilliant flashes alternating with dull light emitted by the imago, are not due to the presence of phosphorescent material in or on the body of the beetle, but rather to a nervous excitation or impulse, caused, to some extent, by influences from outside

acting on it, and that the brilliance and frequency of the flashes are controlled by the will of the insect.

The objection may be raised that such an amount of nervous energy would be expended by the Firefly Beetle in the production of the light that it would be extremely short-lived. The larva would not use up much nervous energy, as the light it produces is not very brilliant. The energy expended could easily be renewed by feeding. Whether the imago feeds or not I do not know, but I see no reason why the perfect insect should not produce a brilliant light for many nights, even though it should not feed. The expenditure of nervous energy would doubtless be great, but so must it be in the production of loud and continuous sounds by some insects, and in the marvellously rapid movement of the wings of other insects in flying, or of the legs of still other insects in running.

THE "QUEENSLAND NATURALIST."—We welcome the first number of the "*Queensland Naturalist*, the Organ of the Field Naturalists' Club (Brisbane) and its Branches." The new periodical is to be published quarterly, and will, no doubt, further natural history in the northern State. The number contains the second annual report of the Club—for 1907—which indicates steady progress; the presidential address of Mr. H. Tryon, Government Entomologist, who took advantage of the bicentenary of the births of the great naturalists Linnæus and Buffon, and indicated their lines of investigation and influence on succeeding generations; a paper by Mr. G. B. J. Skertchly on "The Brisbane Tertiaries;" some short notes; and a list of members of the Club, in which we notice the name of Dr. T. P. Lucas, one of the original members of the Field Naturalists' Club of Victoria.

"IN AUSTRALIAN TROPICS."—Reliable books dealing with the varied aspects of tropical Australia are not numerous, and, therefore, Mr. Alfred Searcy's splendidly illustrated volume will be read with interest both by the sportsman and the naturalist. Mr. Searcy, during a residence of fourteen years at Port Darwin as Sub-Collector of Customs for the Northern Territory of South Australia, had many opportunities, during official visits, of becoming acquainted with the natives, the natural history, and the productions of that almost *terra incognita*. The 370 pages he has written will be found both entertaining and instructive, and should tend to the formation of a better idea of life in tropical Australia. The headings of a few of the chapters will indicate the character of the work—Adventures with Malay Trepang Fishers, Trips to the Roper, M'Arthur, and Victoria Rivers, Buffaloes, Alligators, Fishing, White-ants—while many of the 56 illustrations included are delightful pictures.

LEPIDOPTERA OF THE VICTORIAN ALPS; TWO NEW BUTTERFLIES FOR VICTORIA.

By G. Lyell, F.E.S., Gisborne.

(*Read before the Field Naturalists' Club of Victoria, 13th April*, 1908.)

From our botanical members we have had several papers describing the plants to be found in our Alps, but as far as I remember no attempt has yet been made to record any of the butterflies and moths, so these few notes may be of interest.

On 5th February last, after the long, hot railway journey of nearly 200 miles to Bright, we found the 16-mile coach ride to Harrietville very pleasant. The narrow, green valley of the Ovens River, with the abruptly rising, steep, timber-clothed ranges on either side, were in delightful contrast to the long stretches of dry, flat country to be seen from the railway between Melbourne and Wangaratta. Several water-races for the dredges near Bright flow down the valley, but these and the pretty rushing mountain stream itself are sadly discoloured by the mining operations higher up.

After a night at Harrietville, we made an early start on the Omeo road for the climb of nearly 3,500 feet to the Hospice standing on Mt. St. Bernard at just above the 5,000 feet level. The narrow, steep mountain road, doubling upon itself continually in its climb up the range, is hard work for the horses, but very pleasant for us, taking us as it does away from the heat of the lowlands and into the coolness of the mountains. For the first two hours of the journey we have occasional glimpses of the dwindling township in its narrow, green valley below, and then having neared the summit of the range, the going and the pace are both improved, and we get a glimpse of the Hospice itself. There it stands, 10 or 12 miles away, up at the head of a big gully, perched just below the skyline of the ridge, and but little below the point where the dwarf Snow Gums give way to the treeless summits.

The past weeks had been very barren, from a collector's point of view, the exceptionally dry season having spoilt even our best grounds, but a decided improvement is noticed as soon as we begin our mountain climb. The rare moth, *Hydriomena heteroleuca*, flies up in numbers from the shady banks overhanging the road, and the butterfly *Xenica achanta* is abundant—this we did not see higher up the mountains, so it is evidently hardly an alpine species. *Heteronympha merope* is also abundant at the lower elevation, while only an occasional specimen is seen above 4,000 feet, where its place is taken by *H. solandri*, a species described by Waterhouse from my collection as lately as 1904. *Pyrameis kershawi* and *P. itea* are numerous on the coach road, and the occasional specimens taken on the heights are noticeable on account of their very large size—three examples of *P. itea*

taken on the summit of Mt. Hotham (6,100 feet), give an average expanse of 67 mm.

Arriving at the Hospice, we meet our Castlemaine friends, Dr. Drake and his wife, and, examining their captures, are pleased to note a new butterfly for Victoria in *Hesperilla munionga*. This was described by Olliff from Mt. Kosciusko in 1889, and but very few specimens have yet been secured. Its nearest ally is *H. perornata*, from which it is separated by its narrower dark markings and the golden-yellow ground-colour of its underside. We were evidently rather late for this species, as one specimen taken the day of our arrival, and another a few days earlier, were the only examples secured or seen, though we made careful search all through the twelve days spent at the Hospice.

On the 10th February we drove to Mt. Hotham, six miles distant, and the highest point on the Omeo road. Here, on the extreme summit (6,100 feet) we found another butterfly new to Victoria in *Xenica orichora*. This was named by Meyrick from Mt. Kosciusko in 1885, and has since been several times taken in the same spot, but not elsewhere. Anderson and Spry, in "Victorian Butterflies," mention it as a possible Victorian species likely to be taken near Bright—an opinion now verified. This species was fairly abundant, though not in the best condition, and the preponderance of females showed we were rather late for it. Early January should be the most likely time for both these new Victorian species.

Two other rare butterflies were *Heteronympha solandri* and *Hesperilla monticolæ*. Both these were to be taken on the coach road and in the gullies at from 4,000 to 5,000 feet, and both were fairly abundant. Though so lately described, *H. solandri* is not at all rare at these heights—it has evidently been confused with the similar *H. banksii* by those few collectors who have visited the mountains. *H. monticolæ* is a Kosciusko species, described from the male alone, by Olliff, in 1889. Three years ago we took both sexes near Walhalla, and the female was then described by Waterhouse. Last month Mr. C. French secured specimens from Walhalla again.

Xenica correæ, as usual above 4,500 feet, was very common indeed. In the evenings it might be seen in dozens, clinging to the Cladium and other herbage along the watercourses near the heads of the steep gullies. In one spot I counted no less than twenty-seven specimens of this pretty little butterfly that could have been encircled by the 12-inch ring of the butterfly net ; but when thus at rest no net is needed, the glass-bottomed pill boxes being much more expeditious and convenient.

Our handsome swallow-tail butterfly, *Papilio macleayanus*, is plentiful at the Hospice earlier in the year, and I was rather surprised to take two large females in very fine condition on the summit of Mt. Hotham, and a torn one nearer the Hospice.

Lycænidæ were conspicuous by their absence, with the exception of the ubiquitous *Zizera labradus*. We took one specimen each of *Neolucia serpentata* and of *N. hobartensis*.

Among the moths the Hydriomenidæ, as anticipated, were in great abundance and variety. Quite a number of species restricted to the alpine regions were secured. The showy *Hydriomena chrysocyma*, previously on record from Kosciusko only, was abundant in spots, and the equally fine *H. perornata* was met with. *H. cataphœa*, *polycarpa*, *stereozona*, and the handsome *H. oxygona*, were all to be taken, and *H. heteroleuca* was very abundant, though rather worn. An allied but darker species that I have not yet determined was taken resting on rocks in the steep banks of the coach road, and *H. opipara*, in poor condition, was also secured. *H. ebuleata* was, perhaps, with the exception of *Agrotis spina*, the most abundant moth seen, but was not now at its best.

Among the loose stones of the cairn crowning the summit of Mt. Hotham, *Agrotis spina*, the "Bogong" Moth of the blacks, was present in myriads. A knock against the cairn raised a hum like a hive of bees, and every stone dislodged revealed specimens.

Upon the summit of this mountain, also, a number of specimens of a dingy but very interesting geometer were taken—a hairy moth, evidently closely allied to the genus Oenone, which Meyrick described from the extreme summit of Mt. Wellington, Tasmania, and of which he wrote:—"Doubtless an early type, having near relationship to Dichromodes on the one hand and to the European Brephos on the other. It would appear to have been brought into close competition with the ancestors of Dichromodes, and to have been worsted, surviving only in the mountains of Tasmania. Similarly Brephos has maintained itself in Europe only by becoming adapted to the wintry climate of the earliest spring."

The Mt. Hotham species is a very strong flier, keeps close to the herbage, and from its obscure black and grey colouring is somewhat difficult to follow and capture.

In "plumes" we came across the whitish alpine species, *Mimeseoptilus celidotus*, and also the better-known *Platyptilia emissalis*. Down in a densely wooded gully, beating the occasional tea-tree along the small stream, I disturbed the pretty *Euchloris boisduvalaria* and *Asthena balioloma*, *A. oceanias*, and *A. urarcha*. Here, too, I took several specimens of the pretty monoctenid, *Onychodes traumataria*; this, as it floats down from the boughs of the tea-tree, bears a very strong resemblance, not only in colour and shape but also in movement, to the coloured eucalypt leaves that are dislodged at the same time.

Being so near the summit of the Alps, and the hillsides being so steep, the collecting conditions were not of the best. Except-

ing only along the ridges and on the coach road no level ground was to be met with—steep and densely wooded hillsides and trackless gullies had to be descended. But the new and rare species to be taken compensated for all minor difficulties. On the ridges we took *Talis megalarcha*, the largest of Australian "hay-moths," another Kosciusko species now first recorded from Victoria, and also some few specimens of the much more widely distributed *Thinasotia pentadactyla* (*claviferella*). We wondered if we should find any species peculiar to the Snow Gums, but a lot of beating only resulted in one xyloryct, *Agriophara ametrodes*, and a few *Scoparia philonephes*.

We can recommend the St. Bernard Hospice as an ideal spot from which to collect during January, and, as showing the abundance of specimens, I brought back with me as the result of twelve days' collecting 626 set moths and butterflies and an additional 121 which I have placed on the boards since my return.

During our stay the thermometer touched 33° and reached a shade temperature of only 77°, so the evening wood fires of "Snow Gum" were in pleasing contrast with the heat we had left behind. Heavy rain during the previous night left the mountains clothed in dense mist during our ride down to Harrietville on the morning of the 18th, and the 19th February saw us again on the railway at Bright, with pleasant memories of our holiday on the top of the mountains.

List of species captured, all at 4,500-5,000 feet except when otherwise stated. Those prefixed * now first recorded from Victoria :—

BUTTERFLIES.

Pyrameis kershawi, M'Coy
P. itea, F.
Junonia vellida, F.
Heteronympha merope, F.
H. solandri, Waterh.
Xenica klugii, Guer.
X. achanta, Don. (2,500 ft.)
*X. orichora, Meyr. (6,000-6,100 ft.)
X. correæ, Oll.
X. kershawi, Misk. (3,000 ft.)
Zizera labradus, Godt.
Neolucia hobartensis, Misk.
N. serpentata, H. S.
Delias aganippe, Don.
D. harpalyce, Don.
Papilio macleayanus, Leach
*Hesperilla munionga, Oll.
H. monticolæ, Oll.
H. compacta, Butl.
H. peronii, Latr.
H. flammeata, Butl.
Trapezites phigaloides, Waterh.

MOTHS.

Halone sobria, Walk.
Euproctis leucomelas, Walk.
Microdes diplodonta, Turn.
Asthena balioloma, Turn.
A. oceanias, Meyr.
A. urarcha, Meyr.
Scordylia leucophragma, Meyr. (3,000 ft.)
Hydriomena interruptata, Gn.
H. anthracinata, Gn.
H. heteroleuca, Meyr.
H. cydalima, Turn.
H. languescens, Rosen.
H. insulsata, Gn.
H. ebuleata, Meyr.
H. perornata, Walk.
H. leucozona, Meyr.
H. stereozona, Meyr.
H. polycarpa, Meyr.
H. oxygona, Meyr.
H. opipara, Turn.
*H. chrysocyma, Meyr.
H. cataphæa, Meyr.
H. subrectaria, Gn. (3,000 ft.)
H. subochraria, Dbldy.
Diploctena argocyma, Turn.

Xanthorhoe pauper, Rosen. (3,000 ft.)
X. subidaria, Gn.
X. centroneura, Meyr.
Leptomeris liotis, Meyr.
Euchloris boisduvalaria, Le G.
Taxeotis oraula, Meyr.
*Dichromodes diasemaria, Gn.
Onychodes traumataria, Gn.
Agrotis spina, Gn
Euplexia callisina, Turn.
Phalænoides tristifica, Hubn.
Thinasotia pentadactyla, Zell.
Herculia albidalis, Walk.
Catamola capnopis, Meyr.
Heliothela ophideresana, Walk.
Eclipsiodes drosera, Meyr.
Scoparia philonephes, Meyr.
S. protorthra, Meyr.
Mimeseoptilus celidotus, Meyr.
Platyptilia emissalis, Walk.
Acropolitis signigerana, Walk.
Cacœcia polygraphana, Walk.
Anisogona placoxantha, Lower (3,000 ft.)
Tortrix amœnana, Walk.
Lichenaula calligrapha, Meyr.
Agriophara ametrodes, Meyr.
Peltophora charaxias, Meyr.

And 34 species not yet determined.

THE BUFFALO MOUNTAINS.

THE recent issue by the Department of Mines of Victoria, as No. 6 of the "Memoirs of Geological Survey of Victoria," of a report by the Director, Mr. E. J. Dunn, F.G.S., on the Buffalo Mountains, splendidly illustrated with photographs of characteristic features, should, as the author says, "serve to bring into prominent notice the most wonderful mountain tract within the State—a true 'Garden of the Gods'—and it is hoped that the marvels of this region will draw many tourists from all quarters, and thus turn a latent asset of great value into a most potent attraction." The memoir is accompanied by a large scale map of the area (30 chains to 1 inch), the result of a careful and minute topographical survey by Mr. O. A. L. Whitelaw. The illustrations, fifty-three in number, have been reproduced from photographs by Mr. Walcott and others, and many of them are striking pictures. Mr. Dunn gives the area of the granite plateau as about 13½ square miles, being some seven miles from north to south and four across at its widest part, and when it can safely be said that almost the whole of this area is studded with "sights," it will be seen how great is the addition made to picturesque Victoria, for, until the execution of the recent survey, it is probable many of the groups of rocks were entirely unknown. The general level of the plateau is about 4,500 feet above sea level, and about 3,700 feet above the surrounding country, and as the boundaries of the plateau are usually abrupt precipices, the range appears as a formidable obstacle from many points of view. On the plateau hills rise from three to four and even six hundred feet above the general level. Mt. Buffalo, usually known as "The Horn," rises to 5,645 feet above sea level, and the map shows fifteen elevations over 5,000 feet high, with many more just under that level. The report discusses the physical features at length, their method of formation, &c., the origin of "The Plains," as the narrow strips of treeless soil along the watercourses are called, calls attention to the marvellous groups of rocks, monoliths, and perched

blocks, the waterfalls, fissuring, degrading and denuding influences, metamorphism, and dykes. The dimensions of some of the more prominent rocks may be quoted as examples—thus "The Grandfather" is 110 feet long, 40 feet high, and 20 feet thick; "Og, Gog, and Magog," three immense tors, the largest 100 feet high, 104 feet long, and 43 feet wide; "The Pebble," 54 feet long, 40 feet high, and 42 feet broad; "The Leviathan," 108 feet long, 70 feet broad, 40 feet high, standing on a base 21 feet by 12 feet; "Mahomet's Coffin" is suspended at each end, and is 30 feet long; the "Riven Rock" stands 80 feet high, the "Sentinel" 60 feet. One of the first objects seen by a visitor to the plateau is "The Monolith," a huge block, 30 feet high, 22 feet long, and 14 feet broad, perched on the edge of another block, apparently wanting only a slight shake to send it over; and the existence of these perched blocks proves that no serious earth tremor has taken place in these regions for many—perhaps thousands of years. In speaking of the magnificent forms and sizes of these rocks Mr. Dunn says:—"These rocks are not only grand, wonderful, and beautiful, but they inspire a feeling of awe when it is realized what gigantic forces have been employed in fashioning them and how cycle has followed cycle while their evolution was in progress. That these marvellous rocks have been formed by hewing away all the surrounding and overlying mass of granite seems almost incredible, but that is what has really happened. It is as though a sculptor quarried away a whole mountain of granite to create one solitary statue. . . . Long before the Egyptian monarchs hewed granite monoliths the natural ones on the Buffalo Mountains stood like sentinels on their lofty pinnacles, and had already had their angles rounded by exposure to thousands of winters and summers." Beyond mentioning the existence of the Snow Gums, *Eucalyptus coriacea*, and their influence on the disintegration of the granite, the report does not touch on the botany of the region, which in itself, at certain seasons of the year, is worth seeing. For that, until a thorough "Guide" to the mountains is written, and which will be a necessity if the proposed Government tourist *châlet* is carried out, visitors will have to depend upon the descriptive articles which appeared in these pages a few years ago (*Vict Nat.*, xvi., p. 81; xx., p. 4; and xx., p. 144). We trust that in opening up tracks for tourists the Government will not lose sight of the fact that the whole plateau should be treated as a sanctuary for all indigenous animal and plant life, for which, from its position and isolation, it is admirably adapted, and before any extensive works such as making lakes for skating surfaces in winter are entered upon, a thorough examination of the area from a biological point of view should be undertaken. Unless this is done at once many of the rarer plants will disappear, and thus the mountains, which should be the show-place of our highland flora, will lose much of their charm for the nature student.—F. G. A. B.

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The twenty-eighth annual meeting of the Club was held in the Royal Society's Hall on Monday evening, 15th June, 1908.

The president, Mr. G. A. Keartland, occupied the chair, and about 40 members and visitors were present.

CORRESPONDENCE.

From the hon. secretary of the Hawthorn and Camberwell Microscopical Society, announcing their intention to hold their annual conversazione at Camberwell on the 23rd June, and extending a cordial invitation to the members of the Club.

REPORTS.

A report of the Club excursion to the Clifton Hill quarries on Saturday, 23rd May, was submitted by Mr. F. Chapman, A.L.S., who kindly acted as leader, in the absence of Mr. E. O. Thiele, B.Sc. He stated that the excursion was attended by about forty members and friends, including some members of the Australian Church Ramblers' Club, introduced by Mr. Haig, as well as several students from the Continuation School. A short demonstration was given at the top of the quarry, when the occasion was taken to point out some of the principal features of volcanic action here and elsewhere. Since this locality has been previously visited several times, and more or less detailed reports have appeared in recent volumes of the *Naturalist*, it is only necessary to say that among the interesting features noticed on this occasion were fine examples of ropy lava, pieces of fossil tree-trunks at the base of the large quarry, on river silt and under the enormous thickness of basalt, and a deposit of pure limonite many inches in thickness, and probably of lacustrine origin, high up in the smaller quarry, between two distinct flows of lava. This latter was found on a previous visit by Mr. Armitage, who was with us and kindly pointed it out. A fair number of minerals of the usual kinds were collected.

A report of the excursion to the Botanical Gardens on Saturday, 13th June, was given by the leader, Mr. F. Pitcher. He said that, considering the threatening afternoon, there was a very fair attendance of members and friends. A number of the more notable trees, &c., were pointed out, so that members could watch their future development with greater interest. The new propagating houses were inspected, as also the conservatory and the new water-lily lake, but naturally, owing to the time of year, the number of plants, &c., in bloom was rather small.

In the absence of Mr. D. Le Souëf, C.M.Z.S., who acted as leader of the juniors' excursion to the Zoological Gardens on Saturday, 6th June, Mr. G. A. Keartland reported that fully forty junior members attended. They were shown round the gardens by Mr. Le Souëf, who described the various animals seen, and imparted some very interesting details respecting their habits and history, giving our young members ample food for thought during the afternoon's inspection.

ELECTION OF MEMBERS.

On a ballot being taken, the following were duly elected members of the Club :—As ordinary members—Miss E. Cuthbert, 77 Power-street, Hawthorn ; Miss A. M'Innes, Power-street, Hawthorn ; Mr. F. Norris, 789 Drummond-street, North Carlton ; Mr. Wm. Jas. Stephen, 32 Robinson's-road, Hawthorn. As country member—Mr. Joseph E. Gabriel, Sale.

ANNUAL REPORT.

The hon. secretary, Mr. A. J. Kershaw, F.E.S., read the twenty-eighth annual report, for the year 1907-8, which was as follows :—

"To the Members of the Field Naturalists' Club of Victoria.

" Ladies and Gentlemen,—Your committee have much pleasure in presenting to you the twenty-eighth annual report, embracing the work of the Club during the year ending 30th April, 1908.

" During the year 40 new members were elected, consisting of 15 ordinary, 6 country, 4 associates, and 15 junior members. The total membership now amounts to 295, comprising 7 honorary, 2 life, 156 ordinary, 58 country, 18 associates, and 54 juniors. As compared with the previous year, there has been a loss of 1 honorary, 4 ordinary, and 7 associates, and a gain of 8 country members. There has been a material falling off in the number of junior members, owing to a very great extent to the difficulty experienced in getting into closer touch with them individually. It is felt that some further inducement is required to retain their interest and encourage them to avail themselves of the special opportunities provided for gaining a closer insight into the study of nature.

" It is with very deep regret that we have to record the death of two members of long standing. In January last Major R. L. J. Ellery, F.R.S., F.R.A.S., formerly Government Astronomer of Victoria, and one of the few remaining ' original ' members of the Club, passed away at the age of 80 years. Early in the following March we had to record the death of Dr. A. W. Howitt, C.M.G., D.Sc., F.G.S., for many years an honorary member of our Club. The loss of these two such widely known and highly respected

scientists is greatly to be deplored, and will long be felt in scientific circles. Still another loss has been sustained by the death, in October last, of the late Mr. C. Walter, who, though not of recent years a member of the Club, was one of the earlier members, and well known to and highly respected by most of our botanical members.

"The attendances at the ordinary monthly meetings continue most satisfactory, and reflect the keen interest taken in the proceedings by the members. The papers contributed were of a highly interesting and valuable nature. Altogether 26 were read, of which 13 related to zoology, 7 to botany, 1 general, and 5 to trips and excursions. Of the zoological papers, 1 was devoted to mammals, 5 to birds, 1 to crustacea, and 6 to insects. Several of the papers were illustrated with large series of excellent lantern views, which added considerable interest to the subjects dealt with.

"The authors were Messrs. R. W. Armitage, F. G. A. Barnard, Isaac Batey, C. F. Cole, Professor A. J. Ewart, D.Sc., Ph.D., F.L.S., C. French, F.L.S., F.E.S., T. S. Hall, M.A., D.Sc., A. D. Hardy, F.L.S., J. H. Harvey, E. Jarvis, G. A. Keartland, G. Lyell, F.E.S., A. H. E. Mattingley, C.M.Z.S., D. M'Alpine, A. J. North, C.M.Z.S., O. A. Sayce, J. R. Tovey, and G. A. Waterhouse, B.Sc., F.E.S.

"Natural history notes on subjects of general interest were read at most of the meetings, and these, together with the exhibition of specimens and remarks on those calling for special mention, continue to form a valuable feature of the Club's work. It is to be regretted, however, that the exhibits, which always attract considerable attention from the members and visitors, have not been so numerous as could be expected. Objects of unusual occurrence or showing any peculiar features are always appreciated, and members are urged to assist as much as possible by the more frequent exhibition of specimens.

"The usual programme of senior and junior excursions was carried out during the year, short reports of which were submitted at the ordinary meetings. These excursions have been fairly well attended, and greatly appreciated by those taking part. Your committee would, however, like to see a greater number of the members availing themselves of these excellent opportunities for field work.

"The twenth-fourth volume of the Club's journal has been completed, under the editorship of Mr. F. G. A. Barnard, who has again devoted a considerable amount of time and care to ensure its successful production. Its circulation is gradually being extended, principally by exchange with other societies, and in this way the work of the members and the objects of the Club are becoming more widely known.

"Your committee have given very careful attention to several matters of special interest to the Club during the year. One of the most important of these is that relating to the National Park at Wilson's Promontory. The urgent necessity of vesting the Park in trustees and the appointment of a ranger was seriously considered, and in July last it was decided to enlist the co-operation of the Director of the National Museum, Professor Baldwin Spencer, with a view to further action being at once taken in the matter. Professor Spencer readily consented to again assist in the movement, and forwarded letters to all the societies and institutions interested, proposing that a conference be held to consider the advisability of approaching the Government on the matter. Each society and institution was asked to nominate two members as their representatives at the conference. The proposal was unanimously endorsed by the various bodies approached, and your committee appointed Professor A. J. Ewart and Mr. G. A. Keartland to represent the Club.

"The conference was held at the Melbourne Public Library, where the Trustees generously placed their room at the disposal of the delegates. It was unanimously decided to ask the Government to reserve permanently the whole of Wilson's Promontory as a National Park for Victoria, to vest the Park in trustees, and to appoint a ranger as custodian, and a deputation was arranged to place these resolutions before the Minister of Lands, Mr. Mackey.

"The deputation was received by the Minister on the 18th December, who expressed himself as thoroughly in sympathy with the proposal, and at once agreed to vest the whole of the Promontory in trustees, with the exception of a half-mile margin around the coast, over which, however, he promised to give the trustees control. He also agreed to appoint a ranger and to make him an officer of the trustees.

"Another meeting of the conference was held early in the present year, and a list of representatives of the various societies and institutions was drawn up and submitted to the Minister of appointment as trustees. These nominations have since been approved of by the Minister, who, however, has constituted them a board of management instead of trustees as was suggested.

"The board consists of a representative of each of the eight societies and institutions taking part in the movement, among whom one of our vice-presidents, Prof. A. J. Ewart, will represent the Club. It is expected that the newly constituted board will shortly make a start on the important work which they have undertaken.

"Your committee, although much gratified with the results which have so far attended this movement, greatly regret the

decision of the Minister not to include the half-mile margin in the area permanently reserved, and will not feel satisfied until this decision is rescinded and the whole of the Promontory set apart for the purpose desired. Encouraging progress has, however, been made, and the Club has now good reason to expect a successful outcome of its long and earnest endeavours to secure this area as a permanent sanctuary for our native fauna and flora.

"The thanks of the Club are due to Professor Baldwin Spencer for the whole-hearted manner in which he has urged on this movement on every possible occasion, and to whom much of the success attending it is due. Your committee also desire to record their hearty appreciation of the keen interest and valuable support accorded by the Directors of the Australian Natives' Association.

"Another matter with which the Club has long been concerned, and to which your committee have given their serious attention, is that relating to the *Fisheries and Game Acts.* From time to time various questions relating to the preservation of our native animals, and the lessening or extending of the close seasons, have been submitted to this, as well as other similar bodies, for their opinion. With a view to securing the best possible advice, and at the same time ensuring the protection and preservation of our native animals, the Director of the National Museum, Professor Baldwin Spencer, communicated with the various Melbourne societies interested, suggesting the formation of a committee consisting of representatives of each society, the National Museum, and the Zoological Gardens, to which all requests relating to the *Fisheries and Game Acts* could be referred for report. The proposal met with unanimous approval, and representatives were appointed by each of the bodies interested. Mr. G. A. Keartland was appointed by your committee to represent the Club.

"At the first meeting, held on the 29th November last, the whole matter was considered, and an executive appointed, consisting of Professor Baldwin Spencer and Messrs. J. A. Kershaw and A. H. E. Mattingley. The Government was approached, and at once consented to officially recognize the committee, and submit all questions relating to the *Fisheries and Game Acts* for its report. The committee has since been consulted regarding matters relating to the above.

"Prior to the formation of the above-mentioned committee, the desirability of altering the date of the close season for Opossums was considered, and it was decided to recommend that the dates be altered from 1st June to 31st December to those of 1st March to 31st October in each year.

"The advisability of continuing or modifying the existing close season for seals was also dealt with.

"In consequence of reports being received regarding the destruction of the native wattles in the vicinity of Melbourne, an appeal was again made through the press for their preservation, with, it is hoped, beneficial results.

"A proposal to grant 15 acres of the Domain grounds as a site for a new hospital was viewed with serious concern, and a strong protest was made on behalf of the Club against any further alienation of our public parks. Similar action was also taken with regard to a suggestion that portion of the Royal Park be utilized for the same purpose.

"The extremely interesting geological sections exposed during the formation of Alexandra-avenue was found to be in danger of being altogether lost, owing to the planting of creeping and other plants on the face of the cutting. The Public Works Department has been approached on several occasions with a view to the preservation of two small sections, with so far no satisfactory results. Further action will be taken, and it is hoped that the department will fall in with the wishes of the Club.

"As announced in the last annual report, a similar request to the Railways Commissioners, regarding certain sections in the railway cuttings, was readily granted. A further request has been made to the Commissioners that notice boards, indicating the nature of the formation, be erected on each of the sections.

"During the year a sub-committee, with Dr. C. S. Sutton as as secretary, was appointed to compile a list of popular names for our commoner native plants, with the ultimate object of publishing a 'Floral Calendar,' and a revised issue of 'The Flora of Victoria.' The work will necessarily take some considerable time to accomplish, but satisfactory progress has already been made, and we are pleased to report that the Minister of Agriculture has consented to publish a recording census, which will be extremely useful to the committee.

"The usual exhibition of wild flowers was held in the Club rooms in October last, and, notwithstanding the exceptional dryness of the season, a good display was made, thanks to the energy and enthusiasm shown by several of our members. Collections were forwarded from various distant parts of the State, while the localities nearer Melbourne were represented by an excellent collection of flowers. Great credit is due to the members who undertook the work, and devoted so much of their time to the labelling and arrangement of the exhibits.

"The thanks of the Club are due to the various leaders of excursions and others who have assisted in a practical manner to forward the work of the Club. To Mr. J. Searle, our hon. lanternist, we are again much indebted for continuing to gratuitously place his lantern and services at our disposal. To Messrs. T. R. B. Morton and G. Coghill we have to tender our

hearty thanks for their generous action in again placing their office at the disposal of your committee for their meetings.

"The hon. librarian, Mr. A. D. Hardy, reports that during the year further progress was made in the re-arranging and cataloguing of the library, but this was done only tentatively, on account of the deficiency of shelving accommodation. During the year 154 volumes or parts were received in exchange and 62 volumes or parts were purchased, making the total number of volumes and parts in in the library about 1,000. Only a small amount of binding was actually done, but a considerable number of volumes are now ready for the binder. He urges that unbound parts of valuable works should not be lent to members in that state. Some progress was made with the card catalogue, in the preparation of which he had received help from Mr. W. A. Roger, the hon. assistant secretary and librarian. There had been a fair demand for the loan of books and periodicals by members, which would doubtless be increased if the facilities for ascertaining the contents of the library were better. The purchase of further text-books of a standard character is highly desirable.

"Regarding the financial position of the Club, the receipts for the year show a slight falling-off as compared with those of the previous year, while the expenditure has been greater. We started the year with a credit balance of £116 14s. 1d., and conclude with one of £114 os. 7d. with all accounts paid. The receipts from all sources amounted to £146 os. 8d., while the expenditure was £148 14s. 2d.

"In conclusion, your committee desire to congratulate you on the sound position of the Club, and the large amount of valuable work accomplished during the year. Additional workers are, however, urgently needed, and it is earnestly hoped that the new year upon which we have just started will see more of our members contributing the results of their observations in the particular branch of natural history in which they are interested.

"G. A. KEARTLAND, *President.*
"J. A. KERSHAW, *Hon. Secretary.*

"1*st June*, 1908."

The report was received, on the motion of Messrs. J. H. Gatliff and O. A. Sayce.

In discussing the report, Mr. Sayce remarked that every encouragement should be given to the younger members by devoting more time to discussing the papers read, and otherwise stimulating them in their early efforts. He also dwelt on the importance to such members of evenings being set apart for practical work in the various branches of natural history.

A suggestion by the hon. librarian, in his report, that the library rule, that paper-bound parts of serials be not loaned until

the volume is completed and bound, should be adhered to, evoked a good deal of discussion, during which the importance of making current publications available to the members at the earliest possible opportunity was emphasized. On the motion of Mr. O. A. Sayce, seconded by Prof. Ewart, it was decided that this clause be deleted from the librarian's report, and that the advisability of lending unbound parts liable to damage be left to the discretion of the hon. librarian. After further discussion, in which Mrs. Bage, Dr. T. S. Hall, Prof. Ewart, Messrs. D. Best, A. D. Hardy, and others took part, the report was adopted, on the motion of Messrs. D. Best and J. H. Gatliff.

FINANCIAL STATEMENT.

The hon. treasurer, Mr. G. Coghill, read the financial statement for 1907–8, which was as follows :—

RECEIPTS.

To Balance, 30th April, 1907					£116 14 1
,, Subscriptions—					
Ordinary Members	£92 17 0				
Country Members ...	21 10 6				
Associates ...	4 2 6				
Juniors	2 12 0				
		£121 2 0*			
,, *Victorian Naturalist*—					
Subscriptions and Sales	9 11 4				
Advertisements ...	6 15 0				
Reprints	4 5 6				
		20 11 10			
,, Sales of Badges		1 9 7			
,, Interest		2 17 3			
			146 0 8		
			£262 14 9		

EXPENDITURE.

By *Victorian Naturalist*—					
Printing	£76 11 3				
Illustrating ...	7 7 5				
Free Reprints ...	4 15 0				
Reprints	5 9 6				
Back Numbers Purchased	1 0 0				
		£95 3 2			
,, Rooms—Rent and Attendance ...		9 5 0			
,, Library—Periodicals ...	5 10 4				
Books ...	0 16 0				
Binding ...	3 17 6				
Insurance, &c.	1 4 0				
		11 7 10			
Carried forward			£115 16 0		

* Subscriptions :—Arrears, £9 ; 1907–8, £105 16s. ; 1908–9, £6 6s — total £121 2s.

Brought forward...	£115 16 0		
By Wild Flower Exhibition—Expenses ...	0 5 3		
,, Printing and Stationery	11 12 0		
,, Postages, &c.	16 16 11		
,, Purchase of Badges	2 2 0		
,, Subscription to Werribee Gorge Improvement Fund	2 2 0		
		£148 14 2	
,, Balance Melbourne Savings Bank ...	102 17 3		
,, ,, London Bank	11 3 4		
		114 0 7	
		£262 14 9	

G. COGHILL, *Hon. Treasurer.*
26th May, 1908.

Audited and found correct.

J. SHEPHARD, D. BEST, } *Auditors.*

29th May, 1908.

The following statement of assets and liabilities was also read :—

ASSETS.

Balance in Banks	£114	0 7
Arrears of Subscriptions (£60), say	30	0 0
,, for Reprints	2	12 0
Library and Furniture (Insurance Value)	130	0 0
	£276	12 7

LIABILITIES.

Subscriptions paid in advance	£6	6 0

The financial statement was received, on the motion of Messrs. A. H. E. Mattingley and J. Stickland, and, after discussion, was adopted, on the motion of Messrs. F. Pitcher and C. F. Cole.

PRESIDENT'S ADDRESS.

The president, Mr. G. A. Keartland, then delivered the following address :—

"TWENTY-ONE YEARS' MEMBERSHIP OF THE FIELD NATURALISTS' CLUB OF VICTORIA, AND MY OBLIGATIONS TO IT.

"It is now twelve months since the members of this Club did me the honour of electing me to the office of president ; and, as my term has expired, I have been reminded that I am expected to give a president's address. Whilst some of my predecessors have spoken on the work of the past year, and to a certain extent reiterated the annual report, others selected a subject with which they were familiar, and confined their remarks to it. Now, I will leave the report of the year's work to speak for itself, and devote a brief period to reviewing my twenty-one

years of membership of this Club, its memories, and what I have gained from it.

"From early boyhood I had always taken a keen interest in all matters pertaining to natural history, and any book or newspaper article on my favourite hobby was perused with avidity. No holiday spent at town sports furnished half the pleasure derived from a ramble in the forest or along the course of a river, where I could study the habits of our native fauna, examine nests, collect eggs, or capture mammals, birds, or reptiles in order to make pets of them, afterwards visiting the Museum to find out their proper names.

"This unsatisfactory style of working continued until the year 1886, when I one day saw a paragraph in the *Age*, giving an account of a meeting of the Field Naturalists' Club. I determined to try and find out some of the members of the society, in order to learn from them the best method of pursuing my study, and to ascertain what works to read for guidance. I told my difficulty to the late Mr. W. Elliott, the then horticultural editor of the *Leader*, who at once said that a friend of his, Mr. Chas. French, would kindly propose me as a member.

"Although I gladly availed myself of the offer, I attended the next meeting (early in 1886) with very serious misgivings, and walked past the gate of this hall twice before mustering up courage to enter. I was afraid that I should meet a number of learned scientists, who would soon make it apparent that my room was preferable to my company. However, when once inside the room I found myself amongst an extremely sociable body of ladies and gentlemen, all of whom readily answered my questions; and I am afraid some of those questions appeared very simple.

"At that time the Rev. J. J. Halley was president, and, as I had learnt many years before that he was a keen ornithologist, I soon entered into conversation with him. In those days the late Mr. H. Watts talked about microscopical matters; Mr. F. G. A. Barnard about botany and entomology; Mr. D. Best, coleoptera; Messrs. Forbes-Leith, A. J. Campbell, Robert Hall, W. Hatton, J. T. Gillespie, C. French, jun., W. Macgillivray, E. D'Ombrain, and others, ornithology; Mr. S. H. Wintle, geology, and so on; and I started home from my first meeting with a fixed determination to study all branches of natural history. However, after attending a few meetings and excursions, I learnt how vast was the contract I had undertaken, and decided to devote my attention to one branch, ornithology, which had always occupied the chief share of my thoughts, and therefore studied Gould's 'Handbook' until I could quote largely from its pages.

"In conversation with the gentlemen previously mentioned,

as we examined specimens on the table, I acquired much information, and at the same time found that my earlier observations in the field enabled me to be of service to them. I think the first time I ventured a decided difference of opinion from that expressed by others was when a discussion took place regarding one of our native birds—the Chestnut-breasted Teal, *Nettion castaneum*, Eyton, formerly known as *Anas castanea*, Eyton. I expressed a firm conviction that there were two species of teal, but Mr. Forbes-Leith reminded me that Gould had stated that there was only one—that the bright-coloured one was found only in the breeding season, and that it was the male in its nuptial dress. After procuring further evidence, in July, 1890, I read a paper (*Vict. Nat.*, vol. vii., p. 43) on the subject, and produced specimens shot in the month of June in support of my contention, which has since been fully recognized as correct.

"In November, 1887, I had the pleasure of joining in the Club excursion to King Island, the organizing of which was greatly due to the exertions of Mr. A. J. Campbell. The results of that excursion, and the names of those who participated in it, are now matters of past history. Suffice it to say that a considerable amount of work was done, the fauna and flora of the island being fairly well catalogued. Other extended excursions were held, but I had not the opportunity of taking part in one until the excursion to the Kent Group in November, 1890, during which I gained a fuller knowledge of the range of several of our sea-birds, at the same time making a nice collection of them.

"In February, 1894, I had occasion to visit Sydney on business, and, furnished with a letter of introduction from Mr. Barnard to Mr. A. J. North, Ornithologist to the Australian Museum, I made the acquaintance of the latter, who kindly showed me the collections and introduced me to the officials of the Museum at their work, and in various ways added to my knowledge of taxidermy. The friendship then formed has continued ever since, and Mr. North was joint author of the reports of the ornithological section of the two exploring expeditions in which I afterwards participated. Mr. North, by the way, is one of the original members of this Club, and was an exhibitor at its meetings before he went to Sydney.

"Early in 1894 the Horn Scientific Exploring Expedition to the Western Macdonnell Ranges, Central Australia, was equipped, and to my connection with this Club I owe the fact that I was asked by Professor Spencer to become one of the party. My duties were to collect anything that had life, and some things that had not. The trip resulted in the addition of a vast amount of information concerning a number of mammals, birds, reptiles, fish, and insects, many of which were new to science. In the

ranges I made the acquaintance of Mr. C. E. Cowle, and with his kindly aid obtained many birds' eggs previously unknown, all of which have since been exhibited at our meetings.

"In 1896 I was appointed to accompany the Calvert Exploring Expedition across the great desert of north-west Australia, and again had opportunities of noting the range of many rare birds and plants, besides the discovery of several new species. It was when apparemtly stranded after our perilous trip across the desert, in which two comrades and ten camels perished, that I first realized the practical value of the friendships formed in this Club. Just when things appeared at their worst, telegrams reached me on the Fitzroy River from two members of this Club, as follows:—"If in need of financial assistance, wire at once." However, matters were not so black as they looked. I had the satisfaction of doing more work and returning home without taxing the generosity of these gentlemen; but I will never forget my feeling when I opened those telegrams.

"Having said so much of a personal nature, let me now give a very brief review of items which occur to my memory. On glancing round the room I miss many old friends. Some have gone to distant parts, others have resigned, but many have gone to their long home. Many of our members furnished papers, or took parts in the proceedings of the Club, which only need mentioning to awaken happy memories. Who will forget the interesting lecturette we had at one of our conversaziones from Mr. C. A. Topp, entitled 'Life on an Old Rail,' which revealed what a wealth of animal and vegetable life existed on a piece of old timber. The papers on fungi contributed by Mrs. Martin, the late Baron von Mueller, and Mr. H. T. Tisdall were full of useful information. Mr. O. A. Sayce gave valuable hints on 'Staining Reagents for Microscopic Work.' Then we had a series of papers by Mr. Robert Hall, in which the birds of Box Hill were critically discussed; Mr. A. J. Campbell used to read notes on the Cuckoos and their foster-parents. Accounts of excursions to Albatross Island, by Messrs. Ashworth and Gabriel; to the Bloomfield River district, North Queensland, by Mr. D. Le Souëf; and in recent years, botanical outings by Messrs. Barnard, Weindorfer, and Dr. Sutton, were all extremely interesting. Mr. C. Barrett's papers on birds, showing the various changes from nestlings to maturity, were very valuable, and a class of work of which we want a great deal more. Dr. Hall has made us familiar with the geology of a considerable portion of Victoria, and many other names might be mentioned of those who have contributed to our knowledge.

"I feel sure I am correct when I assert that it is largely due to the work of this Club that nature study occupies such an important position in the curriculum of our public schools.

Twenty years ago such a subject as nature study was unknown. During my term of membership of this Club a number of its members have been called upon to fill important public appointments, and I believe they one and all acknowledge the benefit they have derived from their attendances at its meetings and excursions. Indeed, it is possible to learn more in one field lesson than in a whole month's book study ; therefore, I would emphasize to our members, especially the juniors, the advantages they can derive from so doing.

"In conclusion, I must congratulate the Club on the possession of so many leaders in the various branches of study, who are at all times ready to assist beginners, and acknowledge my personal indebtedness to most of them, especially to Mr. J. Searle, our honorary lanternist, who, by his readiness to place his services at our disposal, has enabled the work of our members to be brought more forcibly before us."

On the conclusion of the address Dr. T. S. Hall moved that a hearty vote of thanks be accorded Mr. Keartland, this was seconded by Mr. F. G. A. Barnard, and carried by acclamation.

ELECTION OF OFFICE-BEARERS FOR 1908–9.

The following office-bearers, being the only nominations received, were declared elected :—President, Mr. G. A. Keartland ; vice-presidents, Professor A. J. Ewart, D.Sc., Ph.D., and Mr. J. A. Leach, M.Sc. ; hon. treasurer, Mr. G. Coghill ; hon. librarian, Mr. A. D. Hardy, F.L.S. ; hon. secretary, Mr. F. G. A. Barnard ; hon. assistant secretary and assistant librarian, Mr. W. H. A. Roger ; hon. editor, Mr. F. G. A. Barnard ; committee, Messrs. J. Gabriel, T. S. Hall, M.A., D.Sc., J. A. Kershaw, F.E.S., F. Pitcher, Dr. C. S. Sutton.

Mr. O. A. Sayce moved a vote of thanks to the retiring office-bearers and referred especially to the work of the retiring hon. secretary, Mr. J. A. Kershaw, who, after occupying the position during two separate terms for five years, was relinquishing it in consequence of pressure of other work. Mr. J. Stickland seconded the motion, which was carried by acclamation.

The president endorsed the remarks relating to the hon. secretary, and Mr. Kershaw, in acknowledging the vote of thanks, said he was gratified to feel that his efforts on behalf of the Club were so much appreciated by the members. The work had always been a pleasure to him, and he regretted that the pressure of other duties obliged him to relinquish it. He hoped still to be of use to the Club in other directions.

GENERAL BUSINESS.

The president announced that, owing to the limited space available for exhibits in the upper hall when used for the ordinary

meetings, it had been decided to provide accommodation in the small room on the ground floor for that purpose.

Professor Ewart, in referring to the importance of the conversazione held at the close of the meetings, regretted that so much time was frequently taken up in the reading of lengthy papers as to greatly interfere with this part of the programme. He stated that the purpose of the Club was not solely for the reading of papers, and considered the short informal conversazione quite as important for the welfare of the Club. Simply with a view to enable the time to be apportioned to the best advantage, he would move—"That the time devoted to the reading of papers should not extend beyond 9.45 p.m."

Mr. O. A. Sayce suggested that, instead of putting the motion as a hard and fast rule, it might be adopted as a by-law of the Club.

After further discussion, Mr. G. Coghill moved—"That it be a resolution of the Club that the reading of papers cease at 9.30 p.m." This was seconded by Mr. F. G. A. Barnard, and carried.

Professor Ewart gave notice that at the next meeting he would move that the above resolution be incorporated as a rule of the Club.

NATURAL HISTORY NOTES.

Mr. A. D. Hardy, F.L.S., stated that early in the previous week he was shown a specimen of *Acacia suaveolens* in full bloom, collected by Dr. Cherry near Rosedale, Gippsland.

Messrs. F. G. A. Barnard, J. Gabriel, J. A. Kershaw, F.E.S., and G. A. Keartland contributed remarks on their exhibits.

EXHIBITS.

By Mr. F. Barnard.—A ripe pineapple, grown at Kew under glass without artificial heat.

By Mr. F. G. A. Barnard.—Growing fern, *Botrychium ternatum*, collected near Oakleigh more than twenty years ago.

By Mr. C. F. Cole.—Young of the Koala, *Phascolarctos cinereus*, taken from the pouch on 9th April, 1908; locality, Grantville, Vic.

By Master Frank Cudmore.—A series of obsidian bombs, showing considerable variety in form, found on Oakvale station, S. Australia.

By Mr. C. J. Gabriel.—Marine shells, comprising *Fistulana grandis*, Desh., from New Caledonia; *Clavagella australis*, Sow., from Port Jackson; six species of genus Brechites, from Singapore, &c., including *B. strangei* from Tasmania; and ten species of Xenophora from various parts, including *X. solarioides* from Queensland.

By A. D. Hardy, F.L.S.—Three phials containing specimens

illustrating the growth of young Sheoak, *Casuarina quadrivalvis*; also filaments of antheridium of Nitella shown under the microscope.

By Mr. G. A. Keartland.—Pair of Gang-Gang Cockatoos, *Callocephalon galeatum*, and crop of same full of seeds of a species of eucalyptus.

By Mr. J. A. Kershaw, F.E.S., on behalf of Mr. C. W. Maclean, Inspector of Fisheries.—Example of so-called "Sea-fibre," found in large sheets on the beach at Welshpool. The material was said to appear about August, and to disappear again about the end of October. On submitting a sample to Professor Ewart, Government Botanist, the material was found to be composed of the filaments of a species of algæ, probably mainly of Cladophora, which had been felted into a mat-like mass by the action of the wind and tide, forming a sheet some five feet long.

By Mr. G. B. Pritchard, B.Sc.—Fibre-balls and portion of grass-stem, illustrating the manner in which it is shredded into fibre by the action of sand-blows. From Middleton Beach, near Albany, Western Australia.

After the usual conversazione, the meeting terminated.

Economic Geology of Victoria.—A useful catalogue of the publications in which references will be found to the economic geology of Victoria has been published by the Mines Department as No. 3 of vol. ii. of "The Records of the Geological Survey." The full title is "A Contribution to the Economic Geology of Victoria, to the end of 1903." Its author, Prof. J. W. Gregory, F.R.S., D.Sc., lately Director of the Geological Survey, and his assistants must have put a tremendous amount of work into the compilation, as it seems to have been very thoroughly done, and amounts to over 120 closely printed pages of references.

Protection of the Fauna and Flora of Australia.—The scientific societies of South Australia desire to enlist the sympathy of kindred societies in other parts of the world in a proposal, which was recently made to the South Australian Government, to set aside some 313 square miles of country at the western end of Kangaroo Island as a reserve for the protection of the native fauna and flora. A reserve of 67 square miles in the vicinity of Cape Borda was readily granted, but it is considered that the larger area is not excessive when the importance of the proposal is borne in mind. Kangaroo Island, it will be remembered, was the home of the now extinct Emu, *Dromœus ater*, and, at the present time, possesses some very local birds and plants. We trust that the movement will be brought to a successful issue.

EXCURSION TO STONY POINT, WESTERN PORT.

THE Easter excursion, originally fixed for Cowes, on Phillip Island, was changed to Stony Point, another locality in Western Port Bay, on account of its easier accessibility, and for its proximity to a fairly sheltered inlet, where it was thought a good variety of marine life would be found. Stony Point, 45 miles from town, was reached before noon on Good Friday, and our little party of six were soon found making themselves at home in Mrs. Osterlund's cottage, near the railway station, where we had arranged for temporary residence. From Mr. Osterlund we had hired a motor-launch, and, after a hasty dinner, we lost no time in boarding the launch and commencing our dredging operations. A little run of ten minutes or so brought us to our starting point, and, dropping the dredge overboard, we drifted down with the ebb-tide to Tortoise Head, and back again with the flood, which occupied us till half-past six. We found our skipper, Mr. Osterlund, a splendid man, strong as a lion, and, having a good, useful knowledge of the bottom, he saved us a lot of useless work, loss of time, and damage to the dredge, and we returned to the pier with a good haul, well pleased with the afternoon's work.

Early to bed was the order, as we anticipated a long day's work on the morrow, but we were doomed to disappointment, for a south-east wind blew all day, raising a nasty "jobble" on the water, and as the Field Naturalists viewed the scene with fearful eyes, the dredging trip was postponed until next day. The morning was spent in turning over the stones at low tide, and many interesting forms of life were obtained. As the tide rose too high to continue the search we went for a stroll near the inlet which separates Stony and Sandy Points; however, beyond two species of estuarine shells and the Mangrove trees, with their singular breathing tubes, which were new to some of us, there was little of interest. A fine flock of the Flame-breasted Robin, *Petrœca phœnicia*, evidently resting after their migratory flight from Tasmania, was noted.

Next morning broke beautifully fine, and we hurried over breakfast, but we were again doomed to temporary disappointment: the tide was out, and the launch was stranded on the mud flat. After waiting two hours for sufficient water, at about eleven o'clock we went on board, and were soon at work dredging with the flood tide, which runs with considerable force past Stony Point. We worked on till it was too dark to see our captures, and returned to the pier thoroughly satisfied with the results.

Monday morning found us again working the rocks at low tide for a little while before leaving for town by the mid-day train.

The importance of Western Port as a collecting ground for marine life seems to be little understood by those interested in

that department of natural history. Here we have a magnificent sheet of water, covering perhaps 80 square miles, the whole of which is influenced by tides ranging from 8 to 10 feet. Channels meander in all directions, varying in depth down to sixteen fathoms, and in width from a few hundred yards to two or three miles. These channels teem with marine life of wonderful variety. Look, for example, at the result of our little trip, the work of practically only two days. Leaving out of the question the Bryozoa, Hydrozoa, Crustacea, &c., we collected no less than 220 species of Mollusca, there being 53 bivalves and 167 univalves. Among them were the very rare species *Typhis yatesi*, Crosse; *Lippistes blainvilleanus*, Petit; *Drillia gabrieli*, Pritchard and Gatliff; *Mitra glabra*, Swain.; *Conus segravei*, Gatliff; and the Chitons, *Loricella angasi*, Ad. and Angas, and *Acanthochites speciosus*, H. Adams. The latter Chiton is extremely rare, and the last record of its occurrence was by the late Mr. Bracebridge Wilson, at Port Phillip Heads, many years ago. Two Modiolas were secured—*M. albicosta*, Lam., and *M. arborescens*, Chem. This latter beautiful shell was a great find. Some years ago my son, Mr. C. J. Gabriel, obtained a few specimens of it in company with *M. victoriæ*. The peculiar habit of these shells is that they are always embedded in tufts of sea-weed held together by mud, and great care has to be exercised in separating the fragile shells from their environment, otherwise disaster is sure to occur. We were also fortunate in obtaining two species of tube-shells—*Humphreyia strangei*, A. Ad., and *Clavagella multangularis*, Tate. The tube-shells are very interesting, and a short description may be acceptable. Strictly speaking, the tube is only the adult stage of the shell, for in early life the valves are quite free from any tube whatever, as may be seen in a specimen collected by my son about three years ago. In the larger form, *Humphreyia strangei*, the fish builds the tube, which is of calcareous material, upon its shell. The tube is quadrangular in form, and at first you may fail to see the connection, but near the base you will find the little bivalve, only about three-eighths of an inch long, embedded on one of the angles. The smaller form, *Clavagella multangularis*, is built up similarly, but differs in the tube being multiangular and that one valve only is embedded in the tube, the other swinging loosely inside. The reason for this I leave to wiser heads to explain. The sketch map will give you an idea of what ground has been worked, and the amount which yet remains to be done. My son and I have spent most of our holidays in these waters for the last fifteen or twenty years, and we have not covered one-fourth of the area. In Bryozoa alone I have collected over 200 species, while on one short trip I collected 120 species of sponges for Professor Dendy. Among other objects taken in Western Port may be mentioned the rare mollusc, *Murex triformis*, many rare fish, and also Amphioxus.

I append a list of the Mollusca found during trip, determined by Mr. C. J. Gabriel, examples of most of which have been presented to the National Museum collection.—J. Gabriel.

MARINE MOLLUSCA FOUND NEAR STONY POINT, APRIL, 1908.

