THE

VICTORIAN NATURALIST

THE JOURNAL AND MAGAZINE

OF THE

Field Naturalists' Club of Victoria

VOL. XLI

MAY, 1924, TO APRIL, 1925

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

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

MELBOURNE:
RAMSAY PUBLISHING PTY. LTD., 203-5-7 KING STREET
1925

ILLUSTRATIONS:

ERRATA:

Page 6—Errata in *Naturalist*, April, 1924.

Page 24—Errata in *Naturalist*, May, 1925, page 2.

Page 96—Errata in Bogong Plants, pages 53-74.

Page 99—Erration in August *Naturalist*, page 90.

Page 147, line 21—For "Guaphalium" read "Gnaphalium."

Page 163, line 20—For "Silcified Lignita" read "Silicified Lignite."

Page 204, line 11—For "*Senecio odoratus*" read "*Veronica notabilis*."

Page 204, line 15—For "Orchid" read "Orchard."

Page 209, line 12 from bottom — For "luxurious" read "luxuriant."

Page 232—Errata in Noojee Plants, pages 170-183.

The Victorian Naturalist.

Vol. XLI.—No. 1. MAY 8, 1924. No. 485.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday, 14th April, 1924.

The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about fifty members and visitors were present.

REPORTS.

A report of the excursion to Sherbrooke, on Saturday, 15th March, was given by the leader, Mr. F. Pitcher, who reported a good attendance of members. The object of the excursion was ferns, and of these twenty-six species were noted during the day. Some gullies, not often visited, around the head waters of the Monbulk Creek, proving a delighful area for investigation.

On the motion of Messrs. F. Pitcher and C. Daley, it was decided that a letter of thanks be sent to Miss Billing, of Sherbrooke, for her hospitality to the members of the excursion party.

A report of the excursion to the Botanical Gardens on Saturday, 29th March, was given by the leader, Mr. P. R. H. St. John, who said that, notwithstanding a showery afternoon, there was a good attendance of members who enjoyed the outing. The conservatory, propagating sheds, &c., were visited, and many interesting novelties brought under the notice of the visitors.

A report of the excursion to Bayswater on Saturday, 5th April, was given by the leader, Mr. C. Oke, who said the excursion had been well attended, and as the day was all that could be wished it had been much enjoyed. Insects were the objects of search, but, excepting ants, were not numerous. Numbers of the crater-like openings to the nests of the Brown Ant, *Aphænogaster longiceps*, were observed, and their mode of construction investigated. A specimen of the Black-mottled Lacewing, *Porismus strigatus*, Bohem, proved a great attraction to several of the excursionists who were unacquainted with it.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Dorothy Round, 9 Warburton-road, Camberwell; Miss Sharman, 1 Sir William-street, Kew; and Mr. J. Davidson, 3 Leslie-street, Richmond, were duly elected members of the Club.

GENERAL BUSINESS.

The president, on behalf of the Club, offered congratulations

to several members who had secured University honours at the recent examinations, viz., Miss R. Chisholm as B.A.; Mr. P. C. Morrison as B.Sc.; and Mr. C. D. Gillies, M.Sc., as B.S., also to the daughter of a member, Miss D. Coleman, who is an enthusiastic worker at the wild-flower exhibitions, as B.A.

Mr. E. E. Pescott, F.L.S., referred to the recent retirement from the Education Department of the Club's president, Mr. C. Daley, B.A., F.L.S., and wished him many years of life to enjoy his well-earned rest. He was supported in his remarks by Messrs. Barnard, Williamson, and Hardy.

Mr. Daley briefly responded.

Mr. W. J. Stephen called attention to the proposal to form golf links in Riversdale Park, and urged that the Club take steps to prevent the removal of trees from the eastern portion of the park, which was a beautifully wooded area, such areas adjacent to Melbourne being now very scarce. He moved that a letter be written to the Tramway Board to that effect. This was seconded by Mr. E. E. Pescott, and carried unanimously.

Some discussion took place regarding the proposed American Museum expedition to Australia for collecting ethnological specimens, and on the motion of Messrs. Pescott and Barnard it was decided to communicate with the Minister of Customs, and urge that the collection be made only under stringent conditions, and that the export of any specimens be prohibited.

NOTES ON EXHIBITS.

Mr. F. Pitcher drew attention to his exhibit of ferns from the Strathbogie Ranges, and remarked on the interesting nature of the vegetation of the district.

Mr. L. Thorn drew attention to his exhibit of the various stages in the life history of one of the lycæmid butterflies.

Mr. E. E. Pescott drew attention to a series of hand-coloured photographs of Australian birds and flowers exhibited by Mrs. E. Coleman, the work of Miss Llewellyn, of Ballarat.

MICROSCOPICAL DISPLAY.

In place of the reading of papers, the evening was devoted to a display of microscopic objects by members, about twenty microscopes being in use.

The following are some of the principal objects shown :—

By Mr. F. Chapman, A.L.S.—Section of Devonian Chert, from Rhymil, Aberdeenshire, Scotland, containing the oldest known structure in any fossil plant, *Rhynia gwynne-Vaughani;* type slides of interesting and rare foraminifera, from Nare's Harbour, Admiralty Island, Cocos-Keeling Island, Great Barrier Island, New Zealand, Coldaren, Farol Channel.

By Mr. V. Gray.—Rotifer colony, *Lacinularia natans*.

By Miss O. Hardy.—Entomological slides, including stomata of larva of Gum Emperor Moth, showing valve-like structure; pollen basket of bee, &c.

By Mr. A. D. Hardy.—Botanical sections, including sections of wood of Blue Gum, *Eucalyptus globulus*, and Murray Pine, *Callitris verrucosa*; pollen grain of various trees, &c., showing different forms.

By Mr. C. Lambert.—Botanical sections.

By Mr. C. Oke.—Proventriculus of Apple-borer Beetle, *Leptops hopei*.

By Mr. J. Searle.—*Tubercle bacilli*; Larva of Small Caddis-fly; Simulinum larva (larva of a small black fly very troublesome to cattle).

By Mr. A. L. Scott.—Sections of basalt under ordinary and polarised light.

By Mr. J. Shephard.—Larval Branchipods, Branchipus (adult), Eulimnidia (adult), Lepidurus (adult).

By Mr. J. Strickland.—Anthrax bacillus.

By Mr. J. Wilcox.—Rotifer, *Melicerta ringens*.

EXHIBIT.

By Mr. F. Pitcher.—Austral Filmy Fern, *Hymenophyllum australe*, collected on Sherbrooke excursion, 14th March, 1924; stem of Common Bracken Fern, 7 feet 3 inches long, from Lima East, Strathbogie Ranges; also dried specimen of Sickle Fern, *Pellæa falcata*, Blanket Fern, *Pleurosorus* (*Grammitis*) *rutæfolius*, and Rock Fern, *Cheilanthes tenuifolia*, fronds over eighteen inches long; juvenile and adult foliage of Blue Gum, *Eucalyptus globulus* (adult leaves over twenty inches long), from Sugarloaf Creek, Strathbogie.

After the usual conversazione the meeting terminated.

"THE AUSTRALIAN FORESTRY JOURNAL."—In the January number of this journal a writer points out that it is waste of good timber to ringbark the trees with the idea of getting a better crop of grass for grazing purposes. For some time he had taken particular notice of paddocks in which most of the trees had been rung, with the view of finding out what difference the killing of the trees made to the paddock, and, from the observations he has made, has come to the conclusion that more and better grass is to be found where trees exist than where there are none, or dying, the explanation being that the fallen leaves of the trees act as a mulch and fertilizer of the soil.

EXCURSION TO SHERBROOKE.

A BEAUTIFUL early autumn morning greeted the excursionists *en route* to Sherbrooke by the 8.50 a.m. train on Saturday, 15th March. The train journey was enjoyed. Although few plants along the line were in bloom, the grass lands, farms, gardens, and native vegetation look bright and green after the splendid summer rains. It was noted that plants of the Hop Bitter Pea, *Daviesia latifolia*, which is valued by some herbalists for its medicinal qualities, were still abundant between Bayswater and Boronia, though not so plentiful as formerly. After leaving Blackburn, plants of the Golden Spray, *Viminaria denudata*, were also still to be found surviving in the railway reserve near to Boronia station. The Leper Acacia, *A. leprosa*, which abounds between Upwey and Belgrave, gave promise of abundant flowering next spring. At Belgrave our party numbered seventeen in all, including our president and Miss Raff, whom we were pleased to welcome after her return the previous week from her holiday and studies in Europe. We passed through the township to the track which leads through the forest to the Sherbrooke Falls. Our excursion object being ferns, our attention was soon attracted to the various species prevailing along the track, and their distinctive characteristics were pointed out. The rough and soft tree-ferns of varying heights and girths of stems were readily determinable after journeying a little way along our path. The exceptionally tall growths and immense size of many of the White Mountain Ash, *Eucalyptus regnans*, and other timber trees, as well as of the Hazel Pomaderris, Christmas Bush, Prickly Currant-bush, Blanket Leaf, and Austral Mulberry plants were pointed out *en route*. Various mosses and lichens and small botanical specimens of the ferns were gathered by the members under authority of the permit obtained by the leader from the Secretary for Lands. About half a mile along the pathway to the Falls we were met, under arrangement, by Mr. A. G. Hooke, the Club's treasurer, who led us into a side track on the right up the hill and through a fine gully and dense bower of soft tree-ferns. On these ferns were remarkably fine growths of the Shining Filmy Fern, the Bristle Fern, and alongside the track were seen some splendid examples of the Leathery Shield Fern, Soft Water Fern, Tender Bracken, Necklace Fern, and Mother Spleenwort. Two large plants of the common garden Hydrangea, which had been planted in the vicinity of this track by the proprietor of Sherbrooke Lodge, were found to be growing luxuriantly. They bore numbers of large, rich, blue-coloured flowers as a result of the iron influence of the soil in which they were luxuriating. After passing through this grove the track led us out on to the eastern boundary of the main Sherbrooke Falls valley vegetation,

and through an area now covered with the Common Bracken, the most cosmopolitan of the world's ferns. After a journey of about half a mile we were guided by Mr. Hooke to the country house of one of his relatives, a Miss Billing, where, at about 1 o'clock, we were welcomed by that lady and Mr. Hooke, sen., and Miss Hooke, who had kindly prepared a very acceptable lunch for the party. This was partaken of under the shade of trees in the garden, and was greatly enjoyed by all. At its conclusion the leader and our president expressed, on behalf of the excursionists, sincere thanks for the extremely kind thought and action of Miss Billing. This was supported with enthusiasm by all the excursionists, who joined in singing, "For they are jolly good people." A photograph of the party was then taken as a memento of the occasion by Mr. Harvey. We then started for Clematis Avenue Gully, at South Sassafras. As we left the house, picturesque views of Olinda and Mernda were observable in the distance, and further along on our journey beautiful views in the direction of Nethania Springs, Monbulk, and the Gippsland mountains beyond were noticed as we passed by the well-kept gardens of the tourists' home of "Grendon" and the adjoining properties. After a pleasant walk of about a mile we reached the head of the gully, which was our objective. Some tall examples of our rough tree-ferns were very attractive objects as they stood along the valley roadsides as single specimens, or in groups of three and four, up to 20 or 30 feet in height. This Clematis Avenue Gully appears to be about half a mile in length, and eventually joins the Monbulk Creek. Good road approaches have been made which enable motorists and others to reach this gully from Belgrave and to make a round trip through Sherbrooke, Sassafras, and Ferny Creek districts to Ferntree Gully. We entered this gully from one of the highest of the many tracks leading from the road, and spent about 1½ hours searching for different ferns. The most interesting noticed here were the Shiny Shield Fern, The Shade and Weeping Spleenworts, the Austral Filmy Fern, the Batswing Fern, the Lance Fern, the Finger Fern, the Kangaroo Fern, the King Fern, and the Scented Polypody; the last-named was to be seen covering branches of the Sassafras and other gully trees, as well as the tree-ferns. Some fine examples were met with throughout the day of the common Shield Fern, with young plants developing in various stages at the tips of the parent fronds. One of our party obtained a number of mosses and fern specimens for University work. Minute plants of the Batswing Fern, showing distinctly the prothallus from which they were developed in each case, were obtained from a side bank of the road. As we left the gully at about 4 o'clock, a leisurely walk down the well-made

and nicely-shaded road to Belgrave enabled us to reach the station in time to catch the 5 p.m. train to Melbourne. A few of the excursionists remained for later trains. The weather was perfect, and a most enjoyable day was spent. The following is a complete list of the twenty-six ferns noted during the day. In view of the fact that nearly one-half of the species of Victorian ferns may be found in the Sherbrooke district, and the many changes recently made in their specific names, I have deemed it advisable to add to my report in tabular form the vernacular names of the twenty-six species observed during the excursion, with the new specific names, as well as the older and more familiar ones, in brackets.

Bristle Fern, *Trichomanes venosum.*
Austral Filmy Fern, *Hymenophyllum australe* (*H. javanicum*).
Shining Filmy Fern, *H. flabellatum* (*H. nitens*).
Soft Tree-fern, *Dicksonia antarctica* (*D. billardieri*).
Rough Tree-fern, *Alsophila australis.*
Shining Shield Fern, *Dryopteris decomposita* (*Aspidium decompositum*).
Ground Polypody, *D. punctata* (*Aspidium punctatum*).
Common Shield Fern, *Polystichum aculeatum* (*Aspidium aculeatum*).
Leathery Shield Fern, *P. adiantiforme* (*Aspidium capense*).
Rainbow Fern, *Davallia dubia.*
Shade Spleenwort, *Athyrium umbrosum* (*Asplenium umbrosum*).
Necklace Fern, *Asplenium flabellifolium.*
Mother Spleenwort, *A. bulbiferum.*
Weeping Spleenwort, *A. flaccidum.*
Gristle Fern, *Blechnum cartilagineum.*
Fishbone Fern, *B. discolor* (*Lomaria discolor*).
Lance Fern, *B. lanceolatum* (*Lomaria lanceolata*).
Soft Water Fern, *B. capense* (*Lomaria capensis*).
Common Maiden-hair Fern, *Adiantum æthiopicum.*
Tender Bracken, *Pteris tremula.*
Batswing Fern, *Histiopteris incisa* (*Pteris incisa*).
Common Bracken, *Pteridium aquilinum* (*Pteris aquilina*).
Finger Fern, *Polypodium Billardieri* (*Polypodium australe*).
Kangaroo Fern, *P. pustulatum.*
Scented Polypodium, *P. diversifolium* (*Polypodium scandens*).
King Fern, *Todea barbara.*

F. PITCHER.

ERRATA IN APRIL *NATURALIST*.

Page 236, exhibit by J. Searle—For "Apendicula" read "Appendicularia."

Page 244, line 2—For "throat" read "thorax."

NOTES ON THE NATYA DISTRICT.

By CHAS. OKE.

(*Read before the Field Naturalists' Club of Victoria, 10th Mar.*, 1924.)

THESE few notes on the Natya district, while based on three short visits paid to the district in July, 1919, September, 1922, and June, 1923, may really be taken as a report of the Club excursion in September, 1922.

Natya is situated about 40 miles from Swan Hill, or 250 miles from Melbourne, and is about four or five miles from the Murray. In July, 1919, the Lands Department was advertising land as a soldier settlement in the parish of Pines, and as a friend of mine, Mr. J. Hann, was desirous of taking up land in the Mallee, we decided to go and have a look at it. So, on the 19th of July, 1919, we travelled by train as far as Piangil, then the terminus of the line. We spent the night in the train, as beds were not procurable in the town, and were awakened early by the noise of the other free boarders, mostly shearers making for early sheds in New South Wales. After breakfast we rolled our swags and set off for Possum Flat, where we expected to camp for a week or ten days.

The immediate vicinity of the town did not seem very inviting from an entomological point of view, but no doubt much interesting material might be taken quite close to the town, for just at the station entrance I caught the first beetle, *Onthophagus henleyensis*, Blackb., one of the small dung-chafers. Right in the main street were some logs, and on turning these over a number of *Talaurinus squamosus*, Macl., were obtained, this being the first Victorian record of this beetle.

On making inquiries at the coffee palace as to the most direct track to Possum Flat, we received quite a bewildering lot of advice as to "short cuts," but decided to go along the newly-laid railway line for a couple of miles and then get on to a track leading to our objective. Soon after leaving the railway line we got amongst the mallee, and from here on we hardly saw a break in the dense virgin growth. Some miles out we reached a small tank, and decided to have lunch. While my friend "boiled the billy" I had a look around. Every stick and piece of wood seemed to be harbouring several *Cubicorrhynchus granulatus*—they could have been taken in hundreds; but insects, other than ants, were scarce. Everything was very dry—in fact, it was practically a drought, as no rain had fallen, we were told, for over four months. Soon after leaving the tank we passed over a large sand-ridge, and gladly would I have spent some time here; but, being under promise not to hunt beetles until the tent was up, I had to abandon the idea. A couple of miles further on my friend

decided he must have a rest as soon as we reached the top of the next rise; but just before we started up this rise I noticed that there was a slight depression, about a dozen paces across, running along the base of the ridge, where the grass was nice and green. This was the only really green grass we saw in the district. I suggested that we take our rest there, and, to stop further argument, I dropped my swag at once and started hunting. Under a mallee root, within the green depression, I caught a fine blue specimen of *Eutoma tinctillatum*, Newm., and two specimens of *Chalcopterus picipes*, Macl., and, seeing a hole near the edge of another root, I dug it out, and caught a nice example of *Carenum elegans*, Macl. As this was the first one of the species I had taken myself, I considered it a real prize, and it certainly is a very fine insect, with its head and front of prothorax jet black, the rest of the upper surface dark green, and its "elegant" shape with beautiful lustre. Under a stick I got a Staphylinid that was new to science; it has since been described as *Lathrobium orthodoxum*, Lea, and several Polylobi were found amongst leaves and grass. A very pretty little Saprinus, metallic blue with coppery head and prothorax, was found running around a bit of dry bone. An Anthicid, *Formicomis kingi*, Macl., and the Carabs, *Parroa apicalis*, Sl., and *Tachys mitchelli*, Sl., were also added to the captures before time to move on was called. It is with regret that I think of this spot and the few minutes spent there. An hour's collecting would not have exhausted all its possibilities.

After this break we hurried on to Possum Flat, and started to put up the tent, when two returned men drove along in a light springcart. These were the first two to take up blocks in this area, and had only arrived a few days previously, and were camped in the scrub near by. They offered to drive us over their blocks, so as to give us an idea of the country—an offer we gladly accepted, and so saw the first bit of mallee (about half an acre) rolled in the parish. The first block had an unusually high sand-ridge on it, and up this we went to have a look around us. This drive lasted over an hour, with the consequence that it was nearly dark when we returned to our unpitched tent, and so we had to finish putting it up by candle-light.

Just as dawn was breaking I heard a fox yelping, so, picking up the rifle, went after him, and, though I saw him, I could not get within shooting distance. After this I had a hunt around Possum Tank. Here I took four species of Amycterides —*Talaurinus squamosus*, Macl., *Pfalidura flavosetosa*, Ferg., P. (sp. ?), and *Cubi granulatus*, the latter being in great numbers. Three species of Clivina were obtained from holes in the bank, and a few small things were taken at the water's edge. Running

over and amongst leaves on the ground were numbers of two species of Laius, of the Malacodermidæ. After breakfast we visited the large sand ridge, and I dug out a few young specimens of the large Mallee Cockroach, *Geoscapheus gigantæus*; but by 9 o'clock I began to feel so queer that we decided to return to the camp, and soon after reaching it I collapsed with pneumonic influenza, and was half-dragged to bed, where I remained for three days, and was then brought into Piangil. That I lived to reach Melbourne is, I believe, entirely due to the attention I received from my friend, but his ideas of nursing would not commend themselves to the average doctor. His one idea was to keep me lively, and with that object in view tried to make me walk about, though he really pulled me around. The only thing of interest I saw near the town was a medium-sized eucalypt with hundreds—if not thousands—of a small leaf beetle on it. Unfortunately, I only took a few specimens, thinking it must be a common species, but it was then unnamed, and was described last year by Mr. Lea as *Monolepta arida*.

The Club excursion to Natya from 23rd September to 2nd October was arranged for the State-school holidays, and I thought there would have been a fairly large party; but, through the School Exhibition, the holiday was cut out, and the party dwindled down to two of us—Mr. J. E. Dixon and myself. Leaving Spencer-street at 8.30 a.m., we arrived in Bendigo at 11.40, and after an early lunch started off from there at 12 o'clock for Natya. The journey to Bendigo is too well known to need any comment. After leaving Bendigo there is a little timber to be seen till Raywood is passed, after which the country is a flat plain, almost treeless, or, excepting small clumps, quite so, until nearing Swan Hill. At first sight these plains seem devoid of interest, but to anyone interested in bird-life there is much to be seen, such birds at White Ibis, Straw-necked Ibis, Native Companions, Plovers, Dottrels, Wedge-tailed Eagle, Hawks, Crows, and Magpies being recognized from the train. Then there is Pyramid Hill. This is seen for miles, gradually resolving itself from a misty, nebulous mass into a sharp pinnacle rising abruptly from the plain, and then, as you pass it just before reaching the station called Pyramid, it appears to swing around, and discloses another mountain behind it, and then you see it gradually fading away in the distance as you pass on towards Kerang. Further on you see the lakes at Mystic Park, Lake Charm, and Lake Boga, where you are almost sure to see Black Swans, Duck, Teal, Coots, and perhaps other water-fowl.

In several places between Mystic Park and Swan Hill there are large clumps of prickly pear, Opuntia, on land that appears

to be of very little use. Surely this should not be allowed to remain. It may not be spreading much at present, but that is no guarantee that it will not become more virulent and start spreading rapidly. The lesson of the prickly pear in Queensland and New South Wales ought to be sufficient to make any Government see that it is not allowed to acclimatize itself in our State. Beyond Swan Hill the journey becomes very tiresome, and the four and a half hours that it takes to do the 40 miles is mostly taken up by the driver or guard "swapping yarns" with the station masters and other friends along the line.

Arrived at Natya, we were met by Mr. Hann, who had kindly offered to put up a party of the Club, and he was somewhat disappointed on finding out that only two had come. It was a beautiful, bright, starlight night, with a keen nip in the air that suggested frost, and we soon had all signs of drowsiness blown away as we bowled along at a smart pace to Mr. Hann's house, a distance of six or seven miles, and two and a half miles beyond Possum Flat.

Sunday morning we were astir early, and wandered around the house and its sheltering patch of scrub, consisting of White Mallee, three Acacias, and Turpentine-bush, with, of course, a sprinkling of smaller shrubs, and, on a patch of sand, the Porcupine-grass. One of the first things to attract the eye were the numerous raised-up little mounds of fresh earth, or, as they were more often on the sandy patches, sand. These were about eight or nine inches high, and about four or five inches across, and were the result of the burrowing of our largest Victorian dung-chafer, *Bolboceras sloanei*, Blkb. These go down eighteen inches to two feet, and require some effort to dig out. The first thing we thought of looking for were Carenums, and, as we were both armed with strong trowels, we were soon busy digging out burrows. Some species seem to have their holes out in the open—that is, away from cover—*e.g.*, *C. elegans*, Macl.; but they are mostly near fallen Mallee, or leaves or sticks. This is rather a tedious pastime, digging in the hard ground, as some of them go down from six to nine inches, and up to two feet along, and when you get to the end, where there is generally a small chamber, you very often strike a "dud," or worse still, when inexperienced, the large cockroach, *Geoscaphus gigantcus*, popularly known as the "Mallee Turtle." On the sandy patches it is rather difficult to follow the tunnels, for, though you push a thin stick into the tunnel, they often turn off at almost right angles, and you dig past without seeing the hole, which, of course, easily fills with the sand.

I suppose it was due to this that the following incident

occurred:—I saw a Carenum sitting in the entrance to a burrow, and made an unsuccessful attempt to cut off his retreat with the trowel, so I carefully pushed a stick down and started digging, and after I had dug about five feet along a tortuous course, and over a foot deep, I saw something wriggling in the sand, and thought I had found it, but, on lifting it out on the trowel, found it was a lizard, *Hetronota binoei*, Gray, a pretty mottled little species in liver and white. Just where I lost the original tunnel and got into the wrong one I could not find out.

Tiring of watching us digging, our host suggested a walk down to his tank and the water-channel. Between two patches of crop he has left a strip of about 50 yards. One end of this is a patch of hop-bush, and intermingled are a few fair-sized eucalypts. Here, amongst some old hop-bush stumps, we obtained a few specimens of *Eutoma tinctillatum*, Newm., and *Chalcopterus picipes*, Macl.; this is the only species of Chalcopterus that, in Victoria, seems to be habitually on the ground, and I have not heard of this species being taken under bark or on tree-trunks, as other species are. In the small branches of the hop-bush we found two species of Belus breeding, as also was *Stigmodera parallela*. Eventually we were persuaded to leave the hop-bush, and, rather than trust us in the scrub, our host suggested cutting across the crop for the tank. Here we obtained a few small things near the water, such as *Bembidium jacksoniense*, Guer., *Notophilus gracilis*, Blackb., *Trogophlæus punctatus*, Fvl., and some water-beetles. Under a log were a number of small Tenebrionids and a number of small weevils. I was quite pleased with the later until it suddenly dawned on me that they were the wheat weevil.

Mr. Hann decided to leave us and go back to cook the dinner, and made us promise to be back by 1 o'clock sharp. Mr. Dixon and I decided to follow along the channel to the scrub, and so back to the house, about a mile, collecting as we went. Turning over Mallee roots, we got a few more beetles, a fine *Pterohelæus blackbourni*, *Semanopterus convexiusculus*, and *Eutoma* (*Carenum*) *gratiosum*, Sl.—a real prize. This was described from a specimen in Mr. C. French's collection, and, though it was labelled as "Mallee, Victoria," Mr. Sloane has since cast doubt as to the habitat being correct.* This is apparently only the second specimen to be found. Beating some Acacias, we obtained several small weevils, including a species of Myllocerus, also a Lemidia, but were surprised at not getting a single Melobasis. On some Purple Daisies, *Stigmodera elongatula* and *S. flavopicta* were obtained, while several attempts to catch a beautiful silvery Syrphid fly were unsuccessful.

* Proc. Linn. Soc. N.S.W., vol. xxv. p. 383

Returning towards the house through the scrub, we came across two very fine trees of the Bitter Quandong, or Ming, *Fusanus* (*Santalum*) *persicarius*, F. v. M., laden with fruit. We had to cross a sand-ridge, and on this we saw the first pines. Hitherto it had appeared as though the parish had been named, like Possum Flat, from an absence of its namesake. Here we also saw our first bull-ants' nest. These ants, *Myrmecia vindex*, Sm., var. *nigriceps*, Mayr., are very fierce, and when I stamped on the ground, a foot away from the nest, they all came tumbling out in a great hurry and fury to defend the home against all comers. Only two nests were seen in the district, and they were both the same size and shape. They appeared as though they had been raised up in a perfect cone, and then undermined in the centre, so that it had fallen in, leaving a crater-like structure. The sides were over two feet high and about 14 or 15 inches across at top. Two or three hundred ants must have come out of this first nest, and all had black heads and abdomens, the rest a pale yellowish-brown. We got back soon after three, and found dinner ready, and nothing was said about the two hours we were late. We had accepted an invitation from Mr. and Mrs. J. Ferguson to go over to their house to tea; so soon after dinner the three of us drove over. The track passed through Possum Flat and the Natya Station to about a mile beyond. Now it was daylight, what a difference was to be seen in this track from when I had walked over it in 1919! Large paddocks of two or three hundred acres without a single tree, and rolling going on all the time! One settler who has 700 acres has only one tree left—his house (?) leans against it—on his holding.

Monday morning was dull and rather close, and we went over the road to some large sand-ridges. Here I was surprised to find the Dotted Sun-Orchid, *Thelymitra ixiodes*, Sw., growing in great profusion, as also was the Fringed Spider-Orchid, *Caladenia dilatata*, R. Br., and a few specimens of a Pterostylis unknown to me. Some ant nests were searched carefully for inquilines, but, with the exception of a small Ctenisophus, with *Iridomyrmex rufoniger*, nothing was found. Amongst the clumps of Porcupine-grass pieces of a Scaraphites were common, but it was not till the Thursday that I caught a live specimen, and found it to be *S. hirtipes*, Macl. The most common insect here appeared to be the pretty Bombylid fly, *Neuria apicalis*, Macq. Pieces of Mallee an inch or more in thickness, broken down and lying on the ground, were very plentiful. The roots below were carefully grubbed out, and found to contain the larvæ of a longicorn beetle. A number of these were brought home, and from them a large black-and-white species of Hesthesis was bred out. In the afternoon we went to Possum

Flat, and here, in a nest of *Iridomyrmex gracilis*, I obtained a single specimen of Daveyia, probably *mira*, Lea. This beetle was named from specimens obtained at Geelong and Portland by Mr. H. W. Davey, and this is an interesting extension of its distribution. Insects were not as numerous as we had expected; still, we managed to get a few interesting specimens, including Trogophlæus, sp. n. (?), *Lathrobium exigium*, Blkb., *Pæderus cruenticollis*, Germ., var. (?), Eupinoda, sp. (?), Ctenisophus, sp. (?), Clivina, two species, *Bembedium jacksoniense*, Guer., *Mecyclothorax punctatus*, Sl, *Pfalidura flavosetosa*, Ferg., and several water-beetles. Ants were numerous, but, with the exception of a pale species of Camponotus, perhaps a form of *nigriceps*, were only small, common species. Flying around some Dodder-Laurel were several specimens of *Candalides hyacinthina simplexa*, one of our Mallee Lycænid butterflies. Shaking the tangled masses of Dodder-Laurel into the umbrella in search of the *simplexa* larvæ only produced negative results, but a most interesting spider, belonging to the Argiopidæ, with two large humps on its back, was caught.

Towards night it became very hot, and while we were having dinner it reached 98° in the dining-room. Numerous insects came in to the light, including a number of species either found in or near water, such as Clivina, Trogophlæus, Blædius, Bidessus, Copelatus, &c. This surprised me, as there was no permanent water nearer than Possum; but next morning, on unpacking some sheets of fibrous plaster from Lake Boga, the mystery was explained.

The next three days were spent near the house, and several interesting finds were made, the most interesting being, perhaps, a Tenbrionid inquiline, *Thorictosoma tibiale*, Lea, from the nest of *Euponera lutea*. This has only recently been described from two specimens taken in Western Australia. Another Western Australian insect found was Clark's Jumping Bull-Ant, *Myrmecia clarkia*, Craw., also recently described. Ants were very numerous, especially on the flats. *Iridomyrmex detectus* and *Camponotus nigriceps* had their nests in every direction, while two species of Crematogaster were also very numerous. One of the most interesting species found was a Meranoplus. This ant, which is less than a quarter of an inch, has a peculiarly-shaped head and a remarkable thorax; the latter, at a glance, seems to be nothing but spines. *Podomyrma adelaidæ* were fairly common, running in and out of their nesting-holes in twigs, especially in the "Wait-a-While," *Acacia colletioides*. Several species of Iridomyrmex were seen, the most common being *detectus*, while its var., *viridianeus*, Vieh., was also common. Of Pheidole only a few were seen, and only two nests found. Three species of Thynnid and one Vespid

wasp, with a few Chalcids, were the only other Hymenoptera taken. Very few species of Lepidoptera were seen, *Junonia vallida* being the only butterfly, besides the one already mentioned, that was seen. From the White Mallee, *Eucalyptus gracilis*, two larvæ of *Hyleora eucalypti*, Doubl., were taken. These pupated on the 4th and 10th October, and emerged on 3rd and 7th April, and, fortunately, were male and female. The commonest moth was a very pretty little black-and-yellow Pyralid, on the Desert Cassia, *C. eremophila*.

Orthoptera were represented by a small black cricket, a few small, immature grasshoppers, and one imagine of *Chortoicetes terminifera*, Walk., and three or four species of cockroach, including the large "Mallee Turtle," *Geoscapheus giganteus*, Tepper. This large cockroach is about 2⅝ inches long and 1⅛ inches wide, and of a bright reddish-brown; is wingless, and has the front legs admirably adapted for digging. Its egg capsule is about three-quarters of an inch in length. These cockroaches were very plentiful, and one morning, after a shower of rain overnight, they were running about the flat the house is on in such numbers that a hundred could have been caught in less than an hour. The same morning I took the gun to try for a rabbit on one of the sand-ridges without success, but on passing over the ridge to the flat beyond I saw two foxes running around amongst the Mallee and picking up something and eating it. On getting a little closer I saw they were eating these cockroaches. Unfortunately, the foxes were too far apart to get but the one, the vixen. So she will eat no more 'roaches or birds.

Coleoptera was our chief desire, and this partly accounts for the fact that we obtained far more species of this order than all the other orders put together. There was no need to go far, for a morning spent in a few acres produced several interesting beetles, all "new to me," and, just to name some, I might mention these few:—*Quedius andersoni*, Blk., Conosoma, sp. (?), *Eupines concolor*, Sharp, Eupinoda, sp. (?), Pselaphophus sp. (?), Arthropterus, sp. (?), *Sarticus dixoni*, Sl., *Carenum versicolor*, Sl., *Cerotalis semiviolacea*, Cast., Gigadema (three species), *Adelium goudiei*, *Chalcopterus leai*, Blkb., *C. longsculus*, Blkb., *C. lepida*, *Trox eyrensis*, Blkb., *Haplonycha carinata*, Blkb. (?), *H. bicolor*, Blkb., *H. opaca*, Lea, *H. pectoralis*, Blanch., Byromorpha, sp. (?), Cryptodus (two species). On this flat a small land shell occurs belonging to the genus Pupina, which Mr. C. Hedley informs me is new to science. We saw very few reptiles, two or three Blue-tongued Lizards (Tiliqua) and the same number of the Bearded Lizard, *Amphibolaurus barbatus*, Cuv., and Fraser's Delma, *D. fraseri*, being the only lizards, and only one snake, the Brown, *D. textilus*.

Entomologists do not need to cover much ground while collecting. Still, we thought a day at the river might prove both enjoyable and profitable, so we decided to go there on the Friday. We left about 8 o'clock in the morning, but did not reach the Murray until after 12, as we did not know to cut through some paddocks. Where we stopped and had lunch the river ran between high banks, and I doubt if it ever overflows, but half a mile lower down were some typical Murray flood-flats. Fairly soon after starting to collect I turned over a small log that was covering the nests of *Euponera lutea* and Iridomyrmex, sp. (?). Right between the two nests I saw a small beetle, since named *Orectsceles bifovcicollis*, Oke. In the nest of *Euponera lutea* were some *Eupines flavoapicalis*, Lea, and several specimens of a Microchætes, while over twenty specimens of *Diphobia familiaris*, Oll., were obtained from a nest of *Camponotus nigriceps*. The flood-flats were very dry when we were there. If there had been more moisture about it would have been better for us; but, even as it was, there were some nice things to be taken, including the following species of Staphylinidæ:—*Cryptobium elegans*, Blkb., *Lathrobium australicum*, Sol., *L. orthodoxum*, Lea, *L. mutator*, Fvl., and its var. *bipartitum*, *L. gratellum*, Fvl., *Scopæus latebricola*, Blkb., *Scymbalium australe*, Fvl., *Domene torrensis*, Blkb., *Quedius luridipennis*, Macl., Leptacinus, sp. (?), *Neobismius procerulus*, Grav., *Eulissus chalcopterus*, Er., *E. phœnicopterus*, Er. It was strange, considering the dryness of the ground, that there should have been so many Staphylinidæ, but no doubt it is the occasional overflowing of the Murray that attracts them.

Under the bark of logs were numerous long, thin, spotted Scorpions. These were very close to Keyserling's figure of *Isometrus maculatus*, De Geer, but the apical segment of the tail is shorter and broader, and the spine not so acutely curved. Under the bark of the River Gums beetles were very scarce, but we got a few Chelifers and spiders, also several Marbled Geckos, *Phyllodactylus marmoratus*, Grey, were seen; perhaps they had cleaned up the insect life. Termites were in every piece of dead wood, even in pieces that had one end in the water, and, although they were carefully searched for inquilines, the only result was three specimens of a species of Aleocharides (Staphylinidæ) unknown to me. About two hundred yards from the river some clumps of Mallee were just coming out in flower, and from these a few small weevils were taken, including *Lybæba pretiosa*, Lea, two species of Lemidia, and a species of Ditropidus. On digging out a burrow under this Mallee, a fine example of *Phloscaphus tuberculata*, Macl., was obtained. We stayed at the river till dark, and got back home at 10.30, well satisfied with our day on the Murray.

Saturday morning we visited a sand-ridge near the house, and here we took *Eurycaphus dilatatus*, Macl., *Astræus mastersi*, Macl., *Sclerorinus goudiei*, Ferg. (?). About 10 o'clock it rained very heavily, and we got drenched before we got back. It was not till four that it cleared sufficiently for us to venture forth again for a final look around the water-channel. We had barely reached there when it rained again, and we returned drenched to the skin. And this in a part of the country where, according to local tradition, "it never really rains"! Sunday was mostly spent in gathering flowers for the Club's wild-flower show. An early start was made for the train on Monday morning, and it was just light enough as we crossed Possum Flat to see the pretty patch of *Kochia triptera*, and long for another day, especially as we remembered we did not have a good look for small insects amongst this Three-winged Blue-bush or the patch of *K. brachyptera* (?) a little further on. On arrival at the station we found we had twenty minutes to spare, so we made a hasty search around the station. In a nest of the Green-head Ant, *C. metallica*, three Polylobi, a Microchætes, and a small black Trichopterygid were obtained, and from a bush of *Daviesia genistifolia* a pretty little Monolepta was taken, while under some old bags were several Anthicids.

My third visit was made on 23rd June till 26th June, 1923, which, of course, only left two days for collecting. The conditions this time were very different from the first visit, although it was only a month earlier in the year. Then everything was dry, and the earth on the flats crumbled into dust on being touched. Now the flats were just like so much mud, with water in every little depression, so it made collecting rather difficult. I was particularly anxious to obtain some more of the little land shells, Pupina, sp. (?), but, though I dragged around a couple of bags to kneel on, and looked well amongst the leaves and rubbish, I could not see a sign of one. The rain had evidently swamped out numbers of a small scorpion from their retreats. I had not seen this species on my former visits. It is similar to the common species in the Dandenongs and around Melbourne, and is probably only a form of that species. They were so numerous amongst dead leaves that it was necessary to exercise great care in handling them. *Quedius andersoni*, Blk., was now fairly abundant, as also were a species of Conosoma, and a species of Polylobus, near *longulus*, Oll. I spent nearly an hour watching a solitary Jumping Bull Ant, *Myrmecia clarki*, Craw., to see where its nest was, but it would not go to it. Opening a nest of the Green-head Ant, I got three small white crickets, and two in another nest. Very little fresh material was found around the house, but on the Monday I went to Possum Flat and got a pair of the Bombardier Beetle,

Pheropsophus verticalis, Dej. This beetle makes a fairly distinct sound when it "bombards," and apparently five or six "shots" is its limit, and then it has to wait three days before firing again. Such was my experience with this pair. Here I also caught a most interesting little "squeaking" weevil. I know of two other weevils that "squeak" when caught, but this one is by far the best "squeaker." My specimens vary in size from 3½ to 7 mm., 6 mm. being the usual size, and are of a light stone colour, with dark brown mottling on back, and coarsely punctured. Under a piece of tin was a specimen of *Catadromus australis*, Cast., and the only Scydmænid I have from the district, Heterognathus, sp. (?), was obtained from the nest of *Iridomyrmex rufoniger*.

Tuesday morning I returned to Swan Hill, and had the afternoon to devote to collecting along the river. The Victorian side is without a sign of trees, but on the New South Wales side there is a single row of trees growing. Stripping the bark off these was rather tiresome, as nearly every piece had a swarm of ants under it—a small blackish species of Iridomyrmex. They were there in thousands, but, so far as I could find, without inquilines of any kind. Three species of Staphylinidæ were very common—namely, *Scymbalium arcuatum*, Fvl., *Pinophilus rufitarsis*, Fvl., and *Lathrobium australicum*, Sol., while single specimens of *Scybalium australe*, Fvl., *S. duplopunctatum*, Fvl., *Cryptobium elegans*, Blkb., and *Neobisnius procerulus*, Grav., were all taken under the bark of these trees. From nests of Iridomyrmex under tins and pieces of wood I took a few *Articerus constrictiventris*, Lea, apparently a rare species, as no complete male has yet been described. The armature of the intermediate tibiæ is very similar to *A. nitidicollis*, Raff. Another specimen of *Eupines concolor*, Sharp, was also taken, and I saw a Pselaphid with a general appearance of *Batraxis armitagei*, King, but more robust, which, I regret, escaped me through someone coming up to me to find out what was wrong. (I'm sure this man still thinks I am "dippy.") A few small weevils and some common Carabs, including in the latter *Catadromus lacordairei*, Boisd., and the Bombardier Beetle previously mentioned, were about all I could find before the daylight faded away, and, having used my box of matches, I had perforce to make my way the best way I could along the mud-channel that served as a road to the hotel.

Much interesting material could, no doubt, be gathered around Swan Hill, and the conditions that are there to-day are likely to remain for years to come. But at Natya it is very different. Each year sees large tracts of Mallee rolled and burnt, and in a few years all this district will be open, undulating country, without a patch of scrub anywhere, with only a narrow fringe

of Mallee on either side of the road left for anyone to see what used to grow all over this parish. Even the fringe on the roads, which are few and far between, has an unhappy existence, because, as the centre of the track becomes boggy after rain, the road is either widened or a fresh track made. Of course, all this clearing of the Mallee is good progress for the country, but it hurts the naturalist to see all the natural growths disappearing so rapidly, and with it going the birds disappear, and species of land mollusca and Arthropoda become extinct without having been recorded, as some of these are probably very local.

There can be very little doubt that some of the insects herein mentioned are distributed over a small area only; others extend right through the Mallee, a few east and north, and some right through to Central and Western Australia, while only four of the beetles, *Cataclromus lacordairei* and *Scymbalium arcuatum*, *Pinophilus rufitarsis*, Fvl., *Stigmodera flavopicta*, Boisd., and four of the ants, *C. metallica*, *Iridomyrmex rufoniger*, *I. gracilis*, and *Camponotus nigriceps*, mentioned occur, or are known to occur, near Melbourne. Of course, there are plenty of insects common to both localities, but I have refrained from mentioning these. In the three trips I have taken 245 species of Coleoptera.

It is interesting to compare the list of Coleoptera of the Sea Lake district by Mr. Goudie * with mine, from Natya. Several in some families are missing from one or the other. Iridomyrmex, the best ant for inquilines, I have not been able to find in the Natya district, though Mr. Goudie finds it in great numbers around Sea Lake. Mr. Goudie has had the advantage of living for years at Sea Lake, while my trips to Natya have only been hurried visits; but I have hopes of being able to re-visit Natya and continue my investigations of its insect life. I am greatly indebted to Mr. A. M. Lea for identifying most of the Staphylinidæ, and to Mr. J. Clark for identifying some of the ants, and to both I tender my thanks.

SOME EAST GIPPSLAND NOTES.—A brief holiday of six days towards the end of February afforded me the opportunity of visiting a portion of Victoria of which I previously had little knowledge. My first objective was Nowa Nowa, at the head of Lake Tyers, about 210 miles from Melbourne. During an early morning ramble some nice specimens of *Isotoma axillaris*, the Rock Isotome, were noticed. This plant is not recorded from the eastern ("E.") division in the "Census." From

* Goudie, J. C., "Coleoptera of North-West Victoria," *Vict. Nat.*, vol. xix., p. 41.

Nowa Nowa we visited the Buchan Caves, and along the road saw several plants growing in their native habitat for the first time. That curious composite, *Humea elegans*, Plume Humea, occurred at one or two places, but, being past its best, its "plumes" had lost the pink tinge which earlier in the season renders them attractive. "Native tobacco" was the name given them by a resident, evidently from their large tobacco-like leaves, which are somewhat sticky and aromatic. The twiner *Kennedya rubicunda* was noticed climbing up the saplings or over the bracken in many places, its large trifoliate leaves being rather handsome. Buchan Caves—or, rather, the two we visited, the Fairy and the Royal Caves—we considered well worth the trip, and we were glad to find that Buchan is becoming well patronized as a tourist resort. A charge of two shillings and sixpence per head is made by the Government for all visitors entering a cave, this amounting to an average of £40 to £50 per week, while on one day during Christmas week three hundred visitors were shown through the Caves. The Caves contain all the forms of stalactites, stalagmites, &c., usually seen in limestone caves, together with shawls, mysteries, &c. The formations are perhaps not on such a large scale as those of Jenolan, N.S.W., but they are equally beautiful, and worthy of inspection. A large sum of money has been spent by the Government in opening up the Caves and making the passages more roomy. Electric light is available for showing off the many beautiful features to the best advantage. There are several other caves besides the two visited, and, as further exploration is going on, there are great possibilities ahead. Buchan itself is well situated overlooking the valley of the river of the same name—a rushing stream with a pebbly bed, on its way to join the Snowy. A rather weird sight along the road was a small forest of glaucous-leaved gum-trees, *Eucalyptus cinerea*, F. v. M., Mealy Stringybark. These had a very singular appearance as we drove through them. Many other strange plants and shrubs were seen, but "motor botanizing" is a somewhat difficult matter. Next day, on the way to Lake Tyers Entrance, we saw quantities of the Sunshine Wattle, *Acacia discolor*, which a few weeks later would be displaying its fluffy yellow balls for the benefit of passers-by. The road (portion of the Prince's Highway) crossed an arm of the lake, and in a cutting could be seen fairly large marine fossils, awaiting the hammer of the collector. Tree-ferns were not so numerous as had been expected, but here and there a few occurred. Lake Tyers, with its many arms and bays, offers the explorer endless beauty spots, while the naturalist will find many objects of interest. At Lakes Entrance we found Mr. T. S. Hart's admirable paper in the

October (1923) *Naturalist* most useful as a guide. Here the high bank on the northern side of the North Arm was botanically most interesting, and introduced me to several plants known to me only from dried specimens. The concluding part of our trip, across Lake King and up the Mitchell River to Bairnsdale, was noteworthy from the remarkable "silt jetties" between which the river makes its way into Lake King; these were well illustrated in Mr. Hart's previous paper on the physiography of the Lakes in the *Naturalist* for December, 1921. The trip, on the whole, was a most enjoyable one, made all the more interesting by having such papers as I have referred to as guides on our wanderings; hence the value of papers of a similar character for the benefit of future travellers. —F. G. A. Barnard.

A.A.A.S.—The sixteenth volume of the Proceedings of the Australasian Association for the Advancement of Science, being the record of the Wellington, N.Z., meeting in January, 1923, has been issued during the month. The volume extends to 872 pages, and contains, in the various addresses, reports, and papers, evidence of a great amount of painstaking research in various directions. The report of the Ecology Committee contains a useful bibliography of Australian floristic and ecological plant-geography. The Mueller medallist for the year 1923 was Mr. J. H. Maiden, I.S.O., F.R.S., F.L.S., well-known for his valuable contributions to Australian botany, and who has recently retired from his position of Government Botanist of New South Wales and Director of the Botanic Gardens, Sydney. The next meeting of the Association will be held in Adelaide during August next.

Sagacity in a Kookaburra.—A recent Nature note in the *Argus* says:—"At Traralgon Dr. Hagan got a young Laughing Jackass (Great Brown Kingfisher) from a nest about four weeks ago, the nest being about three miles out of the town. It took the old birds three weeks to locate the young bird in the doctor's garden, but they did it, and Mr. Tom Fisher says that they have been rather surprised at the quantity and variety of the food brought to the youngster. In one morning the old bird brought two big yabbies, a half-grown bush rat, and an eel 6 inches long, before midday. During the afternoon the youngster was fed wholly on frogs, and Dr. Hagan remarks upon the manner in which the old birds vary the diet. On one day they will fetch nothing but young Sparrows or other small birds, the next day frogs only, and perhaps on the following day exclusively mice. Some days he notices that they bring in nothing but small Blackfish. This is a very interesting observation, and suggests that keeping pet birds on a regular diet through the year must soon affect their health."

The Victorian Naturalist.

Vol. XLI.—No. 2. JUNE 5, 1924. No. 486.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th May, 1924.

The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about forty members and visitors were present.

REPORT.

A report of the visit to the Biology School, Melbourne University, was given by the chairman, who said that about twenty-five members of the Club had taken part in the visit, and had spent a pleasant and profitable afternoon. Professor W. E. Agar, M.A., F.R.S., invited the party into the lecture-room, where he gave a short statement of the Mendelian theory of inheritance. He based his remarks on a number of skins of domestic fowls of the Rhode Island Reds and Plymouth Rock breeds, and the progeny of interbreeding the two forms, in which it was clearly shown which were the dominant and which the recessive characters. The party then visited the laboratory, where a number of interesting exhibits were on view, which were explained by Prof. Agar and Mr. P. C. Morrison, B.Sc.

ELECTION OF MEMBER.

On a ballot being taken, Miss MacGeachy, "Deepdene," Burke-road, Balwyn, was duly elected a member of the Club.

GENERAL BUSINESS.

Mr. F. G. A. Barnard drew attention to the reported diminution of Mutton-birds at Phillip Island owing to the destruction of their nesting-places by the shifting sand. He had been present at a recent meeting of the National Parks Association, when Mr. F. Lewis, the Inspector of Fisheries and Game, had stated that, unless steps were taken to plant marram-grass to stay the sand, the greater portion of the "rookeries" on the island would be destroyed.

On the motion of Messrs. Barnard and French it was decided to write to Mr. Thomson, Cowes, asking his advice in the matter.

The president drew attention to the very great loss a member, Miss A. Fuller, had just sustained in the very sudden death of her brother, and moved that a letter of sympathy be forwarded to her. This was seconded by Mr. F. G. A. Barnard and carried in silence, all standing.

Messrs. F. Pitcher and A. J. Tadgell were elected to audit the accounts of the Club for the year 1923–4 just closed.

PAPERS READ.

1. By Mr. J. C. Goudie, entitled "Notes on the Coleoptera of North-West Victoria," Part XI.

In this part the author dealt with the families Tenebrionidæ, Cistelidæ, Melandryidæ, and Anthicidæ, the first-named family being the most numerous in the Mallee country around Sea Lake. The fact that only 47 species of Tenebrionidæ were listed, while Australia is credited with over 1,000 species, indicated an arid climate and the absence of wooded areas. Only three species appeared to be peculiar to the district, while several of the others are to be found throughout Western New South Wales, South-Western Queensland, and in South Australia—in fact, almost wherever "Mallee" conditions prevail.

In the absence of the author the paper was read by Mr. F. G. A. Barnard, who, with Mr. C. Oke, remarked on some of the beetles mentioned.

2. By Mr. P. F. Morris, entitled "A New Species of Brachycome."

The author described as new to science a species of Brachycome found by Mr. H. B. Williamson, F.L.S., on the Bogong plateau, North-Eastern Victoria, at an altitude of about 4,000 feet. The plant is only two to three inches in height, and resembles a small form of *B. scapigera*, D.C., but the achenes are not winged as in that species. The ray florets are pale lilac or light blue.

Messrs. Williamson, Pitcher, and Heber Green remarked on the interest of the locality and its plants.

3. By Mr. L. B. Thorn, entitled "Notes on the Life-Histories of Some Victorian Lycænid Butterflies."

The author, by means of specimens and drawings, briefly indicated the differences between butterflies and moths, and then the position of the Lycænidæ in the usual classification of butterflies, of which he said Waterhouse and Lyell, in their work, "Australian Butterflies" (1914), recorded eighty-nine species for Victoria. Of these, twenty-nine species belonged to the family under notice, popularly known as "blues" and "coppers," so called on account of their bright metallic colourings, giving first of all the grouping of butterflies and a sketch of a typical life-history. The author then dealt with eight species—three belonging to the sub-family Ogyrinæ, three to Miletus, and two to Ialmenus. Attention was called to the remarkable fact that the caterpillars of the Lycænidæ are nearly always attended by ants—some by one species of ant, some by another; but a definite reason for this action has yet to be discovered, beyond the fact that the caterpillars secrete a fluid

of which the ants are very fond. Owing to their habits the butterflies of this group are difficult to capture, hence rearing the caterpillars is usually adopted by collectors, though with some difficulty, on account of the necessity for providing the ants usually associated with them.

Messrs. Searle, Barnard, and Oke remarked on the interest of this association of two such dissimilar orders of insects and other points in their life-histories.

EXHIBITS.