Gastropoda.

Murex triformis, *Rve.*
M. angasi, *Crosse*
M. denudatus, *Perry*
M. umbilicatus, *T.-Wds.*
Typhis yatesi, *Crosse*
Trophon petterdi, *Crosse*
T. paivæ, *Crosse*
Purpura succinta, var. textilosa, *Lam.*
Sistrum adelaidensis, *C. and F.*
Lotorium subdistortum, *Lam.*
L. bassi, *Ang.*
L. spengleri, *Chem.*
L. verrucosum, *Rve.*
Colubraria bednalli, *Braz.*
Fusus undulatus, *Perry*
F. dunkeri, *Jonas*
Fasciolaria australasia, *Perry*
Latirus clarkei, *T.-Wds.*
Cominella costata, *Q. and G.*
C. lineolata, *Lam.*
Zemira australis, *Sow.*
Nassa fasciata, *Lam.*
N. jacksoniana, *Q. and G.*
Voluta undulata, *Lam.*
Mitra vincentiana, *Verco*
M. strangei, *Ang.*
M. tasmanica, *T.-Wds.*
M. glabra, *Swain.*
M. scalariformis, *T.-Wds.*
Marginella johnstoni, *Petterd*
M. turbinata, *Sow.*
M. pisum, *Rve.*
M. lævigata, *Braz.*
M. halli, *Prit. and Gat.*
Ancilla marginata, *Lam.*
A. oblonga, *Sow.*
Columbella semiconvexa, *Lam.*
C. lincolnensis, *Rve.*
C. angasi, *Braz.*
C. tenuis, *Gask.*
C. nubeculata, *Rve.*
C. brunnea, *Braz.*
C. atkinsoni, *T.-Wds.*
Pseudamycla miltostoma, *T.-Wds.*
Cancellaria lævigata, *Sow.*
C. purpuriformis, *Val.*
Terebra kieneri, *Desh.*
T. fictilis, *Hinds.*
T. inconspicua, *Prit. and Gat.*
Drillia quoyi, *Desm.*
D. beraudiana, *Crosse*
D. trailli, *Hutton*
D. telescopialis, *Verco*
Drillia gabrieli, *Prit. and Gat.*
Mangilia delicatula, *T.-Wds.*
M. alucinans, *Sow.*
M. st. galliæ, *T.-Wds.*
M. incerta, *Prit. and Gat.*
Cithara compta, *Ad. and Ang.*
C. kingenensis, *Petterd*
Clathurella tincta, *Rve.*
C. sexdentata, *Prit. and Gat.*
C. denseplicata, *Dunk.*
C. modesta, *Ang.*
C. letourneuxiana, *C. and F.*
C. bicolor, *Ang.*
Mitromorpha flindersi, *P. and G.*
Daphnella fragilis, *Rve.*
D. tasmanica, *T.-Wds.*
Conus anemone, *Lam.*
C. segravei, *Gatliff*
C. rutilus, *Menke*
Cypræa angustata, *Gmel.*
C. australis, *Lam.*
Natica sagittata, *Mke.*
N. beddomei, *Johnston*
N. subcostata, *T.-Wds.*
Eunaticina umbilicata, *Q. and G.*
Calyptræa calyptræformis, *Lam.*
Crepidula unguiformis, *Lam.*
Hipponyx australis, *Lam.*
Turritella subsquamosa, *Dunk.*
Tenagodes weldii, *T.-Wds.*
Lippistes blainvilleanus, *Petit*
Scala jukesiana, *Forbes*
S. aculeata. *Sow.*
S. translucida, *Gatliff*
Pyramidella bifasciata, *T.-Wds.*
Turbonilla micra, *P. and G.*
T. casta, *A. Ad.*
T. mariæ, *T.-Wds.*
T. fusca, *A. Ad.*
T. brevis, *P. and G.*
Odostomia suprasculpta, *T.-Wds.*
O. mayii, *Tate*
O. metcalfei, *P. and G.*
Cerithium monachus, *C. and F.*
Bittium granarium, *Kiener*
B. minimum, *T.-Wds.*
B. cerithium, *Q. and G.*
Cerithiopsis crocea, *Ang.*
C. semilævis, *T.-Wds.*
Triphora tasmanica, *T.-Wds.*
Diala monile, *A. Ad.*
D. pagodula, *A. Ad.*
D. varia, *A. Ad.*

Styliferina translucida, *Gat.*
Littorina mauritiana, *Lam.*
Risella melanostoma, *Gmel.*
Nerita melanotragus, *Smith*
Liotia tasmanica, *T.-Wds.*
Cyclostrema angeli, *T.-Wds.*
C. weldii, *T.-Wds.*
C. micra, *T.-Wds.*
Pseudamycla micans, *A. Ad.*
Rissoa incidata, *Frau.*
R. olivacea, *Dunk.*
R. cyclostoma, *T.-Wds.*
R. tenisoni, *Tate*
R. hulliana, *Tate*
R. cheilostoma, *T.-Wds.*
R. flammea, *Frau.*
R. dubitabilis, *Tate*
R. strangei, *Braz.*
Rissoina flexuosa, *Gould*
R. d'orbignyi, *A. Ad.*
Phasianella australis, *Gmel.*
P. rosea, *Ang.*
Turbo undulatus, *Mart.*
Leptothyra rosea, *T.-Wds.*
Astralium fimbriatum, *Lam.*
A. aureum, *Jonas*
Clanculus limbatus, *Q. and G.*
C. aloysii, *T.-Wds.*
C. dunkeri, *Koch*
C. plebeius, *Phil.*
Austrocochlea constricta, *Lam.*
Diloma odontis, *Wood*
Phasianotrochus irisodontes, *Q. and G.*
Bankivia fasciata, *Menke*
Cantharidus ramburi, *Crosse*
Gibbula tiberiana, *Crosse*
Minolia tasmanica, *T.-Wds.*
Calliostoma meyeri, *Phil.*
C. allporti, *T.-Wds.*
C. legrandi, *T.-Wds.*
C. hedleyi, *P. and G.*
Euchelus baccatus, Mke.
E. scabriusculus, *Ang.*
Stomatella imbricata, *Lam.*
Schismope atkinsoni, *T.-Wds.*
Megatebennus concatenata, *C. and F.*
Puncturella harrisoni, *Bedd.*
Subemarginula emarginata, *Blain.*
Scutus anatinus, *Don.*
Acmæa costata, *Sow.*
A. calamus, *C. and F.*
Ischnochiton crispus, *Rve.*
I. contractus, *Rve.*
I. novæ-hollandiæ, *Rve.*
Plaxiphora petholata, *Sow.*
Acanthochites speciosus, *H. Ad.*
A. granostriatus, *Pil.*
Loricella angasi, *Ad. and Ang.*
Bullinella arachis, *Q. and G.*
B. pygmæa. *A. Ad.*
Bulla australis, *Gray*
Haminea brevis, *Q. and G.*
Philine angasi, *Crosse*
Salinator fragilis, *Lam.*
Ophicardelus australis, *Q. and G.*

LAMELLIBRANCHIATA.

Clavagella multangularis, *Tate*
Humphreyia strangei, *A. Ad.*
Solen vaginoides, *Lam.*
Saxicava australis, *Lam.*
Myodora ovata, *Rve.*
Thracia myodoroides, *Smith*
Mactra ovalina, *Lam.*
Spisula parva, *Petit*
Mesodesma glabrella, *Lam.*
Macoma mariæ, *T.-Wds.*
Chione disjecta. *Perry*
C. cardioides, *Lam.*
C. strigosa, *Lam.*
C. undulosa, *Lam.*
C. placida, *Phil.*
Meretrix planatella, *Lam.*
Dosinia, sp. (?)
Tapes fabagella, *Desh.*
Cardium cygnorum, *Desh.*
C. pulchellum, *Gray*
C. tenuicostatum, *Lam.*
Loripes crassilirata, *Tate*
Lucina brazieri, *Sow.*
Erycina acupuncta, *Hedley*
Diplodonta globularis, *Lam.*
Lasæa rubra, *Mont.*
Lepton trigonale, *Tate*
Rochefortia donaciformis, *Ang.*
Cyamiomactra mactroides, *T. and M.*
Crassatellites kingicola, *Lam.*
Cardita bimaculata, *Desh.*
Mytilicardia calyculata, *Linn.*
Trigonia margaritacea, *Lam.*
Nucula micans, *Ang.*
N. hedleyi, *P. and G.*
Barbatia fasciata, *Rve.*
B. squamosa, *Lam.*
Glycimeris radians, *Lam.*
Limopsis rubricata, *Tate*
Modiola ater, *Zelebor*
M. albicosta, *Lam.*
M. australis, *Gray*
M. arborescens, *Chem.*
Philobrya fimbriata, *Tate*
Pteria papilionacea, *Lam.*
Lima bullata, *Born.*
Pecten medius, *Lam.*
Chlamys asperrimus, *Lam.*
Cyclopecten nepeanensis, *P. and G.*
Ostrea angasi, *Sow.*

The Pre-Historic Elephant.—Natural science is obtaining greater prominence in the newspapers of the day, and in the *Illustrated London News* of 7th March will be found an excellently illustrated article on the researches now being made in the Fayûm Desert, Egypt, about 50 miles south-west of Cairo. Here the remains of more than 30 species of land animals, many of gigantic size, have been discovered, and Prof. Osborn, of the American Museum of Natural History, considers Northern Africa to have been the ancestral home, perhaps two millions of years ago, of our modern elephants.

Hawthorn and Camberwell Microscopical Society.—The annual conversazione of this society was held at Camberwell on Tuesday evening, 23rd June, when, notwithstanding the inclement weather, there was a good attendance of members and friends. Visitors had a fine choice of subjects for examination, as some sixty microscopes were in use, each having its own particular subject, which was indicated by a prominent placard, while on the adjacent walls were enlarged diagrams of the objects displayed. The president, Mr. O. A. Sayce, in a brief address, referred to the objects of the society, and regretted that the example of the society was not followed in other suburbs of Melbourne, an example which he felt sure would add greatly to the interest in the everyday objects around us. During the evening a lecturette, illustrated by lantern views, was given by Dr. T. S. Hall, M.A., on "The Geology of Camberwell," which, as it appealed to an audience familiar with the places mentioned or depicted on the screen, was greatly appreciated, and brought home to many how geologically interesting are the hills and valleys of the Eastern Suburbs.

Cormorants.—At the May meeting of the Victorian Fish Protection Society and Anglers' Club, Mr. A. H. E. Mattingley, C.M.Z.S., who, by the way, is an enthusiastic fisherman as well as bird observer, read an interesting paper in which he maintained, in opposition to the usual idea, that Cormorants are the angler's best friends. He based his remarks on the fact that enemies to fish ova or the young fry are far more serious than those of the adult fish, and that the loss of any full-grown fish which Cormorants may devour is more than counterbalanced by the vast amount of good which they do as enemies of yabbies, turtles, frogs, &c., which are very destructive to fish ova and young fry. The results of his observations among the Cormorant rookeries of the Murray swamps convinced him that these birds did more good than harm. The full text of the paper will be found in the *North Melbourne Courier* of 29th May and 5th June, 1908.

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FIELD NATURALISTS' CLUB OF VICTORIA.

A special general meeting was held at the Royal Society's Hall on Monday evening, 13th July, 1908, to consider a proposed addition to the rules.

The president, Mr. G. A. Keartland, occupied the chair, and about 40 members were present.

In accordance with notice, Prof. A. J. Ewart, D.Sc., moved that the following words be added to rule 3, viz. :—"The reading of papers at ordinary meetings shall cease at 9.30 p.m." The mover contended that a mere resolution such as passed at the last meeting was not imperative enough, since it might be set aside at short notice ; whereas as a rule the matter was placed beyond the reach of any meeting or chairman.

Several members thought there was no necessity for a hard and fast rule, which on some occasions might be found to act harshly.

On a vote being taken, the requisite majority for the adoption of the additional words was not obtained.

The business of the ordinary meeting was then proceeded with.

REPORTS.

A report of the visit to the Zoological Gardens on Saturday, 11th July, was given by the hon. secretary, who said that, despite the threatening weather, about twenty-five members and friends attended. The director, Mr. D. Le Souëf, C.M.Z.S., met the party and conducted them round the gardens, giving interesting information about many of the exhibits. A specimen of the Tree-climbing Kangaroo of North Queensland was seen to great advantage. Unfortunately, heavy rain came on before all the animals, &c., had been seen, and brought the visit to an abrupt conclusion.

A report of the visit of the junior members to the Biological School, University, on Saturday, 4th July, was also given by the hon. secretary, who said, considering the wet afternoon, there had been a good attendance of juniors. In the unavoidable absence of Prof. Baldwin Spencer, M.A., C.M.G., who had intended giving a demonstration on "How Animals Hear," Dr. Georgina Sweet, D.Sc., kindly took his place, and dealt with the same subject, taking for her types the crayfish, the shark, the frog, and the human species. The demonstration was fully illustrated by specimens, models, drawings, &c., and was attentively followed by the juniors, after which a brief examination was made of the School museum.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Peters, 12 Murphy-street, South Yarra, Mr. Reginald Kelly, Healesville, and Mr. Woolf Marks, 413 Collins-street, city, were duly elected ordinary members; and Masters Geoffrey Berry, James Bryce, Edwin Drake, and Leo Gillan, all of Canterbury, were duly elected junior members of the Club.

GENERAL BUSINESS.

Mr. F. G. A. Barnard referred to a proposal made by the Moorabbin Shire Council to acquire the Blackrock estate, near Sandringham, for a public reserve, and moved that the support of the Club be given to the matter. Seconded by Mr. D. Best.

Messrs. Shephard, Nicholls, and Topp urged that if secured the estate should be left as much as possible in its present wild state, and this provision having been added to the resolution, it was carried.

Mr. G. Coghill moved, and Prof. Ewart seconded—"That a letter of farewell be forwarded to Her Excellency Lady Northcote in view of the interest she had exhibited in the last conversazione of the Club." Carried.

PAPERS.

1. By Mr. E. Jarvis (communicated by Mr. J. A. Kershaw, F.E.S.), entitled "Notes on the Structure and Habits of the Neuropterous Insect, *Bittacus australis*."

The author gave a highly interesting account of the method adopted by this scorpion-fly when securing its prey, and detailed the structure of the mouth parts of the insect.

2. By Prof. A. J. Ewart, D.Sc., Ph.D. entitled "Some Notes on the Flora of Victoria."

The author briefly referred to the various conditions affecting the flora of Victoria, and contrasted it in several ways with that of England. He remarked that little seemed to have been done towards ascertaining whether many of our smaller plants and shrubs possessed characters of economic value.

Some discussion ensued, when Mr. F. Pitcher said that, from experiments made, several native plants seemed capable of producing useful fibres, but they had not been tried in commercial quantities.

Mr. A. D. Hardy, F.L.S., remarked that many years ago an attempt had been made in the Heytesbury Forest to obtain sugar from the grass-trees.

Mr. C. A. Topp, M.A., referred to the prevalence of evergreen trees and shrubs in Australia, and asked if any particular reason could be assigned for this.

The author replied that, doubtless owing to the absence of very severe cold, the movement of sap was scarcely retarded through-

out the year, and as a consequence the irregular shedding of the leaves.

NATURAL HISTORY NOTES.

Apus.—Mr. R. W. Armitage called attention to his exhibit of specimens of Apus collected in a small pool close to the seashore at Townsville, North Queensland, in January last.

Mosquitoes and Malaria.—Mr. R. W. Armitage read a short note recording the occurrence of malarial fever in the island of Samarai, off the coast of Papua, immediately after the appearance of numbers of Anopheles mosquitoes, which were regarded by the inhabitants as having been blown from adjacent islands by a heavy gale.

EXHIBITS.

By Mr. R. W. Armitage.—Specimens of crustacean, Apus, sp., collected near seashore, Townsville, North Queensland, in illustration of note.

By Miss C. Cowle.—Dried plants, &c., from the River Forth, Tasmania, including *Eucryphia Billardieri*, *Lomatia tinctoria*, *Campynema lineare*, &c.

By Mr. J. Gabriel.—Seaweed, *Claudea elegans* (in fruit), dredged in Western Port Bay.

By Mr. C. J. Gabriel.—Marine shells—*Argonauta argo*, Lin., Japan; *Murex tenuispina*, Lam., Ceylon; *M. palma-rosæ*, Lam., Ceylon; *M. ternispina*, Lam., Northern California; and *Trophon triangulatus*, Carp., California.

By Mr. J. H. Harvey.—Stereoscope, with views of the most recently opened-up portions of the river branches of the Lucas Cave, Jenolan, N.S.W.

By Mr. G. A. Keartland.—Specimen of Powerful Owl, *Ninox strenua*, Gld.

By Mr. E. B. Nicholls.—Tail of Skate used as riding whip, from Godaveri River, India.

By Mr. G. B. Pritchard, B.Sc.—A very large fossil sea-urchin, *Linthia mooraboolensis*, from Batesford, near Geelong.

By Mr. J. Stickland.—Rotifer, *Floscularia ornata*, Ehren., from Bulleen (under microscope).

After the usual conversazione the meeting terminated.

Honours.—The degree of Doctor of Science has been bestowed by the Victoria University, Manchester, England, on Professor W. Baldwin Spencer, C.M.G., M.A., F.R.S., Professor of Natural Science at Melbourne Univerity. Prof. Spencer was a distinguished student of Owens College, Manchester, now included in the Victoria University, and it is gratifying to find that his great services to Natural Science in Australia have been thus recognized by his *Alma Mater*.

WILD LIFE OF THE MURRAY SWAMPS.

By A. H. E. Mattingley, C.M.Z.S.

(*Read before the Field Naturalists' Club of Victoria, 13th April*, 1908.)

For fifty miles or so up the River Murray from Echuca the stream is lined on either side by a series of swamps, which in a normal season teem with bird-life. In summer the district is a Red-gum, *Eucalyptus rostrata*, forest, and one can drive from place to place in search of specimens, but at the nesting season, which occurs in spring, the waters of the Murray, increased by the melting of the winter snows at its sources in the Australian Alps, inundate the swamps, and cover the level country, so that it becomes a vast inland lake. To get about then it is necessary to employ flat-bottomed boats, and pole or paddle wherever you want to go.

It was under the latter conditions, during November, that a friend and myself spent some ten days in the flooded forest, seeking for information about the nesting habits of the many land and water birds which resort there in the breeding season. At that time they are safe from many of their enemies, and close to large supplies of frogs, yabbies (freshwater crayfish), snails, &c., on which to subsist.

After a train journey of about 180 miles, we reached Mathoura (a station on the Echuca-Deniliquin line) late in the afternoon. As we crossed the Murray at Echuca we had noticed that the stream was much higher than when we made a similar trip the previous year, and we wondered whether we would be able to reach our destination, some eight miles from Mathoura, with all the heavy baggage we had brought with us. However, on arrival, we found a large flat-bottomed boat provided for us instead of the orthodox buggy we had expected.

Having stowed our baggage safely in the somewhat rickety boat, we proceeded up the Gulpha Creek, paddling against the stream, which was running very swiftly. Our course was marked out by picturesque Red-gums, *Eucalyptus rostrata*, on either hand, which threw their shadows across the water. Everything was calm and beautiful ; the air, warm and balmy, and fragrant with the aromatic odour of the eucalypts, gave promise of fine weather for some time, and in this respect we were not disappointed.

Near the place of embarkation we had noticed a Brown Tree-creeper, *Climacteris scandens*, carrying food to its nestlings in the hollow spout of a box-tree. A colony of Welcome Swallows, *Hirundo neoxena*, skimmed gracefully over the water, catching insects for their progeny snugly cradled in mud nests, shaped like a bisected bowl, which they had built under an adjacent bridge. Occasionally one of these birds would dip its beak into the water and take a drink while

in full flight. It was also noticed that these birds are not expert insect-catchers, for several of them made repeated efforts to catch a small moth, which finally escaped them. Safely fixed on some overhanging branch, many of the bowl-shaped mud nests of the Pied Grallina, *Grallina picata*, were noted, the birds usually flushing off the nests some distance in advance of our boat, meanwhile piping a plaintive note of remonstrance. A nest of the Black-and-White Flycatcher, *Rhipidura tricolor*, was noticed on a dead limb of a tree which had fallen into the creek. It was found to be lined in a marvellous pattern with short red hairs, evidently plucked from the back of some obliging horse, and contained four eggs. These birds are commonly known as "Shepherds' Companions," and are very pugnacious when any other bird ventures near their nest. A Reed-Warbler, *Acrocephalus australis*, trilled its enlivening and richly melodious notes as it flitted from reed-stem to reed-stem in search of food for its family of three, which we noticed in a deep, cup-shaped nest, securely fastened to the slender, waving reeds. Notice with what knowledge these birds build their nests; observe how they place them half-way up the stems so as to be above flood level, and yet not high enough to suffer much from the vibration of the reeds when swayed by the wind; notice also how deep the interior of the nest is, so as to prevent the eggs or young birds falling out should the wind sway the reeds more violently than usual.

As we paddle by a Red-gum, out darts a Sacred Kingfisher, *Halcyon sanctus*, from a spout about twelve feet above the water, and from the repeated swoops he makes at us, uttering the while a shrill note of anger, as we try to investigate his home, we conclude that he has a family domiciled there. Many other birds, which will be noticed later on, were seen as we proceeded up the creek. In about four miles we entered the Redbank Swamp, a large sheet of water, which was covered all over with duck-weed, swan-grass, sedges, reeds, and water-lilies, the latter being simply a blaze of vivid yellow flowers, which filled the air with a delightful fragrance, reminding us that flowers are the beautiful hieroglyphics by which Nature tells us how much she loves us.

A colony of the Tippet Grebe, *Podicipes cristatus*, was disturbed in the channel, a spot such as they prefer to hunt in for small fish, on account of its being free from entangling weeds. Soon the booming of the Bittern, *Botaurus pœciloptilus*, was heard on all sides as the birds first inspired and then respired their weird notes, and with the view of making a closer acquaintance with these birds we mentally decided to revisit this spot. Ducks of various species were flushed as we proceeded, and on rounding one grassy point a White Ibis was disturbed, which straightway dropped its capture—a large yabbie (crayfish)—and flew hurriedly away. At length we reached our destination, just as daylight was rapidly disappearing.

Next morning we decided to revisit the Redbank Swamp, and as we drop down the stream several Blue Wrens, *Malurus cyaneus*, are observed in the reeds fringing the creek, their dome-shaped nests being suspended in some Scotch thistles close by. Doubtlesss the Wrens had learned the value of the sharp prickles as a protection to their belongings. Further on a Chough, *Corcorax melanorhamphus*, was flushed from its large bowl-shaped mud nest, situated at the end of a tall swaying sapling, about fifty feet above the ground, and, on investigating its contents with the aid of a rope ladder, we found a clutch of five typical eggs.

We now pushed on to reach a sand ridge we knew of, where we hoped to find the nests of the Bee-eater, *Merops ornatus*. A short search revealed some of their burrows, but only one contained a single egg, so we decided to revisit the locality later on. Many Rose-breasted Cockatoos, *Cacatua roseicapilla*, commonly known as "Galahs," were seen feeding amongst the grass on the ridge.

Returning to the swamp, we paddle across the roadway, which on a previous visit we had driven along, now several feet under water. In a distant corner we find a large patch of reeds and rushes which had been taken possession of by a colony of White Ibis, *Ibis molucca*, for nesting purposes. Nests were everywhere along the edge, and while three is the usual clutch for this bird, clutches of five and six were by no means uncommon, showing that a prolific season was being experienced. Several birds were still busy building, being noticed carrying sticks and eucalyptus leaves in their bills. No doubt the eucalyptus leaves tend to keep insect-life away from the young birds, otherwise softer material would be chosen for nest-building.

A Reed-Warbler sang gaily to its mate, and its notes were welcome music to the tired-out ornithologists. The antithesis of a good thing is usually close at hand, so here was a Grass-bird, *Megalurus gramineus*, in the same patch of reeds, uttering its mournful note. What freak of evolution could cause a bird somewhat similar in size, colour, and nesting habits to the Reed-Warbler to produce notes with such a contrast.

Forcing our way through the tangled growth of water-weeds, we disturbed several Bald-Coots, *Porphyrio melanotus*, which, after uttering a shrill fright-note, go fluttering away with their long red legs dangling down in a broken fashion for some distance before they tuck them up under their blue feathers. As evening approached we turned homewards, when presently an unfamiliar bird note arose from a clump of tall grass growing in the swamp. It sounded like a cry of anguish uttered by a frog when caught by a snake, then the note suddenly changed to a sharp, not unpleasant chirp, and these two notes were continued

without any lengthy interval. Investigation proved the notes to have been made by the little Grass-Warbler, *Cisticola exilis*.

We had previously heard the booming of a Bittern in the neighbourhood, and we naturally expected to find some of their nests, but were unsuccessful. The Bittern was considered a bird of ill omen by the ancients, and it was formerly believed that the booming sound was made by the bird with its bill inserted in the soft mud, but investigation has shown that the sound is produced by the bird equally well either when in flight or on land. The legs of this bird are of a pale green colour, and the claws long and slender. The middle claw is serrated, or toothed like a saw, for the purpose of better holding its slippery prey, such as small fish, frogs, and lizards, and also to enable it to stand on the slippery rushes, which as the bird alights on them bend in a half-circle downwards, and were it not for the jagged toe-nails it would slide down the deflected stems. Here again is an example of the adaptation of a bird, or its parts, to its environment.

Next day we made another attempt to find a nest of the Bittern. On our way the nest of a Black Swan, *Chenopis atrata*, was discovered, built of cats'-tails and rushes interwoven with the broken down tops of adjacent rushes. In this way the nest was able to accommodate itself to the rise and fall of the water of the swamp, and thus the eggs are saved from destruction. The nest contained seven eggs, and it was rather late in the season to make such a find, for several broods of large cygnets had already been seen. These beautiful birds, as well as many other denizens of the swamps, are in danger of extinction in this locality, as, owing to the stoppage by the New South Wales Government of the monetary grant for provisioning the aboriginals of the district, they have been obliged to work for their living or else hunt. Naturally they choose the latter, and raid the swamps for eggs, consequently the water-fowl have a serious enemy to contend with.

Paddling down Warrick Creek, a White-fronted Heron, *Notophoyx novæ-hollandiæ*, is observed sitting on her nest at the end of a limb some seventy feet above the water, and though in a somewhat awkward position we managed after an hour's exertion to reach it by means of the rope ladder, when five blue-tinted eggs rewarded our gaze. At length we came across a Bittern's nest, containing but one egg. The nest was composed of green rushes, and harmonized wonderfully with the solitary egg, rendering it almost indistinguishable in the subdued light. Swans with their broods of grey downy cygnets were here also, and paddled valiantly through the swamp-weeds out of our way. I have frequently remarked the calming effect of the natural oil deposited from the breast feathers of this bird on the ruffled waters of some estuary or lake, the water to the leeward of a flock being quite smooth, whilst all around were curling waves.

Island Creek, on the Victorian side of the Murray, was our destination on the following day. Here we hoped to find Spoonbills and Little Cormorants nesting. Landing on the only dry piece of land we could find, several varieties of birds were noticed engaged in building operations, among them an Orange-winged Sittella, *Sittella chrysoptera*, which had chosen the side of a dead limb high up in a gum-tree, and had we not seen the bird going to and fro to its nest we should have been unable to find it, owing to the close resemblance of the structure to the dead wood. Probably it is to dodge the Whistling Eagle that the Sittella has learned the necessity for disguising its nest. The Black-faced Graucalus, *Graucalus melanops*, also suffers from the depredations of the eagles, and I was informed that these eagles have been seen to swoop down and carry off both nest and nestlings. The nest of the Graucalus is usually hung between the forks of some dead limb of a swamp gum. The birds are often called "Cherry Hawks" in this district, owing to their partiality for the cherries of the settlers.

At length we reached the rookery of some Little Cormorants, *Phalacrocorax melanoleucus*, and with some qualms of conscience took some clutches of eggs, for the valuable work these birds do in keeping down the enemies to fish ova, such as yabbies, turtles, and eels, is far more than the value of any adult fish they may eat. After many wanderings backwards and forwards amongst the snags and shady gums, we at last observed a Spoonbill on its nest, situated on a limb about sixty feet above the water. An hour and a half was spent before we succeeded in getting the rope-ladder fixed; however, at length this was accomplished, and the ascent made. The large stick nest contained four large white eggs, and formed a pretty picture for the camera.

A two-days' camp at Reedy Lake was the next part of our programme, so the boat was loaded up with luggage, and we started off up the Murray, and again pass into Island Creek. As we proceeded, Musk-Ducks were heard chirping pleasantly—a peculiar note, which one would not ascribe to a duck—and we soon notice a nest, situated among some rushes, containing four large greenish-yellow eggs, cosily covered with soft down. Pushing onwards through the flooded country we met some timber-getters securing logs for the saw-mills at Echuca. They informed us that every second tree around Reedy Lake was in possession of a snake, but this did not deter us, and we pushed on. Luncheon time arrived, but with no dry land for miles around, how was the billy to be boiled? There was nothing for it but to select the broad trunk of a fallen monarch of the forest and land on it. As we prepared to step on it a Tiger Snake reared up, and disputed our intrusion into its abode, but a poling stick showed it we were the stronger party.

After lunch we started again, and soon came to a Little Cormorant "rookery" in some stunted gum-trees, every available portion of which was packed with nests of the Little Cormorant and Little Black Cormorant, and there being more birds than the trees could hold, the overflow had been obliged to take to the higher trees round about. One often finds a Whistling Eagle's nest in close proximity to such a rookery; doubtless the eagles take toll of the young cormorants for the benefit of their own young. As we approached we could hear a pulsating sound—a great purring, as it were—as the adult birds attended to their maternal duties, and on getting near the rookery the old birds rose as a cloud, which flashed black and white as they circled round overhead. After a great deal of trouble we secured photographs of the scene, which can hardly be described in polite language. The young birds, in their fright, literally pelted us with undigested food, in which large yabbies and frogs predominated, and the general surroundings of the nests were far from pleasant.

Poling and paddling onwards we at length reach Reedy Lake, and, as daylight is fast disappearing, look about for a dry spot to pitch our tent. This takes some time, but finally a water-logged knob with just sufficient room for our camp is found, and we are soon ready for a night's repose. Next morning, owing to the dearth of bird-life in this part of the district, we determine to return by another route, noting many interesting birds as we proceed.

Our next journey was planned to occupy three days, as we wanted to visit some "heronries" some distance away. We proceeded up the Murray to the mouth of the Edwards, which, instead of being a tributary of the Murray, receives its water from that stream. Aided by a strong current, we made excellent progress, though at several places snags and drift wood had to be removed before our boat could pass. Several broods of Teal, *Nettion castaneum*, and many Wood-Ducks, *Chenonetta jubata*, were seen. In one bank the tunnels of the Platypus were rather numerous, and the footprints of the animal could be seen on the sand at the entrance, just above water-level. The stream became narrower, the trees denser and higher, and everywhere a dank, swampy odour greeted the nostrils. The hoarse croaking calls of herons could be heard ahead. Several White Egrets and Nankeen Night-Herons, disturbed by our presence, arose and flew away with that clumsy wheeling flight peculiar to the cranes and herons. Nearly every tree was tenanted with the large stick nests of the herons mentioned. At last we reached our destination, known as Reedy Nook, in the vicinity of St. Helena, a wild, isolated, unfrequented locality, hence the name.

At the camping ground we found the remains of an aboriginal's

mia-mia, and pitched our tent alongside. In the top of a huge gum-tree, fully 200 feet above the ground, were seen several nests of the Pacific Heron, *Notophoyx pacifica*, quite safe from molestation from below. Further on we find the objects of our search—several White Egrets, *Herodias timoriensis*, sitting on their bulky stick nests, which, however, are somewhat less in size than those of the Nankeen Night-Herons; but these also were out of our reach. We paddled round the heronry, and reckoned that it contained from 100 to 150 birds—less than one-sixth of its former size, owing to the depredations of the plume-hunters. The disastrous nature of this traffic I dealt with at length in the *Emu* for October last (vol. vii., part 2), and unless some means is found to enforce its discontinuance the utter annihilation of this heronry is only a question of a few seasons. But our desire is to get a photograph of the nests and their contents, so, after a long search, a nest is located in a tree about seventy feet above the water, and we proceeded to fix the rope ladder, which proved no easy task. At length the ladder is fixed, and the limb reached, but the climber has still higher to go before he gets sight of four delicately shaded blue eggs in a stick nest. No time is lost in getting up the camera, but fixing it in such an aerie position is a difficult matter. However, this is in turn accomplished and a picture secured. Before leaving this spot we encircle the heronry of the Nankeen Night-Herons, and estimate the number of birds to amount to several thousands.

Next morning, after diligent search, several nests of the Night-Herons were found nearer camp, in trees which were more easily climbed, and we were enabled to make a close investigation of them. In the centre of the heronry we found that a pair of Black-cheeked Falcons, *Falco melanogenys*, had placed a nest, and doubtless as soon as the young herons appeared would be ready to turn them to account; in the meantime that black egg-stealer, the Raven, *Corone australis*, hovered about the heronry, and robbed the birds of their eggs whenever the nests were left temporarily unguarded.

Further investigations showed that there were here both the large White Egret, *Herodias timoriensis*, and the lesser Plumed Egret, *Mesophoyx plumifera*, as well as the Little Cormorant, *Phalacrocorax melanoleucus*, nesting in close proximity to one another, in some cases in the same tree. Having taken a number of photographs of different phases of the life-histories of the birds, we returned to camp. Several nests of the little Blue Wren, containing eggs, were noticed close by in a Native Cherry tree.

Setting our boat once more towards home, we had before us a hard day's paddling against stream, and there was little time for ornithological observations. We passed several broods of young Wood-Ducks, Teal, &c. A small collection of nests of the Little

Cormorant was seen, and as we approached more closely the more adult young birds began to fall out of their nests, being evidently stimulated by fright, for none of them were seen to fly off the nest, and as a rule they fell into the water unceremoniously on their breasts. Not far away two nests of the White Ibis were seen in an unusual situation, on the top of the stump of a fallen tree.

For the last day of our holiday it was planned to make final visits to several nests we had mentally noted during our various excursions and get photographs of them in their natural state, but the fates were against us, for soon after starting rain commenced, and increased in violence as we proceeded, so that we were compelled to shelter for a time under some Murray pines on a sandbank. Here we found the tunnel of a pair of Bee-eaters, *Merops ornatus*, and so as to avoid having a day without some result we set to work and sectioned the tunnel, at the further end of which, in a slightly enlarged chamber, were six roundish white eggs. We took our photo. under difficulties, for the rain splashed in the sand continuously. These burrows have a diameter of about 2 inches, and vary from 2 to 5 feet in length. The bird lays its eggs on the sand, no lining being provided for the nesting chamber, and when entering its burrow it backs into it.

In these brief notes I have been able to mention only a few of the more notable birds seen, and the wonderful variety of bird-life abounding in this portion of Riverina may be gathered from the fact that during our ten-days' excursion we noted no less than 125 species, but there were some others that we could not identify. Within a radius of 50 miles from Mathoura the country supports many millions of birds. The approximate number of Ibis frequenting this area in a good season amounts to, perhaps, one million. These birds destroy a large number of noxious pests daily, such as grasshoppers and snails. The devastation caused by grasshoppers is well known, whilst the snails act as the intermediate host of the liver fluke, which cause such havoc amongst our sheep. The quantity of these noxious pests which this immense number of Ibis dispose of daily amounts to the astonishing total of 2,200,000,000. Upon investigation the crop of an adult bird yielded 2,200 insects, grasshoppers and snails predominating. The vast amount of good these birds do can therefore be gauged by these figures.

The next day saw us returning to Melbourne, heavily laden with the results of our ten-days' sojourn among the birds, but after all I was not satisfied I had not obtained a picture of a White Egret feeding its young, so I again arranged for a short flying visit during my Christmas holidays. The result of this trip will also be found in the October *Emu* (vol. vii., 1907, p. 71); suffice it to say that the sights that met my gaze as we approached

the heronry were more than I had bargained for. Dead and dying Egrets were everywhere. The plume-hunters had been there before me, and the wreck they had left behind made my blood boil with indignation. It would not have been so bad had the slaughter consisted only of the hundred or so adult birds, but, as these were the parents of three times as many fledglings, left to die of starvation, you may readily guess how I felt. I took photos. of the scene, one which you will agree with me is far from pleasant to contemplate. Let us hope that the day will come when ladies will eschew Egret plumes as decorations for their head-gear, as I am sure they would if they only knew what cruelty the securing of these plumes causes, for it is only at the nesting time that the adult birds, which are furnished with the coveted plumes, can be approached with any degree of certainty by the hunters.

During my three days I was able to get several photos. of other species of birds which I greatly desired, and, last but not least, I secured a picture of a duck-shooter and his punt gun, a murderous weapon ten feet long. But this was a toy to some that are still surreptitiously used on the swamps, and which are capable of destroying a mob of one hundred ducks at one discharge. Under such treatment it is a wonder that any ducks are left in the district, and, were it not for the sparsely settled country in the interior of Australia, where some at least of our game-birds are able to breed unmolested, except by droughts, we would certainly have few game-birds left. With such a large space of difficult country to supervise, the energies of the officers administering the *Game Act* are severely taxed, and, if we are not to have complete extermination of our water-birds, much more stringent measures and laws will have to be devised for their protection.

[The paper was illustrated by a splendid series of some eighty lantern slides, depicting the many phases of bird-life touched on. —Ed. *Vict. Nat.*]

Apus.—The spirit specimens of Apus, a phillopod crustacean, exhibited by me at the July meeting of the Club differ from the allied genus Lepidurus, which is common in Victoria, in that Lepidurus has a flap-structure between the two filiform processes at the posterior end of the abdomen. These specimens were collected by me at Townsville, North Queensland, on 3rd January, 1908, from a small fresh-water pool about 4 feet wide, 10 feet long, and 3 inches deep, which had been in existence for less than a fortnight, and was within a hundred yards of the sea. I estimated the pool to contain at least two thousand living specimens of Apus, besides other crustaceans. Professor Spencer informs me that he was not aware that Apus occurred so near the sea coast, as it is a Central Australian form of Entomostracan.—R. W. Armitage.

NOTES ON THE SCORPION-FLY, *BITTACUS AUSTRALIS*.

By Edmund Jarvis.

(Communicated by J. A. Kershaw, F.E.S.)

(*Read before the Field Naturalists' Club of Victoria, 13th July*, 1908.)

This common scorpion-fly is a familiar object in country districts during the spring and early summer, when it may be seen flying about the blossoms of the leptospermums and other plants, or resting among the flowers. It belongs to the family Panorpidæ of the order Neuroptera. The body is of the usual slender neuropterous shape, with the wings moderately large, and when folded projecting beyond the extremity of the abdomen.

Although related to the dragon-flies, it is most unlike them in habits and structure, the flight being slow and weakly, more like that of the Tipulides, whilst the abdomen is much shorter, and the head small, with the lower portion produced into a beak, at the end of which are the parts of the mouth. The antennæ are long and somewhat setaceous. The most remarkable difference is in the legs, which are very long, and wonderfully adapted for catching and holding the prey of this most voracious insect. The femora and tibiæ are covered with minute spines, the latter armed with two long ones at their extremities, whilst the joints of the tarsi are flexible and can be used for grasping objects like a hand, the terminal joint being shaped somewhat like a pointed finger-nail and capable of doubling completely over against the preceding joint.

It is not unusual to see this extraordinary creature flying slowly through the air encumbered by the weight of some insect it has captured dangling at the end of one of its long hind legs, and held by the foot, which grasps it round the body; it presents a curious and conspicuous object, more especially when, as frequently occurs, the insect it carries happens to be considerably larger than itself. The principal victims appear to be bees and other insects of about the same size, but on more than one occasion I have seen it supporting at some height above the ground, although with apparent difficulty, a specimen of the day-moth, *Phalænoides tristifica* (*Agarista lewini*), which it had succeeded in overpowering, and was retaining, for the juices of so large a body would doubtless afford it several meals.

I had often wondered how a soft-bodied insect like *Bittacus australis*, three-quarters of an inch only in length, could possibly overpower the common Honey-bee, *Apis mellifica*, an insect of about equal bulk, and possessing the apparent advantages of a hard body and powerful sting, until one day it was my good fortune to see exactly how the capture was effected. It was on one of those glorious, perfectly cloudless mornings in November,

with the sun warm and invigorating without being hot, when I was collecting insects on the white-clay country at Emerald, that, whilst standing by a large bush of *Daviesia corymbosa*, watching the number of species of bees that were attracted to the blossoms, I heard a sudden loud buzzing, louder than that caused by the continuous murmur of the bees, and saw that a specimen of *Bittacus australis* had just seized a large Honey-bee which was making frantic but ineffectual struggles to escape from its clutches. It had grasped its victim with both hind legs and was holding it as far as possible from its body, with the flexible tarsi wrapped around the unfortunate bee and working continually, just like the fingers of a hand, to prevent it from turning towards its enemy. In such a position, with its back to the fly, the poor insect was unable to make use of its sting, and all efforts to twist around were anticipated and prevented by the movements of the numerous sharp spines of the encircling tarsi. Some muscular effort is doubtless required to enable the fly to keep its hind legs in an extended and rigid position in spite of the struggles of a large winged insect, which may account for these being larger and stouter than the others, with the femora being somewhat incrassated and the tarsi being larger and more powerful. So intent was it upon securing its prey that I was allowed to examine its every movement minutely, and, whilst wondering what would happen next, it suddenly put out its two mid-legs and caught the tips of each primary wing of the bee between the two last joints of the tarsus, in much the same manner as we should take hold of anything between a finger and thumb, and pulled them out to their fullest expanse, thus effectually preventing the last remote chance of escape by these organs of flight. The scorpion-fly was now hanging from the bush by its two arms, and holding its prey with extended wings and body still grasped by the hind tarsi. And now came the closing scene of this insect tragedy ; the hind legs slowly contracted to bring the body of the victim nearer, and the cruel, beak-like mouth approached, and, after hovering close to it for a few seconds, was inserted between the head and prothorax of the bee, which was unable to make the slightest resistance whilst its captor was piercing and biting through the slender, fleshy neck.

As the structure of the mouth-parts seems to be particularly interesting, I will endeavour to give a full description of this portion of the insect's anatomy. The beak constituting the mouth is about three times the length of the head, the point being formed by the labrum and labium, which are hollowed longitudinally internally, and have their edges fringed with stiff hairs, which, when pressed together, unite and form a complete and slender tube. The maxillary palpi are moderately long, four-jointed, and placed about half-way down the beak ; the maxillæ

being represented by two exceedingly fine lances, thickly armed with curved teeth-like spines with their points directed upwards, and bearing a strong resemblance to the prickles of a blackberry leaf when under the microscope. It seems probable that these organs are capable of being used like saws, which would perhaps account for the continuous and tremulous motion observable in the head of this insect whilst it is piercing its victims. The labial palpi, which are small and situated close to the end of the mouth, apparently consist of only two joints. The mandibles are represented by two stout lances ribbed longitudinally, the extreme points of which are abruptly curved inwards and have a small tooth just below the point. It seems very likely that these teeth and hooked points are used for tearing as well as piercing.

Anopheles and Malaria.—Mr. W. J. Rainbow, F.L.S., in his little book on "Mosquitoes," published this year, makes the the statement that—"Many people think that mosquitoes can be blown into new or different localities by strong winds, and it has been asserted that Anopheles are so distributed, but this a popular error." In connection with this, the following may be of interest:—In April and the beginning of May of this year, at the end of the wet season, a succession of heavy north-westerly gales blew across the island of Samarai, which lies south-east of Papua. The island was afterwards found to be swarming with adult Anopheles mosquitoes. As no Anopheles had been found on the island for many years, having disappeared when the sago swamps were drained and filled with earth, it seems highly probable that these Anopheles were blown from adjacent swamp-covered islands where they were to be found. Within ten days of this visitation every person residing in Samarai who had never till then suffered from malarial fever was down with the disease. Some of these people had come to Samarai four years before, and, as the island was regarded as being quite free from fever, had never expected to contract the disease. As Samarai is looked upon as the sanatorium of Papua for whites, it would be rather an important matter to prove or disprove the liability of Anopheles to be blown from a fever-infested haunt to a place free of the disease.—R. W. Armitage.

The late Dr. A. W. Howitt.—Some little time ago a sub-committee of the Royal Society of Victoria was appointed to consider the question of establishing some memorial of the late Dr. A. W. Howitt. It has now been decided to raise a fund of at least £100, and found a "Howitt Medal," to be awarded from time to time to the author of distinguished work dealing specially with the Natural Science of Australia. Dr. T. S. Hall, M.A., has been appointed hon. treasurer, and will be pleased to receive contributions to the fund.

Food Plants of Victorian Longicorn Beetles.—In continuation of list in the February *Naturalist* (xxiv., page 155) I append particulars of the localities and food plants of the following longicorn beetles :—

Atesta bifasciata, Pasc.—Studley Park, &c. Food plant, Yellow box, Eucalyptus melliodora.
Distichocera Thomsonella, White.—Eltham, &c. F.p., Mistletoe, Loranthus pendulus.
Didymocantha sentellata.—Coode Is., &c.; f.p., Acacia mollissima. You Yangs; f.p., Casuarina quadrivalvis.
Hebecerus Australis, Boisd.—Greensborough. F.p., Acacia dealbata.
H. crocogaster, Boisd.—Eltham, &c. F.p., Acacia mollissima and A. dealbata.
H. marginicollis, Boisd. Same as H. crocogaster.
Monohammus argentatus, Hope. — Gippsland. F.p., Aster glandulosus.
Phoracantha fallax, Pasc.—Frankston, Coode Is., &c. F.p., Acacia mollissima.
Scolobrotus Westwoodi, Hope.—Studley Park, &c. F.p., Eucalyptus melliodora.
Symphyletes modestus, Pasc.—Clayton. F.p., Acacia oxycedrus.

—J. E. Dixon. Richmond.

Victorian Forests.—A brief report for 1907 on the Victorian Forests, by the acting conservator, Mr. A. W. Crooke, appears in the annual report of the Secretary for Mines just issued. Regarding forest fires, he says that he believes "few forest fires are purely accidental. Most of them are either deliberate acts, or the result of criminal carelessness." Under the new Act, which came into operation on 1st January last, he expects to be able to reduce forest fires to a minimum. It is satisfactory to note that the revenue from timber royalties, &c., amounted to £29,000 for the year. Four striking illustrations are given of the magnificent virgin forest of *Eucalyptus amygdalina* in the Rubicon Ranges, near Alexandra.

The Ground or Swamp Parrakeet.—"F. R." in the *Australasian* of Saturday, 1st August, gives some interesting notes about this parrakeet, *Pezoporus formosus*, Lath., which he says is becoming very scarce in the Western District of Victoria, where it was once plentiful. This is doubtless due to the fact that the bird lives entirely on the ground, never to his knowledge perching in trees. It makes its home among the tussocks usually found on swampy land, and is thus an easy prey to the prowling fox.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, the 10th August, 1908.

The president, Mr. G. A. Keartland, occupied the chair, and about 45 members and visitors were present.

CORRESPONDENCE.

A letter was received from Mr. Victor Hood, private secretary to His Excellency Sir T. Gibson-Carmichael, stating that the Governor and Lady Carmichael "hope to be able to take considerable interest in the doings of the Field Naturalists' Club," and accepting the invitation to open the forthcoming conversazione on 22nd September.

A circular letter was read from the Royal Society of Victoria, in which an appeal was made for subscriptions towards founding a "Howitt Medal" as a memorial of the late Dr. A. W. Howitt. The hon. secretary mentioned that the committee had voted two guineas to the fund, and hoped members would contribute individually. Dr. T. S. Hall, M.A., the hon. treasurer of the fund, explained in fuller detail the proposed scheme, and commended it to the members as worthy of support.

REPORTS.

The hon. secretary reported that about twenty-five members had visited the Botanical Department at the University on Saturday, 8th August, when Miss Jean White, M.Sc., in the unavoidable absence of Prof. Ewart, D.Sc., took charge of the party, and demonstrated some interesting experiments which were being carried on with regard to the growth of plants under certain conditions, and briefly described some of the museum specimens.

The hon. secretary, in the absence of the leader, Mr. R. W. Armitage, stated that the junior excursion to Studley Park on Saturday, 1st August, had been well attended, and a satisfactory afternoon's work had been accomplished.

The hon. librarian acknowledged the receipt of the following donations to the library :—"Types of Floral Mechanism," by A. H. Church, M.A., D.Sc., part 1, types i.–xii. (purchased); *Journal of Agriculture of Victoria*, June and July, 1908, from the Secretary for Agriculture, Melbourne; *The Emu*, vol. viii., part 1, July, 1908, from the Australasian Ornithologists' Union; "Memoirs of Geological Survey of New South Wales—Geology, No. 6: Geology and Mineral Resources of the Western Coalfield" (with map and sections separate), from Department of Mines and

Agriculture, Sydney; "Proceedings of Linnean Society of New South Wales," vol. xxxiii., part 1, from the Society; *The Australian Naturalist*, vol. i., parts 3–11, from the New South Wales Naturalists' Club; *The Agricultural Gazette of New South Wales*, June and July, 1908, from Secretary for Agriculture, Sydney; *Queensland Naturalist*, vol. i., part 1, March, 1908, from the Brisbane Field Naturalists' Club; *Journal of the West Australian Natural History Society*, vol. i., No. 4, from the Society; "Annual Report for 1906 of the Smithsonian Institution, Washington, U.S.A.," from the Institute; "Bulletin of the American Museum of Natural History," vol. xxiii. (1907), from the Museum; "Bulletin of the Wisconsin Natural History Society," vol. v., parts 1–4, from the Society; "Proceedings of the Hawaiian Entomological Society," vol. i., part 5, from the Society; *Nature Notes*, May and June, 1908, from the Selborne Society, London; *Knowledge*, May and June, 1908, from the proprietors.

ELECTIONS.

On a ballot being taken, the Rev. C. C. Dugan, B.A., Preston, and Mr. J. L. Robertson, M.A., Moonee Ponds, were duly elected ordinary members; and the Misses Gladys Griebenow, Evelyn Pepperell, Janet Sinclair, Lousia Parkinson, Masters Albert Pitcher, Ernest Pitcher, Norman Fullard, Lennie Robson, Clifton Sutherland, and Eric Sutherland as junior members.

GENERAL BUSINESS.

The president reported that a deputation representing the various societies interested in the natural history of Australasia had waited on the Commonwealth Prime Minister, the Hon. A. Deakin, during the week, and made representations as to the enormous destruction of certain birds going on throughout the States, mainly for the purposes of personal decoration. The deputation urged that the export of such bird skins from Australia should be prohibited, and from the Prime Minister's remarks it was almost certain that the traffic would be controlled as desired.

The hon. secretary stated that the mattter of the purchase of the Blackrock estate, near Sandringham, for a public park had been brought before the Premier since last meeting, but so far as he could learn there seemed to be little chance of the idea being carried out, owing to the large sum which it was necessary to raise to secure the land, and while those advocating the purchase desired to retain the land in its present wild state, the local shire council contended that it should be cleared for use as a sports reserve.

The hon. secretary said that he had been asked to announce that a meeting would be held on Thursday, 13th inst., for the

purpose of forming a society devoted entirely to investigation by means of the microscope.

Prof. Ewart and Mr. G. Coghill thought that such a society would only weaken existing societies, and hoped that the promoters would carefully consider the position before taking any definite steps.

Dr. Kaufmann said that there was no intention to clash with existing societies, and thought that it would be found that the new society would fill a decided want.

PAPERS.

1. By Mr. T. Carter, M.B.O.U. (communicated by Mr. A. J. Campbell, C.M.B.O.U.), entitled "Description of a Supposed New Grass-Wren, from Western Australia."

The author stated that the bird, for which he proposed the name *Amytis varia*, differed in many particulars from *Amytis gigantura*, Milligan (*A. megalurus*, Sharpe), described in the *Victorian Naturalist*, xviii. (1901), p. 72. It was much darker in colour, the rictal bristles were well developed and easily visible, and the bird was rather larger in all dimensions. Owing to the fact that it has been found only in "Marlock" scrub, he gave it the vernacular name of the Marlock Grass-Wren.

The chairman said that the genus was an interesting one, but very difficult of study, owing to the extreme shyness of the birds.

2. By Mr. J. H. Gatliff, entitled "Description of a New Australian Volute Shell."

The author said that the shell he proposed to describe had been in his possession for many years, having been purchased from the late J. F. Bailey, who had given "North Queensland" as its habitat. There were two specimens of the same shell in the National Museum collection, unnamed, with the same locality. The shell somewhat resembles *V. canaliculata*, M'Coy, but on taking the opportunity of sending it to England lately, the British Museum authorities decided that it was not that species, and stated that it did not agree with any described species; he therefore determined to name it *Voluta* (*Armoria*) *spenceriana*, in honour of Professor W. Baldwin Spencer, C.M.G., in recognition of his many valued services to the natural history of Australia. The type specimen and the Museum specimens were exhibited in illustration of his remarks.

NATURAL HISTORY NOTES.

"Onion Grass."—Prof. Ewart referred to the difference of opinion as to the correct naming of the introduced irid known as "Onion Grass," and read letters received from various authorities regarding it. The Kew (England) authorities confirmed their

identification as *Romulea rosea*, Eckl., which they considered to be the same as *R. bulbocodium*, Seb. and Maur. The South African Museum identified it as *R. rosea*, Eckl., var *parviflora*, Baker. Mr. Spencer le Moore, of the British Museum, and Dr. Rendle, one of the leading authorities on monocotyledons, considered it to be identical with Ker-Gawl's figure of *Trichonema cruciatum*, but followed Baker in classing it as *Romulea longifolia*, Baker, to which the former name is a synonym. Prof. Ewart remarked that Bentham described the plant as *Trichonema ochroleuca* and that the *Romulea* (*Trichonema*) *bulbocodium* of the "British Flora," with which Baron Mueller identified it, was now *R. columnæ*, Seb., and that the confusion was further increased by the difficulty of tracing the plant through the various genera—Ixia, Trichonema, Romulea—in which it had at different times been placed. He asked members to search for large, many-flowered specimens with the stigma overtopping the anthers, and remarked that the characters Kew considered to be quite inconstant appeared to be remarkably constant under Australian conditions.

Some Hawthorn Birds.—Mr. C. F. Cole said that a nest of White-backed Magpie, *Gymnorhina leuconata*, Gld., and one of Striated Tit, *Acanthiza lineata*, Gld., had been found at Hawthorn on 5th July. During July several flocks of Noisy Minahs, *Manorhina garrula*, Lath., had visited the district, and on 8th August a fine specimen of the Wedge-tailed Eagle, *Uroaëtus audax*, Lath., measuring 7 feet 6 inches from tip to tip of wing, had been shot.

EXHIBITS.

By Mr. G. Anderson.—Young lampreys (alive), about three inches long, taken from the Yarra some six months ago.

By Mr. H. H. Baker.—Under the microscope, permanent mounted specimens of the tube-building rotifer *Melicerta ringens*, and of Amœba.

By Mr. C. F. Cole.—Nest and egg of Satin Bower-bird, *Ptilonorhynchus violaceus*, Vieill., taken at Lang Lang, South Gippsland, 12th November, 1907; also three male birds from same locality, showing plumage at about twelve months, two years, and maturity (several years).

By Mr. J. G. Dixon.—Beetle, *Xylonychus eucalyptus* (Scarabidæ), taken that day at Sandringham; also nine species of Victorian longicorn beetles with their food-plants.

By Mr. C. French, F.L.S.—Specimens of a remarkable stalk-eyed fly, *Zygotricha*, sp., from Endeavour River, N. Queensland, and enlarged coloured drawing of same by Mr. E. Jarvis; collection of biting flies and malaria-carrying ticks from the Sudan.

By Mr. C. French, jun.—Aboriginal stone tomahawks

(polished) recently found at Warragul, Bairnsdale, and Dandenong Ranges.

By Mr. J. A. Gatliff.—Shells, *Voluta (Armoria) spenceriana*, Gatliff; and *V. (Armoria) canaliculata*, M'Coy, in illustration of paper.

By Mr. A. D. Hardy, F.L.S.—A fresh-water alga, *Pleurococcus vulgaris*, clustered on the empty carapace of an "Elephant Water-flea," *Bosmina longirostris*, from the Yan Yean water supply.

By Mr. J. A. Kershaw, F.L.S., for National Museum.—Two specimens of the new volute, *V. spenceriana*, Gatliff, for comparison with type.

By Mr. A. H. E. Mattingley.—A fish, *Periopthalmus*, sp., from Queensland. This genus, popularly known as "Mudhoppers," is said at times to leave the shallow water of the mud-flats and climb into the mangrove trees, where it is equally at home.

After the usual conversazione the meeting terminated.

On Bird Destruction.—Mr. Robert Grant, Taxidermist of the Australian Museum, after whom I named a Bird of Paradise, described in the *Victorian Naturalist* of January, 1906 (vol. xxii., p. 156—see also vol. xxiv., p. 136), recently brought me two more specimens for examination. He informed me that altogether twenty-one specimens of *Paradisea granti* had passed through his hands, and of this number seventeen entire bird-skins, minus their legs, had been prepared for the decoration of ladies' hats. We have only the type of the species in the Australian Museum collection. Comment is needless.—Alfred J. North. Sydney, August, 1908.

Food Plants of Victorian Longicorn Beetles.—The following are the localities and food plants of the longicorn beetles exhibited by me at the August meeting :—

Omophæna tæniata, Pasc.—Frankston, &c. Food plant, Yellow Box, Eucalyptus melliodora.

Omotes erosicollis, Pasc.—Eltham. F.p., Eucalyptus melliodora.

Pentacosma scoparia, Newm. — Frankston. F.p., Viminaria denudata.

Rhytiphora rugicollis, Dalm.—Carrum. F.p., Acacia longifolia.

Stephanops nasuta, Newm.—Oakleigh, &c. F.p., Acacia mollissima and A. Baileyana.

Strongylurus cretifer, Hope.—Mooroolbark, &c. F.p., Native Cherry, Exocarpos cupressiformis.

Strongylurus scutellatus, Hope.—Carrum. F.p., Aster ramulosus.

Symphyletes albo-cinctus, Guér.—Mordialloc, &c. F.p., Acacia mollissima.

Uracanthus acuta.—Studley Park, &c. F.p., Acacia dealbata and A. mollissima.

—J. E. Dixon. Richmond.

SOME NOTES ON THE FLORA OF VICTORIA.

By Alfred J. Ewart, D.Sc., Ph.D., F.L.S., Government Botanist, and Professor of Botany, Melbourne University.

(*Read before the Field Naturalists' Club of Victoria, 13th July*, 1908.)

The early general accounts of the flora of Victoria by Baron Mueller have been, to some extent, superseded by the short but excellent accounts given by Mr. G. Weindorfer in the "Victorian Year-Book for 1904" (issued by the Government Statist), and by Mr. C. A. Topp, M.A., LL.B., in the Melbourne Handbook of the Australasian Association for the Advancement of Science, 1900. In several respects, however, these general views need amplification, especially as the progress of settlement, drainage, irrigation, and cultivation continues to affect the character and distribution of the native flora. The following remarks will serve to complete the accounts already given, as well as to draw attention to certain features which come prominently out in a general view of the flora, but have not previously been discussed.

The factors which influence a flora and determine its characters are the result of the interaction of telluric, oceanic, and solar influences, and may be grouped under the following heads:—

1. The previous geological history of the country, and its relationship to other countries.
2. The present and past climate, in which the most important factors are—
   (*a*) Average annual temperature, and extremes of heat and cold.
   (*b*) Average annual rainfall, and its distribution throughout the year.
   (*c*) Character and depth of the soil.
   (*d*) Prevailing winds and their intensity and direction, including the influence of drift sand, &c.

The two latter factors influence more the local than the general distribution through large areas, although the influence of wind on the flora of the coastal districts around Melbourne, and on that of large areas of the north and south-western districts, is very pronounced.

The previous geological history of Victoria is by no means certain, although evidences of elevation and subsidence are shown in many parts, and volcanic eruptions and lava outbursts in past ages have been responsible for the sudden destruction of the local flora over wide areas. In the same way, the existing evidence of glacial action points to the occurrence of a cold glacial age in the history of Victoria, when arctic conditions prevailed, and all the requirements were produced for the subsequent development of a homogeneous alpine flora on the tops of the lofty mountains as the cold receded and more favourable

conditions prevailed, leaving arctic species stranded, as it were, on the top of every lofty mountain throughout the State. The alpine flora of Victoria is, however, apparently more modern and hence less striking than that of Europe, although many features of similarity exist between the two. The more modern character of the Victorian alpine flora is, for instance, evidenced by the facts that the plain and alpine floras largely overlap, and that the latter shows less type differentiation than usual. Species which pass from alpine or sub-alpine regions to the plains are *Arabis perfoliata*, *Billardiera scandens*, *Correa Lawrenciana*, *Hypericum japonicum*, *Sagina procumbens*, and *Stellaria pungens*, although species are not wanting, such as *Drosera Archeri*, &c., which are exclusively restricted to high alpine elevations. Little doubt exists as to a land connection with Tasmania in past ages by way of King Island, and this is borne out by the large number of species common to the two States, Tasmania and Victoria. New Zealand, on the other hand, is widely distinct in its flora from that of Victoria, so that, if New Zealand and Australia were ever connected, the separation must have occurred in very remote ages.

Present Climate.—The average annual rainfall of 26 inches approximates to that of England, and this, coupled with its warmer climate and continental connections, makes the flora of Victoria somewhat more numerous and varied than that of Great Britain, in spite of the smaller area of the State. The idea that Victoria is much drier than Great Britain is hardly correct. The chief difference is that in Great Britain a few places are exceptionally wet (Ben Nevis, 151 inches per annum; one station in Lake district, 177 inches per annum), whereas in Victoria a few regions are exceptionally dry (the north-west portion of the Mallee). The Lake district in England, and the S.W. coast of Scotland, with an annual rainfall of 40 inches, correspond exactly to the Otway Forest and South Gippsland, where the rainfall just exceeds 40 inches. Over a very large part of the east coast of England and Scotland the rainfall is below 25 inches. The average for London is, for instance, 24 inches—*i.e.*, below the average for Victoria; and in one drought year, when agriculture in Essex and neighbouring counties suffered greatly, it was as low as 16 inches. A point of great importance is that in all the wettest parts of Great Britain the flora is of a special character, and limited to a few bog, humus, or hygrophilous types, whereas it is in the drier regions that the flora is more abundant and varied—that agriculture is of most importance, and the land most valuable.

In Victoria, owing to its warmer climate, a higher rainfall is required to reach the limit at which it becomes detrimental to agriculture, and at which bog, humus, and hygrophilous floras

prevail. Although this limit is reached in parts of South Gippsland, the Otways, and on some of the higher mountain ranges, it is only over limited areas, which represent a relatively small portion of the total surface of Victoria. The conditions are, therefore, very different to those prevailing on the west coasts of Ireland or Tasmania, where, owing to the high rainfall, enormous tracts of land are quite unsuited for the ordinary practice of agriculture, though, naturally, not entirely useless. Even in Victoria, however, if the curves for rainfall and temperature coincided instead of being opposed—*i.e.*, if the rains of the south fell on the northern areas—the climate, flora, and agricultural possibilities of the State would be enormously improved, and irrigation would be largely unnecessary.

As it is, there are over 2,000 species of flowering plants and vascular cryptogams in Victoria; and when the lower cryptogams—Algæ, Musci, Fungi, &c.—are added, the species total fully 5,000. England possesses about 1,200 flowering plants and ferns; but, owing to its relatively large expanse of coast and its more uniformly moist climate, Algæ, Musci, and Fungi are better represented.

The climate of Victoria may be fairly compared with that of the south of France or Spain, but the flora is widely dissimilar as regards the species and genera, and even some of the orders (Proteaceæ) of which it is composed. A number of common British genera—*Hypericum*, *Stellaria*, *Cardamine*, *Drosera*, *Capsella*, &c.—are represented in Victoria, but mainly or entirely by distinct Australian species. A few cosmopolitans—*Spergularia rubra*, *Sagina procumbens*, *Myosurus minimus*, *Potentilla anserina*, *Oxalis corniculata*, *Portulaca oleracea*, *Polygonum hydropiper*, *Lemna minor*, *Potamogeton*, &c.—are, however, natives of Victoria, and they, with others, form a connecting link with the world's flora. Thus *Prunella vulgaris*, L., the "Self-Heal," and *Solanum nigrum*, the "Black Nightshade," are common English weeds, while native species of *Sida*, *Hibiscus*, *Anagallis*, *Heliotropium*, *Cyperus*, &c., also occur in Asia, Africa, and America. Such non-European plants as *Parietaria debilis*, *Dodonæa viscosa*, *Avicennia officinalis*, and *Tetragonia expansa* are especially interesting, since they connect our flora with that of the old and new worlds on the one hand and with that of New Zealand on the other.

The dominant general features of the Victorian flora are determined by the necessity of protection against periodic drought and intense sunlight. The latter affects, of course, exposed plants only, and is shown by the common presence of vertical leaves or phyllodia on so many of our forest trees, with the result that they yield relatively little shade, and at the same time transpire less actively than if horizontally expanded.

Various adaptations for surviving periods of drought are shown, such as the formation of reduced evaporating surfaces and fleshy leaves like those of the salt-bushes, by the transformation of branches which would bear leaves into thorns and prickles, such as *Acacia armata*, &c.

In addition, many herbaceous perennials in dry seasons or situations develop as annuals, surviving the dry period in the form of seed. The seeds of many Leguminosæ (*Acacias*, *Jacksonias*, *Viminaria denudata*, &c.) have impermeable cuticularized seed-coats when fully ripened, so that they may remain dormant in the soil for long periods of years, germinating when brought to the surface and the coats softened by heat, by the alkaline ash of bush fires, or by mechanical abrasion.

A few introduced trees, such as the Moreton Bay Fig, Maple, and Plane, shed a portion of their leaves in drought so that the remainder may have a chance of surviving, and the same may be shown to a limited extent by some of the native trees, although the latter are nearly all evergreen, the leaves being shed irregularly all the year round without ever leaving the tree entirely bare. The erect, branchless, lower stems and thick fibrous bark of so many of our Eucalypti are probably protective adaptations against bush fires, and this peculiarity often causes them to be unaffected by a fire which would completely consume a European pine forest under similar conditions. The frequently delayed dehiscence of *Callistemon*, *Hakea*, *Banksia*, &c., especially under moist conditions, is probably also an adaptation to drought conditions or to recurrent bush-fires, for both causes clear the land of existent vegetation to a greater or less extent, and, at the same time, excite the escape by dehiscence of the seeds which are to replace it, and the germination of those dormant seeds whose coats have been softened by the heat and ashes.

The coast scrub of Tea-tree (Leptospermum and Melaleuca) protects itself against wind and sand-drift by growing close together, the leaves, which demand a fair exposure to light, being found at the upper surfaces and edges of the scrub only, and giving its interior a peculiarly gloomy character. Where the scrub is dense, no plants grow beneath; but where it is less dense a few mosses, grasses, and such orchids as *Caladenia*, *Pterostylis*, &c., may be found, and an introduced *Polygala*, *P. myrtifolia*, L., is sometimes abundant. The Mallee scrub of the north-west (shrubby Eucalypti) affords an instance of similar adaptation, but in this case to inland conditions.

In spite of its close connection with the rest of Australia, the barriers to migration in the past have sufficed to enable Victoria to retain a fairly large number of endemic species, at least 46, although possibly some of the latest-described plants may prove to be merely varieties or hybrids of species with a wider range.

This appears especially to be the case with the genus *Pultenæa*, of which no less than five new species have been recently recorded, one of them, *P. Weindorferi*, Reader, being found comparatively near Melbourne. In any case the comparison with England, which, in spite of its isolation as an island and larger area, has hardly any true endemic species, is very striking.

The endemic species of Victoria include *Eucalyptus alpina*, *Acacia tenuifolia*, *Pultenæa* (9 species), *Grevillea* (4 species), *Aster Benthami*, *Goodenia Macmillani*, *Prostanthera* (3 species), *Styphelia* (2 species), *Thelymitra* (2 species), *Prasophyllum* (2 species), *Stipa* (2 species), *Poa* (2 species), *Lepidosperma tortuosum*, and many others. There is, however, a smaller percentage of endemic species in Victoria than in any other State of Australia, owing to the greater range of conditions within its boundaries and to the close connection with neighbouring States, the northern and western boundaries of Victoria being political rather than geographical or botanical.

The genera with endemic species, and more especially *Pultenæa*, *Grevillea*, *Acacia*, *Eucalyptus*, *Thelymitra*, and *Prasophyllum*, may be regarded as especially adapted to Victorian conditions and as characteristic representatives of its flora.

The latter is, however, in a transitional condition, and is rapidly undergoing modification as the result of civilization.

The chief factors tending to the disadvantage of the native flora are—the progress of deforestation, the draining of swamps and swampy localities, sheep pasturing and the spread of rabbits, the increase of the area under cultivation or irrigation, and the introduction of hordes of alien weeds and garden escapes, many of which are not merely more or less aggressive weeds of cultivation—*Senecio*, *Carduus*, *Centaurea*, *Anagallis arvensis* (Pimpernel), *Sonchus* (Sow Thistle), and Tares (*Vicia*), &c.—but also establish themselves on pastures and virgin ground, largely ousting the native flora. Such plants are the Gorse, *Ulex Europæus*, Perennial Thistle, *Carduus arvensis*, Onion Grass, *Romulea cruciata*, Blackberry Bramble, *Rubus fruticosus*, Briar, *Rosa rubiginosa*, Ragwort, *Senecio Jacobæa*, St. John's Wort, *Hypericum perforatum*, Stinkwort, *Inula graveolens*, Boxthorn, *Lycium horridum*, Prickly Pear, *Opuntia monacantha*, and many others. The list of proclaimed plants of Victoria now includes no less than 42 species, of which only the Nut Grass, *Cyperus rotundus*, Chinese Scrub, *Cassinia arcuata*, the Mistletoes, *Loranthus celastroides* and *L. pendulus*, and the Prickly Acacia, *Acacia armata*, are native plants.

One striking peculiarity is to be noted—namely, that the introduced Pimpernel is ousting the two native Pimpernels, and the same applies in other cases also. Thus the native Hypericum is not particularly abundant, whereas the introduced Hypericum, or

St. John's Wort, is spreading rapidly. The introduced Dodder, *Cuscuta epithymum*, L., seems to be more dangerous, especially to lucerne, than the native Dodders; while the parasite Cassytha (Lauraceæ), sometimes mistaken for Dodder, hitherto has confined its attacks to native vegetation and left cultivated plants untouched.

One curious feature of the native flora is the small number of useful economic plants it contains. A few of the forest trees produce good timber, but the latter is usually too hard, heavy, and brittle when seasoned to be of much value, except for special purposes where durability is all-important and little working required; while the softer woods are, for the most part, not very durable, or are very liable to warp and crack—at least, under the methods of seasoning usually adopted here. There are practically no native fruits and no native cereal grains of any value as food for civilized man. Even the native fodder grasses and fodder plants are, with a few notable exceptions, inferior in quality or objectionable on account of their armed fruits, and are being driven out by more suitable and adaptable introduced grasses.

All the Leguminosæ used as fodder (Clover, Trefoil, Vetch, &c.), are introduced, so that if we exclude the *Acacia*, with its wattle-bark, this important order contains no native representatives of pronounced economic value. A large number of our native flowers would possibly be capable of great improvement under cultivation, and other native plants might be found to develop useful economic properties under selective treatment. The cultivated plants of the world are mainly the result of selective adaptations from the floras of Europe and Asia, and no one seeing the original wild mustard for the first time could have predicted, without long trial extending over generations, the series of useful cultivated plants (cabbage, cauliflower, rape, mustard, brocoli, Brussels sprouts, turnip, &c.) to which this one genus would give rise. If only such investigations are made before it is too late, although we may regret, on sentimental grounds, the shrinkage of the native flora and the probable ultimate extinction of many of its representatives, it can only be regarded as the inevitable result of the progress of settlement, while the spread of the different weeds of cultivation is the usual, though by no means an unavoidable, accompaniment of the same change.

The proper establishment of the National Park at Wilson's Promontory will render it possible to preserve many species which seem in danger of extinction—at least, until such time as their economic possibilities have been thoroughly ascertained; and it is sincerely to be trusted that none of our endemic species will be suffered to become absolutely extinct when a special harbour and sanctuary exists for them. A species once extinct

cannot be revived by any means; and to allow plants to become extinct before all their economic possibilities have been thoroughly tested is a wanton wasting of the hidden treasures which Nature scatters lavishly around us.

DESCRIPTION OF *VOLUTA (AMORIA) SPENCERIANA, SP. NOV.*, FROM NORTH QUEENSLAND.

By J. H. Gatliff.

(With plate.)

(*Read before the Field Naturalists' Club of Victoria, 10th Aug.*, 1908.)

Voluta (Amoria) spenceriana, *sp. nov.*

Shell white, fusiform, smooth, polished, apex blunt, spire short, whorls six and a half, including the nucleus; suture well defined on the later whorls, and becoming strongly channeled at the aperture; outer lip anteriorly expanded, edge acute, body whorl somewhat inflated at the upper portion; columella bears three ascending plaits. Marked sparsely with light yellowish-brown, a few irregular linear markings running down from the suture, and two series of broad equidistant bands of distant zig-zag lines on the body whorl; spotted below the suture, spots ceasing on the penultimate whorl, the remaining spiral whorls being without markings; salmon tinted in the interior.

Size of type.—Length 55, breadth 21 mm.

Habitat.—North Queensland (J. F. Bailey).

Observations.—May be readily distinguished from its congeners by its expanded lip, only having three plaits, its short spire, and the outline and marking of the shell are different.

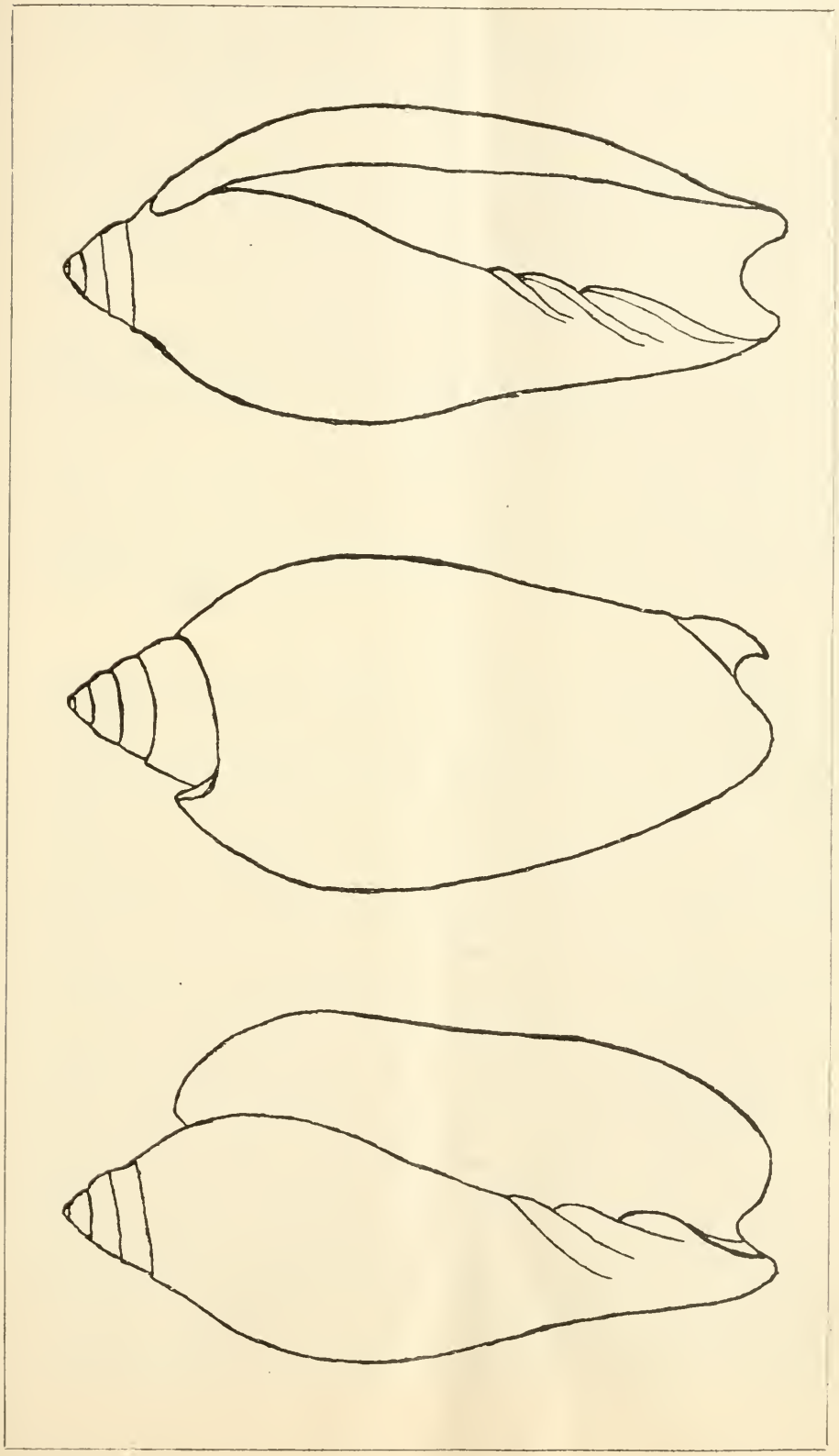
It is nearly related to *V. canaliculata*, M'Coy, but Mr. E. A. Smith, of the British Museum, who has examined it, does not consider it to be that species, which has a markedly canaliculate suture, and four plaits on the columella, and he could not identify it with any species hitherto described.

I have named it in honour of Professor W. Baldwin Spencer, C.M.G., M.A., F.R.S., &c., &c., formerly president of this Club, whose skilled researches in the domain of natural science are so widely known and appreciated.

Type in my collection.

Two specimens, without specific name, habitat given as Australasia, have been exhibited in our National Museum since 1880, when they were purchased from Mr. Thatcher. They are rather larger and more solid than the type, in fresher condition, and consequently the markings are stronger.

PLATE 4.



VOLUTA SPENCERIANA, SP. NOV.

M. EDITH GATLIFF, *del.*

DESCRIPTION OF A SUPPOSED NEW GRASS-WREN.

By T. Carter, M.B.O.U., Broome Hill, W.A.

(Communicated by A. J. Campbell, C.M.B.O.U.)

(*Read before the Field Naturalists' Club of Victoria*, 10*th Aug.*, 1908.)

Having recently procured a specimen of an Amytis which does not agree in many particulars with Mr. Milligan's description of *Amytis gigantura* (*megalurus*, Sharpe), (*Vict. Nat.*, xviii. (1901), p. 27), I send the following description and proposed name for it, as I think it will prove to be a new species.

Up to the present I believe only one specimen of *A. gigantura* has been obtained, and that is not available for inspection at time of writing, but upon future comparison, or the obtaining of a further series of skins, should the bird just obtained prove to be the same, the following description may still be of value in showing variations in colour and size. Mr. Milligan's account did not mention the sex, and, unfortunately, my specimen was so severely shot that the sex could not be determined with certainty, but I think it is a female. Probably it is not very material, as the sexes in this genus do not differ very much in colour.

Amytis varia, Marlock Grass-Wren, *sp. nov.* (?).

Forehead, crown of head, hind neck, and cheeks black, with numerous striations of white. The whole of mantle, back, and upper tail coverts rich rufous on margins of feathers, the centre part of each feather being dark chocolate-brown, and the shafts white, which white, extending some little distance up the vanes, gives the whole of the striations on the head, hind neck, and mantle a remarkable "fish-bone," or, as I believe ladies would term it, "feather-stitch" appearance. Tail, rusty-brown, with shafts (10) darker in shade on upper surface, the whole of the tail feathers being distinctly barred with about thirty bars. Under surface of tail feathers reddish-brown, with whitey-red shafts. Chin, throat, and breast rufous, each feather striated with white. Sides of chest and abdomen similar, but darker in shade, and striations not so white. Flanks and under tail coverts still darker in colour, but striations pronounced on under tail coverts. Primaries dark brown, with lighter margins and white shafts. Under wing coverts bright chestnut. Bill dark horn colour. Tarsi dark purplish-flesh, with feet of a darker shade. Soles yellowish. Irides reddish hazel. Rictal bristles six in number on each side—four together, stout, and about 10 mm. in length, the remaining pairs, next the beak, being slightly shorter and thinner. The whole of bristles very distinct and visible.

Below I have tabulated the main differences between the two skins, for better comparison :—

Amytis gigantura (megalurus).

Mr. Milligan describes this as having rusty-red shoulder-patches as in *textilis*, and further on as having "a bright chestnut patch on each side of spring" *(sic)* "but in front of thigh."

"Whole of the upper surface, extending from the forehead to and including the wings and tail, a uniform dull brown.

Rictal bristles six, the sixth being rudimentary. [Apparently all are small, as a powerful lens had to be used to make them out.—T.C.]

[There is no mention of bars on tail feathers.] Shafts of tail feathers lighter than webs.

Length	Wing	Tail	Tarsus	Culmen
7.25	2.75	3.75	0.95	0.5

A. varia.

No chestnut patches on body or shoulders.

Upper surface in three distinct shades, the dark head and neck being very pronounced.

All six bristles well developed, and visible to average eyesight.

Bars on tail feathers very distinct, and shafts above much darker than webs.

Soft parts different in colour.

Length	Wing	Tail	Tarsus	Culmen
7.50	3.0	4.20	1.20	0.4

As I have only seen this bird on three occasions, and each time in a patch of "Marlock" scrub, I propose the vernacular name of Marlock Grass-Wren.

Scenery Preservation.—The beautifully illustrated report for 1907-8 of the Scenery Preservation Board of New Zealand is an example which might well be followed by the Australian States. New Zealand has grasped the fact that much beautiful scenery is quickly destroyed by the opening up of the country by railways, &c.—witness the many picturesque gullies which were visible when our Gembrook line was first opened, now tenanted by rung timber and burnt tree ferns. The report for 1907-8 deals mainly with the scenery of the Wanganui River, well known as one of the beauty spots of the world. This river, which is navigable for small passenger steamers to 143 miles from its mouth, has been carefully examined, and it is proposed to make no less than 54 reservations along its banks, varying from 30 to 9,000 acres, amounting in all to 46,500 acres. These reservations, while leaving plenty of places for settlement, will include all the most picturesque bluffs, bends, &c., and prevent the river being robbed of its beauty by the advance of settlement. Up to 31st March last 117 reservations have been made in various parts of New Zealand, amounting to 34,000 acres. Much of this land had to be repurchased, having been previously sold or selected, at a cost of about £15,500. A brief *résumé* is given of what has been done in Australia in the same direction, but it is very insignificant compared with what is being done in the Argentine Republic, where extensive areas

are being set aside for tourist purposes. The previous year's report dealt with the scenery along the recently opened main trunk line from Auckland to Wellington, and recommended 20 reservations, amounting to 24,000 acres.

Protection of Native Birds.—Among other letters on this subject which have appeared in the *Argus* lately was the following forcible one from Mr. G. E. Shepherd, of Somerville, an enthusiastic ornithologist. He says :—"The thanks of all nature lovers, particularly ornithologists, are due to you for your very able and opportune article regarding our indigenous birds. As a resident of Mornington Peninsula for upwards of 40 years, I say most emphatically that even now the result of the indiscriminate destruction of birds is beginning to be felt. Lagoons and swamps that were considered to be permanent 40 years ago are dry depressions, as a result of the wading birds that kept the yabbies in check being either driven away or slaughtered. Only two seasons ago, whilst making bird observations in and around a lagoon, I noticed a stately Pacific Heron feeding in the shallow water. My successive visits seemed to inspire confidence in this noble creature, but, alas, less than a week elapsed ere I found him dead on the margin of the swamp, shot merely for amusement. The White-fronted Heron consumes large quantities of grasshoppers and crickets. I have seen the birds working in hundreds in a potato field ; coming in the early morning, and remaining all day, retiring to thick timber to roost in the evening. White Herons are now very scarce, the Bittern and Nankeen Night-Heron are seldom seen, and, unfortunately, when seen are very often shot, like the heron previously mentioned. Hawks are beginning to become very scarce here, a result largely due to people's ignorance. Even the beautiful and harmless little Kestrel is shot "on sight," simply because it is a hawk, without a single thought being given to the fact that it has its own field to labour in, and its own destiny to fulfil. To the State schools and teachers we must, I think, look for the remedy. Let children be taught that it is wicked to destroy birds without good reasons ; also let them be taught to see for themselves that bird-life is part of the great scheme of Nature. Finally, let us have laws enacted and administered that will be a protection to useful birds of all classes."

Eels.—Much interest is attached to the early stages in the life-history of eels, and as the young elvers will soon be ascending the rivers from the sea, observers can render good service by securing specimens and forwarding them with data to the National Museum, Melbourne. Fuller particulars will be found in the "Fishing Notes" in the *Australasian* of Saturday, 5th September.

The Victorian Naturalist.

Vol. XXV.—No. 6. OCTOBER 8, 1908. No. 298.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 14th September, 1908.

The president, Mr. G. A. Keartland, occupied the chair, and about 80 members and visitors were present.

REPORTS.

A report of the Club excursion to South Morang on Saturday, 22nd August, was given by the leaders, Messrs. G. A. Keartland and A. D. Hardy, F.L.S. The former said that a fair variety of small birds, such as shrike-tits, cuckoos, tree-creepers, and honey-eaters, had been observed in the timber along the banks of the Plenty River, but the squally weather of the afternoon had been against good work being done. Mr. A. D. Hardy said that beyond seeing some good specimens of the Silver Wattle, *Acacia dealbata*, in full bloom, which was mainly the object of the excursion, little of botanical interest was noted during the afternoon. Owing to recent rains the stream was too high to be crossed, and attention could therefore only be given to one bank. Later in the season the locality would prove more interesting, owing to the variety of shrubs which would then be in bloom. Advantage was taken of the presence of young fruits on the Native Cherry, *Exocarpos cupressiformis*, to demonstrate their mode of growth, and to point out that the part popularly regarded as the fruit is really the fleshy fruit-stalk. He mentioned that a short demonstration on the geological features had been given by Dr. T. S. Hall, M.A. The party, which numbered about twenty-two, returned to Armstrong's Hotel for tea, and spent a pleasant hour or so before the train left for town.

A report of the Club excursion to Sandringham on Saturday, 12th September, was given by Mr. C. A. Topp, M.A., who said he was very pleased to be able to join in the Club excursions once more. Since he last collected over the Sandringham country the spread of building operations had greatly curtailed the collecting ground, and he was much indebted to Mr. C. French, jun., for guidance as to the direction for the excursion. Some forty species of plants were noted in bloom during the afternoon. Under the tea-tree the orchids *Pterostylis nutans*, *P. nana*, *P. pedunculata*, and *P. concinna* were fairly common, though the ground seemed unusually dry. In an opening in the scrub a number of the little Adder's-tongue Fern, *Ophioglossum vulgatum*, were pointed out. On turning inland, near the Blackrock estate, the more showy orchids *Caladenia deformis* and *C. carnea* were noted. Here also the acacias *A. longifolia*,

A. suaveolens, and *A. oxycedrus* were prominent features, together with *Bossiæa cinerea* and *Daviesia ulicina*. Taken altogether, the outing was much enjoyed by the members present, who numbered about twenty-five.

It was reported that the junior excursion to Sandringham on Saturday, 5th September, under the leadership of Miss Jean White, M.Sc., had to be abandoned on account of inclement weather.

ELECTIONS.

On a ballot being taken, Miss Z. Fenton, 81 Merton-street, Albert Park, Miss M. Lazarus, M'Kean-street, North Fitzroy, Miss H. Maddren, Retreat-road, Hampton, Mrs. C. J. Sarovitch, Beach-street, Port Melbourne, and Mr. C. Waters, Continuation School, Melbourne, were elected as members; Miss E. Showers, Showers-street, Preston, as an associate; and Master N. Crossley, High-street, Northcote, as a junior member of the Club.

GENERAL BUSINESS.

Wilson's Promontory National Park.—In the absence of Prof. A. J. Ewart, D.Sc., Mr. J. A. Kershaw, F.E.S., reported that Prof. Baldwin Spencer, M.A., C.M.G., had been elected chairman of the Board of Management of the Wilson's Promontory National Park, and that, as the result of representations to the Minister of Lands, it had been decided to add to the Park almost the whole of the half-mile strip along the coast line which had not been included in the original reservation, the excepted portions being the lighthouse reserve and small areas at Refuge Cove, Waterloo Bay, Oberon Bay, and Mt. Singapore, which, though under the control of the Board, would be set aside as landing-places for fishermen and others. A sum of money had been granted for the expenses of management, and it was intended to erect a stock-proof fence across the isthmus as soon as possible. It was resolved, on the motion of Messrs. Sayce and Gatliff—"That the thanks of this Club be accorded to the Hon. the Minister of Lands for his efforts in securing the permanent reservation of the half-mile strip at Wilson's Promontory, and for his action in generally forwarding the movement."

Mr. G. Coghill said that he understood the Government Botanist proposed to make a botanical survey of the Park at Christmas time, and suggested that the proposed excursion to Baw Baw be postponed, with the view of helping Prof. Ewart.

The matter was left for future consideration.

PAPER READ.

By Dr. T. S. Hall, M.A., entitled "Australian Animals and their Origin."

The author's remarks took the form of a lecture, illustrated by lantern views, in which he dealt very fully with the various aspects of the subject. He first of all pointed out that it was remarkable

that Australia possessed no indigenous member of the cat tribe, or of the hoofed animals, while the presence of certain other groups were facts which doubtless indicated a change of geographical conditions at some former time. A restored picture of the Diprotodon, a gigantic creature of the kangaroo type, was given, with particulars of its probable mode of life. The Platypus and Echidna were referred to as two of the most remarkable animal forms at present existing on the globe. The great group of marsupials, in which is included almost all the Australian mammals, indicated that Australia had long been cut off from the other parts of the world. Attention was drawn to the Ceratodus or Queensland Lung Fish, a member of a family of which there are only three living genera, one found in South America and the other in Central Africa. The Minnow or Mountain Trout (Galaxias) was another instance of similarity between forms in Australia and South America, for a Galaxias is found in the streams of Chili and Patagonia. Even in lower forms, such as beetles, three of the largest groups—Buprestidæ, Curculionidæ, and Cerambycidæ (Longicornes)—were equally characteristic of the two continents. Our fresh-water tortoise is closely allied to a South American, and in addition to these relationships it was pointed out that certain relationships exist with South Africa and New Zealand, with the former more particularly as regards the flora, and, taken altogether, the evidence points to a great southern land mass, with a more genial climate than that now experienced towards the south pole, as place of origin of the ancestors of a great many of our Australian forms.

The lecture was followed with great interest, and at the close a number of questions were asked, the replies to which amplified several points raised.

NATURAL HISTORY NOTES.

Snakes.—Mr. J. Booth, M.I.C.E., mentioned that two snakes recently found at Croydon had been identified by Mr. J. A. Kershaw, F.E.S., as *Denisonia nigrescens*, a species which had not been previously recorded for Victoria.

EXHIBITS.

By Mr. J. W. Audas. — Coral from Magnetic Island, near Townsville, N. Queensland.

By Mr. F. G. A. Barnard.—Flowering branches of *Acacia acinacea*, from Studley Park, with many of the flower headlets transformed into galls by insect agency.

By Mr. G. Coghill.—Flowering branches of *Acacia pycnantha*, from Tunstall.

By Mr. C. French. F.L.S.—Specimens of male and female of a new timber-feeding moth, *Hepialus (Chargia)*, sp., and female of *Hepialus (Chargia) scripta*, Scott, from Western Australia.

By Mr. C. French, jun.—Four aboriginal head-plumes, from Daly River, Northern Territory.

By Mr. C. J. Gabriel.—A rare Victorian mollusc, *Coralliophila rubrococcinea*, Melv. and Standen, taken alive off rocks at Point Lonsdale. This shell has also been recorded from Persian Gulf and South Africa. *Lioconcha castrensis*, Linn., from Philippines; *Callista erycina*, L., from Ceylon; and *C. aurantiaca*, Sow., from California.

By Mr. A. D. Hardy.—A monœcious example of *Casuarina distyla* collected at Sandringham excursion, 12th September, 1908, showing staminate and pistillate flowers and fruits.

By Mr. J. T. Hamilton.—Wild flowers from United States.

By Miss M. Lazarus.—Fossil tooth-shell and whalebone, from Grange Creek, Hamilton.

By Mr. A. H. E. Mattingley, C.M.Z.S.—A giant earthworm from Poowong, Gippsland, measuring 8 feet 6 inches in length.

After the usual conversazione the meeting terminated.

FIELD NATURALISTS' CLUB CONVERSAZIONE.

The sixteenth conversazione of the Field Naturalists' Club of Victoria was held in the Masonic Hall, Collins-street, Melbourne, on Tuesday and Wednesday, 22nd and 23rd September, 1908.

For the first time in the history of the Club a meeting was attended by vice-royalty, His Excellency Sir Thomas Gibson-Carmichael and Lady Carmichael being present. A basket of wild flowers, arranged by Mrs. Coghill, was presented to Lady Carmichael on her arrival by Miss Sylvia Leach, a junior member of the Club.

The president, Mr. G. A. Keartland, briefly referred to the principal aim of the Club, which, he said, was to spread a knowledge of the fauna and flora of the State. For many years this had been neglected, but, mainly through the energy of the Club, the matter had eventually been brought under the notice of the Education Department, and the subject now formed an important item in the curriculum of our State schools. Greater results were looked for in the future than in the past, in view of the fact that the present rising generation had better opportunities of learning than their elders had enjoyed. The Club, therefore, confidently hoped that as time went on its exhibitions would grow in magnitude and interest year by year. The progress already made was satisfactory, seeing that it now required such a room as the Masonic Hall to adequately display the members' collections. He then asked His Excellency to declare the exhibition open.

Sir Thomas Gibson-Carmichael said it gave him great pleasure indeed to comply with the request. Not having seen one of the Club's exhibitions before, he could not, of course, say whether this one was better or worse than usual, but it struck him as he walked up

the hall that at any rate it was a very interesting display. It was an exhibition that he was personally very anxious to look at, and, presuming that to be the wish of all present, he would not occupy more time in speaking than he could help. For himself he felt certain that the Field Naturalists' Club of Victoria was an extremely useful institution. Nothing could be more important than the encouragement of young people especially to use their eyes, and nothing made young people use their eyes more accurately than the study of the fauna and flora of their own districts. He therefore thought the work which the Club was doing was certain to be valuable work, and he hoped before long to know more of that work. He trusted that some of the results members had attained would be communicated to him, and so add to the pleasure he would derive from his residence in Victoria. He declared the exhibition open.

His Excellency then made a close inspection of a number of the exhibits, in company with the president and other office-bearers, and was introduced to several of the exhibitors, who readily afforded further information regarding their specimens. Lady Carmichael evidenced considerable interest in the wild-flowers, which were brought under her notice by Prof. Ewart. An adjournment was then made to the lecture-room, in order to hear Mr. C. L. Barrett's lecturette on bird life, after which some further exhibits were inspected before the vice-regal party departed.

Three years had elapsed since the last exhibition, and though the ardour of some of the older members was not so keen as perhaps it was twenty years ago, the display was a very fine one, quite equal to, if not surpassing, previous attempts. Again the exhibition of wild-flowers was a feature of the conversazione, and though it was anticipated that the present season, owing to the unusual dryness of the summer and coldness of the early spring, would prove detrimental to a fine display, no fault could be found with this section of the exhibition. Members had visited distant parts, or induced country friends to forward collections, so that it was possible to compare at a glance the wild-flowers of the Mallee with those of the coastal country, or of the mountains with the plains. Considerable help in this direction was also given by the teachers of several country State schools, for which the Club is deeply grateful.

It may be remarked that perhaps finer exhibits of such flowers as *Kennedya monophylla* and the many acacias were made on this occasion than usual, owing to the lateness of the spring, and the fact that the exhibition was held on a somewhat earlier date than for some years past.

A new feature of the conversazione was the large series of jars containing pond-life, both animal and vegetable. These proved a constant source of interest, viewed either with the naked eye or by means of the microscope.

The microscopists of the Club were not allowed many spare moments by the wondering public, there being a constant demand for a glimpse at the more minute forms of Nature's handiwork. A party of University teachers and students added greatly to this department by an exhibition of the development of chick embryos, section cutting, and camera lucida drawing, &c.

In addition to the exhibits by members of the Club, interesting displays were made by the Entomological Branch of the Department of Agriculture and by the State Forests Department, while Mr. W. R. Guilfoyle, F.L.S., Director of the Melbourne Botanic Gardens, kindly provided a number of palms, ferns, &c., for platform decoration, in addition to a fine display of cut blooms of Australian shrubs, &c.

On Tuesday evening a lecturette, entitled "Wild Birds in their Haunts," illustrated by lantern views, was given by Mr. C. L. Barrett, whose remarks on the pictures displayed were most attentively listened to. The lecturer dealt first with the bird-life of the Olinda Creek and the Dandenong Ranges; then with cases of protective resemblance, such as the young of the Dottrel amongst the shingle of the Werribee River; and finally illustrated some of the difficulties photographers of bird-life have to overcome when in pursuit of their pictures. Many of the illustrations evoked considerable applause, and would hold their own with others of a similar character from other countries.

The lecturette on Wednesday evening was given by Prof. A. J. Ewart, D.Sc., on the subject "Carnivorous Plants." With a fine series of lantern slides the three classes of contrivances by which certain plants secure animal food were briefly demonstrated. The droseras or sundews were taken as representing the first type, those which caught their insect victims by means of sticky exudations; the second type was illustrated by Venus's Fly-trap, *Dionœa muscipula*, the leaves of which are provided with sensitive hairs, and close like a mouse-trap when the hairs are disturbed by an insect; while the Nepenthes or pitcher-plants represented the third type, where the victims are drowned in special pitcher-shaped leaves.

The lantern for the lecturettes was again provided and worked by Mr. J. Searle with his accustomed skill.

EXHIBITS.

The following is a list of the exhibitors, with particulars of their exhibits as furnished by them :—

ARMITAGE, R. W.; Kitson, J. S.; Tutton, A. E.; and Waters, C., Continuation School, Melbourne—Two live Silver-grey Opossums, *Trichosurus vulpecula*—one in captivity over six months; a live Rugged Stump-tailed Lizard, *Trachysaurus rugosus*; jars containing Water-weeds—Nitella, Chara, Lemna, Azolla, Myriophyllum, Riccia, &c.; jars containing Animal Life—Planorbis, Limnæa, Paludina, Ancylus with ova, Unio, Astacopsis (young), *Hyla aurea* (larvæ), Cypris, Daphnia, &c.; also a large variety of lower forms of life demonstrated under microscopes.

BAKER, H. H., Melbourne—Watson and Sons' Microscopes and Accessories ; Collecting Apparatus for field workers.

BARNARD, F. G. A., Kew—Pair of Flying Mice, *Acrobates pygmæus* (mounted) ; growing Victorian Orchids, *Pterostylis nutans* and *P. concinna* ; all the Victorian ferns of the genus Lomaria, viz. :—*Lomaria alpina*, *L. lanceolata*, *L. rivularis*, *L. Patersoni*, *L. Capense*, *L. Capense*, var. *procera*, and *L. discolor*, var. *bipinnatifida* ; growing specimen of Native Beech, *Fagus Cunninghami*.

BEST, D., Auburn—Four cabinet drawers of Australian Beetles—Buprestidæ, Cerambycidæ, &c.

COCHRANE, Miss S., Carlton—Paintings of Victorian Orchids and Wild Flowers.

COLE, C. F., Auburn—Cases of Mounted Birds, viz. :—White-plumed Honey-eater, with young of Pallid Cuckoo ; Blue Wrens, with nest and eggs ; Satin Bower-birds ; Black Cockatoos ; Grey Goshawk ; Mountain Ducks ; Pectoral Rails ; Parrots, &c.

COLES, H. J., Melbourne—Cases containing group of Lyre-birds ; Reed-Warbler, with nest ; Chestnut-breasted Sheldrake, with young ; Pointed Snipe ; Brown Quail ; Kangaroo ; Wedge-tailed Eagles ; Native Bears ; Opossums ; mounted Fish, &c.

CUDMORE, Master F., South Yarra—Collection of Fossils.

DEPARTMENT OF AGRICULTURE, Entomological Branch—Cabinet drawers of Life-Histories of Insects, &c., &c.

DIRECTOR BOTANIC GARDENS, Melbourne—Collection of Australian Flowers and collection of Victorian and other Australian Acacias, both from plants growing in Melbourne Botanic Gardens.

DIXON, J. E., Richmond—Six cabinet drawers of Australian Coleoptera (Beetles) ; families—Lucanidæ, Scarabidæ, Buprestidæ, and Cerambycidæ.

EWART, Prof. A. J., D.Sc., University—Plant Models. Coloured Drawings of Australian Plants, by Miss Sambell.

FRENCH, C., F L.S., Auburn—Four cabinet drawers of Foreign Butterflies (family Morpho).

GABRIEL, J., Abbotsford—Twenty cabinet drawers of Australian Birds' Eggs.

GABRIEL, C. J., Abbotsford—Cabinet drawers of Australian and Foreign Marine Shells, including 110 species of Pectens and Chlamys, 170 of Cyprea, Spondylus, Tenophora, &c. ; case of rare Victorian Marine Shells.

GATLIFF, J. H., Carlton—Four cabinet drawers of Marine Shells (genus Voluta ; 62 species, 220 specimens).

HALL, Dr. T. S., M.A., Camberwell—Graptolites.

HARDY, Mrs. A. D., Kew—Trap-door Spiders, &c., from Queensland.

HARDY, A. D., F.L.S., F.R.M.S., Kew—Skin of Dingo from Wilson's Promontory ; dried Ferns from Otway Forest ; specimen of "Vegetable Caterpillar," *Cordyceps taylori*.

HARVEY, J. H., A.R.I.V.A., East Melbourne—Stereoscope and Views of Jenolan Caves, &c.

KEARTLAND, G. A., Preston—Australian Birds' Skins.

KERSHAW, J. A., F.E.S., Windsor—Twelve cabinet drawers of Australian Butterflies and Moths.

LYELL, G., F.E.S., Gisborne—Three cabinet drawers of Australian Moths (family Geometrinæ, "Emeralds," &c.)

MATTINGLEY, A. H. E., C.M.Z.S., North Melbourne—"From Bird to Bonnet" (enlarged Photographs of Bird Destruction) ; Punt Guns ; Bark Canoe ; Photographs of Birds and Nests.

NEWELL, J., Fitzroy—Cages of live Australian and Foreign Birds ; cases of Foreign Beetles, Butterflies, and Moths.

NICHOLLS, B., North Melbourne—Teeth of Australian Animals.

Rollo, Miss J., South Yarra—Violin, &c., made of native woods by J. Hoglund, assistant lighthouse-keeper, Wilson's Promontory.

Spry, F., South Melbourne—Two cabinet drawers of Australian Butterflies, showing life-histories.

State Forests Department, Melbourne—Specimens of Victorian Timbers; Photographs of Forest Scenes.

Sutton, Dr. C. S., Carlton—Dried Victorian Orchids.

Wilson, H. W., Training College, Carlton—Jars containing Pond-life; many species of Crustaceans, including *Koonungia cursor*, the remarkable Crustacean recently described by Mr. O. A. Sayce; Aquatic Insect Larvæ; Aquatic Plant-life, &c.

Wild Flowers were exhibited by—

Mr. J. W. Audas, from Frankston and Bendigo, including *Acacia aspera*, *A. pravissima*, *Cryptandra amara*, *Grevillea alpina* (yellow variety), *Pultenæa stricta*, var. *incurvata*, &c.

Miss N. Barlow, from South Weston, Knowsley.

Mr. F. G. A. Barnard, from South Wandin.

Mr. A. G. Campbell, from Pomonal, Grampians, including *Thryptomene Mitchelliana*, *Daviesia brevifolia*, *Grevillea alpina*, *Styphelia Sonderi*, *S. adscendens*.

Miss Cochrane, from Sandringham and Bunyip.

Mr. G. Coghill, from Launching Place, Emerald, Castlemaine, and Mansfield, including *Acacia diffusa*, *A. myrtifolia*, *A. microcarpa*, *Eucalyptus gracilis*, *Pterostylis cucullata*, *P. pedunculata*, *Epacris microphylla*, *Eriostemon correifolius*, *Drimys aromatica*, *Lyonsia straminea*, *Caladenia congesta*, and *C. cærulea*.

Mr. C. Cole, from Lang Lang, including *Acianthus caudatus*, *Caladenia Patersoni*, and *C. carnea*.

Miss C. Cowle, from Sandringham.

Mr. A. W. Crowe, from Moe, including *Boronia pinnata*, *Bauera rubioides*, var. *alba*; *Myoporum deserti*, *Epacris impressa* (very fine).

Mr. St. Eloy D'Alton, from Dimboola, including *Acacia sclerophylla*, *A. rigens*, *A. farinosa*, *A. brachybotrya*, *A. trineura*, *Eriostemon pungens*, *E. deformis*, and *Prostanthera coccinea*.

Mr. S. Eason, from Sea Lake.

Mr. W. French, from Hawkesdale, including *Lhotzkya genetylloides*, *Grevillea oleoides*, *G. repens*, *Goodia lotifolia*, &c., grown in school garden.

Mr. S. W. Fulton, from Mt. Dandenong, including *Caladenia carnea*, *C. deformis*, *Senecio australis*, *Coprosma hirtella*.

Miss S. Giles, from Belgrave.

Mr. G. Hill, from Mooney's Gap, Ararat, including *Grevillea lavandulacea*, *G. aquifolium*, *G. oleoides*, *Correa speciosa* (red) and *C. speciosa*, var. *Hillii*, *C. æmula*, *Tetratheca ciliata* (very dark colour).

Miss L. Horner, from Stawell, including *Conospermum Mitchelli*, *Bœckea diffusa* (fine colour).

Miss M. E. Jones, from Wonga Park, Croydon.

Miss Montgomery, from Portarlington.

Miss H. Singleton, from Mangalore.

Miss V. J. Smith, from Upper Plenty, including *Eutaxia empetrifolia*.

Dr. C. S. Sutton, from Frankston, including *Cyrtostylis reniformis*, *Pterostylis longifolia*, *P. pedunculata*.

Mr. W. P. Thomas, from Grantville.

Miss Wisewould and Mr. F. Wisewould, from South Gembrook, comprising fungi and complete plants of many showy species.

Microscopical Section.—Owing to pressure on space, details will appear in next *Naturalist*.

PLATE 5.

JOHN BRACEBRIDGE WILSON (1828-1895.

From a photo. by MASSINGHAM, *Geelong.*

The Victorian Naturalist.

Vol. XXV.—No. 7. NOVEMBER 5, 1908. No. 299.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th October, 1908.

The president, Mr. G. A. Keartland, occupied the chair, and about 60 members and visitors were present.

REPORTS.

A report of the Club excursion to Black Rock, Sandringham, was given by Mr. C. French, jun., who acted as leader, in the unavoidable absence of Mr. C. L. Barrett. The afternoon had been set apart for ornithology, so a visit was made to Ebden's paddock, the site of the proposed park, as almost the only portion of the district remaining in its natural state. Here a few birds, such as the White-browed Scrub-Wren, Fulvous Honey-eater, New Holland Honey-eater, White-plumed Honey-eater, White-shafted Fantail, and Yellow Robin were seen. The nest with young of the Mountain-Thrush was also noted. Some members devoted themselves to botany, and secured specimens of the orchids *Caladenia carnea*, *C. deformis*, *Pterostylis nana*, *P. pedunculata*, *Diuris longifolia*, the Adder's-tongue Fern, *Ophioglossum vulgatum*, and the singular lycopod, *Phyloglossum Drummondi*.

A report of the Club excursion to Ringwood on Saturday, 3rd October, was given by the leaders, Messrs. G. Coghill and O. A. Sayce. The former took charge of the botanical section of the party, and reported an interesting afternoon among the wild-flowers, of which about 80 species were noted in bloom, among which was a very fine specimen of the orchid *Pterostylis barbata*. The crustacean section, under Mr. O. A. Sayce, also had an interesting afternoon, and the leader devoted some time to pointing out, with help of the specimens captured, the general features of the classification of Crustacea.

A report of the junior excursion to Blackburn, on Saturday, 3rd October, was given by the leader, Mr. C. French, jun., who reported an attendance of over fifty. As entomology was the subject for the afternoon, and a number of interesting finds were made, opportunity was taken to demonstrate the methods of pinning and setting insects for cabinet puropses, and practical work was done by several of those present. Some attention was also given to wild flowers, and Mr. G. Coghill kindly assisted in the management of the excursion.