By Mr. C. Daley, B.A., F.L.S.—Water-worn pebbles from Latrobe River gravels, Victoria.

By Mr. P. F. Morris.—Dried specimens of *Brachycome alpina*, sp. nov., found at Pretty Valley, Bogong Plateau, by Mr. H. B. Williamson, F.L.S., January, 1923, in illustration of paper.

By Geological Survey of Victoria, per Mr. A. E. Rodda.—Coorongite, from Lake Coorong, South Australia. This substance has been the subject of considerable discussion amongst geologists, as by some it has been thought to be a process in the formation of petroleum, but this view is now generally opposed. It is a dark-coloured gelatinous material of the appearance and consistency of crude rubber. It is inflammable on account of its oil content, and burns with the characteristic smoky flame and odour of burning oil. Coorongite occurs in the dried-up portions of shallow fresh-water or brackish lakes, such as Lake Coorong, in South Australia (from which it takes its name), in the form of flattened masses or sheets, and is now generally considered to be a product of the decomposition of fresh-water algæ.

By Mr. W. H. A. Roger.—Stones found in the sand and river gravel forming the bed of the Fitzroy River, about 60 miles from Rockhampton, Queensland.

By Mr. J. Searle.—Under microscope.—Blood smears—(*a*) avian blood (normal); (*b*) avian blood (pathological); (*c*) human blood (normal); (*d*) human blood (pathological); the avian blood (pathological) showing an abnormal number of polynuclear leucocytes, eosinophil leucocytes, and myelocytes.

By Mr. L. B. Thorn.—Victorian Lycænid butterflies, &c., in illustration of paper.

By Mr. H. B. Williamson, F.L.S.—Specimen of Long-tongue Greenhood Orchid, *Pterostylis grandiflora*, R. Br., collected by exhibitor at Newstead, 4th May, 1924; microscopic slides of flowers of the rare orchid, *Prasophyllum ciliatum*, Ewart and Rees, collected by exhibitor at Newstead, 4th May, 1924.

After the usual conversazione the meeting terminated.

The following exhibits should have been included in the report of the April meeting, May *Naturalist*, page 3 :—

By Mr. C. Daley.—Spear-heads from Kimberley district, North-West Australia.

By Mr. J. R. Leslie.—A representative collection of Tasmanian mosses.

By Geological Survey of Victoria, per Mr. A. E. Rodda.—Fossil fruits in brown coal, from Lal Lal, Victoria.

By Mr. A. J. Tadgell.—Flowers of Ploughshare Acacia, *A. vomeriformis*, grown at Sandringham (plant obtained at Grampians).

ERRATA IN MAY *NATURALIST*.

Page 2.—Line 5 from bottom—for "Rhymil" read "Rhynie."
Line 4 from bottom—for "*Rhznia*" read "*Rhynia*."
Line 3 from bottom—for "foranimifera" read "foraminifera."
Line 1 from bottom—for "Coldaren, Farol Channel," read "Cold area, Faröe Channel."
Page 3—Line 18—for "Eulimnidia" read "Eulimnadia."
Line 19—for "Strickland" read "Stickland."

BALLARAT PINE PLANTATIONS.—Considerable space is given to an illustrated article in the *Australian Forestry Journal* (Sydney) for January on the tree-planting that has been done around Ballarat by the Water Commission and by the City Council, the result being that bare lands have been turned into profitable forests. In 1921 there were 200,000 trees growing of marketable value; since that time various species of conifers have been added, in many cases by the thousand. Since 1904 over £12,000 has been received from the sale of timber. The results of these plantings prove that the Ballarat district is well adapted for pine plantations, and as these, it has been shown, can be established on old worn-out mining areas, there is no sacrifice of good land suitable for other cultivation.

"THE AUSTRALIAN MUSEUM MAGAZINE."—The two numbers for the current year of this magazine are well up to the standard of those of the first volume. The magazine is one in which almost any nature-lover will find something of interest, while the articles are generally well illustrated. The issue for April contains an article by Mr. Chas. Barrett, C.M.Z.S., entitled "Wild Life of the Mallee," with a number of figures of Mallee life. Another article, by Mr. A. Musgrave, F.E.S., entomologist to the Australian Museum, Sydney, entitled "Some Australian Insects Injurious to Man," deals with quite a number of insects whose attacks are more or less unpleasant, but none of them of a serious character.

NOTES ON THE COLEOPTERA OF NORTH-WESTERN VICTORIA.

PART XI.

By J. C. GOUDIE.

(*Read before the Field Naturalists' Club of Victoria, 12th May, 1924.*)

TENEBRIONIDÆ.

THIS family, well represented in Australia, belongs to the comprehensive group of the Heteromera, in which all the species have the front and middle tarsi 5-jointed, and the hind tarsi 4-jointed. This, with the moniliform antennæ, serves easily to distinguish them from the Carabidæ, which many of the species otherwise resemble considerably. They are varied in habits, some large groups of species being exclusively ground-dwellers, these being mostly night-feeders, taking shelter by day under logs, &c., whilst others, such as Chaltopterus, frequent trees and shrubs. I am indebted to Mr. H. J. Carter, F.E.S., for the names of many species, for revising my list, and for the following note on the same:—"The first noticeable point that occurs in an examination of the list is the poverty of the region in the group, both in genera and species, as compared with Eastern Australia or the coastal districts of the west. The following figures indicate the remarkable difference of numbers. Of the 110 genera and 1,053 species of Australian Tenebrionidæ, the collection made by Mr. Goudie—probably nearly exhaustive of the region—shows 20 genera and only 47 species. This indicates an arid climate and scantiness of wooded regions—at least, of the larger timber and denser vegetation of eastern areas—a fact which is further shown by an analysis of the genera. No less than 21 of the 47 species belong to the allied groups Helæinæ and Nyctozoilinæ, which are specially characteristic of the central and western fauna. Of these, only three—*Onosterrhus acuticollis*, Cart., *O. goudiei*, Cart., and *Æthalides marginicollis*, Cart. (so far as I know)—are peculiar to the district, the rest being also found in Western New South Wales, South-Western Queensland, or (as with the majority of Mallee insects) in South Australia. Other typical dry-country genera represented are Exangeltus, Mesomorphus, and Gonocephalum (one species of each), and Cestrinus (three species). Of the Adeliinæ, so numerous in Eastern Australia, only five species are found. Cardiothorax is unrepresented, or merely suggested by its ally, *Otrintus behri*, Germ., found from Western New South Wales to Eucla (S.A.) Adelium is represented by three species (out of a total of 61 for Australia), of which *A. goudiei*, Cart., seems to be peculiar to the region, while a single Seirotrana completes the tally of this sub-family.

Of the probable Torresian or Austro-Malaysian representatives, *Anansis metallescens*, Westw., and seven or eight species of Chalcopterus (of the 11 Australian species), have been taken by Mr. Goudie, none, however, peculiar to the district. While the Tenebrionidæ are apparently more able to resist arid conditions than the moisture-loving Carabidæ, they yet depend largely on vegetation in which they breed, and this, again, is dependent on rainfall. A comparative list of Tenebrionidæ for each region would thus be a fairly accurate measure of its rainfall."

This is a rather formidable, but true, indictment of the Mallee as a producer of Tenebrionids. As a kind of set-off, however, it might be suggested that if the greater part of the vast Eyrean sub-region were included in the comparison, the result would not be greatly altered. It may be also pointed out that, although the number of genera and species is small, yet the individual numbers of some genera, such as Saragus, Chalcopterus, Cestrinus, Adelium, and Seirotrana, are great—in fact, they are the most common of Mallee beetles. It would be interesting to know how many genera and species of this family are to be found in the heavily-timbered areas of Gippsland, to test the theory as to their numbers being an index of rainfall.

Exangeltus gracilior, Blackb.

A rather narrow, brownish or piceus beetle, under half an inch long; the elytra are closely and strongly punctate. Found under the bark of trees, and has a wide range over the central area of the continent.

3662. *Mesomorphus villiger*, Blanch.
Gonocephalum elderi, Blackb.
3664. *Cestrinus punctatissimus*, Pasc. = *aversus*, Pasc.
3671. *C. trivialis*, Er.
C. brevis, Champ. = *aspersus*, Blackb.

The above five species are small dark brown or blackish beetles, usually found under dead leaves on the ground.

Platydema bicinctum, Champ. (?)
3709. *P. limacella*, Pasc.

P. bicinctum occurs in large numbers about chaff sheds, &c. It is one-twelfth of an inch in length, and is brown, with two yellow fasciæ on the elytra. *P. limacella* is larger, shining black, with a red spot on the shoulder, and another at the tip of each elytron. Specimens have been found in birds' nests.

Tribolium myrmecophilum, Lea, Proc. Roy. Soc. Vict., xvii. (n.s.), part 2, p. 383.

"Distinguished from the cosmopolitan *T. confusum* and

ferrugineum by the small terminal joint of the antennæ and other features." It occurs rather plentifully in the nest of the wood ant, *Iridomyrmex nitidus*.

3742. *Pterohelæus bullatus*, Pasc.
P. dispersus, Macl. = *fraternus*, Blackb.
P. granuliger, Macl.
P. nitidissimus, Pasc.
P. planus, Blackb.

These species of Pterohelæus are blackish or piceus, the largest being *P. granuliger*, three-quarters of an inch long. The outer margins of prothorax and elytra are produced and flattened. They are slow-moving beetles, usually met with under logs or under the bark of trees.

3768. *Helæus castor*, Pasc.
3780. *H. moniliferus*, Pasc.
3784. *H. princeps*, Hope.
3787. *H. squamosus*, Pasc.

These are broad, flat beetles, having the explanate rim greatly developed, overlapping in front so as to encircle the head. The elytra are carinate or ridged. *P. princeps* is black, about 1¼ inches in length. All the species are found in the most arid situations, under logs, &c.

Saragus catenulatus, Macl.
S. lævis, Macl.
S. latus, Blackb.
S. frenchi, Cart.

The species of Saragus are short, roundly ovate, generally black, with costate elytra, except *S. lævis*, which is smooth. Habits similar to Helæus. *S. frenchi*, slightly over a quarter of an inch long, is the smallest of the Mallee species.

Onosterrhus acuticollis, Cart., Ann. Queens. Mus., Nov., 1911.
O. goudiei, Cart., *loc. cit.*
O. (*Hypocilibe*) *rotundatus*, Blackb.
3834. *O. vage-punctatus*, Haag. Rut.

The four species of Onosterrhus are decidedly rare. They are smooth, strongly convex, bluish-black beetles, the largest, *O. rotundatus*, being seven-eighths of an inch long. They occur on the ground, sheltering under fallen boughs.

Æthalides marginicollis, Cart., Proc. Linn. Soc. N.S.W., xxxiv., part 1, p. 136.
Æ. punctipennis, Bates, Ent. Mo. Mag., x., 1873, p. 50.

These are stout, convex, and black, with costate and wrinkled elytra. *Æ. marginicollis* measures 17 x 9 mm.; *punctipennis* is smaller. Both are rare insects, found under logs.

3839. *Amphianax subcoriaceus*, F. Bates = *Agasthenes goudiei*, Cart.

This is a black, somewhat shining, rather flattened species, from half to three-quarters of an inch in length. Both basal and apical angles of prothorax are shortly but acutely produced. Mr. Carter, in a letter to me, has authorized the above synonymy.

3849. *Agasthenes westwoodi*, F. Bates.

A slightly larger beetle than the preceding, but similar in shape, colour, and habits, being taken on the ground under logs. I have seen only two specimens. It occurs also in Western Australia.

3858. *Hypaulax orcus*, Pasc.

A fairly common species, about three-quarters of an inch long. It is deep black, with rows of strong punctures on the elytra, and with the hind angles of prothorax produced. It is a sluggish insect, feigning death when disturbed. Found under logs, &c.

Tenebrio obscurus, Fab.

An introduced species, occurring in houses and sheds.

3913. *Anansis* (*Prophanes*) *metallescens*, Westw.

A fine and rare beetle. It is an inch in length, the head, legs, and prothorax are black, the front angles of the latter being produced into long, acutely-pointed spines. The upper surface is of iridescent metallic colours, a mixture of green, blue, and purple. Two specimens taken resting on tree-trunks. At Nyah, on the Murray, I took a specimen under a log.

Hymæa laticollis, Cart., Proc. Linn. Soc. N.S.W., 1908, vol. xxxiii., part 2, p. 410.

An elongate, sub-cylindrical, shining fulvous-brown beetle 5 mm. in length. The head is placed vertically. On each elytron are four amber-coloured tubercles, linear-oval in shape, placed as follows:—Two on basal half (inner one nearer base), one smaller near apical declivity, the fourth (much larger) on the shoulder. A rare species, only two examples being known. They were found under the bark on a log at Sea Lake in April. The type is in the National Museum.

4007. *Otrimus behri*, Germ.

This is a long, narrow, carab-like species, met with under stones and logs. It is black, about three-quarters of an inch long, the elytra striate. The femora are considerably thickened.

4011. *Adelium angulicolle*, Cast.

A. goudiei, Cart., Proc. Linn. Soc. N.S.W., xxxiv., part 1 p. 150.

4047. *A. similatum*, Germ.

These also have a superficial resemblance to the Carabidæ. They are of a bronzy-green colour, and measure about three-

quarters of an inch. Their favourite habitat is under the leaves of fallen boughs.

4037. *Seirotrana parallela*, Germ.

One of the commonest beetles in Victoria. One meets with it almost everywhere. It is narrower than the species of Adelium, is of a black-bronze colour, and about half an inch long.

4146. *Chalcopterus affinis*, Bless. = *howitti*, Pasc.
4148. *C. iridicolor*, Bless.
C. juvenis, Blackb.
4120. *C. picipes*, Macl., var.
4121. *C. polychromus*, Pasc.
4126. *C. resplendens*, Boisd.
C. versicolor, Blackb.
C. vividus, Blackb.

Wherever there are eucalyptus trees there are almost sure to be some of these beetles resting on the trunk or hiding under the bark. Although so common, they are, as many of their specific names indicate, amongst the handsomest of our beetles, being of rich iridescent colours, in which green, blue, and red or purple predominate. They are very convex, with small head and prothorax, and measure from a half to three-quarters of an inch in length. When handled these beetles emit a pungent odour. Over 100 species have been recorded as Australian.

CISTELIDÆ.

This family is close to the Tenebrionidæ. Mr. Carter, who revised the group in 1915,* gives the following differentiating characters :—" (1) Pectinate claws ; (2) anterior coxal cavities closed behind ; (3) the presence of lamellæ on the tarsi." They are active, slender beetles, of small to medium size, frequenting flowers and foliage, and appear in numbers early in the summer.

4169. *Anaxo brevicornis*, Bates.
A. cylindricus, Germ.
A. cylindricus, var. *obscurus*, Blackb.
4198. *Chromomæa fastigiata*, Germ.
4177. *C. unicolor*, Bates.
4206. *Metistete omophloides*, Hope.
4182. *Apellatus lateralis*, Pasc.
Dimorphochilus pascoei, Macl.
4193. *Homotrysis carbonarius*, Germ.
4207. *H. pascoei*, Macl.

MELANDRYIDÆ.

Scraptia lugubris, Lea, Tr. Roy. Soc. S.A., xli., p. 166.

* Proc. Roy. Soc. Vic. 28, N.S., Pt. 1.

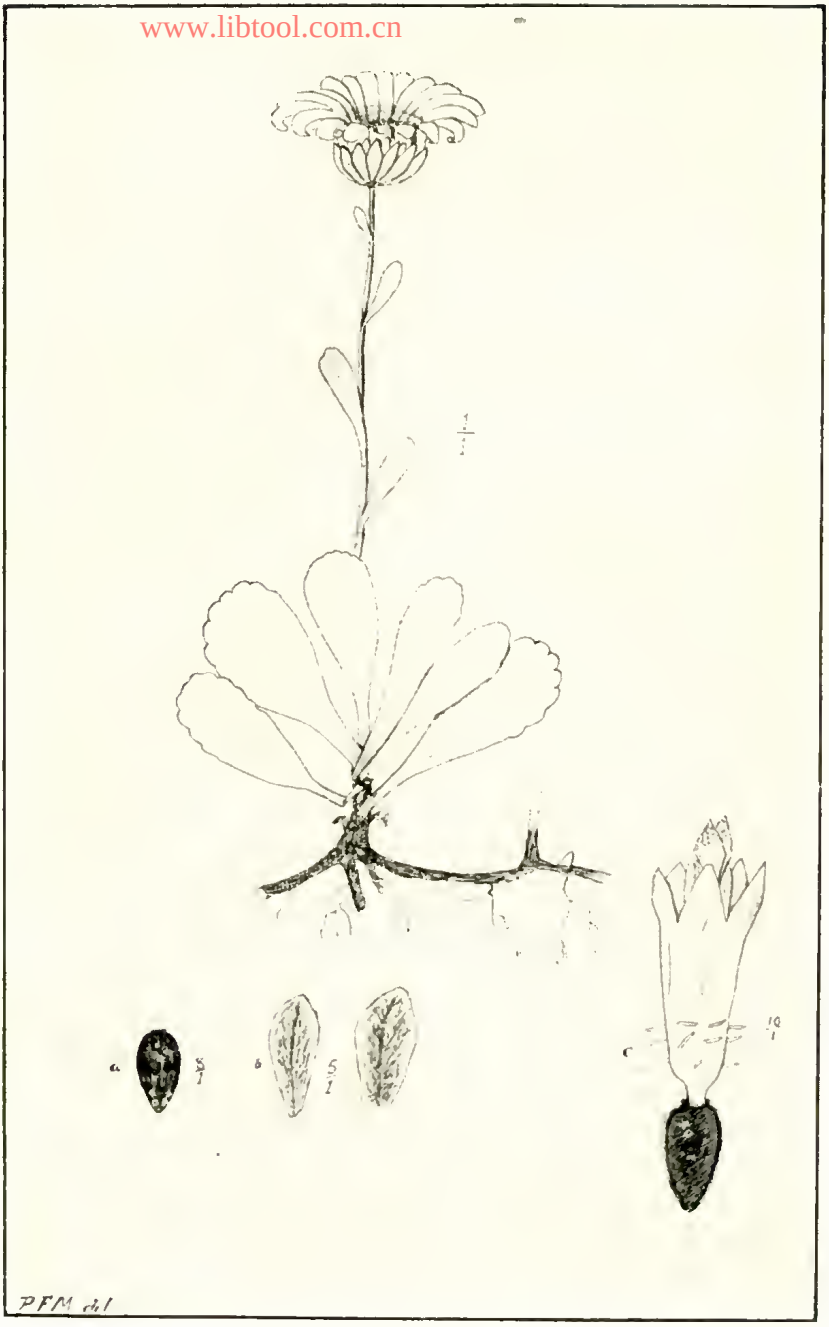
ANTHICIDÆ.

These are small beetles found on flowers, occurring at lights or amongst rubbish on the ground. Many of them have transverse markings on the elytra.

4254. *Formicomus mastersi*, King = *kingi*, Macl.
Anthicus ambulans, Lea, Proc. Linn. Soc. N.S.W., xlvii., part 4, p. 482.
4282. *A. floralis*, Linn.
4295. *A. mastersi*, Macl.
4297. *A. myrteus*, King.
A. politulus, Lea.
4306. *A. unifasciatus*, King.

VICTORIAN GEOLOGY.—The Victorian Department of Mines has recently issued several publications dealing with the geology of the State. In Bulletin No. 42, "The Daylesford Goldfield," Mr. H. S. Whitelaw and Mr. W. Baragwanath (the Director of the Geological Survey) gave a comprehensive account of that goldfield, known at its origin, in 1852, as the Jim Crow diggings. This district is known to many persons, containing as it does the celebrated Ajax line of mines, from which many thousands of pounds' worth of gold have been won. The bulletin is well illustrated with maps and plans of the various mines, &c. A contoured plan of Mount Franklin is very interesting, as it is one of the best preserved craters in the State. The greater part of the rim is over 100 feet above the floor, while a small portion is 280 feet. An illustration is given of the scene in the basin, looking towards the breach, which shows a well-wooded floor. Daylesford is also known for its mineral springs, of which there are a dozen or so in different directions. The best known is the Hepburn Spring, whose life seems to depend upon whether workings on the Frenchman's line of reef happen to be in progress or not. For the sake of the attraction to the district, this mine, unless very rich, should be kept closed. Bulletin No. 46 is devoted to a report on the Phosphate Deposits in the Mansfield District. This is by Mr. A. M. Howitt, with palæontological appendices by Messrs. F. Chapman, A.L.S., T. S. Hall, D.Sc., and R. A. Keble. This is also well illustrated. The deposit of phosphate rock has been known since 1904, and is now being mined for commercial purposes by the Heathcote Chemical Co. Four miles south is another deposit known as the Howe's Creek beds. Mr. Chapman's report records quite a number of genera and species, some of which are new to science, belonging to Upper Cambrian times, though determined in 1918, the report has only now been made available to the public.

PLATE I.



BRACHYCOME ALPINA, P. F. Morris, n. sp.

A NEW SPECIES OF BRACHYCOME.

By P. F. Morris, National Herbarium, Melbourne.

(With Plate.)

(*Read before the Field Naturalists' Club of Victoria, 12th May, 1924.*)

Brachycome alpina, P. F. Morris, sp. n.

Herba perenne, scabrida, rhizomate, 5–10 cm. alta; foliis omnibus (v. plerisque) radicalibus, obovato-spathulatis, obtusis, grosse crenatis in petiolum angustatis, 1–2.5 x 0.5–1 cm.; scapis solitariis erectis, 5–10 cm. altiis; capitulis parvis 1 cm. latis; radii flores ligulis conspicuis pallide lilacini, disci flavi. Involucri squamis obovatis lanceolatis 5 mm. x 2 mm. Acheniis nigris, non compressis, marginatis, obovatis-lanceolatis, 2 mm. longis; pappo brevissimo.

A small perennial plant 5–10 cm. high, scabridous, root-stock rhizomatic, branched, having the withered remains of the old leaves at the apex. Leaves (radical) 1–2.5 cm. in length, 0.5–1 cm. across, obovate-spathulate, toothed towards the apex, crenate or more or less entire, and narrowed into a broad petiole. Scape not branched, erect, 5–10 cm. high, bearing a single capitulum and 4–6 distant leaves, much shorter and narrower than the basal ones. Capitulum 1 cm. broad at base and 3.5 cm. across the tips of the ray florets; involucral bracts 5 mm. long, 2 mm. broad, bluntly pointed. Ray floret pale lilac or light blue, narrow, about 6–8 mm. long, ligulate. Disc floret yellow, slightly more than twice the length of achene. Achene 2 mm. long, obovate-lanceolate, not compressed, and having a thickened margin; the achene turns black at maturity. Pappus minute, or none.

Pretty Valley, Bogong Plateau, Victoria. Collected by H. B. Williamson. Placed in Bentham's Section II., Paquerina ("achenes never winged, pappus minute or none"). Placed next to *B. trachycarpa*, F. v. M.

Superficially the plant resembles a small form of *B. scapiformis*, D. C. (Sec. III., Brachycome), which has winged achenes narrow and acute involucral bracts, and is a much larger plant.

Explanation of Plate.

Drawing natural size. *a.* Achene; *b.* Involucral bracts; *c.* Disc floret showing stigma and achene (variously enlarged).

"The Trans-Australian Wonderland."—Every naturalist at least who has made the overland journey between Perth and Melbourne, or *vice-versa*, will be interested in this booklet of nearly one hundred pages, describing, with the aid of illustrations, some of the features of the Ooldea district. Its

author, Mr. A. G. Bolam, station-master at Ooldea, has spent his spare moments profitably in jotting down what he has learned by his own observations, and what he has learned from the aboriginal inhabitants of the district about the beasts, birds, reptiles, plants, &c., of his neighbourhood. Fishes cannot be included for the simple reason that Ooldea is hundreds of miles from any stream. Ooldea is about 425 miles west of Port Augusta, and it is situated just on the eastern edge of the wonderful Nullabor Plain, which stretches westerly for 450 miles—an almost dead level, treeless tract, covered by such dwarf salt-bushes and other vegetation which can exist on an annual rainfall of about eight inches. Ooldea is fortunate in being situated near a "soak," where underground water can always be obtained, and this has made it an important station on the line, and also a great meeting-place for the natives for hundreds of miles in either direction. Among the animals dealt with are the Marsupial Mole, Kangaroo Mouse, House-building Rat, Fat-tailed Mouse, Bandicoots, &c. The first-named animal is a little creature of about six inches in length; it is without eyes or ears, but possesses legs and feet, with which it is enabled to disappear into the sandy soil in a twinkling. The House-building Rats construct a home for themselves of fine sticks, sometimes as large as six feet in diameter and three feet in height—a seemingly wonderful performance for such small creatures; underneath is a tunnel home. Some remarkable lizards are to be met with among the sand-hills, such as the Mountain Devil (Moloch), a formidable-looking creature, but perfectly harmless, living on ants, flies, &c., and, becoming quite tame, are useful creatures about the house. The Frog or Barking Lizard is an extraordinary-looking animal, but quite harmless. The birds include the Wedge-tailed Eagle, Wild Turkey, Mallee-fowl, Cave Owl, &c. The latter bird lives in the caves and blow-holes of the Nullabor Plain. Quite a number of species of smaller birds are seen from time to time, while Cockatoos and Parrots often appear in large numbers, so that Ooldea cannot be considered quite devoid of interesting specimens of natural history. The vegetation is naturally of a kind that can withstand heat and droughts. Acacias, Myoporums, Cassias, Quandongs, are a few of the genera represented. In the *Naturalist* for March, 1920 (vol. xxxviii., p. 128), Mr. J. A. Kershaw gave a list of about forty species, mostly trees and shrubs, collected in the neighbourhood just as samples of the vegetation; some of these are to be found in Victoria, such as *Godenia pinnatifida* and *Pittosporum phillyroides*. The little volume concludes with an interesting description of the aboriginals of the district, both in their primitive state and since their contact with white men.

The Victorian Naturalist.

Vol. XLI.—No. 3. JULY 10, 1924. No. 487.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE forty-fourth annual meeting of the Club was held at the Royal Society's Hall on Monday evening, 16th June, 1924.

The president, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about seventy members and visitors were present.

CORRESPONDENCE.

From Miss A. Fuller, thanking the Club for the letter of sympathy forwarded to her on the sudden death of her brother.

From the local secretary of the A.A.A.S., reminding members of the meeting of the Association, which will be held in Adelaide during August next. The Club delegates to the meeting are Mr. F. Chapman, A.L.S., Mr. C. Daley, B.A., F.L.S., and Dr. C. S. Sutton.

REPORTS.

A report of the excursion to the Clifton Hill Quarry, on Saturday, 24th May, was given by the leader, Mr. A. L. Scott, who said that a fair number of members had taken part in the excursion, and had been greatly interested in the quarry, which is of immense size, and is now nearly worked out. The basalt here is celebrated for the many beautiful minerals which it contains, but on this occasion did not yield any very unique specimens.

A report of the excursion to the Entomological department of the National Museum on Saturday, 7th June, was given by Mr. C. A. Lambert, who said that the party was met by Mr. G. F. Hill, entomologist to the Museum, who exhibited a number of drawers of insects from various parts of the world, and kept the members thoroughly interested for several hours with the remarks he made about them.

A report of the excursion to Ferntree Gully on Monday, 9th June (King's Birthday), was given by the leader, Mr. C. Oke, who said that a small party of members had spent the day in the vicinity of Sherbrooke, and collected a large number of natural history objects of all kinds, of which further mention would be made later.

ELECTION OF MEMBER.

On a ballot being taken, Mr. W. B. Cottman, 54 Point Nepean-road, Elsternwick, was duly elected a member of the Club.

GENERAL BUSINESS.

Mr. F. G. A. Barnard referred to the death of Mr. J. B. Walker, the result of a street accident. Mr. Walker had been a member of the Club for some thirty years, and was the senior partner of Walker, May and Co., the printers of the *Naturalist* for about thirty-five years. He moved that a letter of sympathy be sent to Mr. Walker, jun. The chairman said that one of the associate members of the Club, Mr. S. J. Walker (not related to the late Mr. J. B. Walker) had also passed away since last meeting, and moved that a letter of sympathy be sent to his relatives. The motions were carried in silence, all standing.

ANNUAL REPORT.

The hon. secretary, Mr. C. Oke, read the forty-fourth annual report, for the year 1923–4, which was as follows:—

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

"Ladies and Gentlemen,—In presenting the forty-fourth annual report of the Club for the year ended 30th April, 1924, your committee congratulates members on the continued success of the Club, and desires to thank them for the support received during the past twelve months.

"Commencing the year with 303 members and associates on the roll, there were elected 27 ordinary and 5 country members. Two deaths occurred, and resignations numbered 14, leaving a membership of 319—an increase of 16 for the year. It is with deep regret we have to record the deaths of two well-known members—Mr. J. Cronin, Director of the Botanic Gardens, who passed away in June. Although not an active member of the Club, Mr. Cronin was always very sympathetic towards the Wild-flower Exhibitions, and sent good displays of cultivated native flowers from the Gardens. Mr. W. H. D. Le Souëf, Director of the Melbourne Zoological Gardens, after a long illness, passed away in September. In the earlier days of the Club he was a prominent office-bearer and worker, but in later years became more attached to the Ornithologists' Union. An account of his activities appeared in the October (1923) *Naturalist*.

"The monthly meetings have been held regularly, with an average attendance of 60–70 members and friends. Ten papers have been read and four lectures delivered, and these, together with the discussions that have followed, have proved very interesting, and have shown that the work of the Club, both on the scientific and popular sides, has been maintained at its usual high standard. The following lectures and papers have

been delivered:—In May—'Thrips: An Unpopular Insect Treated Popularly,' by Mr. R. Kelly, and 'On a Thalassoid Element in the Australian Molluscan Fauna,' by Mr. C. Hedley; in June—'Botanical Notes about Bairnsdale, and the Eastern Lakes,' by Mr. T. S. Hart, M.A., B.Sc.; in July—'Effects of the Ice Age on Tasmanian Topography,' by Mr. A. N. Lewis; in August—'The Vegetation of the Cradle Mountain, Tasmania,' by Dr. C. S. Sutton; in September—'The Fossiliferous Beds of Violet Creek, near Hamilton, Victoria,' by Mr. F. Chapman, A.L.S.; and 'Notes on Spiders,' by Mr. S. Butler; in October—'The Flora of the Whipstick Scrub,' by Mr. D. Paton; in November—'Four Weeks' Collecting on Richmond River and Queensland,' by Messrs. A. N. Burns and L. Thorn; and 'Coleoptera of North-Western Victoria, Part IX.,' by Mr. J. Goudie; in December—'The Microscope, and What It Reveals,' by Mr. J. Searle; in January—'Notes on Victorian Orchids, No. II.,' by Mr. E. E. Pescott, F.L.S., and 'Views of a Trip Through Gippsland, and Around the Mildura District,' by Mr. H. B. Williamson, F.L.S.; in February—'Some Glimpses of Our Bush Birds,' by Mr. F. E. Wilson, and 'Description of a New Genus of the Family Epacridaceæ,' by Mr. H. B. Williamson, F.L.S.; in March—'Notes from Natya,' by Mr. C. Oke. The April meeting was devoted to a display of microscopes and microscopic objects. Some of the papers were illustrated with lantern slides, and nearly all the papers have appeared in the Club's journal.

"The excursions are as popular as ever, and have generally been well attended. A number of Saturday afternoon trips have been made to places around the metropolis, while whole-day excursions to places further afield have been made, such as to Frankston, Mooroduc, Yarra Junction, Healesville, Beaconsfield, Brisbane Ranges, Belgrave, and Sherbrooke, and more extended visits have been made to Bendigo, National Park, and Warburton.

"The annual exhibition of wild-flowers was held in the Melbourne Town Hall on Tuesday, 3rd October, and was opened by the Premier, the Hon. H. S. W. Lawson. Flowers were not so plentiful this year, with the result that the tables were not quite so full as on some previous occasions, but on the whole it was a very creditable display, and resulted in a net profit of £107. Of this, £53 was donated to the Victorian Bush Nursing Association. In returning thanks for the donation, the Bush Nursing Association asked the Club to nominate two of its members as life governors, and the committee recommended the president, Mr. C. Daley, B.A., F.L.S., and the hon. editor, Mr. F. G. A. Barnard, for the positions.

"The Plant Names Committee completed its task of revising the lists of vernacular names early in the year, and the 'Census of Victorian Plants' was published in time for the October wild-flower exhibition, where there was a fair demand for the volume. It was decided by the Club that presentation copies of the book be issued to those gentlemen who had given so much time and thought to the compilation of this work, and leather-bound copies were presented at the December meeting to the following:—Prof. A. J. Ewart, Dr. C. S. Sutton, Messrs. J. W. Audas, F.L.S., W. R. A. Baker, F. G. A. Barnard, C. Daley, B.A., F.L.S., A. D. Hardy, P. F. Morris, F. Pitcher, E. E. Pescott, F.L.S., P. R. H. St. John, and H. B. Williamson, F.L.S., to all of whom the Club is much indebted for their labour.

"The Plant Names Committee has given place to the Plant Records Committee, consisting of four members—namely, Dr. Sutton, Messrs. F. P. Morris, P. R. H. St. John, and H. B. Williamson, F.L.S., whose duty it will be to inquire into new records of plants and alterations in nomenclature, and recommend the publication of the same from time to time in the *Naturalist*.

"It is always gratifying to see members' names among the new graduates at the University, and this year the following have graduated:—Miss R. E. Chisholm, as Bachelor of Arts; Mr. C. Gillies, as Bachelor of Surgery; and Mr. P. C. Morrison, as Bachelor of Science, to all of whom we offer the Club's congratulations.

"The fortieth volume of the *Victorian Naturalist* has been completed, and once again the Club is greatly indebted to the hon. editor, Mr. F. G. A. Barnard, for his untiring effort in producing an interesting and useful journal. Unfortunately it could not be maintained at the intended size of twenty-four pages.

"Your committee has had under grave consideration the increased cost of the *Naturalist*,* and under existing conditions finds that it has, apparently, to decide between reducing the size of the journal or finding a cheaper printer, and an early decision will have to be made, as the position is serious.

"The hon. treasurer reports the receipts for the year amounted to £182, and the expenditure to £344—a debit of £162 for the year, exclusive of the cost of printing the 'Census.'

"Your committee has given its co-operation to all measures for the preservation of various localities as sanctuaries for our native flora and fauna.

* In comparing the cost of the *Naturalist* for 1922-3, £155, and 1923-4, £249, allowance must be made for the increase in the number of pages and plates, 70 and 14 respectively; in addition to which a larger number of copies were printed.—[Ed. *Vict. Nat.*]

"The attendance at the twelve committee meetings has been as follows:—Messrs. Oke, 12; Sutton, 12; Williamson, 12; Daley, 11; Searle, 11; Thorn, 11; Barnard, 9; Chapman, 7; Hooke, 7; Hughes, 6 (resigned after 7 months); Wilson, 6; Kershaw, 3; and Pescott, 3.

"In conclusion, your committee desires to express its gratification at the way its efforts to maintain the work of the Club, and to further its aims, have been supported by the members, and trusts the same support will be given to the incoming committee.

"On behalf of the committee,

"(Signed) CHAS. DALEY, *President.*
C. OKE, *Hon. Secretary.*

"Melbourne, 21st May, 1924."

The report was received, and adopted, on the motion of Messrs. G. Coghill and J. H. Harvey, A.R.I.V.A.

FINANCIAL STATEMENT.

The hon. treasurer (Mr. A. G. Hooke) read the financial statement for 1923-4, which was as follows:—

RECEIPTS.

To Balance, 30th April, 1923				£70 0 10
,, Subscriptions—				
Ordinary Members	£124 17 6			
Country Members	27 5 0			
Associate Members	1 7 6			
		£153 10 0*		
Victorian Naturalist—				
Subscriptions	4 4 6			
Sales	2 7 9			
		6 12 3		
,, Badges, Sales of		0 18 0		
,, Donations—				
Publishing Fund		5 13 0		
,, Interest—Savings Bank and War Loan		15 17 7		
			182 10 10	
,, Sales of "Census of Victorian Plants"			34 7 0	
,, Wild-flower Exhibition—				
Admissions		95 1 0		
Sales of Flowers and Plants		48 16 5		
Refreshments (profit)		17 0 1		
			160 17 6	
,, Savings Bank Deposit withdrawn—				
Plant Names A/c.		150 0 0		
General A/c.		75 0 0		
			275 0 0	
			£672 16 2	

* Arrears, £14 15s. 0d.; 1923-4, £127 12s. 6d.; advance, £11 2s. 6d.—total, £153 10s.

EXPENDITURE.

By *Victorian Naturalist*—							
Printing	£206	11	3				
Illustrating	42	9	5				
Free Reprints	13	17	8				
Reprints Charged	6	15	10				
				£269	14	2	
„ *Victorian Naturalist*—							
Wrapping and Posting				22	2	2	
„ Rooms—Rent and Attendance				13	10	0	
„ Library—							
Books and Periodicals	£2	5	0				
Insurance	0	7	0				
				2	12	0	
„ Lantern—Expenses				0	14	6	
„ Printing				23	4	0	
„ Postages, &c.				7	18	0	
„ Crockery for Wild-flower Exhibition				4	17	5	
							£344 12 3
„ Wild-flower Exhibition—							
Town Hall and Attendance				11	5	0	
(Rent, £18, paid in previous year)							
Printing and Advertising				7	4	0	
Cartage, &c.				9	4	7	
Flowers and Plants				8	1	3	
Donation—Bush Nursing Association				53	0	0	
							88 14 10
„ Census of Victorian Plants—Printing and Binding							215 12 6
„ Melbourne Town Hall—Deposit Wild-flower Exhibition, 1924							18 0 0
							666 19 7
„ Balance in E. S. & A. Bank							5 16 7
							£672 16 2

A. G. HOOKE, *Hon. Treasurer.*

30*th May*, 1924.

Audited and found correct.

ALFRED J. TADGELL,
FREDERICK PITCHER, } *Auditors.*

13*th June*, 1924.

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

ASSETS.

Balance in E. S. and A. Bank				£5	16	7
War Loan Bond				20	0	0
Arrears of Subscriptions (£40), say				20	0	0
Deposit in Savings Bank				100	0	0
"Census of Victorian Plants," Stock on hand at cost price				181	5	6
Library and Furniture at Insurance Value				130	0	0
Rent of Town Hall—paid in advance				18	0	0
Sundry Accounts due—						
Advertisements in *Naturalist*	£3	15	0			
Reprints	6	15	10			
				10	10	10
				£485	12	11

LIABILITIES.

Subscriptions paid in advance	£11 2 6
Char-a-banc Fund	6 13 0
Outstanding Accounts	*Nil*
	£17 15 6

On the motion of Messrs. G. Coghill and F. Pitcher, the statements were read and adopted. The latter remarked on the accuracy and detail in the accounts as presented by the hon. treasurer.

ELECTION OF OFFICE-BEARERS.

The chairman said that Mr. E. E. Pescott, F.L.S., had withdrawn his nomination for the office of president, owing to the fact that he considered Mr. Searle's long membership of the Club and the great assistance he had been to many members in pursuit of their hobbies entitled him to the position, and that he would not be a candidate for the office of vice-president for which he was eligible, in accordance with the rules of the Club. The following office-bearers, being the requisite number required, were then declared elected :—President, Mr. J. Searle ; vice-presidents, Messrs. G. Coghill and F. E. Wilson, F.E.S. ; hon. treasurer, Mr. A. G. Hooke ; hon. librarian, Dr. C. S. Sutton ; hon. editor, Mr. F. G. A. Barnard ; hon. secretary, Mr. C. Oke ; hon. assistant secretary and librarian, Mr. H. B. Williamson, F.L.S. Mr. F. Pitcher said that he desired to withdraw his name from the nominations for the committee owing to pressure of other engagements. The remaining nominees, Messrs. F. Cudmore, J. A. Kershaw, A. E. Rodda, and L. Thorn were declared elected, and on a nomination being requested for fifth place, Mr. J. Stickland was nominated and duly elected.

A vote of thanks to the retiring committee was moved by Mr. J. Stickland, and carried unanimously.

PRESIDENT'S ADDRESS.

The retiring president, Mr. C. Daley, B.A., F.L.S., said that it was customary for the retiring president to give an address on the work of the Club or on some special subject. He proposed to say a few words about Australian gem stones.

In the course of his remarks the president said that gems had played an important part in history and superstition from time immemorial. They had even been the cause of wars. Tradition and romance were inseparable from certain famous stones, and even to-day amongst some races magical powers are atttched to certain kinds of stones. Australia has produced almost every kind of gem, though in many cases either not of sufficient size, or in insufficient quantity, to really establish

the search for any particular kind as a profitable industry. The most valuable of all gem stones, the diamond, had been found in all the States, but nowhere approaching the production of the Rand, in South Africa. New South Wales had the distinction of producing the largest diamond, found near Oberon in 1905, and weighing 28¾ carats. Supphires have been found in considerable quantities, especially in Queensland, but mostly the green and yellow types. Rubies occur at several places in Queensland and New South Wales, but are generally too small to command high prices, though their colour is good. Quartz crystals were prized to some extent by the Australian aboriginals, and specimens are often found associated with the *débris* of their kitchen middens. A gem of the silica group is the opal, and Queensland has produced some of the finest specimens known to the world; a variety known as "black opal" is dictinctly Australian, and commands a high price, one weighing 6½ carats was sold for £102. A remarkably fine opal known as the "Flame-tree Opal," weighing 253 carats, was found in Queensland some years ago. It is almost chameleon-like in its changing hues. When examined it was found to have in its structure fossil remains of the ginko tree of the Jurassic period. The topaz and beryl have been found near Stanthorpe, in Queensland, and in other places. Garnets have been found in considerable quantities north of Oodnadatta, in South Australia, also at Harcourt, Maldon, and Omeo, in Victoria. A large number of other gem stones were mentioned, and their chemical composition given. From the indications already given it may safely be concluded that many valuable discoveries await the secker after Australian gem stones.

PAPER READ.

By Mr. A. J. Tadgell, entitled "Mount Bogong and Its Flora."

The author gave an interesting account of his last visit to Mount Bogong, Victoria's highest mountain (6,508 feet), in January last, in company with Mr. A. G. Hooke, the hon. treasurer of the Club, and a friend. Owing to its distant position, considerable time is occupied in reaching it from Melbourne and making the ascent. Remarking on the flora, which is decidedly alpine in its character, the author said that his collections, as the result of several trips, amounted to 256 species. He had also collected some fifteen mosses, all at more than 5,500 feet. He concluded with a list of the species collected, with notes of the height at which they were found.

REMARKS ON EXHIBITS.

Mr. H. W. Davey, F.E.S., read some notes on two Marbled Geckos (lizards), which he exhibited with young recently born.

Mr. C. French, jun., contributed a note on some parasites collected from a dog by Mr. H. F. Clinton, which had not previously been collected from that host in Australia.

Mr. A. N. Burns, F.E.S., referred to his exhibit of specimens of four species of Prickly Pears (Opuntia) which are proving terrible pests in Queensland and Northern New South Wales, about 29,000,000 acres being infested with this cactus in the former State. He also called attention to two very rare Lycaenid butterflies in the case exhibited by Mr. L. Thorn.

EXHIBITS.

By Mr. F. G. A. Barnard.—Flowers of Long-podded Wattle, *Acacia elongata*, grown at Kew.

By Mr. A. N. Burns, F.E.S.—Four species of Opuntia (prickly pear) from Queensland, with photographs of experimental cages used by Prickly Pear Board in Queensland.

By Mr. Geo. Coghill.—Flowers of *Grevillea rosmarinifolia*, from a cultivated plant in his garden at Canterbury.

By Mr. C. Daley, B.A., F.L.S.—Case of gem stones in illustration of his address; also, on behalf of Mr. D. Cameron, Mortlake, N.S.W., samples of the following chemicals extracted from the crude oil distilled from *Eucalyptus dives* in the Braidwood district, N.S.W.:—(*a*) piperitone, the crude oil contains 30 to 50 per cent. of it; this is oxidized to (*b*) thymol, or reduced to (*c*) menthol; in the latter case there are two stages —piperitone to (*d*) menthone, menthone to menthol.

By Mr. C. French, jun.—Specimen of a remarkable gall-making coccid (scale insect), *Apiomorpha munita*, from Croydon, Victoria; also the Kangaroo Louse, *Heterodoxus longitarsus*, found on a domestic dog, not previously recorded for Australia from this host; collected by Mr. H. F. Clinton, at North Melbourne.

By Geological Survey of Victoria, per Mr. A. E. Rodda.—Samples of retinite (fossil resin) from brown coal mines at Lal Lal and Yallourn, also alluvial gold mines at Allendale and Creswick.

By Mr. A. G. Hooke.—Photograph (enlarged) of Mount Bogong, showing the greater part of the top of the mountain.

By Mr. H. E. James.—Flowers of *Eriostemon obovalis* and *Pimelea*, sp., from Retreat-road, Bendigo.

By Mr. C. Oke.—Insects from Menzies Creek, and zircons, &c., from Beechworth.

By Mr. F. Pitcher.—Photographs of webbing and nests of spider, *Arachnina higginsi*, on Douglas Pine, 9 feet high, taken by Mr. C. Hammond in his garden at Belgrave, May, 1924.

By Miss J. Raff, M.Sc., F.E.S.—Leaflet by Dr. Alfred Moore, F.E.S., describing a simple method of mounting insects.

This method is adopted by Prof. Maxwell-Lefroy as the standard for use in the Entomological Department of the Royal College of Science, London. The materials used are celluloid slides and "Thymoplas," a specially prepared plasticine containing a strong preservative. In illustration of above—mounted preparation of a stick insect hatched from egg, and eggs showing the characteristic lid which is pushed off at hatching.

By Mr. W. H. A. Roger.—Three tubes and penholder containing opal chips, from White Cliffs, N.S.W.

By Mr. J. Searle.—Australian precious stones—diamond and topaz from Beechworth, Victoria; sapphire, Queensland; tourmaline, South Australia; zircons, Tasmania; opals, Queensland; turquoise, King River, Victoria; also pearls, Thursday Island and Western Australia.

By Mr. A. L. Scott.—Basalt and basaltic glass (tachylite), under the microscope.

By Mr. A. J. Tadgell.—Geological specimens from Mount Bogong, consisting of metamorphic gneiss (mica schist or phyllite) pegmatite, felspar, quartz with large plates of mica (muscovite), white quartz showing tourmaline crystals.

By Mr. L. Thorn.—Case containing sixty-six species of Australian Lycaenid butterflies, including *Miletus delicia*, var. *duaringae*; and *M. ignita*, var. *chrysonotus*.

By Mr. H. B. Williamson, F.L.S.—Hairball from stomach of a cow.

After the usual conversazione the meeting terminated.

The Kangaroo Louse.—Some interest is attached to the parasites from the domestic dog, exhibited on behalf of Mr. H. F. Clinton, from the fact that they have not previously been recorded from this host in Australia, and were collected by Mr. Clinton, in company with Mr. J. Fraser, from an Irish terrier at North Melbourne, Victoria, on 15th April last, and identified as the Kangaroo Louse, *Heterodoxus longitarsus*, Piaget. Specimens were forwarded to Professor Harrison, Sydney University, who confirmed the determination and the new locality record. Harrison and Johnston (1916) state that they find this species to be generally distributed upon the genus Macropus, and that it has also been recorded from dogs from several localities in America and Africa, as well as from Japan, and from a jackal from Africa. They also state that it is undoubtedly a marsupial parasite, and all occurrences on carnivora must be regarded as stragglers. Mr. W. M. Bale, Kew, Victoria, has in his collection specimens of this parasite, which he obtained from a dog in 1886.—C. French, jun., 16th June, 1924.

NOTES ON THE LIFE-HISTORIES OF SOME VICTORIAN LYCAENID BUTTERFLIES.

By L. B. THORN.

(*Read before the Field Naturalists' Club of Victoria, 12th May, 1924.*)

BEFORE dealing directly with the Lycaenid butterflies, the subject of my paper, it may perhaps be advantageous to some of those present to have a few of the main facts in the life-history of a butterfly put before them.

Butterflies and moths belong to the Order **Lepidoptera** or insects having wings clothed with scales. This order is divided into two sections, the first being called the **Rhopalocera** or club-horned antennae; butterflies belonging to this section. The majority of our butterflies are day-fliers, and like the bright sunshine. A few species in Queensland and northern New South Wales fly in the evening, just before dusk. When at rest the wings of a butterfly are usually held erect above the back, with the upper surfaces pressed closely together. The second section is called the **Heterocera** or insects with broad feathery or fine thread-like antennæ. Moths belong to this section, and, as a rule, fly after sunset, and have the above type of antennæ. The wings of a resting moth are nearly always seen folded along the back, or flat against the surface on which they rest.

Butterflies and moths are among the giants of the insect world. They can be defined as insects with two pairs of membranous wings well adapted for extended flight, and clothed with scales overlapping each other like the slates on the roof of a house, flattened and rounded on the surface of the wings, but more or less hair-like upon the body. The head is usually provided with a tubular proboscis that can be curled up like a watch spring when at rest, and, when extended, is admirably adapted for sucking up the honey from flowers. Typical butterflies are usually slender-bodied insects with delicate legs and richly-tinted wings; they fly about in bright sunlight, visiting flowers and feasting upon the nectar that they find in the blooms. They have large compound eyes, so that they can see very well; and the slender, tubular mouth is very highly developed in all butterflies.

This evening I am dealing with nine species of our Victorian Lycaenid butterflies, of which I have specimens on exhibition, with, in some cases, complete life-histories. My notes on the species are the result of observations made in the field, and by breeding out some of the species. The localities where the larvae, pupae, and perfect insects have been taken will also be given. All these beautiful butterflies exhibited belong to the family Lycaenidae, which is divided into two sub-families,

Ogyrinae, Theclinae, and four genera—Ogyris, Miletus, Ialmenus, and Protialmenus.

The first stage in the life-history of a butterfly is the ovum, or egg; the second the larva, or caterpillar; the third the pupa or chrysalis; and, lastly, the imago, or perfect butterfly. The eggs of Lycaenid butterflies are smooth, and almost spherical; sometimes smooth and much flattened at base and apex, sometimes densely pitted and flattened. They are deposited either singly or in clusters upon the stems, young shoots, or flower-buds of the food plant. The caterpillar is composed of thirteen segments or rings, the first one being the head. They have sixteen legs, the first six being the true legs, which reappear in the perfect insect, while the other ten are termed pro-legs, or claspers, which are used for holding on to the food plant while the caterpillar is feeding, and are entirely lost when the change into a chrysalis takes place. The Lycaenid larva or caterpillar is almost invariably flattened and slug-like in shape, with the head concealed while at rest. The posterior segments usually possess dorsal glands, which secrete a liquid much prized by ants. The ants, consequently, attend the larvae and shepherd them. Some of these caterpillars feed during the day, others at night, sheltering during the daylight in ants' nests, under loose bark or stones, in curled leaves or flower-buds, or in crevices of the trunk of the food-plant. The chrysalis is usually smooth, and in transverse section ovoid, sometimes much flattened, and with the abdomen extended in lateral ridges. It is usually attached by the tail, and sometimes by a central silken girdle-thread in either horizontal or vertical position, and with the head either upwards or downwards. It is generally found in the same position as the sheltering larvae, more rarely loose just beneath the surface of sandy soil. The perfect butterfly is usually of a small size and delicate structure, with beautiful rich colours of blue, purple, green, and copper. All the legs are developed for walking, but the front pair less so than the others, and are better developed in the female than in the male. These four stages in some of the species exhibited take a year to complete; with other species there are generally two broods in a season—the spring and autumn.

The first three species of butterflies shown belong to the sub-family **Ogyrinae,** genus **Ogyris.** The caterpillars of these three species of butterflies feed on mistletoe, which is nearly always found high up on encalypts and other trees. Consequently, the butterflies are nearly always seen flying high up over the top of the trees and around the mistletoe, with the result that they are difficult to capture on the wing; hence the best way to secure good specimens is to find the larvae or pupae and breed out the perfect insects.