The hon. librarian reported the receipt of the following donations to the library :—"Annual Report of the Secretary for Mines,

Victoria, for 1907," and "Records of the Geological Survey of Victoria," vol. ii., part 4, from the Mines Department, Melbourne; *Journal of Agriculture*, Victoria, vol. vi., No. 8, August, 1908, from the Secretary for Agriculture, Melbourne; "The Edible Fishes of New South Wales," by D. G. Stead, from the Department of Fisheries, Sydney; "Forest Flora of New South Wales," part 31, by J. H. Maiden, F.L.S., Government Botanist, from the Forest Department, Sydney; "Records of the Australian Museum," vol. vii., No. 2, from the Trustees, Sydney; "Proceedings Linnean Society of New South Wales," vol. xxxiii., part 2, from the Society; *Agricultural Gazette of New South Wales*, vol. xix., parts 8, 9, August and September, 1908, from the Department of Agriculture, Sydney; "Contributions to the Queensland Flora," by F. M. Bailey, F.L.S., Government Botanist, from the author; *The Queensland Naturalist*, vol. i., No. 2, June, 1908, from the Brisbane Field Naturalists' Club; "Memoirs of the American Museum of Natural History," vol. ix., part 4, from the Museum; *Nature Notes*, June, 1908, from the Selborne Society, London; *Knowledge*, July, 1908, from the proprietors.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. Robert Jones, 421 Collins-street, was elected an ordinary member, and Miss E. Flood, Barker's-road, Hawthorn, Masters Ewen A. Cameron, Tennyson-street, Sandringham, Rex Cornelius, Chaucer-crescent, Canterbury, Keith Rae, Darling-street, South Yarra, and Frank Walpole, Chapel-street, East St. Kilda, were elected junior members of the Club.

GENERAL BUSINESS.

Mr. O. A. Sayce brought under the notice of the meeting the desirability of having provision in the rules of the Club for the affiliation of societies having kindred tastes, and moved a resolution to that effect, which was seconded by Prof. Ewart. Dr. T. S. Hall, M.A., and Mr. A. D. Hardy, F.L.S., supported the suggestion, and the resolution was carried.

Mr. O. A. Sayce submitted a draft of the necessary rules, which was left for the consideration of the committee.

PAPERS READ.

1. By Mr. G. A. Waterhouse, B.Sc., B.E., F.E.S., entitled "A New Form of Papilio for Australia."

In the absence of the author, the paper was read by the hon. secretary. The author gave a description of a second female form of the butterfly *Papilio ægeus*, Don, long known in Australia as *Papilio erectheus*, Don. The new form, which he named *P. beatrix*, as compared with the ordinary female of *P. ægeus*, is nearly white, and has been recorded from Cape York and Prince of Wales I., North Queensland. It corresponds to the white

female form *amanga*, Boisd., of *P. ormenus*, Guérin, inhabiting New Guinea and the adjacent islands. He also recorded true *P. ormenus* from Australian limits for the first time, and referred to some specimens from the Woodlark Is.

Mr. J. A. Kershaw, F.E.S., remarked on the interesting nature of the paper, and said that the author was to be congratulated on the good work he is doing in Australian Lepidoptera.

2. By Mr. J. H. Maiden, F.L.S., Government Botanist, New South Wales, entitled "Records of Victorian Botanists" (communicated by Prof. A. J. Ewart, D.Sc.)

In the absence of the author the paper was read by Prof. Ewart. The author gave brief notes of the various persons, now deceased, who had contributed to a knowledge of Victorian botany, including several who had devoted their attention to sea-weeds only. He remarked how very necessary it was for future workers that such details should be placed on record, and regretted that in several instances he had been unable to obtain the information he desired. Several of the persons referred to had been more or less prominently connected with the Club, and the mention of their names aroused considerable enthusiasm.

Dr. T. S. Hall, M.A., referred to the early work of Bunce at the Geelong Botanic Gardens, and Mr. F. Pitcher and Mr. F. G. A. Barnard to the work of the late Mr. J. G. Luehmann, the latter expressing the hope that some day an adequate history of the collections in the National Herbarium would be placed on record.

EXHIBITS.

By Mr. R. W. Armitage.—Live specimens, under the microscope, of a Protozoön, probably one of the Tentaculifera epizoic on branchiæ and pleopods of the fresh-water crustacean *Koonunga cursor*, Sayce.

By Mr. G. Coghill.—Wild flowers from the Ringwood excursion, including orchid *Pterostylis barbata*.

By Mr. C. French, jun.—A scale-insect, *Rhizococcus lecanioides*, Green, new to science, found at Sandringham, July, 1908.

By Mr. C. J. Gabriel.—A rare Victorian shell, *Haliotis conicapora*, Peron, with specimens of the common *Haliotis nævosa*, Mart., with which it is sometimes confounded; also *Siphonalia dilatata*, Quoy and Gaimard, from Frankston.

By Mr. J. T. Hamilton.—Flowering spike of orchid *Dendrobium speciosum*.

By Mr. A. D. Hardy, F.L.S.—Branchlet with flowers of "Native Beech" or "Myrtle," *Fagus Cunninghami*.

By Mr. A. H. E. Mattingley.—A live lizard, *Amphibolurus muricatus*, White, commonly known as "Bloodsucker," from Ringwood.

By Mr. O. A. Sayce.—Specimens of fresh-water crustacean,

Koonunga cursor, Sayce, collected at Lake Wendouree, Ballarat, by Mr. J. M. Edgar (new locality).

By Mr. H. W. Wilson.—Crustaceans from pools near Garden Vale railway station, North Brighton, viz. :—*Branchinella australiensis*, "Fairy Shrimps," male and female (those obtained from one pool were quite red); *Estheria packardi*, and *Lynceus macleayana*.

After the usual conversazione the meeting terminated.

FIELD NATURALISTS' CLUB CONVERSAZIONE.

The following details of the exhibits in Microscopical Section were unavoidably omitted from last *Naturalist* :—

Microscopical Section.—Microscopical exhibits were made by—

Miss F. Bage, M.Sc., and Miss Buchanan—Chick Embryos (alive).
Miss Raff and Miss O. Davies—Microscopic Section-Cutting.
Dr. Georgina Sweet and Miss Rees—General microscopic objects.
Mr. H. H. Baker—Diatoms, &c.
Mr. F. Chapman, A.L.S., F.R.M.S.—Fry of Oysters and Mussels (shells moving under polarized light), Salt Crystals from drop of water from Dead Sea, Crumpled Glaucophane Schist, from Piedmont, Italy; Artificial Avanturine; "White Coal" (spore coal from Tasmania), &c., &c.
Mr. J. Gabriel—Circulation of Blood in tail of Tadpole.
Mr. A. D. Hardy, F.L.S., F.R.M.S.—Freshwater Algæ; Cyclosis in Nitella, and cells of *Vallisneria spiralis*.
Dr. J. C. Kaufmann—Brachionus; Hydra (mounted), showing stinging cells.
Mr. W. Stickland—Protozoon Clusters; Synura; *Volvox globator*, showing currents produced by ciliary movement.
Mr. J. Stickland—*Limnias ceratophyllus* (with dark ground illumination); *Stentor roselii*. Ehr.; Polycystinæ (dark ground illumination).
Mr. J. Wilcox—Vorticella; *Limnias ceratophyllus* (direct illumination).

The inaugural meeting of the recently-formed Microscopical Society of Victoria was held in the upper hall of the Athenæum on Friday, 9th October, when the president, Rev. W. Fielder, delivered an exhaustive address, entitled "Contributions of the Microscope to Human Welfare." There was a good attendance, and a fine display was made of microscopes and objects.

Potatoes and Cockatoos.—"F. R.," in a recent *Australasian*, says that Western District farmers are finding that cockatoos have taken a liking to potatoes, and will quickly destroy any tubers showing above the ground. The King Lory, *Aprosmictus cyanopygius*, Vieill., has lately developed the same taste, but so far has not learned to dig for the tubers.

Platypus.—Nature lovers will be pleased to learn that several of these shy animals have been seen recently in the Yarra, near Kew, where they appear to be increasing in numbers.—F. G. A. B.

RECORDS OF VICTORIAN BOTANISTS.

By J. H. Maiden, Government Botanist and Director of the Botanic Gardens, Sydney.
(Communicated by Prof. A. J. Ewart, D.Sc.)

(*Read before the Field Naturalists' Club of Victoria, 12th Oct.*, 1908.)

In the following records I have used the term "botanist" in a somewhat wide sense, having included collectors of note whether they described their finds or not, notable horticulturists, and, in my general list (5) botanists who have described Australian plants whether they visited this land or not. I have included no living man so far as I am aware. Some notes on South Australian botanists will be found in 4, of New South Wales ones in 5, and I am taking steps to publish my notes on the botanists of other Australian States in their respective States. It will be seen how imperfect is the record of some who have worked amongst us and who have not been very long removed by the hand of death.

Records of departed botanists form a branch of Australian history of practical value to working botanists. They afford a guide to their published works and indicate where their observations were made. The lists of species named after the various botanists and collectors are valuable (so I have often found) for tracing particulars of botanical journeys, biographical notes, and other useful information.

Select Bibliography Quoted.

1. Bailey, F. M. "A Concise History of Australian Botany" (Proc. Roy. Soc. Queensland, viii.)

2. Hooker, J. D. "Introductory Essay to the Flora of Tasmania," cxii.-cxxviii. ("Outlines of the Progress of Botanical Discovery in Australia.")

4. Maiden, J. H. Address of the President, Section D, Biology, Australasian Association for the Advancement of Science, Adelaide Meeting, 1907. Contains biographical notices of South Australian and some other botanists.

5. Maiden, J. H. "Records of Australian Botanists—(*a*) General, (*b*) New South Wales" (Proc. Roy. Soc. N.S.W., xlii., 1908).

6. Britten and Boulger. "British and Irish Botanists."

7. Mennell, Philip. "The Dictionary of Australian Biography . . . . from the Inauguration of Responsible Government down to the Present Time (1855-1892)." London, 1892.

8. Barnard, F. G. A. "Some Early Botanical Explorations in Victoria" (with map of Mueller's explorations in Victoria, 1852-5), (*Vict. Nat.*, xxi., 17).

ADAMSON, FREDERICK M. ( ).

In 2 at p. cvi. is a "Catalogue of Some of the Naturalized Plants of the Australian Colonies (chiefly compiled from the Melbourne collections and notes of F. Adamson, Esq.)" Mr. Adamson's notes refer to Melbourne. Hooker further states that he "formed very extensive and excellent collections there between the years 1840 and 1855, and these have all been sent to Sir W. Hooker."

He was a member of the Philosophical Society of Victoria, 1855, and his address was given as 111 Little Lonsdale-street west, but I can find no further particulars concerning him.

ALLITT, WILLIAM ( ).

Of Portland, Victoria, where he had charge of the local Botanic Garden (1863). He sent many interesting specimens to Mueller from the district. See Fragm., iv., 103.

Styphelia Allittii, F. v. M., = *Leucopogon Allittii*, F. v. M., was dedicated to him.

ARTHUR, JOHN (1804–1849).

Born at Dunkeld, Scotland; arrived in Melbourne per ship *David Clark* on 31st October, 1839. Died January, 1849, in his official residence, Melbourne Botanic Gardens.

He was a trained landscape gardener in his native land, and on his arrival in Melbourne engaged in farming pursuits in the Heidelberg district.

When the Botanic Gardens site had been determined upon, principally through the pronounced opinions and foresight of Mr. C. J. Latrobe, then Superintendent of the Province of Port Phillip, the area was taken over in February, 1846, and Mr. Arthur was appointed first superintendent of the garden, and began by fencing in 5 acres on the east side of the present garden, bordered by Anderson-street and declining towards the lagoon (present lake). During the short period he was in charge he performed excellent work, and a number of trees planted by him are vigorous at the present day.

I am indebted for most of the above information to Mr. Ambrose C. Neate, late of the Melbourne Botanic Gardens, who obtained it from Mrs. W. Barr, one of Mr. Arthur's daughters, who is still living.

BACKHOUSE, JAMES (1794–1869).

An admirable observer who botanized in most of the Australian colonies (1838–41). He was a Quaker philanthropist engaged on a religious mission. See 5.

BARKER, MRS. ( ).

Of Cape Schanck; a collector of algæ. *Rhodophyllis Barkeriæ* was named after her by Harvey, and figured in his "Phycologia Australica."

Becker, Ludwig (–1861).

Died near Cooper's Creek. Artist, naturalist, &c., of Burke and Wills Exploring Expedition, 1860. He collected plants at different times. Not to be confused with Herman Beckler, medical officer of the same expedition, who left it owing to some dispute. See 5.

He was a member of the Council of the Philosophical Institute of Victoria for 1857.

Meteorological, astronomical, and zoological papers by him will be found in Trans. Phil. Inst. Vict., i., iii., v. He is represented by paintings in Nat. Gall., Melbourne.

Speaking of *Eremophila Beckeri*, Mueller (Fragm., i., 156) states :—"Speciem designavi nomine amici Ludovici Becker, qui plures observationes in regnum animalium et vegetabilium terræ australis instituit, et nostræ faunæ et floræ cognitionem delineationibus pulchris et fidelissimis auxit."

He is commemorated by the following plants :—*Hovea Beckeri*, F. v. M. = *H. longifolia*, R. Br., var. *lanceolata*; *Disoon Beckeri*, F. v. M. = *Eremophila Beckeri*, F. v. M. = *Myoporum Beckeri*, F. v. M.; *Ptilotus Beckeri*, F. v. M. = *Trichinium Beckerianum*, F. v. M.

Bosisto, Joseph (1827–1898).

Born at Cookham, Berkshire, 21st March, 1827; died at Richmond, Victoria, 8th November, 1898.

He was a pharmaceutical chemist, and arrived in Adelaide in 1848. He was probably the earliest manufacturer of essential oils in Australia on a commercial scale, and gave special attention to the manufacture of eucalyptus oil, building up a large business in this article. He took to politics, and was in the Victorian Legislative Assembly from 9th April, 1874, to 11th March, 1889, and from 20th April, 1892, to 4th September, 1894, and, by means of Exhibition Commissions and Royal Commissions, he exercised considerable influence in the direction of the manufacture and utilization of products from Australian indigenous vegetation.

For useful biographical details, see 7, and also "Men of the Time in Australia, Victorian Series" (2nd edition, 1882).

His contributions to scientific literature include :—"Abstract of a Paper on the Yield and Uses of Volatile Oils from Native and Imported Plants in the Colony of Victoria" (Proc. R.S. Vict., vi., 52); "Some Notes on the Culture of Opium in Gippsland" (*ib.*, x., 39); "On the Culture of *Mentha piperita*, or True Peppermint, in Victoria, &c." (*ib.*, x., 116); "Is Eucalyptus a Fever-destroying Tree?" (*ib.* xii., 10).

Bunce, Daniel (1813–).

Born 18th March, 1813. (See his "Australasiatic Reminiscences," p. 154.)

On Leichhardt's second expedition he tells us that he collected upwards of one thousand plants, in triplicate where practicable, and these were placed in the National Herbarium, Melbourne.

In Leichhardt's "An Account of a Journey to the Westward of the Darling Downs, undertaken with the View of Examining the Country between Sir Thomas Mitchell's Track and My Own," and on his expedition to Peak Range, he speaks highly of the seeds and plants Bunce collected.

Bunce also collected "in the neighbourhood of the Darling Downs, and especially in the dense brushes of Moreton Bay and northerly ranges of Wide Bay."

He reached Melbourne (St. Kilda) after an absence, with Leichhardt and on his own account, of nearly three years. "After recruiting, we resumed our travels down the Murray River, which we followed till it joined the sea through Lake Alexandrina and Encounter Bay—having by this means followed the Great Western system of waters from their upper sources in the tropics." An account of this excursion was published in the Melbourne *Argus* under the title of "Journal of a Naturalist."

Mr. William Sangster, of Melbourne, has favoured me with the following information :—"Daniel Bunce, who was designer and first curator of what used to be designated the Geelong Botanic Gardens, claimed the honour of being Victoria's first botanist. In 1852-53 he was manager of a Bendigo mining company, and used to send interesting contributions to the Melbourne *Argus* descriptive of the flora of the Bendigo Ranges. Mr. Bunce, with whom I was intimately acquainted, was a botanical enthusiast, and managed, with little money help, to establish a collection of trees and plants in Geelong almost equal to that of the Melbourne Botanic Garden."

Bunce wrote the following works :—"A Manual of Practical Gardening for Van Diemen's Land" (Hobart Town, 1838); "The Australian Manual of Horticulture," by Daniel Bunce, author of "Hortus Tasmaniensis;" "Guide to Linnean System of Botany;" "Manual of Pract. Gardening, &c." (2nd ed., Melb., 1850); "Languages of the Aborigines of Victoria and other Australian Districts, with Parallel Translations and Familiar Specimens in Dialogue" (12mo, Melb., 1851); "Wanderings in the Australian Colonies" (*Journ. of Australasia*, i., 1856); "Australasiatic Reminiscences of 23 Years' Wanderings in Tasmania and the Australias; including Travels with Dr. Leichhardt in North or Tropical Australia" (Melbourne, 1857). (This work contains many autobiographical notes.) "Languages of the Aborigines of Victoria and other Districts; Dialogues, Parallel Trans., &c." (Geelong, 1859.)

He is commemorated by *Panicum Buncei*, F. v. M.

I am indebted to Messrs. William Sangster and W. R. Guilfoyle for some of the information concerning Mr. Bunce.

Charsley, Fanny Anne ( ).

Beaconsfield, Victoria. Daughter of a Melbourne solicitor. Author of "The Wild Flowers around Melbourne" (London, 1867), which consists of 13 large quarto coloured litho. plates of excellent drawings.

Curdie, Daniel (1810-1884).

Born at Slidderie, Arran, Scotland, 9th January, 1810, the sixth son of Daniel Mac Curdy. Received his preliminary education at the town of Ayr, and took his M.A. degree at Glasgow in 1832; then proceeding to Edinburgh, he graduated M.D. there in 1838. Amongst his class-mates were David Livingstone and Archibald Campbell Tait.

He left in the ship *Caledonia*, arriving in Sydney on the 29th September, 1839. Mitchell had recently discovered "Australia Felix," and after inspecting portions of New South Wales and deciding that squatting would pay better than the medical profession, Dr. Curdie and his nephew overlanded to Port Phillip, and, on reaching Melbourne, camped with their stock on the site of the present Botanic Gardens. On 8th October, 1840, Dr. Curdie fixed his homestead at "Tandarook," 12 miles south of the present town of Camperdown. "Tandarook," in aboriginal language, signifies a place where the "native bread" fungus (*Polyporus Mylittæ*) is to be found. For 11 years Dr. Curdie combined squatting with the practice of his profession.

He was distinguished by his uniform kindness to the blacks. In 1845 he followed Curdie's River down to the sea, and the estuary was called Curdie's Inlet after him.

He left for Europe on "Black Thursday" (7th February, 1851), and in Scotland, continuing his studies of sea-weeds, he was so fortunate as to discover a new one. He returned to Melbourne, with a wife, on 14th January, 1854.

He was an enterprising pastoralist, who unselfishly devoted time and means to many objects for the public good.

Dr. Curdie frequently exchanged letters with the great Robert Brown, and also with Sir Joseph Hooker, on matters of Victorian botany. He was a correspondent for many years of Mueller's, who often visited "Tandarook."

He took a great interest in the Melbourne University, and was for many years a member of the Senate. He was admitted *ad eundem gradum* on 23rd April, 1870. He was a member of the Government expedition sent to observe the total eclipse of the sun at Cape York in 1872 in the steamer *Governor Blackall*. The trip enabled him to study sea-weeds under favourable conditions; this was the branch of botany to which he devoted special attention. Mrs. Curdie was also a highly educated woman, and her tastes lay in the direction of botany and horticulture.

Dr. Harvey, the great algologist, who visited Victoria in 1855, collected sea-weeds with Dr. Curdie at the mouth of the Glenelg River and other places. He figured in his "Phycologia Australica" the following sea-weeds, by which he commemorated Dr. Curdie :—*Curdiea laciniata*, *C. obtusata*, and *Nitophyllum Curdieanum*.

Dr. Curdie died on 22nd February, 1884.

I am indebted for most of the above details concerning Dr. Curdie to Mrs. M. L. Tangye, one of his daughters, who has favoured me with a most interesting account of the life of this grand old Victorian pioneer, and I only regret it is not in my power to print it in full.

DALLACHY, JOHN (1820 (?)-1871).

Born in the north of Scotland, about 1820. As a young gardener he was at Haddo House, the Earl of Aberdeen's place. Sir William Hooker, the Director of Kew, being on a visit to Haddo, Dallachy applied to him to be put on at Kew, and Sir William granted the request. In a few years he returned to Haddo as head gardener, the grounds being at that time the most extensive and the finest in Scotland, the Earl being "an eager and enthusiastic botanist." New Holland plants were especially cultivated. Mr. Wm. Sangster, of the Toorak and Macedon Nurseries, served under Dallachy at that time.

Dallachy left Scotland in 1847 to fill an appointment as manager of a coffee plantation in Ceylon, and bore a letter of introduction from Lord Aberdeen to the Governor. After the gold discovery in Australia, Dallachy asked the Governor of Ceylon to give him a letter to Mr. Latrobe, who, on the death of Mr. Arthur, appointed him, in 1849, Superintendent of the Melbourne Botanic Gardens, the title being later changed to that of Curator. Many of the trees he then planted are still conspicuous on the south-eastern slope.

On his arrival in Victoria he had been engaged as gardener by Consul J. B. Were, at Brighton.

He used to make frequent botanical expeditions in Victoria (see 8) on behalf of the Gardens—*e.g.*, he is stated to have been the first to follow up the River Yarra to its source in the Baw-Baw Mountains.

He introduced Baron von (then Dr.) Mueller to Governor Latrobe, and recommended him as a suitable person to be appointed plant collector and botanist.

Through various causes Dallachy lost his position in the Gardens, and went as botanical collector in Victoria and Queensland, while Mueller (in 1857) succeeded him in charge of the Gardens.

On leaving the Gardens he started a nursery at Mt. Erica (now East Prahran), but failed to make it a success.

He died in his tent, near Rockingham Bay, Queensland, 4th June, 1871.

He was one of the best botanical collectors, perhaps the best, ever employed by the Botanic Gardens, and he discovered a large number of new species, particularly in Queensland, and especially at Rockingham Bay—a celebrated locality of his. Certain volumes of Mueller's "Fragmenta" teem with references to his finds, and the herbarium labels in the Melbourne Herbarium testify to his zeal and discrimination. I have seen some of Dallachy's letters, and the following notes on these letters show a portion of his itineraries :—

First as to Victoria—

(*a*) Mt. Murchison (Mr. Jamieson's station), Murray River, 1858.

(*b*) Tyntyntha station, Swan Hill, 25th July, 1858.

(*c*) Darling, 8th November, 1858. "I am very pleased with Mr. Goodwin ; he is a very excellent man and good company. He is well informed on all subjects, and is highly respected on the Murray." (*Eremophila Goodwini* was named after this gentleman.)

Some of the specimens collected on the above trip or trips are referred to in the "Flora Australiensis" as "from the Darling Desert."

Eventually—I do not know the date—Dallachy left for Queensland, and he returned to Victoria no more.

I have seen letters from him from—

(*d*) Rockhampton, 23rd March, 1863.

(*e*) Rockingham Bay, 15th March, 1864. In the latter letter he stated that he went with Messrs. Dalrymple, Scott, and Kennedy as far as the Herbert River (42 miles from Rockingham Bay). He was at Rockingham Bay up to 31st August.

(*f*) Then he writes from Rockingham Bay, 14th October, 1868 (written to Mr. Heyne, of the Melbourne Botanic Gardens).

(*g*) I have seen a letter from him dated Cardwell, 26th August, 1870.

For most of the above particulars I am indebted to Mr. William Sangster, Mr. W. R. Guilfoyle, Director of the Melbourne Botanic Gardens, and Mr. Ambrose C. Neate.

This botanical worthy, to whom justice has not been done either in Victoria or any part of Australia, is commemorated by the following species :—*Acacia Dallachiana*, F. v. M. ; *Casearia Dallachii*, F. v. M. = *C. tomentosa*, Roxb. ; *Eugenia Dallachiana*, F. v. M. ; *Psychotria Dallachiana*, Benth. ; *Webera Dallachiana*, F. v. M. ; *Jasminum Dallachii*, F. v. M. = *J. didymum*, Forst., var. *pubescens* ; *Solanum Dallachii*, Benth. ; *Chenolea Dallachyana*, Benth. ; *Conospermum Dallachyi*, F. v. M. = *C. Mitchellii*, Meissn. ; *Grevillea Dallachiana*, F. v. M. = *G. alpina*, Lindl. ;

Premna Dallachyana, Benth.; *Amanoa Dallachyana*, Baill. = *Cleistanthus Dallachyanus*, Baill.; *Amomum Dallachyi*, F. v. M.; *Antidesma Dallachyanum*, Baill.; *Echinus Dallachyanus*, Baill. = *Mallotus Dallachyi*, F. v. M. = *Macaranga Dallachyi*, F. v. M.; *Euphorbia Dallachyana*, Baill. = *E. Drummondii*, Boiss.; *Excœcaria Dallachyana*, Benth.; *Phyllanthus Dallachyanus*, Benth.; *Pogonia Dallachyana*, F. v. M.; *Fimbristylis Dallachyi*, F. v. M. = *F. disticha*, Boeck.

Hannaford, Samuel, Junior (as he called himself), (1828-1874).

Born at Totnes, Devonshire; died at Hobart, 3rd January, 1874.

He emigrated to Melbourne in 1853; became at once an honorary coadjutor of Mueller in Victorian botany. He resided in Warrnambool in 1855 and 1856, then removed to Geelong till 1863. For a time he edited the *Victorian Agricultural and Horticultural Gazette*. He became editor of the *Launceston Times*, and in 1868 removed to Hobart. In 1870 he was librarian of the Public Library there.

He industriously botanized for nearly the whole of his residence in Australia, sending largely to Mueller. Some of his specimens have fallen into my hands, and the labels show him to be most neat in his methods and scientifically accurate in his details. Mueller named the genus *Hannafordia* (Sterculiaceæ) after him.

He co-operated with the Rev. John Fereday in collecting algæ at the Tamar Heads, Tasmania, for Harvey, who in his "Phycologia Australica" figured *Ptilota* (?) *Hannafordi*, Harv.

He published four works, viz.:—"Flora Tottoniensis . . . . Flowering Plants and Ferns . . . . of Totnes" (Totnes, 1851); "Jottings in Australia: or, Notes on the Flora and Fauna of Victoria" (1856); "Sea and Riverside Rambles" (1860); "The Wild Flowers of Tasmania; or, Chatty Rambles Afloat and Ashore, amidst the Sea-weeds, Ferns, and Flowering Plants, with a Complete List of Indigenous Ferns and Instructions for their Cultivation" (8vo, pp. 188, 1866).

The last three works were published in Melbourne. See also 7.

Harvey, William Henry (1811-1866).

Professor of Botany, Trinity College, Dublin, and a well-known authority on algæ. He visited Victoria and other colonies in 1855. See 5.

Heyne, Ernest Bernhard (1825-1881).

Born in Meissen, Saxony, 15th September, 1825, the son of Dr. Carl August Heyne. Died in Adelaide, 16th October, 1881.

He was educated at the University of Leipzig, taking up chiefly botany and languages. On leaving the University he was appointed to a botanical post in the Royal Gardens at Dresden, and was chosen botanist for an expedition to Spain, but, the original plan having been abandoned, he left Germany and came to Victoria in 1849.

From 1854 to 1867 he was employed in the Melbourne Botanic Gardens under Mueller. He was secretary to Mueller and also his principal plantsman (Mr. Ferguson succeeded him). He possessed considerable botanical knowledge, and formed a large herbarium, which unfortunately came to grief after his death.

Early in 1868 he went to Adelaide, where he carried on a business as florist and nurseryman in Rundle-street until his death.

He was author of "The Amateur Gardener," greatly enlarged, of the fruit, flower, and vegetable garden, with plates. It reached a 4th edition (Adelaide, 1886, p. 210). He also translated various pamphlets on viticulture and botany from the French and Spanish. In Adelaide he was secretary of the Vinegrowers' Association and one of the founders of the Gardeners' Association, still in existence.

He is commemorated by *Aster Heynei*, F. v. M. = *Olearia xerophila*, F. v. M.; and *Cyperus Heynei*, Bœckel = *C. ornatus*, R. Br.

I am much indebted for biographical details to his children, Miss Laura and Mr. Carl F. Heyne.

Howitt, Alfred William (1830–1908).

Explorer, ethnologist, petrologist, geologist, botanist (Eucalyptus), and eminent in each pursuit.

An admirable obituary notice from the pen of Prof. W. Baldwin Spencer will be found in this journal (with portrait) for April, 1908 (xxiv., 181). See also *Nature*, 2nd April, 1908, p. 515.

An earlier biographical notice will be found in 7.

He is commemorated by the genus *Howittia*, and in the species *Marsilea Howittiana*, A. Br., *Rapanea (Myrsine) Howittiana*, *Eucalyptus Howittiana*, F. v. M.

Latrobe, Charles Joseph (1801–1875).

Born in London, 20th March, 1801; died in London 2nd December, 1875.

Arrived on 30th September, 1839, as Superintendent of Port Phillip, and left Melbourne in May, 1859.

For biographical notices see 7.

It is only just to enumerate this gentleman in a list of Victorian botanists. He founded the Melbourne Botanic Gardens, selecting the site and educating public opinion on the subject. He took the warmest interest in the early development of the

Garden, visiting it frequently—"several times a week," says one of my informants. He appointed the first three Curators—Arthur, Dallachy, and Mueller. His interest was not merely of the official kind; he had a real knowledge of plants, exotic and native; some who know him personally agree on this. Mr. John G. Robertson, writing to Sir William Hooker, at Kew, in November, 1854, has a charmingly egotistic touch when he remarks:—"With the exception of the late Mr. Robert Lawrence, Mr. Ronald Gunn, and our much-respected ex-Governor, Mr. Latrobe, I never met any individual resident who knew anything more about Australian plants than myself."

He is commemorated by *Glycine Latrobeana*, Benth.

Layard ( ), "of Melbourne," collector of algæ (2).

Luehmann, Johann Georg (1843–1904).

He was born at Buxtende, near Hanover, Germany, and died at Melbourne, 18th November, 1904.

A short obituary notice will be found in this journal (xxi., 108).

Luehmann was an excellent botanist, who entirely effaced himself during the lifetime of Mueller, and after that botanist's death began the publication of "Reliquæ Muellerianæ," in the first paper of which he modestly stated that he was but dealing with specimens that had been accumulated by his distinguished predecessor. The sentiment does honour to him, and is an illustration of his innate modesty, but it is not generally known that for 30 years before Mueller's death he was the latter's right-hand man, and his services in the building up and critical examination of the National Herbarium, Melbourne, were very great. It would be impossible to write the history of that herbarium without giving Luehmann very great credit. He knew every handwriting on the labels, and there died with him a vast amount of valuable information in regard to it, for he had a great reluctance to put the results of his knowledge upon paper.

Following is a list of his publications (he published nothing during Mueller's lifetime):—"Reliquiæ Muellerianæ: Descriptions of New Australian Plants in the Melbourne Herbarium"—*Vict. Nat.*, xiii., *Acacia Tysoni*, 111; *Acacia Cuthbertsoni* and *A. palustris* (*ib.*, 117); *Eucalyptus torquata* (*ib.*, 147); *Eucalyptus corrugata* (*ib.*, 168). "Observations on *Nerotes sororia*, F. v. M." (*ib.*, xiv., 147); "Description of a New Australian Labiate Plant (*Hemigenia Macphersoni*)," (*ib.*, xv., 20); "Some Observations on Pre-Linnean Botanists" (*ib.*, xv., 50); "Description of a New Lobelia from W.A. (*L. Toppii*)," (*ib.*, xvii., 169) = *L. gibbosa*, Labill.; "A Short Dichotomous Key to the Hitherto Known Species of Eucalyptus" (Proc. A. A. A. S., vii., 523).

The following species commemorate him:—*Eugenia Luehmanni*, F. v. M.; *Eucalyptus Luehmanniana*, F. v. M.; *Casuarina*

Luehmanni, R. T. Baker; *Pultenæa Luehmanni*, Maiden (this journal, xxii., 100).

MALLARD ( ).

Mrs. Captain Mallard, "who collected many interesting algæ in a short visit to Port Phillip."

Polysiphonia Mallardiæ, Harv., in Harvey's "Nereis Australis" and "Phycologia Australica," commemorates this collector.

MORTON, WILLIAM LOCKHART ( ).

A Victorian resident for many years, who used to collect largely for Mueller, and whose writings contain many references to the indigenous vegetation.

He wrote:—"Notes on a Recent Personal Visit to the Unoccupied Northern District of Queensland" (with a map), (Trans. Phil. Inst. Vic., iv., 188); "Remarks on the Physical Geography, Climate, &c., of the Regions lying between the Rivers Lachlan and Darling" (Trans. Roy. Soc. Vict., v., 128), which contains references to a number of plants. "Suggestions for the Introduction of Animals and Agricultural Seeds into Victoria" (*ib.*, v., 15).

MUELLER, FERDINAND VON (1825-1896).

Mueller was not a Victorian botanist, but an Australian one, and a brief sketch of him will be found in 5. (See also *Vict. Nat.*, xxii., p. 101; also xiv., p. 94; and 8 for details of his journeys in Victoria).

RALPH, THOMAS SHEARMAN (1813–1891).

He was M.R.C.S., Eng., and an Associate Lin. Soc. Lond.

He was an ardent microscopist and botanist, and mainly devoted his attention to the exotic flora of the Melbourne district. He resided for more than 20 years at Kew, and was for many years president of the original Microscopical Society of Victoria, afterwards a section of the Royal Society of Victoria.

Author of "Elementary Botany for the Use of Beginners" (Australian edition, Melbourne, 1862); "On Some Remarkable Changes which have Taken Place in the Flowers of the *Plantago major*" (Trans. Roy. Soc. Vict., vi., 1); "On the Structure of the Flower of the Mignonette" (*ib.*, 8); "On the Coccus affecting the Orange" (*ib.*, 10); "On Dry Rot" (*ib.*, 29); "On the Structure of two Plants—*Nitella* and *Chara*" (*ib.*, 26); "On the Œcidium affecting the *Senecio vulgaris*, or Groundsel" (*Vict. Nat.*, vi., 18).

RAWLINSON, THOMAS E. ( ).

Mr. Rawlinson, of Melbourne, collector of algæ (2).

I assume that this gentleman is identical with T. E. Rawlinson,

Civil Engineer, of Queen-street, Melbourne, hon. sec. Royal Society of Victoria in 1865, member of Council for some years previously, and a frequent contributor of papers to its journal.

Richardson, John ( ).

Collector of natural history specimens in Mitchell's expedition in New South Wales and "Australia Felix" in 1836. See 5.

Robertson, John George (1803-1862).

There is a letter from this worthy to Lieut.-Governor Latrobe, dated Wando Vale, 26th September, 1853, giving an autobiographical account of himself. He arrived in Van Diemen's Land in 1831 and went to Portland Bay in February, 1840. See "Letters from Victorian Pioneers," edited by T. F. Bride (published by Trustees of the Public Library, Melbourne, 1898). Governor Latrobe was a guest at Wando Vale on more than one occasion, as "he and Mr. Robertson had similar tastes in botany."

He was born at Glasgow, 15th October, 1803, and died at Baronald, Lanark, Scotland, in 1862. He was "botanist and naturalist with an Indian expedition for two years before 1831" (Mr. William Moodie, in a letter to me). He was long engaged in pastoral pursuits, and was at one time owner of Wando Vale station, near Casterton, Victoria. He was in Tasmania for nine years, during the last seven of which he managed Formosa Farm for Mr. R. W. Lawrence, the botanist, who died in 1833. He arrived at Portland Bay in 1840, following the Hentys, bringing stock, &c., valued at about £3,000.

He sent his dried plants to Sir William Hooker, but they were acquired just before the foundation of the official herbarium at Kew, and Mr. Hemsley tells me there is no formal record of the extent of the collection. Mr. William Moodie says:—"Before my uncle left for the old country I helped him to pack 4,000 botanical specimens which he had collected at Wando Vale and elsewhere, and which he presented to Kew." I have a number of specimens collected by Mr. Robertson at Wando Vale, Rivoli Bay, and Portland, and it is very likely some are in the National Herbarium, Melbourne, although the date of his leaving the colony was about the time that Mueller founded the National Herbarium of Melbourne. He is referred to by Hooker in 2.

He was a regular correspondent of Ronald Gunn, and I have a "List of Plants received from Mr. J. G. Robertson" in Gunn's neat handwriting. All the plants are numbered. There are ten and a half closely written pages, with critical notes.

I have also a "List of Plants of Van Diemen's Land" in Robertson's handwriting, three pages foolscap, double column. Also a long list of plants supplied to his order by Mr. George Fry, nurseryman, of Launceston, dated 25th May, 1846, showing that

Mr. Robertson was an ardent cultivator of plants. Mr. Moodie says his first care at Wando Vale was to form a garden.

These documents were presented to me by Mr. Moodie.

I am much indebted to Mr. J. Clancy, shire secretary of the Shire of Glenelg, Casterton; Mrs. M'Conochie, of Hurstville, Sydney, whose husband's brother-in-law Mr. Robertson was; but especially to Mr. William Moodie, of Mona Vale, Coleraine, a nephew.

He is commemorated by *Ranunculus Robertsoni*, Benth., and *Calochilus Robertsoni*, Benth.

SULLIVAN, D. (–1895).

He died 2nd June, 1895, at Moyston, near Ararat, Victoria, where for 27 years he had been in charge of the local State school.

An obituary notice is to be found in vol. xii., p. 36, of this journal.

Following is a list of his papers, so far as I can ascertain them:—"On the Victorian Ranunculaceæ" (abstract), (*Vict. Nat.*, i., 19); "The Epacridaceæ of the Grampians" (*ib.*, ii., 23); "Native Plants of the Grampians and Vicinity" (six papers in vol. ii. and four papers in vol. iii.); "Droseraceæ—Sundews" (ii., 202); "Victorian Leguminosæ" (Wing's *Southern Science Record*, ii., 249, 275); "Mosses of Victoria, with brief Notes" (*ib.*, iv., 106).

He is commemorated by *Caleya Sullivani*, F. v. M., and *Dicranum Sullivani*, C. M. (a moss).

SWAINSON, WILLIAM (1789–1855).

Born at Liverpool, 8th October, 1789; died at Fern Grove, New Zealand, 7th December, 1855. Zoologist. F.L.S., 1816; F.R.S., 1820. "Instructions for Collecting" (1808); "Naturalist's Guide" (1822). Studied *Iris*, Sweet, "Flower Garden," 2nd series, iii., 254. "Botanical Report on Victoria" (1853); "Greek Plants in Herb. Liverpool Bot. Gardens" (Pritzel, 309; Jackson, 218; Roy. Soc. Catalogue, viii., 893; Proc. Linn. Soc., 1855–6, xlix.; *Naturalist*, iv., 397 (1839)). Water colour portrait by Harrison at Kew.

The above from 6. See also 7, where it is said that his death took place on the 6th December, at the Hutt, Wellington, N.Z. See his obituary notice by Prof. Thos. Bell in Proc. Linn. Soc., 1856.

There are two zoological papers by him in Proc. Roy. Soc. Tas. for 1855.

In my Presidential Address before the Linnean Society of New South Wales (P.L.S. N.S.W., xxvi., 796) will be found an account of Swainson's extraordinary "Victorian Botanical Report," the

result of Governor Latrobe having appointed him to study and report "on the timber of the colony, chiefly Eucalypti and Casuarineæ." He made 1,520 species or varieties of eucalypts, 201 pines, and 213 species of Casuarineæ. Surely this is one of the most remarkable of all Australian botanical documents! The genus *Swainsona* (Leguminosæ) commemorates him.

Tisdall, Henry Thomas (? 1836–1905).

Born at Waterford, Ireland. Arrived in Melbourne in 1858. He died 10th July, 1905, aged 69 years. Buried at Heidelberg Cemetery. There is an obituary notice in this journal, vol. xxii., 56. See also the *Australasian* for 22nd July, 1905.

Following is a list of his papers:—"Fungi of the Country East of Mt. Baw Baw" (*Vict. Nat.*, i., 169)—this is Part i. of the succeeding paper; "Fungi of North Gippsland," Part ii. (*ib.*, ii., 106); "Victorian Agarics" (*ib.*, iv., 203); "Fungi of the Season" (*ib.*, vi., 107); "A Curious Fungus (*Cordiceps*), (*ib.*, vi., 119); "A Winter Journey in the Mountains" (*ib.*, vi., 139); Victorian Fungs New to Science" (*ib.*, vii., 96); "On a Species of *Isaria*" (*ib.*, x., 90); "Notes on the Genus Calocera" (*ib.*, x., 127); "Symbiosis between Fungi and Phanerogams" (*ib.*, x., 115); "Under Eastern Baw Baw: a Botanical Trip in Gippsland Mountains" (*ib.*, xi., 93); "A Botanical Peep into the Rocky Pools of Sorrento and Queenscliff" (*ib.*, xiv., 7 (2), xiv., 86); "Algæ of Kerguelen's Land" (*ib.*, xvi., 23); "Plants of Prey" (*ib.*, xvi., 107); "A Trip to Angelsea River" (*ib.*, xvii., 24); "Notes on the Native Bread (*Polyporus Mylittæ*)," (*ib.*, xxi., 57); "On the Fungi Growing in Mines" (Proc. Roy. Soc., Vict., xxiv., 41, 46); "The Algæ of Victoria" (Proc. A. A. A. S., vii., 493); also author of a text-book, "Botany Notes," which I have not seen.

Walter, Carl (? 1831–1907).

Born in Mecklenberg, Germany; died 11th October, 1907. See an obituary notice of him in this journal, xxiv., 110. He did a vast amount of botanical collecting in Victoria and south-eastern New South Wales during many years for Baron von Mueller, securing many new species, and assisted in getting together the collection of vegetable products in the Technological Museum, Melbourne. He well deserves a place in a list of Victorian botanists. He published but little, and his papers include:—"Records of Plants New to Victoria and New Districts for Victorian Plants" (*Vict. Nat.*, xvi., 98); "A New Variety of an Orchid (*Diuris punctata*, var. *D'Altoni*, Walter), (*ib.*, xxiii., 240).

Some of his records in later years are faulty, which I attribute largely to his defective eyesight.

Prostanthera Walteri, F. v. M., was named after him.

WATTS, HENRY (1828–1889).

Died at Melbourne, 16th December, 1889. He was a good microscopist. His botanical studies were chiefly devoted to algæ, both fresh-water and marine, and while living for many years at Warrnambool he was a contributor of algæ to Harvey, who figured *Wrangelia Wattsii*, Harv., and *Crouania Wattsii*, Harv., in his "Phycologia Australica."

See an obituary notice, with other biographical notes, in *Vict. Nat.*, vi., 138.

He was the author of "On the Fresh-water Algæ of Victoria" (Trans. Roy. Soc. Vict., 1861–4, 67); also a paper "On Fossil Polyzoa" (*ib.*, 82); "A Trip to Mt. Macedon in Search of Fresh-water Algæ" (Wing's *S. S. Record*, iii., 252); "On a Species of Fresh-water Algæ from Victoria" (*Vict. Nat.*, i., 21); "Some Recent Additions to our Knowledge of Microscopic Natural History" (*ib.*, iii., 133)—(includes lists of fresh-water algæ and Desmidieæ).

First librarian (1881-2), also a vice-president of the Field Naturalists' Club of Victoria. He is further commemorated by *Acacia Wattsiana*, F. v. M.

WHAN, WILLIAM TAYLOR (1829-1901).

Born at Ballinderry Bridge, Moneymore, County Derry, Ireland, 30th October, 1829, and died at Skipton, Victoria, 2nd April, 1901; buried at Skipton.

He was a Presbyterian minister, licensed by the Presbytery of Tyrone in 1860, and arrived in Victoria and was inducted into the charge at Skipton the same year. He remained there till 1884, when he resigned, and became minister at Port Fairy in September, 1885, where he resided up till three weeks before his death.

He was M.A. of Queen's College, Belfast, Ireland, and F.R.M.S. He won the University Gold Medal in Natural History, and a Senior Scholarship in the same subject. He was an old member of the Field Naturalists' Club of Victoria, and contributed to the earlier numbers of the *Victorian Naturalist*, but no botanical papers. He is referred to in the "Flora Australiensis" as having contributed plants to that work, and he collected for Mueller for many years.

After he went to reside at Port Fairy he took a great interest in both conchology and algæ, and formed considerable collections. It was at Skipton and in the Mt. William districts that he mainly made collections of Phanerogams. Besides contributing largely to the Melbourne Herbarium, he sent many specimens to the botanical professor (Dr. Dickie) at Queen's College, Belfast.

He is commemorated by *Acacia Whanii*, F. v. M. = *A. lanigera*, A. Cunn., var. *Whanii*.

I am indebted for most of the above biographical details to his daughter, Miss Whan.

WILSON, FRANCIS ROBERT MUTER (1832–1903).

A Presbyterian minister, long in charge of the church at Kew, Melbourne.

He devoted his attention to lichens, and his herbarium, purchased by the New South Wales Government, is in the National Herbarium, Sydney.

In addition to Australian and New Hebrides lichens, he personally collected at Matlock, Derbyshire, England, in August, 1884.

Following is a list of his papers, for which I am indebted to Mr. E. Cheel:—"Notes on a Few Victorian Lichens" (*Vict. Nat.*, iv., 83, 1887); "Description of two New Lichens, and a List of Additional Lichens New to Victoria (*ib.*, v., 29, 1888); "An Hour on a Coral Island, by a Student of Lichenology" (*ib.*, v., 141, 1888); "A Hunt for Lichens in East Gippsland, Victoria" (*ib.*, vi., 57, 1889); "An Additional List of Lichens New to Victoria" (*ib.*, vi., 60, 1889); "A Description of Forty-one Victorian Lichens New to Science" (*ib.*, vi., 61, 1889); "An Additional List of Lichens New to Victoria" (*ib.*, vi., 76, 1889); "Notes on Lichens in New South Wales" (Proc. Roy. Soc. Q., vi., 85, 1889); "List of Lichens Found in New South Wales" (*ib.*, vi., 89, 1889); "Notes on a Remarkable Growth in Connection with a New Species of *Sticta*, with Description of both" (*ib.*, vii., 8, 1889); "Lichens from the Victorian Alps" (*Vict. Nat.*, vi., 178, 1890); "Lichens from Western Australia" (*ib.*, vi., 180, 1890); "Australian Lichenology" (Trans. A. A. A. S., ii., 549, 1890); "A List of Queensland Lichens New to Science" (Bailey's *Botany Bulletin*, No. 7, 28, 1891); "On Lichens Collected in Victoria, Australia" (*Journ. Linn. Soc.* (Botany), xxviii., 353, 1891); "The Climate of Eastern Tasmania as Indicated by its Lichen Flora" (Proc. Roy. Soc. Tasmania, 131, 1892); "Tasmanian Lichens" (*ib.*, 133, 1892); "The Lichens of Victoria, Part i." (Proc. Roy. Soc. Victoria, vol. v., 2nd Series, 141, 1892); "On Mr. Robert Hall's Collection of Lichens from Kerguelen Island" (*Vict. Nat.*, xv., 41, 1898); "Lichenes Kerguelenses a Roberto Hall, Anno 1898, prope Royal Sound in Kerguelen insula lecti, et in Herbario Nationali, Melbourniensi, depositi" (*Mém. de l'Herbier Boissier*, No. 18, 87, 1900).

WILSON, JOHN BRACEBRIDGE (1828–1895).

Born at Topcraft, Norfolk, the only son of the Rev. Edward Wilson, rector of that place. Died 22nd October, 1895, at Geelong. There is a brief obituary notice in this journal, xii., 81. M.A., F.L.S.; also member of the Kgl. Bayer. Botanische Gesell-

schaft (Regensburg). See also the *Geelong Advertiser* for 23rd October, 1895.

He was at first intended for the diplomatic service, and with this view he entered St. John's College, Cambridge. His ability was sufficient to have enabled him to take a high place on the mathematical or classical tripos; but botany and geology had such a strong attraction for him that he was content with the ordinary pass degree. Late in the fifties he came to Australia, and, after a little press work, he joined the staff of the Geelong Church of England Grammar School, of which the present Dean of Melbourne (Dr. G. O. Vance) was then head. In 1863 he was appointed to succeed Dr. Vance, and occupied the position of head-master until his death.

Mr. Wilson's name will perhaps be remembered longest in connection with his official position, for no "old boy" of the Geelong School in his time can think of him otherwise than as the ideal Christian scholar and gentleman. But his work for science was far more important and extensive than is generally known. He encouraged a love for natural science amongst his boys to an unusual extent. To learn botany and geology from him was—even to boys—far more of a pleasure than a task. He was, moreover, in correspondence with scientific men all over the world on those subjects, like the algæ and the sponges, on which he was a recognized authority. He was much associated in his scientific work with the late Baron von Mueller, and with Professor W. Baldwin Spencer, of the Melbourne University. He was an enthusiastic dredger of Port Phillip Bay and Western Port, and the greater part of his fine collection of algæ, mounted and arranged with that neatness which was a characteristic, is in the National Herbarium, Melbourne.

He published several small scientific works, amongst which were "Florula Corioensis" (excursions near Geelong in search of plants); "Comparative Methods of Digestion, Circulation, and Respiration in Fishes, Amphibia, and Mammals," and "Catalogue of Algæ collected at or near Port Phillip Heads and Western Port" (Proc. Roy. Soc. Vict., iv., New Series, 157, 1892); published an earlier systematic list of the marine algæ collected by him, chiefly dredging, at Port Phillip Heads and Western Port—about 300 (*Vict. Nat.*, iii., 128, 1887); "Discovery of Catenicella in the Miocene Tertiary Beds near Geelong" (a Polyzoon), (*Jour. Micr. Soc. Vict.*, i., 1880; Wing's *S. S. Rec.*, i., 46).

For the accompanying photograph, by Massingham, Geelong, the only one known, and for most of the above notes, I am indebted to his nephew, the Rev. H. M. H. Rupp, rector of Yea, Victoria, and formerly rector of Warialda, N.S.W., himself an excellent botanist.

A NEW FORM OF PAPILIO FOR AUSTRALIA.

By G. A. Waterhouse, B.Sc., B.E., F.E.S.

(*Read before the Field Naturalists' Club of Victoria, 12th Oct.*, 1908.)

It is but seldom that an entomologist has the pleasure of recording a new butterfly of large size from Australia, especially a new form of Papilio. It has long been known that *Papilio ormenus*, Guérin, of New Guinea, is a polymorphic species. In addition to the typical male and typical female, no fewer than two other forms of male and three other forms of female have received distinctive names. For several years I have suspected a similar condition of things in the case of *Papilio ægeus*, Don. (so long known in Australia as *P. erectheus*, Don.) though probably in a lesser degree. I have now the satisfaction of describing a second and very distinct form of the female of *Papilio ægeus*, from the extreme north of Queensland. This new capture corresponds to the female form *amanga* of *Papilio ormenus*.

For this important and highly interesting form I propose, in honour of my wife, the name of

Papilio beatrix.

Female.—Length of costa of fore-wing, 70 mm.

Above.—Fore-wing creamy-white, with veins and interneural streaks marked with dark-brown; costa towards the base very dark-brown, that colour extending into the upper part of basal end of cell; a dark spot at upper distal end of cell; apical area broadly brown, extending as a sinuous brown band along the termen: on termen between the veins, a row of pale yellowish semicircular spots, diminishing in size towards the apex, and a double spot between veins 1 and 2. Hind-wing.—Base and central area white, extending as an obscure pale band above vein 7; costal area brown; termen broadly darker brown, marked with two series of pale spots; the first pale yellowish, semicircular, interneural on the termen; the second subterminal, consisting of a large yellow anal spot, three paler yellow elongate spots barely separated by veins 3 and 4, one spot (joined to the white central area), upper half orange, lower half white, between veins 5 and 6, an orange spot between veins 6 and 7, and another between veins 7 and 8; the large dark areas above spots between veins 2 and 3 and 3 and 4 sprinkled with blue scales.

Below.—Fore-wing whiter than above, the dark apical area less extensive; basal third of wing dark brown. Hind-wing as above, except that the white area extends as a broad white band between veins 7 and 8; the costal area is darker, the upper two spots of the subterminal band are darker, the third spot is not connected with the white central area, and there is a complete discal series of blue scalings.

Thorax brown; abdomen above buff, below dark brown, with a central paler line.

The type specimen in my collection was captured on Cape York by Mr. H. Elgner during February of this year; both in size and shape it is similar to the ordinary female form of *Papilio ægeus*, Don. A second specimen from the same locality during the same month is much darker above; the terminal interneural spots of both wings are much smaller; the subterminal series of spots of hind-wing is represented by deep orange spots between veins 7 and 8 and 6 and 7, with a faint orange splash below vein 6, and an orange anal spot, thus leaving the outer third of wing almost wholly dark-brown. Below, this specimen is much as in the type, but the subterminal spots of hind-wing are deeper in colour, and do not approach each other so closely. A second example of this beautiful form (Prince of Wales Island, June, 1908) is in the collection of Mr. G. Lyell. A third specimen (Prince of Wales Island, June), in my own collection, has a distinct series of pale lunules on the hind-wing both above and below, and the extension of the white central area below between veins 7 and 8 is much narrower.

So far I have knowledge of but six specimens of this form. Three of these, as mentioned above, are in my own collection; two others, from Prince of Wales Island, are in the collection of Mr. G. Lyell. The sixth specimen is in the Miskin collection of the Queensland Museum, and is one of the two specimens (the other I am unable to trace) recorded by Miskin in his catalogue as *P. ormenus*. By the courtesy of the trustees and the Acting-Director of the Museum I have been enabled to examine this specimen in Sydney, and I find that the white area of the hind-wing below is extended to the costa.

The distinctive point that at once separates this form from the corresponding *P. ormenus* form, *amanga*, is the presence of the white bar joining the central area and the costa, as in the normal form of female *P. ageus*.

Miskin's error in recording his specimens under the name of *P. ormenus*, Guérin, does not remove the latter species from our Australian lists. I have examples of *P. ormenus* from Darnley Island and from Murray Island (both within Australian territorial limits). I have examined a number of specimens from these islands, and in addition to the typical form of male and the typical form of female (the so-called "aberration" *polydorinus*), I have in my collection a single male form *pandion*, several of the female form *amanga*, including one all pure white above, and a single female very close to the form *inornatus*.

In his "Revision of the Eastern Papilios" (1895, p. 305), Rothschild remarks that *Papilio ormenus*, from the Woodlark Islands, may be different from *P. ormenus*, Guérin, from New Guinea. I have lately examined two small series from the Woodlark Islands, and the following notes should therefore be of

interest. The first collection comprises three males and five females. The males hardly differ from some New Guinea males, on the under side of the hind-wing they have scarcely any markings, except the orange anal spot. Four of the females belong to the white *amanga* form ; they are variable in their markings, and, on the whole, of a purer white than any I have from New Guinea. The remaining female (Rothschild's so-called " typical " female) is marked somewhat as in the male, but has a complete series of subterminal spots on the hind-wing above and below, and the smaller white central area of hind-wing is represented below. The second collection contains seven males and five females. The males are very similar to those of the first collection except one specimen, which has the whitish discal scales of hind-wing below better developed. Four of the females are white *amanga* forms, very variable as usual, with the light area of the fore-wings in three of the specimens very much reduced. The fifth specimen is also of the so-called " typical " form, and only differs from the single specimen of this form in first collection in having the white central area of hind-wing larger.

The absence of the *polydorinus* form of female, and the predominance of the white *amanga* form of female, should be noted. It is probable that the white *amanga* form is much commoner on the islands surrounding New Guinea than upon the mainland itself.

We have received the first number of *The Microscope*, a monthly journal edited and published by Messrs. H. and F. Baker, 78 Swanston-street, Melbourne. It is brightly written, and will, no doubt, assist in the advancement of microscopical science. The subscription rate is 3s. 6d. per annum, post free.

Frogs.—Among my exhibits at the recent conversazione were two frogs (Crinia?) which lay their eggs away from water; also a number of tadpoles hatched from eggs laid away from water. Some of the eggs were merely kept moist, and the tadpoles emerged in about forty-eight hours, but from a number of the eggs which were dropped into an aquarium on 1st June last the tadpoles did not emerge till 29th July and later. Why should there be so great a difference between the hatching in air and in water?—H. W. Wilson.

Entomological. — The valuable collection of Australian Coleoptera formed by Mr. C. French, F.L.S., Government Entomologist, as the result of many years' study, and which contains a number of type specimens, has been purchased for the National Museum, Melbourne. With this addition the Museum will now possess the most complete series of Australian beetles in the world.

The Victorian Naturalist.

Vol. XXV.—No. 8. DECEMBER 10, 1908. No. 300.

FIELD NATURALISTS' CLUB OF VICTORIA.

A special general meeting of the Club was held at the Royal Society's Hall on Monday evening, 16th November, 1908, to consider a proposed alteration in the rules.

The president, Mr. G. A. Keartland, occupied the chair, and about 55 members and visitors were present.

In accordance with notice given at the previous meeting, Mr. O. A. Sayce, moved—"That the following rules be added after rule 21, and that rules 22 and 23 be altered to numbers 26 and 27 respectively:—

"22. Any Society organized for a special branch of Natural History study, or any Society meeting outside the Metropolitan area which is organized for general Natural History study, may apply for affiliation. The Committee shall draw up the conditions of affiliation, and shall submit them to a Special General Meeting convened for the purpose. A majority of two-thirds of the members voting shall be required to pass the agreement, including the said conditions, with or without amendment.

"23. Affiliation shall confer only such powers as are defined by the original agreement of affiliation, or such amendment as may from time to time be passed by a two-thirds majority of members voting at any Special General Meeting called for the purpose.

"24. An affiliated Society may withdraw from affiliation by its members paying all arrears, returning all books or other property which may have been borrowed from the Club, and giving a properly signed notice to the Secretary of its desire to resign.

"25. The Club may remove from affiliation any affiliated Society by a resolution passed by a two-thirds majority of members voting at any Special General Meeting called for the purpose."

Mr. F. Wisewould seconded the motion.

Mr. A. D. Hardy supported the proposal, and the alterations were carried unanimously.

The business of the ordinary meeting was then proceeded with.

REPORTS.

A report of the excursion to Melton on Saturday, 24th October, was given by the leader, Mr. G. A. Keartland, who reported a fair attendance. The district seemed still to be suffering somewhat from the drought of previous years, and natural history objects were rather scarce; a female Black-eared Cuckoo was perhaps the most notable specimen collected. However, a very enjoyable day was spent.

A report of the excursion to the You Yangs on Cup Day, Tuesday, 3rd November, was given by the leader, Mr. F. G. A. Barnard, who stated that a very interesting day had been spent, though no very important finds had been made. The mountains had been well traversed, and the members were surprised at the park-like appearance of the western slopes.

A report of the two-days' excursion to Plenty Ranges on 7th and 9th November (King's Birthday) was given by the leader, Mr. J. A. Kershaw, F.E.S., who gave an interesting account of the rambles made in the vicinity of Toorourrong Reservoir.

A report of the excursion to Frankston on Saturday, 14th November, was given by Mr. J. Shephard, in the absence of the leader, Prof. A. J. Ewart, D.Sc. He said that there had been a good attendance, and, though no very noticeable flowers were seen, a very interesting afternoon had been spent. Prof. Ewart had discussed the various plants found, and drew attention to the importance of preserving bits of the local flora in its primitive condition in places conveniently situated with regard to Melbourne.

A report of the junior excursion to the Zoological Gardens on Saturday, 7th November, was given by the leader, Mr. G. A. Keartland, who stated that about 20 juniors were present, and seemed considerably interested in what they saw and were told. The party were fortunate in seeing the Tallegalla, or Scrub-Turkey, forming its egg-mound. This the bird accomplished by standing with its tail towards the heap, and, grasping the sand with its feet, throwing it rapidly backwards, the presence of the large party close to the aviary seeming to make no difference to the bird.

ELECTION OF MEMBERS.

The following persons were duly elected members of the Club:—As ordinary members—Miss S. de Mumby, "Burton," Watts-street, Box Hill; Mr. A. Rutter Clarke, Orrong-road, Toorak; Mr. Adolph Cohen, 380 Lonsdale-street, City; Mr. J. G. O'Donoghue, Bambra-road, Caulfield; Mr. P. R. H. St. John, Mason-street, South Yarra. As junior members—Miss Lucy Bryce, Victoria-avenue, Canterbury; Miss Lizzie Demaine, "Monomeith," Canterbury; Master Martin Berry, Victoria-avenue, Canterbury; Master Cyril Collis, "St. Edmunds," Canterbury-road, Camberwell; Master Robt. Demaine, "Monomeith," Canterbury; Master Wilfrid Thomas, Burke-road, Hawthorn; Master Neville Armytage, "Alta Vista," Punt-road, South Yarra; Master Gerald Armytage, "Como," South Yarra; Master Jos. H. Davies, 4 Westbourne-terrace, Grey-street, St. Kilda; Master Fullerton Mollison, Melbourne Mansions, Collins-street; Master Geo. Ormrod, "Moorkyne," Heidelberg; Master Jas. G. Gillespie, "Toolang," St. Kilda-road; Master Auster O'Dowd, 43 Robinson-street, Moonee Ponds; Master Amergin O'Dowd, 43 Robinson-street, Moonee Ponds; Master Arnold Spooner, Fairfield.

PAPER READ.

By Mr. F. Chapman, A.L.S., F.R.M.S., entitled "A Sketch of the Life-History of the Foraminifera."

This took the form of a lecture in explanation of a fine series of lantern illustrations, in which the more salient points regarding our present knowledge of the life-history of this lowly but important group of organisms were dealt with. The Foraminifera, not long since regarded as having a body of almost structureless protoplasm, have been shown, by the careful studies of workers like Williamson, Max Schultze, Munier Chalmas, Schaudinn, and Lister, to exhibit a wonderfully beautiful series of changes during their existence, chiefly connected with their reproduction. Each type-form is fitted to reproduce its kind in two ways—first, by asexual division ; second, by the formation and conjugation of zoöspores. In the first case the resultant form commences with a large chamber (form A) ; in the second, with a small chamber (form B). From observation it is known that form A can give rise either to form A or form B, but form B can only reproduce the form A. The latter is characterized by a single nucleus, excepting during the phase of reproduction, when the nucleus divides by simple fission, and the resulting nuclei, each taking up a thick coating of cytoplasm, is invested with a shelly covering, breaking away as a separate entity of the megalospheric type. Usually this reproduction is carried on in the multiloculine forms in the peripheral chambers, which are known as "brood chambers." In a similar manner megalospheric young are reproduced by form B. The formation of microspheric young, on the other hand, is carried out in the following way :—The nucleus of form A disintegrates, the chromidia derived from the nucleus create numerous little centres, each with a covering of cytoplasm. These vesicular nuclei then divide twice by the method of karyokinesis or mitosis, the resulting four cells being each furnished with two flagellæ. They thereupon conjugate with other swarmers outside the shell. The fusion of their nuclei takes place after some delay, and, lastly, the nucleus of the conjugated body divides, and a shell is then formed. This constitutes the microsphere. The phenomenon of "dimorphism" was first suspected to indicate different reproductive stages of the same species by Munier Chalmas, in regard to the coin-like Foraminifera of Eocene age known as Nummulites. Earlier observers, however, as de la Harpe, von Hantken, and Rupert Jones, were well aware of the existence of "couples" of Nummulites, in which one of the forms had a large central chamber and a small test, whilst the other had a small central chamber and a large test. Schlumberger, working in conjunction with Munier Chalmas, and later by himself, was able to prove, by means of skilful section-cutting of the tiny shells, the existence of dimorphism in practically all the genera of the Miliolidæ. There was one exception, however, in the genus *Alveolina*, about which there was only a provisional record of the occurrence of Form B (with the microsphere), by

Munier Chalmas. This has since been clearly shown to exist in specimens occurring in considerable numbers at the present day on the Barrier Reef, at Cairns Reef, Queensland. It has a special interest for members of the Club, since the examples were collected by Mr. C. Hedley and our fellow-member, Mr. J. Gabriel.*

Plastogamy in the Foraminifera was also briefly described as the union of two or more tests of similar species, observed in such genera as *Discorbina*, *Patellina*, *Textularia*, and *Bulimina*. The apertural surfaces of the tests come into contact, and the contents flow out and intermix. Following upon this the nuclei break up, without subsequent fusion, and the newly-formed nuclei gather around themselves a zone of cytoplasm. These young forms then secrete a shelly investment, comparable to the megalosphere, separate, and leave the old parent shell perfectly empty. This process only takes place, according to Schaudinn's observations, when both individuals have their nuclei in the same phase or condition.

Mr. O. A. Sayce congratulated the lecturer on the interesting nature of his remarks, and Mr. F. G. A. Barnard expressed his surprise at the possibility of cutting sections of such delicate objects as foraminifera.

EXHIBITS.

By Mr. F. Chapman, A.L.S., F.R.M.S.—Nummulites from the Eocene, to illustrate dimorphism; dimorphic Alveolinæ, and *Orbitolites complanata* with brood cells, from the Great Barrier Reef, North Queensland, collected by Mr. J. Gabriel; models of Foraminifera, by Reuss and Fritsch, in illustration of lecture.

By Mrs. Cudmore.—Quandongs (fruit of *Santalum acuminatum*) from Avoca station, Wentworth, N.S.W.

By Mr. A. D. Hardy, F.L.S., F.R.M.S.—Desmids, *Closterium lanceolatum*, Kutzing, collected from a rock pool in the You Yangs by Mr. F. G. A. Barnard on the recent excursion.

By Mr. G. A. Keartland.—Black-eared Cuckoo, *Misocalius palliolatus*, Lath., from Melton, and egg of same species taken at Oakleigh.

By Mr. J. A. Kershaw, F.E.S.—Root of elm which had grown through and almost enclosed the neck of a bottle, found while excavating the National Museum grounds.

By Mr. C. Oke.—Insects collected during excursion to Plenty Ranges.

By Mr. J. Shephard.—Flowering spike of Grass-tree, *Xanthorrhœa australis*, about six feet in length, from the Wimmera.

After the usual conversazione the meeting terminated.

* See Journ. Roy. Micr. Soc., Lond., 1908, p. 151.

EXCURSION TO THE YOU YANGS.

THE You Yangs have never proved a very prolific collecting ground, and as the last excursion party from the Club, which visited the mountains some years ago, brought back such a dismal report of destruction by rabbits, our excursion committees have feared to put the locality down again until the present season. The day before Cup Day was so unpleasant, and the forecast for Cup Day so unpromising, that those who had made up their minds to take part in the excursion feared a repetition of former experiences at these hills. However, when the party of ten reached Little River at 7.30 a.m. on Tuesday, 3rd November, they found a fresh breeze blowing from the south-west, and though the horizon in that direction looked somewhat ominous, the storm passed over Geelong, and only the merest trace of it reached the You Yangs.

From Little River station the hills appear to be little more than mile away, but in reality they are nearer four miles distant, and more than an hour passed before we set foot on the gentle slope of granite detritus with which they are surrounded. On our way across the lava plain much energy had been expended in turning over stones in search of beetles, but without results, except some very ordinary species, and some members of the cockroach tribe. A few birds were seen, but these will be dealt with in a separate note, for which I am indebted to Mr. J. G. O'Donoghue.

Three species of plants are noteworthy as characteristic of the You Yangs—viz., *Prostanthera nivea*, which should be called the "Snowy Mint-bush"; the Rock or Parsley Fern, *Cheilanthes tenuifolia*, which occurs in great patches everywhere; and the Blue Gum, *Eucalyptus globulus*, a species of eucalypt one would not expect to find in such an exposed situation. The Prostanthera was almost the first flower met with, and, though just past its best, the sight it presented in places was alone well worth the trip. The flowers are larger than most of our Prostantheras, and on some of the bushes were of quite a lilac shade. It is also worthy of remark that the plant does not appear to be inconvenienced by cultivation and clearing, for in the forest plantation, where the ground had been ploughed, it is again springing up; and in another part, where a fire had passed through it, the bushes are again branching out at the ground-level, and making good growth. Some time before we reached the foot of the range the sweet perfume of a wattle was borne along by the wind, and on reaching the slope we noted some fine trees of *Acacia mollissima* in full bloom. Why should not such a fine blossoming tree be alive with birds and insects when in that state? But now there was little life about them. An introduced shrub, *Nicotiana glauca*, is here somewhat common, and a little further along

quantities of a garden Linaria were very evident. Our way led over the south-eastern flank of Station Peak, as we wanted to find a large mass of granite which is marked on the Geological Survey map (19 S.E.) as existing a little to the south-west of that peak. We passed through a fine lot of Prostanthera, and I might say acres of the Native Tobacco, *Nicotiana suaveolens*; also such shrubs as the large, smooth-leaved form of *Correa speciosa*, with *Clematis microphylla* trailing over it; *Aster glandulosus*, *Cassinia aculeata*, with Sheoaks, Banksias, Blackwoods, Native Cherries, Bursarias, &c. The well-known Hedge or Kangaroo Acacia, *A. armata*, is here in one of its natural habitats. A few eucalypts occur, principally one we took to be the Red Box, *Eucalyptus polyanthema.*

Presently the rock mass came in view, and on reaching it we were astonished at its extent. It must be nearly 100 yards in diameter, and at its southern edge rises about 80 feet above the hillside, the northern edge being flush with the mountain side. Some one with a penchant for figures has calculated that it contains about 4,000,000, cubic feet of stone, and would weigh about 300,000 tons. An interesting account of this rock occurs in a paper descriptive of the geology of the You Yangs read by Professor E. W. Skeats, D.Sc., at the Adelaide (1907) meeting of the Australasian Association for the Advancement of Science, but as yet only advance copies of the paper are available for reference. In the centre of the mass is a large depression filled with soil, the result of ages of weathering of the granite, and in this soil are growing many small trees and large shrubs, such as *Acacia mollissima*, *Bursaria spinosa*, &c. Some fine Kangaroo Apples, *Solanum aviculare*, were here in full bloom, and, from the wealth of flowers, at a little distance presented quite a purple tinge. In the surface of the granite several rock pools exist, which at the time of our visit were full of water, so that the tourist, except in the height of summer, should generally be able to secure water here, for as a rule the ranges are rather short of that commodity. A good spring also exists directly under the southern face of Station Peak.

From the largest of the pools I skimmed what I took to be a floating scum of fresh water algæ, and, the situation being rather remarkable, I submitted it to Mr. A. D. Hardy, F.R.M.S., who has given me the following note :—"The material had unavoidably been much shaken up in transit, and appeared when received as a soapy green fluid with darker clots. Microscopically examined, it proved to be a mass of desmids of a single species only, *Closterium lanceolatum*, Kutzing, and, excepting numerous protozoa, no other organisms were present. This species occurs in various parts of Victoria, and was recorded from the weedy margin of Lake Colac a few years ago (*Vict. Nat.*, xxii., p. 66)."

The occurrence of an alga in such a remarkable position is most interesting, and shows that the most unlikely localities are often productive of unlooked-for results in both zoology and botany.

From the summit of the "rock basin," as Prof. Skeats calls it, we had a good view of the plantations made by the Forest Department some years ago. These amount to some hundreds of acres, and in the distance appear to consist of various species of eucalyptus, acacia, pines, &c., but I understand the result of the experiment is not considered very satisfactory. We now turned northwards through a park-like growth of Banksias, Casuarinas, Native Cherries, Blackwoods, &c.; one Bursaria had a stem diameter of fully 12 inches. Among the herbaceous plants seen were *Arthropodium strictum*, *Burchardia umbellata*, *Diuris maculata*, &c., till we came to the southernmost gorge of the range, which we ascended to the main ridge. From the saddle we followed the crest of the range to the south, which rises sharply to the trig. station. The track wound between immense masses of granite of all shapes and sizes, and among these grow numerous trees of the Blue Gum, *Eucalyptus globulus*. Though by no means stunted, the trees assume a more branched habit than those we are accustomed to see in plantations about Melbourne.

The topmost stone was reached soon after mid-day, when a great panorama presented itself to our view. An hour was pleasantly passed in refreshing the inner man, and admiring the distant landscape. Some fifteen miles to the south Geelong was plainly visible, and, further still, the sand-dunes at Barwon Heads. Close at hand were cultivated fields and crops in every direction, but to the north-east, towards Melbourne, the powder magazines at Laverton were the extent of our view, Melbourne and suburbs being enshrouded in haze. How different the prospect from that seen by the first white man who ascended the peak, Captain Flinders, on 1st May, 1802. Wonderful to relate, neither tourists nor fire have yet destroyed the tripod erected by the trigonometrical surveyors in the early sixties, marking the highest point, 1,154 feet above sea level. While lunching under the shelter of the rocks, a couple of black and white butterflies, probably *Delias harpalyce*, fluttered above the tree-tops, and it is somewhat remarkable that I noted the same fact (*Vict. Nat.*, iii., p. 102) on my last visit to the peak, more than twenty years before. Presently we saw the first of the white migratory butterflies, *Belenois java*, of the season. A few dragon-flies occurred at this high elevation, but beetles were very scarce. The rock basin we had visited earlier was plainly visible from the summit, but so dwarfed as to be almost unrecognizable.

Having spent about an hour on the top, we descended to the saddle again, and climbed the next peak, on the sides of

which are granite rocks of all shapes and sizes reminding one of the Buffalo Mountains. In fact, the tourist who cannot afford the time and cost of a visit to the Buffaloes can see here, in half a day from Melbourne, but on a smaller scale, almost all the features of those mountains, at a cost of about five shillings. An article in the *Leader* of 7th September, 1907, with illustrations from the camera of Mr. E. O. Thiele, conveys a good idea of the geological features of the You Yangs. On reaching the next saddle we decided to descend again to the western slope, and visit the forest plantations. Here we again found a strong growth of Prostanthera, and on it was taken the only buprestid beetle of the day, *Stigmodera bicolor*. Continuing through the plantation northerly, a little spring was passed, where *Utricularia dichotoma* was flowering in the boggy ground. The country hereabouts was very park-like, dotted with eucalypts, sheoaks, &c., but searching under the bark and shaking the branches revealed few insects worthy of mention. Another high hill was ascended, and afternoon lunch partaken of while admiring the distant prospect.

We then turned stationwards along a ridge, and finally descended on to the plain again, and passed through a thicket of Swamp Tea-tree, *Melaleuca ericifolia*. A three-mile walk across paddocks brought us to the station, where we found another member, who had come down by the mid-day train, and reached Station Peak just as we ascended the next hill, but was unfortunately unable to attract our attention, so we missed the benefit of his company and he had to finish the day by himself.

In former reports of visits to the You Yangs (*Southern Science Record*, ii., p. 8; *S.S.R.*, iii., p. 17; and *Vict. Nat.*, iii., p. 99), little mention was made of the ornithology of the district, Mr. O'Donoghue's notes will, therefore, be of value as indicating the character of the bird-life likely to be met with. He says:— "The first bird noted on leaving Little River railway station and proceeding along the line towards Geelong was the Nankeen Kestrel, which was observed circling among the red gum trees margining the river in the vicinity of the bridge. It is very probable that the bird had its nest thereabouts. On the plain between the railway station and the Peak the White-backed Magpie, the Ground-Lark, and the Black-breasted Plover were observed. On reaching the base of the mount a number of Nankeen Kestrels were noted soaring near the summit; but on the party attaining the trigonometrical station some hours later they were not to be discerned, having possibly withdrawn to another locality on the advent of a pair of Brown Hawks, which were observed circling in the neighbourhood of the crest for a lengthy period. No other birds were noted by the party during their ascent and descent of the Mount, although there was ample cover and abundance of

insect life. Among the Casuarinas, Native Cherries, and wattle trees flourishing on the southern slopes of the Mount, the Black and White Fantail, the Harmonious Thrush, the Yellow-rumped Tit, and the Mountain Thrush were noted. In a slight depression on the western slope a company of Scarlet-breasted Robins comprising eight individuals, was observed amongst a growth of Senecio. In the neighbourhood of the large rock basin which is a prominent feature in the landscape of the western slope, the Yellow-rumped Tit, Mountain Thrush, White-backed Magpie, White-shafted Fantail, Babbler, and Warty-faced Honey-eater were met with. The White-shafted and Black-and-White Fantails were often encountered amid the Snowy Mint-bush which thickly clothes this portion of the Mount. Although the Red Wattle-bird was not seen, its harsh note was repeatedly heard. The presence of this bird and the Warty-faced Honey-eater was undoubtedly due to the number of flowering Eucalyptus and wattle trees, and to the Snowy Mint-bush, acres of which were thickly invested with blossom. To the north-west the country is park-like for the most part, free from boulders, and timbered by *Casuarina quadrivalvis* and *Eucalyptus polyanthema.* Here the White-backed Magpie, Blue-faced Honey-eater, Rosehill Parrakeet, Yellow-rumped Tit, White-fronted Chat, Garrulous Minah, Ground-Lark, and Black-and-White Fantail were noted. A nest of the last-mentioned was discovered in a Casuarina. Several pairs of what were assumed to be White-shouldered Caterpillar-eaters were seen, but, owing to the excessive shyness evidenced by the birds, a close inspection was rendered impossible. They may have been Hooded Robins. Their bulk only influenced me to assume otherwise. In the immediate neighbourhood of the hills to the north-west of the peak, the Ground-Lark, the Grallina, the Crow, and the Flame-breasted Robin were met with. A pair of Yellow-tufted Honey-eaters was observed in a flowering Eucalyptus, *E. polyanthema*, situate on the margin of the plain. On being disturbed they directed their flight towards a stunted but dense growth of *Melaleuca ericifolia*, through which the party a short time previously were obliged to force a passage. The Melaleuca was in bloom, but no birds were seen or heard in it or its vicinity. At different times during the journey to Little River numbers of Crows and Magpies were discerned on the plain to the west of the line. Stubble Quail and Brown Song-Larks were often flushed by the approaching train from the long grass within the railway reserve."

The granite of the ranges seems to offer a great variety of composition, details of which will be found in the paper by Professor Skeats previously mentioned. On the whole, we enjoyed the outing thoroughly, and though the You Yangs cannot be considered a good collecting ground, still, as I have

pointed out, they have their characteristic plants, &c., while the geological features are totally unlike those to which we are accustomed in other excursions around Melbourne. We have no hesitation in recommending the locality as one that should be occasionally visited in the spring or early summer, and if the route we followed be adopted the visitor will not be disappointed at the scenery presented to him.—F. G. A. Barnard.

EXCURSION TO PLENTY RANGES.

This year the Plenty Ranges were chosen for the usual King's Birthday excursion, and permission having been courteously granted by the Metropolitan Board of Works to explore the watershed of the Toorourrong Reservoir, a tract of about 10,000 acres of uninhabited country embracing the southern slopes of Mount Disappointment, it was confidently hoped that a profitable trip would follow, but, as will be seen, the results were somewhat meagre, owing to the severity of the bush-fires of past years in that region.

Five members left Melbourne by the mid-day train for Whittlesea on Saturday, 7th November; four more journeyed by the evening train, and another joined us the following morning, bringing our party up to a total of ten. Whittlesea (27 miles) was reached after an excessively weary train journey of 2¾ hours—about half an hour late. Having seen our luggage safely packed in the vehicle awaiting us, we started on the four-mile walk to "Wildwood," the farm-house of Mr. J. L. Coulthard, where arrangements had been made by our hon. secretary to accommodate the party.

Shortly after leaving the township by the Yea road the aqueduct from Toorourrong to Yan Yean was reached. This we decided to follow in preference to the road. It was not long before we were all engaged in an active search for objects of interest. A number of the commoner wild-flowers were noted, but a diligent search under logs, bark, and in the branches of the acacias, &c., for wood-boring beetles failed to reveal anything of interest. "Wildwood" was reached about six o'clock. We found it well situated close to the foot-hills of the ranges, on the western side of the eastern branch of the Plenty River, about a mile south-west of the Toorourrong Reservoir, and was, therefore, within comfortable distance of the locality we desired to work. The house being too small to provide sleeping accommodation for our party, arrangements had been made to have the use of the barn; this we found had been made as comfortable as possible, with a plentiful supply of clean straw on the floor, covered with a tarpaulin. There was ample room and we at once set to work to make ourselves comfortable for our short stay.

About eight o'clock we met the four members who had come up by the evening train. After a short rest a moonlight visit was made to the Toorourrong Reservoir; this is about 30 acres in extent, and is prettily situated at the junction of the eastern branch of the Plenty River and Jack's Creek, and in the bright moonlight, so clear as to reflect the adjacent hills in the placid waters, presented a beautiful sight, which well repaid us our walk. On the return journey, in the stillness of the night, the clear, lively whistle of the Black-and-White Fantail was repeatedly heard close by, accompanied occasionally by the mournful note of the Boobook Owl. In the evening a Podargus was seen to perch on a tree close to the house. When first seen it was resting in a crouching position, but when approached it stretched itself up in a vertical position, with its bill pointing upwards in a line with its body, and then might easily have been mistaken for a broken branch of the tree on which it was resting.

Thoroughly satisfied with our trip so far, we turned in for a good sleep, in anticipation of a long day among the hills on the morrow. Sleep, however, was out of the question. The night had turned very cold, and with every hour it seemed to become colder. Mutterings, groans, and long-drawn sighs were heard all round, accompanied by rustling straw as one after another twisted and rolled about in a vain endeavour to find a warmer spot.

Relief was felt when at four o'clock the Laughing Jackass, followed shortly by the melodious Magpie, announced the coming day. Five o'clock saw most of our shivering party astir. The morning was cold, and the grass wet from the heavy dew which had fallen during the night, but a sharp walk on the adjoining hillsides, turning logs, stripping bark, &c., soon helped us to forget our long night's experience. A special search was made for the larvæ and pupæ of the rare blue butterfly *Ogyris olane*. The larvæ feed on the Mistletoe, *Loranthus pendulus*, and when fully grown travel down the tree-trunk (often a considerable distance) to near the base, pupating under the loose bark. We were early rewarded by the discovery of a pupa, which led to an active search on every tree trunk on which the Mistletoe could be seen, and two or three additional pupæ were taken. One of these has since emerged. The larvæ of one of our skipper butterflies, *Hesperilla donnysa*, feed on the Sword Grass, *Cladium*, sp., the pupæ being securely concealed between two leaves neatly bound together. A few of these were also found, and one has since emerged. Birds were fairly numerous, one of the first to attract attention by its beautiful note being the Hooded Robin, *Melanodryas bicolor*. The Magpie- or Mud-Lark, Harmonious Shrike-Thrush, White-throated Tree-creeper, White-throated Thickhead, Pallid Cuckoo, Butcher-bird, and many others were noted during our morning's ramble. The Blue Wren, *Malurus*

cyaneus, was everywhere seen, and a nest containing three eggs was found close to the farm-house.

Returning for breakfast, we were joined by our botanists, who had gone further afield. About nine o'clock a start was made for the ranges. The river and adjacent flats are bordered with fine blackwood and other acacias, &c., affording splendid harbour for various kinds of small birds, such as Tits, Robins, Fly-catchers, Honey-eaters, &c. Our attention was drawn to the somewhat unusual sight of a Pelican flying heavily overhead. Insects were particularly scarce ; very few Lepidoptera were seen, and these only of the commonest species. A few isolated patches of Leptospermum were eagerly searched, but yielded nothing but a few of the commoner beetles. The arrival of another member, who had made an early start and cycled from town, now completed our party.

Following the western margin of the reservoir, we entered what promised to be some better country, in the valley of the Running Creek. This is the principal stream entering the Plenty River above the reservoir from the west. Here we took our first planarians, *Geoplana mediolineata* and *G. hoggii*. We followed the creek for some distance, but were soon greatly disappointed to find that the greater part of the valley had been burnt out by bush-fires during recent summers. Collecting, as far as zoology was concerned, was almost out of the question, though our botanists fared better, and collected, among other plants, a number of fine examples of orchids. Birds were numerous along the bed of the creek, and among those seen were the Rufous and White-throated Thickheads, Sacred Kingfisher, Orange-winged Sittella, Scarlet and Flame-breasted Robins, Masked Wood-Swallows, Leatherheads, and others. Wombats were evidently numerous, judging by the large numbers of their burrows and upturned soil along the hillsides. At mid-day we lunched at a spot evidently used in the early days as a crossing place by timber-cutters, whose overgrown track we had traversed for some distance. About half a mile further on we decided to leave the valley, and, turning eastwards, crossed the ridge at the back of Cleeland's Hill, close to the granite boundary, and, entering the Plenty Valley, passed through some rather rough, scrubby country back to the reservoir, where we spent a short time among the timber on the eastern bank.

Some of our party proceeded along the track towards the Cascades for a mile or so, while the remainder returned home.

Sunday evening turned particularly cold, and a roaring fire engrossed our attention until bed-time. The possibility of sleep was anxiously discussed, and it was finally decided to make the attempt. A careful selection of the warmest looking corners was made, and the majority unanimously elected to lie amongst the

straw wrapped in their rugs, with the tarpaulin on top. Some managed to obtain a fair amount of sleep, but the others passed another most uncomfortable night, and gladly welcomed the dawn. Two of our party having to return to town by the 7.30 a.m. train, had to turn out soon after five o'clock. Our entomologists, wishing to indulge in more bark-stripping, &c., managed to put in a couple of profitable hours before breakfast.

After breakfast a start was made for the Cascades along the Jack's Creek track, a walk of about 4½ miles. The day promised to be warm, and we looked forward to better results than those of the previous day. We took our time, and thoroughly searched any likely-looking spots. The commoner butterflies, such as the Painted Lady, Australian Admiral, and the little blue, fairly scarce on the previous day, were now particularly numerous. A fair number of moths were also noticed before we left the flats, such as *Philobota catachrysa*, *Antidica pilostilus*, but all were well-known species. A full grown Blue-tongue Lizard, *Tiliqua scincoides*, the only one seen during the trip, was found basking in the sun. Some time was devoted to a careful search among the timber along the margin of the reservoir, and several more larvæ and pupæ of *Ogyris olane* and some bombycid larvæ were taken. Beetles, however, were particularly scarce, notwithstanding the energy displayed by at least one of our party. As we proceeded wild-flowers became more plentiful and varied, and in marked contrast to our experience of the previous day. A fine clump of the Mountain Ash, *Panax sambucifolius*, was passed close to the track, the largest of which was fully 12 feet high. Our first white butterfly, *Belenois java*, was noticed shortly after passing a bend in Jack's Creek known as Smith's Gully, and a little further on up the spur another species, *Xenica hobartia*, always welcome to the collector, was captured. Bordering the track some fine bushes of *Grevillea alpina* in bloom were admired. A steep and rather hot climb brought us to the top of the Cascades. After a little time here we descended to the fern glade at the bottom, where we enjoyed our lunch while admiring the rush of water into the basin at our feet.

On our return journey we followed the narrow track bordering the creek, the opposite side of which was a dense mass of vegetation. Here the Coachwhip-bird was heard and the Flame and Yellow-breasted Robins seen. Two more specimens of the small brown butterfly, *Xenica hobartia*, were also met with. The magnificent group of King Ferns, *Osmunda barbara*, remembered from a previous trip, were again admired. Nothing worthy of special mention was noticed on the remainder of our trip, and we reached home in ample time to partake of early tea and pack up our belongings. A pleasant walk to the station in the cool of the evening terminated our visit to the Plenty Ranges, which,

if not as profitable from a naturalist's point of view as was expected, proved a most enjoyable one. But our homeward train journey proved the reverse of pleasant. Although announced at the station to start at 8.30 p.m. the train did not leave until 9.30 p.m., and when, after a weary journey of over two hours, with every compartment crowded to the utmost, we arrived at Spencer-street at 20 minutes to 12 p.m., we had to hurriedly disperse to catch our midnight trains for the suburbs.

Close attention was paid by Mr. G. Anderson to the birds seen. He records just fifty species for the outing, and, in addition to those already mentioned, the following were noted: — Crow, Sooty Crow-Shrike, Rosella Parrot, King Parrot, Brown Hawk, Kestrel, White-breasted and Black-breasted Cormorants, Dabchick, Black Duck, Black Swan, White Cockatoo, Fan-tailed and Bronze Cuckoos, Yellow-rumped Tit, Reed-Warbler, Brown Tree-creeper, Yellow-tailed Tit, Fire-tailed Finch, White-shafted and Rufous Fantails, White-fronted Chat, Welcome Swallow, Stubble Quail, Brown Song-Lark, and White-plumed and White-eared Honey-eaters.

For some remarks on the botany of the outing I am indebted to my co-leader, Dr. C. S. Sutton, who, however, was only able to be with us on the first day. He says :—"The botanical results of the excursion were disappointing. Many plants which were confidently expected to occur were not seen, and there were absolutely no surprises, nothing out of the ordinary being collected. In the course of an early morning ramble the fine, conspicuous yellow flowers of *Hibbertia obtusifolia* were fairly common on a dry hillside. We had decided to traverse the valley of the Running Creek, but, after proceeding some distance, found that unfortunately the country had been swept by bush-fires some time previously, and, owing to continued dry seasons, was but slowly renewing its floral covering. Had we continued a couple of miles further into the granite country plants of greater interest would probably have been met with. Quite the most persistent and prevalent species was *Stellaria pungens ;* its white star flowers appeared everywhere. The flowers of the purple fringed-lily, *Thysanotus tuberosus*, were frequent in one part. The broom tea-tree, *Leptospermum scoparium*, was just about to blossom, but *L. lanigerum*, which occurred sparingly along the margin of the lake, was in full bloom. While descending the ridge which separates the creek from its neighbours several fine bushes of *Grevillea alpina*, covered with their singular red and yellow flowers, were noted. Among the orchids seen perhaps the most uncommon was *Gastrodia sesamoides*, the long, horizontal tuber of which seemed to terminate in the root of a bracken fern. *Prasophyllum Australe* and the pretty *Caladenia Menziesii* were fairly common in one locality,

but *C. Patersoni* was quite scarce. A few specimens of the usual form of *Caladenia carnea* were seen, but the variety possessing the musky odour occurred rather plentifully in two forms—the one slender and single-flowered, the other more robust, with, in some cases, as many as five flowers; among both forms were several with pure white flowers. Belated specimens of *Glossodia major*, *Pterostylis cucullata*, *Diuris maculata*, and *Thelymitra longifolia* were also seen. Passing round the reservoir *Mazus pumilio*, *Ranunculus rivularis*, and very robust plants of *Epilobium glabellum* were met with. During a hurried visit to the lower part of the Jack's Creek valley *Comesperma ericinum*, *Pultenæa Gunnii*, *Pimelea linifolia*, and *Dampiera stricta* were found, all in very good condition, and there is no doubt that we would have fared much better had we confined our attentions to this creek rather than the one we had just before left. However, the Jack's Creek district is easier to get at, and can be readily worked on some future occasion. Altogether nearly 100 species of plants were noted in bloom. All of the dozen species of ferns seen were ordinary species, and do not call for special mention."

Notwithstanding the miserable train service on the Whittlesea line, it is to be hoped another excursion will be put down at no distant date for the Toorourrong district, for, having learned something of the geography of the locality, and with "Wildwood" so convenient for headquarters, we feel sure there yet must be some interesting collecting to be done on the southern slopes of Mt. Disappointment.—J. A. Kershaw.

[Some interesting notes on the geology of the Whittlesea district, with a map, will be found in a paper read by Mr. J. T. Jutson before the Royal Society of Victoria, and recently published in its proceedings (vol. xxi. (new series), part i., page 211).—Ed. *Vict. Nat.*]

A New Protozoon?—The protozoön shown at the October meeting of the Club alive under the microscope on the branchiæ of a living specimen of the crustacean *Koonunga cursor*, Sayce, is one of the Tentaculifera or Suctoria. The Suctoria are characterized by the possession of suckers or tentacles which have the power of stunning or paralyzing and then holding fast comparatively large infusorians which come in contact with them. The protoplasmic contents of the prey then pass in a liquid stream through the suckers into the body of the suctorian. These minute creatures live epizoically on various marine and freshwater organisms. Lankester states that very frequently a particular species is found on only one genus of host. It is possible that the suctorian exhibited, which seems on examination to have affinities with both the genera Trichophrya and Solenophrya, may be new to science.—R. W. Armitage.

CORRESPONDENCE.

THE SPECIFIC NAME OF THE INTRODUCED ROMULEA.

To the Editor of the *Victorian Naturalist.*

SIR,—I have much pleasure in forwarding for your perusal a copy of the latest *Kew Bulletin of Miscellaneous Information*, in which there is a note upon "Romulea as a Pest in Australia." In this journal for January and February, 1908 (xxiv., 138, 154) the question was raised as to the correct scientific name of the so-called "Onion Weed," and a letter of inquiry sent to Kew by Mr. Jas. Tovey was the immediate cause of the subject being referred to in the *Bulletin.* It may be regarded as settled, as far as the comparison of authentic specimens and the details of leaf-sections can make it, that the Australian introduced plant is *Romulea bulbocodium*, Seb. and Maur., as originally determined by the late Baron von Mueller. *R. rosea*, Eckl., is regarded as a synonym, and in referring to these two species the writer remarks :—"The leaf-sections of these two species and of the Australian plant are identical, and show the leaf to be twice as broad as thick, while the outline of the leaf is linear, and quite unlike that of *R. cruciata*, Eckl."

The Field Naturalists' Club is specially concerned with the fauna and flora and with the correct determination of both indigenous and introduced forms. While it seeks to popularize the study of natural history by means of expressive common names, it has always aimed at scientific accuracy, for, as it was happily expressed in the presidential address for 1907 (*Vict. Nat.*, xxiv., 49), "in a new country, until your objects have been collected in fairly large numbers and dealt with from a *systematic* point of view, it is difficult to see on what lines to investigate the steps in their individual life-histories."—I am, yours, &c.,

D. M'ALPINE.

Pathologist's Branch, Department of Agriculture.
Melbourne, 26th November, 1908.

[Among the remarks in the *Kew Bulletin* in connection with this subject it is stated that in Western Australia the plant is known as "Guildford Grass"; also that while the leaves are indigestible and have been known to cause the death of animals, the corms, on the contrary, are highly nutritious, and have been found to contain 75.3 per cent. of starch in the dry substance—a greater percentage than in the potato !—ED. *Vict. Nat.*]

THE next meeting of the Australasian Association for the Advancement of Science will be held in Brisbane in January, 1909. Intending members should communicate with the hon. secretary for Victoria, Dr. T. S. Hall, University.

The Victorian Naturalist.

Vol. XXV.—No. 9. JANUARY 14, 1909. No. 301.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting was held at the Royal Society's Hall on Monday evening, 14th December.

The president, Mr. G. A. Keartland, occupied the chair, and about 50 members and visitors were present.

CORRESPONDENCE.

From Dr. Kaufmann, hon. secretary of the Microscopical Society of Victoria, conveying the Society's fraternal greetings and hearty good wishes. The president said he appreciated and reciprocated the Society's good wishes.

REPORTS.

A report of the excursion to the Botanic Gardens on Saturday, 21st November was given by the leader, Mr. F. Pitcher, who reported a good attendance of members. Special attention was paid to characteristics in foliage, and the flowers of the banana were examined and dissected. The fine display of blooms of the Japanese Iris in the new lake was greatly admired.

A report of the excursion to Carrum on Saturday, 28th November, was given by Mr. W. H. A. Roger (who acted as leader in the unavoidable absence of Mr. C. French, jun.), who said the attendance was rather small, and little of interest was noted.

A report of the excursion to Willsmere, Kew, on Saturday, 12th December, for pond-life, was given by the leaders, Messrs. W. and J. Stickland, who reported a good attendance, and, owing to the fine weather, a very enjoyable outing. A large number of interesting captures were made, but owing to shortness of time a full examination of the material had not yet been made. Very fine growth of fresh-water sponges was noted, also the customary Polyzoa and Hydras. The strange-looking tube-building rotifer, *Cephalosiphon limnias*, was very plentiful, and it was noted that, though the full-grown specimens had an enormous dorsal antenna, there was scarcely any sign of it in the young specimens. Some clusters of *Lacinularia socialis* were found to have apparently died in an extended condition, and in some of them, although no other sign of life could be detected, the flame cells were seen to be vibrating in full vigour.

A report of the junior excursion to Black Rock on Saturday, 5th December was given by the leader, Miss Freda Bage, B.Sc., who reported a fair attendance of juniors. Though almost low tide, a strong wind from the sea prevented much wading from being done, therefore attention was paid to objects picked up along the shore, and the main features pointed out. An interest-

ing talk ensued on methods of preserving the captures, and altogether a very interesting afternoon was spent.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. C. L. Plumridge, 8 Gordon-avenue, Kew, and Mr. R. N. Walcott, F.G.S., National Museum, Melbourne, were elected ordinary members; and Miss Marian Booth, 25 Rathdown-street, Carlton, Miss Amy Gregory, Black-street, Middle Brighton, Miss M. M'Donald, 100 Kerferd-road, Albert Park, Miss Vera Scott, 30A Council-street, Clifton Hill, and Miss Daisy Searby, 58 North-street, Ascot Vale, were elected junior members of the Club.

GENERAL BUSINESS.

Prof. A. J. Ewart, D.Sc., referred to a letter in the current (December) *Naturalist* with regard to the correct specific name of the introduced Romulea, and said that, though he personally disapproved of controversy, he was compelled to reply, and read a statement he would hand to the editor of the *Naturalist* for publication.

PAPERS READ.

1. By Prof. A. J. Ewart, D.Sc., entitled "Biological Survey of Wilson's Promontory," part i.

The author summarized the results of a visit paid to the Prommontory in September by Messrs. J. W. Audas, of the National Herbarium, and Mr. P. R. H. St. John, of the Botanic Gardens staff. The former, who devoted himself to the flora, collected over 300 species of plants, and brought the total number of plants recorded from the Promontory up to 364. It was found that the abnormally dry season and the great fires of last summer had seriously damaged the plant-life in many parts. Mr. St. John, besides assisting with the plants, took particular notice of the bird-life, and added about ten species to those noted by the Club excursion party in December, 1905.

Mr. A. D. Hardy congratulated Messrs. Audas and St. John on the results of their explorations, and said with regard to their statement that they had not seen the Native Beech, *Fagus Cunninghami*, the purple orchid, *Glossodia major*, or the bulrush, *Typha angustifolia*, which he had included in his list of the Promontory plants, that, though he had not seen the first-named species, he had been assured on good authority that it occurred on the eastern side of the Promontory. He had no doubt about *Glossodia major*, and in this he was corroborated by Dr. T. S. Hall. As regards the bulrush there was some doubt, as the plant was not in bloom at the time of his visit, but the late Mr. Walter had confirmed his identification.

Mr. St. John, in referring to the fauna of the Park, said that there were still a large number of Koalas, or Native Bears, *Phasco-*

larctos cinereus, Goldf., in the southern part of the peninsula, while many thousands of Black Swans were seen on Shallow Inlet.

The president said that the presence of the Rose-breasted Cockatoo, as mentioned by Mr. St. John, was an interesting fact, as it rarely occurred so far south.

Dr. Hall and Mr. D. Best expressed some doubt as to the number of swans reported to have been seen, but Mr. Armitage confirmed the author's statements.

Mr. J. Kershaw, F.E.S., asked if foxes had been seen, and the locality where traces of lyre-birds were noticed, and was informed that no signs of foxes had been met with. The lyre-bird traces had been seen near Mount Latrobe. Mr. St. John added that neither kangaroos nor true dingoes had been met with.

Dr. Hall mentioned that applications had been called for a ranger, and it was expected that an appointment would be made shortly.

2. By Dr. C. S. Sutton, entitled "Botanical Notes of a visit to the Snowy River."

The author gave an interesting description of the flora of the country around Orbost, and more particularly of a piece of jungle country about six miles on the road towards Marlo, at the mouth of the Snowy. Here occur a number of climbers not to be found further west, and the author suggested that some effort should be made to have this spot properly reserved.

Dr. Hall remarked on the curious incursion of tropical plants down the south-eastern coast of Australia, gradually decreasing in numbers as they approached the south, and mentioned the marked resemblance between Eastern Australian jungle vegetation and the flora of Malaysia.

Prof. Ewart said that this was an instance which showed that it was not temperature alone which determined the distribution of plants, but a combination of temperature and moisture, supplied in this case by the humid easterly sea breezes.

Mr. F. Pitcher and Mr. G. Coghill referred to the interesting description given by the author of jungle near Orbost, and suggested that steps be taken to secure its reservation.

NATURAL HISTORY NOTE.

Mr. F. Pitcher mentioned that a few days previously he had seen in the Botanic Gardens a bird in company with some Thrushes which, though resembling them in other ways, was entirely fawn in colour. Mr. Keartland said the bird was probably a Thrush, the fawn colour being due to deficiency of colour-pigment in the skin.

Mr. C. J. Gabriel drew attention to his exhibit of a curious and interesting mollusc—a bivalve shell belonging to the genus Gastrochæna, obtained dredging off Point Cook, Port Phillip Bay. During the Club's excursion to Stony Point last Easter specimens

of two genera of "tube shells," known as Aspergillum and Clavagella, were dredged up, the former having its valves firmly incorporated with the calcareous protecting tube and visible from the outside, the latter with the valves in the interior, one imbedded in the tube, the other capable of movement, while in the Gastrochæna the valves are entirely free.

The two specimens from Point Cook were associated with *Barbatia fasciata*, Rve., and *Cardium tenuicostatum*, Lam.

There was also exhibited a specimen from South Australia found on *Chlamys bifrons*, Lam.

EXHIBITS.

By Mr. R. W. Armitage.—Specimens of Bladderwort, *Utricularia flexuosa*, obtained during Willsmere excursion.

By Miss Cochrane. — Large gum-leaf from North-Eastern district.

By Mr. C. French, jun.—A new weevil, *Desiantha nociva*, Lea, at present very destructive to tomato and other plants near Melbourne.

By Mr. C. J. Gabriel.—A rare shell, *Gastrochæna tasmanica*, Woods, dredged off Point Cook, Port Phillip Bay; the first specimen obtained during fifteen years' dredging.

By Mr. G. A. Keartland.—An albino specimen of the White-backed Crow-Shrike, *Gymnorhina leuconota*.

By Mr. C. Oke.—Dried flowers from Western Australia, collected by Mr. W. Du Boulay.

By Messrs. W. and J. Stickland.—Specimens from Willsmere excursion—Fresh-water sponge, and, under microscope, the tube-building rotifers, *Melicerta ringens* and *Cephalosiphon limnias*.

After the usual conversazione the meeting terminated.

A Rare Victorian Butterfly.—The appearance of the butterfly *Papilio sthenelus*, Macleay, in our State is so seldom noted that a recent capture seems worthy of record. Anderson and Spry record it from Bacchus Marsh, Melbourne, and Moe, but their most recent date is November, 1890. I have not heard of its capture in recent years till this month it has been sent me by Mr. Frichot, of Dimboola, who took it on the wing on 8th November. Mr. G. A. Waterhouse, of Sydney, saw a specimen flying in the streets of Adelaide on 11th of this month, but it is known there as a rare visitor only. He tells me he has only once seen it flying in Sydney, but several single specimens have been captured there in recent years. Such a conspicuous insect could hardly be overlooked if at all abundant. I have records of it from Tennant's Creek, Port Darwin, Wyndham, Somerset, Cairns, Kuranda, Esk, Brisbane, and Richmond River. It is not plentiful near the coast, but occurs freely on the Darling Downs, in Queensland.—G. Lyell. Gisborne, 18/11/1908.

EXCURSION TO MELTON.

Eleven members, including one lady, journeyed to Melton on Saturday, the 24th October, to participate in this excursion, which is generally regarded as an ornithological one, but on this occasion botany was a strong element. As the train approached Rockbank several Black-breasted Plover were observed, which appeared to be family groups, as these birds are early breeders. Then Ravens, Brown Hawks, Kestrels, &c., were passed. On arrival at Melton we at once sought the route taken on previous occasions to Mr. Raleigh's farm, where a country member, Mr. F. L. Billinghurst, of Bacchus Marsh, had arranged to join us. To our surprise nearly all the paddocks we usually crossed were under crop, which, together with numerous barbed-wire fences, somewhat retarded our progress. Here Restless and Brown Flycatchers, Brown Tree-creepers, Pied Grallinas, Pipits, Acanthizæ, Wood-Swallows, and other birds arrested our attention. At Mr. Raleigh's farm we found Mr. Billinghurst awaiting us, and we soon made a start for the mallee scrub, passing on our way through a patch of ideal country for birds, but few were seen. We anticipated finding many species nesting, but young White-browed Pomatorhinus among the saplings, and some Pardalotes inspecting their burrows conveyed the impression that either the birds were breeding late or perhaps may not breed at all this season. Whilst enjoying our lunch the note of the Harmonious Thrush was heard, and in response to our call he came and hopped about the bushes and branches overhead, calling and whistling whilst we mimicked him. Next a brood of young Hooded Robins indulging in their first flight was observed. Yellow-faced and Yellow-tufted Honey-eaters were numerous. A Sacred Kingfisher, apparently disturbed from its nest, perched near us. But a surprise was awaiting us. On skirting the outside of some dense scrub, a Black-eared Cuckoo, *Misocalius palliolatus*, Lath., was seen hopping about a small dry tree. It was shot, and proved to be a female. In its oviduct was an egg complete all but the shell, and there were a number of other large yolks. The inference to be drawn from this is that, although it is usual to find only one cuckoo-egg in the nest of the foster-parent, the same cuckoo may lay in a number of different nests. Three of the party interested in botany and entomology went further afield through some scrubby country as far as the Coimadai Creek, but did not get much for their extra walk. Nice specimens of the fern *Grammitis rutifolia* were found growing in some rock crevices, and a specimen of the little yellow butterfly, *Terias smilax*, was observed. Early in the day a few specimens of the orchid *Pterostylis mutica* were found not far from the station, but just past their best. Though in better condition than on the occasion of our visit twelve months before, the country was still suffering from the succession of dry seasons, which probably accounts for the scarcity of birds, &c.—G. A. Keartland.

BIOLOGICAL SURVEY OF WILSON'S PROMONTORY.

First Report by Alfred J. Ewart, D.Sc., Ph.D., F.L.S.

(*Read before the Field Naturalists' Club of Victoria, 14th Dec.*, 1908.)

With the consent of the Minister for Agriculture, the National Herbarium has undertaken to make a complete botanical survey of Wilson's Promontory, and, as a first beginning to that end, Mr. J. W. Audas, of the National Herbarium, and Mr. P. R. H. St. John, of the Botanic Gardens, spent a fortnight in the Promontory in October last exploring its botanical and other treasures. They confined themselves to the south and south-west of the National Park, leaving the north-east portion for a second visit. As can be seen from the appended map, prepared by Mr. A. D. Hardy, their route was a very extended one, and as a result the number of plants collected, named, and deposited in the National Herbarium amounts to well over 300.