My first species is the Common Mistletoe Blue, **Ogyris olane,** Hewitson, exhibited with the four stages in its life-history—viz., eggs, inflated caterpillar, chrysalis, and perfect insects of both sexes (see fig. 1). The food plant of this species is the Drooping Mistletoe, *Loranthus pendulus*, which is found on eucalypts. The caterpillars are night feeders, hiding under loose bark on the trees during the day. Sometimes I have found the larvae and pupae, with two species of ants, on the same tree, but they are more often found without ants attending them. When full grown a number of caterpillars crawl down the tree to pupate under bark, which is generally found loose near the base of the trees. It is interesting to note that the pupae, when exposed to a strong light, make a faint clicking sound. I remember the first time I brought home several pupae, and while transferring them into the breeding box, under a strong electric light, to my surprise one after another made this sound, and I found that by placing the pupae in a tin the sound was more clearly defined. There are two broods in a season of this beautiful butterfly. In the spring the caterpillars are found in various stages from June to September. The perfect insects being on the wing during the end of September and throughout October and November. The autumn brood is on the wing in the months of January, February, and March. The majority of the insects emerging from this latter brood in the breeding box were females. Last season I made a note of how long it took this butterfly to emerge from the chrysalis. A full-grown caterpillar was secured on the Mooroodue excursion, 20th October, 1923; the caterpillar turned into a chrysalis on the 27th October, and the perfect female, which is shown, emerged 6th December, thus taking forty days for the butterfly to emerge. The central area on the wings of the male butterfly is dull purple; on the wings of the female bluish-purple. The localities where the larvae and pupae have been secured are Frankston, Eltham, Macedon, Bendigo, and along the Ferntree Gully-road.

The second species is the scarce Mistletoe Blue, **Ogyris abrota,** Westwood, of which I exhibit two stages in the life-history—the pupa and perfect insects of both sexes. The food plant of this species is the common Mistletoe, *Loranthus celastroides*, which is found principally on eucalypts. The caterpillars are night feeders, hiding under loose bark on the trees during the day. They are attended by a number of small black ants of the genus Crematogaster. This ant has a heart-shaped abdomen, and when disturbed raises the abdomen and moves slowly around and about the caterpillar and chrysalis. This butterfly is becoming very scarce in Victoria. It is a rather local butterfly, and generally found in numbers

where it occurs. While on a visit to Broadmeadows with Mr. A. N. Burns, in 1922, we noticed a couple of Meat Ants, *Iridomyrmex detectus*, coming down a tree with two young larvae of this butterfly between their mandibles. After catching the ants we found that both the caterpillars were dead, and very nearly bitten in two. There was one eucalypt tree bearing the Common Mistletoe that was free from this ant and on which I was always sure of finding a caterpillar or chrysalis every season. This year I paid a visit to the tree and found that the Meat Ants had invaded the tree, with the result that my search for a larva or pupa proved fruitless. It seems strange that this large ant kills the larvae of this pretty butterfly, as these same ants attend with great care caterpillars of the Imperial Blue Butterfly, and will always attack you if the larvae or pupae are disturbed. In the spring brood the larvae and pupae are found in the months of July to October; perfect insects are on the wing in the months of October and November. In the autumn brood the butterflies are on the wing in February and March, a large number of female butterflies emerging in this latter brood. The central area on the wings of the male butterfly is rich dark purple; the forewings of the female are brown-black, with the central area light yellow. Localities where larvae and pupae have been collected are Broadmeadows and the You Yangs. W. H. A. Roger secured larvae and pupae at Black Rock and Springvale.

My third species is the Satin Blue, **Ogyris amaryllis meridionalis,** Bethune-Baker. The food plant of this species is the Slender Mistletoe, *Loranthus linophyllus*, which is found on Sheoke trees in the north-west of Victoria. F. E. Wilson captured the specimens exhibited in the Mallee during September, 1917. The wings of the male butterfly are metallic blue; of the female, metallic blue tinged with purple.

The next three species belong to the genus Miletus. The butterflies of this genus are noted for their beautiful metallic colours on the upper surface of the wings and also by the rich metallic markings on the under surface of the wings.

The fourth species is the Moonlight Blue, **Miletus delicia delos,** of which I have the four stages—the eggs, inflated larvae, pupae, and perfect insects of both sexes (see fig. 2). The central area on the wings of the male butterfly is metallic green, of the female metallic blue. This species is one of our most beautiful butterflies, and is very rarely seen on the wing. This year, for the first time, I found a specimen of this butterfly on the wing. It was walking over the flowers of the Sweet Bursaria, *Bursaria spinosa*, feasting on the nectar with the wings held erect above the back, with the upper surfaces pressed closely

together. The caterpillars of this butterfly are night feeders, hiding under loose bark, also in holes in the tree made by the boring beetles and wood-moth caterpillars. One of the inflated caterpillars shown to-night was found on a Black Wattle, *Acacia mollissima*; the other on a Blackwood, *Acacia melanoxylon*. They are always attended by a number of small black ants of the genus Crematogaster. This ant has a heart-shaped abdomen, and when disturbed raises the abdomen and moves slowly around and about the larvae. The attendance by ants is due to the fact that the larvae secrete a liquid from two glands situated at the posterior end of the body. The ants are also a protection for the caterpillars from parasites, which kill a large number of other species of butterfly caterpillars that are not attended by ants, and also a great number of moth caterpillars, every season. The Moonlight Blue Butterfly larvae are found from the end of January to the middle of November. I have had them feeding for nine months in the breeding-box. From February to April the larvae would come out at dusk from under a piece of blotting paper pinned in the corner of the box and crawl on to their food plant, placed in a bottle of water. From the end of May to July the larvae appear to semi-hibernate or eat very little of their food plant. During August, September, and October the caterpillars seem to be very hungry, and make up for the two months they hibernated—in fact, every week I noticed a difference in the size of the larvae. I used to place small pieces of apple on the food plant. The caterpillars seem to prefer the apple first before going on to the Acacia to feed. I also gave the ants bread soaked in water. If the ants were not in the breeding box to attend the larvae the secreted liquid would form into a mould or mildew, which kills a number of species of Lycaenid larvae every season. This white mildew develops on the eleventh and twelfth segments, situated at the posterior end of the body. Once this mildew forms on the caterpillar it generally keeps in the same position for a week, and gradually shrinks to nearly half its original size, becoming hard and rigid. When full grown the caterpillars attached themselves to the breeding-box with a silken pad at the tip of the abdomen, and also by a central silken girdle-thread. They turned into a brown chrysalis, which gradually became black a week before the butterfly emerged. There is only one brood of this lovely butterfly during the season, the perfect insects being on the wing in the months of December and January. Localities where the larvae and pupae were secured, Dandenong and Woori Yallock. W. H. A. Roger, while collecting at Springvale, found a number of pupae of this butterfly in a roll of loose bark, which was on the ground near the base of a Black Wattle, a number

of ants mentioned being inside the roll of bark with the pupae.

The fifth species is **Miletus ignita,** Leach. The caterpillars of this butterfly feed on the Golden Wattle, *Acacia pycnantha*. H. W. Davey, while collecting ant-nest beetles at Ocean Grove, found a number of caterpillars and pupae of this butterfly. They were attended by a number of small ants, not identified. The caterpillars were found hiding under the roots and curved trunk of the young Golden Wattles, and came out to feed at night. The pupae are found in the same position as the sheltering caterpillars throughout October and November. The butterflies are on the wing in November and December. The central area on the wings of the male butterfly is dull coppery-purple; on the wings of the female, purple tinged blue.

My sixth species, **Miletus hecalius,** Miskin, has been captured on the wing near Sherbrook Falls, Belgrave. A. N. Burns secured a number of pupae at Como, New South Wales, and forwarded four to me, from which three butterflies emerged, a pair of them being exhibited this evening. The central area on the wings of the male is rich purple; on the forewings of the female there is a central patch of orange.

The next two species belong to the genus Ialmenus. Seventh species, the Imperial Blue, **Ialmenus evagoras,** Donovan, showing the four stages in the life-history—eggs, inflated caterpillar, chrysalis, and perfect insects of both sexes. The central area on the wings of this beautiful butterfly is pale metallic blue. This insect is locally common, and generally found in numbers where it occurs. The caterpillars are found in various stages from December to March, feeding during the day on young Early Black Wattles, *Acacia decurrens*, and the Black Wattle, *Acacia mollissima*, and are always attended by a number of small black ants, probably of several species. These ants are always moving quickly, on and about the larvae. It is amazing to watch how the ants keep with the caterpillars when disturbed. Sometimes there will be a number of larvae grouped together, and if one moves away from the rest the ants are after it. A number will run on to the back of the caterpillar, holding on with their mandibles, while a number move around to head it back, and generally succeed in bringing the caterpillar to a halt after it has moved a few inches. When a caterpillar falls to the ground it is wonderful how quickly the ants on the ground find and keep with it, and when the caterpillar is touched or disturbed, by the way the ants immediately show fight, by running over the hand and nipping it with their mandibles. The majority of caterpillars have pupated by the end of January, and are found attached to small branches, and under surface of leaves of small stunted Acacias. Often

a number of pupae are found clustered together on a silken web spun by the caterpillars. The colour of the chrysalis is brown, which gradually turns a dark brown a week before the butterfly emerges. This season I made a note how long it took the butterfly to emerge from the chrysalis. Twelve full-grown larvae were secured on a small Black Wattle on 3rd February; larvae pupated from the 4th to the 10th of February; perfect insects emerged from the 2nd to the 9th of March, thus taking four weeks for the butterfly to emerge, from the time the caterpillar turned into a chrysalis. Localities where the larvae and pupae were secured, Eltham and Woori Yallock.

The eighth species is **Ialmenus icilius,** Hewitson. G. Lyell has secured larvae and pupae of this rare butterfly at Gisborne, and it also occurs in South and Western Australia. The central area on the wings of the male being metallic green, on the wings of the female metallic blue. The specimen exhibited was captured in Western Australia.

The ninth species is **Protialmenus ictinus,** Hewitson, Imperial Blue, with two stages in the life-history is exhibited, pupae and perfect insects. The caterpillars are found feeding during the day on the Black Wattle, *Acacia decurrens*, and the Blackwood, *Acacia melanoxylon*. They are always attended by the large fierce Meat Ant, *Iridomyrmex detectus*, and I well remember the first time I climbed a tree to secure some full-grown caterpillars. When the larvae were disturbed this large ant immediately attacked me, and it did not take me long to reach the ground and pull off my coat to brush off the ants that were holding on to my arms with their strong mandibles. When a caterpillar falls to the ground it is wonderful how quickly the meat ants moving about near the base of the tree find and shepherd the caterpillar. The larvae and pupae of this butterfly are found in the months of October, November, and December, the perfect insects being on the wing in the end of December and January. Localities where the larvae and pupae were secured, Broadmeadows. A. N. Burns found the larvae and pupae at Bacchus Marsh. J. E. Dixon found larvae and pupae at Kerrisdale, and W. H. A. Roger found the larvae and pupae at Trawool. This species occurs all along the eastern side of Australia and as far north as Kuranda, in Northern Queensland.

My remarks this evening may have created an interest in some of the younger members of the Club who have not yet settled down to any particular line of study. To my mind the development and life of a butterfly is a subject of deep interest. The part different species play in the economy of nature requires patient investigation, and any facts gleaned should be recorded.

The published literature on Victorian butterflies is some-

what scanty. In 1893 E. Anderson and the late F. P. Spry, both members of this Club, published "Victorian Butterflies and How to Collect Them," in which most of our species were illustrated. It is a useful book for a young beginner, but is now out of print, and difficult to obtain. In 1907 W. J. Rainbow, of the Australian Museum, Sydney, published "A Guide to the Study of Australian Butterflies," a more comprehensive work, in which were illustrated a number of life-histories of Australian butterflies. In "Australian Insects," by W. W. Froggatt, Government Entomologist of New South Wales, a number of species are illustrated, also many moths. The standard work at present on Australian butterflies is by Waterhouse and Lyell (also members of this Club), published in 1914. This is a most complete work, describing and illustrating the whole of our Australian butterflies, numbering four hundred and twenty species, also illustrating types of the larvae and pupae of the different families. In this work eighty-four species are recorded for Victoria, classified as follows:—Nymphalidae, 19, of which fourteen belong to the sub-family Satyrinae, "browns" or "forest" butterflies; Lycaenidae, "blues" and "coppers," 29; Pteridae, "whites" and "yellows," 6; Papilionidae, "swallow-tails," 4; and Hesperidae, "skippers," 26. The parts of "Destructive Insects of Victoria," by C. French, first Government Entomologist of Victoria, also contain some account of the life-histories of certain Victorian butterflies, and I am indebted to several of these authors for some of the information included in these notes.

Though not approaching the size and coloration of the more tropical species, Victorian butterflies are not without some beauty, and are well worthy of study.

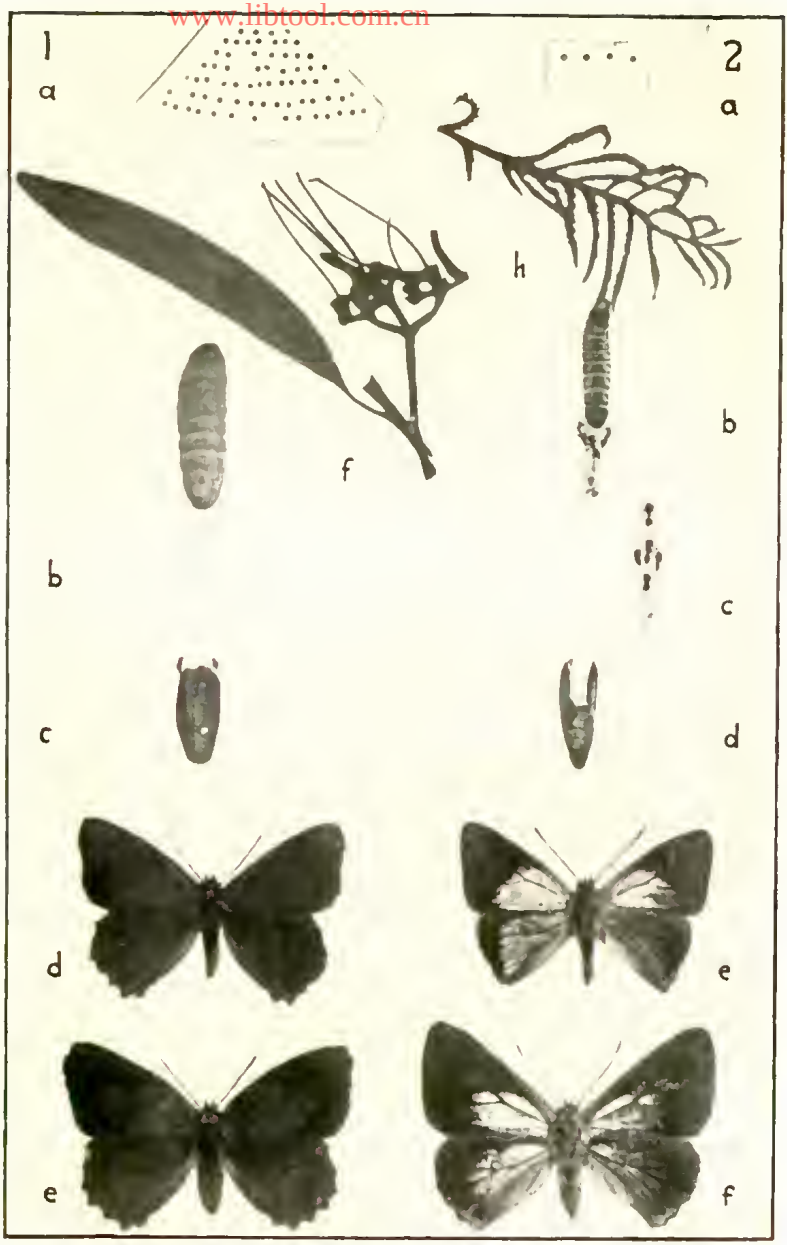
Explanation of Plate.

1.—*Ogyris olane*, Hew., "Mistletoe Blue."—*a*, eggs; *b*, caterpillar; *c*, chrysalis; *d*, imago (male); *e*, imago (female); *f*, food plant (Drooping Mistletoe, *Loranthus pendulus*).

2.—*Miletus delicia delos*, "Moonlight Blue."—*a*, eggs; *b*, caterpillar; *c*, ants which attend caterpillar; *d*, chrysalis; *e*, imago (male); *f*, imago (female); *h*, food plant (Black Wattle, *Acacia mollissima*).

AN APPRECIATION.—*Nature* (London) for April 19th, 1924, says that the *Victorian Naturalist* for February, 1924, contains "a very readable account" by Mr. D. J. Paton of "a very unusual plant formation" (the Whipstick Scrub, near Bendigo), and gives brief notes on the characteristics of the vegetation.

PLATE II.



1.—MISTLETOE BLUE BUTTERFLY (*Ogyris olane*), Hew.
2.—MOONLIGHT BLUE BUTTERFLY (*Miletus delicia delos*).

MARBLED GECKOS HATCHED IN CAPTIVITY.—Early last November Mr. J. E. Dixon, of this Club, returned from a collecting trip to the Mallee around Lake Hattah, North-West Victoria, where he kindly collected for me some living specimens of the Marbled Gecko, *Phyllodactylus marmoratus*, Gray. According to a paper, "The Lizards Indigenous to Victoria," by Lucas and Frost, read before the Royal Society of Victoria, 13th April, 1893, the writers state that this lizard is usually met with under logs and stones. These are certainly not the usual places to look for this species, as, although I have met with great numbers of this gecko, they have always been found under the loose bark of trees, and I have never yet found any under stones, it being essentially an arboreal species. A much rarer species, *Diplodactylus strophurus*, Dum. and Bibr., is usually taken under stones; so also is the Flat-tailed Gecko, *Gymnodactylus miliusii*, Bory., a ground species, which is fairly plentiful under granite slabs on Mount Alexander and similar situations. The several geckos collected at Hattah by Mr. Dixon were received by me on 6th November of last year, and were at once placed in an insect breeding cage having the usual glass front. At night, when the geckos were crawling up this glass, it could easily be seen that two of the females each contained a pair of eggs. The first female deposited her eggs on the night of 14th November, while the other did not deposit her eggs until two days later. I then removed the eggs from the cage and placed them in the small box shown here to-night, together with a small quantity of dry soil for the eggs to rest on, so as to prevent their rolling about. The first egg hatched out on the 7th of this month (June), and two more eggs hatched on the 12th; the other egg was accidentally broken some time before. The young geckos, shortly after emerging from the egg, commenced to shed their skin, this process being completed within twenty-four hours, the markings from which this gecko has received its specific name being then most pronounced, as can yet be seen on the young specimens exhibited to-night. It is of interest that these geckos have hatched out at the present time (June), and also the time taken to hatch—viz., 207 days, or nearly seven months, as well as the small number of eggs laid by the female. Mr. Dixon has just informed me that, although he has also seen great numbers of this gecko, he, like myself, has never yet come across one of this species under a stone.—H. W. DAVEY, F.E.S., 16th June, 1924.

"Flora of South Australia," Part II.—Another of the handbooks of the flora and fauna of South Australia, issued by the British Science Guild (South Australian branch), has just been published. This part comprises the second third of the plants of South Australia, and is the work of Mr. J. M. Black, the author of the first part (with the exception of the Orchidaceae, which was contributed by Dr. R. S. Rogers). Arranged under the system of Engler, this part comprises the families Casuarinaceae to Euphorbiaceae inclusive, extending to 203 pages (5½ × 9). A third part will complete the work, which will be of great advantage to students of South Australian plants. It contains twenty-four full-page plates and about 120 figures in the text, all by the author of the work. These are most useful, as they give in many cases dissections of the flowers variously enlarged. No attempt has been made to record a vernacular name for each species, but where a fairly universal one exists it is given. Turning to the Acacias, we find eighty species listed, among them *A. rivalis*, J. M. Black, "Silver Wattle," *A. decurrens*, var. *mollis*, Willd., being "Black Wattle" and "Silver Wattle" (*A. dealbata* does not occur in South Australia), while *A. armata*, R. Br., "Kangaroo Thorn," does not claim Kangaroo Island as one of its habitats, as is usually believed. *A. rhetinodes*, Schlecht., appears to be the correct spelling of the specific name, as it is derived from the Greek *rhetinodes*, resinous. Apparently, according to the rules of priority, the Sturt Pea must henceforth be known as *Clianthus speciosus* instead of *C. Dampieri*, as named by Allan Cunningham. That the work has entailed a tremendous amount of research on the part of the author is apparent in every page. It will be found equally useful by Victorian botanists as by those of the sister State. The published price is three shillings. Other volumes of this series which have been issued are Fishes (6s.), by Mr. E. R. Waite, F.L.S., and Mammals, Part I. (4s.), by Dr. F. W. Jones. About twelve more are in course of preparation.

The Anakie Heath, *Choristemon humilis*, H. B. Williamson.—I have ascertained that previously to my gathering the specimen from which this plant was described and figured in the March *Naturalist* (vol. xl., p. 231), a specimen had been handed to me by my companion and guide, the Rev. A. C. F. Gates, M.A., by whose good offices the excursion was made possible. As no significance was attached to the find at the time, this was inadvertently overlooked by me, and I regret that the name of Mr. Gates as first collector was omitted from the description in the *Naturalist*.—H. B. Williamson.

The Victorian Naturalist.

Vol. XLI.—No. 4. AUGUST 7, 1924. No. 488.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 14th July, 1924.

The president, Mr. J. Searle, occupied the chair, and about fifty members and visitors were present.

REPORTS.

A report of the visit to the Geological Museum on Saturday, 21st June, was given by the leader, Mr. A. E. Rodda, who said that, by the courtesy of Mr. W. Baragwanath, the Director of the Geological Survey, the museum was made available for the visit of the members of the Club, about twenty of whom spent a very interesting afternoon in the examination of the fine collection of rocks, minerals, &c., displayed. In addition, a number of slides of diatoms and foraminifera were examined under the microscope.

In the absence of the leader, Mr. F. G. A. Barnard, a report of the excursion to Mitcham on Saturday, 5th July, was given by Mr. C. Daley, B.A., who said that he was one of a party of several members who missed the appointed train, and, arriving at Mitcham late, did not catch up to the party led by Mr. Barnard, and so could not say what his party had observed. However, he and his fellow-members had spent an enjoyable afternoon rambling through the paddocks, where a fair amount of the Common Heath, *Epacris impressa*, principally the white variety, was seen.

[Mr. Barnard reported subsequently that, with a party of about a dozen members, he had walked towards the Deep Creek *via* Quarry-road, and thence through the bush to the Lilydale-road. Heath was not as plentiful as expected, but sufficient was obtained to satisfy the desires of the party. Early blossoms of two Acacias, *A. myrtifolia* and *A. verticillata*, *Correa speciosum*, and a few spring flowers, were noted.]

ELECTION OF MEMBERS.

On a ballot being taken, Mr. D. M. Ebbs, 6 Fernhurst-grove, Kew; Mrs. V. Miller, Lambeth-place, St. Kilda; Miss C. Quarterman, 4 Canterbury-road, Toorak; Mr. T. J. James, 110 Maling-road, Canterbury; Mr. W. Mohr, 9 Marine-parade, St. Kilda; Mr. J. M. Sinclair, 700 Burwood-road, Hawthorn; were duly elected ordinary members; and Miss J. Curdie, c/o Mrs. A. J. Black, Mount Noorat, *via* Terang, as a country member of the Club.

GENERAL BUSINESS.

Mr. C. L. Barrett, C.M.Z.S., called attention to the great destruction of wild-flowers going on in every direction. He considered it time for the Club to see what protection could be afforded to the fast-disappearing native flora, and drew particular attention to the practice of visitors to heath districts gathering such large quantities of that favourite flower. He also thought that collectors of orchids should refrain from digging up quantities of plants for home cultivation, which, as a rule, was unsuccessful.

Mrs. Coleman also deplored the destruction which was going on, and made some valuable suggestions as to the gathering of wild-flowers for the annual exhibition. These might be sent to intending exhibitors with the hope that greater care would be exercised in collecting exhibits. Miss Nokes, Dr. Sutton, and Messrs. Williamson, Daley, Pitcher, Oke, and Searle also referred to the importance of Mr. Barrett's suggestions.

Mr. Barrett referred to the way in which flowers and shrubs were protected in the United States of America, and more particularly in California, and thought that something similar might be done in Victoria. He moved—"That the committee be asked to consider means for protecting the native flora and of remedying the mischief already done." This was seconded by Dr. Sutton, and carried unanimously.

PAPER READ.

By Mr. J. Stickland, entitled "The Aquatic Protozoa of the Melbourne District, Part II."

The author, in continuation of his paper in the *Naturalist* for August last (vol. xl., p. 65), in which he dealt with the class Sarcodina, described the class Mastigophora, the individuals of which are provided with flagella for purposes of locomotion, &c. In this group the boundary between plants and animals was completely obliterated; hence many forms were claimed by both botanists and zoologists. Representative local species of the various orders were described and illustrated by large-scale drawings.

Mr. H. B. Williamson congratulated the author on the interest of his remarks, and suggested that a "pond-life" night might be arranged, which would place members more in touch with the subject of the paper.

The president mentioned the interesting tests that could be made in phototaxis and galvanotaxis in the group dealt with—the Infusoria—and gave examples of the galvanotaxis of several species, demonstrating how the experiments could be carried out.

EXHIBITS.

By Mr. C. L. Barrett, C.M.Z.S.—Several species of South African ants, including *Messon barbarus*, the species mentioned in the Bible; also males and workers of the Driver, or Legionary Ant, Dorylus, sp.

By Mr. J. E. Dixon.—Scorpions from various Victorian localities—Ouyen, Lake Hattah, Natya, Mount Arapiles, Castlemaine, Gippsland, and Karn, Broken River, being probably six different species.

By Mr. A. E. Rodda.—A "bull-roarer"—an instrument used by the aboriginals during ceremonial gatherings, from North Queensland.

By Mr. J. Searle.—Photomicrographs of the protozoan, *Diplodinium ecaudatum*, stained by Mallory's connective tissue stain and Heidenhain's iron hæmatoxylon stain, to show the neuromotive apparatus.

By Mr. A. J. Tadgell.—Blooms of *Acacia verniciflua*, Varnish Wattle, grown at Sandringham. This Wattle produces abundance of flowers, and grows well in poor soil. A pretty effect is produced if the Western Australian Sarsaparilla, *Kennedya pentaphylla*, can be grown as a background to the Wattle, the sky-blue flowers of the creeper blending well with the deep yellow of the Wattle.

After the usual conversazione the meeting terminated.

"The Old Pioneers' Memorial History of Melbourne."—This recently-published volume of about 500 quarto pages, profusely illustrated with maps and drawings, though not containing many references to natural history, is well worth perusal by field naturalists, most of whom should be of a literary turn of mind, and interested in what has gone before. The author, Mr. Isaac Selby, has succeeded in getting together a vast amount of information about men and women who were foremost in the foundation of our city and State, many of whom have left indelible marks on the days that have come after, and he is to be congratulated on having carried out such a self-imposed task so well. The price of the volume is twelve shillings and sixpence, and the profit on the sales is to be devoted to a lasting memorial of those pioneers whose resting-place in the Old Cemetery, West Melbourne, has recently been resumed for market purposes, in spite of the protests of relatives and friends—an example of utility before sentiment.

MOUNT BOGONG AND ITS FLORA.

By Alfred J. Tadgell.

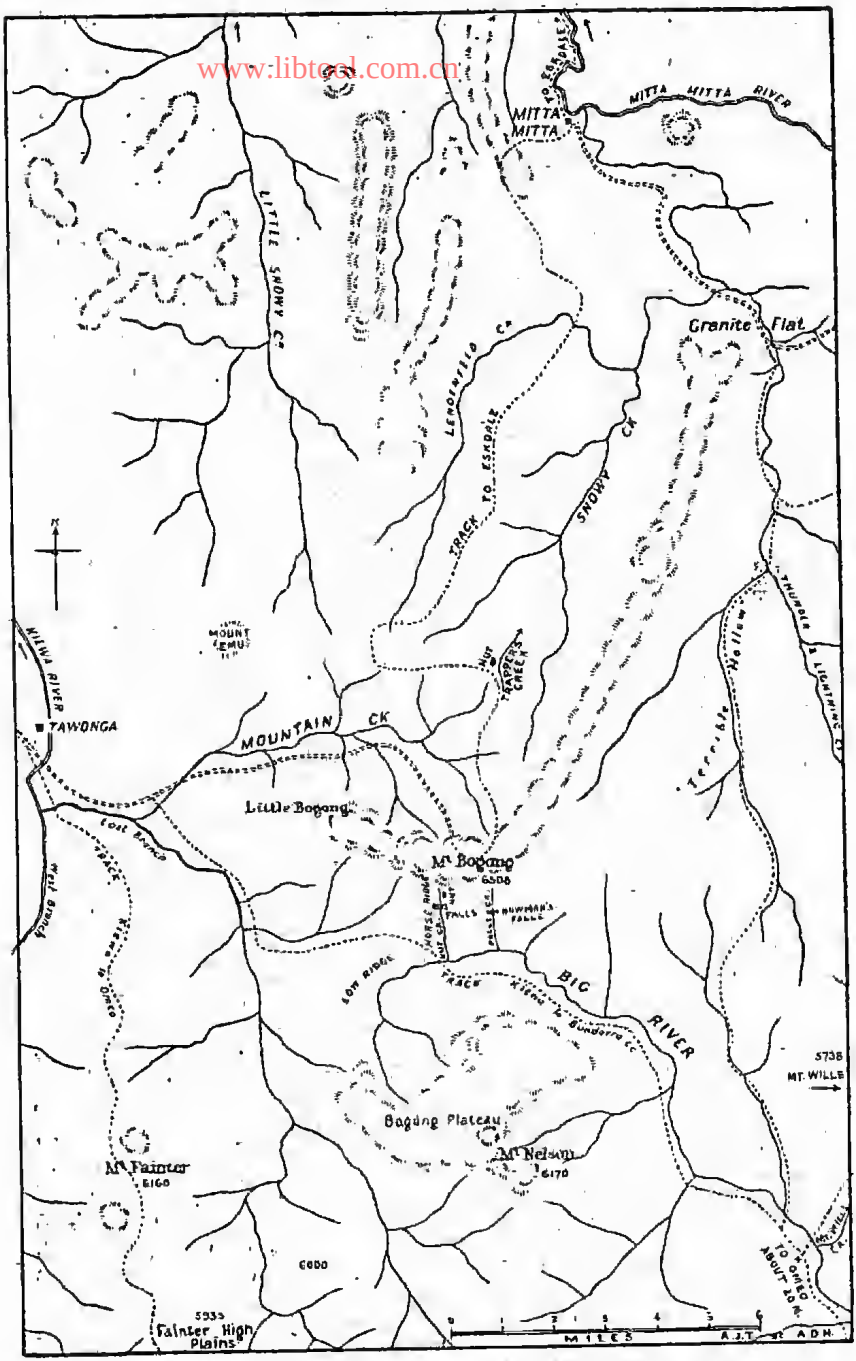
(*Read before the Field Naturalists' Club of Victoria, 16th June, 1924.*)

With my friends, Messrs. Blagdon and Hooke—the latter your esteemed honorary treasurer—I spent a fortnight last Christmas, as well as part of January and February, 1923, on Mount Bogong, Victoria's highest mountain. Its remoteness from the capital may be judged by the fact that Bright is 210 miles from Sandringham (Melbourne), Tawonga 24 miles further, and Mount Bogong Hut (by horse) yet another 24 miles. You will perhaps realize the distance better if I say that our train journey from Sandringham began at about 5 a.m., and ended at Bright at 5.30 that afternoon. We were in our conveyance for Tawonga within an hour later, arriving at our guide's house at 10 p.m. Next morning at 6.45 we were in the saddle, and arrived at the hut on Mount Bogong at 7 p.m. that evening. The journey even takes longer in returning, as, though we left Mount Bogong Hut at 10.30 on Thursday morning, facilities did not allow of our reaching home till Saturday at 4 p.m.

We do not advise, unless experienced, that the traveller essays Mount Bogong unaided. One traveller we met set out from Tawonga in the morning, but had returned by evening. Guide maps direct, but lines are not shown on the countryside. There are few indications, many blind gullies, spurs innumerable, and rough country.

The Tawonga valley gives one a sensation of pleasure, as one misses the desolation of the Ovens Valley, through sluicing operations, and the St. John's Wort, though Californian Stinkweed, *Gillia*, is in evidence. The Kiewa River, known to the aborigines as the Ki-ee-wa (flowing waters), commands our first attention. A great natural barrier, part of the High Plains, under Mount Bogong, acts as a buffer and throws the waters of the Big River away to the east, and those of the Kiewa, which absorbs the Mountain Creek, towards the north. At the mountain end of the valley the river has two main branches, known as the eastern, rising under Mount Bogong, and its high plateau, and the western, having its source in the Diamentina, under Mount Hotham. A large delta-like area takes in Mount Beauty and beyond. The branches join near the local post-office or township of Tawonga.

The river bulked largely in the report of the Commission on the Kiewa Hydro-Electric Scheme in 1919, and later in that of its engineer. Much was expected from the scheme in the development of the North-East of Victoria. Storage basins were to be constructed under Mount Bogong and the High Plains at 3,000 feet, using the Rocky Valley and Pretty Valley



MOUNT BOGONG AND ITS SURROUNDINGS.

branches of the East Kiewa. Statistical information is still being gathered from the High Plains.

On our two occasions of enforced waiting we botanized several miles up both the east and west branches of the Kiewa. The residents are rather proud of the Red Cypress Pines, *Callitris calcarata*, on the banks of the eastern branch, and local tradition ascribes their being brought by aborigines from a considerable distance.

Leaving our guide's house on the West Kiewa, a road takes us first north, then east. Before a mile has been traversed our pack-horse is seen struggling with a shifting pack, and falls, with our food and belongings under him. In a couple of miles we are crossing the wide stream of the East Kiewa, and a pretty picture is made by our horses splashing in the sunlight-reflected water. The tall Narrow-leaved Lomatia lines the banks of the stream, with the Slender Tea-tree, *Leptospermum attenuatum*, a handful of whose astringent fruits our guide carries in his pocket as a useful bush medicine. The last settlement is soon passed, and we no longer hear the hum of milking-machine motors. Splashing across Mountain Creek, we pass through a mile or two of rich grass flats, in which from time to time may be seen traces of a track, and halt near the junction of Soda Creek, whose mineralized water our guide advises not to drink too freely. We are here about 2,000 feet high, and seven miles of the journey have been completed. At our backs is a spur, once used as a cattle track up to Mount Bogong, but since discarded owing to the steep grade and its roughness. The rosaceous burr, Bidgee-widgee, *Acaena sanguisorba*, a common plant, grows around us, an infusion of which is used by local bushmen as an eye-wash, and which, twenty years ago, I found an effective astringent on a trip to Mount Kosciusko. The Prickly Currant-bush, *Coprosma Billardieri*, abundant about here, is, in February, loaded with its bright scarlet, edible berries, that look like red currants. Strap Ferns, *Blechnum* (*Lomaria*) *Pattersonii*, and others line the banks of the creek, while the "Common" Spleenwort—which, by the bye, is rare as a Victorian fern—and the Small Rasp Fern, *Doodia caudata*, are to be found among the rocks. Twice we cross the creek and climb out to the drier spurs, keeping on the highest ridges up to 3,000 feet. Numerous holes made by the Wombat, *Phascolamys latifrons*, are passed, and although our guide shouts a warning, a rider is seen struggling as his horse turns a somersault; but by wonderful dexterity he falls clear, a little shaken, though without damage even to his eyeglasses, while in another moment he had caught and remounted his horse.

On our first visit, though the ridge at 4,000 feet leads

southerly and direct over the Mount, circumstances compel our guide to make a detour to the north-east to locate the Trapper's Creek hut, so we descend over a saddle of the range for three miles into a wide valley, on the opposite water-shed. We cross miry country and push through under-scrub that brushes our heads roughly and has no respect for our clothing. A bad take-off when his horse jumps a log causes a broken saddle girth, and another rider is precipitated on to his shoulder, still no damage.

Trapper's Creek at 3,000 feet is seen with overhanging Myrtle Beech and Sassafras trees, and we emerge on to the cattle-yards of the grazier and a nicely-built hut 15 x 11. It is a useful shelter, a kind of half-way house, where the cattle spell a night before the final ascent to the top, still twelve miles distant. It is situated on the Eskdale to Mount Bogong track, near where there is an indicator fastened to a tree—"To Granite Flat"—but this track will be found to be overgrown. The hut is not hard to locate if general directions are followed, and the saddle of the ridge found. A recluse dwelt in the hut for a number of years, finding a living trapping native fauna. Overnight we had puzzled at a notice a wag had fastened on the door of the hut, which read, "Look under the bed for strangers"; but some of us slept on the floor, on gum leaves, and we did not realize his joke until next morning, when Mr. Maddison killed a good-sized snake before we had proceeded far. Snakes, however, we found scarce, while we saw no foxes.

The mighty Bogong now stood out in all his majesty as though challenging us to scale him, while his long spurs acted like buttresses for his bulky side. Our trail along the ridges from Mountain Creek had shaped itself into the form of a horseshoe, and a well-worn cattle track was met and followed to the hut beyond the summit and on to the opposite side. Snowdrifts increased in size and in number, and my friends began to develop plans for a toboggan, made later, and which at Christmas time they were able to enjoy to their hearts' content. Beyond the wide Mountain Creek depression on our right hand there is a splendid view that culminates in the Kiewa Valley in the west, while to our left hand, looking easterly, there is the deep vale of Lightning Creek, with "Terrible Hollow." The ridge dips again at 3,700 feet, and we dismount to ease our horses up the steep slopes of the "Pinch." A nice creek is crossed at 4,000 feet, and large Snow Gums, *Eucalyptus coriacea*, var. *alpina*, and Silvertops, *E. Sieberiana*, intermingle. At 5,000 feet we find ourselves among dwarfing eucalypts, ghostly and bleached, with the remains of a young bullock, that has gone down from exhaustion among the

tangled Snow Gum jungle during last mustering, when heavy snow made the going almost impassable.

Mount Bogong is now only separated from us by a narrow and steep connecting ridge, down the slope of which our guide has known more than one beast to fall and fail to return. We are at last on the side of the mountain, and the panorama extends for 50 miles. Mount Kosciusko, with several peaks, Gibbo, Pilot, The Cobboras, are on the eastern sky-line, while, looking back northward, a wondrous view is seen of broad river valleys—the Mitta and others, to the River Murray, lost in a sea of ranges, far beyond the New South Wales border. We feel, with Hazlitt, that "we are surrounded with the constant sense and superstitious awe of the collective power of matter—of the gigantic and eternal forms of Nature, on which from the beginning of time the hand of man has made no impression."

The final effort has been too much for "Sam," our pack-horse, who, for the second time, struggles with his burden, but is only prevented from sliding further down the mountain side by again lying on our provender and by a rush of arms that held him back. At the top of the slope a wide expanse of snow causes us to make a detour from the track, and at the same time the aneroid perceptibly falls when the intensified warmth and sunshine of the lee side of the mountain are no longer afforded among the many large snowdrifts of the summit.

We had no petrologist with us, so only a few specimens were collected as we made the spurs leading up to the summit. They are laid on the table this evening, and show the decomposed state of some of the rocks. They may have a little interest, perhaps, for some of our members. My friend, Mr. J. T. Jutson, tells me that they consist mainly of specimens of metamorphic gneiss (mica schist or phyllite), pegmatite, felspar, with large plates of white mica (muscovite) and milky white quartz, with black bands of a mineral that Mr. Rodda says is tourmaline.

Rain, sleet, snow, and losses by the cattlemen on Mount Bogong were reported at this time (June) last year by the press; but the winter season is not the only time an uncharitable welcome will be received from the Spirit of the Mount. On our arrival on top, at the end of January, 1923, we were greeted with stinging hail, sleet, and painful cold. A few days later we were witnesses of one of the Mount's peculiar phenomena. A wall of thick bush-fire smoke, after first filling the valleys and obscuring the hills on the north side, gradually crept up Mount Bogong and banked up for several miles along the crest, as the air from the south met and checked its further movement.

Writing from Omeo in December, 1854, to Sir William Hooker, of Kew Gardens, England, Baron von (then Dr. F.) Mueller

tells that he is the first and only white man who has ascended the two highest summits of Bogong, and he has named them Hotham and La Trobe, in honour of two of the Colony of Victoria's Lieutenant-Governors. He added that on these ranges he found the boiling-point to be 198° Fahr. He expressed disappointment that the vegetation of these lofty Victorian mountains did not boast of as many peculiarities as he had anticipated, for, as he said, the Australian highlands reflected Tasmanian forms. Mount Latrobe has since been often ascended. Mr. Black, the Surveyor-General, trigonometrically measured it as 6,508 feet above sea level, and found it to be Victoria's highest mountain. It now bears the name of Mount Bogong.

In 1886 Dr. von Lendenfeld and Mr. James Stirling explored the Victorian Alps together geologically. In their report to the Victorian Mining Registrar, March, 1886, they fully describe the difficulties of their journey in January, 1886, to the summit, from the Omeo or eastern side. Mount Bogong is situated at the northern end of a high plateau or massed elevation, extending for sixty miles between the Mitta River in the east and the Kiewa River in the west. The mount is divided from the southern portion of the table-land by the deep ravine of the Big River, a tributary of the Mitta, and is connected with it by a low, rocky ridge. The explorers further explained that Bogong got its name from the caterpillars of a night moth. These caterpillars are called "Bogong" by the aborigines, and, being exceedingly abundant at certain seasons of the year, were half-roasted and formed a favourite food at their "Bogong" (or "Bugong") feasts. (A juicy grub would certainly be more palatable than a winged insect when singed.)

Mount Bogong itself forms a long ridge, the slopes of which on the north and west are very steep and rocky, those on the south side less so, while those of the east have a more gradual slope still, but only a few spurs are passable for horses. It extends from west to east about five miles, slightly curving to the south, and appears as a bald, isolated and almost inaccessible mountain even in the near distance. It is about half a mile broad, with slightly undulating summits of three elevations, about a mile apart, and of about the same height. At the centre of Mount Bogong, on the north-eastern of the summits, and at the highest point of 6,508 feet, there has been erected a large, high, and well-built cairn, on which time has left little trace. Another smaller cairn was built at the south-west summit by the geodetic survey where the Mount overlooks Mount Buffalo and the beautiful Kiewa Valley, and in the near distance Little Bogong, 1,000 feet lower. This latter is difficult of access, as tangled scrub and rocky outcrops impede progress so much that my legging came off, and I did not miss

it for some time until too late to recover it. If the intervening space between Mount Bogong and Little Bogong were made easier to cross, as no doubt it will be for tourists some day, judging from the Ministerial visit to Tawonga, and the promise made by the Minister to a recent deputation, Mount Bogong will come into its own and be fully appreciated, as the distance from Little Bogong to the Kiewa River crossing is only about five miles, while the distance between the upper and lower summits is about a mile and a half to two miles. Now the distance from Tawonga to Mount Bogong is twenty-one miles. I am not saying that a motor-car or buggy will make the trip in so short a distance, but a good horse track would not be a very expensive work, and the return journey will be as easy to accomplish in a day as is the trip from Harrietville to Mount Feathertop, which is taken by so many. What finer scenery could be had? The view from Mount Bogong is regarded as the finest in the Alps.

In describing the geology of Mount Bogong, Mr. Stirling states that, although marked "granite" on the map, it is really gneiss (a hard, crystalline rock of thin layers, mainly of the same material as granite). It is a highly metamorphosed sedimentary rock, outcropping, and forming escarpments on the north and west sides of the mountain near the summit. Blows of white milky quartz are frequent, and stand out prominently. Lower down the Mount, the rock is transmuted into metamorphic granite, quartz, white felspar, and dark brownish-black mica. Rounded and flattened masses of basalt-like rocks—quartz porphyrites—occur, which, he thinks, are transported boulders derived from Mount Nelson, twelve miles to the south, at the extremity of the High Plains. Von Lendenfeld adds that, on the summit of Mount Bogong, the metamorphic gneiss has retained its stratified character. It will thus be seen that the geological structure of Mount Bogong differs from Mounts Hotham and Feathertop. The summit of Hotham is a recurring mass of argillaceous greyish and bluish slate, alternating with siliceous and felspathic sandstone, some of these argillaceous members being full of anastamotising seams of quartz, while on the eastern slopes, near the Omeo road, are basalt outliers, and sedimentary rock is exposed in the cuttings."

Arrived at the mountain top of Bogong, at 6,450 feet, one views the cairn for the first time, and leaves it a few hundred yards on the right hand, while one follows the well-worn cattle track for a good two miles along the grassy crest of the mountain, bearing south-east, and heading for the grazier's hut on the opposite slope. We pass what our guide denominates a "rocking stone"—an oval, water-worn stone about twelve inches long, lying in a hollow cradle of a huge rock. The

rocking stone is now loose as the result of exposure to the elements. This may be part of one of the transported masses of stone that Mr. Stirling refers to, in what he thinks is glacier action, near the summit. Snow Gums, protected somewhat by the dome-shaped mountain mass, are reached at 6,000 feet, and the track continues through them for a quarter of a mile before leading down for another half a mile to the hut at 5,900 feet, where the valley closes in.

Without direction it would be difficult to locate the hut, but a good indicator is the depression on the south-west side leading to the commencement of a stream that springs out of the mountain, and whose rocky bed soon shows deep erosion from melted snow waters. This is close to the first Snow Gums, and to the right of them. The hut cannot be seen from here, as it is situated among the trees, close to the creek, but it is "a hollow in the hills," suggestive of where one would naturally look for a camp. If the stream be followed for half a mile in a westerly direction the hut is passed before the creek takes a southerly trend, as it follows parallel, under the horse ridge, a spur leading down, by an easy grade for a horse to the Big River, which it joins at about 4,000 feet. It requires a walk of 2½ hours from the hut to reach the Big River, but the journey on return will take 4 hours, as part of it will be through very rough and dry tangled Snow Gum scrub, while steep slopes occur towards the river bank.

The Big River, a swiftly-flowing, pellucid mountain stream, 25 feet wide, is spanned by a fallen tree bridge, and its many rapids and deep holes suggest good trout fishing. The river's straight outline is like a liquid road for more than a quarter of a mile through the overhanging vegetation when viewed from its banks. We cross the old mining pack track from Tawonga towards Omeo, and follow it over the river a little, as it leads up to Mount Nelson and the High Plains.

The grazier's hut, which is the only dwelling on Mount Bogong, is an erection that has defied the elements for many years, and one can imagine the packing of the stout iron for the roof from Tawonga in those rough old days, and the difficulties for twenty-four miles of a horse with such dead weight. In imagination we follow the horse up the steep slopes where the rocks on edge and the sharp-sided razor-backs make foothold so uncertain that even we are glad to dismount, though the day is windless. The hut is built very strongly of chocks and logs and dab, with a capacious chimney and doorway occupying the whole of the north end of the building. A glance at the structure, and one would think it proof against wind and rain, as its position was chosen, not only because of the abundance of wood and water close by, but for the shelter that the mountainside affords, while the last rays of the setting

sun give as much light and warmth as possible when the days grow shorter. We found, however, by the splash of rain on the sleepers' faces at times, how searching are the elements on a boisterous night, when, as we lay in bed, we would listen for the rush of mountain wind up the valley, till it struck our home and caused it to shiver. But what pleasure can be more joyous than to hear the rain pattering on the iron roof of a hut when you know that you are safe within, and you watch the blaze of the huge log fire, provided the wind is not driving the smoke down and filling the hut, kept up well into the night! It is only in the early hours of the morning that you are looking for the extra blanket. The hut remained a faithful friend to us, though it must lie buried under the midwinter snow many feet deep.

Daybreak was heralded by Red-tipped Pardalote's unceasing call, "Which-ee-coo, which-ee-coo," thrice repeated in quick succession. From sunset till dark he was back, again restlessly breaking the silence. Scarcely a mile from the hut, on the southern slope, as one looks towards Mount Nelson, one takes a rough scramble into the bed of the creek, aided by tall Grevilleas and Mountain Plum Pine, *Podocarpus* (*Nageia*) *alpina*. One arrives at a nice cascade, over which a good flow of water runs. Here our new fern, *Cystopteris fragilis*, luxuriates, bathed in the spray from the running stream as it shelters under the rocks or in their crevices. Almost immediately a sudden drop reveals a waterfall of some thirty feet. Again one works out to the high mountain side near by, which still overlooks Mount Nelson and the high plateau, and, as one pauses for breath, one's attention is arrested by what, if they were anywhere else, might be mistaken for three newly-made unrolled macadamized roads, or long shoots of loose stones from some mine near by, and running down the mountain side for 100 yards. On investigation they prove to be talus, caused by the weathering of the mountain's escarpments; and very difficult these loose masses of stones prove to us to walk over, on the steep slope of the range. Returning to the ridge overlooking the hut, where the Snow Gums commence, and where our creek rises, we pass for half a mile by a gradual fall on to the east side of the mountain. Here is the salt-lick flat of the graziers, where salt is put out for the stock. It is somewhat swampy just now, and out of the soddened ground a creek soon forms to join those that flow later to the Big River from this side. Two fine sphagnum moss beds are close at hand, fed by the melting snow and springs.

By the end of February the Sun Orchid takes possession, and countless sky-blue flowers of *Thelymitra venosa* give beauty and delight the eye of the flower-lover. The outlets of the sphagnum beds are rushing creeklets that join that from the

salt-lick flat. In the pools of the latter we find an interest, not only in the plant life, but in numerous tadpoles disporting themselves, while hard by, on hearing the call, we collect the Golden-yellow Frog, *Hyla ewingi*. The height, 5,800 feet, seemed to us interesting and unusual, as the frogs must have hatched out while the snow lay on the ground, and ice made the water very cold. As a matter of fact, there was still abundant snow but a few yards distant, extending in an unbroken drift for a mile or more. On referring the matter to Mr. Jas. Kershaw, of the National Museum, that gentleman was kind enough to identify the frog and supply me with a note, stating that the occurrence was not unusual for this widely-distributed species.

About a mile east from the sphagnum beds, after the valley has widened considerably, it once again contracts into a rocky flat, and a nice series of cataracts are passed. We thought at first that this was "the bit of a fall" to which the graziers had referred, but my ever-energetic companions, Messrs. Hooke and Blagdon, always on the look-out for something new, were not long in making a discovery of importance. The stream was running fast, along a narrowing bed, when the country showed a deep depression, and a valley was seen, hemmed in on all sides by steep hills. Suddenly the water was precipitated over a rocky face, estimated by us at 130 feet, by three clear drops of nearly 50 feet each, depositing the water into a large, rocky pool below. Howman's Falls are worthy of Mount Bogong, and the natural swimming pool was not long in being tested, though the icy water did not allow of the swimmers remaining long in the bath, but quite long enough for a photo. to be taken of them in their pleasant surroundings.

A curious circumstance is that of another face over which no water flowed on either of our two annual visits. This face almost adjoined, was of the same height, and its dry basin and the water-worn condition clearly showed that at one time it must have been the original fall and the channel's course, but how it had been deflected the precipice and approach did not permit of our examining. Animal life is absent from the mountain, although at one time, it is said, there were large, fierce, half-bred dogs running wild with dingoes. Only a brown-coloured porcupine ant-eater, *Echidna aculeata*, was run to earth, from which our dogs in vain tried to dislodge it.

Large black-winged insects with red blotches, grotesque in appearance and slow in movement, beautifully-coloured Locustidæ, leisurely moved back to the rocks when disturbed. Eagles, Kestrels, Hawks, Crows, Lory Parrots, and Pardalotes could be heard and seen almost to the summit. In fact, this seemed a common meeting-ground for several large individual flocks of Raven Crows, at whose gatherings something of very

grave importance seemed to be discussed, for on a sudden they would all take wing, and, after a deal of cawing, would re-assemble and begin the discussion over again. Shortly after sunset millions of Bogong moths were to be seen, all flying eastward in one direction, and not flying hither and thither, as is their bent elsewhere, and, although such a large number, they did not seem to impede each other's flight. At the same time there were to be found on the stones in the creek hard by hundreds quenching their thirst, and, although the water ran strongly, covering part of their bodies and wings, they held a firm grip with their feet for several seconds before flying off. It would seem difficult to drown these Cut-worm Moths, *Agrotis infusa*, as they easily recover the banks of the creek if by chance they get into the water.

A fourteen-mile walk from the hut for the full length of the mountain crest, "over the top" and down on to Little Bogong, and back, provided a good and varied day's outing after our horses had left. As there was no spring water available we made our tea from a snowdrift. The smoky taste of the tea caused our cook to be censured, but, as our guide informed us that when the snow waters came down into the Kiewa River at Tawonga it was similarly tainted, we wondered at the cause. On referring the matter to the Government Meteorologist, he explained to me "that the peculiar flavour was caused by the soot from bush-fires, brought down by the rain and snow, a matter previously reported to him." Perhaps the light atoms remain in suspension in the same manner as those that cause the phenomena called the red and sulphur-coloured snow of Europe.

There is, as far as I am aware, no separate extensive list of plant-life that has been collected on Mount Bogong, so I am appending a list as a "contribution to the flora," showing at what heights over 4,000 feet the plants were collected. This gives 256 native species, 28 varieties, 13 immigrant weeds, also 24 species of mosses, &c. In the *Victorian Naturalist*, for March, 1904 (vol. xx., p. 156), there is a short account of a visit to Mount Bogong by Dr. C. S. Sutton and Mr. G. Weindorfer, but the visit only allowed of a hurried stay on top of a little more than an hour, and then under unfavourable conditions. Twenty-seven species of plants were recorded at over 4,000 feet. May I express my admiration of these enthusiasts who went up and down the mountain in one day, as you would agree with me that a journey one way in twenty-four hours is quite sufficient, especially with pack-horse and impedimenta. That indefatigable worker, the late Mr. James Stirling, collected over our Australian Alps, and made a comprehensive survey recording its flora at varying heights and many collecting grounds, listing Tasmanian and Australian alpine, with other plants, even comparing our flora with that of part of Scotland and

Antarctica. In his report to the Mining Registrar, and in a paper read by him before the Botanical Society of Edinburgh on 12th February, 1903, he specifically mentions eighty species of Mount Bogong plants, exclusive of two species of Muscæ. Most of these appear under the initials "St." in Prof. Ewart's "Flora of the Victorian Alps" (*Vict. Nat.*, Oct., 1910, vol. xxvii.), but in this last list no collecting grounds or heights are given.

In my list some of the plants are shown to have a higher range of elevation than that recorded by Mr. Stirling. Evidently some of the species collected by this gentleman were not submitted to the Government Botanist for confirmation, or recorded by the National Herbarium of Victoria. I fear that some of the plants must be regarded as doubtful records. Indeed, some are left out of the "Census of Victorian Plants" recently published by this Club. Thus, *Dichosciadeum ranunculaceum* (*Azorella dichopetala*), *Olearia* (*Aster*) *rosmarinifolium*, *Plantago stellaris*, *Euphrasia antarctica*, *Ranunculus anemoneus* are not regarded as valid Victorian plants. *Brachycome exilis* is included, but this is a small annual not recorded for the North-East, and hardly likely to endure the rigorous conditions of Mount Bogong. *Stylidium* (*Candollea*) *serrulata* is now included in *S. graminifolium*. It may be found that *Colobanthus subulatus* (*C. Benthamianus*), which I have not collected on Mounts Feathertop, Hotham, or Bogong, may have been mistaken for *C. Billardieri*, whose leaves are not subulate, and which is common on Bogong. When I first found it on Mount Hotham, in 1915, it had previously been regarded only as coastal (*vide* p. 144, Proc. Roy. Soc. Vict., vol. xxix., part 2, 1917). *Acacia alpina* and *Boronia algida*, though common between 4,000 feet and 5,800 feet on the Mount Hotham portion of the Alps, must be rare if found on Mount Bogong, as we did not find either of them. I sought for them both, down to 4,000 feet, on the north and south, and as far as 5,000 feet on the east and west slopes, as well as the on summit, but without success. Mr. Stirling mentions the Acacia as widely distributed—"Mount Bogong, ascending to the rocky summits of the eastern points"; while the Boronia, he states, "grows on the rocky slopes of the mountain." Could *Podolepis acuminata* also, which we could not find, have been mistaken for *P. longipedata* when out of flower, abundant here, and so robust that Mr. Maiden spoke of similar plants on Mount Kosciusko as like young lettuce plants. I have yet to collect *Cotula alpina* from these Alps. The fern *Pleurosorus* (*Grammitis*) *rutifolius*, collected by Mr. Stirling at 6,000 feet, may probably be *Cystopteris fragilis*, that I recorded last year. My own notes say that, when dry, the fruit masses merge, and they lose their individual character, reminding one of Grammitis.

Both grow in crevices of rocks. Mr. Stirling found *Aster glandulosus* at 5,800 feet; my Olearia (Aster) found at that height is *O. ramulosus*, var. *communis* (the minute-leaved form).

I have fully availed myself of the generous assistance of the gentlemen connected with the Melbourne National Herbarium, and Messrs. Audas and Morris have been kind enough to go to a lot of trouble to compare specimens for me with those in their large and varied collection, and have retained a large number I have sent them.

The following plants have been added to the Census as the result of our two Mount Bogong trips:—*Carex pyrenaica*, *Cystopteris fragilis*, a new species of the orchid genus Caladenia which Dr. Rogers will shortly publish the name and description of, *Ranunculus Muelleri*,* the variety *oblongatus* of *Erigeron pappochroma*, while a new locality has been listed for *Olearia ramulosa*, var. *communis*, and *Trichomanes humile*. It was through my horse getting away from me while I was botanizing down a steep slope, and by having to follow on foot for two miles, that I found the Felted Buttercup on the summit.

Some of the plants collected are worthy of notice. A form of *Erechtites hispidula* assumed a beautiful beet-root red all over its foliage. The white forms of *Hovea longifolia* and *Dianella tasmanica* do not seem to have been previously noted. We also found white forms of *Stylidium graminifolium* and *Viola betonicifolia*, though we did not see *Viola Caleyana*. *Veronica Derwentia*, which usually has bluish-white corollas, was found in groups with bright pink colouring. The plants marked in my list with ? were not sufficiently advanced to name other than vegetatively, as *Prostanthera incisa*, at 5,000 feet would be new for N.E., and *Tristania laurina* at 4,000 feet, neither of which could be found in fruit or flower. Some of the rarer alpine plants were found to be by no means uncommon here. Some were even abundant—*Didiscus humilis*, *Acyphilla simplicifolia*, *Exocarpus nana*, four species of orchids, the Edelweiss, Wheel Heath, and Podolepis. The Hoary Sunray was a miniature flower show, with 110 flowers in a radius of little more than one foot square. On the other hand, such plants as *Daviesia ulicina* and *Helichrysum rosmarinifolium* were uncommon or very local. The Royal Grevillea, *G. victoriæ*, tall and handsome, was abundantly covered with its rich, large, crimson flowers, and showed two distinct forms of leaves. On some plants lanceolate, while on others they were quite ovate. Masses of *Euphrasia* and purple *Brachycome*

* It had been considered up to this date that *Ranunculus Muelleri* had been confused with *R. lappaceus* var. *subsericeus* and wrongly recorded for Victoria (Williamson p. 91, Vict. Nat. Sept. 1923, Vol. 40, No. 5). The Committee compiling the Census 1923, accordingly omitted it.

ciliaris were sights, down the slopes, not to be forgotten—quite gardens in themselves. I was surprised to find *Dichondra repens* at the elevation of 4,000 to 5,000 feet. I fear that contact with the hairy stems and fruits of *Bossiæa foliosa*, a shrub that stock will eat, and which was abundant and much handled, was responsible for my dermatitis, so put the note in as a warning to others. The Silver Daisy, *Celmesia* (*Aster*) *longifolia*, is well liked by horses, our guide assured us, but when they first come upon it, and the snow, they are disposed to shy at both. The Tree Violet, *Hymenanthera dentata*, which by an obvious misprint on page 45 of the Census appears as "All but N.E.," is a handsome shrub in the Kiewa Valley from six to eight feet high. On the summit of Mount Bogong it is a dwarf, spinous, divaricate shrub, whose flowers are found on its underneath side, close to the ground.

Collectors do not always make the same records when going over the same ground, even at the same time of the year. Thus, of the twenty-seven species recorded by Dr. Sutton and Mr. Weindorfer, four are not on my list. Of the 80 species Mr. Stirling collected, I did not find 31; while I have 159 native species out of the 221 that I collected not recorded by either of the other collectors from Mount Bogong.

My thanks are due to Mr. A. D. Hardy, who has assisted in adapting the map issued in the Victorian Mining Registrar's report, March, 1886. The additional information recorded will aid in following the narrative, and will be found useful to others visiting the locality.

The *Naturalist* for September, 1923 (vol. xl., p. 88) contains, a short illustrated article, with map, by Mr. H. B. Williamson, F.L.S., who visited the plateau from the eastern side earlier in the year. His map shows more of the surrounding country than the present one.

CRYPTOGAMIA.

The student of bryology will sometimes find a medley of mosses "smothering each other," as the late Mr. Bastow once described some that I sent him. But the question arises: do they, in smothering, destroy life by living upon each other only, or do they not rather contribute to the prolongation of the existence of their life-associates?

Symbiosis is the living together of two organisms in close relation for mutual benefit. It occurs among the mosses, ferns, and some other of the plant-life on Mount Bogong. Some plants appear to receive help to exist among rock crevices, where warmth is essential to maturity in their brief life-season, while later their concern is the retention of that life. Some of the mosses, Hepitaceæ, &c., intermingle. Many occur with ferns; some with Droseraceæ, some with Crassulaceæ; others are attached to Cyperaceæ and Juncaceæ, and even with

Compositæ. At least eight of the seventeen species of ferns here listed are found on Mount Bogong in rock crevices only. The Finger Fern, *Polypodium Billardieri*, is much more abundant on Mount Bogong than on the Mount Hotham portion of the Alps. In both localities, in lieu of fern-tree hosts of the lower gullies, rock crevices are chosen. On Bogong it will be found associated with Gnaphalium, Hymenophyllum, and Asplenium. In return for the benefit derived from the mosses, the latter will be found sometimes well coated with fibre wrapped around and well up half the length of the stems and branches. The Filmy and Bristle Ferns, *Hymenophyllum Tunbridgense*, and *H. australe* (*H. javanicum*) and *Trichomanes humile*, are found abundant in communal existence, and are sometimes difficult under these conditions to separate into their respective species, while in close association with them are to be found as many as ten different species of mosses, &c., some of which become so fragmentary on being separated from their hosts as to make determination difficult when immature.

The following mosses, hepatics, and lichens were collected (except No. 4), but the absence of capsules in a number of instances gave my Sydney and Melbourne Herbarium friends much trouble, and made the determinations difficult and incomplete. I found it very interesting to note the plant associations, so subjoin them :—

Muscæ— Names.	Height.	Associations.
1. Acanthocladium extenuatum	5,600	15, *b*, *e*.
2. Amblystegium (Hypnum) fluitans	6,450	Floating in marsh caused by melting snow.
3. Bartramia Halleriana ..	6,000	*b*, *d*, *e*, *i*, *j*.
4. Blindia robusta	6,500	Stirling colr.
5. Bryum, sp.	6,000	*i*.
6. Hookeria hepaticæfolia ..	6,000	16, 17, *c*.
7. Hypnodendron (Hypnum) comosum	6,000	15, *g*.
8. Isothecium gracile	6,000	*a*, *c*, *d*, *f*.
9. Orthorrhynchium Thorpeanum (syn. Phyllogonium elegans)	5,800	*c*, *d*, *f*.
10. Philonotis fertilis	6,000	*i*, Stirling also col.
11. Polytrichum juniperinum	5,500–6,000	18, *a*, *d*, *e*, *g*, *l*, *i*.
12. Psilopilum pyriforme ..	6,000	(rare).
13. Rhizogonium parramattense	5,800	15, *c*, *d*, *f*, *h*.
14. Stereodon cupressiforme ..	5,800	*b*, *c*, *d*, *f*.
15. Sphagnum cymbifolium ..	5,800	1, 7, 13.
15A. Ptychomnion aciculare ..	5,800	*b*.

Hepaticæ—

Names.	Height.	Associations.
16. Mastigobryum novæ-hollandiæ	5,500–6,000	6, *c*, *d*, *e*, *f*, *l*.
17. Meteorium limbatum	.. 5,800	6, *b*, *c*, *d*, *f*.
18. Teboulia hemisphericum	5,500–6,000	11.
19. ? (unidentifiable) ..	.. 6,000	*m*.

Lichenes—

20. Parmelia physodes ..	.. 6,000	24.
21. Parmelia physodes, var. pulverata	.. 5,800	*d*.
22. Parmelia conspersa ..	.. 5,800	9, 16, *c*, *d*, *k*.
23. Thamnolia vernicularis	.. 6,450	Between rocky outcrops.
24. Usnea barbata ..	.. 6,000	On cairn and rocky outcrops, 20.

ASSOCIATES OF THE MOSSES, HEPATICS, AND LICHENS.

Filicales—

a. Asplenium flabellifolium—8, 9, 11.
b. Cystopteris fragilis—1, 3, 14, 17, 15A.
c. Hymenophyllum australe (H. javanicum)—6, 8, 9, 13, 14, 16, 17, 22.
d. Hymenophyllum Tunbridgense—3, 8, 9, 11, 13, 14, 16, 17, 21, 22.
e. Polypodium Billardieri (australe)—1, 3, 11, 16.
f. Trichomanes humile—8, 9, 13, 14, 16, 17.

Cyperaceæ—

g. Carex breviculmis—7, 11.
h. Scirpus antarcticus (S. cartilagineum)—13.
i. Scirpus cernuus (S. riparius)—3, 5, 10, 11.

Juncaceæ—

j. Luzula campestris—3.

Crassulaceæ—

k. Crassula Sieberiana—22.

Compositæ—

l. Gnaphalium Collinum—11, 16.

Droseraceæ—

m. Drosera arcturi—19.

A CONTRIBUTION TO THE FLORA OF MOUNT BOGONG.

REFERENCES.—St, James Stirling; SW, Dr. Sutton and G. Weindorfer; T, Tadgell; *, naturalized aliens; ?, not fully identified; †, doubtful (see notes).

Name.	4,000 ft.	Up to 5,000 ft.	Up to 6,000 ft.	Summit and over 6,000 ft.
Abrotenella nivigena	—	—	St	—
Acacia alpina (†)	—	—	SW	St
A. dealbata	T	—	—	—
A. melanoxylon	T	—	—	—
A. mollissima	T	—	—	—
A. penninervis	SW, T	SW	T	—
A. penninervis, var. falciformis	T	—	—	—
Acæna sanguisorba	T	T	T	T
Aciphylla glacialis	—	—	T	T, St
A. simplicifolia	—	—	T	—
Agrostis venusta	—	—	T	—
A. scabra	—	—	T	T
Arthropodium paniculatum ..	T	T	—	—
Asperula (oligantha) scoparia ..	T	—	St	—
A. conferta	—	T	—	—
A. Gunnii	—	—	T	T
Asplenium flabellifolium ..	—	T	T	—
Astellia alpina	—	T	T	—
Australina Muelleri	T	—	—	—
Azorella cuneifolia	—	St	St	—
Bæckea Gunniana	—	—	St, T	—
Blechnum (Lomaria) penna marina	T	T	T	St, T
B. discolor	T	—	—	—
B. capense	T	—	—	—
B. fluviatile	T	—	—	—
Blennodia alpestris (Erysimum capsellimum)	—	—	—	St
Boronia algida	—	—	—	St
Bossiæa foliosa	—	SW, T	T	—
Brachycome ciliaris	—	T	—	—
B. ciliaris, var. robusta ..	—	T	T	T
B. nivalis	—	T	St, T	T
B. decipiens	—	T	T	—
B. scapiformis	—	T	T	SW, T
B. stricta	T	T	T	—
B. exilis	—	St	—	—
B. Tadgellii (Tovey & Morris)	—	T	T	—
Brunella vulgaris	T	T	T	—
Bulbine bulbosa	—	T	T	—
Caladenia (nov. sp., Rogers)	—	T	T	—

Name.	4,000 ft.	Up to 5,000 ft.	Up to 6,000 ft.	Summit and over 6,000 ft.
Calamagrostis rudis, var. contracta	T	—	—	—
C. nivalis	—	—	T	T
C. densa	—	—	T	—
C. quadriseta, var. minor	—	—	T	—
Callistemon Sieberi (C. salignus, var. Sieberiana)	—	—	St	St
Caltha introloba	—	—	St, T	St, T
Cardamine dictosperma	—	T	—	—
C. hirsuta	T	T	T	—
C. hirsuta, var. tenuifolia	—	—	T	T
Carduus lanceolatus (*)	—	T	—	—
Carex acicularis	—	St	T	—
C. pyrenaica	—	—	—	T
C. Gaudichaudiana	—	—	T	—
C. polyantha	—	T	T	—
C. Buxbaumii	St	St	St	—
C. chlorantha	—	—	T	—
C. alsophila	—	T	—	—
C. breviculmis	—	T	T	—
C. longifolia	—	St	St	—
C. inversa	T	T	T	—
C. appressa	T	T	—	—
C. pseudo-cyperus	—	St	—	—
Carpha alpina	—	—	T	—
Cassinia aculeata	T	—	—	—
Celmesia longifolia	—	—	T	St, T
Cerastium vulgatum (*)	—	T	T	—
Chenopodium murale	—	T	—	—
Chiloglottis Gunnii	—	T	T	—
Choretrum lateriflorum	T	—	—	—
Claytonia australasica	—	T	T	T, St, SW
Clematis aristata	T	T	—	—
Colobanthus subulatus (Benthamianus)	—	—	St	St
C. Billardieri	—	—	T	—
Coprosma hirtella	T	T	—	—
Cotula filicula	T	T	T	T
C. alpina	—	—	—	St
Craspedia Richea	T	T	—	—
C Richea, var. alpina	—	—	St, T	T
Crassula Sieberiana	—	T	T	—
C. longifolia, var. latifolia	—	—	T	T
Cystopteris fragilis	—	—	T	—
Danthonia penicillata	—	St	St	St
D. penicillata, var. pilosa	—	T	—	—
D. penicillata, var. alpina	—	T	T	—

Name.	4,000 ft.	Up to 5,000 ft.	Up to 6,000 ft.	Summit and over 6,000 ft.
Danthonia penicillata, var. racemosa	—	T	—	—
D. robusta	St	St	St	—
Daucus brachiatus	T	—	—	—
Daviesa latifolia	T, SW	T, St	—	—
D. ulicina	SW, T	T	—	—
Dianella tasmanica	—	SW, T	T	T
D. tasmanica, var. alba	—	T	T	—
Dichondra repens	T	—	—	—
Dichosciadeum ranunculaceum (Azorella dichopetala) (†)	—	—	St	—
Dicksonia antarctica	T	St	—	—
Didiscus humilis	—	—	T	T
Diplaspis (Huanacea) hydrocotylea	—	St	St, T	St, T
Dipodium punctatum	St 4,500	—	—	—
Drimys aromatica	T	T	T	T
Drosera arcturi	—	—	T	St, T
Dryopteris punctata	T	—	—	—
Epacris Bawbawensis	—	T	T	T
E. microphylla	—	—	T	—
E. serpyllifolia	—	—	St	—
E. petrophylla	—	St	St	—
E. nubigena	—	—	T	—
Epilobium glabellum	T	T	T	—
E. confertifolium	—	—	T	T
Erechtites hispidula	T	T	T	—
E. hispidula, var.	T	—	—	—
E. prenanthoides	—	T	—	—
E. quadridentata	—	T	—	—
Erigeron pappochroma	—	T	T	T
E. pappochroma, var. oblongatus	T	—	T	—
Eriostemon myoporoides	T	T	—	—
Erythrea australis	T	—	—	—
Eucalyptus coriacea, var. alpina	—	T, SW	T	—
E. Sieberiana	T	—	—	—
Euphrasia collina	T	—	—	St, SW
E. collina, var. alpina	—	T	T	T
E. antarctica (†)	—	—	St	St
Ewartia catipes	—	—	T	SW, St, T
Exocarpus nana	—	—	T	—
Galium Gaudichaudii	T	—	—	—
G. aparine (*)	T	—	—	—
Gaultheria hispida	—	T	—	—
Gentiana montana (saxosa) (alpine form)	—	—	T	T, St

Name.	4,000 ft.	Up to 5,000 ft.	Up to 6,000 ft.	Summit and over 6,000 ft.
Geranium dissectum	T	T	T	—
Gleichenia dicarpa	—	St	—	—
Glyceria dives	T	T	T	—
Gnaphalium alpigenum ..	T	T	—	St
G. japonicum	—	T	T	—
G. collinum, var. radicans ..	—	—	T	T
Goodenia hederacea	—	SW, T	T	T
G. hederacea, var. cordifolia ..	—	T	—	—
Grevillea alpina	—	—	St	—
G. australis, var. montana ..	—	—	T	SW, T
G. victoriæ	T	SW	T	—
Halorrhagis micrantha ..	—	—	T	—
H. tetragyna	SW, T	T	T	—
H. teuchroides	—	—	T	—
Helichrysum lepidophyllum (baccharoides)	—	St, T	T	St, T
H. leucopsidium	—	—	SW	—
H. scorpioides	T	T	—	—
H. lucidum	—	T	St	—
H. lucidum, var. alpina ..	—	—	T	T
H. rosmarinifolium	T	T	T	—
H. rosmarinifolium, var. ledifolium	—	—	T	T
H. rosmarinifolium, var. thrysoideum	St	St	—	—
H. semipapposum	T	T	—	—
H. Stirlingii	T	—	—	—
Helipterum anthemoides ..	T	T	St, T	—
H. incanum (alba)	—	—	St, T	T
H. incanum, var. auriceps ..	—	T	T	—
H. incanum, var. auriceps, var. alpina	—	—	St, T	T
Herpolirion novæ-zealandæ ..	—	—	T	—
Hierochloe redolens	T	T	—	—
Histiopteris (Pteris) incisa ..	T	—	—	—
Hovea longifolia	—	T	St, T	T
H. longifolia, var. alba.. ..	—	—	T	—
Hydrocotyle hirta	T	T	—	—
H. laxiflora	T	—	—	—
Hymenanthera dentata (Banksii), var. angustifolia	—	—	T	St, T
Hymenophyllum tunbridgense	—	—	T	T
H. australe	—	—	T	—
Hypochæris radicata (*) ..	T	T	T	T
Hypolæna (Calostrophus) lateriflora..	—	—	St, T	T

Name.	4,000 ft.	Up to 5,000 ft.	Up to 6,000 ft.	Summit and over 6,000 ft.
Juncus communis	T	—	—	—
J. pauciflorus	—	T	—	—
J. plebejus	—	—	T	—
Kunzea Muelleri	—	—	T	St, T
K. peduncularis	T	—	—	—
Lagenophora Billardieri	T	T	T	T
Leptorrhynchus squamatus	—	—	T	T
Leptospermum lanigerum	T	T	T	—
Leucopogon (Styphelia) collinus	—	St	St	—
L. Macraei	—	—	T	—
L. Hookeri	—	—	T	—
Lissanthe (Styphelia) montana	—	—	T	SW, T
Lomandra longifolia	T	—	—	—
L. filiformis	T	—	—	—
Lomatia ilicifolia	SW, T	—	—	—
L. Fraseri	T	—	—	—
L. longifolia	T	—	—	—
Loranthus pendulus	T	—	—	—
Luzula campestris	T	St, T	T	T
Lycopodium clavatum	—	—	T	—
L. clavatum, var. fastigiatus	—	—	—	T
L. selago	—	—	T	T, St
Mentha laxiflora	T	—	—	—
Microceris scapigera (Forsteri)	T	St, T	T	T
Mimulus moschatus (*)	T	—	—	—
Nertera depressa	—	—	T	—
Olearia Frostii	—	T	T	—
O. flavescens	T	T	—	—
O. glandulosa	—	—	St	—
O. subrepandra	—	T	—	—
O. megalophylla	T	T	—	—
O. myrsinoides	T	—	SW	—
O. ramulosa, var. communis	—	—	T	—
O. rosemarinifolia (†)	—	—	St	—
Oreobolus pumilio	—	—	T	—
Oreomyrrhis andicola	T	T	T	T
O. pulvinifica	—	St, T	T	St
Orites lancefolia	—	—	T	St, T
Oxalis corniculata	T	T	T	St
Oxylobium alpestris	—	T	T	St, T
O. ellipticum	T	T	T	—
O. procumbens	—	—	—	SW
Pelargonium australe	T	T	St, T	—
Pentachondra (Trochocarpa) pumila	—	St	T	St, T
Persoonia confertiflora	SW	—	—	—

Name.	4,000 ft.	Up to 5,000 ft.	Up to 6,000 ft.	Summit and over 6,000 ft.
Phelâbium (Eriostemon) phylicifolium	St	St	St	—
P. podocarpoides (alpinus)	—	—	T	St, T
P. ovatifolium	—	St	St	St
Picris hieracholdes (*)	T	T	—	—
Pimelea alpina	—	T	T	St, T, SW
P. axiflora, var. alpina	T	—	T	T, SW
P. ligustrina	—	SW	St	—
P. ligustrina, var. hypericifolia	T	—	T	—
Plantago stellaris (†)	—	—	—	St
P. tasmanica	—	T	T	T
Platylobium formosum	T	T	—	—
Pleurandropsis (Eriostemon) trymalioides	—	T	T	St
Pleurosorus (Grammitis) rutifolius	—	—	—	St
Poa annua (*)	—	—	T	—
P. cæspitosa	—	—	St, T	T
P. cæspitosa, var. alpina	T	—	—	—
P. cæspitosa, var. latifolium	—	—	T	—
Podocarpus alpina	—	T	T	—
Podolepis acuminata	—	—	St	—
P. longipedata, var. robusta	—	—	T	T
Polygonum aviculare (*)	T	T	T	—
Polypodium Billardieri	—	—	T	T
Polystichum aculeatum	T	T	T	T
Poranthera microphylla	T	T	T	St
Prasophyllum brevilabre	T	—	—	—
P. Suttonii	—	—	T	T
P. Tadgellianum (Rogers)	—	—	T	T
Prostanthera cuneata	—	T	T, St	T
P. lasianthos	T	T	—	—
P. lasianthos, var.	—	T	—	—
P. incisa (5,500) (?)	—	—	T	—
P. rotundifolia	—	—	—	T
Pteridium aquilinum	T	—	—	—
Pultenæa juniperina, var. planifolia	T	—	—	—
Ranunculus anemoneus (†)	—	—	—	St
R. hirtus	T	—	—	—
R. Gunnianus	—	—	T	T
R. lappaceus	T	T	T	T
R. Millanii	—	—	—	St
R. Muellerii	—	—	—	T
Richea Gunnii	St	St	St, T	T
Rubus parvifolius	T	T	T	—

Name.	4,000 ft.	Up to 5,000 ft.	Up to 6,000 ft.	Summit and over 6,000 ft.
Rumex acetoscella (*)	T	T	T	T
R. Brownii	—	—	T	—
Scaevola Hookeri	—	—	T	—
Schizeilema fragoseum (Azorella Muelleri)	—	St	St, T	St, T
Scirpus cernuus	—	—	T	—
S. inundatus	—	—	T	—
S. setaceus	T	T	—	—
S. cartilagineus, var. alpina ..	—	—	T	—
Scleranthus biflorus	—	—	T	T
S. mniaroides	—	—	T	T
Senecio dryadeus (australis) ..	T	—	St, T	—
S. velleioides	—	—	T	—
S. pectinatus	—	—	St, T	T
S. vagus	T	—	—	—
S. odoratus	—	T	T	—
S. lautus	—	—	T	—
Shœnus apogon	—	—	T	—
Spergularia rubra	—	—	T	—
Stackhousia linarifolia ..	T	—	T	—
S. pulvinaris	—	—	—	St
Stellaria pungens	T	T	T	T
Stylidium (Candollea) serrulata	—	SW	St	—
S. graminifolium	T	T	St, T	T
S. graminifolium, var. alba ..	—	—	T	—
Taraxacum officinale (*) ..	T	T	T	—
Thelymitra venosa	—	—	T	—
T. grandiflora	T	—	—	—
Thysanotus tuberosus ..	T	—	—	—
Tieghemopanax (Panax) sambucifolius	T	—	—	—
T. (Panax) sambucifolius, var. angustifolia	T	—	—	—
Trichomanes humile	—	—	T	—
Trifolium pratense (* ?) ..	T	—	—	—
T. repens (*)	T	T	T	—
Trisetum subspicatum ..	—	—	T	T
Tristania laurina (?)	T	—	—	—
Uncinia compacta	—	—	T	T
Urtica incisa	T	—	T	—
Veronica Derwentia	SW, T	T	St	—
V. serpyllifolia	—	—	T	T
V. arvensis (*)	T	—	—	—
Viola betonicifolia	T	T	T	—
V. betonicifolia, var. alba ..	—	T	—	—
V. caleyana	—	—	St	—

Name.	4,000 ft.	Up to 5,000 ft.	Up to 6,000 ft.	Summit and over 6,000 ft.
V. hederacea	T	St, T	—	—
Wahlenbergia gracilis	T	St, T	T	T

The plants included in the above list are classified according to the systematic arrangement adopted in the "Census of the Plants of Victoria" by the F.N. Club of Victoria, 1923.

Families.	Species.	Varieties.	Aliens.
Araliaceæ	1	1	—
Campanulaceæ	1	—	—
Caryophyllaceæ	6	—	1
Chenopodinaceæ	1	—	—
Compositæ	50	10	4
Convolvulaceæ	1	—	—
Crassulaceæ	1	—	—
Cruciferæ	3	1	—
Cyperaceæ	20	—	—
Droseraceæ	1	—	—
Epacridaceæ	10	—	—
Ericaceæ	1	—	—
Euphorbiaceæ	1	—	—
Filicales	17	—	—
Gentianaceæ	2	—	—
Geraniaceæ	2	—	—
Goodeniaceæ	2	1	—
Gramineæ	12	5	1
Halorrhagidaceæ	3	—	—
Juncaceæ	4	—	—
Labiatæ	5	1	—
Leguminosæ	13	2	2
Liliaceæ	8	1	—
Loranthaceæ	1	—	—
Lycopodiaceæ	2	1	—
Myrtaceæ	8	—	—
Œnotheraceæ	2	1	—
Orchidaceæ	8	—	—
Oxalidaceæ	1	—	—
Plantaginaceæ	2	—	—
Polygoniaceæ	1	—	2
Portulaceæ	1	—	—
Proteaceæ	8	—	—
Ranunculaceæ	8	—	—
Restionaceæ	1	—	—
Rosaceæ	2	—	—
Rubiaceæ	6	—	1
Rutaceæ	6	—	—
Santalaceæ	2	—	—

Families.	Species.	Varieties.	Aliens.
Scrophulariaceæ	4	1	2
Stackhousiaceæ	2	—	—
Stylidiaceæ	2	1	—
Taxaceæ	1	—	—
Thymeleaceæ	3	1	—
Umbelliferæ	13	—	—
Urticaceæ	2	—	—
Violaceæ	4	1	—
Winteraceæ	1	—	—
Species			256
Varieties			28
Aliens			13
Mosses, Hepatics, Lichens, additional			24

ALFRED R. C. SELWYN.—One hundred years ago on 28th July last was born, in Somerset, England, the man who made Victorian geology, or, rather, put Victorian geology on such a sure foundation that few of his conclusions have been upset. He was head of the Victorian Geological Survey from 1852 to 1869, during which period he and his staff succeeded in geologically mapping a large portion of the State. The maps produced were models of their kind, and at the time were not excelled by those of any other country. Unfortunately for Victoria, one of those "cutting downs" of governmental expenditure which happen now and again led to the departure of Mr. Selwyn to Canada, where he carried on a similar survey until his retirement in 1894, honoured by scientific societies all over the world. He died in Vancouver in 1902, at the age of 78, respected by all who knew him.

THE KEA, *Nestor notabilis*.—This fine New Zealand parrot has the reputation of killing sheep by alighting on their backs and digging into the carcass for their kidney fat. According to an article in the July (1924) *Emu*, by Mr. J. Moncrieff, on "The Birds of the West Coast of New Zealand," this practice has never been witnessed, and, like many other natural history stories, requires to be proved. At any rate, it is believed by the authorities, and at the request of the sheep-farmers a bonus of six shillings per beak is being paid as a means of getting rid of the poor birds. As the bird is a large one, it affords a good and profitable target to the shooter. The bird is a quaint one and plays many tricks on confiding tourists to the higher regions it frequents, such as carrying boots out of tents, &c. Before extirpating this fine bird the matter should be definitely decided by experiment or by careful watching.

The Victorian Naturalist

Vol. XLI.—No. 5. SEPTEMBER 4, 1924. No. 489.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall, on Monday, 11th August, 1924.

The President, Mr. J. Searle, occupied the chair, and about fifty-five members and visitors were present.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. and Mrs. R. W. Wilkinson, Alma Road, East St. Kilda; and Mr. A. J. Day, 199 Toorak Road, South Yarra, were duly elected ordinary members of the Club.

GENERAL BUSINESS.

The President announced that the Annual Exhibition of wild-flowers would be held in the Melbourne Town Hall on Tuesday, 21st October, and urged members to make the exhibition a success. It had been decided to give half the net proceeds to the Victorian Bush Nursing Association.

Mr. H. B. Williamson, F.L.S., referred to the quantities of wild-flowers exposed for sale in the streets and florists' shops, and, while admiring the taste for indigenous flowers which has grown considerably during the last year or two, deprecated the collection of these flowers and their sale for monetary gain, as it would undoubtedly hasten their extirmination. He urged members to obtain what evidence they could regarding the question in view of future discussion.

Mr. C. Daley, F.L.S., and Mr. F. G. A. Barnard also spoke on the subject.

PAPERS READ.

1. By Mr. F. Pitcher, entitled, "In the Strathbogie Ranges."

The author gave some interesting notes of an autumn visit to the Strathbogie Ranges, which he visited from the vicinity of Lima. The country traversed was principally granitic, and contained many interesting spots from a botanical point of view, ferns of many species being plentiful, while in the early summer wild-flowers should be very plentiful.

The author exhibited a fine series of specimens in illustration of his remarks.

Messrs. H. B. Williamson, F.L.S., and G. Coghill also referred to the interesting nature of the district.

2. By Dr. W. Macgillivray (Broken Hill), entitled, "An Excursion in South-western Queensland."

In the absence of the author, the first portion of the paper was read by Mr. F. E. Wilson. The author gave some account of the birds and vegetation seen during a motor-trip from Broken Hill, N.S.W., to Hungerford, and then to the nearest rail-head in Queensland. The paper gave a detailed description of the natural history of the trip.

Mr. H. B. Williamson, F.L.S., remarked on the interest of the author's observations, and said that though the trees were different, a large proportion of the smaller plants mentioned were to be found in Victoria, especially in the north-west.

Mr. C. Daley, F.L.S., remarked on the similarity of the bird-fauna to that of our north-western area.

NATURAL HISTORY NOTE.

Mr. L. Thorn drew attention to his exhibit of three species of the Silvery Wattle-moths, and gave some account of their life histories.

EXHIBITS.

By Mr. F. G. A. Barnard.—Flowering branches of the Long-podded Wattle, *Acacia elongata*, of New South Wales, grown at Kew.

By Mr. G. Coghill.—Flowers of native shrubs, etc., grown at Canterbury:—Rosemary Grevillea, *Grevillea rosmarinifolia;* Mountain Grevillea, *G. alpina;* Olive Grevillea, *G. oleoides;* Bushy Heath-myrtle, *Thryptomene Mitchelliana;* Fringed Heath-myrtle, *Micromyrtus ciliatus;* and Long-leaf Wax-flower, *Eriostemon myoporoides*, with Purple Coral-pea, *Hardenbergia monophylla* growing over it.

By Mr. C. Daley, F.L.S.—Flowers of Bushy-Heath-myrtle, *Thryptomene Mitchelliana*, and Fringed Heath-myrtle, *Micromyrtus ciliatus*, grown at Caulfield; Steatite, from Black Ranges, near Stawell.

By Mr. J. E. Dixon.—Coleoptera collected at Ferntree Gully and Emerald during July.

By Mr. L. Hodgson.—Flowers of Varnish Wattle, *Acacia verniciflua;* Mudgee Wattle, *A. spectabilis;* Mountain Grevillea, *Grevillea alpina;* Fern-leaf Grevillea, *G. asplenifolia;* Fuchsia Heath, *Epacris longiflora;* and Fringed Heath-myrtle, *Micromyrtus ciliatus*, grown at Canterbury.

By Mr. V. Miller.—Flowers of Dwarf Greenhood (orchid), *Pterostylis nana*, from Cheltenham Park.

By Mr. C. Oke.—Rare beetles—*Curculum scaritoides* (m. and f.), from Eltham, rare so near Melbourne; and *Pheidoliphila granulata*, Lea, from Sunshine, only the second specimen of this beetle that has been found.

By Mr. F. Pitcher.—Dried plants, etc., collected at Lima East, in illustration of paper:—Foliage of Blue Gum, *Eucalyptus globulus*, young foliage, 4 in. x 6 in.; adult foliage, over 20 in. long, one leaf being 25½ in. long and 3½ in. wide; Frond of Bracken Fern, 7 ft. 3 in. in length; Fronds of Maiden-hair Fern, Rock Fern and Sickle Fern, each 18 in. long; Delicate Rue Fern, *Anagramma (Grammitis) leptophylla;* Orchid, Striped Greenhood, *Pterostylis reflexa;* and other plants found in bloom.

By Mr. W. H. A. Roger.—Portion of pod of Climbing Bean, *Entanda scandens*, also a bean, from scrub near Cooktown, North Queensland.

By Mr. L. Thorn.—Specimens of Silvery Wattle-moths:—*Thalaina clara*, *T. inscripta*, and *T. punctilinea*, with pupa cases, etc.

After the usual conversazione, the meeting closed.

The Tasmanian Field Naturalists' Club.—For many years this club has made a feature of its "Easter Camps," the twenty-first of which was held this year at Marion Bay, Forestier's Peninsula. These camps are usually well attended, no less than forty members and friends taking part this year. An illustrated report of the outing has been issued by the club, which gives brief details of the activities of different sections of the party, as well as a general account, mainly historical, by Mr. Clive Lord, F.L.S.

"The Lyre Birds of Mount Buffalo."—This is an attractive booklet of about a dozen pages, containing seven ½-plate reproductions in sepia of photographs of Lyre Birds, their nests and young, taken at Mount Buffalo by "Guide Alice," who also supplies short notes explanatory of the pictures. Mr. Charles Barrett, C.M.Z.S., has written an appreciative introduction, which serves to introduce the reader to "Guide Alice," through whose patience and perseverance the almost unique pictures were secured. The snap of the male bird, with his tail-feathers proudly displayed, is very fine, and was worth waiting for. The booklet is priced at half-a-crown, and will form a nice souvenir to post to friends at home and abroad.

THE AQUATIC PROTOZOA OF THE MELBOURNE DISTRICT.

Part II.

By John Stickland.

(Read before the Field Naturalists' Club of Victoria, 14th July, 1924.)

In the first part of this paper, which appeared in the *Victorian Naturalist* for August, 1923 (Vol. XL., p. 65), it may be remembered that a brief sketch of the characteristics of the organisms constituting the phylum Protozoa was given, including a little about their physiology, after which the lowest group, Class 1, Sarcodina, received attention. A distinguishing feature of the forms included in that class was their power of extending and withdrawing portions of their cytoplasm in the shape of blunt or thread-like processes—the pseudopodia—by means of which they are able to travel slowly and also capture their food.

In this paper I propose to deal with Class 2, the Mastigophora. The organisms belonging to this class, with very few exceptions, do not extend pseudopodia, but in their stead possess one or more whip-like organellæ, known as flagella, at what may be regarded as the anterior end of the animal in most cases. It is in connection with these flagellate forms principally that botanists and zoologists join issue.

Speaking of flagellates, Professor G. S. West, in his "Algæ," vol. 1, page 162, says, "It is well known that among the heterogeneous assemblage of forms in the group, the distinction between animal and vegetable organisms entirely breaks down," and, although he claims certain forms as undoubted plants, equally eminent zoologists, while admitting their plant-like nature, consider that they cannot be omitted from the Protozoa.

The sedentary forms use their flagella for procuring food by creating a disturbance in the water which brings the food particles into contact with them, while the free swimmers use them for the purpose of locomotion also, as mentioned in the previous paper. According to Verworn, the flagella of Flagellates, like the cilia of the Infusoria, are possessed of the power of contracting, like the fibrillæ of muscle fibres in the higher animals, hence their capacity to move. The flagellum originates at or near the nucleus of the animal,

often from a special particle known as the "blepharoplast," hence it is more than a mere prolongation of the animal's cytoplasm. A central thread or axial filament runs through the entire length of the flagellum, which thus bears some resemblance to the axopodia of the Heliozoa. The movement of the flagellum seems to be extremely effective in producing locomotion by the animal of which it forms part, as it is frequently noticeable that the mere tip is waving even when rapid swimming is induced.

As is frequently the case in nature, the transition from a lower to a higher type is bridged over by intermediate forms, so here the gap between the pseudopodia bearing Sarcodina and the flagellate Mastigophora is filled by some creatures which are capable of extending pseudopodia although furnished with a flagellum. Such an animal is Mastigamœba, which, although flagellate, ingests its food after the manner of an Amœba. Animals of this type are very rare if my experience is any criterion.

Professor Minchin, whose classification I am adopting, divides the Mastigophora into three sub-classes, Flagellata, Dinoflagellata, and Cystoflagellata. The first-mentioned sub-class contains most of the organisms to which reference will be made. They are not of large size even for Protozoa, some indeed are extremely minute, as will be seen. They are in some cases free swimming, in others sedentary; some have one flagellum only, others have two or more; some are solitary, others colonial in their habit. Dinoflagellates will receive attention later, but the Cystoflagellates, of which the marine luminous form, Noctiluca, is a type, have never been represented in my gatherings and will therefore be passed over.

The sub-class, Flagellata, is divisible into several orders. Order I, known as the Pantostomina, contains animals having no definite mouth opening. The Mastigamœba before referred to belongs to this category. As I am uncertain of the identity of the only creature, apparently of this type, which I have taken, I pass on to Order II, Protomonadina. This order contains some parasitic forms, such as the dreaded Trypanosomes, which are outside the scope of my paper. The Protomonads ingest their food at the base of the flagellum; those with which we have to do are holozoic as far as their nutrition is concerned.

Of those to be had near Melbourne we may mention *Spongomonas intestinalis*, Cienk. This is a social animal.

biflagellate, of the "isomastigote" type, the flagella being of equal length. It is extremely small, measuring only about 8 micra in length. The individuals comprising the colony are embedded in the surface of a thread-like zoothecium, often considerably branched and of a brown colour. They are oval in shape and appear like dots in the surface of their domicile. The flagella, being always in motion, are very hard to see, their presence being, however, demonstrated by the commotion among particles in the surrounding water. The colony may contain hundreds of individuals and are of decidedly rare occurrence near Melbourne. I have taken this form only in the Kilby Lagoon, at East Kew, and the Botanic Gardens.

Another animal somewhat similar in shape is *Anthophysa vegetans*, Müller, which is also colonial in habit. It is another extremely small creature, being from 5 to 10 micra in length, and is "paramastigote," that is, possessing two flagella of unequal length. The colonies in this case are oval or spherical in shape, containing numerous individuals closely attached to one another and to the end of a frequently somewhat roughly-constructed peduncle of a dark brown colour, often branched, constructed of excreted matter. It is quite a common occurrence to come across the colonies detached from their peduncle rolling through the water after the manner of Volvox. *Rhipidodendron huxleyi*, S.K., is another minute isomastigote animal, about 12 micra in length, forming colonies inhabiting branching zoothecia, of a dark brown colour, very granular in appearance. The various branches of the zoothecium consist of four thread-like structures placed side by side, the extreme ends of which contain the tiny builders. This form can be obtained in most ponds near Melbourne.

A very interesting and beautiful little animal is *Stylobryon petiolatum*, Duj. It forms fixed colonies of ten or twelve zooids attached to some medium of support by a common rigid stalk or peduncle. The animal secretes a transparent vase-shaped lorica, one individual occupying each domicile. Each lorica, after the first, is attached by a pedicil to the inner surface of the one below, the animal itself being also supported by a pedicil fixed to the bottom of its lorica. It has two flagella of unequal length. The lorica measures about 25 micra in length. Stylobryon is a decidedly rare form, and has been recorded only from the Black Pool at Heidelberg and a small pond at Bulleen. Dendromonas, St., forms

a tree-like colony and is destitute of a lorica. It also has two unequal flagella, which sometimes appear as if proceeding from the side of the animal, which measures from 8 to 10 microns in length.

The Family Choanoflagellidæ contains a number of remarkable forms of extremely minute size. They are monomastigote and characterised by the presence of a transparent cup-shaped collar enclosing the area around the flagellum. They are sessile in some genera and stalked in others, some of the latter forming colonies containing a considerable number of individuals attached to a common centre. In all the flagellates previously referred to the flagellum is of the "tractellum" type, that is, it draws the animal to which it belongs after it, as it were; in the case of the Choanoflagellates, however, when swimming freely, it is used as a "pulsellum," that is, it impels the animal before it after the manner of a single oar used in sculling a boat from the stern.

A form which I take to be *Monosiga consociatum*, S.K., is sessile and frequently found in large numbers closely packed side by side, completely encasing the supporting filament, which not infrequently is the stalk of a vorticellid. In *Codosiga botrytes*, Ehr., we have a similar animal forming a stalked colony. These Choanoflagellates are only 6 to 15 microns in length and the collar so delicate that it is extremely difficult indeed to see it satisfactorily; at its outward edge it generally appears as two lines only, one on each side of the flagellum.

It is remarkable that practically identical collared cells occur in sponges and indicate a close relationship between the Protozoa and the Porifera. The Choanoflagellates are sometimes designated Craspemonads.

The third order—Polymastigina—consists of animals having three or more flagella. Of these I have found no certain representative. They are mostly parasitic.

Order IV is known as Euglenoidena and is well represented in the pools near Melbourne. The animals comprising it have a well-defined mouth opening and œsophagus at the base of the flagellum. *Euglena viridis*, Ehr., is perhaps one of the best known. It is spindle-shaped and monomastigote, the flagellum is possessed of an axial filament which is hard to make out. The possession of green chromatophores stamps it as being holophytic in its manner of nutrition. It has a stigma, or eye spot, red in colour, containing numerous

pigment granules of hæmatochrome. Euglena is extremely changeable in shape or "metabolic," thus a part of the creature, say near the anterior end, will become thicker than the remainder of the animal, the thickness will travel along the length of the animal, disappearing at the posterior end. Englenas are decidedly positively phototactic, possibly through the possession of the stigma referred to, which is considered to be sensitive to light. A good demonstration of this was seen recently when passing along Alexandra Avenue one bright Saturday afternoon, when a red scum-like material floating on the surface of the water in the rocky fountain pool near the Queen's statue was noted. On returning a couple of hours later when the light was less intense not a sign of this red substance was to be seen. An examination later under the microscope showed it to consist of innumerable red Euglenas, possibly *E. sanguinea* of Ehrenberg, many of which were of the round form Euglenas assume when resting. *E. spirogyra*, Ehr., is a larger animal than *E. viridis*, and not nearly so common, and is characterised by well-defined spiral markings extending over its whole length. A large and extremely sluggish form occasionally met with I take to be *E. deses*, while *E. acus* is extremely thin and needle-like.

Amblyophis, Ehr., differs from the Euglenas by being blunt and rounded at the posterior end. My experience as a collector indicates that it is very rare.

Phacus, Nitzsch, is another genus belonging to the same order. There are several species, and all are beautiful objects. Their thin film-like substance and slowly-revolving motion when swimming, suggest the falling leaf, the contained chloroplasts add to the similarity by reason of their greenness. *P. triqueter*, Ehr., is the commonest; it is oval in shape and has a short spur-like extension at its hinder end, while *P. longicaudus*, Ehr., as its name indicates, is possessed of a long tail-like appendage. It is found in two forms, one quite flat and the other twisted into a spiral. *P. pyrum*, Ehr., has well-defined spiral ridges extending across its whole length; it is, however, rarely taken. The members of this genus have a prominent stigma. The genus Trachelomonas, Ehr., is very well represented, occurring in most of the ponds and ornamental lakes in the vicinity of Melbourne. The constituents of this genus form tests of orange or red colour, said to be of a calcareous nature. The animal does not fill

its test, while from an opening at one end projects a single flagellum. The green colour of the contained chloroplast can be noticed through the test. A very common member of the genus is *T. hispida*, St. It is oval or sub-spherical in shape and generally devoid of any collar at the opening. The test is covered all over with knobs. Its length is 25 to 30 micra. *T. armata*, Ehr., is not so common. It is characterised by the presence of several long curved spines at the posterior end of the test. A species having a cylindrical test, sometimes somewhat pointed at the posterior end and with an elongated neck-like extension round the flagellum, bears an exact resemblance to a floating bottle.

Another family, Astasiidæ, belonging to the same order, furnishes us with an interesting creature, *Astasia tricophora*, Ehr. It is shaped like an elongated pear, with a flagellum of considerable length, of which it moves little more than the tip. Being destitute of any chromatophores, it is colourless. *Anisonema grande*, St., presents some features which are very distinct from those of others of the same family. It is "heteromastigote," that is, possessing two flagella of very different kinds, the one being of the ordinary tractellum type, while the other trails behind when the animal swims. It is able to attach itself instantly by the extreme end of this trailer, and, when thus anchored, darts about in any direction as far as the flagellum will allow.

Order V is called Chromomonadina, the members of which contain brown-coloured chromatophores and are destitute of any œsophagus. One of the most interesting forms in this group is Dinobryon, Ehr., of which several species are described. The one generally taken here is *D. sertularia*, Ehr. It bears a considerable general resemblance to Stylobryon referred to earlier, but differs in important respects. It inhabits a vase-shaped lorica which is not pedecillate, but each one—of course excepting the first or original one in the colony—is perched on the edge of the one below. Two may be attached to the one supporting lorica. Unlike Stylobryon, which is a fixed form, the whole Dinobryon colony, which may consist of twenty or more individuals, is free swimming, and presents the appearance of a spray of flowers.

Mallomonas sp., although belonging to the same order, is a very distinct form. It possesses no lorica, but, in addition to a flagellum, is completely surrounded with stiff setose appendages suggestive of an infusorian. It has a habit of darting

quite suddenly from place to place. It is extremely minute, measuring only 25 microns in length. *Synura uvella*, Ehr., forms colonies, the individuals in which may number thirty or forty. The colony is spherical in form, the animals being connected to a common centre, and rolls through the water after the fashion of the well-known Volvox. The exterior of each creature is covered with short spines. *Uvella virescens*, Ehr., is a very similar form, but is destitute of the spinous cuticle of Synura; by some it is regarded as simply a variety of the latter. Both Synura and Uvella are biflagellate. *Uroglena volvox*, Ehr., another free swimming colonial animal, is rather rare. Unlike Synura, the zooids are not connected together, but are embedded in the outer part of a gelatinous sphere.

Order VI, Phytomonadina, forms the great battle-ground for zoologists and botanists. The chloroplasts contained by the constituent animals indicate that they are decidedly holophytic. The enclosing envelope is of cellulose. Family 2 of the order, Chlamydomonadidæ, contains some interesting genera. Chlamydomonas, Ehr., is an extremely minute biflagellate form, but is at times found in such countless myriads as to give large bodies of water a decidedly green appearance. I have found it frequently in pans containing drinking water for the fowls.

A very beautiful little organism is *Sphaerella pluvialis*, Flotow. It consists of a hyaline sub-spherical envelope of cellulose, within which, but separated from it by a small space, is the cell proper, which is connected with the cell wall by numerous strands of protoplasm. A conical projection of the inner cell reaches the cell wall in one part and from it project two flagella. On one occasion when by chance examining some rain water which had collected in an old iron pot placed on the fowl-house roof to get it out of the way, I discovered it to be swarming with most beautiful specimens of this form. In this position it could only have developed by being wind borne. This organism was formerly widely known as *Protococcus pluvialis*. A red form is known as Hæmatococcus.