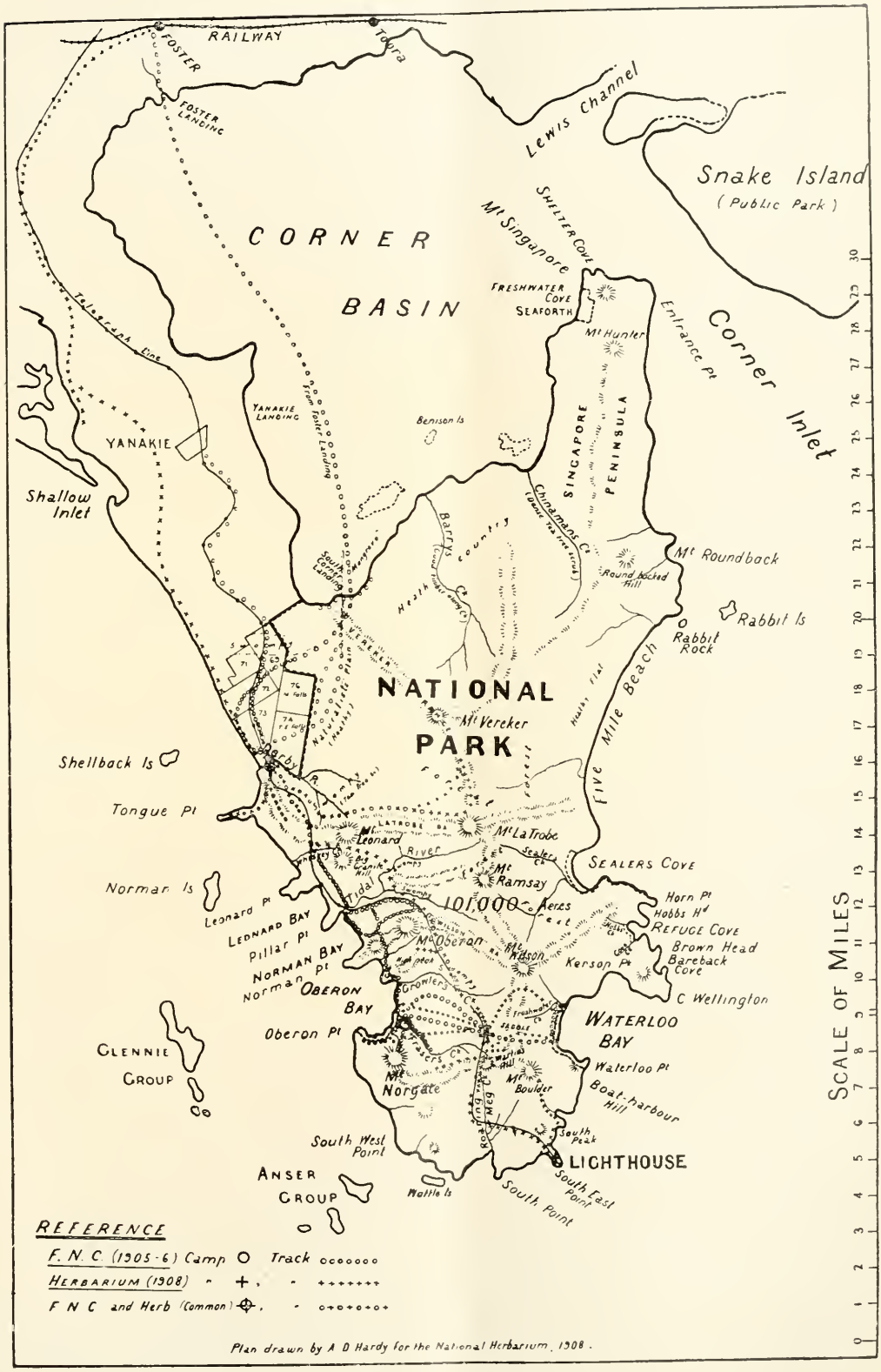
In the report of the Field Naturalists' Club excursion party to the Promontory in December, 1905 (*Vict. Nat.*, vol. xxii., p. 217), Mr. Hardy records 181 flowering plants and ferns, a number of which, however, had already been collected by Baron von Mueller, who was probably the first to make a botanical trip through the Promontory. On the appended list any names given in Mr. Hardy's list, but not collected during the present excursion, are marked with the letter (H.) Mr. Hardy informs me that, owing to his portfolio having fallen into the sea, his collection of specimens was much damaged, so that it is not possible to verify the list thoroughly, but specimens of five of the eleven plants not seen have since been sent to the Herbarium.

In a few cases it is possible errors may have crept in. Thus, neither Mr. Audas nor Mr. St. John saw a single specimen of *Fagus Cunninghami*,* Hook., or of *Typha angustifolia*, L. The former may have been destroyed by the fires, but hardly the latter, which is either absent or very scarce. The orchid *Glossodia major*, R. Br., recorded as in flower at Christmas time, seems doubtful, being at least a month later than usual. Hence, following the usual Herbarium practice, only those records can be accepted in such cases as definitely established which are supported by actual specimens, so that the accuracy of the naming can be verified in case of need. Again, "*Calocephalus fastigiata*" is evidently intended for *Calostrophus fastigiatus*.

The total number of plants recorded for Wilson's Promontory now amounts to 364, and probably nearly a fourth of the flora of Victoria will be found represented in the National Park. It includes some fairly rare plants. Thus *Fieldia australis*, A.

* Mr. Hardy informs me that this plant was not actually seen, but that it may be found on the eastern side.

PLATE 6.



MAP OF NATIONAL PARK, WILSON'S PROMONTORY.

Cunn., is only recorded from two localities in Victoria in Bentham's Flora, one of these being Sealers' Cove. Again, *Xanthosia tridentata*, D.C., which was found at an elevation of 1,000 feet, is only recorded from Wilson's Promontory in Victoria.

Although the present list is by no means a complete one, it is interesting to note that of the whole of the Natural orders represented in Victoria thirty-one so far appear unrepresented on the Promontory. The orders are, however, all small ones—Ceratophylleæ, Nymphaeaceæ, Magnoliaceæ, Menispermeæ, Capparideæ, Elatineæ, Zygophylleæ, Celastrineæ, Sapindaceæ, Plumbagineæ, Amarantaceæ, Frankeniaceæ, Phytolaccaceæ, Nyctagineæ, Lythrarieæ, Ampelideæ, Olacineæ, Callitrichaceæ, Loranthaceæ, Passifloreæ, Cucurbitaceæ, Jasmineæ, Asclepiadaceæ, Orobancheæ, Ericaceæ, Coniferæ, Palmæ, Alismaceæ, Philhydreæ, Eriocauleæ, Rhizospermæ. Of these, however, representatives of the Ceratophylleæ, Lythrarieæ, and Rhizospermæ, as well as others also, are sure to be found on careful search, but it is curious that no *Grevilleas* appear to occur in the Park, although many localities would be suitable for them.

Unfortunately the list also includes eleven naturalized aliens (Nos. 16*, 41*, 56*, 90*, 175*, 237*, 245*, 286*, 292*, 309*, 326*), which are distinguished on the list by an asterisk. The spread of these weeds has been favoured by the fires and by the presence of stock, among the commonest and most widely spread being *Picris hieracioides* (Hawkweed Picris) and *Papaver hybridum* (Hybrid Poppy). So far only one plant (Cape Weed) which is a "Thistle under the Act" appears to have obtained entry. The abundance of sorrel wherever the carcasses of dead cattle have rotted is worthy of note, the seed having probably been carried by birds or by the animal itself, and flourishing in the soil enriched with humus around the carcass.

A few observations made upon the flora and fauna of the Park by Messrs. Audas and St. John are given beneath, together with a list of the birds noted by Mr. St. John, the total amounting to 83, whereas during the excursion in 1905-6 only 72 were noted. On the whole, however, the avian fauna does not seem to be increasing, but rather the reverse, especially as regards the numbers of individuals. The recent fires appear to be partly responsible for this, and also for the destruction of much valuable timber, all the trees on Mt. Wilson, for instance, having been destroyed. Over the older burnt portions a dense scrub has sprung up, making locomotion difficult, and it will probably be many years before the Park is restored to its pristine grandeur. The urgency of the appointment of a ranger is well indicated by the fact that over 200 head of cattle and a few horses were found enjoying illicit grazing in the Park. To some extent the

numerous poison plants of the Park have meted out a just retribution, but unfortunately on the helpless accessories instead of on the real transgressors.

Botanical Report by J. W. Audas.

Though the great fires of last summer and the abnormal dryness of the season had left some of the mountains almost denuded of vegetation, and plant-life generally was not at its best, nevertheless the whole region was full of interest. One can therefore conclude what charms this great district would manifest under favourable conditions.

A curious feature noted was that "soaks" on top of the different hills contained such plants as are usually met with in swamps in other districts, viz.:—*Sprengelia*, *Epacris obtusifolia*, *E. lanuginosa*, *Juncus*, *Schœnus*. A very noticeable feature was the presence of mountain plants on flats, such as *Diplarrhena Moræa*, "the Butterfly Flag," while *Platylobium formosum*, *Pultenæa mollis*, *Cassinia spectabilis*, *Leucopogon ericoides* were found on the beach growing in sand close to the sea.

On all the wind-swept points of the Promontory the vegetation is very dwarfed, and covers the ground like a carpet. The gullies and creeks are very similar to those in the Healesville district, the vegetation being almost the same, in spite of the fact that granite is more in evidence. We noticed in some of the creeks fine specimens of *Eugenia Smithii*, one measuring no less than 20 feet in circumference ; also some magnificent specimens of *Eucalyptus globulus*, *E. amygdalina*, and *E. obliqua*, &c., besides *Prostanthera lasiantha*, *Acacia melanoxylon*, *Hedycarya Cunninghami*. The specimens of the tree-fern *Cyathea Cunninghami* seen were particularly fine. The bracken fern in some of the gullies was fully 12 feet high, and in one gully the scrub was mainly composed of an almost impenetrable mass of bracken, mixed with *Pultenæa daphnoides* and *P. scabra*. The red variety of *Correa speciosa* was seen fully 15 feet high, and covered with most beautiful and showy bloom. The other plants comprising the scrub were seedling Eucalypti, Musk-wood, Blanket-wood, &c. In contrast to the above, the flora also includes such minute plants as *Drosera pygmæa* and *Stylidium despectum*. A striking feature was the almost total absence of vegetation on the western sides of most of the hills, while the eastern sides were clothed with dense scrub.

One specimen of the so-called "Honeysuckles," *Banksia serrata*, was observed fully 6 feet in circumference. These handsome trees give to the scenery quite a park-like appearance, and in the distance a group of them very much resembles an orchard plantation.

The swamps are very dangerous. Three bullocks got off the usual track, and disappeared in the water and treacherous mud at the bottom immediately.

List of Species, Alphabetically Arranged.

(H.) = species recorded by Hardy. (*) = naturalized alien.

1. Acacia decurrens, Willd.
2. ,, melanoxylon, R. Br.
3. ,, myrtifolia, Willd.
4. ,, oxycedrus, Sieber
5. ,, retinodes, Sch.
6. ,, stricta, Willd.
7. Acæna ovina, A. Cunn.
8. ,, sanguisorbæ, Vahl.
9. Acrotriche serrulata, R. Br.
   ,, ,, var. ventricosa
10. Adiantum æthiopicum, L.
11. Adriana quadripartita, Gaud.
12. Ajuga australis, R. Br.
13. Alsophila australis, R. Br.
14. Alyxia buxifolia, R. Br.
15. Amperea spartioides, Brongn.
16. (*) Anagallis arvensis, L.
    ,, ,, var. cœrulea
17. Anthistiria ciliata, Linn. f.
18. Aotus villosa, Sm.
19. Apium prostratum, Labill.
20. Arthropodium strictum, R. Br.
21. Arundo phragmites, L.
22. Asperula conferta, Hook f.
23. Aspidium aculeatum, Swartz.
24. ,, capense, Willd.
25. Asplenium bulbiferum, G. Forster
26. ,, flaccidum, G. Forster
27. Aster Huegelii, F. v. M.
28. ,, myrsinoides, Labill.
29. ,, ramulosus, Labill.
30. Astroloma humifusum, R. Br.
31. Atriplex crystallinum, Hook. f.
32. Australina pusilla, Gaud.
33. (H.) Avicennia officinalis, L.
34. Banksia collina, R. Br.
35. ,, integrifolia, Lin. f.
36. ,, marginata, Cav.
37. ,, serrata, Lin. f.
38. Bartlingia sessiliflora, F. v. M.
39. Bauera rubioides, Andr.
40. Bedfordia salicina, D. C.
41. (*) Bellis perennis, L.
42. Billardiera scandens, Sm.
43. Blechnum cartilagineum, Swartz
44. Boronia parviflora, Sm.
45. ,, polygalifolia, Sm.
46. Bossiæa prostrata, R. Br.
47. Brachycome diversifolia, Fisch. and Mey.
48. Brachyloma ciliatum, Benth.
49. Brunella (Prunella) † vulgaris, L.
50. Brunonia australis, Sm.
51. Bulbine bulbosa, Haw.
52. ,, semibarbata, Haw.
53. Burchardia umbellata, R. Br.
54. Burnettia cuneata, Lindl.
55. Bursaria spinosa, Cav.
55A. ,, var. Pantoni, Guilfoyle
56. (*) Cakile maritima, Scop.
57. Caladenia carnea, R. Br.
58. ,, Menziesii, R. Br.
59. ,, Patersoni, R. Br.
60. Calandrinia calyptrata, Hook f.
61. Callistemon lanceolatus, Sweet
62. Calocephalus Brownii, F. v. M.
63. Calochilus campestris, R. Br.
64. ,, Robertsoni, Benth.
65. Cardamine dictyosperma, Hook.
66. Carex pseudo-cyperus, L.
67. ,, pumila, Thunb.
68. Cassinia aculeata, R. Br.
69. ,, spectabilis, R. Br.
70. Casuarina distyla, Vent.
71. ,, quadrivalvis, Labill.
72. ,, suberosa. Otto & Dietr.
73. Cassytha pubescens, R. Br.
74. Centrolepis aristata. Roem. & Sch.
75. ,, strigosa. Roem. & Sch.
76. Cladium glomeratum, R. Br.
77. ,, schœnoides, R. Br.
78. Clematis aristata, R. Br.
79. ,, microphylla, D. C.
80. Comesperma calymega, Labill.
81. ,, ericinum, D. C.
82. ,, volubile, Labill.
83. Convolvulus marginatus, Poir.
84. Coprosma Billardieri, Hook. f.
85. Correa alba, Andr.
86. ,, speciosa, Ait.
87. Cotula coronopifolia, L.
88. ,, reptans, Benth.
    ,, ,, var. major
89. (H.) Cryptandra Hookeri, F. v. M.
90. (*) Cryptostemma calendulaceum, R. Br.
91. Cyathea Cunninghami, Hook. f.
92. Cymbanotus Lawsonianus. Gaud.
93. Cynoglossum australe, R. Br.
94. ,, suaveolens, R. Br.
95. Cyperus lucidus, R. Br.
96. Dampiera stricta, R. Br.
97. Danthonia penicillata, F. v. M.
    ,, ,, var. setacea

† Known in the old Herbals and to Bauhin and Clusius as *Brunella*. Changed by Linnæus to Prunella. Changed by Mueller, by Engler, by Bentham and Hooker back to Brunella ; but according to the Congress laws Prunella must stand.

98. Daucus brachiatus, Sieber
99. Davallia dubia, R. Br.
100. Daviesia ulicina, Sm.
101. Deyeuxia quadriseta, Benth.
102. Dianella longifolia, R. Br.
103. ,, revoluta, R. Br.
104. Dicksonia antarctica, Labill.
105. Dillwynia cinerascens, R. Br.
106. ,, ericifolia, Sm.
107. ,, floribunda, Sm.
108. Diplarrhena Moræa, Labill.
109. (H.) Dipodium punctatum, R. Br.
110. Diuris longifolia, R. Br.
111. Drosera auriculata, Backh.
112. ,, binata, Labill.
113. ,, pygmæa, D. C.
114. ,, spathulata, Labill.
115. Echinopogon ovatus, Beauv.
116. Ehrharta stipoides, Labill.
117. Epacris impressa, Labill.
,, ,, var. rosea
118. ,, lanuginosa, Labill.
119. ,, obtusifolia, Sm.
120. Epilobium glabellum, Forst.
121. Erechtites arguta, D. C.
122. ,, prenanthoides, D. C.
123. Erodium cygnorum, Nees.
124. Erythræa australis, R. Br.
125. Eucalyptus amygdalina, Labill.
126. ,, globulus, Labill.
127. ,, Gunnii, Hook. f.
128. ,, Muelleriana. Howitt
129. ,, obliqua, L'Herit.
130. ,, viminalis, Labill.
131. Eugenia Smithii, Poir
132. Euphrasia collina, R. Br.
133. Exocarpus strictus, R. Br.
134. (H.) Fagus Cunninghami, Hook.
135. (H.) Festuca Hookeriana, F.v.M.
136. Fieldia australis, A. Cunn.
137. Geranium dissectum, L.
138. Gleichenia circinata, Swartz
139. (H.) ,, dicarpa, R. Br.
140. ,, flabellata, R. Br.
141. (H.) Glossodia major, R. Br.
142. Glycine clandestina, Wendl.
143. Gnaphalium japonicum, Thunb.
144. Gompholobium Huegelii, Benth.
,, ,, red flowered
,, ,, pale yellow
145. (H.) ,, minus, Sm.
146. Goodenia ovata, Sm.
147. Goodia lotifolia, Salisb.
148. Hakea acicularis, Knight
149. ,, nodosa, R. Br.
150. ,, pugioniformis, Cav.
151. ,, ulicina, R. Br.
152. Halophila ovata, Gaud.
153. Haloragis micrantha, R. Br.
154. ,, tetragyna, Hook f.
155. Hedycarya Cunninghami, Labill.
156. Heleocharis acuta, Tul.
157. ,, sphacelata, R. Br.
158. Helichrysum apiculatum, D. Don.
159. ,, Baxteri, A. Cunn.
160. ,, cinereum, F. v. M.
161. ,, ferrugineum, Lessing
162. ,, leucopsidium, D. C.
163. ,, lucidum, Henck.
,, ,, white var.
164. ,, obtusifolium. F. v. M. and Sond.
165. ,, scorpioides, Labill.
166. Hibbertia acicularis, F. v. M.
167. ,, Billiardieri, F. v. M.
167A. ,, ,, var. parviflora
168. ,, fasciculata, R. Br.
169. ,, sericea, Benth.
170. ,, stricta, R. Br.
171. Hydrocotyle laxiflora, D. C.
,, also a variegated form
172. Hymenophyllum nitens, R. Br.
173. ,, javanicum, Spreng.
174. Hypericum japonicum, Thunb.
175. (*) Hypochæris radicata, L.
176. Hypolæna fastigiata, R. Br.
177. Hypoxis glabella, R. Br.
178. Indigofera australis, Willd.
179. Isopogon ceratophyllus, R. Br.
180. Isotoma fluviatilis, F. v. M.
181. Juncus communis, G. Mey.
182. ,, pauciflorus, R. Br.
183. Kennedya prostrata, R. Br.
184. Kunzea corifolia, Reichb.
185. (H.) ,, peduncularis, F. v. M.
186. Lagenophora Billardieri, Cass.
187. (H.) Lemna minor, L.
188. Lepidosperma concavum, R. Br.
189. ,, exaltatum, R. Br.
190. Leptocarpus Brownii, Hook. f.
191. Leptorrhynchos tenuifolius, F. v. M.
192. Leptospermum lævigatum, F. v. M.
193. ,, lanigerum, Sm.
194. ,, myrsinoides, Sch.
195. ,, scoparium, R. and G. Forster
196. Leucopogon australis, R. Br.
197. ,, ericoides, R. Br.
198. ,, virgatus, R. Br.
199. Lindsaya linearis, Swartz
200. Linum marginale, Cunn.
201. Lobelia anceps, Lin. f.
202. ,, gibbosa, Labill.
203. ,, rhombifolia, De Vriese

204. Lomaria capensis, Willd.
205. ,, discolor, Willd.
206. ,, lanceolata, Spreng.
207. ,, Patersoni, Spreng.
208. Lomatia Fraseri, R. Br.
209. Lotus australis, Andr.
210. Lycopodium densum, Labill.
211. ,, laterale, R. Br.
212. Lyonsia straminea, R. Br.
213. Lyperanthus nigricans, R. Br.
214. Marchantia polymorpha, L.
215. Marianthus procumbens, Benth.
216. Mazus Pumilio, R. Br.
217. Melaleuca ericifolia, Sm.
218. ,, squarrosa, Don
219. Mentha australis, R. Br.
220. Mesembryanthemum æquilaterale, Haw.
221. Mesomelæna sphærocephala, Benth.
222. Microtis atrata, Lindl.
223. ,, porrifolia, R. Br.
224. Mitrasacme polymorpha, R. Br.
225. Muehlenbeckia adpressa, Meissn.
226. Myoporum viscosum, R. Br.
227. Myriophyllum variæfolium, Hook. f.
228. Myrsine variabilis, R. Br.
229. Olearia argophylla, F. v. M.
230. ,, axillaris, F. v. M.
231. ,, stellulata, D. C.
231A. ,, ,, var. lirata
231B. ,, ,, ,, quercifolia
233. Opercularia ovata, Hook. f.
234. ,, varia, Hook, f.
235. Oxalis corniculata, L.
236. Panax sambucifolius, Sieber
237. (*) Papaver hybridum, L.
238. Parietaria debilis, Forst. f.
239. Patersonia glabrata, R. Br.
240. ,, glauca, R. Br.
241. ,, longiscapa, Sweet
242. Pelargonium australe, Jacq.
243. Persoonia juniperina, Labill.
244. Phyllanthus Gunnii, Hook. f.
245. (*) Picris hieracioides, L.
246. Pimelea axiflora, F. v. M.
247. ,, collina, R. Br.
248. ,, glauca, R. Br.
249. ,, humilis, R. Br.
250. ,, ligustrina, Labill.
251. ,, linifolia, Sm.
252. Pittosporum bicolor, Hook.
253. Plagianthus pulchellus, A. Gray
254. (*) Plantago lanceolata, L.
255. (H.) ,, varia, R. Br.
256. Platylobium formosum, Sm.
257. ,, triangulare, R. Br.
258. Poa Billardieri, Steud.
259. ,, cæspitosa, Forst. f.
260. Podolepis acuminata, R. Br.
261. Podosperma angustifolia, Labill.
262. (H.) Polygonum minus, Hudson
263. Polypodium australe, Metten
264. ,, Billardieri, Willd.
265. Pomaderris apetala, Labill.
266. ,, racemosa, Hook.
267. Poranthera microphylla, Brongn.
268. Potamogeton natans, L.
269. Prasophyllum australe, R. Br.
270. ,, brevilabre, Hook. f.
271. ,, elatum, R. Br.
272. ,, fuscum, R. Br.
273. ,, patens, R. Br.
274. Prostanthera lasiantha, Labill.
275. Pteris aquilina, L.
276. ,, comans, G. Forster
277. Pterostylis barbata, Lindl.
278. Pultenæa daphnoides, Wendl.
279. ,, mollis, Lindl.
280. ,, paleacea, Willd.
281. ,. scabra, R. Br.
282. ,, stricta, Sims
283. Ranunculus aquatilis, L.
284. ,, hirtus, Banks and Soland.
285. ,, lappaceus, Sm.
286. (*) ,, muricatus, L.
287. ,, rivularis, Banks and Soland.
288. Restio tetraphyllus, Labill.
289. (H.) Rhagodia Billardieri, R. Br.
290. Ricinocarpus pinifolius, Desf.
291. Rubus parvifolius, L.
292. (*) Rumex Acetosella, L.
293. Sambucus Gaudichaudiana, D.C.
294. Samolus repens, Pers.
295. Scævola microcarpa, Cav.
296. ,, suaveolens, R. Br.
297. Schizæa bifida, Willd.
298. Schœnus brevifolius, R. Br.
299. Scirpus lacustris, L.
300. ,, nodosus, Rottb.
301. Scutellaria humilis, R. Br.
302. Sebæa ovata, R. Br.
303. Siegesbeckia orientalis, L.
304. Selaginella uliginosa, Spreng.
305. Senecio lautus, Soland.
,, ,, variegated
306. ,, odoratus, Hornem.
307. ,, vagus, F. v. M.
308. ,, velleioides, A. Cunn.
309. (*) Silene gallica, L.
310. Sium latifolium, L.
311. Solanum aviculare, G. Forster
312. Sphærolobium vimineum, Sm.
313. Spinifex hirsutus, Labill.

314. Spyridium parvifolium, F. v. M.
315. Stackhousia linarifolia, Cunn.
316. ,, spathulata, Sieber
317. ,, viminea, Sm.
318. Stellaria flaccida, Hook.
319. Stenopetalum lineare, R. Br.
320. Stipa flavescens, Labill.
321. ,, teretifolius, Steud.
322. Stylidium despectum, R. Br.
323. ,, graminifolium, Sw.
324. Stypandra cæspitosa, R. Br.
325. ,, also a pale yellow form
326. (H.*) Suæda maritima, Dum.
327. Swainsona lessertifolia, D. C.
328. Tecoma australis, R. Br.
329. Tetrarrhena juncea, R. Br.
330. Tetratheca ciliata, Lindl.
,, ,, var. alba.
331. ,, ericinum, Sm.
332. Thelymitra aristata, Lindl.
,, pale coloured
333. ,, flexuosa, Endl.
334. ,, ixioides, Sw.
335. Thomasia petalocalyx, F. v. M.
336. Threlkeldia diffusa, R. Br.
337. Thysanotus tuberosus, R. Br.
338. Tillæa recurva, Hook. f.
339. ,, verticillata, Steud.
340. Tmesipteris tannensis, Bernhard.
341. Todea barbara, L.
342. Trichomanes humile, Forst.
343. Triglochin procerum, R. Br.
344. ,, striatum, Ruiz. and Pav.
345. (H.) Typha angustifolia, L.
346. Urtica incisa, Poir.
347. Utricularia dichotoma, Labill.
,, ,, white flowered.
348. Veronica calycina, R. Br.
349. ,, Derwentia, Andr.
350. ,, gracilis, R. Br.
351. ,, notabilis, F. v. M.
352. Villarsia reniformis, R. Br.
353. Viminaria denudata, Sm.
354. Viola betonicifolia, Sm.
355. ,, hederacea, Labill.
,, ,, var. Sieberiana
356. Wahlenbergia gracilis, Schrad.
357. Wurmbea dioica, F. v. M.
358. Xanthorrhœa australis, R. Br.
359. ,, minor, R. Br.
360. Xanthosia tridentata, D.C.
361. Xerotes longifolia, R. Br.
362. ,, Thunbergii, F. v. M.
363. Xyris gracilis, R. Br.
364. Zieria Smithii, Andr.

Natural Orders Represented.

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Report on Zoology by P. R. H. St. John.

No rabbits, but a few hares, were seen, as well as more than a score in all of native bears, some bandicoots, and a fair number of wallabies. Both deer (introduced many years ago) and lyre-birds were distinctly heard, but not seen. Dingo tracks were very abundant, but snakes appear to be comparatively scarce. On the whole, the vertebrate fauna was scanty, as compared with what it should be, and with what it will undoubtedly become under proper management.

Among the birds seen the Black Swans were particularly numerous and interesting, but as regards individual numbers the bird-life of the Park is scanty, and requires fostering. On the appended list any birds observed during the 1905-1906 trip, as well as on the present one, are marked with an asterisk.

*Acanthiza chrysorrhoa	Yellow-rumped Tit
,, lineata	Striated Tit
*Acanthorhynchus tenuirostris ...	Spine-billed Honey-eater
*Acanthochæra carunculata ...	Red Wattle-bird
*Acrocephalus australis	Reed Warbler
Ægialitis melanops	Black-fronted Dotterel
Anas gibberifrons	Grey Teal
* ,, superciliosa	Black Duck
*Anthus australis	Pipit
Aprosmictus cyanopygius ...	King Lory
Artamus sordidus	Wood-Swallow
Biziura lobata	Musk Duck
Burhinus grallarius	Stone Plover
*Cacatua galerita	White Cockatoo

Cacatua roseicapilla ..	...	Rose-breasted Cockatoo
Cacomantis flabelliformis	...	Fan-tail Cuckoo
Callocephalon galeatum ...	...	Gang-Gang Cockatoo
*Calyptorrhynchus funereus	...	Black Cockatoo
Cerchneis cenchroides ...	...	Kestrel
Chalcococcyx basalis ...	...	Narrow-billed Bronze Cuckoo
* ,, plagosus ...	...	Bronze Cuckoo
*Chenopsis atrata ...	...	Black Swan
Cheramœca leucosternum	...	Black and White Swallow
Circus assimilis ...	...	Spotted Harrier
*Collyriocincla harmonica	...	Grey Shrike-Thrush
Corvus coronoides ...	...	Crow
*Coturnix pectoralis ...	...	Stubble Quail
*Cracticus destructor ...	...	Butcher-bird
*Cuculus pallidus ...	...	Pallid Cuckoo
*Dacelo gigas	...	Brown Kingfisher, "Jackass"
*Eopsaltria australis ...	...	Yellow-breasted Robin
*Ephthianura albifrons ...	...	White-fronted Chat
Falco melanogenys ...	...	Black-cheeked Falcon
Fulica australis ...	...	Coot (Darby River)
Gallinula tenebrosa ...	...	Moor-hen (Darby River)
Glycyphila albifrons ...	...	White-fronted Honey-eater
Graucalus melanops ...	...	Black-faced Cuckoo-Shrike
*Grallina picata ...	...	Magpie Lark
*Gymnorhina leuconota ...	...	Magpie
*Halcyon sanctus ...	...	Sacred Kingfisher
*Hæmatopus longirostris ...	...	Pied Oyster-catcher
* ,, unicolor ...	...	Black Oyster-catcher
Hieracidea orientalis ...	...	Brown Hawk
*Hirundo neoxena ...	...	Swallow
*Larus novæ-hollandiæ ...	...	Silver Gull
,, pacificus ...	...	Pacific Gull
Lobivanellus lobatus ...	...	Spur-winged Plover
Malacorhynchus membranaceus	...	Pink-eared Duck
*Malurus cyaneus ...	...	Blue Wren
Meliornis novæ-hollandiæ	...	New Holland Honey-eater
,, australasiana ...	...	Crescent Honey-eater
*Melithreptus lunulatus ...	...	White-naped Honey-eater
Menura superba ...	...	Lyre-bird (gully near Mt. Latrobe)
Nanodes discolor ...	...	Swift Lorikeet
Neophema elegans ...	...	Grass Parrakeet
*Ninox boobook ...	...	Boobook Owl
Numenius cyanops ...	...	Curlew
Nyroca australis ...	...	White-eyed Duck
Pachycephala gilbertii ...	...	Red-throated Thickhead
* ,, gutturalis ...	...	White-throated Thickhead
,, olivacea	...	Olive Thickhead
Pardalotus ornatus ...	...	Striated Pardalote
* ,, punctatus ...	...	Spotted Pardalote
Pandion leucocephala ...	...	Osprey or Fish-hawk
Petrœca bicolor ...	...	Hooded Robin
,, multicolor ...	...	Scarlet-breasted Robin
Peltohyas australis ...	...	Dotterel
*Phalacrocorax carbo ...	...	Black Cormorant
* ,, gouldii ...	...	White-breasted Cormorant
Phaps elegans ...	...	Brush Bronze-wing Pigeon
*Platycercus elegans (Pennantii)	...	Red Lory
Podiceps cristatus ...	...	Tippet Grebe (Darby River)

Porphyrio melanonotus ...	... Bald Coot (Derby River)
*Psophodes crepitans ...	... Coachwhip-bird
Ptilotis leucotis ...	... White-eared Honey-eater
*Rhipidura albiscapa ...	... White-shafted Fan-tail Flycatcher
,, rufifrons ...	... Rufous Fan-tail Flycatcher
*Sericornis frontalis ...	... Scrub Wren
Stipiturus malachurus ...	... Emu Wren
*Strepera cuneicaudata ...	... Grey Crow-Shrike
*Sula serrator	... Gannet
*Trichoglossus novæ-hollandiæ	... Blue Mountain Parrakeet
*Zosterops cœrulescens ...	... White-eye or Wax-eye.

CORRESPONDENCE.

THE SPECIFIC NAME OF THE INTRODUCED ROMULEA.

To the Editor of the *Victorian Naturalist.*

Dear Sir,—I note in your last issue a letter from Mr. M'Alpine quoting extracts from the last Kew *Bulletin* purporting to show that the name *R. cruciata* given to the "Onion Grass" is incorrect. I must frankly confess that I consider it unfortunate that Mr. M'Alpine, instead of doing some work or investigating this matter, prefers to quote the opinions of others.

The error on the part of the Kew authorities has arisen from the fact that there are two *R. cruciatas*—the original one of Ker-Gawl, at first placed under *Trichonema*, and a later one of Ecklon, which is invalid for priority reasons, but which could hardly be expected to agree with our Australian *R. cruciata.*

I may mention that the Cape Herbarium identified our plant as *Romulea rosea*, Eckl., var. *parviflora*, and that we followed Ker-Gawl in raising this variety to specific rank as *R.* (*Trichonema*) *cruciata*, Ker-Gawl. The British Museum identified the plant as *R. longifolia*, Baker, which is a synonym to *R. cruciata*, Ker-Gawl, following the rule that when species are shifted *en bloc* from one genus to another, the original names and authorities for the *species* must be retained in the absence of any reason to the contrary.

This irid was recorded under the name of *Trichonema ochroleuca*, Ker, in Bentham's "Flora Australiensis," vol. vi., p. 399 (1873); as *Trichonema bulbocodium*, Ker, by Mr. Reader, in the *Journal of Pharmacy*, 1887; and as *Romulea bulbocodium*, Sebast., in the "Key to Victorian Plants," 1887-8, by Mueller. In Tasmania and New South Wales it was known as *R. rosea*, Eckl. (*Trichonema rosea*, Ker-Gawl), whereas we have shown that it is the plant distinguished by Ker-Gawl as *Romulea (Trichonema) cruciata*, mainly on account of its short style. The Kew Herbarium follows Battandier (Bull. Soc. Bot. de France, 1889) in considering this character to be a variable one, and the species

therefore invalid. Kew also considers *R. rosea* and *R. bulbocodium* to be conspecific, while the confusion is further increased by the fact that the plant formerly known as *R. bulbocodium* in England is now called *R. columnæ*, Seb.

Faith is an admirable quality, but to place implicit faith in a human institution is mere childishness. I doubt whether any institution has as low a percentage of errors as the Kew Herbarium, but many instances could be given in which the dictum from Kew has differed from that of other authorities equally good, and the same institution is not likely to be right in every case. If we can find specimens of our Australian plant in which the length of the style in regard to the stamens—a most important character—varies, then it will be necessary to consider our Australian plant as a variety, *cruciata* or *parviflora*, of *Romulea bulbocodium*, Seb. ; until that is the case it must remain under its original name as a valid species. Remarks based on second-hand information without any inquiry into the facts will not advance us in any way.—Very faithfully yours,

ALFRED J. EWART.

National Herbarium,
South Yarra, 13th December, 1908.

Recording Census of the Victorian Flora.—This skeleton catalogue of Victorian plants has been prepared by the Government Botanist, Prof. A. J. Ewart, D.Sc., and issued by the Department of Agriculture, primarily with the view of facilitating the recording of the popular names of our native plants. In addition to this space is provided for recording other data, viz.—"Duration and Height," "Time of Flowering," "Colour of Flowers," "Soil and Habitat," and "Use or Character." The catalogue extends to 97 foolscap pages, and is ruled to simplify the insertion of entries. The arrangement and naming is that of Mueller's last census. We trust full advantage will be taken of this scheme by all who are capable of assisting. Such persons are desired to apply to the Government Botanist for copies, which, when filled in as far as can be, are to be returned to the National Herbarium, where the lists will be collated. It is hoped that the information so obtained will ultimately be incorporated in a popular work on Victorian botany—a desideratum badly needed both by the teacher, the student, and the mere lover of plants.

Mr. Charles M'Lennan, familiar to readers of the *Argus* "Nature Notes" as "Mallee-Bird," has been appointed ranger of the National Park, Wilson's Promontory, and, accompanied by the Committee of Management, left for the scene of his duties on the 13th inst.

The Victorian Naturalist.

Vol. XXV.—No. 10. FEBRUARY 4, 1909. No. 302.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 18th January, 1909.

The president, Mr. G. A. Keartland, occupied the chair, and about 50 members and visitors were present.

REPORTS.

It was reported that the excursion to Beaumaris on Saturday, 19th December, under the leadership of Mr. O. A. Sayce, had been well attended, but, owing to rough water, the results were not very satisfactory.

It was reported that the excursion to Heidelberg on Saturday, 9th January, under Dr. Kaufmann, had been fairly attended. The usual lagoons were visited, and numerous specimens of pond life collected, but nothing of remarkable interest was noted.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. M. Morris, Biological School, University; Mr. W. J. Reid, 66 Smith-street, Kensington; and Mr. Alex. L. Scott, 27 Evelina-road, Toorak, were duly elected members of the Club.

GENERAL BUSINESS.

The president welcomed as a visitor Mr. Robert Hall, C.M.Z.S., Curator of the Tasmanian Museum, Hobart, and said that members were pleased to have Mr. Hall with them once more, which was a reminder of the many interesting communications he had made to them from time to time when a member of the Club.

Mr. Hall, in reply, said that he greatly appreciated the welcome, and in his present position had found congenial employment, and trusted if any members visited Hobart they would not fail to call upon him at the Museum, when he would endeavour to make their visit interesting.

Mr. A. H. Mattingley, C.M.Z.S., called attention to the serious danger to the reservation at Gembrook of damage by fire, and suggested that the attention of the authorities should be called to the matter.

PAPERS READ.

1. By Mr. A. J. North, C.M.B.O.U., entitled "Notes on Newton's and the Tooth-billed Bower-birds."

In the absence of the author, this was read by the chairman. It described the finding, in November last, of the first nests and eggs of these bower-birds in the dense scrub, about 30 miles from Atherton, North Queensland, where, after a prolonged search by Mr. Geo. Sharp, with the aid of a number of abor-

iginals, several nests of Newton's Bower-bird were met with. The fact of the nest being placed in an unusual position for that of a bower-bird has probably tended to make the search for them fruitless during the twenty-five years the bird has been known to science, while the eggs are quite unlike those of typical Ptilonorhynchidæ. Only two nests of the Tooth-billed species were found, the eggs of which resemble the eggs of the Cat-bird, though the nest is totally different.

Photographs of the nests and eggs were exhibited in illustration of the papers.

The chairman congratulated Mr. North in having, through Mr. Sharp, cleared up another of the oological uncertainties of Australian ornithology, and remarked on the general characteristics of the bower-bird family.

Mr. J. G. O'Donohue stated that he had noticed in Gippsland that the Satin Bower-birds generally construct their bower or playing place near a low, stout limb of a tree, as if to obtain some measure of protection from it.

2. By Mr. J. W. Audas, entitled "Notes of a Trip to North Queensland."

The author detailed his experiences during a visit paid to North Queensland in July and August last, more particularly as regards the flora and introduced plants of the Kuranda district, where he succeeded in making a number of interesting observations.

Some discussion followed, in which Messrs. Hardy, Coghill, and Mattingley took part.

NATURAL HISTORY NOTE.

Mr. F. Pitcher drew attention to his exhibit of a specimen of *Poa* (*Glyceria*) *dives*, Victorian Sweet Grass, commonly known as "Wild Oats," from Sassafras, Dandenong Ranges, over nine feet in length; also a frond of the Bracken Fern, *Pteris aquilina*, from same locality, over ten feet long.

EXHIBITS.

By Mr. J. W. Audas.—Specimens of twenty Queensland forest timbers; *Balanophora fungosa*, R. and G. Forster; two varieties of cotton; fruits of *Elæocarpus Bancroftii*, F. M. and Bail.; "Johnstone River Almond," gnawed by scrub rats to obtain the kernel; nuts of *Helicia Whelani*, Bail., used by the aboriginals for food, in illustration of paper.

By Mr. F. G. A. Barnard.—Growing specimen of fern, *Lomaria Patersoni*, from Falls Creek, Upper Yarra.

By Mr. C. French, jun.—Ten specimens of the buprestid beetle, *Cyria imperialis*, from Mordialloc, showing variations in markings, also, polished aboriginal stone tomahawk, from Port Fairy.

By Mr. A. H. E. Mattingley.—Skin of Spoon-billed Kingfisher, *Clytoceyx rex*, Sharpe, from New Guinea.

By Mr. A. J. North, C.M.B.O.U.—Photographs of nests and eggs of Newton's and Tooth-billed Bower-birds, in illustration of paper.

By Mr. F. Pitcher.—Large specimens of grass, *Poa (Glyceria) dives*, and fern, *Pteris aquilina*, from Sassafras, Dandenong Ranges; also, wings of buff-plumaged form of English Thrush, from bird killed by cat, Melbourne Botanic Gardens, December, 1908.

By Mr. A. O. Thiele.—*Drosera binata*, from Fitzroy Falls, New South Wales; and syenite with crystals of triclinic felspar, from Bowral, New South Wales.

After the usual conversazione the meeting terminated.

BOTANICAL NOTES OF A VISIT TO THE SNOWY RIVER DISTRICT.

By Dr. C. S. Sutton.

(Read before the Field Naturalists' Club of Victoria, 14th Dec., 1908.)

Never yet having visited the eastern part of Gippsland, it will be easily understood how eagerly I seized the opportunity, which most unexpectedly presented itself in the early part of last October, of paying a visit to Orbost, on the Snowy. Here was a chance at last of making acquaintance with some of the many climbing plants in which the flora of the eastern district is so strong, all but half a dozen of them occurring there, and nearly half of them being strictly confined to that quarter. Now, too, perhaps, if the fates were very kind, would I get to where the Waratah grows, and the *Livistona australis*, our sole representative of the noble family of palms, gives tropical flavour to the landscape.

The weather was dull, cold, and threatening when I commenced my journey, and from the train the country had a very drab appearance. So few flowers were to be seen that it seemed as if spring had arrived only in the calendar and not in strict reality. Indeed, until Moe was passed very little else than *Ranunculus lappaceus* and *Craspedia Richea* was noted. At the Haunted Hill, however, things began to improve somewhat, and a section of the railway reserve was quite gay with low bushes of *Pultenæa glabra*, flowering profusely, *Glossodia major*, *Diuris* (sp.), *Leptorrhynchos tenuifolius*, and others. Still, nothing new to me was seen until between Sale and Bairnsdale, when a Callitris, presumably *C. calcarata*, began to make its appearance, and occasional other unfamiliar plants were noticed, arousing in me the desire to be out of the train, so that I could make closer examination.

Arriving at last at Bairnsdale (171 miles) the steamer was boarded, and we were very soon making our way down the Mitchell—quite a fine stream here, as streams go in Victoria, and about as wide as the Yarra at Kew. After passing Eagle Point the river turns due east, and in a little while is running between two narrow tongues of land, apparently not more than twenty yards wide in places. These silt jetties, as they are called, project straight out into Lake King for a distance of three miles, separating the river from Jones Bay in the north and Eagle Point Bay in the south, and are continued still further by shoals, in which snags are stranded and rushes are sparely growing. The jetties are made use of for farming and grazing purposes to the very end, and carry some low gums. *Melaleuca tenuifolia* was here very prevalent, and just breaking into flower. One could not but be surprised to see here so many fishing parties on both banks. Men, women, and children were in dozens, but as far as one could see they were having no luck, not even a nibble coming to them while we were passing. After leaving the channel at the end of the river Shags and Black Swans were seen in great numbers as we made across to Paynesville. The low shores of Raymond Island, covered apparently with thick tea-tree scrub, were passed in the dusk, and it was pitch dark and between 8 and 9 o'clock before we at last reached Cunninghame, at the Lakes' Entrance.

The coach for Orbost was taken the following morning, and, Lake Tyers having broken out into the sea on account of recent heavy rains, we had perforce to go by Nowa Nowa, on the Boggy Creek, which runs into the northern end of the lake. This detour increased the distance to 47 miles, which the coach takes just nine hours to do, on account of the badness of the roads. For some distance beyond Nowa, in fact, the roads are mere tracks, and it was not until we were well on towards the Snowy that a real road made its appearance.

The season being a late one, flowers were not yet much in evidence. The most prevalent species was *Platylobium formosum*, and *Prostanthera hirtula* extended over a stretch of several miles beyond Nowa. All the Acacias—*stricta*, *melanoxylon*, *verticellata*, and *discolor* were recognized—except *decurrens* had done flowering, though some still bore the remains of blossom. The country passed over consisted of low ridges of loose, dark, sandy soil, and did not appear to be made much use of, as no stock was noticed and evidence of cultivation only seen in four or five localities. The timber was of moderate size, and of the Eucalypts only *amygdalina* was in flower. Quite the most interesting moments of the day were spent in a hurried scramble from the bridge down the rocky banks of Boggy Creek, which here, at least, does not deserve the name. In the short time at my

disposal *Prostanthera rotundifolia*, in very fine flower; *Pomaderris elliptica*, bearing masses of dark orange-coloured blossom; *Lasiopetalum dasyphyllum*, *Zieria Smithii*, the ubiquitous *Correa speciosa*, *Dodonæa viscosa*, with unusually small leaves and seed-cases, and *Marianthus procumbens* were collected.

From my short experience of it I should imagine this creek would be well worth investigation on the part of the plant-lover, and I very much regret I did not stay over here on my return journey to explore it and Mount Nowa Nowa, a few miles up on the eastern bank, instead of spending the time at Cunninghame. The hotel is situated right at the bridge, looks clean and comfortable, and is usually visited by tourists from Lakes' Entrance, who walk or drive along the coast to Lake Tyers, which they traverse by boat, returning from Nowa by the coach. Of the other flowering plants noticed on the way, it will be sufficient to say only that *Hibbertia Billardieri*, with its small, yellow, sparse flowers, and *Indigofera Australis* were the most frequent, and that *Kennedya rubicunda* was not met with until just before reaching the Snowy. Here, too, I might perhaps mention that singularly few orchids were seen, the tally for my whole trip only amounting to *Caladenia latifolia*, *C. carnea*, *C. Patersoni*, and *Glossodia major*.

After the long and tedious journey, cooped up uncomfortably in the coach, it was a decided relief to come to the end of the high country and descend the steep bank of the Snowy River valley, with Orbost at last in sight, and it was not long before we were crossing the bridge spanning the fine river, here quite a hundred yards wide. At Orbost and in the immediate vicinity there is not much of floral interest. All the rich river flats, which were once covered with dense jungle are now cleared, and yield immense crops of lucerne and maize. Just previous to my visit 12 inches of rain had fallen within a fortnight, and the flats had not yet nearly freed themselves of the deluge. In a bend of the river just opposite the town some scrub seemed worth investigation, but the result of a visit proved it to consist entirely of *Hymenanthera Banksii* and *Panax sambucifolius*, the former in flower, with nothing but high bracken beneath. Just away from the river were some very fine specimens of the Mahogany Gum, *E. botryoides*, fine, tall trees, with clean, bright foliage like that of *E. corynocalyx*.

It did not take me long to conclude that if I wanted to see anything characteristic of the locality I would have to go much further afield. On inquiry, Mount Buck, thirteen miles away, was mentioned as a likely place, and there I decided to make an excursion on the last day of my stay. Cabbage Tree Creek, where the Waratah and Livistona might possibly have been seen, was eighteen miles off, and, the road being a bad one, I had

regretfully to put it out of my mind, it being quite out of the question for a one-day trip.

Meanwhile, having one precious afternoon to spare, it was to decide whether to spend it at Marlo, at the mouth of the river, among the coast plants, or in a visit to the one piece of original jungle yet remaining on the further bank of the river, about six miles down. Mr. J. Rowe, an old resident, and long interested in the local flora, whose name was familiar to me as the collector of specimens received from Mr. H. B. Williamson, having kindly offered to accompany me to the latter place, the question was settled. Crossing the bridge, the delightful prospect down the river was again admired, the gums, willows, *Eugenia Smithii*, *Acacia melanoxylon*, and *A. decurrens* fringing the banks making, with their varied shades of green, a most charming picture. On the way the road keeps close to the river, with wide, bare flats on the other side, and occasional huge two-storied barns, through the boards of which could be seen the corn cobs harvested in the previous season.

As we go the valley narrows, and at last the high ground closely approaches the river, and ends in a low ridge known as the Devil's Backbone ; it is between this and the river that the jungle has been left more or less undisturbed. Mr. Rowe informed me that the strip is reserved, but right in the middle of it some neighbouring land-owner has cleared and cultivated a patch. Although there is doubtless other similar scrub existing on the Brodribb and other rivers to the east of the Snowy, it seems very desirable that this piece, being at present the most accessible, should be preserved from further encroachment.

The first plant of interest met with was *Smilax Australis*, a stout, woody climber, armed with unmistakable prickles, and bearing globular black berries and umbels of many minute greenish-white flowers. Very soon an almost impenetrable tangle of vegetation bounded the track. The foundation or framework of the jungle appeared to comprise comparatively few species. *Eugenia Smithii*, *Acacia melanoxylon*, *Hymenanthera Banksii*, *Pittosporum undulatum* (in full bloom), and *Panax sambucifolius* were most prevalent, with occasional other shrubs, such as *Hedycarya Cunninghami*, *Acacia longifolia*, and *Pomaderris apetala*. Among these, and rioting luxuriantly, were a round dozen of lianes, and beneath in the shade that fine fern *Adiantum formosum*, with glossy black stems standing up quite two feet high, had the field almost to itself.

Of the lianes, *Clematis aristata*, covering square yards of the tree-tops with its snowy efflorescence, and *Tecoma Australis*, the only widely spread member of the Bignoniaceæ, its masses of creamy-white purplish-dotted flowers making a magnificent show, were by far the most noticeable. *Rubus parvifolius* and *R.*

rosifolius, similar in appearance, except that the flowers of the latter were larger and white, and the leaves without the investiture underneath, were in association with *Solanum pungetium* and *Urtica incisa*—all plants of a prickle, and as such appropriately found in company. *Sarcopetalum Harveyanum*, another tall, woody climber, with huge ovate-acuminate leaves, some measuring nearly six inches across, but without flower, was next noticed, and *Rhipogonum album*, also only in leaf. *Eustrephus Brownii*, with narrow lanceolate, yellowish, many-veined leaves, another representative of the Liliaceæ, was bearing orange-coloured berries. Still another lily, and somewhat resembling the last-named, but much more graceful, with slender leaves of similar shape, was *Geitonoplesium cymosum*. This was just commencing to blossom, and we were able to gather specimens with the buds of the loose cymes just opening into small white flowers. Still another climber, but not yet showing any sign of flower, was *Vitis hypoglauca*, one of the Gippsland grapes. Like the Smilax, its digitate leaf-stalk bore tendrils, and its leaf-buds were curiously protected by wing-like outgrowths of the petiole. To complete our list of lianes, *Convolvulus marginatus* and *Kennedya rubicunda*, though growing on the outskirts of the scrub, may be mentioned. With them were found *Davallia dubia*, *Pteris falcata*, *Lomaria discolor*, and *Aspidium aculeatum*. The only epiphyte seen was the little *Polypodium serpens*, clinging closely to the bark of a giant Blackwood.

It will be seen, even from my very imperfect description, that there is in this little patch of sub-tropical vegetation, alive as a part of it is with Bell-birds, *Oreoica cristata*, Lewin, something very well worth careful preservation. When the railway is built it will be only a day's journey from town. A few pounds would suffice to fence it in, and it could very easily then be made to contain such other plants peculiar to East Gippsland as do not at present occur there, and would be a veritable botanical garden for the district. I commend it in all confidence to the consideration of the committee for the preservation of our fauna and flora.

On the night before my last day in Orbost the heavens opened again, and in the morning it was raining so hard that any idea of an excursion to Mount Buck was abandoned, and I returned instead to Cunninghame. The following day, the weather having picked up, I decided to spend collecting in the vicinity. In the morning I crossed the water to the sand-hills, and visited the Signal Station and the Entrance, where the Shags and Cormorants were fishing in the troubled waters with much more success than the people on the silt jetties of the Mitchell. The vegetation of the sand-hills somewhat resembles that at Sandringham, but the species are not so numerous. Beyond a fine specimen—the only one seen—of *Stackhousia spathulata*, with long spikes of fragrant

blossoms, *Calocephalus Brownii*, *Scævola suaveolens*, and *Loranthus celastroides*, I did not meet with anything of special interest.

Having soon exhausted the possibilities of the sand-hills, I returned around the end of the water separating me from the hotel, and, crossing over to the high ground, where I gathered another climber bearing umbels of unopened flower-buds, which proved to be *Marsdenia rostrata*, *Phyllanthus Gunnii*, and *P. thymoides*, returned through a fine grove of *Banksia serrata* to the town.

In the afternoon I crossed the bridge over the water on the north of the Cunninghame peninsula and ransacked the high ground behind which Kalimna is situated. Here there were only a few plants in flower, such as *Aster stellulatus*, *Pultenæa daphnoides*, and *Indigofera australis*; but in the thick scrub fringing the lake-side were *Clematis aristata*, *Tecoma Australis*, *Geitonoplesium cymosum*, and *Smilax Australis*, with *Pteris falcata*, growing very freely, and *Pteris arguta*, and last, but by no means least, one fine bush of *Howittia trilocularis*, which I had previously unsuccessfully sought for at Mount Arapiles, in western Victoria.

NOTES ON NEWTON'S BOWER-BIRD, *PRIONODURA NEWTONIANA*, De Vis, AND THE TOOTH-BILLED BOWER-BIRD, *SCENOPŒETES DENTIROSTRIS*, Ramsay.

By Alfred J. North, C.M.B.O.U., C.F.A.O.U., Ornithologist to the Australian Museum, Sydney, New South Wales.

(*Read before the Field Naturalists' Club of Victoria*, 18*th Jan.*, 1909.)

Every ornithologist and oologist usually has some favourite family in birds, or their eggs. From the time when as a boy I first read the accounts of the bower-building habits of the family *Ptilonorhynchidæ*, of Australia, the various members of it have never once ceased to attract and interest me. Here we find a group of birds, not content with following out their ordinary natural instincts in building nests, laying eggs, and rearing their young, but who form bowers or play-grounds, which they more or less decorate with various articles, as suits the tastes of the different species. In the genera *Ptilonorhynchus* and *Chlamydodera* bones form a great portion of the objects carried to the bowers, and to a less degree shells, small stones, fruits, berries, and metallic substances; the decorations of the bowers of *Sericulus* consisting mainly of land-shells and berries. *Prionodura* ornaments its bower entirely with floral decorations, and in this respect comes closer to the Gardener-birds of New Guinea, belonging to the genus *Amblyornis*, than it does to the typical members of

PLATE 7.

FIG. 1. NEST OF NEWTON'S BOWER-BIRD (EXTERIOR VIEW).
(About ½ nat. size).