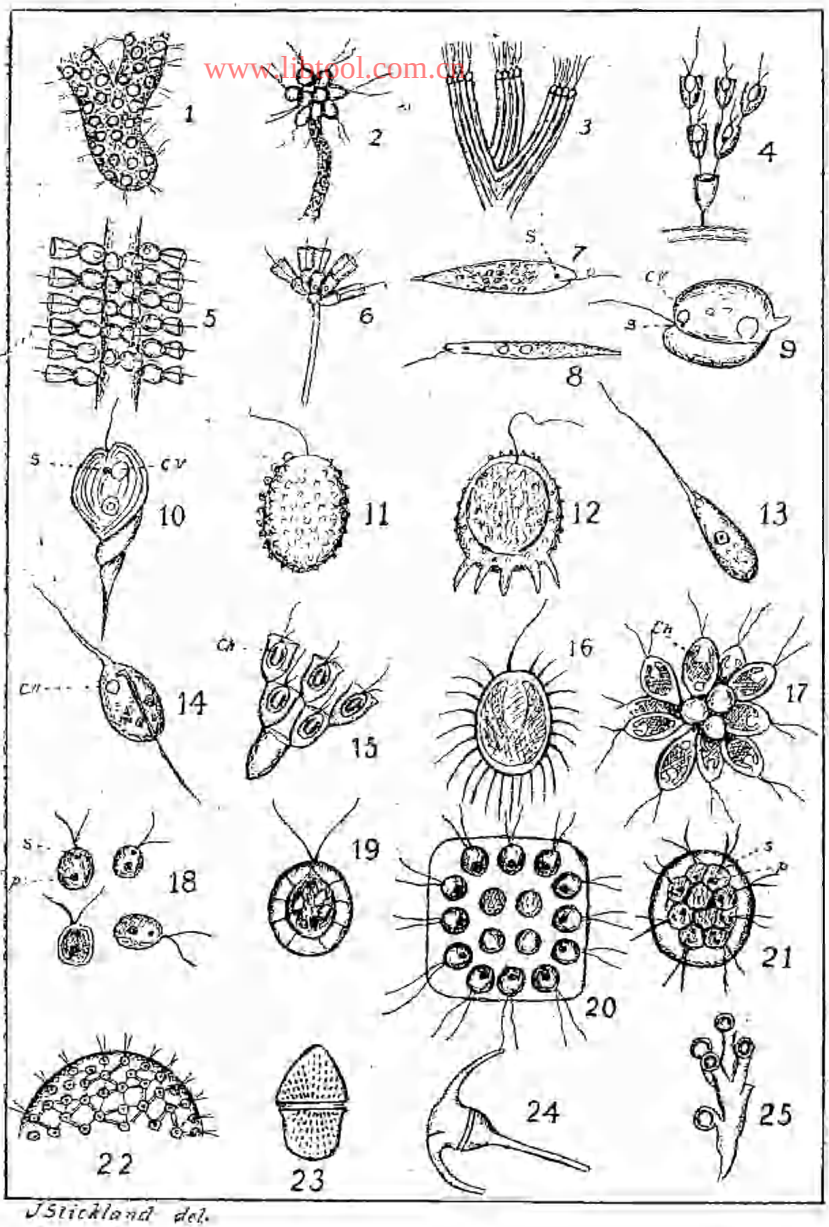
Family IV, Volvocidæ, contains many well-known forms. *Gonium pectorale*, Müller, consists of a colony of sixteen cells, placed in one plane, with the flagella projecting outward. The cells are enclosed within a gelatinous envelope. *Pandorina morum*, Müll., is a colony of cells sometimes num-

bering thirty-two, in a compact mass of spherical or oval form, surrounded by a very transparent envelope, each cell possessing two flagella and an eye spot. The best known and most important genus in this order is doubtless Volvox. It is also the most beautiful. A number of these rolling about in a drop of water when viewed under a low power of the microscope never fails to excite admiration. In shape the Volvox colony is generally spherical, and the gelatinous substance forming its exterior is perfectly transparent. Imbedded in this investment are many green cells, not in a compact mass as in Pandorina, but separated from one another by some little space which varies in different species. *Volvox globator*, Ehr., is a common and cosmopolitan form, and may be regarded as belonging to the plankton. The cells, which are said to number as many as twenty thousand in one colony, are irregular in shape and measure only a few micra in diameter. Each cell is furnished with an eye spot, one or more contractile vacuoles and two similar flagella. Connecting these cells with one another are somewhat irregular strands of protoplasm, often of a branching type. Whereas in Pandorina each cell is capable of reproducing a new colony, it is not so in Volvox, in which this capacity is limited to a few special cells known as parthenogonidia, which reproduce new colonies asexually. Several of these daughter colonies are generally to be seen within adult forms. They are set free to assume independent existence by the rupture of the parental investment. The vast majority of the cells forming the colony are sterile. A sexual method of reproduction may be noted in some colonies. When this takes place a few cells divide and form antherozoids, or sperm cells, and others also few in number, become oospheres. After fertilisation the last-mentioned form oospores, which in *V. globator* are stellate. Self-fertilisation takes place in *V. globator*, which is monœcious. *V. aureus*, also known as *V. minor*, is smaller than *V. globator*, and the cells in the colony are not nearly so numerous, being only about two thousand in number. They are round in shape and considerably more widely separated. This, together with the character of the connecting protoplasmic strands, render the identification of *V. aureus* an easy matter. The protoplasmic strands in this case run in practically straight lines from cell to cell and are frequently double and never branch. The oospore is round, not stellate. A form in which the cells are round, but not connected by protoplasmic strands, has been named *V.*

tertius by Meyer. I recently took a specimen answering this description, but, until verifying its identification, cannot claim it with certainty. Microscopical members might be on the look-out for this form. West, in his "Algæ," mentions a species of Volvox—*V. Rousselletii*—as consisting of fifty thousand cells. Volvox may be obtained in the Botanic Garden lake all the year round.

Sub-class II, Dinoflagellata, is divided into two orders, of which the second—the Dinifera—only interest us now. The organisms constituting this order are characterised by the possession of two flagella, one placed in a longitudinal groove situated in the ventral surface, the other in a transverse groove which nearly encircles the animal. The flagellum in the longitudinal groove trails behind the creature when it swims. The order Dinifera is subdivided into two families, the first being known as the Gymnodinidæ, which is represented in our local ponds by *Gymnodinium fuscum*, Ehr. This animal resembles a diamond in shape with one of the long corners rounded off. Its colour, as its name indicates, is a reddish-brown, with rod-like markings radiating from the centre. As is the case throughout the family, it is destitute of the well-developed cuirass which is a marked feature of many Dinoflagellates. I have not found it to be very widely distributed, but it may be had practically all the year round in the pond in the Horticultural Gardens.

The second family of the Dinifera, the Peridinidæ, contains some interesting genera which, however, have not supplied many examples. The members of this family are entirely enclosed within a firm envelope or cuirass, consisting of a number of plates of cellulose, or some modification of the same; the joints where these plates meet are very distinct. The Peridinium generally found here is spherical in shape, and I have not determined its species, very probably it is *P. tabulatum*. An animal very distinct from most others of the family is *Ceratium tripos*, Müll. Here we find the cuirass extended into three long horns, one at one end and two recurved ones at the opposite end, which give it a singular appearance, the greater part of the animal consisting of these "horns." Ceratium may be found



J Stickland del.

Stigma (eye spot); C.V. Contractile vacuole; Ch. Chromatophore; P. Pyrenoid

Protozoa illustrating Class 2, Mastigophora.

in both fresh and salt water. In the former habitat it is very rare, the only example I have taken under such conditions was obtained in the lily pond in Queen's Park, Moonee Ponds. At a recent excursion to Frankston, however, a large number was obtained in the sea.

The consideration of Class IV, the Infusoria or ciliate forms, must be reserved for some future occasion.

EXPLANATION OF PLATE.

1.—Spongomonas intestinalis.
2.—Anthophysa vegetans.
3.—Rhipidodendron huxleyi.
4.—Stylobryon petiolatum.
5.—Monosiga ?consociatum. A colony.
6.—Codosiga ?botrytes.
7.—Euglena viridis.
8.—E. acus.
9.—Phacus triqueter.
10.—P. longicaudus, spiral form.
11.—Trachelomonas hispida.
12.—T. armata.
13.—Astasia tricophora.
14.—Anisonema grande.
15.—Dinobryon sertularia.
16.—Mallomonas sp.
17.—Uvella viresceus.
18.—Chlamydomonas sp.
19.—Sphaerella pluvialis.
20.—Gonium pectorale.
21.—Pandorina morum.
22.—Volvox aureus, showing characters of protoplasmic strands connecting cells.
23.—Gymnodinium fuscum.
24.—Ceratium tripos.
25.—Colony of Dinobryon encysted.

BIRD NOTES.—The month of July must be regarded in the bird world as the beginning of spring, particularly this year, when the rainfall has been the lowest for a considerable number of years. The prevalence of fine mild days caused many birds to commence nesting earlier than usual, and even the cuckoos arrived in the Ashburton district fully a month earlier than in previous years. On July 13 the nest of a Yellow-tailed Tit, *Acanthiza chrysorrhoa*, with three eggs, was found in an acacia bush at Ashburton, while in a tall eucalypt in the vicinity a pair of White-backed Magpies, *Gymnorhina leuconota*, was still building a nest which they had commenced during the latter part of June. It is noticeable with early-breeding birds that a longer period is required for nest building than with those that nest later in the season. Both the Wattle-Bird, *Acanthochaera carunculata*, and Swift Parrot, *Euphema discolor*, annually visit the box trees near Melbourne during the winter months. While a few of the former remain to nest locally, the parrots retire further inland as the nesting season approaches. A notable record for this year is the early appearance of the Bronze, *Chalcococyx plagosus* and Fan-tailed, *Cacomantis flabelliformis*, Cuckoos; both birds were seen at Ashburton on July 20, and the latter bird has been seen or heard every week since. It is practically certain the Fan-tailed Cuckoo remained in the northern parts of Victoria during the winter, as a bird was noted in the Caulfield Park on May 11, and a week later another one was seen in the Mooroolbark district.—D. DICKISON, East St. Kilda, 22nd August, 1924.

THE YELLOW-FOOTED POUCHED-MOUSE.—In May last, whilst awaiting the train at Everton (Bright line) station, I paused near a clump of Red Box trees for an *al-fresco* lunch. Here I made my first acquaintance with a little animal which, on reference to "Lydekker's Marsupials" (Naturalists' Library), plate xxvii, I take to be *Phascologale flavipes*. I became so interested in the little creature that I almost missed the train. In the locality, tree-creepers (Climacteris sp.) were plentiful, and for a while, as the little marsupial dodged about among the leaves and sticks on the ground, and by the rapidity of its movements as it spirally climbed the trunk of a box-tree I took it to be one of these birds, but in its later actions it became more conspicuous and I could see it was not a bird. It moved spirally round the base of a box-tree, *Eucalyptus polyanthemos*, in little jumpy runs, then climbed a two-feet thick tree trunk in a

half spiral and disappeared, only to be seen again ten feet higher up on one of the tertiary branches in an incredibly short time. Thence it presently reached another branch, nearly three feet distant, by a horizontal jump, the same sudden and apparently effortless jump that is made by a Ringtail Possum. Appearing now here, now there, and often out of view, it seemed to be searching the bark for food, probably in the shape of beetles and other insects which were in crevices in the bark, hence it would be a good friend to the forester. As it may have been eating ants, I would be pleased to have confirmation or otherwise of my observations from some reader who has had better opportunities of seeing this little animal than I have had. Lydekker quotes Krefft as saying "that in confinement this species killed any number of mice put into the same box." Were domestic mice referred to?—A. D. HARDY, Studley Avenue, Kew, 14th August, 1924.

CORRECTIONS.—The following corrections should be made in the August *Naturalist*:—

Page 53, line 30: For "*Correa speciosum,*" read "*speciosa.*"
" 55 " 20 " "*Kennedya pentaphylla,*" read "*Hardenbergia Comptoniana.*"
" 58 " 28 " "*Acacna sanguisorba,*" read *Acaena sanguisorbae.*"
" 58 " 35 " "*Pattersonii,*" read "*Patersonii.*"
" 59 " 44 " "*coriaceum,*" read "*coriacea.*"
" 68 " 3 " "*ramulosus,*" read "*ramulosa.*"
" 68 " 34 " "*Acyphilla,*" read "*Aciphylla.*"
" 72 name 18 " "Astellia," read "Astelia."
" 74 " 20 " "E. petrophylla," read "E. petrophila."
" 75 " 14 " "H. teuchroides," read "H. teucroides."
" 76 " 34 " "O. rosemarinifolia," read "O. rosmarinifolia."
" 76 " 38 " "Orites lancefolia," read "Orites lancifolia."
" 77 " 1 " "Phelabuim," read "Phebalium."
" 77 " 40 " "R. Muellerii," read "R. Muelleri."
" 73 Remove "Celmisia longifolia var. latifolia" from line 5 from bottom, and insert after line 26.
" 74 Remove "Ewartia catipes" from line 7 from bottom and insert after name 20, "E. petrophila (E. nubigena = Ewartia nubigena).

The Victorian Naturalist

Vol. XLI.—No. 6. OCTOBER 9, 1924. No. 490.

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall, on Monday evening, September 8, 1924.

In the absence of the President, the ex-President, Mr. C. Daley, B.A., F.L.S., occupied the chair, and about forty-five members and visitors were present.

REPORTS.

A report of the excursion to Warrandyte, on Saturday, August 16, was given by the leader, Mr. C. Daley, B.A., who said that twenty-two members and friends took part in the outing, which was arranged for the purpose of seeing the Silver Wattles, *Acacia dealbata*, in bloom, along the river banks. Favoured by a pleasant day, though somewhat dull, the char-a-banc trip of about forty miles was much enjoyed. The wattles had suffered somewhat from the recent severe frosts, but there was enough bloom remaining in good condition to reward the excursionists for their long journey. The outing partook rather of a social nature, and little collecting was done.

A report of the excursion to Bayswater, on Saturday, August 30, was given by the leader, Mr. C. Oke, who said that there was a good attendance of members. Insects were rather scarce, the season being somewhat late, owing to recent cold weather, and few specimens of note were captured.

A report of the excursion to Alphington, on Saturday, September 6, was given by the leader, Mr. J. Stickland, who said that, notwithstanding the great increase of water in the pools, owing to the recent rains, specimens of pond-life were very numerous, but he had not yet had an opportunity of thoroughly examining the material brought home.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Wilson, 92 Park Street, South Yarra, was duly elected an ordinary member; and Mr. A. Wade, Ridley College, Parkville, an associate member of the Club.

GENERAL BUSINESS.

The Hon. Secretary called the attention of members to the Annual Exhibition of Wild-flowers, to be held in the Melbourne Town Hall, on Tuesday, October 21, and urged them to interest their friends in the country in the matter. Circulars had been prepared giving directions as to the collection and forwarding of flowers, copies of which could be had on application. He also asked for assistance at the Town Hall on the morning of the exhibition, and hoped a number of members would be able to give some time to the arranging of flowers, etc.

The increasing destruction of wild-flowers was referred to by several members. The quantities of Thryptomene exposed for sale in the city this season caused some comment. While some members thought that if carefully cut it would do no harm to the plants, others thought some action should be taken to regulate its collection. Mr. Oke said that on the previous day, at Ferntree Gully, he had seen two motor cars decorated with wild-flowers, more especially with the beautiful climber, the Purple Coral Pea, *Hardenbergia monophylla*, which, as everyone knows, quickly fades and withers when picked. Long streamers of this pea were entwined all about the cars and over the hoods. Both cars looked very pretty at the time, but the flowers would soon fade, and, besides, the display for future seasons would be lost. He thought that some action should be taken, or the beauty of the bush would soon be a thing of the past.

Mr. C. Daley, B.A., F.L.S., as one of the Club's delegates on the General Council of the Australasian Association for the Advancement of Science, gave a short account of the recent meeting in Adelaide, which he said was well attended, and he was pleased to see several other members of the Club amongst those present. He said that the programme of lectures, addresses and papers was a very full one, and had been well attended. The excursions were of an interesting nature, and he considered the meeting a great success and trusted much good would result from it.

PAPER READ.

By Dr. W. MacGillivray, entitled, "A Trip to South-west Queensland" (continued).

This was the concluding portion of the paper commenced at the previous meeting, and dealt principally with the floral

features of the trip from Charleville back towards Broken Hill, and revealed what a splendid display is made by the flowering plants and shrubs during a good season, in a region which is generally regarded as the last place to look for flowers.

Several members spoke as to the interest of the papers, and expressed surprise at the variety of vegetation in a part of the continent which is generally regarded as arid and desolate.

EXHIBITS.

By Miss E. C. Cameron—About a dozen species of Mallee flowers from Tempy, N.W. Victoria.

By Mr. C. Daley, F.L.S.—Purple Slate or Shale from Mount Lofty, S.A.; Aboriginal implements—chipped stones (scrapers) from S.E. of Lake Eyre, and hammer stones from Costal Midden, South of Marino, S.A.; Obsidian Button from Lake Eyre district; seeds of *Abrus precatorius*, Jequirity or "Lucky Seeds" from North-west Australia.

By Mr. C. Oke—Copperhead Snake, *Denisonia superba* from Preston.

By Miss G. Nokes—Flowers of orchids, *Caladenia carnea*; "Pink Fingers" and *C. deformis*, "Blue Fairies" from Sandringham.

After the usual conversazione, the meeting terminated.

THE SMOKER PARROT.—A correspondent at Ouyen records in the *Argus* "Nature Notes" the breeding of this bird, known variously as the Black-tailed Parrot, Rock Pebbler, or Regent Parrot, *Polytelis melanura*, in captivity. A dozen eggs were laid, but only six were sat upon, the result being two fine birds now a year old.

DEATH.—As we go to press the death is announced of Mr. L. B. Thorn, a member of the Committee of the Club, and an enthusiastic lepidopterist. Further particulars will appear in the next *Naturalist*.

CORRECTION.—August *Naturalist*, page 60. The conclusion of the third paragraph should read:—". . . . specimens of gneiss, mica schist (or alternatively phyllite), and regmatite, the minerals comprised felspar, muscovite and quartz."

IN THE STRATHBOGIE RANGES.

By F. PITCHER.

(Read before the Field Naturalists' Club of Victoria, 11th August, 1924.)

[ABRIDGED.]

Nothing has hitherto appeared in the *Naturalist* regarding the Strathbogie Ranges, a tangled group of granite hills situated between Euroa and Mansfield. The highest hill, Mt. Wombat, rises to 2600 feet, or about 1800 feet above the surrounding country. One of the most regular and consistent contributers of wild-flowers to the Club's annual exhibitions has been Mrs. Evans, of "Flowing Vale," Lima East. This lady had often pressed me to pay her district a visit, but circumstances did not allow an opportunity until April last, when, with my wife, I accepted the invitation. To reach Lima East necessitated a journey of 135 miles by rail, via Benalla, on the North-eastern line. Here a branch line runs almost due south, ending at Tatong, a few miles beyond Lima, where there is a considerable saw-milling industry. We were met at Lima, and motored out to "Flowing Vale," a distance of some five or six miles. Here we were among the foothills of the Strathbogies.

A short ramble on the afternoon of our arrival soon showed us that the district would be a prolific collecting ground in the spring and early summer. Among the granite rocks the well-known Rock Fern, *Cheilanthes tenuifolia*, grew luxuriantly with fronds of more than eighteen inches in length. An epacrid, *Melichrus urceolatus*, R. Br., Urn Heath, having ashy-green foliage, was rather common and well in flower. The Golden Everlasting, *Helichrysum lucidum*, brightened the locality with its golden heads of flowers. Here also was the Finger-flower, *Cheiranthera linearis*, A. Cunn. but not bearing its beautiful blue flowers. Later I obtained some plants which I handed over to the Botanical Gardens on my return to town.

A few days later we visited the Newbery, or Newton, Falls, situated at the head of a valley east from Sugar-loaf Peak, about three miles away. This walk revealed many other interesting plants and shrubs. The district reminded one of the Grampians, especially as the Common Fringe-myrtle, *Calytrix tetragona*, was very abundant. The Box-leaf Acacia, *A. buxifolia*, was promising a fine display of bloom in a few

weeks' time. The Mountain Grevillea, *G. alpina*, and the Hairy Geebung, *Persoonia rigida*, were also noted. The only orchid seen was the Striped Greenhood, *Pterostylis reflexa*. The falls were about 40 feet in height, and when well supplied with water must be an imposing spectacle, the water falling over immense granite boulders in its descent to the basin below. Ferns of various species were fairly plentiful. A number of young plants of the King Fern, *Todea barbara*, was obtained for home cultivation, the glossy surface of the leaves making this fern an attractive pot plant. The maiden hair fern, *Adiantum Æthiopicum*, was luxuriant in its frondage, many fronds measuring eighteen inches in length.

Next day the Lower Lima Falls on the Sugarloaf Creek were visited. On the way thither some fine young Blue Gum Eucalypts, *E. globulus*, twenty to thirty feet in height, were passed, the foliage of the upper portions of these was the typical long strap-like leaves, many measured were over 20 inches, and one was 25½ inches by 3½ inches wide, while the lower portions of the trees were still bearing the rounded silvery-grey juvenile foliage, the whole making a beautiful picture in the bright sunlight. Here also the Common Bracken was of very strong growth. One frond I cut measured seven feet three inches in length. Though an old fern collector, I found here my first specimen of the Meadow Moonwort, *Botrychium australe*, a widely-distributed plant, but nowhere plentiful. Being strange to me, I first took it to be some introduced plant. The Blanket Fern, *Pleurosorus (Grammitis) rutifolius*, grew in the crevices of the rocks. The Correa and other shrubs bordered the pathway, while the Drooping Mistletoe was seen on the branches of many of the gum trees. The rocks along the track were of immense size and various shapes, reminding one of ruined castles or ancient cathedrals.

Our rambles in the district were interrupted by a visit to the Dookie Agricultural College, some forty miles away on the other side of Benalla. This proved very interesting, but hardly comes within the scope of my paper. However, advantage was taken of a few minutes' wait at Benalla to visit the Public Gardens, prettily situated on the banks of the Broken River. Here some very fine Eugenias were bearing a wealth of their pink fruits, making a handsome sight. Numerous fine coniferous trees testified to the suitability of the situation for their growth.

The next day was spent in a visit to the main Lima Falls, a journey of about six or seven miles, and situated somewhat further away than the other falls, and in steeper and more rugged country necessitating the use of horses. On this occasion we were accompanied by the local schoolmaster, Mr. Jordan, and Mr. Lewis, a recent arrival from England, who was studying Australian farm life at "Flowing Vale." The trees were larger and shrubs more plentiful, but did not offer a greater variety than we had already seen. The falls were carrying a good volume of water, and looked well in the bright sunlight. Some time was spent in the vicinity, but no new ferns were noted. From the top of the falls a fine view was obtained of the immense rocks forming the crest of the Sugarloaf Peak.

Our stay with the Evans family was a most pleasant one, and, as Mr. Evans was one of the pioneers of the district, he was able to give us an amount of historical information which was extremely interesting. Mrs. Evans proved herself an ardent lover of our native flora as well as a most enthusiastic collector and capable guide in this trackless district.

The district is one which, in the right season, would make an excellent exploring ground for a Club party, and I hope to hear that an effort will be made at an early date to visit these ranges *en masse*.

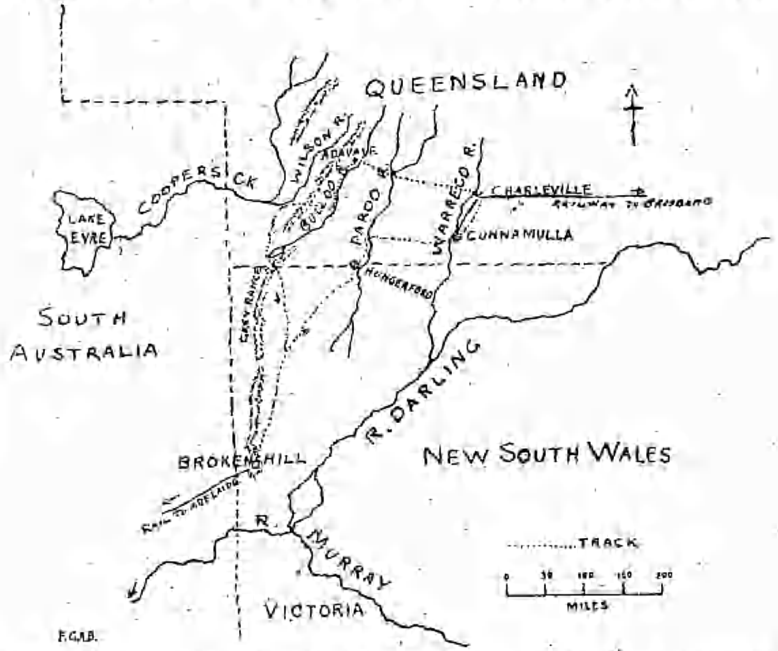
MUTTON BIRDS.—An interesting article by Mr. F. Lewis, R.A.O.U., Acting Chief Inspector Fisheries and Game Department, Melbourne, appears in the October *Emu* (Vol. XXIV, pages 1, 2), giving details of a number of observations made at Phillip Island, Westernport, Victoria, regarding the return of the birds to their breeding burrows during the seasons 1920-23. This bird, *Puffinus tenuirostris*, also known as the Short-tailed Petrel, arrives in great numbers from 26th to 30th November each year for breeding purposes. The eggs are large for the size of the bird and are much sought after by residents and others for culinary purposes. The question has arisen whether, when the first egg is taken, the birds lay again. Mr. Lewis' experiments seem to be fairly conclusive that the birds do not lay more than one egg, but that they return to the same rookeries, and often actually to the same holes each year. From these facts it should be possible to frame regulations which will give the birds that measure of protection which is badly needed at the present time, as there is evidence that their numbers are gradually decreasing.

AN EXCURSION IN SOUTH-WEST QUEENSLAND

By Dr. W. MacGillivray, Broken Hill.

(Read before the Field Naturalists' Club of Victoria, 11th August and 8th September, 1924.)

On August 15, 1923, four of us, Dr. Chenery, interested, like myself, in Ornithology; Mr. P. C. Riddell, principal of the local Technical College, and our driver, Norman Reid, packed all our camping gear, with sufficient petrol to take



us to the nearest rail-head in Queensland, and took the northern road leading from Broken Hill. The previous year had been one of drought, but good rains had fallen in the autumn and in early winter; all growth, however, had been retarded by severe frosts, but for all that, the country was becoming green from herbage that had to seize any opportunity to reproduce itself. Birds were very scarce, the majority not having returned after having left the district for more favoured localities during the dry year.

Our road took us out on the eastern side of the Barrier range, crossing Stephen's Creek at nine miles, then Yalcowinna Creek 10 miles further out. A few Little Corellas,

Cacatua sanguinea, and Galahs, *C. roseicapilla*, were seen feeding on the ground or flying along Campbell's Creek. On the gravelly country that we passed over before reaching this creek, the ground was white with the Hairy Cress, *Blennodia lasiocarpa*, and to a lesser extent with the Yellow Cress, *B. nasturtioides*, with the Woody Cress, *B. trisecta*, and the blue *Erodium cygnorum* by way of contrast in smaller patches. *Craspedia chrysantha* was mostly in bud, with *Helipterum polygalifolium*. Areas of the nasty-smelling cruciferous *Blennodia cardaminoides*, were soon forgotten in contemplating the gloriously-yellow single plants of *Senecio gregorii*.

At about forty miles we enter the Eurowie Hills, where the vegetation is again not so forward. Occasional creeks, lined with Red gums, *Eucalyptus rostrata*, which provide nesting hollows for a few Galahs, Little Corellas, or Ringed-Neck Parrots, *Barnardius barnardi*, are crossed at intervals. The Rocky Hillsides are clothed in Mulga, *Acacia aneura*, Dead Finish, *A. tetragonophylla*, *Eremophila alternifolia*, and *E. oppositifolia*, with *Acacia osnaldi* along the smaller water courses. Emerging from the hills to the more open country we find patches of the Yellow Everlasting, *Helipterum polygalifolium*, well in flower. On to Eurowie, fifty miles from the Hill, the road traverses open gravelly slopes which in places are mantled with a snowy covering of *Blennodia lasiocarpa*. From Fowler's Gap to Sandy Creek Bore we pass over an open gravelly plain with a gum creek away to our right and the Barrier Range out to the left. From this plain we flush a few Australian Dottrell, *Peltohyas australis*; Orange Tangs, *Ephthianura aurifrons*, and an occasional Pipit, *Anthus australis*. Beyond the Bore the country becomes sandy with a ground flora of New Zealand spinach, *Tetragonia expansa*, and young plants of the Ham and Eggs Daisy, *Myriocephalus stuarti*, some only of which are in bud.

Bancannia Lake, 100 miles from Broken Hill, is reached late in the afternoon, as our motor had not been working too well. We leave the northern road eight miles further on, going off to the right, still through sandy country. Caterpillars are numerous, the New Zealand Spinach being eaten in many places to bare stalks. We disturb numbers of Whistling Eagles, *Haliastur sphenurus*, and a few Black Kites, *Milvus korschun*, from the ground where they had been feeding on the caterpillars. These insects were at all stages of development, from tiny newly-hatched ones, to the fully

matured grubs that were burrowing into the sand to pupate. Little Corellas, *C. sanguinea*, and Galahs are becoming more numerous on the creeks that we pass. After passing Nundora Station we came to a gate, from one of the posts of of which a Galah flew. We afterwards learn that a pair of these birds had nested in the same post for the past three seasons, and we are advised to keep a look-out when approaching another gate about six miles on from Wonnaminta Station, which we reach about an hour after dark, after negotiating several bad creeks and washaways, but the welcome that we receive from Mr. and Mrs. Jackson makes light of all our troubles.

The next morning is spent in looking round the homestead; the dams are all full and the young red gums along the creek looking fresh and well owing to the recent local rains. All old trees had been cut out years before to feed the furnaces of a woolscour. Fairy Martins, *Hylochelidon ariel*, were busy building their nests under sheds and verandahs until the arrival of a Goshawk sends them all high in the air to wait there until he departed, when they came down and started gathering mud along the water edge, with which to construct their retort-shaped nests. We were shown the site of a Greenie's *Meliphaga penicillata*, nest in a climbing plant on the verandah. Many White-Browed and Masked Wood Swallows passed overhead on their southerly migration, some dropping out to feed or rest for the night. The walls of the house are of pisa protected by plaster. In a place where the plaster had fallen off, a Red-Backed Kingfisher, *Halcyon pyrrhopygius*, had burrowed in, and reared a brood of young a season previously. Striated Pardalotes, *P. striatus*, also regularly build in these walls, and the White Face, *A. leucopsis*, in the guttering of roofs.

Leaving Wonnaminta after lunch, the solitary Koonenberry Mountain soon looms up, and our road winds round its eastern end, which is continued for a considerable distance as an outcropping ridge, and the gravelly plains that we pass over are a result of this mountain's denudation. These plains bear a picturesque appearance, consisting of pure white patches of quartz or blossoming *Blennodia lasiocarpa*, alternating with others of vivid green Spinach and other herbage, and others of a dull yellow colouring due to *Blennodia nasturtioides*, or a bright golden yellow with the Sunray, *Helipterum polygalifolium*. After crossing we pull up within two miles of the foot of the mountain, and walk over

to it as I was anxious to get an idea of the survival vegetation on the crest of this residual. The first mile was over a plain occupied principally by *Atriplex vesicarium*, the species of perennial saltbush which above all others makes it possible for the Western Darling country to be used for grazing purposes, and gives a name to the saltbush plains. *Helipterum floribundum* was mostly in bud; a brilliant-white Sunray, which at times covers large tracts of country, and which is a valuable fodder plant. The crabholes (soakage depressions), that are found on sandy and gravelly plains, were here occupied principally by two composites, a small yellow-flowered Groundsel, *Senecio brachyglossus*, with bright green foliage which appears more green than yellow in the mass, as the flowers are inconspicuous, and *Helipterum strictum*, a small white flowering annual with dark green foliage. Occasional clumps of the fleshy Groundsel, *Senecio gregorii*, made splashes of brilliant yellow at intervals, with *Helipterum polygalifolium* in small communities. No grass except some very young stuff just showing above the ground, was to be seen. A White-fronted Tang, *E. albifrons*, is disturbed from her nest low down in a saltbush, the nest containing three hard-set eggs, to which the bird soon returned when we went on. Shortly after an Orange Tang, *E. aurifrons*, flushed from her nest well concealed also in a saltbush: this nest contained three eggs of the Tang and one of the Narrow-billed Bronze Cuckoo, all nearly hatching.

We pass a few stunted Belars, *Casuarina lepidophloia*; Bullock Bushes, *Heterodendron oleifolium*, and Mulgas, *Acacia aneura*, scattered at long intervals over the plain. A gum creek, bordered as usual with *Eucalyptus rostrata*, crosses our path, and winds its way through a gap in the ridge. Crossing this we start climbing the foothills, on which Needle Bush, *Hakea leucoptera*; Belars, *Casuarina lepidophloia*; Leopard Trees, *Flindersia maculosa*, and Dead Finish, *Acacia tetragonophylla*, makes an open scrub. Up the mountain, Mulga and Dead Finish are the principal trees. *Eremophila oppositifolia* and *E. alternifolia* are flowering, and *Cassia sturtii* showing signs of revival, after being dry and miserable, form the undershrub. On top, a few ragged pines, *Callitris robusta*, grow from crevices in the big boulders that cap the mountain. Other plants are *Solanum ellipticum*, *Isotoma petraea*, *Parietaria debilis*, *Leptorrhynchus panaetioides*. The Eriostemon, which I am anxious to find, proves to be identical with the species

found on Mt. Manara, on the opposite of the Darling Valley, and not with that found on the hills near Broken Hill. Bird life is scarce, Red-capped Robins, *P. goodenovii*, and Little Crows, *C. bennetti*, and Chestnut-eared Finches, *Taenopygia castanotis*, only. Dr. Chenery found a nest of the Wedge Bill, *Sphenostoma cristatum*, in a Dead Finish, containing two half-fledged young and the nest of a Singing Honey Eater, *M. virescens*, with two hard-set eggs; the nest was unusually placed, being two feet from the ground in a Kochia. A small flock of Sitellas, *Neositta pileata*, were busy searching the Mulgas for food. A Shingle-backed Lizard, *Trachydosaurus rugosus*, on the plain is photographed and allowed to go. This lizard is vegetarian and viviparous and is capable of aestivating for long dry periods of two or more years, during which time they remain buried in the ground, usually under the roots of some perennial bush. We inspect an old nest of the Wedge-tailed Eagle on one of the creek gums, note many Galahs and Little Corellas, a few Ravens, *C. coronc*, and Magpies, *G. tibicen*, and a lot of Miners, *Myzantha flavigula*; Pardalotes, *P. striatus*, and Greenies, *M. penicillata*. It is late when we return to the motor, so we decide to camp on the first creek; our motor decides, however, that we stay for three days.

A Magpie wakes us early as she is incubating in a sapling close to our camp, two Miners' nests are quite near, and a Crested Bronzewing Pigeon is feeding two young in a nest in an Acacia cana about 100 yds. away. The Miners tune up soon after the Magpie, followed by Galahs and Corellas, with a Whistling Eagle a good last. After breakfast, Mr. Riddell and myself cross a gravelly plain to an elevation near Koonenberry; on this we find a few stunted *Acacia cana* and Belars, big bunches of *Sarcostemma australe*, a few bushes of *Eremophila Duttoni*, and a fine flowering bush near a rabbit burrow of *Senecio magnifica*. One of the Casuarinas supports an old nest of the Wedge-tailed Eagle, *Eurgaetus audax*, the top of the nest being six feet from the ground and the bottom two feet. We return to camp, inspecting another Eagle's nest on the way. After a short rest we go on to a small bare plain covered with remains of Aboriginal fireplaces, with many flint and other chippings. Dr. Chenery who had been down the creek, reports the presence there of the Black Honeyeater, *Myzomela nigra*; the Pied Honeyeater, *Certhionyx variegatus*, and *Malurus assimilis*. After lunch we go down to look these birds up and find them feeding on

the honey-laden flowers of *Nicotiana glauca*, the introduced Tobacco Bush. This bush does little harm, grows usually where nothing else will grow, often shelters a lot of useful herbage, and provides food for a number of honey-eating birds, who are also useful as insect destroyers, to tide them over dry seasons.

A Whistling Eagle was noted building, and a Little Eagle, *Hieraetus morphnoides*, sitting on one egg in her bulky nest at the top of a slender gum.

On the following day we go in a south-easterly direction through scattered *Acacia cana* bushes, in one of which a Singing Honeyeater, *M. virescens*, has a nest and three eggs. We ascend a rocky pinnacle to get a view of the surrounding country and note a fairly thick scrub to the south-east, which we go down to examine. On our way we note the Pied, the Black, the White-plumed, and Spiny-cheeked Honeyeaters, Brown Song Lark, Yellow-throated Miner, Crimson Tang, and Brown Quail. The scrub we find to consist principally of *Acacia cana* with an odd group of Leopards and Belars. The ground being covered with low bushes of *Eremophila maculata* in full flower, these flowers are honey laden and provide a plentiful supply for the Honeyeaters mentioned, which are here in numbers.

Eremophila maculata shows a big range of colours, from bright red, through maroon, terra-cotta, pink, to creamy white, with foliage also varying from bright green to dark purplish red. *Myoporum acuminatum* and *M. deserti* are also growing in this association with *Jasminum lineare* supporting itself on these or other shrubs. Growing up through many of the bushes were the beautiful white or mauve daisies, *Minuria denticulata*, and *M. leptophylla*, and all through the patch at intervals, *Senecio gregarii* and *S. lautus*. Dr. Chenery was not long in finding a nest of the Pied Honeyeater, placed low down in the dead *Eremophila maculata*, through which was growing *Enchylaena tomentosa* in berry, and a white *Brachycome*. This nest, open and cup-shaped, was composed of dried stalks of herbage and rootlets, and lined with finer rootlets. Several nests of *Glycichila albifrons*, the White-fronted Honeyeater, were found at all stages, containing part or full clutches, or young birds newly hatched, to others that were almost ready to leave the nest. These nests were mostly placed low down in the *Eremophilas* and well hidden. The Black Honeyeaters, *Myzomela nigra*, were seen, but had not yet started to nest. After lunch, Mr. Riddell and myself explored a stony and scrub-covered hill

PLATE IV.

"YELLOW-TAILS" *Trichinium Nobile*, LIND.
(The flower spikes are 3-4 inches high.)

A MIXED COMMUNITY
(Mostly Composites of various Species.)

to the east of the camp. Two old Wedge-tailed Eagles' nests were examined, a Spotted Nightjar, *Eurostopodus guttatus*, flushed, and a nest, composed almost wholly of sheeps' wool, of the Singing Honeyeater found in an *Acacia cana*. Other trees and shrubs on this hill were *Acacia aneura*, *A. tetragonophylla*, *Exocarpus aphyllus*, the Quondong, *Fusanus acuminatus*; *Eremophila duttoni*, and masses of *Sarcostemma australe*. On the following morning, the 9th August, we made a further examination of the *Acacia cana—Eremophila maculata* flat, with a view of getting photographs of the various nests and other objects of interest. This being accomplished, we return to camp to find that the parts of the motor for which we were waiting had arrived, so that we were able to continue our journey to Morden Station, where we put in the following night, being hospitably entertained by Mr. and Mrs. Con. White.

The road to Yancannia, which we traversed on the next morning, passed over gravelly open country, on which *Blennodia lasiocarpa* and *B. nasturtioides* were flowering freely, with smaller patches of *Goodenia glauca* and *Helipterum polygalifolium*; elevations support a little scrub, mostly Mulga and Dead Finish, the latter is in flower, but cannot disguise its rugged form and prickly *Phyllodes*. On Sandy tracts the big daisy, *Myriocephalus stuarti*, is well in flower. *Craspedia pleiocephala* is also here. We came to the gate six miles from Morden, in one of the posts of which we had been told to look for a Galah's nest; the pair of birds were there and had been bedding the hollow with green gum leaves carried from an adjacent gum creek. Crossing a creek, our attention is attracted to numbers of tussocks with a yellow button-like inflorescence, *Craspedia globosa*. That fine shady tree, the Whitewood, *Atalaya hemiglauca*, now appears singly and in clumps, and the sandy ridges show a more varied scrub, Mulga, Dead Finish, *Acacia Burkitti*, with *Eremophila longifolia*, *E. sturti*, *E. oppositifolia* in flower; and, later on, *E. alternifolia*. Along the watercourses one sees mostly Belar and Mulga. In moister flats, the Lavender Daisies, *Brachycome sp.*, which vary in shade from light to very dark. *Myriocephalus stuarti*, and occasional plants of the beautiful purple pea, *Swainsona procumbens*, well in flower. We arrive in Yancannia in time for lunch, which delays us three-quarters of an hour. A fine crimson flowering Encalypt, of Western Australian origin, makes a beautiful object in the garden. A graceful tree with smooth

white stem and branches, and small lanceolate leaves, it is well in flower; these are large and of a beautiful crimson colour; it is probably the Mt. Lindsay gum, *E. erythronema*, a very desirable ornamental gum for drier parts of Australia.

We are soon on our way again, our road leading us down the creek through a rank growth of herbage till we are able to cross the water-hole, the only permanent natural water-hole in New South Wales west of the Darling. Over more gravelly plains covered with wild flowers, down along a creek where we note the Moulie Apple Tree, *Owenia acidula*, with its dark, glossy pinnate leaves and bushy rounded top, always a beautiful object. It bears a dark purple fruit about 1 in. by 1½ in. in diameter, nearly all stone, and often eaten by Emus.

Bootra Station is our next stopping place, only long enough to inquire the way, as we are anxious to push on. Shearers have just arrived, after cutting out at Mt. Sturt, and are to start operations on the following day. We go almost due east from here and take a road past the shearing shed, which is some distance from the house, through thick scrub, mostly of Mulga and Bullock Bush, with an undergrowth of Turpentine, *Eremophila sturti; E. duttoni, E. longifolia*, and a carpeting of Cruciferes, Composites, and other herbage. Birds other than Galahs are scarce, but later on we note a Spotted Harrier, *C. assimilis;* many Short-billed Crows, *C. Bennetti;* Singing Honeyeaters, *M. virescens;* Miners, *M. flavigula;* Red-capped Robins, *P. goodenovii;* Greenies, *M. penicillata*. The crows are nesting freely in the Mulga and, pulling up the car under a Mulga, a Wedge Bill flushes from her nest in a bunch of *Loranthus pendulus*. Dr. Chenery finds it to contain three of this bird's beautiful blue spotted eggs. It is almost dark when we come to a dam and pull off the road to a camping place on a box creek, the trees bordering it being mostly Bimble Box, *Eucalyptus populifolia*, a tree with very distinctive rhomboid or rounded green leaves. The harsh calling of a Short-billed Crow wakes us early, to be followed by the beautiful notes of the Rufous Song Lark, *Cinclorhamphus mathewsi*, from the creek quite near our camp. Its nest is afterwards found in the Spinach growing in the bed of the creek, an open cup-shaped structure lined with bark, and constructed of coarser bark, built into a depression scraped in the ground; it contained three fresh eggs. Down the creek a Spiny-cheeked

Honeyeater has her nest in a Mistletoe on a Mulga, and a pair of Galahs had been vainly trying to bed a hollow stump with gum leaves without result, as there was a hole at the bottom through which the leaves fell to form a considerable heap at the foot of the stump. A Crested Pigeon, *Ocyphaps lophotes*, is on her nest in a Mulga also.

We make an early start up past the dam to pick up our road. The day is beautifully fresh and sunny, with a light south wind blowing, as we pass through open scrub of Mulga, Whitewood and Bullock Bush to No. 3 Bore, where we come upon a mob of about 150 Emus feeding on the herbage. An Eremophila, *E. Bowmaniæ*, here attracts our attention, its foliage being silvery grey with large lilac flowers, and is new to us. An *Acacia ligulata* growing by the bore, is showing a few flowers. We take a right-hand track and pass through a stunted growth of this species for some distance; further on we come to a fine, tall Acacia, with a trunk 18 inches to two feet in diameter, which is a stranger, and which we found to be Ironwood, *A. excelsa*, and later became a feature of the landscape until we reach the Queensland border, many of these trees being 50 feet in height. We now pass through thick Mulga and Bullock Bush scrub for some distance till we come to No. 6 Bore, where a tall cypress-like tree is recognised as being identical with one that had grown up on a barren stony spot on the British Mine at Broken Hill. *Codonocarpus cotinifolius*, like its near allies the members of the genus *Brachychiton*, it is pithy and reputed to be good fodder for stock. It is locally known as Mustard Bush. Water is lying in all claypans and depressions, herbage good all the way, and many wild flowers, *Blennodia canescens*, *Brachycome ciliaris* and *Helipterum poligalifolium* prevailing.

We reach Eurosino Station, where we are hospitably entertained by the manager's wife, Mrs. Lawton, and are relieved to find that we have only 25 miles of good road to negotiate before reaching our destination on the Paroo—Wanaaring township. It is soon over, and we enter through shrubby growth of *Eremophila sturti*, *Dodonæa viscosa*, and the Aster, *Olearia pimeleoides*, the latter being finely in flower. The township consists of a dozen or more houses ranged along the main road on the banks of the Paroo; there are several empty ones and many ruins. The Paroo has recently been in flood, but is now only trickling between holes. Immediately below the town, along the water's edge, are growing

a Bimble Box, *E. populifolia;* Black Box, *E. bicolor;* Yapunyah, *E. ochrophloia,* and the Red Gum, *E. rostrata.* A local garden contains two date palms, each about 12 feet in height. These palms do well in this district; there are several fine examples on various stations along the Darling, some planted in early days being 40 to 50 feet in height and bearing large quantities of fine fruit annually. They come into bearing when about ten years old, and practically go on for ever; they should be planted in groups or avenues to facilitate fertilisation, as the sexes are on different trees. At present Australia is importing £600,000 worth of dates annually, and all that we require could be grown here.

Our road from here runs north parallel with the Paroo, and the vegetation passed by varies as the country is subject to inundation or the sandy bordering of the river. The prevailing timber trees on the sandy country are Mulga, Beefwood, *Grevillea striata;* Whitewood, with Ironwood, are the largest and the most conspicuous. We learn from the locals that it is so named because the wood is so hard as to be almost unworkable. On the flooded ground the most conspicuous tree was the Yapunyah, which was blossoming freely, with flowers half an inch in diameter, these being a great attraction for numbers of honey-eating birds. The Bimble Box, with its glossy, bright green leaves, is always attractive, especially the foliage of the young saplings; even the dry leaves that have fallen to the ground shine like pieces of glass when reflecting the sun's rays. Harmonious Thrushes are common along the river, though seldom seen outback. The Red-backed Parrokeet, *P. haematonotus,* follows the river timbers and never ventures away from them. Miners and Spiny-cheeked Honeyeaters are feeding on the flowers of the Yapunyah and frequenting the scrub and under scrub; Pallid Cuckoos are recognised by their mournful calling. About 15 miles from Wanaaring the Bloodwood, *E. terminalis,* adds itself to the timber on the sandy country. On the river soil we find *Acacia stenophylla,* which always keeps to this habitat. The Queanburra, *Eremophila bignoniiflora,* and Lignum, *Muehlenbeckia Cunninghamii;* and, nearer the edge, occasional bushes of the Lignum-like *Eremophila polyclada.* The Wild Orange, *Capparis Mitchelli,* is occasional on the sandy country. At Willara Station we have lunch with Mr. and Mrs. Stalley, and admire a magnificent Lemon-scented Gum, *E. citriodora,* growing in the garden, where it had been planted many years previously.

Its hole was fully two feet in diameter. The children here were being taught from the State Correspondence School in Sydney, and seemed to be making good progress in their studies.

Our next stopping place is Talyalya Station, owned by an old friend, Mr. Austin Clune. Our radiator is leaking badly, so that our driver has to take it off to solder the leaks, the rest of us walking on till he overtakes us. The road passes over sandy ground with the same class of timber and underbush. A single Grey Falcon is seen, also Brown Hawks, *I. berigora;* Whistling Eagles, Little Crows, Galahs, Ring Necks, and Blue Bonnets, *P. haematorrhous.* We have not seen any Little Corellas, *C. sanguinea*, since leaving Bootra. Crested Pigeons, *Ocyphaps lophotes*, are common; Red-capped Robins, Singing, Spiny-cheeked, White-Plumed and Black Honeyeaters. Dr. Chenery found a nest in a charred Mulga stump of the Chestnut-tail Tomtit, containing three fresh eggs, and we note many of the birds. Whitefaces, *A. leucopsis*, are common.

Nearing Hungerford, the border town, we pass first through an avenue of Black Box, *E. bicolor;* then an undershrub of Turpentine, *Eremophila Sturtii*, and *Dodonaea viscosa.* The first building we come to is the Post Office on the New South Wales side; all the rest are in Queensland. We make a few inquiries and, as it is near nightfall, push on to find a camping place before dark. We recross the bed of the Paroo to regain the eastern side, and camp for the night. A Boobook Owl had been calling, but the first streak of day was greeted by the gloriously mellow notes of the Pied Butcher Bird, *C. nigrogularis* followed by those of the Harmonious Thrush, *C. harmonica.* White-browed Wood Swallows are numerous and building their nests. The Little Wee Bill, *S. brevirostris*, is searching the box leaves for smaller forms of insect life, hovering in front of the branchlets or clinging to them when effecting a capture. Our road still follows the course of the Paroo, mostly on flooded country, which supports a more varied tree population—Bimble and Black Box, Yapunyah, still flowering freely and in places forming forests by itself. The Red Gum keeps to the actual watercourse. On sandy stretches we have Mulga, Gidgee, *A. Cambagei;* Ironwood, *A. excelsa;* Beefwood, *Grevillea striata*, with Bloodwood, *Eucalyptus terminalis*, in flower, making a fine show with its corymbose inflorescence; the trees of this species here are

much larger and finer than those in the north-west of New South Wales, owing to the greater average rainfall. All these trees have a grey scaly bark on trunk and limbs. We still have an undergrowth of *Dodonaea viscosa*, but the Turpentine, *Eremophila Sturti*, is gradually being replaced by one of larger growth, with darker bark and broader green leaves without the gummy exudation, *Eremophila Mitchelli*. The Lavender-flowered Eremophila is also being replaced by one with darker green leaves and a light blue flower, *E. Goodwini*. As we go north Gidgee becomes more common than our old friend the Mulga, and has *Eremophila Latrobei*, with its crimson flowers as an undergrowth, and we find whole tracts of country covered with *Eremophila Goodwini*, which is rarely more than two feet in height. We meet here with the Grey-crowned Babbler, *Pomatostomus temporalis*, replacing *P. ruficeps* and *P. superciliosus*, the common species in West Darling country. The two Friar Birds, *P. corniculatus* and *P. citreogularis*, soon make their presence known, from amongst the flowering Bloodwoods and Yapunyahs. Much of the timber in the paddocks bordering the road has been ringbarked, and the ground covering varies from dry and dead herbage in places where no rain had fallen recently, to others that had been favoured with a thunder storm, and here we find the ground covered with a sweetly-smelling composite, *Calotis Plumulifera*, or *Blennodia canescens*, and the Lavender daisy.

We arrive at Eulo at about 2.30 p.m. on August 23, a small township marking the turn off to Cunnamulla, which road we take through a fairly-thick scrub of Mulga, Gidgee and Beefwood, with undergrowth of Turpentine and *Dodonaea viscosa*, which soon opens out until we come to the gravelly ridge which marks the divide between the Warrego and Paroo Rivers. A beautiful hop bush, *Dodonaea boroniaefolia*, with pinnate leaves and small seed vessels in all shades from pale yellowish green to richest dark crimson, attracts our attention. *Cassia artemisioides* is also finely in flower, the flowers being larger and the leaflets broader than those of the species found at Broken Hill. Brown Tree Creepers are common; also Grey-crowned Babblers, Magpies, Garrulous Miners, which have replaced the Yellow-throated species; Greenies, Blue Bonnets; *P. haematorrhous xanthorrhoea*; Ring Necks, *B. barnardi*; Major Mitchells and Galahs.

Our road takes us over some very bare country, evidently subject to inundation, on Moongaree Station. On this a

few isolated specimens of *Swainsona procumbens* are flowering, and a few daisies. The Wilga, *Geigera parviflora*, graces the landscape more often, with its fine dark green bushy growth, and is in flower and scenting the atmosphere. Nearing the Warrego the country is still open, but being dotted with shapely Wilgas and symmetrical White Pines, *Callitris robusta*, has quite a park-like appearance. The road winds through the Red Gums and the Box Trees of the river frontage before crossing the bridge leading to Cunnamulla, a prosperous town of from 1500 to 2000 inhabitants, in which many new buildings are going up, including a shire hall, a general hospital, and maternity hospital. The streets are well planted with the common and Broad-leafed Peppers and White Cedars. A Bottle Tree, *Brachychiton rupestris*, with its curious bulging stem and fine-foliaged top, is both an ornamental and useful shade tree. It was not far north from here that this species was first found by Major Mitchell. Water is laid on all over the town from a fine artesian bore, which has a daily flow of over one million and a quarter gallons, coming from the pipe at a temperature of 107 Fahr. It is a soft alkaline water, with a slightly chlorinous odour. Peaceful Doves were cooing in the street trees, and numbers of Fairy Martins nesting under the high-arched roof of the railway station.

The road from here to Charleville, a distance of 125 miles, was quite perfect for travelling, and in places quite picturesque, as it went north between the river and the railway line amongst finely-timbered country, the trees being mostly Yapunyah, Bimble Box, Bloodwood, Coolibah, *E. microtheca;* Wilga, Ironwood, Gidgee, Mulga, and Beefwood, with White Pines on the sandy patches. *Capparis Mitchelli*, the Caper or Wild Orange, was finely grown and in green fruit. *Eremophila Mitchelli* was more plentiful, *Eremophila longifolia* occasional, as it had been all the way, and *Eremophila bignoniaeflora*, keeping to flooded country as always. The last two have long flowering periods. The Warrego itself was bordered with Red Gum, Black Box and Coolibah, with Tea-tree *(Melaleuca sp.?)* making a thick scrub in amongst the channels in many places.

We pull into the bank of the river for lunch and note many birds, conspicuous amongst which were Jacky Winters, *Microeca fascinans;* Harmonious Thrushes, Grey-crowned Babblers, Yellow-throated Friar Birds, Greenies, Sulphur-crested Cockatoos, Galahs, Cockatiels, Crimson-winged Par-

rots, White-winged Choughs, and Apostle Birds. Grallinas, Crested Bronzewings and Common Bronzewings were numerous, also Striated Pardalotes, and two being flushed from nesting holes in gate posts *en route*. After passing Wyandra, a wayside township on the railway line, we go on for about four miles before making camp for the night on the river bank. Boobook Owls and Owlet Nightjars are heard calling in the night, also, at intervals, the guttural gruntings and roarings of the Koala, *Phascolarctos cinereus*, were heard again after many years.

We are all up early to investigate the bird life of the river; but found nothing new. Fairy Martins are nesting in small colonies along the steep banks. Sulphur-crested Cockatoos scream amongst the trees; garrulous Miners scold us for our intrusion, and the fine mellow notes of the Pied Butcher Bird and of the Harmonious Thrush are distant and near. We are away early, pick up the road, and find it very rough owing to cattle having been over it in wet weather. In open forest many fine Bloodwoods are in flower, the foliage being covered with their corymbs of large creamy-white flowers. The stem and branches are covered with a rough, grey, scaly bark, the uppermost smaller branches only being smooth. The Yapunyahs, *E. ochrophloia*, have their butts black, the bark coming off in flakes, all the rest of the stem and branches being smooth or flesh-coloured or white. The Coolibah have grey scaly stems, the upper branches being smooth and white. The Bimble Box has its branches grey and rough, with rounded glossy leaves. *Eremophila Mitchelli* is, in places, in blossom, which is white, and *E. maculata* is also in flower. More trees and shrubs appear as we near Charleville, and soon we find ourselves in an Ironbark, *Eucalyptus melanophloia* scrub, the trees varying in trunk diameter from 1 to 1½ feet; leaves silvery, and bark rugged and black. We hurry on to reach Charleville before the stores close, as it is Saturday, passing many shrubs that are new to us. On the outskirts of the town we find a lot of tall, graceful Eucalypts, which we afterwards find to be Moreton Bay Ashes, *Eucalyptus tesselaris*, at the western limit of its range.

Charleville is a large and well-built town, nearly all the houses being raised up on piles 6 or 7 feet from the ground, with inverted, tin-dish-like courses to cap them as a protection from white ants and other vermin. The most resistant wood to decay, and white ants, is Gidgee, next to which comes Pine, so long as it lasts impregnated with its natural oils and

resins. Wherever the Pine grows it is being cut for fencing and building purposes, and the forests of it are being gradually cut out, and there is no reproduction.

In Charleville we make a few inquiries as to a likely camping place, make a few additions to the commissariat, and retrace our steps to the Warrego over the week-end. We reach the Ironbark scrub again in time for lunch, and add a few specimens to our plant portfolios. A small and graceful Wattle is coming into flower, *Acacia patens*, which proves to be a new record for the State that we are in. *Indigofolia brevidens* is an old friend met with at the Depot Glen of Sturt. A shrubby Grevillea, with trifoliate leaves and dry seed vessels, is new to us. A tall, scraggy Aster, *Olearia subspicata*, is flowering, but not nearly so finely as *O. pimeleoides* was at Wanaaring. A rough, tussocky grass, *Triodia Mitchelli*, has been eaten down by cattle, but the few green leaves that are left exale a perfume that scents the whole atmosphere of the scrub in an agreeable way. It should be possible to distil a fine essential oil from this plant. *Velleya paradoxa*, *Helipterum polygalifolium* and a Lavender Daisy are growing amongst these plants. Two pretty shrubs are *Phebalium glandulosum* and *Claythrix longiflora*, the latter in flower. We go and camp on a waterhole on the river, choosing a soft, dry, sandy spot for our poor hips. During the night many calls of the Boobook are heard from different quarters, and also of the Koala.

Our driver directed my attention to a crested bird in one of the creek Gums, which proved to be an Eastern Shrike Tit, *Falcunculus frontatus*, the first that I had seen for a long time. This must be about the western limit of its distribution in Queensland. There was a pair, and busy, as usual, pulling bark off in search for breakfast. A Square-tailed Kite was starting a nest on the horizontal fork of a Coolibah by our camp, and we could watch her frantic efforts and admire her patience in trying to fix dry branchlets on a slippery horizontal fork. The branchlets were all snatched from the top of a neighbouring tree by flying sweeps with the bird's claws, carried in them to the chosen site, transferred to the beak before alighting, and then placed in position, the outspread wings being used to prevent slipping as much as possible, but in spite of all this most of the twigs found the ground, from which she never retrieved them, more being obtained from the tree tops. At this camp both Ground Cuckoo Shrikes, *Pteropodocys maxima*, and the Little Cuckoo

Shrikes, *Grauculus robustus*, were seen, and I tried to follow up the melancholy call of a Bronzewing till it led me to a dense Tea-tree patch, with about 30 yards of water to cross, when I decide to leave the bird to its misery.

After breakfast Dr. Chenery and I went up the creek for a while, crossed where a dead *Tiliqua scincoides* was attracting numbers of flies to its dissolution. We also went up on the other side on the look out for the long-lost *Sericornis tryanmula*, then out into the timber Yapunyah, Gidgee, Mulga, and *Eremophila Mitchelli*, on the last of which a Loranth, *L. Murrayi*, new to us, is growing. *L. pendulus* is common on Gidgee and Mulga, and a red and yellow leafed one, like *L. miraculosus*, but not in flower or fruit, on Yapunyah. The same Friar Birds are about, and we admire the droll attitude struck by *P. cornicalatus* when uttering its rollicking notes and it does not require a big stretch of imagination to picture him in an ancient monastery with a flagon of nut-brown ale at hand, head and bald pate rolling back to give forth a jovial song. Peaceful Doves are plentiful, and Jacky Winters and Brown Tree Creepers common. We soon come to the gravelly divide, on which there is quite a thick growth of *Dodonaea boroniaefolia*, with *Eremophila Mitchelli* and *Cassia artemisioides*, occasional trees of *Eremophila longifolia* and bushes of *Eremophila maculata*. There is a good deal of dead timber on the ground, and small birds are plentiful, such as *Acanthiza nana*, *A. uropygialis* and *Geobasileus chrysorrhous*. We find a nest, of the last 6 feet up, in a *Eremophila Mitchelli*, containing three eggs, with one of the Narrow-billed Bronze Cuckoo. *Climacterus superciliosus* and *Sitella chrysoptera* were policing the trunks and branches of the larger trees. The Grey Fantail, *R. flabellifera*, and Willie Wagtail, *R. leucophrys*, were busy about the scrub and tree tops. The Brown Honeyeater, *Stigmatops indistincta*, was very lively in its movements, and a fine singer, many of its notes recalling those of the Reed Warbler, *Acrocephalus australis*. Many Apostle Birds disported themselves in groups. Red-capped Robins and Rufous-breasted Whistlers were frequent, and on our way home along the river we saw several specimens of the Little Cuckoo Shrike, *G. robustus*.

At about 4 p.m. Dr. Chenery and I crossed the river and went straight out into the open forest of Pines, *Callitris robusta*; Mulga, *A. aneura*, and fine tall specimens of the Moreton Bay Ash, *E. tesselaris*, in one of which, at a considerable height, a Whistling Eagle had her nest. We note

Crimson-wing and Ring-neck Parrots, noisy Miners, Friar Birds, Jacky Winters, Willie Wagtails and Greenies, numerous as elsewhere. A pair of little Thornbills, *A. nana*, are building in an *Eremophila Mitchelli* at about 8 feet from the ground, and an Orange-winged Treecreeper, high up on a dry branch of a Moreton Bay Ash. Kookaburras and Frog-mouths are also seen on our way back to camp. At night a Boobook keeps calling from a tree over our camp in the light of the partially-eclipsed moon. These birds seem to be plentiful along the Warrego, and we are struck by the individual variation of their notes. Away from the breeding season their boobook call is rarely heard, being replaced by a single note-hough.

Monday, August 22, we make an early start back to Charleville, but soon pull up at the area of open forest where the ground is covered with flowering bushes of *Eremophila maculata*, the large timber being Bimble Box, Ironwood, Gidgee and Mulga, amongst which are a group of tall flowering Wattles, *A. harpophylla*, with falcate whitish leaves and a very rough dark bark. Birds, mostly attracted by the flowers of the Eremophila, were plentiful—the Yellow-throated and common Friar Birds, Miners, Greenies, Blue-faced Honeyeater, *E. cyanotis;* Brown Honeyeaters and Spiny-cheeked Honeyeaters, also a few Spotted Bower Birds Restless Flycatchers and Jacky Winters.

On the road we pick up Mr. Riddell, who had gone on to take a group of trees consisting of Mulga, Currajong, Needle Bush, Moreton Bay Ash, Bimble Box and Yapunyah.

In Charleville we look up a few people and are advised by all to go out to the Ambathala Waterhole, on the Adavale road, about 70 miles west, as the hole is always kept full from a bore stream. Leaving the town we pass through some fine Moreton Bay Ash trees, Ironwood, Gidgee and Bimble Box; then leaving the larger trees we pass alternately tracts of Mulga and Gidgee scrub, with Bimble Box as the common large tree, Yapunyah coming next. We pulled up for a late lunch in a patch of Mulga. The ground is dry and the herbage scanty, due to the season's rainfall having been patchy. We start again soon, and come to the gravelly ridge which marks the divide between the Warrego and Paroo, covered with the same scrub as before, of *Dodonaea boroniaefolia* and *Eremophila Mitchelli*. The Langlo River is crossed and we have to keep going to reach our camping place for the night, which we do just before nightfall. We find the long

waterhole full, and covered with weeds. The country surrounding it seems to be very dry, and not to have had any rain for some time. The hole is bordered with a good growth of young Red Gums, the old timber all having been cut out. *Acacia stenophylla*, *Eremophila bignoniaefolia*, and occasional trees of *E. longifolia*. Back from the waterhole was a bordering scrub of *Myoporum deserti*, in flower, with scattered specimens of Bimble Box; and beyond this thick Gidgee scrub. This Dr. Chenery and I decide to explore on the following morning. It turned out to be very dry, the ground being bare of vegetation or covered with dead leaves, and birds not plentiful. Ring-necked Parrots were seen, Spiny-cheeked Honeyeaters, Greenies and a few Brown Honeyeaters, Chestnut Tail and Little Thorn Bills, and two families of Black-backed Wrens, *M. melanolus;* Orange-wing Sittelas and White-browed Tree Creepers, Rufous-breasted Whistlers, Grey Thrush and Crested Bell Bird and Red-capped Robins. We decided that we had better go on towards Adavale and pack up and get on our way, calling first at the station, and then picking up the road that leads for some distance through thick Gidgee scrub, then Mulga and Bimble Box. It is all very dry until we begin to climb up the divide between the Paroo and Bulloo, rocky ironstone country. We stop at a gully in the range to examine it; it is moist at first for a small distance, and the scrub thick with many traces of Wallaby. The Mulga and Gidgee are very thick, with an underbush of *Eremophila latrobei* and *E. Bowmani*. *Solanum ferocissimum* and the fern *Cheilanthes tenuifolia* grow in the moister parts of the gully with a Lavender Daisy and the large Yellow Everlasting, *Helichrysum lucidum*. Further in we come upon groups of *Eucalyptus Morrisi*, and a fine Tecoma growing up over the Mallee and Mulga. This proves to be *T. Oxleyi*, differing in leaf and flower from *T. australis*, as I have found it flowering on Mt. Manara. We see very few birds, and resume our journey over the range. On the crest we find a small-leafed shrub in full flower, *Thryptomene oligandra*, making a beautiful object. Associated with this is a great amount of *Eremophila Bowmani*, also flowering freely. A fine tall Eucalypt, with clean, white trunk and branches and small bright green lanceolate-leaves, *E. Thozetiana*, is much admired. It grows freely in the gullies of this range, and thins out as we proceed westward, Adavale seeming to be the limit of its range in that direction.

(To be continued.)

The Victorian Naturalist

Vol. XLI.—No. 7. NOVEMBER 6, 1924. No. 491

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, October 13, 1924.

The President, Mr. J. Searle, occupied the chair, and about fifty members and visitors were present.

CORRESPONDENCE.

From Miss R. Chisholm, B.A., saying good-bye to Club members on account of her departure for Canada, where she will take a course in Domestic Science at Toronto prior to taking up the position of Principal of the McPherson School of Domestic Economy, Melbourne.

On the motion of Messrs. C. Oke and H. B. Williamson, F.L.S., it was resolved that a letter of congratulation be forwarded to Miss Chisholm on her appointment, and on the motion of Messrs. F. G. A. Barnard and F. Pitcher, it was decided that a letter of introduction to similar societies in Canada be given to Miss Chisholm.

DEATH OF MEMBER.

The President referred to the unexpected death of Mr. Leonard B. Thorn, a member of the Committee, who passed away after a short illness on the 3rd ult. He moved that a letter of sympathy be forwarded to his relatives. The motion was carried in silence, all standing. Messrs. C. Oke, H. B. Williamson, F.L.S., and F. E. Wilson, F.E.S., spoke of the devotion of the late Mr. Thorn to the study of lepidoptera, and the loss to the Club by the death of such an enthusiastic member.

REPORTS.

A report of the excursion to Greensborough on Saturday, September 13, was forwarded by the leader, Mr. A. J. Tadgell, who reported a good attendance of members. The day was very pleasant, and the green, undulating countryside made the outing most enjoyable. About one hundred and thirty plants were identified, of which fifty-six were found in flower. Eleven orchids were recorded, while the aliens numbered thirty-eight. The four forms, recognised by Robert Brown, of the liliaceous plant, *Anguillaria dioica*, R.Br., "Early Nancy," were pointed out. Lovers of colour were attracted by the delicate blue of the "Love Creeper" familiar to collectors as *Comesperma volubile*, but recently changed under the law of

priority to *Bredemeyera volubile*. A few birds, such as the Grey Thrush, Paradise, and two species of cuckoos were identified by Mr. Chas. Barrett, C.M.Z.S. From the high bank of the Plenty River a good example of a meander could be seen, with its erosive influence, and Prof. J. W. Gregory's conclusion was recalled that the Plenty, instead of joining the Yarra near Eltham, as it does now, at one time flowed more southerly, and joined other rivers off Portarlington, on the plain or valley whose bed is now occupied by Hobson's Bay and Port Phillip.

A report of the excursion to Ringwood on Saturday, September 20, was given by Mr. J. W. Audas, F.L.S., who reported a fair attendance of members. The railway enclosure was followed for a couple of miles towards Bayswater, where a turn towards Vermont was made, and a belt of scrub searched for wild flowers, with good results, some fifty species, including thirteen orchids, being found in bloom. The list included a number of interesting species, such as *Bredemeyera comesperma, B. ericinum, Sphærolobium vimineum, Utricularia dichotoma, Polypompholyx tenella, Phlyoglossum Drummondii, Euphrasia collina, Hovea heterophylla, Indigofera Australis, Kennedya prostrata, Acacia stricta, A. lenuifolia, and A. myrtifolia. Pultenæa Gunii and Hibbertia stricta* were aflame with colour and very abundant. The climbers *Hardenbergia monophylla* and *Bredemeyera volubile* were seen at their best.

A report of the excursion to Harstbridge on Show Day, September 25, was forwarded by the leader, Mr. A. J. Tadgell, who reported a pleasant outing, the rain of the previous day having freshened the paddocks considerably. About one hundred and fifty plants were identified, of which ninety were in flower. Thirty aliens were among those listed. Some physiological points were demonstrated during the walk, such as the different bushes bearing the male and female flowers of the Prickly Currant bush, *Coprosma Billardieri*. The curious little fern-like plant, *Ophioglossum coriaceum*, attracted some attention. This is usually found in a damp depression, but here it was growing on a hillside. The Gold-dust Acacia, *A. acinacea*, was at its best, and seemed to well deserve its vernacular name. The party had been indebted to Mr. A. L. Scott for some remarks on the geology of the district, and to Mr. J. R. Leslie for the identification of a number of mosses and other cryptogams.

A report of the excursion to Bendigo on Saturday, October 4, was given by the town leader, Mr. C. Daley, F.L.S., who said that the seventh annual excursion to that district had been

successfully carried out by a small party which left town by an early train on the Saturday, and returned on Monday. The date was found to be rather late to see many of the characteristic flowers at their best, but enjoyable outings were made to Peiper's Hill, in the vicinity of One Tree Hill, and to Big Hill, near the Melbourne road. Eighteen plants were added to the list of Bendigo plants recorded on these excursions.

A report of the excursion from Wandin to Evelyn on Saturday, October 11, was given by the leader, Mr. H. B. Williamson, F.L.S., who said that, notwithstanding heavy rain, a small party managed to carry out this excursion, covering a distance of about five miles. Only three common orchids were seen. The most interesting plant collected was *Pultenæa Weindorferi*, Reader. This shrubby plant was originally described in the *Naturalist* of July, 1905 (Vol. XXII, p. 51), by the late Mr. F. M. Reader, from specimens collected by Mr. G. Weindorfer on some swampy land near the Warburton road at Wandin. Recently it has been gathered by Dr. Sutton, and Mr. J. W. Audas, F.L.S., near Gembrook, and specimens, without the collector's name, are in the National Herbarium, marked "Dandenong Ranges." For this and *P. juniperina*, a week or two later would perhaps yield better specimens. The principal members of the bush vegetation seen in flower were the Snow Daisy-bush, Golden Bush-pea, Yellow Riceflower. Other plants noted were the Spoon Riceflower, Alpine Grevillea and Heath Milkwort. The Narrow-leaf Acacia and Myrtle Acacia were past their best.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Mary I. Allfrey, 6 Kensington Road, South Yarra, and Mr. F. E. Grieve, M.A., Wesley College, Prahran, were duly elected as ordinary members, and Mr. K. F. Hatfield, "Talgai," Lilydale, as a country member of the Club.

GENERAL BUSINESS.

Attention was called to the Annual Exhibition of Wild Flowers to be held on Tuesday, 21st inst., and some time was spent in arranging details, in consequence of which it was decided to postpone the reading of the paper by Mr. J. H. Harvey, F.R.V.I.A., until next meeting.

NATURAL HISTORY NOTES.

Mr. A. E. Rodda read some notes on the Eastern Water-dragon Lizard, in illustration of his exhibit of photographs of this lizard.

Mr. C. Oke gave an account of the peculiar attraction the scent of the Wood Ant, *Iridomyrmex nitidus*, seems to have for cats.

EXHIBITS.

By Mr. C. Daley, B.A.—Large specimen of Gypsum from Northern Queensland; also fading blooms of the following plants grown at Caulfield: *Micromyrtus ciliatus*, *Calytrix Sullivani*, *Calytrix tetragona*, and *Thrytomene Mitchelliana*, all having a brown to reddish tinge before fruiting.

Mr. C. French.—Double flowers of Fairy Wax-flower, *Eriostemon obovalis*. This form is very rare.

Mrs. Mattingley.—Some photographs of New Guinea natives, etc., Papuan axe-head, Wood-carving by Papuans, bean of Cascara tree.

Rev. A. J. Maher.—Specimen of Common Spider Orchid, *Caladenia Patersonii*, two feet high, with three large flowers.

Mr. A. E. Rodda.—Photographs of Eastern Water-dragon Lizard, from Aberfeldy River, Gippsland. Also two other species of same group.

Mr. A. L. Scott.—Fossils from Wandong Quarry.

Mr. J. Searle.—Large fossil tooth.

Mr. H. B. Williamson, F.L.S.—"Fibre-ball" from South Australian coast. Flowers from Wandin excursion.

After the usual conversazione the meeting closed.

EXHIBITION OF WILD FLOWERS.

The Annual Exhibition of Wild Flowers was held at the Melbourne Town Hall on Tuesday, October 21, when there was again a good attendance of the general public. The display of flowers was very good, but it has not been possible to complete the full list of exhibitors, etc., in time for the present *Naturalist*. From returns to hand it is expected that about £50 will be available for the Bush Nursing Association, as its share of the proceeds.

The Late Mr. Leonard B. Thorn.—Attracted by Mr. F. P. Dodd's fine exhibition of Queensland and New Guinea butterflies in Melbourne in 1918, the late Mr. L. B. Thorn took up the study of butterflies and moths, and in August of that year became a member of the Field Naturalists' Club. The life histories of the largest members of the group being fairly well known, he devoted himself to the smaller species, and chose the Lycænidæ for special attention. This family is particularly difficult to investigate, as the larvæ of many of the species are night-feeders, and in some cases the attendance of ants

seems to be necessary for their arrival at maturity. The results of some of his observations were published in the *Naturalist* for July last. In September, 1922, he joined Mr. G. A. Waterhouse, F.E.S., of Sydney, and Mr. A. N. Burns, of Brisbane, both members of this Club, in a collecting trip to the Richmond River district, N.S.W., and on to Southern Queensland, in search of certain species of butterflies required for special investigation, and in November of last year, in conjunction with Mr. Burns, gave an interesting account of the trip before this Club (*Vict. Nat.*, March, 1924, XL, p. 221), illustrated by a plate of some of the rarer species collected. He was an adept at setting and displaying his specimens, and was always glad to give information to others regarding the subject. During recent years he had acted as leader of several club excursions, and his name appears in the current programme in a similar capacity. His illness is thought to have been occasioned by too strenuous attention to his hobby, in addition to his every-day life, and his death on October 3, at the early age of thirty-three, leaves a blank in the Club's workers which will be hard to fill. At the last annual meeting he was elected a member of the Committee, and exhibited considerable enthusiasm in that position. It was during the journey to Bendigo that some of his friends learned the sad news, and as Mr. Thorn had frequently joined in that excursion, his fellow-members felt the loss very keenly.

The Late Mr. George R. Hill.—By the death of Mr. G. R. Hill, on the 19th ult., the Field Naturalists' Club has lost one of its oldest supporters, he having been elected a member in January, 1884. Though we believe he was not an actual collector of natural history objects, he encouraged his sons to devote their attention to the life around them. He was a draughtsman by profession, and served the Victorian Railways faithfully for many years, retiring after holding the position of chief draughtsman for twelve years in November, 1894. He acted as a member of the Committee of the Club in 1893-94 and 1894-95. At this time prizes were offered to juniors for collections of natural history objects, and it is pleasing to record that two of his sons secured prizes in these competitions. One afterwards adopted entomology as his life-work, and some two years ago succeeded the late Mr. F. P. Spry as entomologist at the National Museum, Melbourne. Mr. Hill was born in Bristol, England, in 1838, and had reached the ripe age of eighty-six at the time of his death. He left a widow and a family of eight sons.

AN EXCURSION IN SOUTH-WEST QUEENSLAND.

By Dr. W. MacGillivray, Broken Hill.

(*Read before the Field Naturalists' Club of Victoria, 11th August and 8th September, 1924.*)

(Continued from page 120.)

In a gully to the north of the road there is much under-scrub of *Eremophila Bowmani, Cassia Eremophila* and *Indigofera brvidens*, with the *Tecoma Oxleyi* climbing over the trees in masses. The scrub itself is mostly Mulga, *Eremophila Mitchelli;* Wild Lemon, *Canthium oleifolium*, with *Eucalyptus Morrisii, E. ochrophloia, E. populifolia* and *E. Thozetiana* scattered through it. Returning to the road we climb to the top of the range over a rough road, and find *Dodonaea petiolaris* making a great show with its large bladder-like seed pods, of all shades of colour, from pale green to rich, ruddy brown. I recognise it as the one that I had previously found on the Nappa Merrie range, to the north of Cooper's Creek. To find a camping place we run down the western side of the range until we come to a creek crossing the road, which we explore up and down from the road for water; it is very bare, and most of the holes are nearly dry and much trampled with cattle. One, however, a little larger, serves our purposes, as we intend to return to the range early next morning.

We are up early, as the ground was very hard and burry, and we are soon back along the road until we regain the top of the range. We leave the car and climb down a steep, rocky bank on the north side, in which are small caves used by Wallabies for shelter. There are many tracks of these animals through the scrub. The underscrub consists of *Eremophila oppositifolia, E. alternifolia, Cassia eremophila*, and *C. artemisioides*, with Wilga, Mulga and *Eremophila Mitchelli* up to 20 feet in height. The larger timber trees are mostly the Eucalypts already mentioned. Birds are not numerous; *Acanthiza nana* and *A. uropygialis, Petroica goodenovii, Rhipidura albiscapa, Collyriocincla harmonica, Acanthagenys rufogularis*, and *Pomatorhinus temporalis* are seen. On the top of the range bordering the road is a stunted scrub of *Acacia doratoxylon*, and to the south of the road one looks over a sea of scrub interspersed with the larger trees previously mentioned, stretching away for miles. Our driver noted a bird crossing the road which proved to be a female of *Cinclosoma castaneothorax*.

On resuming our journey towards Adavale we pass through scrub, mostly open Mulga, some of which are covered with the *Tecoma Oxleyi*, finely in flower. *Jasminum lineare* and *Marsdenia leichardtiana* are frequently seen climbing or supporting themselves on dead or living scrub trees. Many Bloodwoods are covered in blossom, and are fine large trees, very different from the stunted specimens one finds in the north-west of New South Wales, where the average rainfall is much less than here. We go along the road through the open scrub and note patches of *Cassia pleurocarpa*, or a nearly-allied species, along the road, flowering and growing to a height of 10 or 12 feet. We had previously met with it in small colonies near Charleville, and I had collected it on the sand hills near Fort Grey, in New South Wales, and also in South Australia, near Cordillo Downs Station.

Our road soon takes us into country which had been favoured with good winter rains, as the ground is covered with a carpet of herbage, much of which is in flower, the prevalent yellow colour being due to the *Velleya paradoxa*, an upright-growing form with golden-yellow flowers, and, to a lesser extent, to a procumbent form, *Goodenia glabra*. We stop with the idea of adding to our botanical specimens and boiling the billy for lunch. I was rather surprised to note a scrubby growth of *Petalostylis labicheoides* recovering and growing vigorously after having been burnt to the roots; with us at Broken Hill it grows high up on the slopes of Mt. Robe. A saltbush-like shrub, also growing beside the road, was in flower, and turned out to be a new species of *Prostanthera*. The purple-flowering *Eremophila Goodwini* was fairly frequent. When I found several species of the beautiful turquoise-blue Pincushion, *Brunonia australis*, in my ignorance I made sure that it must be something new, but found afterwards that Major Mitchell had collected it in 1836. Several composites were amongst the other flowers, *Helichrysum lucidum* being the most conspicuous, with the soft Billy Button, *Craspedia Pleiocephala*, in greater number. Two species of Trichinum were present, one with beautiful rose-pink flowering heads, *T. calostachyum*; the other taller, more conspicuous, with silver-white heads, *T. macrocephalum*. *Podolepis rutidochlamys*, a tall thistle-like plant, and *Linum marginale* reared their heads above all the others; *Loranthus pendulus*, the common parasite of the Mulgas.

Resuming our journey, we pass through this class of country for several miles, till near Adavale, when we come to land which had been bared by travelling mobs of cattle, only a few scattered Gums, mostly Yapunyah, Bimble Box and the white-stemmed *E. Thozetiana*, being left to grace the landscape. We cross the Blackwater Creek, running with bore water, before coming to Adavale, a small township on a bare, open space. From here it is our intention to follow the Bulloo down to Thargomindah, and so get our directions, and make off across the common, on the western road, for several miles, till we come to the Bulloo, which we cross before leaving the main western, or Windorah, road to turn south. The Bulloo consists of a wide bed, in which are a number of channels. Most of the holes are full, and some are fine large and deep ones, bordered by Red Gum, *E. rostrata;* Coolibah, *E. microtheca;* *Acacia stenophylla* and *Eremophila bignoniaeflora*. Much rank grass grew in between the channels, mostly Mitchell and Kangaroo grass; the latter, in large tussocks, served to shelter numbers of Wallabies. Our road follows the path of least resistance, down the river on the flooded ground or out into the scrub to cut off a bend. We cross and recross the channel several times before coming to Thargomindah. Our first crossing was 15 miles from Adavale, and we go a few miles to camp in the channel at a good waterhole.

On the following day we decide to let our driver take the car on and wait for us at the next crossing for lunch, whilst Dr. Chenery, Mr. Riddell and I walked the river. It turned out to be a long fifteen miles, and three very weary and hungry men reached the crossing well on in the afternoon. We found the vegetation along the channel very dry, and birds remarkably scarce. A few Pelicans, Cormorants and Spoon Bills frequented the holes. Ducks were few in number. Only two Sulphur-crested Cockatoos and one Galah were noted, and no Parrots. A dry time had sent most of the birds elsewhere. Four birds were found nesting—a Jacky Winter, a Spiny-cheeked Honeyeater, a Diamond Dove, and White-browed Swallow.

We go, after lunch, for about ten miles, till we come to a stony hillside, which is gay with wildflowers, *Velleya paradoxa* and *Helipterum floribundum* preponderating. This hillside was productive of two new species—a pretty pink Gomphrena and an Isotropis—a fine brown perennial pea. *Canthium oleifolium* is here of better growth, and much bushier than on the Warrego. The pretty little Climbing

Pea, *Glycine clandestina*, is frequent. Leopard Trees are again a feature of the landscape, other trees are Bloodwood, Whitewood, Mulga and Dead Finish. The Wedge Bill is heard again, and a solitary pair of Red-rumped Parrots seen just before dark. We pass Comongin Station, quite a town of buildings on the shore of a fine sheet of water: Lake Dartmouth, on which are numbers of Waterfowl. We go on to camp within a few miles on a small waterhole.

Early next morning we hear the Brolgas calling, and see four Banksian Black Cockatoos alight on a Leopard Tree near the camp. Quilpie—we enter on the last day of August—is the western terminus of the Brisbane-Charleville railway, an unpretentious township on bare, open country. After making a few purchases we leave the town again. A flock of twenty-seven Black Cockatoos, *C. Banksii*, fly overhead before we leave, and twelve Brolgas are seen on the outskirts. We are unfortunate in breaking a back spring when only two miles out, so we decide to unload under the nearest Gidgee for our driver to take the trolly back to the local blacksmith whilst we set ourselves to explore the country. The country is very dry, and birds and plants are scarce. A party of Apostle Birds, *Struthidea cinerea*, are busy about a nest high up on a vertical fork of a Yapunyah, going into the nest by turns and doing a lot of chattering. About a hundred yards further on another lot were noticed about a nest, only 15 feet up, in a Gidgee. This nest was a new one, well built up, lined with grass, and contained six eggs. These birds are usually found in small communities, and when a nest is to be built all take a part in it, carrying either mud or vegetable fibre, and waiting their turn to add their quota. Several are often seen fussing about a nest and taking turns to sit on the eggs.

Making another start along the road, we soon pull up to photograph a finely-flowering specimen of the lignum-like *Eremophila Polyclada*, which was covered with its white flowers. Two Prickly Climbers we do not find in fruit or flower, although we have seen them alongside the road at intervals since we arrived at Cunnamulla, and are unable to identify them. The principal scrub tree is still the Gidgee, with Yapunyah, Bimble Box and Bloodwood here and there amongst it. Along the watercourses, with its grey-green foliage at times assuming almost a purplish hue, *Eucalyptus microtheca*, commonly known as Coolibah, *E. rostrata*, a darker green in colour, contrasts with it, and is not so frequent as it was on the Bulloo. *Cassia artemisioides* is more common

now than *C. eremophila*, and many bushes are flowering. *Cassia phyllodinea* forms low bushes, and *Cassia desolata* is often associated with it on stony ground, and sometimes a small-leafed form, *C. Sturti*. The Wild Parsnip is flowering freely, but the Carrot is only in bud; the flowers of the former, a pale mauve in colour, cover whole hillsides in places. We cross the Bulloo twenty-eight miles from Quilpie, and camp for the night. All through our trip mosquitoes have only troubled us for an hour or so at sunset, disappearing after nightfall when the temperature dropped.

There were very few birds about this camp, Crested Pigeons, Peaceful Doves, Grecnies, Spiny-cheeked Honeyeaters, White-browed Wood Swallows, Red-backed Kingfishers and Kookaburras. We have not seen any Blue Bonnets since leaving Cunnamullah, no little Corellas since Bootra Station, in New South Wales, and no Ring Necks since Charleville. Our first stop on the road is to investigate a patch of Gidgee to the left of the track, near to which about twenty Strawnecked Ibis are feeding in the open on caterpillars, and a fine pair of Wedge-tailed Eagles are breakfasting on a dead bullock.

Now that we are getting away from thick scrub *Anthus australis* is becoming more frequent by the roadside. The patch of scrub, being dry, contained very few birds—Chestnut-backed Thornbills, Red-capped Robins and White-browed Babblers. It opens out into scrub of taller growth, in which we find a party of Apostle Birds fooling about a nest which contains three eggs, which they all take in turns to sit on for a few minutes at a time. We return to our car and go on through country that has been eaten bare by travelling cattle, as we are following a main stock route. Twenty Whistling Eagles are counted as they rise from a patch of green, where they have been regaling themselves on caterpillars, and getting efficient help from White-Browed and Masked Wood Swallows. Lunch time is spent on a bore stream, and is hurried through, as the place is infested with sand flies.

The rest of the road is uneventful, and we run into Thargomindah about sunset—a dead town, owing to the surrounding stations carrying few, if any, stock, and consequent depopulation of the country. Most of the houses are empty or in a state of dilapidation and decay; paint has been a stranger to them for many years. The street—there is but one—is lit by electricity, but the lamps are so covered with cobwebs that they only give a dim light. The light is generated at a fine artesian bore about three-quarters of a mile

PLATE V.

CAPER TREE (in fruit), *Capparis Mitchelli*, LIND.

DARLING LILY, *Crinum flaccidum*, HERB.

from the town, the bore water being laid on all over the town. This bore has been running for thirty years; it has a depth of 2650 feet and a daily flow of 670,000 gallons, and comes out of the pipe at a temperature of 160 Fahr. Its chief constituent is sodium carbonate, and it is quite a good water for all domestic purposes, and should combat the effect of acidosis and any tendency to *arterio sclerosis* in the inhabitants.

We left "Thargo," as it is affectionately called by the locals, after lunch on September 2, taking the road to the Wilson River, passing through open country lightly timbered with Bloodwood, Beefwood, Needlewood, Dead Finish and Mulga, till we turn in to the left, at fourteen miles, to camp on the margin of the Bullawarra Swamp. This swamp surrounds Bullawarra Lake, which is about five miles in diameter, a sandhill separating them, except where a feeding water course runs through. In the swamp is much Lignum, *Muhlenbeckia Cunninghami*, and Coolibah, *E. microtheca*, with *Acacia stenophylla*. Bordering the lake one finds mostly Red Gum, *E. rostrata;* Coolibah and *Acacia stenophylla* again. When I waded into the swamp a few Waterhens, *Tribonyx ventralis*, flushed from the Lignum, in which were their old nests, and also a pair of Red-kneed Dotterel. I crossed to the sand ridge to examine the lake, which was open water without any birds on it as far as one could see. A few Maned Geese and Grey Duck were amongst the bordering timber, in which Galahs were nesting freely. Mr. Riddell joined me, and we went on along the edge of the lake. From a large, open hollow a Winking Owl was flushed; the hollow was found to hold three downy young of this species. A Little Falcon came across the lake to one of the trees near us, and as we return to camp a pair of Spur-winged Plovers keep vociferating overhead.

On the following morning Dr. Chenery and I made an early start through the swamp water, which is exceedingly cold, and we are glad to get on to a small island to stamp our feet into sensibility. We first look up the Winking Owl, and find the male roosting in an *Acacia stenophylla* near the nesting tree. The female flushes from the hollow, and they both fly up into the branches of an adjacent Red Gum, where they are immediately attacked by a pair of Little Falcons who give the poor Owls no peace, shifting them from tree to tree, and causing them to call out repeatedly. The Falcons probably had a nest in one of the old Whistling Eagles' or Kites' nests, which were numerous in the adjoining trees.

From one hollow a Little Corella is flushed, the first we had seen since leaving Boorra. We returned to the swamp, and waded through it for a few hours until it became too deep. Ducks were numerous, of several species, Grey Duck, Teal, White Eyed, Freckled, Pink Eared and Musk. Red-kneed Dotterel, were seen with young. Many young of the Black-tailed Water Hen, Reed Warblers and the Little Grass Bird were seen and heard, and *Malurus assimilis*. In the shallower parts were four Brolgas and several Yellow-billed Spoonbills. Waterfowl had evidently all nested and hatched their young, as we found many old nests in the Lignum.

We returned to camp for lunch, and before resuming our journey took specimens of a Saltbush, *Atriplex velutinella* which proved to be a new record for Queensland. The road took us through openly-timbered country again, the principal trees being Bimble Box, *E. populifolia;* Beefwood, *Grevillea striata;* Mulga, *Acacia aneura;* with *Eremophila Sturti* and *Dodonaea viscosa* as shrubs. Grass was scanty and all herbage dry, except in depressions. This was succeeded by Gidgee and Mulga scrub. As we were leaving the swamp we saw strings and flocks of Straw-necked Ibis flying out from the back of the lake to feed on the plains which we are approaching, as the scrub is succeeded by open plains intersected by Gidgee creeks. Alongside the road we take specimens of an Eremophila, which is in flower and is growing in clumps, the bushes growing up to 12 feet in height, and many seem to be shooting up again after being eaten down by cattle. This species, *Eremophila Dalyana*, proved later to be another new record for Queensland. *Swainsona procumbens* was flowering freely in the moister places. *Helipterum floribundum* is dying off, and many of the plains are purple with the dry seed-vessels of a Lepidinar. A creek on our left is timbered with Gidgee and Coolibah, with fine flowering bushes of *Cassia eremophila*, occasional trees of *Acacia sentis* and *Acacia farnesiana*, the latter only in bud. Four Bustards are seen in the saltbush near the next creek on our right, where we stop to refill our radiator and water bag.

On the eastern slopes of the Grey Range the ground becomes very stony, and the scrub is mostly Gidgee. Acres of these slopes are covered with *Trichinium nobile*, and present a fine sight, and this continues over the top, which we cross where it is of low elevation, very rocky, and covered with stunted Gidgee scrub, with a few masses of *Sarcostemma Australe*. As we come down the western slopes to a bare, gravelly plain, two Gib-

ber Birds, *Ashbyia Lovensis*, are flushed, Anthus becomes more common, big flocks of Cockatoo Parrots pass us on their southward migration; but so far we have only seen one Budgerigar. We pull in to Stony Gidgee Creek, in which is a good waterhole to make camp for the night. The principal timber trees on this creek were Coolibah, *E. microtheca*, and Gidgee, *A. Cambagei*, with a few specimens of *A. salicina*. Bushes of *Eremophila bignoniaeflora* and Lignum, *Muehlenbeckia Cunninghami*, grow round the water's edge. Just where we camped this creek wound itself round the point of a very stony hill, which was covered with a very stunted scrub of Mulga and Gidgee, with *Eremophila oppositifolia*, *E. Dalyana* and *Scaevola spinescens* all in flower. On the top of the hill a Eucalypt attracted my attention by its pure white trunk and branches, light-green lanceolate leaves, and cupped seed vessels, placed singly at intervals along the terminal branchlets; it proved to be *E. papuana*, originally described from Port Moresby. It seems strange to me that a tree that flourishes in the humid tropical climate of New Guinea should be found on a dry, rocky range, bordering the desert area. *Dodonaea petiolaris* is also found growing amongst the stones on the banks of the creek, with *Trichinium obovatus* and also *Enchylaena tomentosa*. A White-winged Chough is sitting on her nest in a Gidgee near the camp, and a small mob of Apostle Birds are very much occupied in building a nest, taking it in turns to bring fibre and mud to the nest. A Sparrow Hawk's nest, found on the evening of our arrival to be empty, contains one egg on the following day. Dr. Chenery, by patient watching, found several nesting pairs within a few yards of one another; the first was *Climacteris superciliosus*, feeding its young in a hole in a dead Gidgee. A Red-capped Robin, sitting on her well-camouflaged nest. A Yellow-tailed Thornbill and Dicaeum also had nests in amongst the leaves of Gidgees; the latter looked more like a tangled flocculus of cobweb than a nest, and could be easily overlooked. Two families of Purple-backed Wrens were disturbed on this creek within a mile of the camp. Grecnies and Spiney-cheeked Honeyeaters were fairly plentiful, and breeding. Hooded and Red-capped Robins were seen in the scrub out on the hill.

On a bank of the creek the leafless Ballart, *Exocarpus aphylla*, scented the air with its small white flowers; here it grows as a miserably-stunted bush, far different to the fine bushes seen in the Mallee bordering the Murray, near Mil-

dura. On the second morning we pack up and resume our journey, now over stony plains intersected with creeks at intervals, and for the first few miles we have scrub on both sides, which we soon leave behind. *Eremophila Dalyana* made a low scrub bordering the road again for a time, then more open stony plains, on which we disturb another pair of Gibber Birds, *Ashbyia Lovensis;* the plains are very dry and bare, and there is very little vegetation till we come to some sandhills running parallel to our road, and on our left groups of Whitewood trees grow on top, with *Acacia ligulata* in full bloom on the sides. The Yellow Pea, *Crotolaria dissitiflora,* is also finely covered with flowering spikes, and is a beautiful object, and was growing freely over the sand. The Green Pea, *Crotolaria Cunninghami,* were fewer in number in flower, but numbers of young plants were coming on. Some fine bushes of the Tangled Burr Daisy, *Calotis erinacea,* bright green in foliage and covered all over with orange-yellow flowers, would hold their own in any garden. Around the foot of the sandhills *Swainsona oligophylla* flowered in purple patches. Leaving the sandhills we pull on to ground subject to inundation from the Wilson River; this is very rough and covered with annual Salsolaceous herbage; we cross the river and gain the opposite bank. This river rises on the western slopes of the Grey Range, and runs south parallel with the range, then turns right round and runs north till it empties into the Cooper. From this junction north and east there is an area of Lignum country of about four thousand square miles, irrigated by the flood waters of the Cooper always once, and often twice, or three times annually; this is a wonderful nursery for water birds, and may it long remain undisturbed by the gun of the sportsman.

We follow down the river until we come to Nockatunga Cattle Station, where the station buildings are on a stony rise overlooking a fine permanent waterhole, at the upper end of which there is a fine garden. We remain for two days, and then go down the river to Nocundra, a small township consisting of a police station, store, public house and a few houses. Here we recross the river and follow a car track in order to dodge a lot of rough going on the main one, caused by mobs of travelling cattle having been over it in wet weather. Our track leads us over stony ridges, clothed scantily in Mulga, Gidgee, Dead Finish, with occasional Bloodwoods, with underbushes of *Cassia phyllodinia, Cassia desolata* and *Eremophila Duttoni,* which are flowering. We flush an Australian

Dotterel from her well-hidden nest—a slight depression on a cart track, with a few hardened bits of clay about it. Fine groups of a Trichinium are passed by at intervals, and some photographs taken of them. Our track becomes too faint to follow, and we retrace our own tracks till we come to the old road, and go to cross the Twelve-Mile Creek, which is very gay with wild flowers, the colouring being mostly yellow owing to the dominance of *Senecio lautus*. Our car breaks down, and we carry our baggage for about half a mile to a waterhole, where we camp for the night. A few *Eucalyptus microtheca* and *Acacia stenophylla* border it, with *Eremophila bignoniaeflora* and the Lignum-like *E. polyclada*. A Purple-backed Wren has her nest and young in one of the last-named bushes. A Magpie, *Gymnorhina tibicen*, is feeding two large young in a tree by the camp. Numbers of Brolgas are out on the plain eating caterpillars. In the evening numbers of flocks of Ibis pass over our camp on their way to their roosting places, possibly on the flood waters of the Wilson.

On the following morning we see numbers of Brolgas quite near our camp, and very soon clouds of Ibis appear over the north-west horizon, first, as faint, nebulous masses, which soon materialise; many flocks flying over our camp and others going off to all points of the compass to feed on the harvest of caterpillars. These flocks, all of Straw-necked Ibis, must have represented an immense number of individuals, and they kept coming up from the one quarter in quick succession for an hour and a half before thinning out. The vegetation, nearly all herbage, is very good about this waterhole. We make an early start, and soon note a Mirafra, with fledged young. We examine a sandhill by the way; on it are many traces of the by-gone aboriginal inhabitants in the shape of old fireplaces and flint chippings. *Acacia ligulata* is flowering, and *A. Oswaldi* in bud only. Dead Finish is flowering well. Mulga, Whitewood, Needlewood, *Hakea leucoptera*; Cork Bark, *H. intermedia*; *Eremophila Duttoni* in flower, with bunches of green leaves, in which are the dark-red flowers, and *E. latrobei*, with brighter flowers and narrower leaves. At the foot of the sandhill I am very pleased to find a group of *Eremophila*, which I had previously seen on the stony country bordering the Cooper, and also growing freely at Cordillo Downs, from which place I brought specimens, but without flowers or fruit. I searched through my patch and found only one with a few flowers. These specimens, as the plant was first found in South Australia, were entrusted to

Mr. Black for description. *Trichinium alopecuroides*, with its purple or silvery-white tops, covers the ground in places. Singly one finds *Senecio gregorii*, *Swainsona lephrotricha* and *S. oligophylla*, and a soft procumbent plant, *Gnephosis eriocarpa*, which is frequently used for lining birds' nests. A few stunted Bloodwoods, as the hill gets lower, and more stony, Mulgas become the dominant tree. Across a stony plain a Gibber Bird, a company of Dotterel, and a pair of Black-breasted Plover are disturbed in succession.

A fine mirage is photographed away to our left, over a fertile plain, on which a number of cattle are grazing, with a bright-yellow carpeting of *Senecio lautus* in the foreground, and the Grey Range at the back. More car trouble enables two of us to look over part of the Eaglehawk Swamp, which stretches away to our left, recently dry but now gay with wild flowers, principally *Senecio lautus* and the little Yellow Lily, *Bulbine semibarbata*, the larger *B. balbosa* occurring in occasional plants. The pretty little *Mimulus gracilis* is also found here. There are very few birds, mostly Orange Tangs and White-winged Wrens. We cross several stony stretches between intersecting creeks, large areas being quite purple with *Blennodia canescens*. Gibber Birds, Australian Dotterel and Banded Plovers are passed, all paired and probably nesting. We pull up at Paddy Paddy Waterhole, and find the whole of the creek banks occupied by thousands of Straw-necked Ibis, and the air for a few moments is full of these birds, rising in alarm as the motor comes up to them. The road after this is very rough for a while, then better as we pass over stony plains, and towards evening we fill our canvas bucket and waterbag at a dam and seek a sheltered spot amongst Mulga, Whitewood and *Eremophila Duttoni*, on the edge of a sand ridge, for a night's camp.

An early morning ramble over the sandhill has much of interest: the sand, smoothed by the previous day's wind, is now covered with the tracks of creatures that come out at night, and early morning birds, and we find it an interesting pastime to track these to their ultimate destinations, or to guess at the purpose of their wanderings. The trees on the ridge are Mulga, Gidgee, Whitewood, and occasional Bloodwood and *Acacia cana* again. I flush an Owlet Nightjar from a hollow, and find Yellow-throated Miners, Crested Pigeons, Chestnut-eared Finches and Little Crows in fair numbers. The undershrub consists of *Cassia Sturti*, *C. desolata*, *C. phyllodinea* and *Eremophila Duttoni*. Resuming our journey over gravelly

plains, we flush two pairs of Gibber Birds before coming to two intersecting fences, compelling us to go through three gates to pick up the road again in "gibber" country, covered in annual saltbushes and other herbages, with Mitchell Grass, *Astrebla pectinata*, growing in the Gilgais. A fine Black Falcon is patrolling overhead on the look out for some unwary bird to rise into the air. Not far into this paddock we flush a pair of Gibber Birds, and soon find the nest, rather openly placed amongst the stones and herbage. Bush Larks are singing in the air high overhead, and it is not long before we come upon a Pratincole, with a small chick following her. This swallow-like Plover is a beautifully-graceful bird on the wing, and is also quite at home running over the gravelly plains which form its usual habitat. Gibber Birds are fairly plentiful, and a second nest, from which the female flutters away over the stones, feigning a crippled state, is found, placed openly as the first, and containing three eggs. Another Pratincole, on bare, stony ground, sets us a task to find her eggs, for nest there is hardly any, and the eggs are coloured like the stone.

Several more of these birds are seen before we leave the more open country and come to Bransby Station, but do not delay there, as we are anxious to reach Yanco Station before evening. Another gravelly plain is crossed before reaching the ruins of an old station on a creek; this we cross and go on to the next creek for lunch, where there is a good waterhole. Evidently, from the number of flint chippings and old fireplaces, it must have been a favourite camping place of the aboriginals. A Spiny-cheeked Honeyeater's nest is found in a Eucalyptus—an unusual place for this bird. A Sparrow Hawk is being harassed by those bullies of the bush, the Greenies. On the road again we pass over open country into open scrub, where the herbage improves, the whole roadside soon becoming a garden of wild flowers. Many trees of *Acacia cana* are bursting into bloom, the canary-yellow inflorescence being well set off by the silvery foliage. Dead Finish is flowering also, and the ground is in places white with *Helipterum floribundum*, or golden yellow, from the profusion of *Helipterum polygalifolium* and other yellow composites in lesser numbers. In thicker scrub there is a mixture of *Trichinium alopecuroides*, the thistle-like *Podolepis rutidochlamys*, the large lavender daisy, *Brachycome ciliaris*, *Senecio Gregorii*, in patches of brilliant yellow, or with downy, seeding heads. Amongst the underscrub, *Cassia Sturtii*, *C.*

desolata and *Eremophila Duttoni* are all flowering and in fine foliage. We pull up at Little Dingera and have a cup of tea with the family, and are soon out again amongst the same garden of flowers till we reach Yanco Station, where we run into a party of drovers. About three miles beyond the station we camp at a billabong out from the Warri Warri Creek. Two of us walk over to the creek proper before dark to look up an old camping place, but find the waterhole much reduced in size from silting in the intervening years.

On the following morning we are all up early and on the road again, but pull up where wild flowers and birds appear to be numerous. Budgerigars are now arriving from the north in small flocks. Cockatoo Parrots are going over in larger numbers. Crested Bronzewings, Diamond Doves and Peaceful Doves and Bluebonnets are common. Chestnut-crowned Babblers in the scrub, and White-browed along the creeks; Brown Tree Creepers amongst the creek timber, and the White-browed out in the scrub. Black-faced Wood Swallows—one pair had a nest containing four eggs in a Dead Finish; and the two migratory ones, the White-browed and the Masked, were all fairly plentiful. Singing, Black and Spiny-cheeked Honeyeaters are all busily engaged in domestic duties or hunting for their breakfasts. Mulga, Gidgee and *Acacia cana* are all in fine foliage, for semi-desert species, and the ground is well covered with herbage. The Wild Parsnip, *Didiscus glaucifolius*, is one of the most conspicuous; tall, and covered with its mauve flowering heads, it overtops most other flowering plants. *Podolepsis rutidochalmys* is as tall; but, with only a small thistle-like flower, it is not nearly so conspicuous. *Helipterum polygalifolium* is the brightest of the "everlastings," but whole tracts of scrub are carpeted with the fine pale Heliotrope Daisy, *Brachycome ciliaris*, the flowers being unusually large. Two nests of the Chestnut-eared Finch are found, one in a pendent bough of an *Acacia cana*, and the other in a hollow, dead Mulga stump; both contain eggs. These little birds are not particular as to a site for a nest. A Singing Honeyeater has a nest and two eggs in a bunch of Mistletoe, *Lorantus quandang*, growing on a Mulga; this is the commonest of these parasites. *L. Linophyllus* is also on Mulga and Turpentine Bush, *Eremophila Sturti*, and is in flower and fruit. A pair of Black Honeyeaters, *Myzomela nigra*, are building on a dead branch, and another pair have eggs in a tiny nest, also

on a dead branch of an *Acacia cana*, and the colours of nest, sitting bird, and branch blend so that they are difficult of detection.