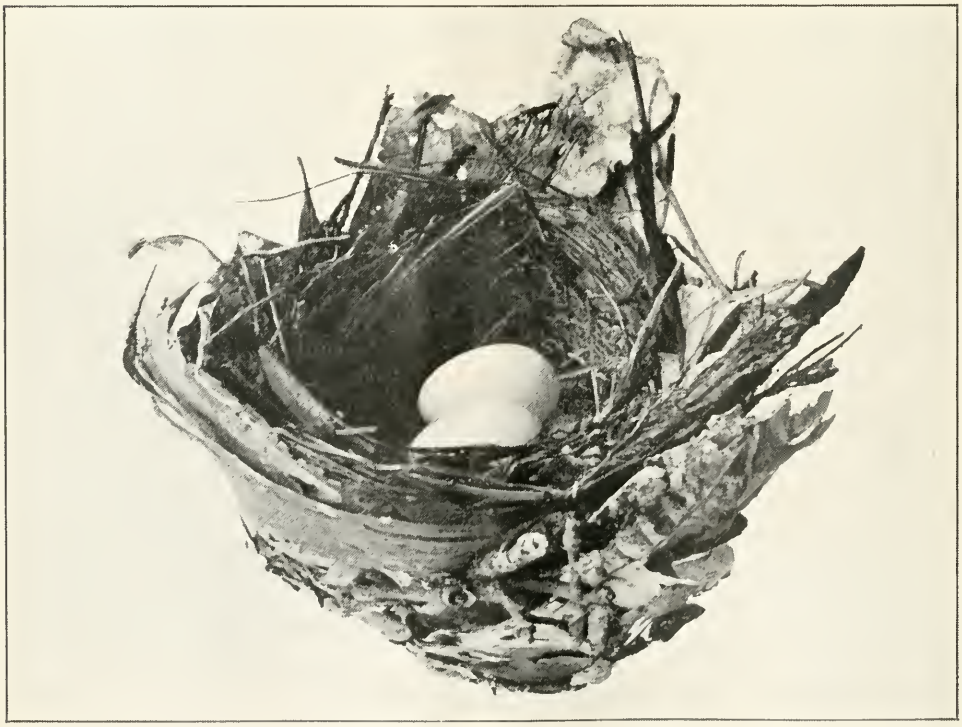
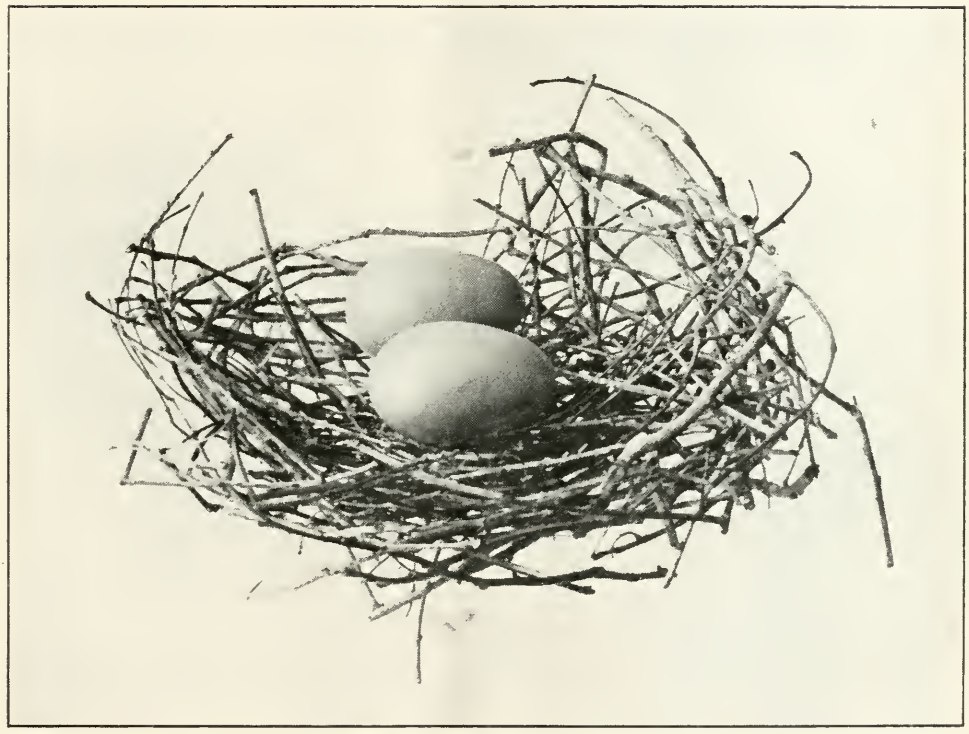


FIG. 2. NEST AND EGGS OF NEWTON'S BOWER-BIRD
(About ½ nat. size).

PLATE 8.



NEST AND EGGS OF TOOTH-BILLED BOWER-BIRD
(About ½ nat. size).

Photo. by A. J. NORTH.

the Australian *Ptilonorhynchidæ*. *Scenopœetes*, as I have pointed out elsewhere,* in habits appears to form a connecting link between the true bower-builders and the Cat-birds, the single representative of this genus contenting itself with clearing a rounded space in the scrub and placing leaves thereon, and usually with the under-side uppermost. The Cat-birds, which are also included in the family *Ptilonorhynchidæ*, so far as is known do not form bowers, or even amuse themselves like *Scenopœetes* with leaf decorations.

Little wonder, then, that the subject of my first contribution to a scientific society should be "Notes on the Bower-birds of Australia,"† and which I read at a meeting of the Linnean Society of New South Wales on the 26th December, 1886. At that time our information, except on *Ptilonorhynchus violaceus* and *Chlamydodera maculata*, was, comparatively, meagre in the extreme, and only the eggs of these two species had been described, both by Dr. E. P. Ramsay. *Prionodura newtoniana* and *Scenopœetes dentirostris* were, too, then each known only from single mutilated specimens. Some additional light was thrown on the subject at that meeting by Dr. E. P. Ramsay and myself separately describing an egg of the Regent Bower-bird, *Sericulus melinus*, Latham, taken from the oviduct, also by my description of an egg of the Fawn-breasted Bower-bird, *Chlamydodera cerviniventris*. In illustration of my paper Dr. Ramsay exhibited the eggs of these two species, among those of other species of Bower-birds. Including the Cat-birds, there are altogether eleven representatives of the family *Ptilonorhynchidæ* in Australia, of which I have had the pleasure of since describing and making known the nests and eggs of the following species:— The Eastern Bower-bird, *Chlamydodera orientalis*, Gould; the Guttated Bower-bird, *Chlamydodera guttata*, Gould; the Cat-bird, *Ælurœdus viridis*, Latham; the Spotted Cat-bird, *Ælurœdus maculosus*, Ramsay; and leaving only those of *Prionodura* and *Scenopœetes* to be described.

Let me now digress for a little while. In order to fully study the habits of the Satin Bower-bird, I kept a pair of these birds in confinement for several years, and occasionally giving them the run of a large confined place, before presenting them to Mr. J. H. Maiden, the Director of the Botanic Gardens, Sydney, who had an aviary especially erected for their reception, in which was enclosed a thickly-foliaged and wide-spreading low tree. I have seen it stated more than once that the adult male of this species evinces a decided preference for anything of a blue or violet colour, but it is contrary to my experience, for the old male when in my possession would as freely pick up and carry about in its

* North, Nests and Eggs Austr. Bds., vol. i., p. 69 (1901).
† Proc. Linn. Soc. N.S.W. (2nd ser.), vol. i., pp. 1,155-62 (1887).

bill a stalk and head of brilliant double-flowering scarlet geranium as it would a blue or any other flower. I also tried it with different-coloured ribbons, and it would pick up a red or brown piece as often as it would a blue one. About their bowers, both in Victoria and in New South Wales, I have generally found one or two blue or partially blue feathers stuck up in the walls of most of the bowers I have examined, but this was due solely to their being the rigid quills or tail feathers of *Platycercus elegans* and *P. eximius*, which are usually found frequenting the same haunts.

In captivity I have had many opportunities of watching these birds construct their bowers, and at all times that duty was performed alone by the male. In fact, the male drives the female or any other bird in the aviary away from the vicinity of the bower during the operation. It is remarkable how quickly the male works, the walls at first being built, which consist of long, thin twigs stuck upright in the soft earth, and the platform or floor being filled in afterwards. I have seen a bundle of twigs thrown in and loosely scattered about an aviary, and in less than two hours the bower would be built and completed.

PRIONODURA NEWTONIANA, Newton's Bower-bird.

Prionodura newtoniana, De Vis, Proc. Linn. Soc. N.S.W., vol. vii., p. 562 (1883); North, Abstr. Proc. Linn. Soc. N.S.W., p. ii. (27th November, 1908).

Our knowledge of the habits of *Prionodura newtoniana* and *Scenopœetes dentirostris* was largely increased by the labours, in 1888, of Mr. Kendal Broadbent, collecting in the Bellenden-Ker Range, North-eastern Queensland, on behalf of the Trustees of the Queensland Museum, Brisbane, and during the same and the following year by Messrs. E. J. Cairn and Robert Grant, performing similar duties in the same part of Queensland on behalf of the Trustees of the Australian Museum, Sydney. The late Mr. W. S. Day also collected a large number of specimens of both species during a nine years' residence at Kuranda, about 21 miles by rail from Cairns. Many private collectors, too, have searched for their nests and eggs. All attempts, however, to gain any knowledge of the nidification and eggs of either species were fruitless. Since the return of the expeditions from Bellenden-Ker Range, sent out by the Trustees of the Australian Museum, I have made every effort to obtain the nests and eggs of these two species, and more especially in 1900, when I was preparing the MS. of Part I. of the second edition of "Nests and Eggs of Australian Birds," in which the Bower-birds are included. My endeavours were ably seconded by Mr. Robert Grant, Taxidermist of the Australian Museum, Sydney, and entirely by his instrumentality they have at last been crowned with success,

furnishing Mr. G. Sharp with a coloured oil-painting of Newton's Bower-bird, which he had prepared, and which the aborgines of the Atherton district, North-eastern Queensland, instantly recognized by the name of "Coleman."

At a meeting of the Linnean Society of New South Wales, held on the 25th November, 1908, I exhibited and described the nest and eggs of *Prionodura newtoniana*, and also exhibited a skin of the female shot close to its nest.

The first nest of *Prionodura newtoniana* was found by one of Mr. George Sharp's blackboys on the 9th November, 1908, in dense scrub about thirty miles from Atherton. It is an open cup-shaped structure, formed externally of dead leaves and portions of leaves, including fragments of stag-horn ferns and a small quantity of dried mosses, and is lined inside at the bottom with thin dead twigs. Externally it measures five inches and a half in diameter by two inches and a half in depth, the inner cup measuring four inches and a half in diameter by one inch and a half in depth, and contained two fresh eggs, the female also being secured. The nest was built about the centre of an irregular-shaped perpendicular aperture in a tree trunk, about four feet long and six inches wide, and was three feet from the ground. Another nest, also containing two fresh eggs, was found in a cleft in the side of a rotten, hollow tree-trunk, and above it at equal distances in the same cleft were two old nests of the same species, the highest one being ten feet from the ground. A third nest, containing also two fresh eggs, was built between the buttresses of a tree about three feet from the ground. Sketches showing the positions of these nests were made by Mr. Sharp and sent with the eggs. Another nest, found on the 20th December, 1908, is externally triangular-shaped at the rim, and is much deeper in form, and in addition to the leaves, portions of and skeletons of leaves, is further strengthened on one side by several small sticks, which are adhered together apparently by a fungoid growth, now dead and dried, the inside of the structure being deep, cup-shaped, and lined with thin twigs and fibrous rootlets. It measures externally six inches in diameter by three inches and a half in depth, the inner cup measuring three inches and a half in diameter by two inches and a quarter in depth. This nest was built about three feet from the ground in a buttress of a fig-tree, and was supported by a number of small sticks placed crosswise from the ground to the base of the nest, and contained a single recently hatched young bird, which Mr. Sharp took and made into a skin a week latter. Most of the nests found were built in fig-trees, and contained each two eggs, but in some only an incubated egg or a young bird.

The eggs vary in form from oval to an ellipse and compressed oval, the shell being finely granulate, lustrous, and typically of a

uniform faint creamy or warm white. One set is almost dead white and lustreless, and all could easily be mistaken for pigeons' eggs except for the texture of the shell. Of fifteen sets now before me, two sets measure respectively—(*a*) 1.4 x 0.98 inches, (*b*) 1.38 x 0.97 inches; (*a*) 1.29 x 0.99 inches, (*b*) 1.25 x 0.95 inches. Six eggs measure—1.32 x 0.98 inches; 1.4 x 1 inches; 1.4 x 1.02 inches; 1.4 x 0.97 inches; 1.4 x 1.03 inches; 1.31 x 0.94 inches.

The eggs of Newton's Bower-bird are totally unlike those of the typical *Ptilonorhynchidæ*, which are noted for their strikingly contrasted colours and peculiarity of their markings. The nest, too, more resembles that of a Cat-bird or Rifle-bird, but differs from either in the position in which it is built. Probably when the nesting habits and eggs of any species of the New Guinea genus, *Amblyornis*, become known, *Prionodura* may be found to be more closely allied to that form.

A nestling about a week old is olive-brown above, or as much of the feathers as are visible from the ends of their sheaths; on the crown of the head some smoky-brown down; the forehead, sides of the head, and the throat bare; fore-neck and breast light olive-brown; thighs with a slight covering of smoky-brown down. Wing, 1.85 inches. Another specimen slightly older has a golden-olive wash to the quills, and the entire plumage is soft and downy. Wing, 2.5 inches.

I know of no species in the Australian avifauna that is affected so much by light as skins of the adult male of Newton's Bower-bird. Specimens that have been mounted and placed on exhibition for a few years, especially in hot climates, when compared with recently procured examples, have a faded and washed-out appearance, particularly of the golden-yellow under parts and portion of the tail feathers. The collection brought back contained about forty fully adult and richly coloured males.

The following information was verbally supplied to me by Mr. Sharp:—

"During our travels in different parts of the tropical jungle we found many play-grounds of the Tooth-billed Bower-bird and bowers of Newton's Bower-bird. I was more interested, however, in Newton's Bower-bird, and never tired of watching the actions of them at their meeting-places. Some of the bowers on the one side were over eight feet in height, and several of these stick-formed walls were beautifully arched over the lower side. It was amusing to watch a bird perched on the bough or stick that runs crosswise near the bottom of these structures stretch out as far as it could to ornament the inside of the higher wall with a flower, usually an orchid. Several times I removed pieces of moss, which is of one kind only, and hung them on shrubs close by, and then drew into concealment and watched, and each time

the birds showed every kind of resentment at my actions, and they were quickly replaced by one of them on the stick across the bower and close to the lower wall. At the larger bowers the males only assembled, and rarely a female, doubtless being engaged in the duties of incubation or tending their young. My blackboys informed me that these birds bathed every day before assembling at the bower, which was always about mid-day, also that if one set fire to their bower they would come round and pick off the pieces of moss before they were consumed. The former I verified one day when my boys informed me that several were bathing in the creek. Hastening to the spot, I saw five males disporting themselves in the shallow water. After a time they left it and flew into a tree, shaking out their feathers and drying themselves, as they slowly flew from tree to tree until they reached the bower. To see what they would do, although much against my will, I one day set fire to their bower. Immediately a male came and perched on a tree close by, and, with his head bowed down and drooping wings, remained motionless for nearly half an hour. I set fire to two more bowers, and the male in each instance acted in a similar dejected manner. The female builds a bower for herself, generally about twenty yards away from the one at which the males assemble. It is in every respect similar to that constructed by the male, but is much smaller, not being half the size."

SCENOPŒETES DENTIROSTRIS, Tooth-billed Bower-bird.

Scenopœus dentirostris, Ramsay, Proc. Zool. Soc., 1875, p. 391.

Scenopœetes dentirostris, North, Abstr. Proc. Linn. Soc. N.S.W., p. iii. (27th Nov., 1908).

Thirty-three years ago last November Dr. E. P. Ramsay described the present species in the "Proceedings of the Zoological Society of London" from a mutilated specimen, the bird being killed by Inspector Johnstone, of Cardwell, with a bullet, in the Sea View Range, North-eastern Queensland. It was not until thirteen years after that much knowledge was gained of its habits and a large series of specimens procured. Frequenting the same situations as Newton's Bower-bird, the history relating to its haunts and habits is so precisely similar to the preceding species that it is needless here to repeat it. Suffice to state that Mr. K. Broadbent, on behalf of the Queensland Museum, and Messrs. E. J. Cairn and Robt. Grant, on behalf of the Australian Museum, Sydney, were again instrumental in obtaining a fine series of these birds, and made us better acquainted with their play-grounds; no information, however, was gained of its nest and eggs.

During the latter half of 1908 Mr. G. Sharp undertook

to clear up the mystery surrounding the nesting habits of both this and the preceding species, and, as a collector in many parts of Australia and New Guinea, no one was more likely to meet with success. Having interests, too, in that part of Queensland, the leisure to search for these nests and eggs, a knowledge of how to treat and deal with aborigines, and ample means at his command, were undoubted factors in his eventually securing the nests and eggs of Newton's Bower-bird and the Tooth-billed Bower-bird.

At the same meeting of the Linnean Society of New South Wales, on the 25th November, 1908, when exhibiting and describing the nest and eggs of Newton's Bower-bird, I also exhibited the nest and eggs of the Tooth-billed Bower-bird, as well as the female, shot near the nest. The first nest of *Scenopœetes dentirostris* was found by Mr. G. Sharp, about five miles from Evelyn, on the 7th November, 1908. The nest of *Scenopœetes dentirostris* is a frail structure, formed throughout of twigs, coarser ones below and finer ones above, as a resting-place for the eggs; it is most flimsy and loosely built, and resembles a nest of one of the smaller pigeons or that of a dove, and averages five inches in diameter by two inches in depth. It was placed in a small, thickly-foliaged tree, about seventeen feet from the ground, and in the most dense part of the scrub. The nest contained two eggs, which are oval in form, the shell being very finely granulate, lustrous, and of a uniform creamy-brown colour, resembling very much the eggs of *Ælurœdus maculosus*, but of a more distinct brownish hue, measuring—(*a*) 1.63 x 1.12 inches; (*b*) 1.64 x 1.1 inches. Another set, taken by Mr. Sharp, on the 8th November, 1908, in the same locality, measures—(*a*) 1.68 x 1.13 inches; (*b*) 1.63 x 1.1 inches.

The eggs are typically those of a Cat-bird, but the nest is the reverse, resembling that of one of the *Chlamydoderæ*, but scantier, and formed of finer materials. Strictly speaking, *Scenopœetes* is not a Bower-bird, for it does not form a bower; on the other hand, it is not a true Cat-bird, for it forms a play-ground, which these birds do not. As I have stated before, it is a connecting link between these two groups, and might be more aptly called a leaf-turner. There is nothing, however, to be gained by altering the vernacular name which it has long been known by, that of the Tooth-billed Bower-bird. I have photographed the nests and eggs of both species, which are here exhibited.

The following information has been extracted from voluminous notes made by Mr. Sharp, or received verbally from him by the writer:—"I arrived at Atherton, North-eastern Queensland, on the 15th September, 1908, and, having finished my business there, left on the 23rd inst. for Herberton, where I stayed a few days,

exploring with a party of aborigines the neighbourhood for Newton's and the Tooth-billed Bower-birds, but without success. Hearing that the birds were to be found in the vicinity of Evelyn, I proceeded there on the 1st October, and some miles distant, with the aid of local blacks, found the haunt of Newton's Bower-bird, also one of their bowers. We all searched for nests, the boys climbing the trees to find them, but, not knowing where to look for them, failed to obtain any. On the 8th October I walked to Cedar Creek, and got another party together, consisting of members of the Glen Alice tribe, of whom the best were the brothers Jack and Dick Gerambie, Toby, Jimmy, and 'King' Billy, and of the little boys Norman, Tommy, and Billy, and arrived at Glen Alice on the 14th inst., when I had by tact gained the complete confidence of the men. I was upon the point of starting out when a message-stick was received that the Cedar Creek and Tully River blacks were to fight the Glen Alice and Herberton tribes, and I gave them permission to leave; they returned three days later, after the fight was over. From that time up to the first week in November diligent search was made for the nests of both Bower-birds. On the 7th November we all left the camp together, and had not gone 200 yards before a little boy, Norman, caught sight of a Tooth-billed Bower-bird sitting on her nest, and called out 'Werimber,' which is the native name of the Glen Alice tribe for this species, and on his doing so the bird flew off the nest. It was in a tree in the thickest part of the scrub, and about 17 feet from the ground, and we could hardly discern the nest, it was so small. We sat quiet, waiting for the bird to return, which she did in a little while, when I went up as close as possible, shook a vine, and again the bird left the nest. Then I sent the boy up to the nest, who reported that there were two 'bambo' (eggs) in it. The bird sat close and was frightened off the nest several times, when I determined to shoot it after it had got some little distance away from the nest, but although I tried five cartridges they were all damp and proved useless. Night coming on, the bird was left, and, returning the following morning, I secured both the female and her eggs. Later on the same day we found another nest of the same species, also with two eggs.

"I now turned my attention to Newton's Bower-bird, and on the 9th November, as three of the boys and I were returning to camp about 4 p.m., fairly tired of hunting, and looking forward to a good tea, as we had shot two Scrub-hens, the boys singing and beating time with sticks, Toby, one of the best collectors, suddenly called out 'Coleman,' the native name for this species, also 'bambo' (eggs). The nest was built about three feet from the ground, in a cavity in a tree-trunk, and contained two eggs, which the bird was loth to leave; in fact, I could have caught

her on the nest with my hand, but there was the risk of breaking the eggs. When frightened off the bird would return to the nest within a minute or two, but eventually I drove her about fifteen yards off and then shot her. I was now satisfied, for after nearly two months' search in all directions, and many heart-breaking failures, with the aid of my boys I had successfully discovered the nests and eggs of the Tooth-billed Bower-bird and Newton's Bower-bird. I returned at once to civilization and despatched my finds to Sydney.

"I had a surprise visit one day while at Evelyn from a collector who had been staying at Atherton for some time, and who also was in quest of Tooth-billed and Newton's Bower-birds' nests and eggs, but who had failed to locate either. I gave him one of the nests of the Tooth-billed Bower-bird, and gave him all information how and where to look for them. Later on he photographed my blackboy Norman half-way up the tree in which the first nest of this species was found, and then I took him out to a bower of Newton's Bower-bird, which he had hitherto never seen, and, after our felling trees to obtain a good light, he photographed it with a group of my boys in the background.

"Knowing now where to look for the nests of the latter species, it was only a matter of detail to search for and find others from then on until the 20th December, when I finally left the scrubs. During the latter part of my stay I had sixty-three members of various tribes on one of my expeditions, but few real workers among them, the boys from eleven to sixteen years being the best. Deluging tropical rains day after day, ticks and leeches, and living on damper made it very disagreeable for the time, and it was the reverse to a pleasure trip. During my expeditions I collected from the Tully River to Nigger Creek, and traversed parts of the country that even some of the aborigines were lost in for some days. My regular good working boys I paid a stipulated sum every week, and also rewarded them when finding a nest, and gave them presents of tobacco. The one also who obtained the most eggs during the week received an additional reward. I was alone during my trips, the only white man of the party, and when saying good-bye to me, although only blacks, some left me in tears."

Mr. Sharp will doubtless receive the thanks of all oologists in now completing our knowledge of the nests and eggs of all the species of Australian bower-birds, and all credit and honour is due to him in obtaining the nests and eggs of Newton's Bower-bird and the Tooth-billed Bower-bird. Were it not, however, for the strong inducements of his friend, Mr. Robert Grant, they would have probably still remained undiscovered, and the eggs now described would have been hatched, and the young birds flying about the bush.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 8th February, 1909.

The president, Mr. G. A. Keartland, occupied the chair, and about 60 members and visitors were present.

The chairman introduced to the meeting Mr. T. Iredale, of Christchurch, New Zealand, who had recently been studying mollusca at the Kermadec Islands; and Mr. J. C. Martin, of Berlin, who is visiting the Australasian States for the purpose of studying their marine fauna.

REPORTS.

A report of the excursion to the Zoological Gardens on Saturday, 23rd January, was forwarded by Mr. J. A. Kershaw, F.E.S., who acted as leader in the unavoidable absence of Mr. D. Le Souëf, C.M.Z.S. The excursion was well attended, and many interesting observations made.

A report of the excursion to Healesville from Saturday, 30th January, to Monday, 1st February (Foundation Day), was forwarded by Mr. R. Kelly, who reported a rather small attendance, but two interesting days' rambling resulted, and, though nothing absolutely novel was collected, the members seemed well satisfied with the outing.

A report of the junior excursion to Port Melbourne beach on Saturday, 6th February, was given by the leader, Mr. J. A. Leach, B.Sc., who reported only a moderate attendance. However, several interesting objects were met with, and an instructive afternoon put in.

The hon. librarian reported the receipt of the following donations to the library:—"History of the Birds of New Zealand," by Sir W. L. Buller, K.C.M.G. (2nd edition), 2 vols., presented by Melbourne University; *Journal of Agriculture*, Victoria, October and November, 1908, from Department of Agriculture, Melbourne; "Report of Trustees Public Library, Museum, and National Gallery of Victoria for 1907," from Trustees; "Records of Geological Survey of Victoria," vol. ii., No. 4, from Department of Mines, Melbourne; "Proceedings Royal Society of Victoria," vol. xxii. (new series), part 1, from the Society; *The Emu*, vol. viii., part 2 (October, 1908) from the Australasian Ornithologists' Union; "Forest Flora of New South Wales," by J. H. Maiden, F.L.S., Government Botanist, vol. iv., parts 1 and 2, from the author; *Agricultural Gazette of New South Wales*, October, 1908, from Department of Agriculture;

"Mineral Resources of New South Wales, No. 12—Report on Drake Gold and Copper Field," by E. C. Andrews, B.A., from Department of Mines, Sydney; "Report of Board of Fisheries of New South Wales, 1907," and "New Fishes from New South Wales," by D. G. Stead, No. 1, from Department of Fisheries, Sydney.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. B. A. L. Jardine, Somerset, North Queensland, was duly elected a country member of the Club.

PAPERS READ.

1. By Mr. A. D. Hardy, F.L.S., entitled "Further Notes on the Flora of Wilson's Promontory."

The author justified the inclusion in his report of several plants the existence of which was not supported by the list prepared by the Herbarium party, and referred to others mentioned by Messrs. Gregory and Lucas as seen by them during their visit in 1885–6. He also referred to the difficulty workers would have in identifying species, owing to the names used in the "Recording Census" issued by the Herbarium differing from those in Mueller's "Key," and thought that a list should be published showing those species the nomenclature of which it had been deemed necessary to alter.

Prof. Ewart, in replying to the author's criticisms, promised to compile a list of the alterations for publication in the *Naturalist.*

2. By Mr. E. B. Nicholls, entitled "Notes on the Teeth of Australian Animals."

This took the form of a lecturette illustrated with lantern slides. The author briefly referred to the various types of teeth occurring in the different forms of Australian animal life, and pointed out the modifications which teeth assume in some cases.

Dr. Hall congratulated the lecturer on the interesting way in which he had brought the subject before the meeting, and referred to the succession of teeth in the marsupials.

NATURAL HISTORY NOTES.

The chairman read a note by Mr. A. J. North, C.M.B.O.U., Australian Museum, Sydney, describing a pair of live parrakeets from the Northern Territory recently purchased by the Museum authorities, which differed in some respects from typical examples of *Psephotus dissimilis*, Collet, and for which he proposed the name *P. cucullatus*, Black-hooded Parrakeet.

Mr. J. Booth called attention to the use of the word "triantelope" for the spiders belonging to the genus Voconia, but discussion was postponed owing to the lateness of the hour.

EXHIBITS.

By Miss F. Bage, M.Sc., and Miss J. White, M.Sc.—Large

land snails (alive), *Helix*, sp., collected near Gympie, Queensland.

By Mr. F. G. A. Barnard.—Flowers and foliage of *Grevillea repens* collected during Healesville excursion; piece of bark of tea-tree (*Melaleuca*, sp.), from the Wimmera, used for printing on instead of cardboard.

By Miss C. Cowle.—Dried plants from Launceston, Tasmania.

By Mr. C. J. Gabriel.—Shells of following species, taken alive near Sydney Heads :—*Septa rubicunda*, Perry, *Cymatium parkinsonianum*, Perry, *C. spengleri*, Chem., *Gadinia angasi*, Dall., *Astralium fimbriatum*, Lam., *Gena nigra*, Q. and G., *Placunanomia ione*, Gray, and *Chlamys lividus*, Lam.; also *Pecten dentata*, Sow., California; *P. keppelliana*, Sow., Cape Verde Islands; *P. zigzac*, Linn., West Indies; *Chlamys purpuratus*, Lam., Peru; *C. crassicostatus*, Sow., Japan; *C. nodosus*, Lam., West Indies; and *C. ventricosus*, Sow., Panama.

By Mr. A. D. Hardy, F.L.S.—Specimen of Native Beech, *Fagus Cunninghami*, Hook., collected at Sealers' Cove, Wilson's Promontory, by Mr. King, of Metung, in illustration of paper.

By Mr. E. B. Nicholls.—Dentitions or teeth of Port Jackson Shark, Little Australian Saw-Shark, True Ray, Porcupine Fish, Crocodile, Platypus, and Tiger Cat (King Island), in illustration of paper.

By Mr. C. Plumridge.—Specimens of larvæ and perfect insects of a lantern-fly, *Scolypoba australis*, attacking ferns in a fernery at Kew.

By Mr. F. M. Reader.—Dried Orchid, *Calochilus paludosus*, from S.W. district, new for Victoria.

By Dr. C. S. Sutton.—Dried specimens of *Stenopetalum lineare* and *Xanthosia pusilla*, from Black Rock.

After the usual conversazione the meeting terminated.

EXCURSION TO HEALESVILLE.

The usual Foundation Day excursion was this year fixed for Healesville, and extended from Saturday, 30th January, to Monday, 1st February. As some eight years had elapsed since the last visit of the Club to the Healesville district—the three days camp at the Maroondah Weir in November, 1900 (*Vict. Nat.*, xvi., p. 131)—it was confidently hoped that there would be a fair muster of members, but such was not to be, and only three members joined me on the Healesville platform on the arrival of the mid-day train at 3.30. p.m. The afternoon looked threatening, and as the hour was somewhat late it was decided to send the luggage on to "Mernda," the boarding-house where accommodation had been secured for the party, and adjourn at once to the grounds of Mt. Yule, my country home, for the purpose of in-

specting the various indigenous and introduced trees and plants which find a home there. The property is bounded by the Watts or Maroondah River, and opportunity was afforded of seeing some magnificent Silver Wattles, *Acacia dealbata*, in seed; several fine Manna Gums, *Eucalyptus viminalis*, some of which were in bloom and some had just shed their bark and presented beautiful clean white trunks, hence the vernacular name "White Gum;" many fine Blackwoods, *Acacia melanoxylon*, bearing masses of reddish-brown seed-pods, which are particularly persistent in this species. Younger plants of this acacia showed several interesting stages of phyllodization. On some of the larger Blackwoods the Mistletoe, *Loranthus Quandang*, had found a footing, and was surely killing its host. This parasite was in the flowering stage. On the banks of the river were the Native Currant, *Coprosma Billardieri*, the Tree Violet, *Hymenanthera Banksii* (both in fruit), and a beautiful specimen of *Lomatia longifolia*. In the grounds, among many other fine plants, were noticed the Tulip Tree, *Liriodendron tulipifera*, and *Catalpa bignonioides* of the United States, a most useful timber tree. The Tree of Heaven, *Ailanthus glandulosa*, was covered with the red-coloured seed-pods, and presented a fine sight. Among the other trees were oaks, sycamores, elms, lindens, willows, many acacias, with rhododendrons and other garden species. A fine *Acacia Baileyana* was pointed out, the trunk and branches of which are perfectly riddled with the borings of the larvæ of the Wattle Goat-moth, *Zeuzera eucalypti*, while, as if to complete the work of destruction, *Loranthus Quandang* had taken possessson of the smaller branches. Birds find the grounds quite a sanctuary, and are much more plentiful there than in the surrounding bush. After paying a visit to the orchard and sampling various kinds of edible fruits, the waning day told us it was time to adjourn homewards.

On Sunday morning an early start was made for the new weir on the Coranderrk or Badger Creek, distant about five miles from the town. Our party was augmented by another member, who had come up by the evening train on Saturday, and my two boys, who are both keen observers. Passing through the township to the Don road we passed a small quarry in the silurian formation in which the strata are almost vertical. Our route was now south-easterly towards the magnificent cone-like range of Mt. Riddell. Along the road were seen many species of eucalypts, mostly dwarf and scrubby, such as *E. Stuartiana*, *eleophora*, *amygdalina*, with the larger *E. obliqua* in bloom—the earliest here flowering, and reminding one that it was the first of the genus discovered and described, l'Heritier giving to it the generic name in allusion to the calyx-lobes of the flowers forming a lid or covering to the stamens, &c.; previously it had been slightly known by the name Aromadendron, given to the genus by Dr.

Anderson, of Captain Cook's expedition. Here the tree is known as Messmate, the boon companion of our Stringy-bark, *E. macrorrhyncha*, whose vernacular name it bears in South Australia and Tasmania. Finer specimens were seen in the higher land later in the day. Scattered about were several fine *E. viminalis* and *E. goniocalyx*, their beautiful white boles in some cases stained pink. The former, though the Manna Gum, had no manna, but paradoxically that substance was plentifully noticed on *E. amygdalina*. Along the road our lepidopterist caught several nice specimens of the golden-barred day moth, *Agarista latinus*, and by the way were seen many plants easily identified but not in bloom. In about 3½ miles we crossed the bridge over the Badger, and close by at Sloss's farm could not but admire a group of splendid Blackwoods, tall and pyramidal, ideal shade trees. We now left the road and followed up the stream, examining many well-known shrubs by the way. Here was the Christmas Tree, *Prostanthera lasiantha*, with its last delicate labiate flowers just falling and the seed-cases well formed. This was quite the appropriate place to see it, for, from its native name, "Coranderrk," the creek and district were named; some of the aboriginals, however, call it "Gheringadah." Perhaps one of these might be adopted when fixing the vernacular names of our plants. As we proceeded we noticed the Elder, *Sambucus Gaudichaudiana*, and the Mountain Ash, *Panax sambucifolius*, both in fruit. We were getting higher, and ferns of many species occurred. The stream was crossed, and presently the weir was reached, at about two miles from the bridge. When the newly made scars on the hillside are hidden by the touch of Nature this will be one of the choicest of the nearer beauty spots of Healesville. The tall, white-stemmed specimens of *Eucalyptus regnans* up the slopes, with *E. viminalis* below, and the wealth of shrubbery and ferns along the stream, form a charming scene. The Metropolitan Board of Works, through whose courtesy we were enabled to visit this portion of the water reserves, has replanted many of the tree ferns about the new works, and consequently the necessarily artificial appearance of the weir will ere long be somewhat removed. After lunch, while some of the party more or less successfully struggled through the thick growth along the creek, in search of ferns, I, equally unsuccessfuly, searched for epiphytal orchids below the weir. Your hon. secretary was very pleased with the results of his search for ferns, and recorded about twenty species for the locality; among them were *Pteris falcata* and *P. arguta* (*tremula*). The specimens of *Lomaria fluviatilis* were some of the largest he had ever seen, the fronds being fully 18 inches in length. We half-expected two members, who proposed to come up by the Sunday train, to pick us up here, but they did not

appear, so we started homewards along the new pipe-track, intending to visit the Graceburn Weir, on the other side of Mt. Riddell, but time scored against us, and we had to be satisfied with reaching the Fernshaw road just beyond Gracedale House. The new track is rather uninteresting to the naturalist, especially at this time of year, except just at either end, the middle distance over the western slope of Mt. Riddell being poor soil timbered with *Eucalyptus macrorrhyncha* and *E. obliqua*. In the gully at the back of Gracedale the track passes through a very fine brake of *Melaleuca squarrosa* and *Leptospermum lanigerum*, with the Coral Fern, *Gleichenia circinata*, scrambling up them to the height of ten or twelve feet. Our way was now home along the Fernshaw road, with the valley of the Watts and the purple slopes of Mt. Monda on our right, the tree-clad hillside of Riddell, which we had just traversed, appearing across the Graceburn on our left. The day, perhaps a little windy for our lepidopterist, was an ideal one for botanizing, and we reached the township quite satisified with our jaunt of some twelve miles.

For the Monday the Chum Creek district was chosen—exactly the opposite direction to our trip of the previous day. This is far the best spring collecting ground near Healesville, and not without interest even at this time of year. The road leaves the Yarra Glen road just across the Watts, and keeps not far from the creek until the bald hills and grass-tree country at the foot of Mt. St. Leonard is reached, and then proceeds through the Yea River gap towards Toolangi. Along the road are quantities of the lycopod *Selaginella uliginosa*, and the fern *Lindsaya linearis*; the gums are principally *E. Stuartiana*, *obliqua*, *amygdalina*, *viminalis*, and *eleophora*, in more or less dwarf or stunted state. This is to the Napoleon of eucalyptography—well, perhaps, not Waterloo, but Moscow—to conquer it a toil, to find fire had been before him, and to return dejected. If there is a case of intercrossing of species it is here; there seems to be a *bar sinister* over the whole group, but it is interesting. I do not infer that this crossing is the cause of the want of size—that is due to the soil. The banks of the stream afforded us opportunities for getting ferns, among which were some not noted on the previous day, such as *Woodwardii caudata* and the Umbrella Fern, *Gleichenia flabellata*. At the State school a halt was made for lunch. Here was noticed *Grevillea alpina* bearing its last blooms. Leaving the rest of the party to while away the time to their individual tastes—and which they did very successfully, adding several beetles, notably a prettily marked buprestid, *Stigmodera*, sp., and numbers of the Diamond Beetle, *Chrysolophus spectabilis*, in its many varieties, to the collections—your secretary and I pushed on for another couple of miles to a barren spot, where, two years previously, I had found a peculiarly

isolated patch of a Grevillea, which I take to be *G. repens*. In the next gully to the west, Long Gully, was found some years ago the beautiful *Clematis aristata*, var. *Dennisii*, named and described by Mr. W. R. Guilfoyle in the *Naturalist* of December, 1898 (vol. xv., p. 97). This apparently was its only habitat, and though it survives in cultivation at the Botanic Gardens, it has, I believe, been lost from this district from repeated burnings and clearings. From these two instances of isolation, complete or partial, it seems to me that on these botanically unexplored slopes other unique specimens might be found, and that it might be worth while on future expeditions to give them a trial in preference to those more gorgeous spots which persistently attract. We duly reached the hill, situated in section 90 of the parish of Tarrawarra North, and after searching perhaps acres of the plant, which is quite prostrate, we were fortunate enough to find one in bloom—a month later than I found it in full bloom in 1907. Spurred on by our good luck we eventually succeeded in getting several more specimens, some of which I hope will retain their freshness sufficiently for exhibition at to-night's meeting. As we returned, late specimens of *Comesperma ericinum* were added to our list, and later on *Gompholobium Huegelii* and *Persoonia juniperina* were met with in bloom. Several lizards were seen as we passed along, and a Black Snake was killed, while another was too quick for us. The day was another delightful one for rambling, and we got back to Healesville in ample time to pack up for the evening train, my companions telling me it was a most enjoyable outing, and not without its results. As for myself, being a country member, and unable to attend the Club meetings, it was quite an event to have some kindred spirits with whom to roam the bush.—Reginald Kelly.

NOTE ON SOME LIVING EXAMPLES OF *PSEPHOTUS DISSIMILIS*.

By Alfred J. North, C.M.Z.S., Ornithologist to the Australian Museum, Sydney.*

While examining a number of live birds in Sydney, in the possession of Mr. Fritz Kruger, who had recently brought them from the Northern Territory of South Australia, my attention was immediately attracted to a cage of parrakeets of a species I had not seen before. Although differing in several respects from Professor Collet's description of *Psephotus dissimilis*, I had little hesitation in referring them to that species, particularly as they were obtained in the same locality—Pine Creek, 200 miles south-east of Port Darwin. There were 16 birds altogether—five fully-

* By permission of the Trustees of the Australian Museum.

plumaged adult males, the remainder females and young males—and an adult pair was secured on behalf of the Trustees of the Australian Museum. While, however, Mr. Kruger was removing them from one cage to another, opportunity was taken of critically examining them and taking the measurements of the adult male.

From Professor Collet's description of the adult male of *Psephotus dissimilis*, the living bird differs in the following respects :—The feathers from the sides of the base of the lower mandible, extending in a line immediately below the eye on to the sides of the nape and upper portion of the hind-neck, are black, and gradually pass into a dark greyish-brown on the upper portion of the back and the scapulars ; the lesser, median, and greater wing coverts are entirely golden-yellow ; the under tail coverts are pale scarlet with whitish margins ; bill faint bluish-horn colour, cere slightly darker ; legs and feet rich fleshy-grey brown ; iris black, eyelid dark greyish-black. Total length, 10.5 inches ; wing 4.9, tail 6, bill 0.5.

Professor Collet describes the adult male of *Psephotus dissimilis* as "forehead, lores, and crown dark chestnut," and Dr. E. Hartert,† of *P. dissimilis* (*?*), "crown of the *male* is dark brown, not at all chestnut," and again Professor Collet states that the greater wing coverts of *P. dissimilis* are black, and the lower (under) tail coverts orange.

The female agrees fairly well with Professor Collet's description, except that the cheeks are pale blue, not grey, as are also the ear coverts, and that the under tail coverts are paler than in the male.

Young males resemble the adult females, but the feathers of the cheeks and sides of the throat and neck are pale verditer blue, and some of the feathers at the base of the bill, and on the forehead, are black. Although these birds are fairly tame, one young male was so quarrelsome, attempting to bite any others that came near it, that eventually it was removed from the cage.

What I regard as the chief point of difference is that not only are the lores, forehead, and crown of the head of the adult male *black*, but that this colour extends down the anterior portion of the cheeks to the sides of the base of the lower mandible. Viewed in front, the bird appears to wear a black mask or cowl. Should it prove to be distinct, I propose to distinguish it under the name of *Psephotus cucullatus*, and vernacularly as the Black-hooded Parrakeet. Owing to the larger golden-yellow wing-patch, and greater extent of black on the head, it is a more showy and attractive species than its ally, the Golden-winged Parrakeet, *Psephotus chrysopterygius*, which is also found in the Northern Territory of South Australia. Sydney, 6th February, 1909.

† "Nov. Zool.," vol. xii., p. 214 (1905).

NOTES OF A TRIP TO NORTH QUEENSLAND.

By J. W. Audas, Assistant, National Herbarium, Melbourne.

(Read before the Field Naturalists' Club of Victoria, 18th Jan., 1909.)

A visit to Queensland cannot fail to be interesting to the nature student at whatever time of year it may be undertaken, and therefore, when I left Melbourne in July last for a four weeks' holiday, I determined to make an effort to collect such information and specimens as would prove of value in future years. The steamer arrived in Sydney in the midst of heavy rain, which continued during the two days of our stay, consequently nature study there was out of the question. However, on arrival in Brisbane more genial weather prevailed, and I was enabled to see a great deal of the city and its surroundings. Here, though 17 miles from its mouth, the River Brisbane is ample enough to allow large vessels to come right up to the city wharves. A prominent feature near at hand is Mt. Coo-tha, where one can get a glance at the indigenous vegetation, and admire the broad stream wending its way to the sea.

Taking a short train journey of eight miles to Nudgee, I got my first glimpse of a pineapple plantation, hundreds of acres of which were to be seen in full bearing. Two principal crops are picked during the year, but the fruit is obtainable in lesser quantity at all times. When in cultivation the pineapple plant bears one pine for the first crop. When this is removed the plant sends up several shoots, which in their turn also fruit, but successful pine growers do not allow these shoots to fruit, as their crop would be inferior, but snip them off and use them for young plants, which in that sub-tropical climate can be planted at any time of the year.

I paid a visit to the Brisbane Botanical Gardens and interviewed the director, Mr. J. Bailey, who kindly showed me through the conservatories, and pointed out for my admiration the many beautiful orchids and other hot-house plants. Crotons and Acalyphas were doing particularly well in the open. The gardens contain some very fine palms, among which were noticeable the Royal Palm, *Oreodoxa regia*, H. B. et K., Date Palm, *Phœnix dactylifera*, L., and *Archontophœnix Alexandræ*, H. Wendl. and Drude, a Queensland palm.

At the Agricultural Department, in George-street, overlooking the river, which is spanned by a magnificent bridge fully a quarter of a mile long, and where most of the public offices are situated, I renewed my acquaintance with the Queensland Colonial Botanist, Mr. F. M. Bailey, and was pleased to find him well, and (though now at the age of 81 years) still able to carry on his duties with interest and energy.

In and around Brisbane, and in fact throughout all of northern Queensland, I noted that many of the houses are built on piles

some 12 or 15 feet above the ground, the reason for which I did not discover, but it would probably be to escape the ravages of the termites or white ants, which are very destructive to buildings and furniture throughout the State. It was very rarely that a chimney could be seen in any of the private dwellings, the climate being so warm as to render fires unnecessary. After leaving Brisbane, on the 1st of August, and before passing Lady Elliot Island, situated just below the tropic of Capricorn, we were fortunate in seeing a shoal of Flying Fish, a species of mackerel which abounds in these waters. It was a lovely sight to see them rising clear out of the water and "flying" for a hundred yards or more, the sunlight turning their wings to silver, gold, and many iridescent colours. I was not able to visit Rockhampton, for, on arrival at Keppel Bay, from which communication is made with the city by lighter and launch, there was not sufficient time available to go ashore, as the city is some 40 miles up the Fitzroy River.

Mackay, although on the coast, is also communicated with by lighters, which ply to the vessels at anchor about a mile and a half from the shore. It seemed rather unfortunate that a city of such big industries should be handicapped by lack of shipping facilities, the water being shallow for such a long distance from the shore as to make the construction of a jetty a matter of very considerable expense. It is the principal centre of the sugar trade of Queensland—"Sugaropolis," as it is called—and all the products of its huge sugar mills have to be taken to the vessels for loading by the lighters previously mentioned.

Steaming away to the north of Mackay we pass through the far-famed Whitsunday Passage, studded with coral islands of all shapes and sizes, some rising hundreds of feet above sea level, timbered with Hoop Pine, *Araucaria Cunninghami*, and other varieties; others low-lying, destitute of vegetation, and at high tide overswept by the sea. Navigation through these islands is a matter of expert seamanship. At the northern end of the Whitsunday Passage is Dent Island, on which is situated the lighthouse which guards the entrance to the Passage, and to the west lies the famous Lion or Pentecost Island, so called because it presents a remarkable resemblance to a recumbent lion with head erect when viewed from certain points. Immediately on leaving the Passage the town of Bowen appeared in the distance, and very shortly afterwards our steamer was berthed beside the jetty. Having two hours to spare at this port, I landed and walked towards the town; noted a fine grove of Cocoanut Palms close to the beach, also Mango trees well out in flower, and some nice specimens of *Poinciana regia*, with seed-pods nearly two feet in length. The town, though small, boasts a museum of some importance, and an inspection of it would be of interest to students of zoology.

The approach to Townsville is heralded by the treeless Castle Hill, which rises so abruptly as to appear almost perpendicular from a seaward point of view, and nestling round its base lies the city, with Mt. Stuart to the west and Mt. Elliot to the south, while about six miles to the north lies Magnetic Island, so named by Captain Cook because the action of the compass was affected when his vessel was in proximity to it. This island is well patronized as a watering-place by the Townsville folks, the vegetation being left in its natural state, and *Abrus precatorius* flourishes exceedingly, its seeds, red with black spot (prayer seeds), being greatly admired, and gathered by tourists as souvenirs. Along the beaches many handsome shells, and occasionally large pieces of coral, may be found.

At "Acacia Vale," a show spot lying some four miles to the west of Townsville, I noticed some fine specimens of *Poinciana regia*, and was struck by the particularly fine growth of the cocoanut palms, which were to be seen here in full bearing, with the fruit adhering closely to the axil of the leaves of the main stem. I examined a nut which had fallen to the ground and in which the process of germination had started; the "plumule" had grown about a foot and the "radicle" had already taken hold of the earth. This particular specimen I brought back with me, and it was afterwards exhibited in the Government Botanist's exhibit at the Royal Show in September last, and is now in the carpological collection at the Melbourne University. After spending a delightful hour in the shade of a huge Robinia, and partaking of some choice strawberries, ripe and luscious as only Queensland strawberries can be, I was compelled to bid a reluctant farewell to the genial hostess, Mrs. Gulliver. The monotony of the drive back to Townsville was broken by the sight of a flock of fully a hundred Ibis, with their striking plumage of glossy black body and white breast, feeding along the mud flats, which cover some miles in this locality, and which at high tide are inundated by the waters of Ross Creek. Nearer to the city the growth of the castor oil plant was so prolific as to have become a vegetable pest.

Our steamer, a vessel of 6,500 tons, was of too large a type to pass through the famous Hinchinbrook Channel, and, in consequence, I was unable to see that interesting part of the voyage. A few miles out from Townsville a whale was sighted playing about a few hundred yards from the vessel. Forging away to the north the view presented the bold heights of Bartle Frere and the peaks of Bellenden-Ker, the highest points of these two mountains being respectively 5,400 feet and 5,200 feet, and after rounding Cape Grafton, at the entrance to Trinity Bay, we were soon berthed at a wharf facing the main street of the town of Cairns. The city itself is only a few feet above sea level, and during the hot weather is often scourged by dengue fever and other pestilent diseases peculiar to moist tropical climates. On

the waste places around the town a periwinkle, *Vinca rosea* (a hot-house plant in our climate), grows in the greatest profusion.

At Cape Grafton is situated the Yarrabah Mission Station, where a population of some 300 aboriginals are in the charge of the Rev. E. Gribble. The institution, with grounds of some 300 acres in extent, is almost self-supporting, but receives a small Government subsidy. The work carried on is principally tree-felling, gardening, and farming, and the products of these industries are disposed of at Cairns, being conveyed thither by a motor launch (worked by two blackboys), which, laden with dairy produce, vegetables, &c., may be seen journeying thither twice weekly. The buildings, which the aboriginals erect themselves, are situated on the sloping ridges facing Trinity Bay. The settlement boasts a gasworks, a steam saw-mill, an up-to-date hospital, and a waterworks, while the literary taste of the natives is catered for by a regular weekly paper printed in "pigeon" English.

On the morning of 6th August I made an early start by the 7 a.m. train, bound for Kuranda, which is situated 21 miles inland from Cairns, and which was the most northerly point I visited. *En route* I alighted at Redlynch to inspect the Kamerunga State Nursery, and, following a track along the Freshwater Creek, on the banks of which grew some fine specimens of the Paper-bark Tree, *Melaleuca leucodendron*, while in the water were a great many showy water-lilies, probably belonging to the genus Nymphæa. After a particularly trying walk of two miles in the moist Queensland heat I reached the nursery.

The Inspector of Tropical Agriculture, Mr. H. Newport, was absent in Brisbane, but Mr. Malcolm, the overseer, kindly showed me round the grounds, which comprise an area of 30 acres. At this nursery no pretension is made at landscape gardening or showy flower beds and lawns such as we are accustomed to see in our Melbourne Botanical Gardens, but a small conservatory is kept, and a few bright-coloured flowers adorn the main walk. Along the front entrance is a nice plantation of Alexandra Palms, and near by are other palms of commercial value—viz., the Cocoanut Palm, *Cocos nucifera*, L., the Sugar Palm, *Arenga saccharifera*, Labill., and the Oil Palm, *Elaeis guineensis*, Jacq. On the better developed fruit spikes of the latter were hundreds of fruits, about the size of a walnut, clustering closely together. About five acres is set apart for the propagation of rubber-producing trees, the one chiefly grown being *Hevea braziliensis*, commonly known as Para, but other kinds producing good rubber are *Ficus elastica* (Rambong or Assam), *Castilloa elastica* (Central American), *Manihot Glaziovii* (Ceara rubber), and *Tabernæmontana crassa* (West African rubber). The milky secretion or latex of these trees is of

great commercial value, and is obtained by making incisions in the bark, through which the latex exudes and afterwards hardens. This operation is called "tapping," and the time at which it may be performed is settled more by the size of a tree than by its age, and usually the smallest size tree tapped would measure 17 or 18 inches in circumference at a height of four feet from the ground. It takes about four years under very favourable conditions for a rubber tree to attain this size, and about six years without careful cultivation. The cups used for collecting the latex are of various sizes, generally about three inches across at the top, with sloping or rounded bottoms, which, however, do not prevent their standing on level ground. Some of the latex hardens about the incisions in the bark before it can flow into the collecting cups. This is known as "scrap," and it has to be removed by hand, or otherwise it would prevent the flow of the latex. This operation has to be performed every day, as, if allowed to coagulate for a period longer than twelve hours it becomes difficult to manipulate. From one variety the latex is obtained from the fruit, which is about the size of a cocoanut, but it is said to be of inferior quality.

An interesting feature was the collection of fibre plants, the one chiefly cultivated in Queensland being the *Agave rigida*, variety *Sisalana*, Sisal Hemp, and for the product of which a ready market is found in New York, where it is used in the manufacture of rope. Many plants were in bloom, the bulbils growing in thick clusters, and the inflorescence in some cases 30 feet high. This plant has been known to grow for 100 years before reaching the flowering stage, and has for that reason been called the Century Plant. *Fourcroya gigantea*, Mauritius Hemp, is similar in appearance and growth to the Agave, belonging to the same natural order, Amaryllideæ; it sends forth great numbers of leaves, from six to nine feet in length, which produce a great amount of fibre, but it is not of such commercial value as Sisal hemp. Another useful fibre-producer is *Musa textilis*, Manilla Hemp, which furnishes the well-known Manilla rope.

Just at the present a great deal of attention is given to the cultivation of the tobacco leaf, chief varieties grown being:— Florida, Brewer's Hybrid, Zimmer's Spanish, and Giant Lemon. Very often the plants are cut down by the severe frosts, but they quickly ratoon again. The cut leaves, after being thoroughly aired in a drying shed, are packed and pressed in boxes, a grader being used to sort the sizes. The stalks are used for snuff-making.

Some introduced varieties of cotton are grown, such as Upland and Sea Island, but several varieties which produce good cotton now claim attention, these being Truett's Big Boll (a Queensland hybrid), of fine quality, pure white, and a profuse bearer. In cultivation cotton thrives best in a good sandy loam, not too

rich in humus (decayed vegetable matter). When ready for picking the bolls turn brown and burst open. In a few days the boll husk will have also opened, exposing the soft, dry cotton, which adheres so loosely to the pod that it may be removed by a slight pull. Experiments are now being carried out to decide which districts of Queensland are suitable for the profitable cultivation of Upland and Sea Island cotton.

The Arnatto plant, *Bixa orellana*, L., indigenous to South America, is being experimentally cultivated. Outwardly the fruit greatly resembles that of the castor oil plant, and from its seeds a pigment used for butter-colouring is obtained. The fruit of *Artocarpus incisa*, L., true Bread Fruit, a plant native of the South Sea Islands, attracts attention by its great size, the slightly globular-shaped fruits being terminal on long peduncles. It is a very nourishing fruit, and may be cooked in a variety of ways, either fried in slices or baked entire, after the manner in which it is roasted by the natives. Many delicious fruits, quite unknown in our State, are cultivated. Custard Apples, of the genus Anonas, such as Sour Sop, Sweet Sop, Bullock's Heart, and Cherimoyer. The Granadilla and Paw-paw, wholesome tropical fruits, belonging to the same natural order, Passifloreæ, both do well. The former is a vine, easily grown from seed, and trained on trellis. The seeds of the fruit only are eaten, but the outer pulpy covering is sometimes used in cooking. The fruit of the latter resembles a rock-melon somewhat in shape and flavour, and is produced in the axil of the leaves in thick clusters.