A conspicuous tree here is the Cork Tree, *Hakea intermedia*, with rugged, corky bark, and all leaves reduced to prickles. Some of these trees are 25 feet in height, but most of them are from 10 to 15 feet. Along the Warri the trees are *Eucalytus rostrata* and *E. microtheca*. We call at Naryilco Station, and, going on, pass back into New South Wales through the Warri gate in the boundary fence in time to make Olive Downs for tea; leaving again soon after, the road becomes very rutty, and before we are two miles out we break a spring, log it up, and keep going, cross the Grey Range again, and arrive at Tibboobburra at about 8.30 p.m.

On the following morning we go out with the local sergeant of police to look up a Wombat which he had seen several days previously, going towards a rabbit burrow, into which it disappeared. He had lived for many years at Delegate, on the Victorian border, where these animals were numerous, and was well acquainted with them, and was quite sure that the animal he had seen was a Wombat. However, after a careful examination of the ground and burrow, we came to the conclusion that the sergeant had seen some other and smaller animal, probably an Echidna. A Mr. Manoel also told us, when speaking of foxes, that he had seen a pair of Dingoes hunting a fox along a netting fence, one keeping behind the fox and the other out from the fence; they soon caught it and tore it to pieces and had it mostly eaten before he disturbed them. When we were at Adavale and Quilpie we learned from local people that the Dingoes were keeping the foxes in check. The paddock we passed through in our search for the Wombat was looking very well with Wild Parsnip and composites. In amongst the granite boulders surrounding the town, *Prostanthera striatiflora*, was flowering freely, with *Eremophila Freelingi* and *Trichinum obovatus*.

Soon after lunch we leave for Milparinka, passing a Bloodwood in full bloom on the outskirts; this one had creamy-white flowers, but north from this town are several of the same species of trees whose flowers are rose-coloured. This is its southern limit in this part of the State. Over Gibber country for about fifteen miles we come to a Gidgee, *A. Cambagei*, forest, which continues until we cross the Evelyn Creek, named by Sturt after his brother, Evelyn Sturt, and run into Milparinka, which we soon leave behind. Recrossing the

creek, we come, at seven miles, to the Bluff which marks the southern limit of range of *Acacia Cambagei* and *Acacia cana*. The Coally flats, subject to inundation by the same creek, are looking well, and we pass many fine stretches that are purple with a luxuriant growth of the Gilgai Pea, *Swainsona procumbens*. Sandhills succeed this; sparingly timbered with Mulga and Dead Finish, the ground being covered with the Ham-and-Eggs Daisy, *Myriocephalus Stuarti*, now well in flower. Cobham Lake appears like a large mirror in the evening light, and its surface is dotted with swans, several with cygnets. We keep on the road for several miles, and then pull off the track into a sheltering clump of mulga to camp, when the crest of Koonenberry loomed in sight out to our left. Attracted by our fire, numbers of large green, offensively-smelling beetles invade our camp, and make things very unpleasant, and keep us busy throwing them into the fire.

On the following day we soon pass Iduna Park Hotel, a solitary hostel on a bare, gravelly plain. From this class of country we pass into sand and Mulga again at Packsaddle, then on to Bancannia Lake, where we note flocks of Avocets and many Red-capped Dotterel on the shore line. On our way to Sandy Creek bore we found the Daisy, *Myriocephalus Stuarti*, only in early bud on our way up, now in full flower. From Sandy Creek to Fowler's Gap, over a gravelly plain, we note several pairs of *Ashbyia Lovensis*, and a white carpeting of *Helipterum corymbiflorum*, with patches of the dull Yellow-button Daisy, *Craspedia crysantha*. The Euriowie Hills are in places a blaze of yellow from the profusion of *Helipterum polygalifolium* clothing the hillsides and valleys. After leaving the hills we find the country, bordering the grand unconformity of geologists, covered with either *Helipterum corymbiflorum*, *Craspedia crysantha*, or a mixture of the two. A few hours more and we are all settled down in Broken Hill again after an absence of thirty days.

Our plant specimens were entrusted to Mr. E. Morris, a local enthusiast, who submitted those taken in Queensland to Mr. C. T. White, the Government Botanist of that State; the New South Wales specimens to the Sydney Herbarium authorities; and one Eremophila, previously taken in South Australia, to Mr. Black, so that I am indebted to Mr. Morris and the authorities mentioned for the naming of the plant specimens, and my thanks are due to them for the trouble taken.

The Victorian Naturalist

Vol. XLI.—No. 8. DECEMBER 3, 1924 No. 492

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 10th November, 1924.

The President, Mr. J. Searle, occupied the chair, and about sixty members and visitors were present.

REPORTS.

A report of the excursion to the Brisbane Ranges on Saturday, 25th October, was given by the leader, Dr. C. S. Sutton, who said that a small party left town by the morning train for Bacchus Marsh, from whence they motored out about five or six miles towards Staughton Vale. Here the ranges were entered, and the track followed to the Geelong Reservoir. Owing to the cool and moist season, quite a number of interesting plants were still flowering, and a good collection of specimens was made.

A report of the excursion to the Domain, South Yarra, on Saturday, 1st November, was given by the leader, Mr. P. F. Morris, of the National Herbarium. Some twenty-five species of grasses were collected, nearly all of which were introduced species; their principal characters were pointed out, and attention was called to the dependence of the human race on grasses and their products for food, textile manufactures, etc., while domestic animals were also to a large extent dependant on them in one form or another.

A report of the excursion to Mornington on Tuesday, 4th November (Cup Day), was given by the leader, Mr. F. Cudmore, who said that a party of ten left town by the early train, and was met at Mornington by four local friends. The coast road was followed for about two miles to the "Fossil Beach." Here lunch was partaken of, and then, descending to the beach, the hunt for fossils commenced. These occur in a deposit of "blue clay," partly below sea level, and are fairly numerous, representing a large range of species. The find of the day was a perfect specimen of *Cypræa gigas*, McCoy, the largest known species of cowrie, living or fossil. Fragments or complete specimens of several other notable species were also obtained. A couple of hours were pleasantly spent, and the party returned to the station for the 5 p.m. train just as steady rain was setting in.

A report of the excursion to Eltham on Saturday, 8th No-

vember, was forwarded by the leader, Mr. W. Tonge, who said that about fifteen members had visited Eltham for the purpose of an afternoon among the birds. The afternoon was not promising for ornithology; however, in course of the afternoon, quite a number of species were met with, the first being three White-fronted Herons, perched in the top of a dead gum, assuming attitudes resembling dead branches. The nest of a pair of Rosella parrots in an old decayed stump was noted. Numerous other nests were found, and after afternoon tea at the leader's house the party left for the evening train.

Mr. F. Pitcher said that the members were very much indebted to Mr. Tonge for the interest of the afternoon's outing, and moved that a hearty vote of thanks be accorded to him and Mrs. Tonge for their hospitality. This was seconded by Mr. C. Daley, and carried unanimously.

ELECTION OF MEMBER.

On a ballot being taken, Rev. Geo. Cox, "Gunyah," Mornington, was duly elected a country member of the Club.

GENERAL BUSINESS.

The hon. treasurer, Mr. A. G. Hooke, reported that the Exhibition of Wildflowers had been a financial success. There were still some sales of tickets to be received, and some accounts to be met, but he anticipated there would be about £100 to share between the Bush Nursing Association and the Club.

The President congratulated the members on the result, which he considered very satisfactory.

Mr. H. B. Williamson, F.L.S., said that, from a botanical point of view, it was also satisfactory. It was unfortunate that some flowers intended for exhibition had not reached town till the next day, and that some exhibits did not bear the name and address of the sender, so could not be properly acknowledged.

Reference was made by Mr. F. G. A. Barnard to the kindness of Mr. F. Keep in providing two portable stands for use at the flower show, and for arranging for the cartage required on the day of the exhibition. He moved that a vote of thanks be accorded to Mr. Keep. This was seconded by Mr. F. Pitcher, and carried by acclamation.

Mr. C. Daley, F.L.S., drew attention to the destruction being caused by sawmillers in the valley of the Loch River, near Noojee, where some fine myrtle beeches and fern gullies were being spoiled by the extension of tramways. He read a draft of a letter which he suggested should be sent to the

Forest Department, asking that every effort should be made to preserve the beautiful beech and fern gullies of the district.

Mr. A. G. Brown, M.A., endorsed all that Mr. Daley had said, and seconded the resolution that a protest should be made to the department regarding the matter. The motion was adopted.

PAPER READ.

By Mr. J. H. Harvey, A.R.I.V.A., entitled "Notes Along the Coastal Railway, from Brisbane to Maitland."

The author, with the help of a fine series of lantern slides, gave some account of the scenery met with during the railway journey from Brisbane to Sydney, via the coastal line. This line, which may eventually become the main route between Sydney and Brisbane, passes through some fine semi-tropical country, with associated big rivers. From the line can be seen many crops unknown to southern residents, such as sugar-cane, pineapples and bananas. He also gave a number of illustrations of the towns passed through, some of which are of considerable importance.

EXHIBITS.

By Mr. C. H. Borch.—Thirty-three species of Satyrid Butterflies, "browns," including eleven Victorian, three New South Wales, sixteen English, and six Foreign, some of them showing remarkable colourings for this family.

By Mr. F. A. Cudmore.—A large fossil shell, *Cypræa gigas*, McCoy, from the tertiary (Balcombian) clays of Balcombe's Bay, Mornington, collected on the Club's excursion, Cup Day; also several cases of fossils from the same locality.

By Mr. V. Miller.—Fossil shells from Fossil Beach, Mornington.

By Mr. J. Searle.—Parasitic Copepoda, Lernaeopoda sp. on the claspers of the Ghost Shark, *Chimaera Ogilbyi*, from Bass Strait.

By Dr. Sutton.—*Senecio elegans* from Point Lonsdale. Four years ago one plant was seen near the lighthouse; now it is very prevalent. Also herbarium specimens of the following plants from the Brisbane Ranges:—*Eriostemon obovalis, Pultenæa laxiflora, Bossiæa microphylla, Grevillea floribunda, G. aquifolium, G. parviflora, Olearia iodochroa, O. teretifolia, O. pannosa, Prosthanthera denticulata, Pomaderris ferruginea*, and others.

By Mr. H. B. Williamson, F.L.S.—Living specimen of Lizard, *Trachydosaurus rugosus*, collected at Kooloonong, Northern Mallee.

After the usual conversazione the meeting terminated.

EXCURSION TO BENDIGO.

On Saturday, 4th October, the occasion of the Railways Picnic was taken advantage of, and five members of the Club journeyed to Bendigo by an early train, where they were met by Mr. D. J. Paton. After dinner, from the terminus of the train line at Back Creek, the party proceeded in a south-easterly direction through the ranges. The country was looking at its best, the early rains having had the effect of making the wildflower season earlier than usual; hence, the Golden Wattle, *Acacia pycnantha*, except for a belated bloom or two, was in the fruiting stage, whilst the Fairy Wax-flower, *Eriostemon obovalis*, was past its best. These two plants, amid the Ironbarks, *Eucalyptus sideroxylon*, are the glory of the hills when in full bloom in September. However, the Wax-flower still made a fair show, whilst the Pink-eye, *Tetratheca ciliata*, with its ever-attractive flowers, varying almost from pink to magenta in colour-shading, was very fine. The Narrow-leaf Bitter-Pea, *Daviesia corymbosa*, and the Gorse Bitter-pea, *D. ulicina*, were in good flower, as also the Rice-flower, *Pimelea spathulata*. Orchids were scarce, but the Wax-lip Orchid, *Glossodia major*, still lingered. Droseras, Helichrysums, and a few composites, were flowering. An evidently intrusive patch of Common Fringe-Myrtle, *Calytrix tetragona*, was met with, its clustering pink flowers being very fine. The Diggers' Speedwell, *Veronica perfoliata*, was in bud. In the vicinity of Peiper's Hill, near the Strathfieldsaye Road, the scrub flora improved. Crossing the road, the Sun Orchids, *Thelymitra aristata, and T. longifolia*, were numerous, and of large size. The Geebung, *Persoonia juniperina*, was in fruit. The Mountain Grevillea, *G. alpina*, varying in shade from almost white to red, was abundant through the ranges; also the Common Fringe-lily, *Thysanotus tuberosus*, and the Flax-lily, *Dianella revoluta*. A diversion was made to the Grassy-flat Reservoir, and past St. Aidan's Orphanage on the homeward track, about six or seven miles being traversed in all.

On Sunday the party proceeded by motor through Kangaroo Flat, the fine avenues of elm trees and Blue Gums *en route* being much admired. Near Kangaroo Flat the gums on the roadside have not been much interfered with, and provide both ornament and shelter. Reaching the Gap at the Big Hill, our destination, we left the motor, and climbed up the hill to the highest point, the aneroid registering 1620 feet above sea-level. From here a most pleasing and exten-

sive panorama of great extent was before us. Southwards was Mt. Alexander and neighbouring ranges; further westwards, and not far distant, the Mt. Tarrangower ranges, the Daylesford Ranges in the farther distance, and on the horizon the outline of the Pyrences. Past intervening ranges, Mount Hooghly, near Dunolly, and Mts. Moliagul and Kayonra stood out, then Mt. Korong, to the north-west, and over the plain country Pyramid Hill, due north. Eastward, the trees obscured the view somewhat, but the ranges of the Heathcote and intervening country were visible, whilst seven miles away, amid its hills, lay the city of Bendigo. Here and there were glimpses of settled places, and water conservation. The whole country, owing to plentiful rains, was verdant. From Big Hill can be seen in marked contrast the striking difference between the flora of the granite areas with their open, park-like aspect on the eastern side, and the denser forest growth of the more broken ranges of the Ordovician measures on the other. Towards Ravenswood, a little distance away, at the foot of the granite hills, and along the valleys, were extensive patches looking like snow amid the green sward. A visit to one of them showed that the white patches were caused by countless numbers of the composite *Helipterum calvla*. After lunch on the summit of the hill, a course was taken through the slopes and valleys, eastwards. Wax-flower was again scarce. Orchids represented were, *Glossodia major*, a specimen each of the Snake Orchid, *Diuris pedunculata*, and the Musky Caladenia, *C. testacea*, three flowers of Pink Fingers, *C. carnea*, completing the list. Of Acacias, only *A. armata* was in bloom. The Prickly Grevillea, *G. aquifolium*, with blackish flowers, is found growing freely in this area; also, scantily, the Purple Swainson Pea, *S. lessertifolia*. Creamy Stackhousia, *S. linarifolia*, with flowers varying from creamy to yellow, was abundant. We were fortunate to gain the shelter of our conveyance at Cherry-Tree, just before the bursting of a storm, which had been long brewing, and to reach Bendigo without being drenched by the rain. The number of species of plants seen on Saturday was 63, and on Sunday 94—total, 113. The week-end was most enjoyable, weather and other conditions being favourable.

This was the seventh Club excursion to Bendigo, and there are still areas unvisited, which will well repay inspection. Time was found on Saturday to visit the Conservatory and Fernery, both of which have attractions, and are in good order, whilst the results of tree-planting in the streets many

years ago gave frequent cause for admiration of this wise policy. It was noticed that in the streets the Wax-flower and other wildflowers were on sale, this growing practice being much against the preservation of the native flora.

The following seventeen plants have not been recorded previously on these excursions:—

GRAMINEÆ—
Stipa setacea
CYPERACEÆ—
Lepidosperma filiforme
LILIACEÆ—
Dianella levis
Lomandra filiformis
PORTULACACEÆ—
Claytonia australasica
LEGUMINOSÆ—
Pultenæa laxiflora var pilosa
Swainsona lessertifolia
GERANIACEÆ—
Erodium cygnorum
CALLITRICHACEÆ—
Callitriche verna
GUTTIFERÆ—
Hypericum japonicum
BORAGINACEÆ—
Cynoglossum sauveolens
SCROPHULARIACEÆ—
Veronica perfoliata
GOODENIACEÆ—
Velleia paradoxa
BRUNONIACEÆ—
Brunonia australis
COMPOSITÆ—
Toxanthus Muelleri
Helipterum cotula
Helipterum exiguum
Guaphalium luteo-album

D. J. PATON.
CHAS. DALEY.

EXCURSION TO MORNINGTON.

A party of ten members caught the 8.45 a.m. train on Tuesday, 4th November (Cup Day), for Mornington. On arrival there four local friends joined the party, which then followed the coastal road in a southerly direction towards the Fossil Beach. About two miles from the station a sign-post marks a track, which descends through the scrub to the sea. Tables and seats, sheltered by the trees, have been erected by the local Progress Association on a small cliff overlooking the bay, and as the track has been rendered suitable for cars this spot is rapidly becoming a favourite picnic spot. At one time a cement works was established here, but the long-disused lime kilns are now overgrown by trees. On the beach can be seen the outcrop from which the limestone was obtained. After having boiled the billy and had lunch, the party walked along the coast for some 200 yards towards Mornington, until the best exposure of the fossiliferous clays

was reached; there a search was commenced for fossils. Geological hammers and a pick were used to dig up the clays, when the fossils, which were plentiful, were extracted in perfect condition with the aid of knives. A specimen of *Aturia Australis*, McCoy—a cephalopod shell allied to Nautilus—was obtained; a very closely related species is common in rocks of a similar age in Europe. The rare *Nautilus Balcombensis*, Chapman, was represented by some fragments. A specimen of the bivalve shell, *Cucullæa corioensis*, McCoy, was the largest the leader has seen from that locality, and was of particular interest, as it showed the carbonised remains of the hinge ligament. Species of corals, cones and volutes were common, while the cowries collected included a small, ridged form, *Trivia avellanoides*, McCoy, which is still living off the N.S.W. coast in deep water. A fine specimen of *Cypræa gigas*, McCoy, was exposed by the pick, and is exhibited to-night. This is the largest species of cowrie, living or fossil, in the world, and is considered a great find by fossil collectors. After having spent a couple of hours collecting, the party returned to the picnic tables for afternoon tea, later walking back to Mornington to catch the 5.10 train to town. With the exception of one shower, the rain held off until the party had returned to Mornington, and I think members enjoyed the outing.—F. Chapmore.

EXCURSION TO ELTHAM

The afternoon of Saturday, 8th November, was not too promising for ornithology, but about fifteen members turned out for the afternoon's outing. The bridge leading to our destination being under water—the creek being in heavy flood—we were obliged to make a detour along the railway, which caused some delay in getting to our working ground. The district is rich in bird-life, but the birds were unusually quiet, which is not usual after rain. However, as we approached the creek again there was more evidence of some species, at least. The first interesting event was the approach of three White-fronted Herons, *Notophoyx novæ-hollandiæ*, which alighted in a dead tree, and assumed attitudes resembling the dead branches. One of the party was not long in locating a nest of the birds high up in the horizontal limb of a tall River White Gum, *Eucalyptus radiata*, and containing one young bird perched motionless on the edge of the nest. Passing along the siding of the gully, from

which some orchids and other wildflowers were gathered, the nest of a pair of Hazel-eyed Crows, *Corvus coronoides*, was noted about 60 feet up in a Stringy Bark, some of the birds being disturbed from about the nest. Close by, on the horizontal limb of another Stringy Bark, a pair of Choughs, *Corcorax melanorhamphus*, had their nest, containing young birds. After a little delay we succeeded in locating an old, decayed stump, where, in the earth at the bottom, a pair of Rosella Parrots, *Platycercus eximius*, had cleaned out a hole for a nest on 5th October. On the 8th there were three eggs in the hollow, with the female sitting on them to keep them dry, but, owing to the heavy rains at the time, they were later abandoned. A little farther on another Chough's nest was noted, also built on a limb of a Stringy Bark. Not far away a pair of Sparrow Hawks, *Accipiter cirrhocephalus*, had their nest of twigs and leaves built about 25 feet up in a Stringy Bark tree, the male bird doing a fair share of the sitting. While watching one of the birds sitting on the nest, its mate was sailing about overhead with a small bird in its talons, evidently for the sitting bird. In the gully close by we came to the nesting hole of a pair of Spotted Pardalotes, *Pardalotus punctatus*, from which the young birds had flown early in October. Overhead a male Rufous Whistler, *Pachycephala rufiventris*, was giving a fine exhibition of its vocal powers. The party then proceeded up to the house, and had afternoon tea, after which a few more nests near the house, including the snug little nest of the Short-billed Tree-tit, *Smicrornis brevirostris*, built low down in a hanging bough of Red Box; the nest of a pair of Brown Fly-catchers, *Microeca fascinans*, and other nests were examined before leaving for the station.—W. C. Tonge.

The Tasmanian Naturalist.—This journal, which has been missing from our exchanges since 1911, owing to the inability of the Tasmanian Field Naturalists' Club to overcome the greatly increased charges for printing and publishing, has reappeared as No. 1 (New Series), for October, 1924. It consists of twenty-eight pages (double-column) of articles by Tasmanian naturalists. Mr Clive Lord writes on the fish fauna of the State, also Tasmanian reptiles, parrots and whales. Mr. A. N. Lewis deals with outlines of geology, as evidenced in Tasmania; Mr. L. Rodway with gum trees. Altogether a useful contribution for nature students.

EXHIBITION OF WILDFLOWERS.

The Annual Exhibition of Wildflowers was held in the Melbourne Town Hall on Tuesday, 21st October, 1924. The date mentioned was the earliest in October on which the hall could be obtained, and in ordinary seasons would probably have proved much too late to make a good display of our native flowers, but, fortunately, the season turned out so wonderfully cool, with frequent showers, that when the day arrived it was found that the display was quite up to the average of previous years. A late date has its compensations, for it enabled flowers to be exhibited which do not bloom till after the usual date of these exhibitions.

The exhibition was officially opened by Sir James Barrett, President of the Victorian Bush Nursing Association, to which society it had been announced that half the net proceeds would be given. In declaring the exhibition open, which he did with a very brief speech, Sir James Barrett said that there were three things to be grateful for, viz., that we had such beautiful flowers, that the public took such an interest in them, and that the Bush Nursing Association would gain in funds by the holding of the exhibition. He congratulated the Club on the excellence of the display, and the fine attendance of visitors.

Owing to the generosity of a member, two portable stands were erected in the centre of the hall, and enabled large quantities of flowers to be displayed to better advantage. The nearest to the entrance was filled with the Fairy Wax-flower, *Eriostemon obovalis*, and other flowers from the Tarradale district, specially collected by Mr. G. Coghill. A fine display of Australian flowers, grown at the Melbourne Botanic Gardens, was, by the courtesy of the Director, Mr. W. Laidlaw, B.Sc., made by Mr. P. R. H. St. John, whose interest in the Australian flora is well known. Among the fifty or so species exhibited may be mentioned the crimson flowers of the Queensland Spear-lily, *Doryanthes palmeri;* several species of Grevillea, from various States; Boronias, Pultenæas, Dillwynias, Kunzeas, Westringias, Chorizemas, Swainsonas, etc., the whole making a brilliant and effective display. Included in the exhibit was a quantity of *Boronia pinnata*, from Labertouche, West Gippsland, a charming shrub, which is deserving of extensive trial in our gardens. From the gardens came also a quantity of native foliage, which greatly helped in the decoration of the hall.

The orchid display made by Mrs. Coleman, of Blackburn, and friends, was a centre of attraction. Here, at least fifty species of orchids from all parts of the State were displayed. The genus Caladenia was represented by a dozen species, including *C. alba, angustata, cucullata, cordiformis, cardiochila, dilatata, leptochila, reticulata* and *testacea;* ten species of Sun-orchids, Thelymitra, including *T. epipactoides, grandiflora, macmillanii* and *paniculata;* ten species of *Pterostylis* (Greenhoods), including *P. alpina, barbata, falcata, mutica, pusilla,* and apparently a new species or variety, probably a hybrid between *P. falcata* and *P. nutans.* Others were *Sarcochilus parviflorus, Calochilus Robertsoni, Lyperanthus nigricans, L. suaveolens, Diuris longifolia,* and *Microtis parviflora.* An interesting plant of *Caladenia dilatata,* with a flower-stem eighteen inches long, was exhibited by Mrs. Howie, of Vermont, the leaf and flower being proportionately large. Some of the exhibits sent by State Schools consisted largely of orchids, that by the Emerald School being especially good, while Master R. Foubister, of Panton Hill School, sent a most carefully collected series, in splendid condition.

Owing to the late date of the exhibition, *Glossodia major* did not make that splash of colour which usually sets off the orchid display.

A long table was set apart as a "Classification Table." On this Mr. H. B. Williamson, F.L.S., grouped together specimens of certain orders, such as Proteaceæ, Compositæ, Leguminosæ, Myrtaceæ, from all parts of the State, so that students might be able to see at a glance the relationship between the various genera.

The exhibition was under the management of Mr. F. Pitcher, to whose enthusiasm much of its success is due. He was ably assisted by Mr. H. B. Williamson, F.L.S., Dr. C. S. Sutton, and Mr. G. Coghill, to whom fell the impossible task of trying to name the specimens in time for the admittance of the general public.

Included in the display of Western Australian flowers, kindly secured through the good offices of Miss Amy Fuller, were a number of very showy species, several of which had not been seen at previous exhibitions. The ever-popular Kangaroo-paws from that State were in great demand, and likewise the Waratahs from New South Wales. Perhaps the greatest novelty in the hall were some double flowers of the Fairy Waxflower, *Eriostemon obovalis,* sent by Mr. Semmens,

Forest Inspector, Bendigo, from a plant growing near his house.

Flowers were received from a wide range of localities, but it is impossible to more than name the locality and sender. Several packages were without the name of sender, or place collected. Contributions were also received from several Bush Nursing Centres, while collections from State Schools in various parts of the State showed the widespread interest created by the exhibition. As far as could be ascertained, the following is a list of localities from which packages were sent, with the name of the contributor, where given:—

North and North-west.—Taradale, Mr. G. Coghill, Mr. C. Hansford; Bendigo, Mrs. W. H. Warren; Korong Vale, Miss E. M. James; Maldon, Mrs. Brooks, Mr. A. McArthur; Tempy, Bush Nursing Centre; Rushworth, Mrs. Rich.

South-west.—Beaufort, Mr. S. Young; Stawell, Mr. J. A. Hill; Grampians, Mr. C. W. D'Alton.

South.—Forrest, Bush Nursing Centre; Brisbane Ranges, Rev. A. C. F. Gates; Wallan, Rev. W. F. Hart; Diamond Creek, Mrs. Saunders; Eltham, Mr. W. Tonge; Wonga Park, Mr. Dyer; Doncaster East, Mr. F. G. A. Barnard; Ringwood, Mr. James; Montrose, Mrs. G. Richards; Mt. Dandenong, Miss G. Nokes, Miss May and Jessie Young; Pakenham, Mr. F. Wisewould; Mornington, Rev. G. Cox; Red Hill, Mr. R. Haig, Mr. N. C. Higgins; Frankston, Mrs. J. O. Reid, Mr J. W. Audas, Mr. V. Miller; Cheltenham, Mr. C. Daley; Brighton, Mrs. Ballard, Middle Brighton, Miss S. Kinvig; Keysborough, Mr. H. Dickens.

South-east (Gippsland).—Garfield, Miss L. Dyall, Dromin, Mr. W. F. Dyall; Lardner, Miss C. C. Currie; Tyers, Miss J. Galbraith; Heyfield, Mrs. McFarlane; Briagolong, Mr. R. R. Penny; Bairnsdale, Mr. T. S. Hart; Paynesville, Mr. F. Barton, junr.; Hedley, Misses L. and E. Rossiter.

North-east.—Nagambie, Mrs. Cameron; Wattsville, via Dookie, Mr. O'Dowd; Lima East, Mrs. Evans; Beechworth, Miss M. Scott; Springhurst, Mrs. J. D. Read; Chiltern, Mrs. W. Boucher.

Flowers were received from the following State Schools:—Panton Hill, Queenstown, Wonga Park, Healesville, Mt. Evelyn, Emerald, Langwarrin, Red Hill, Black Rock, Newry, Nowa Nowa, Orbost, Middle Tarwin, Macedon, Deep Lead and Castlemaine.

Cultivated native flowers came from the gardens of Mr. J. Watson, "Maranoa," Balwyn; Mr. G. Coghill, Canter-

bury; Mr. L. Hodgson, Canterbury; and Mr. W. Robinson, flowers of Victorian Waratah, grown at Kinglake.

A display of about 350 water-colour drawings of Australian and South African native flowers by Miss Amy Fuller attracted considerable attention.

A volume of dried New Zealand Ferns exhibited by Miss Taylor, of Brighton, proved interesting to many visitors.

Interstate flowers were received from:—New South Wales.—Mr. Chalker, Hill Top. South Australia.—Miss E. Macklin, Adelaide; Mr. J. Davies, Hutt Street, Adelaide. Western Australia.—Mrs. D. Kelvington, Hawthorn, Perth, and Mr. T. H. Morgan, Darlington. Unfortunately, the flowers sent by the Field Naturalists' Society of South Australia were delayed in the post, and were too late for the exhibition. Owing to the severe drought at Broken Hill, the Barrier Naturalists' Club was unable to forward any flowers of Sturt's Desert Pea, an attractive flower, which is always in demand at the sales table.

Pot-grown plants of native species were on sale, and with the sale of bunches of flowers brought in a considerable amount. These sales were conducted by a number of ladies, headed by Miss A. Fuller, while Miss H. Gabriel and other ladies had the management of the refreshment tables.

Several members and friends provided microscopes, under which were shown botanical objects. These proved a great source of attraction and wonder.

It is expected that there will be at least £100 to share between the Club and the Bush Nursing Association.

The Cryptogams of the Hurstbridge Excursion.—The district traversed was not very favourable for the growth of non-vascular cryptogams. Of Hepaticae, several Lophocoleæ and Chiloscyphi, *Fimbriaria Drummondii*, a species of Frullania, and the common Austral Liverwort, *Marchantia cephaloscyphi*, were noticed, whilst the following mosses, with several others not gathered, were common, viz., *Bryum bimum*, *Brentelia affinis*, *Ceratodon purpureus*, *Funaria hygrometrica Taylaria octoblepharia*, *Tortula princeps*, *Thuidium furfurosum* and *Triquibrella papillata*. Fungi were also scarce, a few Agaries and Geasters (Earth stars) only being noticed. Little attention was paid to Lichens, but those seen were probably identical with those found in similar places round Melbourne.—J. R. Leslie.

NOTES ON THE COASTAL RAILWAY JOURNEY FROM BRISBANE TO MAITLAND.

By J. H. Harvey, F.R.V.I.A.

(Read before the Field Naturalists' Club of Victoria, 10th November, 1924.)

Leaving South Brisbane, the inner suburbs are passed through for about six miles, good views of One Tree Hill being obtained until Morooka is reached; then hilly country gives place to undulating landscape. After passing Bethania Junction, the line skirts the Albert River, afterwards crossing it. The country now becomes more hilly again, the formation consisting of sandstones and shales, the land being cleared and cultivated. Much of what appears to be Paperbark Tea-tree of a dwarf type is passed through, and at about thirty miles the bush is entered again. The Comera River, a fine stream, is crossed, the river flats being rich, and all well-cultivated; apart from the flats, the soil is poor-looking. At 47 miles Ernest Junction is reached. Here a branch line runs off to South port, a fashionable watering-place. From near here the cable is taken to Norfolk Island. Banana-growing country is now entered, and approaching Mudgeeraba are fine and very extensive flats and dairy farms. The decomposed shales and sandstones still persist. To the south-west the picturesque McPherson Range is now plainly seen, and after passing West Burleigh the line runs over sandy flats, followed by swamps, the ocean being only about 100 yards distant, until, at Coolangatta, on the New South Wales border, and 69 miles from Brisbane, the train draws up. Half a mile further is "Tweed Heads," which is really the terminus.

Tweed Heads and Coolangatta are virtually the same town, only being in different States. The "border line" is a piece of neutral land, only a few feet wide, along which are two fences, one on each side of the real dividing line; these are cattle-proof fences, to prevent tick-infected cattle from Queensland entering New South Wales. The two form rather a good town, electric lighted, possessing good picture theatres, and commodious family hotels; it is really a watering-place for Brisbane, Lismore and the back country. The geological formation here is basalt, which runs out into the sea on the north, forming Greenmount and Pt. Danger, and ends on the south in another headland, Point Fingal, on

which is a lighthouse with a revolving light. The Tweed River spreads out behind the town into a large lagoon. From the summit of a hill called the "Razorback" the scene is fairly extensive, and the topography of the country around may be easily studied. The Tweed is navigable as far as Murwillumbah, a run of three to four hours by the river steamer, and there is a good steam service, also a motor car service, the distance by road being 20 miles. I chose the steamer. Leaving Tweed Heads at 7 a.m., on a bright morning, we passed between plantations of bananas and sugar-cane, and these were varied with luxurious sub-tropical vegetation. The banana industry was, until a year or two ago, a very flourishing one; it was no uncommon thing for some of the planters to net £100 per week from bananas; then a disease known as "bunchy-top" developed, and large numbers of the planters were ruined. Many trees which had been attacked were pointed out to me as the steamer went along. At a place called Cudgell is a sugar mill, the railway lines from which run out 14 miles into the plantations. The growing sugar-cane is a light pea-green in colour, and looks not unlike maize; it grows to a height of about 12 feet, though I was told that it is no unusual thing for it to attain a height of 18 feet at times, with a thickness of 1¾ to 2½ inches. The hills are volcanic, and the soil on the flats is deep and rich. During the whole run, the fantastic outline of Mt. Warning provided fine backgrounds to the hundred pictures which opened out as the steamer progressed.

The run from Murwillumbah to Lismore is done by train, over basaltic country of a broken and very picturesque nature, with fine, rich brush foliage along the banks of the creeks which, as well as tunnels through spurs, are plentiful. There must at one time have been very dense forests all through here. The train left at 6 a.m., and the manner in which the hills and gullies were picked out under the early morning sun formed an endless series of pictures. Dairy farming appears to be the staple industry, while banana farms are plentiful on the hills. The approach to Byron Bay is over a morass-like area, and the hills which run out into the sea there form a bluff on which the lighthouse is erected. At Byron Bay there is a butter factory, said to be the largest in New South Wales (some say in Australia). Leaving Byron Bay, a steep hill is climbed, and the same kind of picturesque scenery is noted; the general look of the country was not unlike much of the Western District of Victoria.

Passing through Bexhill, the igneous country gives place for a short distance to slates, and a firebrick factory is noted. The shale formation is soon left, and the volcanic soil encountered again.

At 62 miles from Murwillumbah, Lismore is reached. Lismore is on a tributary of the Richmond River, and is a very well-built, lively and prosperous town. This run was the most charming rail journey that I had had for a long time. The town is built on a flat, which is situated in an alluvial basin, and has a pretty setting. It is connected with North Lismore by a good bridge. Ocean-going steamers trade between the town and Sydney, and other parts, the wharf being 70 miles from Richmond Heads; the distance by road is 20 miles. The town was a great place when the cedar and other useful timbers were plentiful; but things have changed, and the means of trade have to change with them.

Leaving Lismore, the hills are contoured by the line for some distance. They are very steep, and were apparently well-timbered at one time. As the line began to rise out of the valley, it was noted that dairy farms were abundant, and the soil was good. After leaving Bentley, a tunnel is passed through, and we now began to rise out on to the plain. After the Richmond River flats are left the country is not worth travelling, as far as scenery is concerned, and the soil passed through appears rather poorer, though now and then a better patch is seen. About five miles before reaching Grafton a glimpse of the Clarence is obtained, but the country is still flat and uninteresting. (It must be understood that I was out for scenery: I took but little notice of the economic value of the land.) Grafton, although so old a town—and a cathedral town, too—is exceptionally quiet. Every day there seems almost like Sunday. The streets are wide, and are laid out at right angles, and the principal streets are planted—some having two rows. These are red and white cedars, camphor laurels, planes, flame trees and grevilleas. In Prince Street is a plain brick clock tower, about 35 feet high. Every one of these towns has its picture theatre. In the street leading from the railway station to the town there is an avenue of jacaranda trees, which were in full bloom as I passed through. Some of the buildings are good, especially the Post Office Court House, two or three banks, and the Roman Cathedral. The river is said to be 750 yards wide, and connection with South Grafton is maintained by steam-ferry. Singular to relate, there is no electric light in Graf-

ton, which is gas-lighted, but the electric light is in use in South Grafton. The town is certainly old-fashioned. It is about 50 miles by river from the city to the Heads.

At South Grafton the train was picked up again, and the country soon changed, the part now entered showing shales and sandstones containing concretionary ferruginous bands, the general appearance being very similar to that of the Hawkesbury sandstone formation, and this continues for the greater part of the way from here to Sydney, broken only occasionally for short distances by sandy flats and marshy-looking patches here and there, and by short igneous intrusions. In places the hills and escarpments remind one of parts of the Kangaroo Valley, and other portions of the off-shoots of the Blue Mountains, although not quite so dramatic in appearance. After passing through Glenreagh, some of the bluffs are very bold. The streams that are crossed and skirted are lined with rich brush foliage, and as much of this was in bloom many of the gullies presented a very gay appearance; it gave one an idea of what scores of miles of this country must have looked like before it was denuded; the timber must have been very rich in parts of it. Suddenly, just before reaching Coff's Harbour, a chain of steep hills is passed through, and in these the brush and undergrowth, palms, elk-horn ferns, and vines grew quite luxuriantly; the whole place is a veritable jungle. At Coff's Harbour works to improve the harbour are in progress, and on one of the heads a large quarry, in what looks like a bluff of basalt, provides useful material for the work. Through Urunga to Macksville the rough country continues. Macksville is practically a wooden town, and the streets, such as could be seen, as it was almost dark, seemed irregular and narrow. Here we were hurried into a fourth-class hotel for tea, and as I had been told that there was only tame country between there and Taree, on the Manning, I went on to the latter town through Kempsey and Wauchope, 108 miles, in the dark. With that exception, I saw the whole of the country by daylight.

Leaving Taree at 9.30 next morning, the country resembled that in the locality of Penrith, east of the Blue Mountains. Soon the sandstone hilly country was met again, and the luscious foliage lining the streams that were crossed, with flame trees and other trees in full bloom, provided magnificent pictures which would have captivated any eye. The line runs along a valley, in which farms are plentiful, and

between Mt. George and Somerset the Manning is crossed; after this a stream was passed over, the jungle on which was so dense that the water could not be discerned, and the whole of the growth along it was a blaze of colour, the pale yellow, orange and red bloom being exceedingly prolific. Farms were seen beside the line, and flame trees, all scarlet with bloom, were plentiful; the richness of the foliage reminded me of that of blackwood, though what it was I am unaware. The landscape is now eroded into abrupt hills and V-shaped valleys, and bold ranges appear between the line and the coast. Some time before Gloucester is reached the line skirts the Barrington River, and lovely views are seen. Swamp oaks, apple tree, spotted gum, box, grey gum, white mahogany and blackbutt abound. The country continues mountainous, and near Gloucester is plenty of ironbark and tallowwood, the latter favoured for street-blocking and for floors.

Near Dingadee the road is seen winding through the seemingly-interminable sandstone, and after passing through another tunnel, about 700 yards long, the country resembles that about Picton on the southern line, the rich-looking paddocks and patches of luscious foliage recalling the scenery of the Illawarra district. Passing through Dungog, the same scenery continues, and, at 211 miles from Macksville, the pretty town of Paterson is reached. The river flats are very fertile, and support extensive dairy farms. The Hunter is crossed near Okehampton, and at 224 miles West Maitland is reached; here the main northern line is joined, and as far as I was concerned the journey was over, as I had traversed the route between there and Sydney so frequently before.

Very little bird life was noticed during the whole of the journey; this may have been due to the extremely high temperature that prevailed, or to the comparatively dry condition of the country—perhaps to both.

Regarding the topographical features of this route, it is of a far more picturesque and interesting nature than the main northern line, via Armidale and Tenterfield, for tourists who desire to observe scenery, and I hope to go over it again some day, under more favourable weather conditions.

THE EASTERN WATER-DRAGON, *Physignathus lesueurii*.—The three photographs of the Water-Dragon Lizard exhibited to-night were taken on the Aberfeldy River, Gippsland. The photographs of two other species of Dragon-Lizard are shown for the sake of comparison. Lucas and Le Souef, in their book,

"The Animals of Australia," describe the Water-Dragon as follows:—"Tail strongly compressed. Body, dark olive above, with darker and lighter crossbars, most marked on the tail; a broad dark band runs from the eye, over the ear, to the shoulders. The cheek pouch is barred with lines of yellow and blue. Length, to over three feet. Habitat, Eastern Australia." The Water-Dragon belongs to the family of Agamidæ, most members of which are unjustly known as "Bloodsuckers." The above-mentioned authors adopted the name of "Dragon Lizard" as being more appropriate. The Water-Dragon is the most distinctly aquatic lizard, and frequents the banks of creeks and rivers from Gippsland to Queensland. I have observed it only in the Thomson and Aberfeldy Rivers, where it appears to be very local, extending only for a couple of miles from the junction of the two streams, being more plentiful in the clearer, and warmer, waters of the Aberfeldy. In other streams of a similar character in the same district it is absent. It is fond of basking on a log or rock close to or in the stream, and there can be approached very closely if no quick movement is made. On being disturbed, it dives in, to re-appear almost immediately, swimming on the surface. If further molested, it dives and stays on the bottom for a considerable time. It swims with a serpentine motion, but not very rapidly, using the tail only, with the limbs pressed close to the sides. The food seems to consist mostly of insects and small animals floating on the surface of the water. From its resting place it plunges into the water to secure a drowning insect, and returns immediately to its look-out. Small dead or disabled fish may also be devoured, but I should say that it is not quick enough in the water to catch healthy ones. I once hooked one on a devon spinner in the Thomson, and on another occasion, while still fishing, a large one, after attempting to swallow the cork floater, dived down and took the earthworm bait. This specimen was sent to the Melbourne Zoo, where it lived for nearly a year. The Water-Dragon is a swift runner, and on a level surface will sometimes assume a semi-erect posture, and run for several yards on the hind legs alone. This peculiar gait is also characteristic of its distinguished cousin, the Frilled Lizard of Queensland. I am not aware that any of the other dragons do this, but the Long-tailed Racer Dragon, common in the Eastern scrubs of Port Phillip Bay, may do so. This latter is undoubtedly the champion sprinter of the tribe. The eggs of the Water-Dragons are buried in the moist sand bordering the water,

and the newly-hatched young ones are short-tailed, and very sluggish. They shelter amongst the loose stones, the colour of which they closely match, being in shades of dull brown. On account of this protective coloration and slow movements they are not easily discerned, and thus escape many enemies. They do not enter the water at this stage, as, doubtless, they would be liable to be devoured by adults of their own species there. Dragon lizards are easily tamed, and, if handled frequently and gently, will not attempt to escape or bite. The teeth are small and blunt, and a bite from a large specimen would hardly amount to more than a pinch.—A. E. Rodda.

10th November, 1924.

"In the Botanic Gardens."—In this booklet, of about eighty pages, the author, the Hon. Frank Clarke, M.L.C., has written a chatty and appreciative description of our Melbourne Botanic Gardens, and the dozen illustrations by Sears increase the charm of the production. Whether residents of other States and countries will agree with one of his opening sentences remains to be seen. He says—"There is nothing to equal the Gardens in all Australia, nor in Europe either." Before beginning his pilgrimage of the Gardens the author gives a brief account of their establishment and history to date. Attention is called throughout to notable trees, plants, etc., and one of his best twelve is *Melalenca styphelioides*, the Prickly-leaved Tea-tree, of New South Wales, growing on the Princes' Lawn, where its white trunk, surmounted by plumes of small dark green foliage, makes a perfect picture. The author seems to prefer to write "ti-tree," which the late Prof. E. E. Morris, in "Austral-English," regarded as an erroneous spelling, and, moreover, without justification, as "tea-tree" is derived from the use to which the leaves of one or more of the Melaleucas, and Leptospermums were put by sailors during the early voyages of discovery to Australia. The publication is admirably adapted for sending to friends at a distance, to give them some idea of the picturesqueness of the Gardens and their contents, or for overseas visitors to add to their collection of reminiscences of their travels. The author's enthusiasm is shown to the end, and his pleasant chat concludes thus:—"Our Botanic Gardens are the rarest thing in all-broad, beloved Australia."

WILD LIFE ON MOUNT EVEREST.—Our friend, Mr. A. E. Keep, during his visit to England has not forgotten the *Naturalist*, and its editor's troubles in securing short, interesting paragraphs. He sends a cutting from the *Times* (London), of 29th July last, in which Major R. W. G. Hingston records some of the fauna found at nearly 20,000 feet above sea-level. Man can exist without distress at 28,000 feet; a wild sheep, a small hare and other mammals are frequent at 17,000 feet. Snipe have been flushed at 15,000 feet. The redstart has been seen at 18,000 feet. Choughs have been seen flocking round a peak at 24,000 feet. Tibetans construct villages up to a height of 15,000 feet, beyond which they are unable to till the ground. At this height beetles may be found sheltering under stones. Even a colony of ants has been found, but both these insects exhibit signs of the intense cold, and hard conditions of the locality. Even butterflies and grasshoppers have been seen up to 17,000 feet. Pond-life also exists at 15,000 feet. Major Hingston concludes:—"Is there any portion of the earth's surface devoid of living creatures? . . . . . Here in this most bleak and inhospitable region, far above the last traces of vegetable existence, living creatures spread themselves abroad over the white wilderness of snow and ice."

A SYNOPSIS OF THE VERTEBRATE ANIMALS OF TASMANIA: By Clive Lord, F.L.S., and H. H. Scott. Hobart: Oldham, Beddome and Meredith. 1924. 21/-. 340 pp. (5 x 8¼).

This volume will be found useful by naturalists on both sides of Bass Straits, for many species recorded are found in Victoria as well as Tasmania. It deals with all forms of vertebrate life, from Lancelets to Bats, and includes a brief reference to the aboriginal inhabitants of Tasmania, now unfortunately extinct. A systematic list of the classes and orders is followed by brief notes about each species, sometimes accompanied by an illustration, such as an outline-drawing of the complete fish or animal, or, in the case of birds, the head only. Unfortunately, the volume lacks an index to the figures and plates, the latter not always being adjacent to the letterpress concerned. A glossary of terms used, and a brief outline of the geological succession of animal life, past and present, will be useful. An index of common names, and another of the classes and genera are included.

The Victorian Naturalist

Vol. XLI.—No. 9. JANUARY 7, 1925 No. 493

FIELD NATURALISTS' CLUB OF VICTORIA.

The monthly meeting of the Club was held at the Royal Society's Hall on Monday, 8th December, 1924.

The President, Mr. J. Searle, occupied the chair, and about sixty members and visitors were present.

REPORTS.

A report of the excursion to Altona Bay on Saturday, 15th November, was given by the leader, Mr. A. E. Rodda, who reported an interesting afternoon, when attention was called to various aspects of natural history, silicified lignite being seen at the disused brown coal mine, quite a number of birds being noted in the coastal scrub, while a freshly-caught specimen of the Port Jackson shark afforded an opportunity for close inspection of its peculiar dentition.

A report of the excursion to the Botanic Gardens on Saturday, 22nd November, for pond life was given by the leader, Mr. J. Searle, who reported a fair attendance of members. He said that many forms of pond life were very abundant, but nothing of special interest had been noted.

A report of the excursion to Black Rock on Saturday, 6th December, was given by the leader, Mr. H. B. Williamson, F.L.S., who said that an instructive afternoon had been spent among the plants found only in the neighbourhood of a sea beach. Owing to the low tide, a large area of grass-wrack (Zostera) was exposed, and could be examined at leisure.

ELECTION OF MEMBER.

On a ballot being taken, Miss L. McMahon, Whitehorse Road, Mitcham, was duly elected an ordinary member of the Club.

GENERAL BUSINESS.

The President announced that Miss G. Nokes, a well-known member of the Club, was about to spent a short holiday in New Zealand, and on behalf of the members wished her *bon voyage*. It was decided to give Miss Nokes a letter of introduction to kindred societies in New Zealand.

The Hon. Librarian reported that he had received from various societies and institutions a number of parts of publications required to complete the series in the Club's library.

He also announced recent additions to the library, and requested members borrowing books to observe the library rules.

PAPERS READ.

1. By Mr. J. C. Goudie, entitled "Notes on the Coleoptera of North-Western Victoria." Part XII.

The author gave a list of the species of beetles belonging to the families Mordellidae, Cantharidae, Œdemeridae, and Curculionidae, which he observed in the Sea Lake district, the last-named family, which is very numerous throughout Australia, being represented by over one hundred species, some of which have not yet been identified.

Some remarks were made by Mr. F. G. A. Barnard (who read the paper in the absence of the author) and by Mr. C. Oke, who spoke of the value of Mr. Goudie's painstaking work on the beetles of his district.

2. By Mr. C. Daley, F.L.S., entitled, "Around Noojee."

The author gave some account of a week spent recently with Mr. J. W. Audas, F.L.S., among the hills and fern gullies of the Noojee district, situated in the Latrobe Valley, about thirty miles north of Warragul. Attention was called to the threatened spoilation of one of the beauty spots of the district known as Myrtle Bower, by the extension of a saw-mill tramway. A list of the trees and plants observed, numbering about two hundred and fifty, was appended.

The Chairman and Messrs. A. G. Brown, F. Pitcher, and E. E. Pescott, F.L.S., spoke as to the interest of the paper, and the need for more careful consideration of beauty spots by the Forest Department when authorising the construction of timber tramways.

NATURAL HISTORY NOTE.

Mr. P. R. H. St. John called attention to his exhibit of two species of Eucalyptus hitherto unrecorded for Victoria, which he had recently collected in the Mt. Toole-be-wong-Ben Cairn district. He also gave an account of a fight he had witnessed between two male Lyre Birds in the same locality.

EXHIBITS.

By Mr. C. Barrett, C.M.Z.S.—Two species of "Eyed" Elaters (click beetles), genus Alans, from United States of America.

By Mrs. Coleman.—Flowers of following orchids:—*Cryptostylis longifolia*, from Blackburn, 8/12/24; *Pterostylis pusilla*, cultivated specimens grown at Blackburn, fourth time of flowering; *Pterostylis decurva*, from Fern Tree Gully, 7/12/24; *Pterostylis decurva*, albino form, found growing in the open in strong sunlight at Fern Tree Gully, 7/12/24.

By Mr. F. Cudmore.—Fossil teeth of extinct species of Cestracion Sharks from the rocks of Beaumaris. Four species represented, viz.: *Strophodus cocenicus*, Tate; *Cestracion cainozoicus*, Chapman and Pritchard; *C. longidens*, Chapman and Cudmore; and *C. Novo-Zealandicus*, Chapman. A species of Cestracion, the Port Jackson shark, is still living in Australian seas.

By Mr. J. E. Dixon.—Sixty-seven species of beetles collected at Gypsum Siding, and Lake Hattah, North-West Victoria; also specimens of "Kopi" from Gypsum Siding.

By Mr. C. French, junior.—Specimens of a scale insect, genus Pulvinaria, probably new to science. Collected at Kewell (Wimmera), by Mr. Jos. Hill.

By Mr. A. E. Rodda.—Specimens of Silicified Lignita, showing minute quartz crystals, lower jaw, dorsal fins, spines, and egg-case of Port Jackson shark, collected on Altona excursion.

By Mr. A. L. Scott.—Photograph of Black Rock excursion party, and of White-fronted Heron (in tree).

By Mr. P. R. H. St. John.—Herbarium specimens of *Eucalyptus agglomerata*, Maiden, from Bunyip, 19th October, 1924, and from Mount Toole-be-wong, 5th December, 1924, unrecorded for Victoria; *Eucalyptus Blaxlandii*, Maiden, Blue Stringybark, from Ben Cairn, Millgrove, 5th December, 1924; juvenile foliage of Shining Gum, *Eucalyptus nitens*, Maiden, not before exhibited; *Blechnum laevigatum*, Cav., from Mount Toole-be-wong and Ben Cairn, 5th December, 1924, first record for Victoria.

By Mr. A. J. Tadgell.—Red Brome Grass, *Bromus rubens* (introduced), from Mt. William, near Lancefield, collected by exhibitor, November, 1924. Previously collected by exhibitor on the Keilor Plains and beyond Sunbury, 1923. This grass is closely allied to *Bromus Madritensis*, both species being of Mediterranean origin. Red Brome Grass differs from *B. Madritensis* in its pubescent stems, and dense ovoid purplish panicles, with very short branches, the purple heads giving it a very distinctive appearance when growing.