The Mango, *Mangifera indica*, L., is the commonest fruit grown in Queensland, flourishing in all parts of the State, the large glossy leaves varying in shape and colour in the different varieties, ranging from palest cream to the brightest of crimson. It is as hardy as a forest tree, requires but little attention, and bears an abundance of fruit, which exhibits the same peculiarity of varying colour. A particularly delicious fruit known as Rose Apple, *Eugenia jambos*, L., is not yet cultivated in Victoria to any extent, but could be grown to advantage even in our mildest parts. *Vanilla planifolia*, belonging to the Orchideæ, requires a special host, and must be planted to creep upon a shady tree. From the pods of this plant the well-known vanilla essence is made. Somewhat similar in form of growth is *Piper nigrum*, black pepper being made from its berries. The gardens abound with plants used in the manufacture of spice. I noted *Curcuma longa*, L., from the roots of which is made one of the chief ingredients of curry powder. *Pimenta officinalis*, Lindley, the berries being used for allspice, and the young shoots are a valuable adjunct to the umbrella trade. *Zingiber officinale*, Roscoe, the variety which is largely imported into England for making what is known as preserved ginger, the young, succulent roots only being used for candying, the multiplication being

effected by division of the remaining roots. *Canna edulis*, Edwards and Ker, and *Manihot utilissima*, Pohl., are two starch-producing plants which, when better known, will be more extensively cultivated in our State. The Kapok Tree is grown, not for commercial purposes, but for its ornamental qualities. I greatly admired the large leaves of the Teak Tree, *Tectona grandis*, Lin. f., some attaining a size of 6 feet in length by 20 inches in breadth. It is a deciduous tree, and its timber is greatly esteemed by ship-builders. A special plantation is set apart for cultivating tea, coffee, and cocoa.

Having thanked Mr. Malcolm for his courtesy, I returned to the railway station. On the way thither my attention was attracted by the prolific growth of the Chinese Burr, *Triumfetta rhomboidea*, Jacq., which was quite a scourge, having literally overrun the place. It is a soft-wooded shrub of the order Tiliaceæ, attaining the height of about five feet, bearing yellow flowers, the seed of which resembles Bathurst Burr. Another pest, flourishing beneath the Chinese Burr, was the Red Head or Milky Cotton Bush, *Asclepias curassavica*, L.

In and around Redlynch, which is situated on a delta of the Barron River, the banana is extensively cultivated, and other tropical fruits. Onward from Redlynch for the next 15 miles, our route wandered over mountain ranges, displaying a charming variety of tropical vegetation telling its own tale of abundant rain and heat. The train climbed upwards, negotiating steep grades, and at times creeping along treacherous-looking cliffs, till at last we came in sight of the Stony Creek Falls. Ten minutes was allowed here to view the falls, which descend in a winding stream from a fern-covered height of 300 feet, and are situated so close to the railway line that the foam has been known to splash over the cars. Overlooking the gorge of the Barron River stands a pinnacle of reddish-grey granite, the outer fragment of a shoulder through which the line was cut. It was formerly called Italian Rock, because a descendant of that sunny land had hoisted his national flag upon it, but it is now known as Robb's Monument, because the late Mr. John Robb, of Melbourne, was the contractor who built that portion of the line. It is said that dynamite plugs had actually been placed for its overthrow, but, fortunately, someone with an eye for the picturesque urged its preservation.

We passed through many tunnels, but the longest (about two miles) was met with just before reaching the Barron Falls. From the railway station, situated at the falls, a pathway has been cut through the tropical vegetation, which enables visitors to go down almost to the water's edge. At the time of my visit the falls were only at about half flood, but I considered the volume of water rolling down in all directions from a height of 700 feet to be a magnificent spectacle. How much finer must it

be in the rainy season. In close proximity to the falls stands a huge Kauri Pine tree—the last of a whole forest—which by good fortune has been preserved from destruction, and is pointed out to visitors as the last of its fellows.

After viewing the falls for a short time, I proceeded to Kuranda, two miles further on, and was soon comfortably located at the Kuranda Hotel. I noted with astonishment the number of indigenous and introduced weeds which flourish in this locality, the most pestiferous being the Sida Weed, *Sida rhombifolia*, L., commonly called *Sida retusa*, which bears countless seeds, which are distributed in various ways, sometimes in the hoofs of stock. The Prickly Pear, *Opuntia vulgaris*, Mill., has a fruit full of seeds, which is eaten by birds, and thus carried about the country. Goat Weed, *Ageratum conyzoides*, L., Black-eyed Susan, *Thunbergia alata*, Boj., *Lantana camara*, L., and *Bryophyllum calycinum*, Salisb., are all met with in the neighbourhood. Approaching the surrounding scrub the somewhat globular fruit of *Pandanus monticola*, F. v. M., one of the screw pines, showed up conspicuously. The fruit-spike is usually about a foot long, with numerous fruitlets about half an inch in length, closely packed, and bearing a very similar appearance to a pineapple. A plant to be avoided when walking through the scrub is the Gympie or Mulberry Nettle, *Laportea moroides*, Wedd. It grows to a height of 15 feet, covered with most virulent stinging hairs, which, if one accidentally touches, leave an effect for weeks, or even months. Near at hand, however, is a cure, although not generally known; it consists of applying the milky latex from the base of the stem of the Cunjevoi or Native Taro, *Alocasia macrorhiza*, Schott., which grows plentifully among the scrub. Progress through the dense vegetation is greatly hindered by two species of Lawyer Palms, *Calamus australis*, Mart., and *C. Muelleri*, Wendl. The former is the larger, but they both grow to a great length, and have been known to measure 300 feet. One is very soon imprisoned by the thorny prickles of the leaf-sheath. One of the features of the scrub is a climbing fig tree, *Ficus stipulata*, Thunb., which I noticed in all stages of growth, from the tiny seedling sending down its delicate shoots from the fork of a tree of larger growth, where it was ensconced, to the fully developed tree. As the seedling grows its roots increase in size and number, forming a complete network round even the largest of trees, eventually covering it completely, thus depriving it of light and air, when it slowly dies, and the roots of the fig tree penetrate its decaying wood. The beauty of the scrub increases the further inward one proceeds, and quite defies my powers of description. Giant trees are interlaced by innumerable climbers, many bearing beautiful flowers, such as the Wax Flower, *Hoya australis*, R. Br., and the lofty climber *Rhaphidophora Lovelle*, Bail., whose habit

of growth resembles the ivy, sending forth rootlets, which adhere to the bark of its support.

I met with many fruits that I considered well worthy the attention of cultivators, but so many introduced sorts adapt themselves easily to the Queensland climate that little regard is likely to be paid to the native kinds, although their appearance is very attractive, the most striking being the large bright purple fruit of Davidson's Plum, *Davidsonia pruriens*, F. v. M. I secured some specimens of *Balanophora fungosa*, R. and G. Forster, a parasite growing on roots of trees in the scrub, which may be seen in the biological collection at the University. It resembles a mushroom, and cattle are fond of eating it. Bullocks driven through the scrub will turn aside to seek it. Some splendid specimens of orchids were to be met with, usually growing high up on the forks and branches of trees in conjunction with Bird's Nest, Elkhorn, and Staghorn ferns, and *Lycopodium phlegmaria*, L., a beautifully tasselled creeping plant. Most noticeable were *Dendrobium speciosum*, Sm., and the Pencil Orchid, *D. teretifolium*, R. Br. Some fine specimens of the Prickly Tree Fern, *Alsophila Leichardtiana*, F. v. M., were about 15 feet high. Their stem is black, very tough, and strikingly marked by white streaks. The Johnstone River Almond, *Elæocarpus Bancroftii*, F. v. M. and Bail., was very plentiful, the nuts lying about in great quantities on the ground, many of the shells, although extremely hard-wooded, having been nibbled through by scrub rats, which feed on the kernels. In like condition were the nuts of *Helicia Whelani*, Bail., the latter being used for food by the native blacks. Many valuable timbers abound in this forest, and, securing the loan of an axe from a bullock-driver whom I chanced to meet, I cut a specimen of the wood of each of the following trees, which are now also in the collection at the Melbourne University :—*Acacia polystachya*, A. Cunn., Hickory Wattle ; *Agathis Palmerstoni*, F. v. M., Northern Kauri Pine ; *Alstonia scholaris*, R. Br., White Pine or Milkwood ; *Cardwellia sublimis*, F. v. M., Glassy Oak ; *Carnarvonia aralifolia*, F. v. M., Red Oak ; *Castanospermum australe*, A. Cunn. and Fraser, Bean Tree ; *Daphnandra aromatica*, F. M. Bailey, Sassafras ; *Davidsonia pruriens*, F. v. M., Davidson's Plum ; *Flindersia Brayleyana*, F. v. M., Silkwood ; *F. Ifflaiana*, F. v. M., Cairns Hickory ; *F. Oxleyana*, F. v. M., Yellow Wood ; *F. Schottiana*, F. v. M., White Ash ; *Gmelina fasciculiflora*, Benth., White Beech ; *Grevillea robusta*, R. Br., Silky Oak ; *Stenocarpus sinuatus*, Endl., White Oak ; *Tarrietia Argyrodendron*, Benth., Crow-foot Elm ; *Tristania laurina*, R. Br., Turpentine ; *Xanthostemon chrysanthus*, F. v. M., Penda ; *Zanthoxylum torvum*, F. v. M., Satinwood.

In my rambles through the jungle, besides the plants before mentioned, I collected specimens of each of the following, which

I presented to the National Herbarium of Victoria, viz. :—*Alpinia cærulea*, Benth., Native Ginger; *Brassaia actinophylla*, Endl., Umbrella Tree; *Bryonopsis laciniosa*, Naud.; *Buckinghamia celsissima*, F. v. M.; *Clematis glycinoides*, D. C.; *Cordyline terminalis*, Kunth.; *Diploglottis Cunninghami*, Hook., f., Native Tamarind; *Eugenia grandis*, Wight, White Apple; *Flagellaria indica*, L.; *Linospadix monostachya*, F. v. M., Walking-stick Palm; *Macaranga Tanarius*, Muell. Arg.; *Mackinlaya macrosciadia*, F. v. M.; *Melastoma malabathricum*, L.; *Mollinedia Wardelli*, F. v. M.; *Pittosporum rubiginosum*, Cunn.; *Rubus rosæfolius*, L., Native Raspberry; *Tricholobus connaroides*, F. v. M.

A visit to this untrammelled region would prove interesting to bird-fanciers. Although my knowledge of ornithology is limited, the abundance of beautiful bird life compelled my admiration. Pigeons predominated. I noticed Bronze-wing, Brown, Pink-head, Small Green, Squatter, and Wonga, besides others which were unfamiliar to me. It is stated by residents of the place that the Torres Strait Pigeon flies thither from its home at the furthest point of Cape York Peninsula in the morning, and returns again at night, but this statement is disputed by ornithologists, who aver that its stay in the forest extends over a longer period. Scrub-Turkeys are numerous. They are similar to any ordinary fowl in size, though differing in plumage, being covered witb smooth black feathers, drooping tail, and red head. Black Magpies, cockatoos, and Scrub-Hens are plentiful, the latter exhibiting a striking resemblance to a Guinea-Fowl.

A particularly novel sight occasionally met with is that of a huge forest tree, whose upper limbs are almost covered by the nests of the Native Starling (as they are called in Queensland), which flock about together, building their nests in close proximity, and forming quite a noisy bird colony in places.

Another novel sight to be met with is the invasion of the quarters of the white ants by a parrakeet, which selects their mounds as a spot in which to nest, commencing operations by boring through the honeycombed exterior and forming a compartment to receive its eggs in the interior without exciting the original tenants. But these harmonious relations do not prevail between the birds and the scrub rats, the latter being very destructive to bird life. I noticed one devouring a pigeon, which, as I approached, quickly decamped, taking his quarry with him. In a decayed log I burst open I found some of the native land shells, *Helix* (sp.) But all this natural beauty is not without its drawbacks. Many dangerous reptiles abound—the Deaf Adder, whose bite is generally fatal, and others—and there are also many snakes which are non-venomous, and one of the latter, the Saltbush Snake, drab coloured, with pink eyes, I secured by coaxing it into a bottle.

An uncanny sight is myriads of large bats, known as Flying Foxes, hanging from the boughs of trees by their toes. They are troublesome to orchardists, playing great havoc on the fruit. The scrub tick, a very minute insect, is a pest that will attack human beings as well as animals, while a much larger one, the cattle tick, is hard for agriculturists to contend with. Cattle attacked by it scratch themselves continually, and the only remedy is to dip all stock periodically, which entails much expense to owners. Before leaving Melbourne I was fortunate in securing from Mr. Charles French, sen., F.L.S., the Government Entomologist, a letter of introduction to Mr. F. P. Dodds, an enthusiastic collector of beetles and butterflies, and at his home in Kuranda he kindly permitted me to examine his collection, which is a particularly fine one.

On the return journey I had only sufficient time to pay a brief visit to the Botanical Gardens at Townsville. Among the first objects to attract my attention were some magnificent Bougainvillæas in flower, the colouring of the floral bracts hanging in racemes being most gorgeous. The showy white flowers of Frangipanni, *Plumeria acuminata*, Ait., looked particularly pretty, and growing in close proximity seemed to intensify the vivid blue of *Jacaranda mimosæfolia*, while plants of variegated foliage such as Caladiums, Combretums, and Ixoras, seen in our State only in hot-houses, were flourishing in the open like weeds.

On reaching Brisbane I paid another short visit to the Botanical Gardens, and spent the remainder of time available in viewing the various Government offices.

Weather conditions at Sydney being much more favourable than at the time of my first call, I paid a visit to the Botanical Gardens. Unfortunately, the director, Mr. J. H. Maiden, F.L.S., was absent, but Mr. Betche spent some time showing me over the Herbarium and carpological collections, which had greatly increased during the two years which had elapsed since my previous visit. To the kindness of Mr. Boorman I am indebted for a thorough examination of the Botanical Gardens, a noticeable feature of which is the sub-tropical nature of the vegetation, evidence of this being shown by the great collection of the Ficus species, including *F. macrophylla*, Desf., Moreton Bay Fig, *F. Bennettii*, Seem. (indigenous to Fiji), and *F. religiosa*, L. (the sacred fig tree of India), all of which exhibited extraordinary growth. The palms are an attractive feature—the Bungalow Palm, *Archontophœnix Cunninghami*, Wendl., Coquito Palm, *Jubœa spectabilis*, H. B. et K., a native of Chili, as well as a number of species of the genera Cocos, Phœnix, and Sabal, and flourishing specimens of Cordyline, Meryta, Panax, Aralia, and Chrysoglossum, all serve to accentuate the sub-tropical appearance. The typical Australian features are the tree ferns,

Alsophila and Dicksonia, the Doryanthes along the borders of the creek, and the recently laid out special collection of native plants near the Government House grounds, all of which do well under cultivation.

The botanical arrangement grounds, occupying a considerable space on the flat in the lower garden, are highly educational, and comprise a large collection of certain natural orders, such as Leguminosæ, Proteaceæ, and Rutaceæ. Close at hand is situated a monument containing the remains of the late Allan Cunningham, the famous botanist, which were originally interred in the Devonshire-street Cemetery in July, 1839, and from which, on the 25th of May, 1901, they were reverently removed and placed beneath the obelisk. Occupying a prominent position on the central walk is the well-known "wishing tree," a large *Araucaria excelsa*, greatly reverenced by the superstitious of the younger generation, who believe that after walking round the trunk three times they will secure the object of their desire. Handsome ornamental plants of the order Sapindaceæ, such as Nephelium, Harpullia, Diploglottis, and Cupania, do well, and other handsome ones are the Bean Tree, *Castanospermum australe*, *Eugenia Luehmanni*, and *E. Ventenatii*, Benth.

I journeyed to Botany Bay on a botanizing expedition, and, although early in the season, I was pleased to find that a great many wild flowers were already in bloom, and the following are a few of the rarer plants secured during the outing :—*Actinotus Helianthi*, Labill., *Boronia pinnata*, Sm., *Bossiæa scolopendria*, Sm., *Epacris microphylla*, R. Br., *Grevillea punicea*, R. Br., *G. buxifolia*, R. Br., *Isopogon anethifolius*, R. Br., *Leucopogon microphylla*, Spreng., *Lysinema pungens*, R. Br., *Styphelia longifolia*, R. Br., *S. triflora*, Andr., *S. viridis*, Andr., *Symphyonema paludosum*, R. Br. Next morning I set out on another expedition to Brookvale, situated 5 miles inland from Manly, where an excellent idea of the bush country near Sydney can be obtained. On this occasion I obtained many plants, a few of the less common being—*Boronia ledifolia*, J. Gay, *Clematis glycinoides*, D. C., *Chloanthes stœchadis*, R. Br., *Gompholobium latifolium*, Labill., *Hemigenia purpurea*, R. Br., *Patersonia sericea*, R. Br., *Persoonia lanceolata*, Andr., *Phebalium squamulosum*, Vent., *Pultenæa stipularis*, Sm., *Rulingia hermanniæfolia*, Steetz, *Sowerbæa juncea*, Sm., *Zieria pilosa*, Rudge. From these two trips I reaped the rich harvest of 75 species, which, on my return, I donated to the National Herbarium, Melbourne.

After a visit to Mr. Carter, a well-known entomologist, at Darling Harbour (for the pleasure of which I am also indebted to Mr. French), my sojourn in Sydney came to an end, and boarding our vessel I was soon landed safely in Melbourne, after an absence of just four weeks.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 8th March, 1909.

The president, Mr. G. A. Keartland, occupied the chair, and about 65 members and visitors were present.

REPORTS.

A report of the excursion to Hanging Rock, Woodend, on Saturday, 20th February, was given by the leader, Mr. H. W. Wilson, who reported an attendance of 15 members and friends, which was very good, considering the distance from town. The almost unique geological features of the locality had been explained at length, and the physiography of the district pointed out, to the evident interest of those present.

A report of the junior excursion to the Botanical Gardens on Saturday, 6th March, was given by the leader, Mr. F. Pitcher, who reported a fair attendance, considering the showery afternoon. On account of the wet, the greater part of the time was devoted to the specimens in the economic museum, and many interesting questions had been dealt with.

The hon. librarian reported the receipt of the following donations to the library :—"Proceedings Royal Society of New South Wales," vols. xxxix., xl., and xli. (1905–7), from the Society; "Proceedings Linnean Society of New South Wales," vol. xxxiii., parts 2 and 3, from the Society; "Records of the Australian Museum, Sydney," vol. vii., part 2, from the Trustees; *Australian Naturalist*, vol. i., No. 12, from the New South Wales Naturalists' Club; "Proceedings Royal Society of Queensland," vol. xxi. (1908), from the Society; "Transactions Royal Society of South Australia," vol. xxxii., from the Society; and *Nature Notes*, October, 1908, from the Selborne Society, London.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. G. M'All, 254 Burnley-street, Richmond, and Mr. C. Searby, B.A., Continuation School, Melbourne, were duly elected ordinary members, and Mr. Tom Carter, M.B.O.U., Western Australia, a country member of the Club.

GENERAL BUSINESS.

The hon. secretary read a communication from the secretary of the Tasmanian Field Naturalists' Club, giving details of an extended excursion to be held at Easter, and inviting any interested to attend.

The president took occasion to welcome to the meeting Mrs. G. Weindorfer, of Tasmania, a country member of the Club, but

who had not had the opportunity of attending a meeting for some years. Mrs. Weindorfer briefly replied, and expressed her pleasure at being once more among her naturalist friends.

Mr. A. H. E. Mattingley drew attention to the increasing pollution of the Britannia Creek, near Warburton, owing to the establishment of a factory for wood-distillation on its banks, and promised to submit samples of the deleterious matter to the committee for consideration.

PAPER READ.

By Prof. A. J. Ewart, D.Sc., entitled "The Changes of Names in the 'Recording Census.'"

The author said that at the February meeting of the Club attention had been called by Mr. A. D. Hardy, F.L.S., to apparent discrepancies between the names used in the recently issued "Recording Census" and those adopted by the late Baron von Mueller in his "Key to the Plants of Victoria," when he promised to publish a list of the alterations. The present paper was the result, and showed that only twelve names had been changed in the new list, but when a new Flora of Victoria came to be published a number of other changes would have to be made, which would be out of place in the present list.

Mr. Hardy thanked the author for the information he had given, but thought that until an authoritative statement of changes was made such lists as those of the Wilson's Promonotory plants in the January *Naturalist* (vol. xxv., p. 145) should conform to published works or be accompanied by the synonyms.

Prof. Ewart pointed out in reply that it was essential that in official work issued from the National Herbarium the latest determined nomenclature should be used, hence the use of Astroloma, Leucopogon, Olearia, Stylidium, &c., in the Promontory list.

DISCUSSION.

As a variation on the reading of papers, the committee had set down a discussion on the Pigeons, Parrots, and Cockatoos of Victoria as an item on the notice paper, with a request for a display of specimens of these groups.

The chairman introduced the subject by pointing out the characteristic features of the groups and their main divisions, showing how the soft bill of the pigeons was adapted for a granivorous diet, while the hard bill of the parrots was adapted for the work of tearing hard seed cases apart, and mentioned that the Gang Gang Cockatoo seemed to feed exclusively on the very minute seeds of some of the eucalypts.

Mr. A. H. E. Mattingley, among other points, referred to the value of other Cockatoos as destroyers of wood-boring larvæ, while some are very destructive to the larvæ of grasshoppers.

Mr. C. F. Cole called attention to several specimens of parrots,

and stated that as a rule they take at least three years to attain adult plumage, which in many cases was very different from that of the young birds.

Mrs. A. D. Hardy referred to the difficulties she had experienced in keeping the Blue Bonnet Parrakeets, *Psephotus xanthorrhous*, in an aviary with other parrots, on account of their pugnacious habits, and eventually had to place them in a separate cage; and asked if any member could say at what age the King Lory attained its adult plumage, but without response.

Mr. A. D. Hardy asked whether any member had observed parrots feeding on the tubers of the native orchids.

The chairman briefly referred to the different points mentioned, and considered that the innovation had been well supported.

NATURAL HISTORY NOTES.

Mr. R. W. Armitage drew attention to his exhibit of a specimen of the Ant-house Plant, so named from the fact that the bulky, gall-like stem is tunnelled throughout, and in these tunnels a small brownish-black ant takes up its abode and forms colonies.

EXHIBITS.

By Mr. R. W. Armitage, for Captain W. C. Thomson, s.s. *Arawatta*, specimen of the Ant-house Plant, *Hydnophytum formicarium*, from Leper Creek, near Cooktown, N. Queensland; also a ground-spider, dug up with egg-case at Footscray on 25th February, eggs hatched on 1st March, since when the young have remained with the mother, illustrating the maternal care evidenced by most Arthropoda.

By Mr. F. G. A. Barnard.—Dense black basalt from crater of Mt. Franklin; "Witches' broom" on cone of banksia, from Mt. Franklin.

By Mr. C. F. Cole.—Larva and cocoon of Gum Emperor Moth, *Antheræa eucalypti*, Scott, from Mont Albert; specimens of Gang Gang and Black Cockatoos, King Lory, Pennant's, Rosella, Red-shouldered Grass, and Cockatoo Parrakeets, and Scaly-breasted Lorikeet, different sexes and ages, in illustration of discussion.

By Mr. H. J. Coles.—Large series of pigeons, cockatoos, parrakeets, &c., in illustration of discussion.

By Mr. C. J. Gabriel.—Rare Victorian shells, dredged off Point Cook, Port Phillip Bay—viz., *Gastrochæna tasmanica*, T. Wds.; *Diplodonta globularis*, Sam.; *Myodora brevis*, Sow.; *Erycina acupuncta*, Hedley; and *Lepidopleurus inguinatus*, Roe.

By Mr. A. H. E. Mattingley.—A Blue Mountain Lorikeet, *Trichoglossus novæ-hollandiæ*, from Gippsland.

After the usual conversazione the meeting terminated.

EXCURSION TO HANGING ROCK.

ADVANTAGE was taken of the fortnightly excursion train to Daylesford for the visit to Hanging Rock on Saturday, 20th February; by this means we were able to leave town at a more convenient time than if the early morning train had been taken. However, as the train lost more than an hour on its journey to Woodend (48 miles), four of the party who motored up reached the township before us. On reaching Woodend we were met by Mr. Birrell, of the local State school, and Mr. Fordyce, of the Campaspe school, who were pleased to have the opportunity of joining in the outing. Our party now numbered seventeen. Owing to the loss of time, it was decided to obtain vehicles and drive out to the Rock, instead of walking the five miles as had been first proposed. The name, Hanging Rock, is rather misleading to those who have not been to the locality, and it may not be out of place to quote from what is probably tbe first description of it which appeared in print. This was written by the late W. Blandowski in 1855, and occurs in a paper entitled "Personal Observations in the Central Parts of Victoria" in the Transactions of the Philosophical Society of Victoria, vol. i., p. 57. He says: —"Dryden's Monument is, as well on account of its geological character as its singular conformation, one of the most remarkable spots in Victoria, if not in the whole of Australia, and, were a careful and minute description of it made, accompanied with good drawings, it would not fail to engage the attention of every geologist. The approach to it presents a scene of imposing grandeur. A massive wall of dolorite, whose deep and sombre hue is in exquisite harmony with the dark green of the eucalyptus, rises almost perpendicularly above the loftiest of the trees, and imparts a striking majesty to the whole view. The interest increases at every step approaching the Monument, and a beautiful variety of rapidly-changing scenery is unfolded like a panorama before the observer's eye. At the base about a thousand pyramidal columns from fifteen to thirty feet in diameter and thirty to one hundred feet in height rise in bold relief from the surface, and invest the hill, which is about a mile in circumference, with an appearance not dissimilar to that of a gigantic porcupine, or to a colossal representation of the structure formed by the *Termes bellicosus*. . . ." The foregoing is a capital description of the mount, and still holds good, though it is probable that the hill is now more hidden from view than it was fifty years ago, owing to the increase in height of the eucalypts growing round its base. On reaching the reserve we found Mr. Shephard, with the aid of his motor, was before us, and had brought a supply of hot water from a neighbouring hotel and prepared tea, which was a welcome addition to our sandwiches. After lunch we followed the track, which winds up the

southern side of the hill between numerous huge monoliths, and then, scrambling between other huge blocks, made our way to the western and higher end, where, amid the many sized and shaped masses of rock, vantage points were secured, and the geology and physiography of the locality demonstrated. It was shown how the rock differs in chemical composition from the generality of lavas, and this difference accounted for the shapes assumed by the rock-masses owing to their peculiar manner of weathering. Chemical analysis has shown that the rock contains a large percentage of soda, and hence is termed "Sölvsbergite," after a town in Norway from whence a similar lava was first recorded. Its occurrence is very rare, for nowhere else in Australia is it found than there, at Camel's Hump, three miles away on the Macedon Range, and at Brock's Monument, a hill on the other side of the Dividing Range towards Romsey, both of which were visible from our standpoint, but in neither case is the outcrop so interesting as at Hanging Rock. Having given some consideration to the physical features of the mount, we turned to the physiography, and noted that, though situated north of the Dividing Range, it is really south of some of the heads of the Deep Creek (Saltwater River), which belongs to the southern drainage system, owing to the fact that thereabouts the Divide is S-shaped, and curves round to the north of the mount towards the Jim Jim, though its exact position was hardly perceptible from our place of outlook; thus the drainage of the Rock finds its way to the Five-Mile Creek, and thence to the Campaspe and the Murray. The hill rises nearly 400 feet above the surrounding country, which is about 2,000 feet above sea level. The day was fairly clear, and, consequently, we had a fine view of the country all round, extending from the Trentham Ranges in the south-west to Wombat Hill (Daylesford), Mt. Franklin, Mt. Tarrengower, Mt. Alexander, Mt. William (Lancefield), and Macedon close at hand. Before descending, a visit was paid to the eastern end of the hill, where the rock-masses, some twenty to thirty feet high, are larger and more majestic than at the other end. Many have been named by visitors from fanciful resemblances to various objects. Several appear ready to fall when the next earth tremor comes along, and thus might disappear the group of stones usually selected for illustrating the character of the mount. On our way down we passed under the huge stone, supported at either end, which is usually supposed to give the name "Hanging Rock" to the locality. On the new tourist map of the Macedon district the mount bears the name Mt. Diogenes, given to it by Major Mitchell when he visited and named Mt. Macedon on his way from Portland to the Murray in 1836. Its other name, "Dryden's Monument," is derived from the name of an early settler in whose run it was included. Some fairly large trees grew at one time on

the mount, but have been destroyed by visitors or fire; however, there are yet some fine Black Wattles and abundance of the shrubby *Cassinia aculeata* to assist in adding variety to the scene. High up in a crevice on the southern face we noticed a solitary tree-fern; probably others formerly existed, but have been removed by visitors. The mount for many years was private property, but some years ago was repurchased by the Government and placed in the hands of trustees as a national reserve, and for the residents for many miles round has become a favourite picnic spot and meeting place at holiday time, while, were it nearer town, it would doubtless be better known to city folks than it is. Having ample time before the train left for town, we had some refreshment, and then walked back to Woodend, thoroughly pleased with the outing, Melbourne being reached after a fast run in the special train.—H. W. Wilson.

The Ant-house Plant of Queensland, &c.—Some notes about an exhibit sent from near Cooktown, and shown at our meeting last night, may be of interest to biologists. The Ant-house Plant, *Hydnophytum formicarium*, is found growing as an epiphyte on the trunks of melaleucas (tea-trees) and mangroves in the tidal mangrove swamps of North Queensland, New Guinea, and many islands of the Malay Archipelago. It bears fleshy green leaves and small white flowers. Its bulky, gall-like, thorny stem is tunnelled throughout, the tunnels being occupied symbiotically by colonies of small brownish-black ants, which take refuge there to escape from the Green Tree Ant, *Œcophylla virescens*, which would make slaves of the small black ants, but they cannot follow them into the tunnels. It would be interesting to know whether the tunnels which exist in the plant would develop without the presence of the ants, or whether the ants cause the plant to become swollen after the manner of gall insects, many genera of which belong to the same order (Hymenoptera) as the ants. As some young plants were growing on one of the specimens, I have given them to Mr. F. Pitcher, of the Botanical Gardens, to see whether it will be possible to grow them in one of the hot-houses there, away from the presence of the ants.—R. W. Armitage. Carlton, 9th March, 1909.

Grasses and their Identification. — Mr. L. Rodway, Government Botanist of Tasmania, has issued, under the direction of the Council of Agriculture of that State, a 32-page pamphlet with the title "Grasses and their Identification." He deals with about one hundred species, indigenous or introduced to Tasmania, giving such details as will help the observer to correctly determine the various species. Two plates of figures are included, but many of the figures are so small as to be of little service. The publication will be extremely useful as an aid in studying a difficult subject.

FURTHER NOTES ON THE FLORA OF WILSON'S PROMONTORY.

By A. D. Hardy, F.L.S.

(Read before the Field Naturalists' Club of Victoria, 8th Feb., 1909.

In the January issue of the *Victorian Naturalist*, Professor Ewart as Government Botanist, prefaces his remarks on the Wilson's Promontory flora,* with a criticism of my botanical report of the Field Naturalists' Club excursion † to the Promontory in December, 1905. Such criticism cannot fail to have a stimulating and beneficial effect on the botanical work of the Club generally, and if the present paper is the direct outcome of that friendly attack by the National Herbarium, it is a response which is probably expected and desired.

Now, in addition to ear-marking with the symbol (H) a number of names in my list as being those of plants not seen by either Mr. Audas or Mr. St. John during their October, 1908, excursion, Professor Ewart suggests that, in a few cases, errors may have crept in, and he specially mentions three species in that connection—viz., *Fagus Cunninghami*, Hook., *Glossodia major*, R. Br., and *Typha angustifolia*, L., and concludes thus:—"Hence, following the usual Herbarium practice, only those records can be accepted in such cases as definitely established which are supported by actual specimens, so that the accuracy of the naming can be verified in case of need." This concluding sentence, taken with the challenge which precedes it, tends to depreciate my recording of that date, excepting where the species listed are represented by specimens submitted to the National Herbarium. If the supposititious errors, other than those of a clerical nature, were really serious mistakes, the number would still be below the 2 per cent. or 3 per cent. suggested as a fair limit, and I find consolation in the apparent contradiction that while certain of my records have been challenged by the National Herbarium, in the absence of supporting specimens, and in observance of the quoted rule, they *are* included in the number (364) in Mr. Audas's list, which Professor Ewart states is "the total number of plants recorded for Wilson's Promontory"!

Presently I hope to show that while the rule may be of the greatest possible use if discriminatingly applied (which means that there are exceptions to almost all rules), it may be somewhat abused by a too rigid application. Of this more anon. First I desire to justify the inclusion of the three species prominently mentioned.

Fagus Cunninghami, Hook.—When including this in my 1906

* "Biological Survey of Wilson's Promontory, First Report," by Alfred J. Ewart, D.Sc., Ph.D., F.L.S., *Vict. Nat.*, xxv., p. 142.

† *Vict. Nat.*, xxii., p. 217.

report I had a small spray in my hand, mailed to me by a donor unknown, but presumably Mr. Barker, who accompanied us on our trip and who assured me that this species (commonly called beech) had been seen by him in the eastern gullies. In my report I should have stated that I had not seen this Promontory plant *in situ*. The important point is that the beech, unless recently destroyed by fire, is to be found at Sealers' Cove. Three other persons having stated that the tree is to be found there, I communicated with Mr. John King, Metung (who for 2½ years conducted sawmilling operations in the locality mentioned), and in his reply he states that the late Dr. A. W. Howitt identified the species for him. The small spray exhibited this evening was collected by Mr. King from a gully at Sealers' Cove.

Glossodia major, R. Br.—Notwithstanding the admitted fact that this is an early-flowering orchid, and that the record for December places it at least a month later than hitherto, I have no doubt as to the correctness of the entry. Other early-flowering species were found there in December—*e.g.*, *Brunonia australis*, *Burchardia umbellata*, *Epacris impressa* (June, 1907, Plenty Ranges), &c.; and, moreover, my identification is supported by Dr. T. S. Hall, M.A.* It was not only there at the given date, but in abundance. That it was not seen by the October excursionists is certainly remarkable.

Typha angustifolia, L.—There are many plants in Victoria and elsewhere, which, by their vegetative characters alone, may be singled out from all others, and this is an instance. I know of no plant so closely resembling this Typha that it might be mistaken for it. Though immature, there was plenty of it growing along the Derby River. Dr. Hall informs me that during the visit of the Park Committee, in December last, a considerable quantity of the matured plant was seen in the locality mentioned. I am of the opinion that it will be found at Sealers' Cove, in the Tidal River area, and also in the Barry's Creek basin in the north.

Next, I have to acknowledge with thanks my indebtedness to the National Herbarium for the correction of a curious clerical error. Among the Compositæ of my list appears "*Calocephalus fastigiatus*." There is no plant of that name. It should be, as Professor Ewart suggests, *Calostrophus fastigiatus*, F. v. M., of the order Restiaceæ.

The flora and the climate of Victoria are, I think, somewhat tricky; the latter being uncertain, while the former displays a well-known isolation in the habitat of many species, so that when collecting over large areas we should not expect to see all that may have been seen by earlier visitors, especially when the visits

* *Vict. Nat.*, xxv., p. 138.

occur in non-corresponding months of different years. Even where a perennial plant has been collected, how often may the same extensive area be traversed without the species being seen again? Such as *Pultenea Weindorferi*, Maiden, near Gembrook, *Styphelia strigosa*, Sm., in the Asylum reserve at Kew, may be quoted at random as examples; while *Grevillea repens*, F. v. M., in the Healesville district, just mentioned in Mr. Kelly's report of the Club excursion last week, serves as a further illustration.

In future, of course, members of our Club may reasonably be expected to supply the National Herbarium with as many specimens for identification as may be conveniently gathered and transferred from the field, but the reports of trusted collectors will not, I hope, lose value in the eyes of the Field Naturalists' Club if specimens of the commonest plants are not produced as evidence of their having been seen, especially when, in remote and difficult regions, the packing of a load on either man or beast becomes a serious matter. Economy of space is then one of the chief *desiderata*, and in packing for safe carriage over mountain or through jungle or morass "every pound tells."

In such circumstances there should be a generous acceptance of records of all well-known plants, and the doubt, if doubt there be, left to those which might easily, in field examination, be confused with others of close kinship. There have been times when the transport of specimens such as *Eucalyptus globulus* (the common Blue Gum), *Ranunculus lappaceus* (the common Buttercup), species of *Banksia* or "Honeysuckles," *Leptospermum lævigatum* (the common coastal "Tea-tree"), *Casuarina quadrivalvis* (the drooping "Sheoak"), and a host of others, was unnecessary and impracticable, and such occasions may arise in future. Again, supposing that, in order to comply with the Herbarium rule, all plant collectors throughout Victoria forwarded to the State authority a specimen of every plant seen, would the Herbarium staff be able to cope with the deluge? The identification and recording of plants being only one of a multitude of works in progress in the Government Botanist's branch, one can readily imagine the submerged Curator of the Herbarium crying—"Hold! enough!"

Mr. F. G. A. Barnard has reminded me of an excursion made during the Christmas season of 1885 by Mr. J. B. Gregory, LL.M., and Mr. A. H. S. Lucas, M.A.* This early excursion, *viâ* Yanakie, seems to have been overlooked by most of us, but Dr. Hall, in his interesting history of the Promontory as a National Park,† briefly referred to it. Some of the plants collected by Mr. Lucas were identified by Baron F. von Mueller. Apart from the general interest which they contain, and in the absence of

* *Vict. Nat.*, vol. ii., 1885-6, p. 150. † *Vict. Nat.*, vol. xxi., p. 128.

specimens in the case of some of my own records, Mr. Lucas's notes may be accepted as corroborative evidence, even though I think he should have written *Exocarpus stricta*, R. Br., instead of *E. cupressiformis*. On reading their account of the trip it will be seen that Messrs. Gregory and Lucas did not attempt a complete list of the plants encountered. "We had first," he says, "at the entrance of the Derby, to fight our way through tall and thick-set bushes of *Styphelia Richea* and *Exocarpus cupressiformis*, which were in berry." *E. cupressiformis* is the common so-called Native Cherry, and grows into a small, handsome tree, whilst *E. stricta* is shrubby and has fruit slightly different from the other. ". . . Stout bushes of *Aster glutescens*, *Cryptandra Hookeri*, and *Alyxia buxifolia* also barred the way." He refers also to *Swainsona lessertifolia* (which, I may mention in passing, some folk charge with that trouble to stock known as coast-disease), *Lotus australis*, and *Scævola pallida*, these being then in bloom about the Derby River. Traversing the route to the lighthouse and near Mt. Bishop he noted *Correa speciosa*, red variety, while "bushes of *Calycothrix tetragona*, covered, some with white, others with pink blooms, made the slopes gay between the gigantic bosses." On Mt. Oberon ". . . . black stumps of *Xanthorrhœa major* were prominent objects and obstacles to fully 1,500 feet above the sea. At the very top grew freely *Kunzea corifolia* and *Callistemon salignus*, which also occurred at the very tip of the lighthouse spur. . . . *Aster stellulatus* showed its variability of form." Near the lighthouse, "on the brow of the hill, *Gompholobium Huegelii* and *G. minus* grew together in abundance." Also near the lighthouse were *Helichrysum lucidum*, *H. obtusifolium*, and *H. dealbatum*.

Mr. Lucas also mentions the occurrence of the interesting fern, *Asplenium marinum*, watered by sea spray on vertical cliffs. Though on the same route, this was not seen by either the Herbarium or the Club excursionists.

The following species collected in 1905-6 were doubted, but specimens have since been kindly checked by the National Herbarium. Of course, as the Herbarium excursionists did not follow the whole of the route of the F.N.C. party, it is only reasonable to suppose that many plants which were found by the latter were not seen by the former. This applies more particularly to the area south of Corner Basin, which was not visited by Messrs. Gregory and Lucas or by the Herbarium officers :—

Avicennia officinalis, L., spurious mangrove. A specimen of this was long ago sent to the Herbarium, but was apparently mislaid or overlooked. It is common on the shores of Corner Basin and its tidal creeks.

Cryptandra Hookeri, F. v. M. This is not uncommon on the western side of the Promontory.

Plantago varia, R. Br. At Corner Basin, where also the introduced *Hypochœris radicata*, L., or "false dandelion," had obtained a footing.

Rhagodia Billardieri, R. Br. Not scarce on west coast.

Senecio odoratus, D. C. (Also recorded by the Herbarium.)

Sprengelia incarnata, Sm. Professor Ewart informs me that this was collected by the Herbarium officers, but omitted from the list.

The following are additions to the record, and I am indebted to the National Herbarium for naming or verifying :—*Salicornia australis*, Soland. ; *Selliera radicans*, Cavan. ; *Aster stellulatus*, var. *quercifolius* ; *Hydrocotyle tripartita*, R. Br. ; and *Chenopodium glaucum* (the last, being without flowers or fruit, may be regarded doubtfully).

Before concluding, I would ask : Are not the members of this Club in need of an easily obtainable datum from which to work consistently in reporting excursions? A comparison of my Promontory list and that published by the Herbarium will show that, after deducting the marked species from the latter, there are a number of mine which do not appear in that prepared by Mr. Audas. This apparent discrepancy is due to the different data used, no synonyms being given in explanation in either case. Until recently Baron von Mueller's "Key to the System of Victorian Plants," issued by the Government as an officially authorized guide, has by tacit consent been the reference used by the Club. That it is not all that can be desired is readily admitted, but it is certainly the best of its kind available at present for members scattered throughout the State, many of them quite out of reach of such works as Bentham's "Flora Australiensis." The National Herbarium has distributed the welcome "Recording Census of the Victorian Flora" prepared by Professor Ewart, and one regrets having to ask for more when we have this evidence of energy in hand. My fear is that without a synonymic list of plants to guide us where the naming is not that of the "Key" or of recent records, some confusion will result. Certainly information will not, through doubt, be forthcoming from those who are familiar with the "Key" names only.

Doubts arise in the minds of many who find, recently published in the *Victorian Naturalist* and elsewhere, names of plants which do not appear in the "Recording Census" ; and perhaps it is not too late to urge upon the authorities the desirability of publishing a supplementary list which would make the nomenclature of the "Recording Census" free from doubt to those who, unlike myself, have not access to a botanical library. In any case, it is hoped that the National Herbarium will one day, not remote, publish an improved handbook having something

of the compactness of the present "Key," and an improvement by reason of additions and corrections rendered necessary in the light of recent investigation. But, until the advent of such a help, is it not better that we should keep consistently to the old datum when publishing in the *Victorian Naturalist*, in which case errors would be the more easily discovered and adjusted, and avoid such literary discrepancies as, *e.g.*, those which may be found by comparing the "Recording Census" and the Herbarium list of Promontory flora? In neither of the foregoing is there anything to show that *Hypolæna* = *Calostrophus*, *Olearia* = *Aster*, *Astroloma* and *Leucopogon* = *Styphelia*, or *Stylidium* = *Candollea*, &c. Then one becomes uncertain whether the absence of, *e.g.*, *Gomopholobium Huegelii*, Benth. (of the Herbarium Promontory list) and *Asplenium flaccidum*, Forst. (Mueller's "Key," part 1) from the "Recording Census" is real or imaginary—whether they were omitted inadvertently or, instead, lurk there under synonyms. A table of equivalents as a general reference where the "Flora Australiensis," &c., are used would, of course, be of the greatest value, but from a busy botanical department this may perhaps be asking too much, and one's thoughts return persistently to Baron von Mueller's "Key," particularly part 1 (1887-8), as a possibly faulty but certainly most convenient datum for our reports of all plants therein included.

[Some references to reasons for changes of names of Australian genera of plants will be found in a paper by the late Baron von Mueller, entitled "Considerations of Phytographic Expressions and Arrangements," in the "Journal and Proceedings of the Royal Society of New South Wales," vol. xxii. (1888), page 187. —Ed. *Vict. Nat.*]

THE CHANGES OF NAMES IN THE "RECORDING CENSUS."

By Alfred J. Ewart, D.Sc., Government Botanist.

(*Read before the Field Naturalists' Club of Victoria, 8th March*, 1909.)

I have been asked, for the benefit of those using the "Recording Census," to indicate those cases where the names used differ from those in the "Key to the System of Victorian Plants." Purposely the naming in the "Recording Census" was kept as close as possible throughout to the naming in the works already in use in Victoria, since to make all the changes that will ultimately prove necessary would have made the work unintelligible in many cases to local botanists, without the aid of a new descriptive flora, which has yet to come.

The Herbarium will steadily oppose all unnecessary changes of name, of which some extraordinary ones have been proposed in the past ten or more years, such as Sirmüllera and Pimelea for our

well-known native Banksias ; Nageia for Podocarpus, and Podocarpus for Phyllocladus ; Banksia for Pimelea ; Genosiris for Patersonia ; Draca for Dracæna ; Juncoides for Luzula ; Iria for Fimbristylis ; Chamærhaphis for Setaria ; Dortmanna for Lobelia ; Statice for Armeria, and Limonium for Statice ; Fagelia for Calceolaria ; Tissa for Spergularia ; Aphora for Podalyria ; Meibomia for Desmodium, and a host of other attempted changes of well-known and established names for fanciful priority reasons. Such changes, even if any valid reason existed for them, could never be enforced, and the attempt to do so would merely create a botanical Tower of Babel and accentuate difficulties already sufficiently great.

From the following list it can be seen that only twelve names have been changed in the "Recording Census" as compared with Mueller's "Key," although in the next "Flora of Victoria," a number of sweeping changes will be necessary in the case of such genera as the "*Styphelia*," "*Aster*," &c., of Mueller's "Census" and "Key." In the "Recording Census," however, such changes would be out of place.

"Recording Census, 1908."		Mueller's "Key to Vict. Plants," 1888.
Gompholobium pedunculare, Lodd.	...	Gompholobium Huegelii, Benth.
Acacia runciformis, Cunn.	...	Acacia lineata, Cunn.
Euphrasia collina, R. Br.	...	Euphrasia Brownii, F. v. M.
Prunella vulgaris, A. D. C.	...	Brunella vulgaris, L.
Pappophorum nigricans, R. Br.	...	Pappophorum commune, F. v. M.
Glyceria Fordeana, F. v. M.	...	Poa Fordeana, F. v. M.
,, fluitans, Scopoli	...	,, fluitans, Scopoli
,, syrtica, F. v. M.	...	,, syrtica, F. v. M.
,, dives, F. v. M.	...	,, dives, F. v. M.
,, ramigera, F. v. M.	...	,, ramigera, F. v. M.
Hymenophyllum australis, Willd.	...	Hymenophyllum javanicum, Spreng.
Hydrocotyle laxiflora, D. C.	...	Hydrocotyle Candollei, F. v. M.

A little confusion is added by the fact that, in certain cases, Mueller gave a plant one name in the first volume of the "Key to the System of Victorian Plants," but a different name in the second volume, without giving in all cases a reason for the change or stating which name he considered valid.

Vol. I. of "Key" (1887-8).		Vol. II. of "Key" (1885).
Geranium pilosum, Solander	...	Geranium Carolinianum, L.
Solenogyne Emphysopus, Hook. f.	...	Lagenophora Emphysopus, Hook. f.
Podosperma angustifolium, Labill.	...	Podotheca angustifolia, Lessing
Gahnia (14 species)	...	Cladium (14 species)
Schizæa bifida, Willd.	...	Schizæa dichotoma, Smith
Hydrocotyle Candollei, F. v. M.	...	Hydrocotyle laxiflora, D. C.

It can be seen, therefore, that fewer changes of name have been made in the "Recording Census," after an interval of 20 years, than were made by Mueller in the two years elapsing between the issue of the second and first volumes of the "Key," the numbers being 12 and 19 respectively.

THE DARWIN-WALLACE CELEBRATION.

The Linnean Society of London has just issued a most interesting record of the Darwin-Wallace celebration, held on 1st July last. The meeting was arranged for the purpose of celebrating the fiftieth anniversary of the joint communication made by Charles Darwin and Alfred Russel Wallace to the society on 1st July, 1858, entitled—"On the Tendency of Species to form Varieties, and on the Perpetuation of Varieties and Species by Natural Selection." In addition to the fellows, foreign members, and associates, invitations were issued to certain distinguished naturalists, every university in the United Kingdom, and to societies publishing on subjects of biology, the result being a great attendance of interested persons, including Dr. Wallace and several members of the Darwin family. The president of the Linnean Society, Dr. Dukinfield H. Scott, presided, and briefly outlined the object of the meeting, and then called on Dr. Wallace to receive the first Darwin-Wallace medal, instituted in commemoration of the event, and alluded to the self-sacrificing position Dr. Wallace had always taken in relation to the great theories first made public in the paper of 1858.

Dr. Wallace, who was received with great enthusiasm, replied at some length, and in doing so took the opportunity of detailing the actual relations between Darwin and himself prior to July, 1858, in order to correct the misapprehensions of popular writers as to what his share in Darwin's work really amounted to. He said he had even been credited with being the first discoverer, whereas the idea had occurred to Darwin in October, 1838, nearly twenty years before it had occurred to him, in February, 1858. Darwin had spent the twenty years in collecting evidence, conducting original observations and experiments, the results of which would be found in his "Origin of Species," and especially in that wonderful storehouse of knowledge his "Animals and Plants under Domestication." In 1844 Darwin had outlined his views to his friends Sir Charles Lyell and Dr. (now Sir Joseph) Hooker. The former strongly urged him to publish an abstract of his theory, in case some other person should precede him, but he always refused, on the plea that he had not got together all the materials for his great work. Then without any warning Lyell's prediction came true, for in June, 1858, he (Dr. Wallace) had forwarded to Darwin a letter, asking him to hand an essay enclosed, "On the Tendency of Varieties to Depart Indefinitely from the Original Type," to Sir Charles Lyell for publication if deemed suitable. Darwin and Lyell at once saw that the essay, if published, would anticipate the former's work, and, on Dr. Hooker being consulted, it was decided to make an abstract of Darwin's work and his essay as a joint communication to the society. Dr. Wallace alluded to the very different way in

which he had dealt with his ideas to that of Darwin. The idea had come to him in a sudden flash of insight, thought out in a few hours, written down with such illustrations and developments as occurred to him at the moment, copied on thin letter-paper and sent off to Darwin, all within one week. He therefore contended that Darwin should ever be recognized as the sole and undisputed discoverer and patient investigator of the great law of "natural selection" in all its far-reaching consequences. Then he went on to consider why, of all the great men who had given attention to the question, he and Darwin had alone hit upon a solution which seemed to be a satisfying one to a large number of able men to-day, and attributed it to the fact that both he and Darwin had been ardent beetle-hunters, and the constant comparison of specimens for new species and varieties had so trained them to observe slight peculiarities of habits, &c., and both being of a speculative turn of mind, they were constantly led to think upon the "why" and the "how" of all the wonderful variety of nature. Finally, he said, when their minds were well stored with the results of personal observation their attention had been directed to theories set forth by Malthus in his "Principles of Population," and though Darwin read the book two years after his return from his celebrated voyage, and he had read it before he went abroad, that influence, combined with their experience as collectors, doubtless led to practically the same conclusion, and he thought that possibly Darwin's precursors in the same line of investigation had failed through lacking that special turn of mind that makes the collector and the species-man. He concluded by saying that he had long since come to see "that no one deserves either praise or blame for the *ideas* that come to him, but only for the *actions* resulting therefrom. . . ."

Sir Joseph Hooker was then called upon to receive the next medal, and, in returning his thanks for the honour done him, entered into details of his relations and correspondence with Darwin, Wallace, and Lyell, and said it was somewhat remarkable that the fact of a meeting having been held on 1st July, 1858, was due to the death of the eminent botanist Robert Brown, a vice-president and councillor of the society. For this reason the ordinary meeting of 17th June was postponed, and a special meeting called for 1st July to fill the vacancy. Advantage was taken of this meeting by Sir Charles Lyell and himself to bring forward the communication by Darwin and Wallace, which otherwise would not have seen the light till September of that year, as they had not been included in the notice paper for the June meeting.

Similar medals were also presented to Professor Haeckel, Prof. A. Weismann, Prof. E. Strasburger, Dr. F. Galton, F.R.S., and Sir E. Ray Lankester, K.C.B., F.R.S., F.L.S. The medal,

as depicted in the publication, bears on the one side an almost profile portrait of Darwin, and on the other a portrait of Wallace, with the simple inscription "LINN : SOC : LOND : 1858–1908," and "DARWIN" and "WALLACE" under the respective busts.

Space will not allow more than a brief enumeration of the other contents of this interesting record. Addresses were presented by the universities of the United Kingdom, by scientific societies, of which not the least interesting was that presented by the Royal Swedish Academy of Science, a society founded by the great Linnæus. The concluding address was given by the Rt. Hon. Lord Avebury, P.C., and briefly recalled many incidents in the life of Darwin, made more interesting by the circumstances of the meeting.

A dinner to the medallists and foreign guests was given in the evening, and later a reception was held in the rooms of the Society, when a number of interesting exhibits bearing on problems of evolution were made ; in addition to which the recommendation certificates to the society of Darwin and Wallace were shown—the former having been elected on 7th March, 1854, and the latter on 18th January, 1872. Two short lantern demonstrations bearing on evolution were also given. The minutes of the special meeting of 1st July, 1858, reprints of the papers by Darwin and by Wallace, and portraits of the medallists make up a most interesting record of some 140 pages.

WILSON'S PROMONTORY.—An interesting account of a day with the birds in the National Park, written by the ranger, Mr. C. M'Lennan, appeared in the *Australasian* of Saturday, 20th March.

VICTORIAN EUCALYPTS.—A series of illustrated articles dealing with the eucalypts of Victoria was commenced in *Every Saturday* of 3rd April.

TOURISTS' MAPS.—At length a start has been made by the Victorian Lands Department in issuing maps of certain localities for the use of tourists. Those issued up to the present comprise :—Map of Buffalo Plateau (showing new road and tracks), the Warburton to Walhalla track, the Gippsland Lakes and Buchan Caves, the Macedon district, and the Werribee Gorge. We hope it will not be long before similar maps are issued of the Dandenongs, the Healesville district, Emerald and Gembrook, Warburton, Daylesford, Lorne, &c. When these are issued on a fairly large scale, like that of Macedon, the tourist can have no fear of losing himself, and can, to a certain extent, plan out his trip before leaving town.

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