After the usual conversazione the meeting closed.

EXCURSION TO THE BRISBANE RANGES.

Only Messrs. Hooke and Miller joined the leader in the excursion to the Brisbane Ranges on 18th and 19th October, which, on account of perfect weather, was most enjoyable. To save time, the rather uninteresting eight and a half miles of very bad road between Bacchus Marsh and McPhail's was covered by car. From the latter place the road through the northern end of the Ranges was followed, and the billy was boiled for lunch at the usual picnicking spot at the big rock outcrop. At the farmhouse on the right, now deserted, the party turned south, passing to the east of the Beremboke settlement, and, after going somewhat astray, crossed Reilly's Creek, and arrived at Durdidwarrh just at dusk. Here accommodation was obtained by the kindness of Mr. Bradley, the caretaker of the Reservoir (Geelong's water supply), and on Sunday morning the walk was resumed. After passing through the water reserve between the road to Steiglitz and the aqueduct, and lunching below the lower dam, a course was taken along a track leading to the Steiglitz-Durdidwarrh Road, and then by another, which finally brought the party to the Meredith Road, about two and a half miles from the Moorabool River. At the river, tea was consumed by the light of the fire that boiled the billy, and the walk resumed in darkness until Meredith was reached at about 9.30. About 30 miles in all was covered, and the small party returned to town by the early train on Monday morning thoroughly pleased with the outing, and firmly resolved to repeat it next Spring.

For those who have not visited the locality, it may be stated that the Ranges, which are composed of slates and sandstones of Ordovician age, covered as to the southern half partly by gravel deposits, maintains an average height of about 1200 feet as far as Anakie, just surpassing 1400 feet at the highest point. From Anakie the height falls to about 600 feet at Maude, which may be said to mark their southern termination.

Separated from the basalt plains by gentle alluvial slopes, the abrupt eastern face of the Ranges, known as the Rowsley fault, runs almost due north and south, and is much dissected by small, gorge-like water courses, the most important of which are the main branch of the Little River debouching at Staughton Vale, and a smaller branch, the overflow from the Reservoir making its exit by the Anakie

Gorge. To the west, the surface passes into the Ballarat plateau.

In spite of the sterile nature of the ground, the rainfall of about 25 inches, well distributed throughout the year, conduces to a quite dense and varied vegetation, except in some of the steeper slopes where the taller growth is associated with the scantiest of ground flora.

About sixteen species of Eucalyptus, generally of quite moderate size, with occasional Casuarinas, Exocarpus and Acacias, compose the tree growth, with larger shrubs of Bursaria, Hymenanthera, Leptospermum, Cassinia, Hakea, Acacias (about thirteen in all), Dodonaea, Pomaderris and Callistemon. The total number of flowering plants and ferns probably amounts to about 400, and amongst them are many interesting species like *Olearia pannosa*, *O. ciliata*, *O. iodochroa* and *O. teretifolia*, *Helichrysum obtusifolium*, *Helipterum anthemoides*, *Acacia aspera*, *A. Mitchelli*, and *A. comeriformis*, *Bossiaea microphylla*, *Pultenaea humilis*, *P. laxifolia*, *Calytrix tetragona*, *Grevillea parviflora*, *G. floribunda*, *G. aquifolium* and *G. lanigera*, *Eriostemon obovalis*, *Boronia anemonifolia* *Pseudanthus divaricatissimus*, *Phyllanthus thymoides*, *Billardiera cymosa*, *Prostanthera denticulata*, *Pomaderris ferruginea*, and *P. prunifolia*, *Leucopogon glacialis* and *Choristemon humilis*, which are rarely or never seen so close to Melbourne.

At the north end of the Ranges the operations of woodcutters and the occurrence of a fire in the previous year have altered the appearance of the vegetation. Gum saplings are growing thickly, and *Trachymene Billardieri* in particular, and a handsome, introduced species, *Selago corymbiflora*, with white flowers looking like an Umbellifer, but belonging to the Scrophulariaceae, are growing most abundantly.

In the water reserve the most noticeable and prevalent plants were *Dillwynia floribunda*, *Platylobium obtusangulum*, *Hibbertia stricta*, and *Tetratheca ericifolia*, all of which were in finer form than the writer had previously seen them. Still more prevalent, but not so noticeable, were the weedy *Halorrhagis tetragynia*, *Opercularia varia* and *Drosera auriculata*, and *Stackhousia linarifolia*. Of orchids, eighteen were noted out of about forty-three recorded, the most frequent being *Thelymitra autennifera*, *Caladenia testacea*, and *C. dilatata*, *Glossodia major*, and *Diuris longifolia*.

About the aqueduct the charming *Pultenaea pedunculata* covered wide areas with green mats adorned with bright

yellow flowers, and is suggested as being admirably adapted for hiding the bare rock in our railway cuttings.

The most notable find during the excursion was another Pultenaea, as yet undetermined by Mr. Williamson.

For further information about this interesting locality members are referred to the papers by the late Mr. O'Donoghue and Mr. St. John, which appeared in the Naturalist, Vol. XXVI, p. 151, and Vol. XXIX, p. 130.

AROUND NOOJEE.

By Chas. Daley, B.A., F.L.S.

Read before Field Naturalists' Club of Victoria, 8th December, 1924.

On Saturday, 25th October, Mr. J. W. Audas and myself left Melbourne by the early train, with the intention of spending a week in botanising in the vicinity of Noojee, an outpost of settlement at the junction of the Loch River with the Latrobe. At Warragul we were joined by another club member, Mr. A. G. Brown.

Noojee lies almost due north of Warragul in well-wooded mountainous country, about 27½ miles from the main Gippsland railway, and is reached by a cockspur line, the journey from Warragul taking three hours and a half, the speed of the train, including the happy-go-lucky stoppages at every embryo station *en route*, being nearly eight miles per hour. At one time this district was heavily timbered with towering Mountain Ash, *Eucalyptus regnans*, and Silvertop, *E. sieberiana*, but for many years axe and fire have been ceaselessly at work, and the once densely-clad hills have on every side been mercilessly denuded of their timber. "You *must* cut it down to get *grass*," said one farmer, in surprise at my expressions of regret at the passing of the forest. Grass, yes—and bracken, too—which, however, has one merit, it serves to keep the rich soil of the hills from being transported by the heavy rainfalls into the despoiled creeks and streams, which, once amid their fern gullies, were as beautiful as those of Fernshawe or Marysville. One tree, however, which escapes the spoiler's axe is the Blackwood, *Acacia melanoxylon*, the specimens of this tree throughout the whole district being especially large, shapely, and beautiful.

The question in the main is an economical one. Which is of the greater value to the State—Wise and careful conservation of forests providing abundant supplies of good timber for ages to come, and, whilst preserving the natural features, yielding also, as in old-world countries, a handsome revenue; or—complete denudation, with grass in plenty, dairy produce, fat cattle, potatoes, onions, bare hillsides beset with rain and wind, swollen streams, widespread silt deposits, frequent floods, climatic changes, and an ever-growing scarcity of timber? Is no happy medium possible? This problem suggests itself as we pass through the bare hills of the Neerim district, once famous for its forest giants, some of which were over 300 feet in height. The rich, volcanic soil and abundant rainfall produced prolific growth. Nearer to Noojee, at Nayook, the highest point on the line, 1413 feet above sea level is reached, some extensive and beautiful panoramic effects being now observed along the Latrobe and its contributor valleys, the finest being towards Mt. Toorongo and the Baw Baws. Approaching Noojee the heads of some of the valleys have been spanned by huge wooden trestle bridges, the longest of which, commanding a splendid view, is said to be 300 feet, and about 100 feet above the creek bed below. Near the head of the Tarago, not far from Nayook, is a beautiful fern-gully reserve which is much frequented by tourists. Along the course of the railway the vegetation had not been very striking, the most frequent plant in bloom being the Prickly Bush-Pea, *Pultenaea juniperina*, which is quite a handsome shrub, with a great profusion of showy flowers—in the mass quite "Old Gold" in hue. In some instances the foliage belied the name, being quite soft to the touch; in others, true to type. Coming nearer to Noojee, where original scrub was more evident, the common Cassinia, *C. aculeata*, with brownish bud clusters ready to bloom, and the Hop Goodenia, with its yellow flowers, grew abundantly; whilst at the top of the cuttings would occasionally come to view a delicately-tinted clump of Blue Dampiera, *D. stricta*, whilst more frequently the truly Handsome Flat-Pea, *Platylobium formosum*, made a pleasing show with its rich, red-tipped, yellow pea-flowers. The Wiry Bauera, *B. rubioides*, with flowers varying from white to pink, justified its name, sending its many wires down the sides of the cutting for a distance of eight or ten feet, suggesting that it might be planted elsewhere to advantage on bare sloping sides of

railway cuttings. The only Acacia with a lingering semblance of bloom was "Prickly Moses," *A. verticillata*. Crossing the heads of the valleys, the vegetation of the moister and more shaded places, such as Tea-trees, Hazel, Christmas-bush, and ferns, was noticeable. Noojee is situated near the junction of the Loch River with the Latrobe, in a low-lying swampy area, the railway station being placed half a mile further on. Some private residences are also built on the much higher hill sites above the railway line. Still in the somewhat primitive stage of settlement, Noojee shows signs of progress and growth.

At the railway station we parted from Mr. Brown, who was going to the Toorongo River, Mr. Audas and I driving about two miles up the Loch River to Mrs. Prescott's accommodation house. The road after recent rains, especially at the soaks from the hills, was boggy and rough. In front of the house are steep and high hills, partly timbered, partly cleared, at the foot of which flows the Loch River amid a prolific and varied growth of vegetation on either side. Behind the house is a parallel ridge of hills covered with scrub and forest growth. The road up the valley passes the house, and on the other side of the river is the tram line to the sawmills some miles further on. Our position was thus a good one for our investigations. Our first outing along the road convinced us that not many species of plants were in flower, but that those that were showed unusual profusion in bloom and richness in colouring. The under-scrub was a dense tangle overrun with Wiry Bauera, the Handsome Flat-Pea, and the Prickly Pultenaea, all in full luxuriance of growth. The Dusty Miller, *Spyridium parvifolium*, and occasionally the Golden Bush-Pea, *P. Gunnii*, the Blue Dampiera, and the ever-welcome "Pink Eye," *Tetratheca ciliata*, were also in flower. Crossing the river next day we climbed the steep hill to find that, as we left the river slope, the bracken covered the hillside to the exclusion of other plants. We followed the tram track round the foot of the hills to Peacock's Mill, finding a good variety of plants affecting a fluviatile area; rushes, sedges, and grasses of many kinds, among which might be mentioned the Tassel Cord-Rush, *Restio tetraphyllus*, whilst the Wire Grass, *Tetrarrhena stipoides*, proved an effective entanglement amidst the river vegetation, among which grew freely the Rough Tree-Fern, *Alsophila australis*, the King Fern, *Todea barbara*, and several species of Blechnum, the Coral

Fern, *Gleichenia circinnata*, the Common Maiden-Hair *Adiantum aethiopicum*, the Necklace Fern, *Asplenium flabellifolium*, the Common Bracken, *Pteridium aquilinum*, and allied species. Small ferns of several kinds, fungi and Club Mosses grew freely in the porous soil in which the Blue Squill, *Chamaescilla corymbosa*, Milkmaids, *Burchardia umbellata*, the Tufted Lily, *Stypandra caespitosa*, a few Purple Flags, three species of Stellaria or Starwort, the Cut-leaf Crane's Bill, *Geranium dissectum*, Yellow Wood-Sorrel, *Oxalis corniculata*, and Bidgee Widgee, *Acaena sanguisorbae*, found congenial conditions for growth.

Along the river course grew the Black, the Early Black, and the Silver Wattles, Prickly Moses, and the Narrow-leaf Acacia, *A. linearis*, with many fine Blackwoods. The Scented Paperbark, *Melaleuca squarrosa*, was in full flower, and less seldom seen were the Swamp Paperbark, *M. ericifolia*, Manuka, *Leptospermum scoparium*, and the Woolly Tea-Tree, *L. lanigerum*. Two attractive shrubs in full wealth of flower were the Snow Daisy-Bush, *Olearia lyrata*, and the Truncate Phebalium, *P. bilobum*. In this rich, peaty soil, especially towards the Latrobe River, luxuriance in growth is seen in the vast number of young Eucalypts, mostly Common Peppermint, Mountain Grey Gum and White Mountain Ash (*E. australiana*, *E. goniocalyx*, and *E. regnans*), of Hazel, *Pomaderris apetala*, and of Christmas Bush, *Prostanthera lasianthos*, with graceful, slender, and straight trunks stretching in close array upwards to the sunlight. Among other plants noticeable, but not very frequent, were the White Elderberry, *Sambucus Gaudichaudiana*, the Common Correa, *C. speciosa*, and the handsome Mountain Correa, *C. lawrenciana*. Here also were two or three trees of the Mutton-Wood, *Rapanea (Myrsine) variabilis*. At Peacock's Sawmill, on the Latrobe, we found that most of the timber from the White Mountain Ash, *E. regnans*, was being sawn at present for fruit cases. In conversation with one of the employees, who had a good knowledge of bush flora and fauna, he referred to a clustering specimen of *Clematis aristata* as "Woodbine," a vernacular name which seems appropriate. He also showed us some fine specimens of figured Blackwood. Crossing the river on a fallen tree, we passed uphill over the tramway line to the scrub above the cutting, the chief botanical features of which have been mentioned. Bauera, Platylobium, Senecio and Dampiera were especially fine. On this slope grew the

"Grass Trigger-Plant," *Stylidium graminifolium*, the Bent Goodenia, *G. geniculata*, the Austral Bluebell, *Wahlenbergia gracilis*, and Tall Lobelia, *L. gibbosa*. We returned by the road, noting a fine festoon of Clematis on the way.

In a later walk along a disused tram line by the river towards Noojee the luxuriance of growth was equally marked. A schoolboy joined us, who gave us the name of "Bootlace Plant" for the Tough Rice-flower, *Pimelea axiflora*, the strong fibrous bark being used in default of laces or string. This was plentiful, as also the Tall Rice-flower, *P. ligustrina*; and the Scrub Nettle, *Urtica incisa*, made its presence distinctly felt. Sweet Bursaria, *B. spinosa*, had not yet sent out its creamy blooms. We noticed both Purple and Common Appleberry, *Billardiera longiflora* and *B. scandens*, in fruit, and the Wonga Vine, *Tecoma australis*. A much more robust climber was the Twining Silk-pod, *Lyonsia straminea*, with its vegetable cables. Humbler moisture-loving plants such as Water Milfoil, *Myriophyllum intermedium*, the Hairy Willow-Herb, *Epilobium junceum*, the Yellow Marsh-flower, *Villarsia uniformis*, the Green Ground-Berry, *Achrotriche serrulata*, Brookline, *Gratiola peruviana*, Broom Spurge, *Amperea spartioides*, the Common and the River Buttercups, *Ranunculus lappaceus*, and *R. rivularis*, were abundant, whilst the lowly Violets, *V. hederacea*, and *V. sieberiana*, frequently grew in spreading mats over a considerable space. Introduced plants are not as yet very numerous. Quite at home and rather a striking plant in a ferny glade grew a new arrival in Victoria—the Himalayan Honeysuckle, *Leycesiira formosa*.

On the ranges behind the house, amid the Eucalypts, were found a few late flowers of Common Heath, *Epacris impressa*, also a restricted patch of the Yellow Hakea, *H. nodosa*, whilst the Holly Lomatia, *L. ilicifolia*, which is well distributed, had for company the less frequent Tree Lomatia, *L. Fraseri*. The Prickly Geebung, *Persoonia juniperina*, was also in fruit. The Cherry Ballart, *Exocarpus cupressiformis*, seemed to grow better on this side of the river. A few flowers of the Blue Pincushion, *Brunonia australis*, were seen, and, restricted to a small area, was a colony of the Wrinkled Daisy-bush, *Olearia rugosa*, with beautiful and attractive spraying blooms. Also on this area we secured five specimens of the Great Snu Orchid, *Thelymitra grandiflora*. The season seemed over for orchids, not even a Glossodia or Diuris being seen.

A day was spent in visiting the upper part of the Loch valley, Mrs. Prescott kindly arranging to drive us up. A well-constructed tram line follows the course of the stream for some miles on the right bank with a twofold divergent track from the left side of the stream. The engine and the bodies of the trucks on this line were at one time part of the equipment of the railway from Sorrento, plying to the Back Beach with holiday makers, now truly rusticating in the forest country in far other, but still useful, employment

Passing up the Loch valley some fine holdings are seen, most of the big timber having been cut out. The inner flats and slopes are under cultivation or used for dairying occupations. A few miles up the granite outcrops are more clearly defined. The road in places is bad, and at certain spots of the consistence of glue. Leaving the trap at the Loch River school, we pursued the way on foot, then passed over the river to the sawmills, at which little work was being done, pending permission to cross the Loch River into the forest beyond. Before resuming, we lunched, and then followed the tram track, a delightful walk, until it crossed the river into the Myrtle Bower. The character of the vegetation here is something like that of the Marysville streams, but more dense. In approaching the river, the tram track had, of necessity, to be cleared, blackwood and myrtle-beech trees of considerable size having been cut down. A large tiger snake on the line, startled at our coming, got safely away into the debris of fallen timber. The line at present ends a few yards over the river. It is a great pity that to reach the timber available for cutting beyond the river the area forming the Myrtle Bower has to be entered, for, admitting the charm of an old timber track in mountainous country, and the beauty with which nature in time seeks to repair the ravages of man, it is regretable that places with such interesting and distinctive types of vegetation cannot be kept in their pristine state, untouched by the spoiler's hand.

The Myrtle Bower extends some distance up towards Petschack's selection, and on each side of the river. In the moist and peaty soil there is a luxuriant growth. The Myrtle-beeches, *Nothofagus Cunninghamii*, are exceedingly fine, sometimes fantastic in the shape of their boles and lofty trunks, adorned with mosses, lichens and epiphytal ferns. The light-green leaves of spring at the tips of each branch of dark-green leaves added to their attractiveness.

Alsophilas, Todeas, and most of our gully ferns grew profusely amid the usual thickets of hazel, musk, christmas bush, acacias, sassafras, blanket-leaf, *Bedfordia salicina*, and supple-jack, characteristic of the mountain streams' flora.

Also in association, but much less numerous, were Elderberry Panax, *Tieghemopanax sambucifolius*, the Sand-fly Zieria, *Z. Smithii*, the Privet Mock-Olive, *Notelaea ligustrina*, and the Small-leaf Bramble, *Rubus parvifolius*, whilst Mountain Correa, *P. Lawrenciana*, an occasional Mutton-wood, the Prickly Currant-Bush, *Coprosma Billardieri*, and the Rough Coprosma, *C. hirtella*, were represented; and the Banyalla, *Pittosporum bicolor*, with pleasing foliage and yellow bloom was noticed.

Under the shelter of this vegetation, in and upon it, and under our feet, also on rocks and stems, grew the smaller, but not less interesting, flora of the moisture and shade-loving plants, in conjunction with mosses and ferns forming an effective green mantle. The chief eucalypts were Mountain Ash, Mountain Grey Gum, Messmate and Silver-top. The only other orchids obtained were the Large Helmet-Orchid, *Corysanthes pruinosa*, and the Common Bird-Orchid, *Chiloglottis Gunnii*, both at Myrtle Bower. After spending as much time as possible in viewing the beauties of this attractive river flora and the ever-sparkling stream, we reluctantly returned along the tram track past the sawmill. A somewhat overgrown tourist track passes through the Myrtle Bower country, and connects with a track past Petschack's abandoned selection over the divide and along Alderman's Creek to Walsh's Creek in the Yarra valley, an interesting excursion for walkers and travellers. Returning to our trap, we were in time to see the schoolmaster killing a copperhead snake. On starting out, Mr. Audas had previously killed one which was on the track. Being desirous to see the Toorongo River Valley, we drove through the town of Noojee over a fine stretch of road, passing a sawmill at work, and also the Hydro-electric station which illuminates the townships of Noojee, Neerim and Warragul. The water power is brought for a few miles by an open channel along the hillsides from the foot of the Toorongo River Falls to the plant where the electric power is generated. The Toorongo River valley is deep, fertile and narrower than the Loch. Not far from the road we met Mr. A. G. Brown, who has a fine property, including hill slopes and alluvial flats, through which the

river flows. We were interested in seeing the luxuriant growth of the introduced Water Meadow-grass, *Poa aquatica*, which has firmly established itself as an effective agent in reclaiming swampy land, as well as providing a good fodder for stock. As a result, the roots of the grass are now in demand, and widely distributed for planting in swampy areas.

From Mr. Brown's residence, and under his guidance, we ascended the hill slopes as far as the water-race, along which we proceeded a considerable distance, the hills having a good forest growth of Messmate, Silvertop, and Peppermint, with a little Mountain Grey Gum and Yellow Stringy-bark, also Black and Early-black Wattles, Blackwoods, Varnish Wattle *Acacia verniciflua*, and Prickly Moses. The scrub vegetation was similar to what has been described. At one place an unusual number of tree-fern trunks had healthy blackwoods, and in one instance a Banyalla, growing from them. A fine prospect of this picturesque valley was obtained, with the road going away over the hills towards the Funma country. The valley is mostly cleared, but the Swamp Gum, *E. ovata*, and the Manna Gum, *E. viminalis*, grow on the flats. Along the watercourse, here and there, as on the slopes to the Loch River, we were struck with the unusual growth of the Giant Mountain-Grass, *Glyceria dives*, to a height of seven or nine feet. As it germinates rapidly after a forest fire, frequently valuable timber has been burned by the settlers and others to encourage its growth for feeding stock; although without the protection of the forest the grass would soon disappear. The Tree Everlasting, *Helichrysum ferrugineum*, grew well along the water channel, and we were interested in observing that the Common Cassinia gave evidence of heteraphylly. In some plants its leaves broadened and appeared to imitate closely the foliage of the Helichrysum.

Rabbits and wombats are found along the watercourse. Here, as in the Loch gullies, we heard the Lyre-bird calling, and saw traces of its presence in numerous scratchings. From the race we went to the valley road past some comfortable homesteads, and, on a well-chosen spot overlooking the stream, and commanding a fine view of the valley, with towering hills shutting it in on either side, we reached the accommodation house, our destination for the night. After lunch, Mr. Brown left us, and then with Mr. Richards, who

has the oversight of the watercourse, we started for the Falls.

As the result of long periods of surface denudation, the underlying granite, which had come into view in the valley, was now freely exposed in mass in the composition of the range. A pleasant walk along a track by the race, and above the river course, skirting a forest-clad hill, led to the foot of the Falls. Up from this valley, into which trickled or ran the water from a thousand rills, came with every breath of wind that subtle bush fragrance from "the Censers of the Mountain Musk." The attractive Snow Daisy-bush, with masses of white flowers, and the yellowish tinge of the new foliage on the Blackwoods, relieved the darker verdure bordering the river. Among many species of grasses, Tussock grass, *Poa caespitosa*, Wallaby grass, *Danthonia penicillata*, and Weeping grass, *Microlaena stipoides*, are evident. On the track an intrusive dioritic dyke came through the granite. The watercourse is patrolled regularly, trees and boulders sometimes falling athwart or in the stream. From the foot of a series of cascades, crossing a rustic bridge, we made our way through a dense thicket of gully vegetation to the Toorongo Falls, a strong body of water precipitating itself over huge granite boulders. This is undoubtedly one of the finest water-falls in our State. Climbing higher with some difficulty, we reached the top of the Falls, the stream coming steadily out from the elevated plateau beyond. Retracing our steep course, we turned up near the little chalet, to the other branch of flaming cascades swiftly rushing in and among the rounded granite boulders, the spray constantly falling on rocks, logs and tree-trunks, stimulating to active growth all the minute forms of vegetable life, which love such conditions and vivify the scene with their emerald hue. Higher up in this gorge are the Amphitheatre Falls, forming a fine picture, the dense vegetation from lowly mosses, lichens, fungi, ferns, to overshadowing trees, providing a beautiful setting for the swirling water hurrying amid granite boulders smoothed and rounded by constant attrition.

Beyond the Toorongo Valley lie forests of Mountain Ash, through which little-known tracks lead to the Baw Baw Plateau, not yet accessible to the ordinary tourist; but just as the railway has opened up the Noojee forest country, from its terminus a new road is being built onward, a

probable precursor of extended railway facilities into the fair valley of Toorongo and the heart of remote Fumina. The Toorongo rises to the east of Mt. Horsfall, where the big timber still exists, and east of it is the basin of the Tangil, draining also to the Latrobe. Although the geological features vary through this area, Ordovician or Silurian measures resting or abutting on the granite, and rich, volcanic soils derived from ancient lava flows overlying, as in many parts of Gippsland, the ranges, there is nowhere any marked difference in vegetation, for the areas insensibly replace each other, and the resultant soil, mostly of volcanic origin, is so rich that with so copious a rainfall differences in flora can hardly be found as in drier areas.

Up the Toorongo River birds seem to be numerous and tuneful; King Parrots, Lories, and other parrots flashed here and there. The Gang Gang, Sulphur-crested, and Black Cockatoos were seen. The Satin Bower-birds are sometimes very numerous in the Loch Valley, and the more common birds, including the Coachwhip Bird and the Harmonious Thrush, are in full song. The Bell Miner, which one would expect to find on these streams, was not noticed, although numerous on the Lower Latrobe River.

In both rivers there is good trout fishing, and crayfish are unusually large. Leaving our pleasant halting-place at Toorongo, and its ever-running waters, we took a track leading over the race straight upwards, with hardly a deviation, to a road 1000 feet above us. It was partly overgrown with bracken and greasy under foot, and in consequence was a stiff climb, necessitating many spells.

Reaching the goal of our efforts—a bush road—we left it to head another uncertain track downward to the Loch Valley, which led us into an area, where, after a warm struggle through intervening, high and dense stretches of bracken, we reached a sawmill not very far distant from our destination.

Next morning we left Noojee by the early train, took our last look from the lofty trestle bridge at the favoured valley, and returned home after a very pleasant and interesting excursion in this fertile district, in which the tourist and nature-lover alike can find much to occupy their time and attention as well as to minister to their pleasure.

This district was the scene of a Club excursion at Christmas, 1919, and a report of the visit will be found in the *Naturalist* for March, 1920 (Vol. XXXVI, p. 153).

In view of the recent changes in many specific names, and the addition of vernaculars for all our plants, I have thought that the following list of the plants seen during the trip may be found useful:—

LIST OF PLANTS COLLECTED OR OBSERVED.

*Plants marked * were in flower; those marked † in fruit.*

FILICALES.

Trichomanes venosum, R.Br., Bristle Fern.
Hymenophyllum tunbridgense, Sm., Tunbridge Filmy Fern.
Alsophila australis, R.Br., Rough Tree Fern.
Dryopteris decomposita, Ktze., Shiny Shield Fern.
Polystichum aculeatum, Schott., Common Shield Fern.
P. adiantiforme, J.Sm., Leathery Fern.
Davallia dubia, R.Br., Rainbow Fern.
Lindsaya linearis, Sw., Screw Fern.
Asplenium flabellifolium, Cav., Necklace Fern.
Pleurosorus rutifolius, Fee., Blanket Fern.
Blechnum cartilagineum, Sw., Gristle Fern.
B. pattersonii, Mett., Strap Fern.
B. discolor, Keys., Fishbone Fern.
B. capense, Schl., Soft Water Fern.
B. Lanceolatum, Sturm., Lance Fern.
B. fluviatile, Lowe, Ray Water-Fern.
Pellaea falcata, Fee., Stickle Fern.
Cheilanthes tenuifolia, Sw., Rock Fern.
Adiantum aethiopicum, L., Common Maiden Hair.
Pteris umbrosa, R.Br., Shade Brake Fern.
P. tremula, R.Br., Tender Bracken Fern.
Histiopteris incisa, J.Sm., Batswing Fern.
Pteridium aquilinum, Kuhn, Common Bracken.
Polypodium Billardieri, C.Chr., Finger Fern.
P. grammitidis, R.Br., Gipsy Fern.
P. pustulatum, Forst., Kangaroo Fern.
Gleichenia circinnata, Sw., Coral Fern.
G. laevigata, Hook. f., Fan Fern.
Todea barbara, Moore, King Fern.

LYCOPODIACEÆ.

Tmesipteris tannensis, Bernh., Fern Club-moss.

SELAGINELLACEÆ.

*Selaginella uliginosa, Spr., Swamp Club-moss.

GRAMINEÆ.

Imperata cylindrica, Beauv., Blady Grass.
*Themeda triandra, Forst., Kangaroo Grass.

*Setaria viridis, Beauv., Green Pigeon Grass.
*Microlaena stipoides, R.Br., Weeping Grass.
*Tetrarrhena Juncea, R.Br., Wire Grass.
*Stipa pubescens, R.Br., Tall Spear Grass.
*S. setacea, R.Br., Corkscrew Grass.
*S. semibarbata, R.Br., Fibrous Spear Grass.
*Echinopogon ovatus, Beauv., Hedgehog Grass.
*Calamagrostis quadriseta, Spreng., Reed Bent Grass.
*Dichelachne crinita, Hook. f., Long-Hair Plume Grass.
*Danthonia penicillata, F.V.M., Wallaby Grass.
*Pappophorum nigricans, R.Br., Niggerheads.
*Phragmites communis, Trin., Common Reed.
*Eragrostis Brownii, Nees., Common Love Grass.
Glyceria dives, F.V.M., Giant Mountain Grass.
G. fluitans, R.Br., Manna Grass.
*Agropyrum scabrum, Beauv., Common Wheat Grass.

CYPERACEÆ.

*Cyperus Eragrostis, Vahl., Dark Leaf Rush.
*C. rotundus, L., Nut Grass.
*C. lucidus, R.Br., Common Leaf Rush.
*Heleocharis acuta, R.Br., Common Spike Rush.
*Scirpus inundatus, Poir., Swamp Club Rush.
*Schoenus apogon, Roem. and Sch., Fluke Bog Rush.
*Cladium glomeratum, R.Br., Soft Twig Rush.
*Gahnia Radula, Bth., Thatch Saw Sedge.
*G. psittacorum, Labill, Brickmaker's Sedge.
*Carex inversa, R.Br., Knob Sedge.
*C. Gaudichaudiana, Kth., Tufted Sedge.
*C. appressa, R.Br., Tall Sedge.
*C. pseudo-cyperus, L., Galingale Sedge.

LEMNACEÆ.

Lemna minor, L., Common Duckweed.

RESTIACEÆ.

*Restio tetraphyllus, Labill., Tassel Cord Rush.
*Leptocarpus Brownii, Hook, f., Coarse Twine Rush.
*Hypolaena lateriflora, Bth., Spreading Rope Rush.

JUNCACEÆ.

*Luzula campestris, Dc., Field Wood Rush.
*Juncus planifolius, R.Br., Broad Leaf Rush.
*J. bufenius, L., Toad Leaf Rush.
*J. polyanthemos, Buch., Common Leaf Rush.
*J. pauciflorus, R.Br., Loose Flower Rush.

LILIACEÆ.

*Burchardia umbellata, R.Br., Milkmaids.
*Chamaescilla corymbosa, F.V.M., Blue Squill.
*Stypandra caespitosa, R.Br., Tufted Lily.
*Lomandra longifolia, Labill., Long Mat Rush.

*L. filiformis, Britten, Wattle Mat Rush.
Xanthorrhoea minor, R.Br., Small Grass Tree.

IRIDACEÆ.

*Libertia pulchella, Spr., Pretty Grass Flag.
*Patersonia glauca, R.Br., Short Purple Flag.
*P. longiscapa, Sweet., Long Purple Flag.

ORCHIDACEÆ.

*Thelymitra grandiflora, Fitz., Great Sun Orchid.
Chorysanthes pruinosa, K.Cunn., Large Helmet Orchid.
*Chiloglottis Gunnii, Lindl., Common Bird Orchid.

FAGACEÆ.

Nothofagus Cunninghamii, Oerst., Myrtle Beech.

URTICACEÆ.

*Urtica incisa, Poir., Scrub Nettle.
*Parietaria debilis, G. Forst., Forest Pellitory.

PROTEACEÆ.

†Hakea nodosa, R.Br., Yellow Hakea.
Lomatia ilicifolia, R.Br., Holly Lomatia.
L. Fraseri, R.Br., Tree Lomatia.
†Persoonia juniperina, Labill., Prickly Geebung.

SANTALACEÆ.

Exocarpus cupressiformis, Labill, Cherry Ballart.

CARYOPHYLLACEÆ.

*Stellaria pungens, Brong., Prickly Starwort.
*S. flaccida, Hook, Forest Starwort.
*S. multiflora, Hook, Many-Flowered Starwort.

RANUNCULACEÆ.

*Clematis aristata, R.Br., Clematis.
*C. microphylla, D.C., Small Clematis.
*Ranunculus lappaceus, Sm., Common Buttercup.
*R. rivularis, Banks and Sol., River Buttercup.

MONIMIACEÆ.

*Hedycarya angustifolia, A. Cunn., Austral Mulberry.
Atherosperma moschatum, Labill., Southern Sassafras.

LAURACEÆ.

†Cassytha melantha, R.Br., Large Dodder Laurel.

CRUCIFERÆ.

*Cardamine dictyosperma, Hook, Forest Bitter Cress.

CRASSULACEÆ.

*Crassula Sieberiana, Ostenf., Austral Stonecap.
*C. macrantha, Diels and Pritz, Rufous Stonecrop.

SAXIFRAGACEÆ.

*Bauera rubioides, Andr., Wiry Bauera.

PITTOSPORACEÆ.

*Pittosporum bicolor, Hook, Banyalla.
*†Marianthus procumbens, Bth., White Merianth.
†Bursaria spinosa, Cav., Sweet Bursaria.
†Billardiera longiflora, Labill., Purple Appleberry.
*B. scandens, Sm., Common Appleberry.

ROSACEÆ.

*Rubus parviflorus, L., Small-Leaf Bramble.
*Acaena ovina, A. Cunn., Sheeps' Burr.
*A. sanquisorbae, Vahl., Bidgee Widgee.

LEGUMINOSÆ.

†Acacia diffusa, Edwards, Spreading Acacia.
*A. decurrens, Willd., Early Black Wattle.
†A. dealbata, Link., Silver Wattle.
†A. linearis, Sims, Narrow Leaf Acacia.
†A. melanoxylon, R.Br., Blackwood.
A. mollissima, Willd., Black Wattle.
A. pycnantha, Bth., Golden Wattle.
†A. verticillata, Willd., Prickly Moses.
†A. verniciflua, A. Cunn., Varnish Acacia.
*Pultenaea Gunnii, Bth., Golden Bush-Pea.
*P. juniperina, Labill., Prickly Bush-Pea.
*Platylobium formosum, Sm., Handsome Flat Pea.
*Bossiaea prostrata, R.Br., Creeping Bossea.
Goodia lotifolia, Salisb., Golden Tip.
†Glycine clandestina, Wendl., Twining Glycine.

GERANIACEÆ.

*Geranium dissectum, L., Cut-Leaf Crane's Bill.

OXALIDACEÆ.

*Oxalis corniculata, L., Yellow Wood Sorrel.

RUTACEÆ.

*Zieria Smithii, Andr., Sandfly Zieria.
Phebalium bilobum, Lindl., Truncate Phebalium.
*Correa speciosa, Andr., Common Correa.
*C. Lawrenciana, Hook, Mountain Correa.

TREMANDRACEÆ.

*Tetratheca ciliata, Lindl., Pink Eye.

POLYGALACEÆ.

*Bredemeyera volubile, Ched., Love Creeper.
*B. ericinum, Ched., Heath Milkwort.

EUPHORBIACEÆ.

*Amperea spartioides, Brongn., Broom Spurge.

RHAMNACEÆ.

*Pomaderris apetala, Labill., Hazel Pomaderris.
*Spyridium parvifolium, F.V.M., Dusty Miller.

MALVACEÆ.

*Plagianthus pulchellus, A. Gray, Common Hemp Bush.

GUTTIFERÆ.

*Hypericum japonicum, Thunb., Small St. John's Wort.

VIOLACEÆ.

*Viola hederacea, Labill., Ivy-Leaf Violet.
*V. Sieberiana, Spreng., Tiny Violet.

THYMELÆACEÆ.

*Pimelea axiflora, F.V.M., Tough Rice Flower.
†P. ligustrina, Labill., Tall Rice Flower.

MYRTACEÆ.

†Eucalyptus australiana, Baker and Sm., Common Peppermint.
†E. goniocalyx, F.V.M., Mountain Grey Gum.
†E. Muelleriana, Howitt, Yellow Stringybark.
†E. obliqua, L'Herit., Messmate Stringybark.
†E. ovata, Labill., Swamp Gum.
†E. regnans, F.V.M., White Mountain Ash.
†E. Sieberiana, F.V.M., Silver Top.
†E. viminalis, Labill., Manna Gum.
†E. elaeophora, F.V.M., Long-Leaf Box.
*Leptospermum scoparium, R. and G. Forster, Manuka.
*L. lanigerum, Sm., Woolly Tea Tree.
*Melaleuca squarrosa, Donn., Scented Paper Bark.
*M. ericifolia, Sm., Swamp Paper Bark.

ŒNOTHERACEÆ.

*Epilobium junceum, G. Forst., Hairy Willow Herb.

HALORAGEÆ.

*Haloragis tetragyna, Hook, f., Poverty Raspwort.
*H. teucroides, P. DC., Germander Raspwort.
*Myriophyllum intermedium, DC., Water Milfoil.

ARALIACEÆ.

Tieghemopanax, sambucifolius, Viguer, Elderberry Panax.
*Astrotricha ledifolia, DC., Star-hair.

UMBELLIFERÆ.

*Hydrocotyle vulgaris, L., Common Pennywort.
*H. geranifolia, F.V.M., Forest Pennywort.

EPACRIDACEÆ.

†Astroloma humifusum, R.Br., Cranberry Heath.
†Acrotriche serrulata, R.Br., Green Ground Berry.
†Epacris impressa, Labill., Common Heath.

MYRSINACEÆ.

Rapanea variabilis, Mez., Muttonwood.

OLEACEÆ.

†Notelaea ligustrina, Vent., Privet Mock-Olive.

LOGANIACEÆ.

†Mitrasacme pilosa, Labill., Hairy Mitrewort.

GENTIANACEÆ.

*Sebaea ovata, R.Br., Yellow Centaury.
*Erythraea australis, R.Br., Austral Centaury.
*Villarsia reniformis, R.Br., Yellow Marsh-Flower.

APOCYNACEÆ.

†Lyonsia straminea, R.Br., Twining Silkpod.

CONVOLVULACEÆ.

*Dichondra repens, R. and G. Forster, Kidneyweed.

BORRAGINACEÆ.

*Myosotis suaveolens, Poir., Sweet Forget-me-not.

LABIATÆ.

*Mentha laxiflora, Bth., Forest Mint.
*M. saturejoides, R.Br., Creeping Mint.
*Brunella vulgaris, DC., Self-heal.
Prostanthera lasianthos, Labill., Christmas Bush.

SOLANACEÆ.

†Solanum xanthocarpum, Schr., Toothed Nightshade.

SCROPHULARIACEÆ.

*Mimulus repens, R.Br., Creeping Monkey Flower.
*Gratiola peruviana, Lindl., Brooklime.
*Veronica calycina, R.Br., Cup Speedwell.

BIGNONIACEÆ.

*Tecoma australis, Wonga Vine.

RUBIACEÆ.

Coprosma Billardieri, Hook. f., Prickly Currant Bush.
C. hirtella, Labill., Rough Coprosma.

CAPRIFOLIACEÆ.

Sambucus Gaudichaudiana, DC., White Elderberry.

CAMPANULACEÆ.

*Lobelia gibbosa, Labill., Tall Lobelia.
*Wahlenbergia gracilis, A. DC., Austral Bluebell.

GOODENIACEÆ.

*Goodenia ovata, Sm., Hop Goodenia.
*G. geniculata, R.Br., Bent Goodenia.
*G. lanata, R.Br., Trailing Goodenia.
*Dampiera stricta, R.Br., Blue Dampiera.

BRUNONIACEÆ.

Brunonia australis, Sm., Blue Pincushion.

STYLIDIACEÆ.

*Stylidium graminifolium, Sw., Grass Trigger Plant.

COMPOSITÆ.

Clearia argophylla, F.V.M., Musk-Daisy Bush.
*C. lyrata, Hutch., Snow-Daisy Bush.
C. myrsinoides, F.V.M., Silky-Daisy Bush.
*C. rugosa, Hutch., Wrinkled-Daisy Bush.
*Lagenophera Billardieri, Cass., Blue Daisy Bush.
*Cotula coronopifolia, L., Water Buttons.
*Cassinia aculeata, R.Br., Common Cassinia.
Helichrysum ferrugineum, Less., Tree Everlasting.
*H. apiculatum, DC., Common Everlasting.
*H. obcordatum, F.V.M., Grey Everlasting.
*H. scorpioides, Labill., Curling Everlasting.
*H. semipapposum, DC., Clustered Everlasting.
*Gnaphalium japonicum, Thunb., Common Cudweed.
*G. luteo-album, L., Jersey Cudweed.
*G. purpureum, L., Purple Cudweed.

*Erechtites prenanthoides, DC., Shrubby Fireweed.
*E. arguta, DC., Rough Fireweed.
*E. quadridentata, DC., Cotton Fireweed.
*Senecio lautus, Sol., Variable Groundsel.
*S. vagus, F.V.M., Saw Groundsel.
*S. velleoides, A. Cunn., Forest Groundsel.
*S. dryadeus, Sieb., Fireweed Groundsel.
S. odoratus, Horn., Scented Groundsel.
*Bedfordia salicina, DC., Blanket-Leaf.
*Cymbonotus Lawsonianus, Gaud., Austral Bear's Ear.
*Microseris scapigera, Sch. Bip., Yam.

ALIEN PLANTS RECORDED AS NATURALISED IN VICTORIA.

Anagallis arvensis, Pimpernel.
Anthoxanthum odoratum, L., Scented Vernal Grass.
Briza maxima, L., Shell Grass.
Calandrinia caulescens, H.B. and K., Purple Calandrinia.
Carduus lanceolatus, Scep., Spear Thistle.
Chrysanthemum leucanthemum, L., Ox-eye Daisy.
Cryptostemma calendulaceum, L., R.Br., Cape-Weed.
Dactylis glomerata, Cocksfoot Grass.
Festuca bromoides, Brome Grass.
Holcus lanatus, L., Yorkshire Fog Grass.
Leycestria formosa, Wallich, Himalayan Honeysuckle (New introduction to Victoria).
Lolium perenne, L., Rye Grass.
Mentha Pulegium, L., Pennyroyal.
Nasturtium officinale, R.Br., Water-Cress.
Paspalum distichum, L., Golden Crown Grass.
Plantago lanceolatus, L., Rihwort Plantain.
Trifolium minus, Rel., Slender Clover.
Vicia sativa, L., Vetch, or Tare.
Rubus fruticosus, L., Blackberry.
Rumex Acetosella, L., Sorrel Weed.
Ranunculus muricatus, L., Sharp-pointed Crowfoot.
Silene gallica, L., French Catchfly.
Papaver hybridum, L., Wild Poppy.
Erodium cicutarium, L'Herit., Stork's Bill.
Agropyrum repens, Beauv., English Couch, or Quitch Grass.

ANOTHER DAY ON MOUNT DISAPPOINTMENT.—When I saw recently that the people of Upper Plenty had opened up a track from their district to the summit of Mount Disappointment, and that, in connection with the Hume and Hovell celebrations, they proposed to make a big excursion to the top, I felt that I should like to join them, as I had some fourteen years before succeeded in reaching the top from a different starting point. On that occasion, which was the subject of a short paper in the *Naturalist* for April, 1911 Vol. XXVII., p. 228), I was accompanied by two other members of the Club, and we fought our way up mostly through bracken as high as ourselves, from the Toorourrong Reservoir, about three miles north of Whittlesea. We found little reward for our exertions, as a perusal of the paper will show. My starting place on this occasion was the end of the road which runs up the valley of Bruce's Creek, on the eastern side of the creek, and distant about five miles easterly from Wallan. This time a party of about seventy-five attempted the trip, and most of them succeeded in reaching the highest point, 2631 feet above sea-level, but as our starting point had an elevation of about 1000 feet, the climb, when spread over a distance of about five miles, was not very strenuous. Neither did it reveal any remarkable points of interest. The way was mostly through the State Forest Reserve, and advantage was taken of the extensive series of fire-breaks, which have been cut for the purpose of forest protection. Towards the summit some planting of *Pinus insignis* have been made, but they are not making much headway. From the giant tree-stumps seen from about 2000 feet upwards, some immense trees must have existed on the rich granite soil years ago, their trunks having been converted into palings and other building material, but few living specimens now remain. To the advantage of the tourist, water is procurable at two or three spots. The view from the summit on Saturday, 6th December, was obscured by clouds, especially to the south. It had been my intention to visit some falls on Bruce's Creek the following day, but as the day promised to be very fine I changed my mind, and repeated the climb to Mount Disappointment, this time getting a fairly good panoramic view, but the plateau-like summit does not provide a good vantage-point. The only flowering shrub of interest was the Balm Mint-bush *Prostanthera melissifolia*, which occurs sparingly on the northern slope during the last two hundred and fifty feet; its flowering season was, however, nearly over.—F. G. A. BARNARD.

The Victorian Naturalist

Vol. XLI.—No. 10 FEBRUARY 5, 1925 No. 494

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th January, 1925.

The President, Mr. J. Searle, occupied the chair, and about fifty members and visitors were present.

CORRESPONDENCE.

From the Forests Department, stating that every care was being taken in planning the timber tramway at Myrtle Bower, Loch River, so that the natural beauty of the district would be interfered with as little as possible.

REPORTS.

A report of the visit to Beveridge Hill on Saturday, 13th December, was given by the leader, Mr. F. G. A. Barnard, who said that the attendance was rather small, probably owing to the extremely hot morning, but fortunately for those who went a cool change came up before they reached their destination. Beveridge Hill has been visited several times, and those who saw it for the first time on this excursion were greatly impressed with the sight of the well preserved crater which it exhibits. According to the military survey of the district now in progress, the hill covers an area of 300 acres, or about three times as much as the University grounds. Its highest point is 1400 feet above sea level, or 400 feet above the plain on which it stands. The crater is about a quarter of a mile across and 250 feet deep. This season, on account of the numerous showers, it has contained a fair sheet of water. In addition to its geological and physiographical interest, the hill is notable as being the first vantage point visited by the explorers Hume and Hovell on the southern side of the Dividing Range on their memorable journey from New South Wales to Port Phillip in November and December, 1824, the following day to our excursion being the centenary of the explorers' visit. An attempt was made to photograph the crater, but without success. The party was indebted to Mrs. Smith, of the farmhouse at the foot of the hill, for hot water to make tea, and for permission to have their evening meal

on her lawn, after which the return was made to the train, and thence to town.

A brief report of the camp out at the National Park, Wilson's Promontory, on January 1-8 was, in the absence of the leader, Mr. C. Daley, F.L.S. (who was delayed by a heavy shower, and arrived later) given by Mr. T. James and Mr. L. Hodgson, who said that the party was favoured by splendid weather, and had a most enjoyable time.

ELECTION OF MEMBER.

On a ballot being taken, Dr. R. E. Shuter, Greendale, via Bacchus Marsh, was duly elected a country member, and Miss Margaret Jeffry, P.O., Molesworth, an associate member of the Club.

GENERAL BUSINESS.

Mr. A. Blake said that during a recent holiday in the Upper Goulburn district he had been surprised at the number of fixed lines being used in various parts of the river, more especially between Granite and Molesworth. He moved that the matter be brought under the notice of the Fisheries and Game Department, with a view to having the practice stopped. This was seconded by Mr. F. Pitcher, and carried unanimously.

PAPER READ.

By Mr. A. L. Scott, entitled "Some Victorian Holidays."

The author gave a number of reminiscences of holiday trips spent in different parts of Victoria when in search of natural history objects; these were illustrated by some excellent lantern views, comprising scenes along the Baw Baw track, at Lorne, the South-West Coast, Wandong, etc.

Messrs. Coghill, Barnard, Brown, Searle, and Williamson spoke of the interesting nature of the author's remarks, and the fine pictures exhibited. Mr. G. Coghill said that he was always on the look-out for new collecting districts for the Annual Wild-flower Exhibition, and asked Mr. Scott if he could give any information about the flowers he noticed in the Anglesea district, but the author said he had not sufficient botanical knowledge to give definite details.

Mr. C. French, junr., said that a list of the plants of the Anglesea district had been published some years ago by Mr. W. E. Adcock in the *Geelong Naturalist*, and probably further information could be found in that journal.

NATURAL HISTORY NOTES.

Mrs. E. Coleman said that several members had for the past three seasons been interested in a "greenhood" orchid which had been collected in certain localities, which suggested a hybrid between *Pterostylis falcata* and *P. nutans*. This has now been identified by Dr. Rogers, of Adelaide, as *P. acuminata*. Several of the flowers were exhibited at the recent Wild-flower Exhibition, together with specimens of *P. falcata* and *P. nutans*.

Miss J. W. Raff, M.Sc., F.E.S., read a note on the egg-laying of the Caper White Butterfly, *Belenois java teutonia*, which she had observed in the University grounds a few weeks before. The note was illustrated by a photograph of the egg clusters on the leaves of the food plant, a species of caper, probably *Capparis Mitchelli*, taken by Mr. A. O'Brien, University Agricultural School.

EXHIBITS.

By Mrs. E. Coleman.—Specimens of Imperial White Butterfly, *Delias harpalyce*, taken at Healesville, 11.1.25; colored drawings by Miss Dorothy Coleman of pupae of same butterfly obtained 26.8.24, and of imagoes which emerged on 15.9.24; flower spikes of orchids, *Microtis oblonga*, Rogers, *Cryptostylis longifolia*, R.Br., and *Spiranthes australis*, Lindl., collected at Healesville, 11.1.25.

By Mr. C. Daley, F.L.S.—Dried specimens of Saw Groundsel, *Senecio vagus;* Scented Groundsel, *S. odoratus;* Myrtle Beech, *Nothofagus Cunninghamii;* Tree Lomatia, *L. Fraseri;* Saw Banksia, *Banksia serrata;* Scented Fan-flower, *Scaevola suaveolens;* and Grass Trigger-plant, *Stylidium graminifolium* (very fine), collected during excursion to National Park, Wilson's Promontory; Aboriginal scrapers, etc., of flint and quartz, hammer-stone, and fragment of stone axe from kitchen middens at Wilson's Promontory.

By Mr. C. French, junior, Government Entomologist.—Small branch of Coast Tea-tree, *Leptospermum laevigatum*, F.v.M., with 87 larva-cases of Hubner's Case-Moth, *Thridopteryx hubneri* attached, from Carrum.

By Mr. L. Hodgson.— Specimens of the Pale-fruit Ballart, *Exocarpus stricta*, R.Br., with fruit attached; flowers of Saw Banksia, *B. serrata;* bark of Swamp Paperbark, *Melaleuca cricifolia;* also shells collected at Sealers' Cove; egg-shaped pebble of water-worn granite from Wilson's Promontory excursion.

By Miss L. McMahon.—Marine shell, *Chione disjecta*, from Wilson's Promontory.

By Mr. V. Miller.—Shells collected at Sealers' Cove, Wilson's Promontory excursion.

By Mr. F. Pitcher.—Dried fronds of Soft Water-fern, *Blechnum* (*Lomaria*) *capense* L. over four feet in length, collected at Snobb's Creek, Alexandra, 3.1.25; blooms of Erect Clematis, *C. glycinoides*, grown on fence of garden at South Yarra; beetles, *Diaphonia* (*Schizorrhina*) *dorsalis*, found burrowing in large numbers in garden at South Yarra.

By Miss J. W. Raff, M.Sc., F.E.S.—Photograph of eggs of Caper White Butterfly, *Belenois java teutonia*, laid on leaves of Capparis sp. in University grounds, Parkville, December 15, 1924, in illustration of note.

By Mr. A. E. Rodda.—Wooden toys of native make, carved from Thornwood, from Bechuanaland Protectorate, South Africa.

By Mr. P. R. H. St. John.—Herbarium specimens of *Eucalyptus phellandra*, R. T. Baker, Mountain Peppermint Gum of New South Wales, collected at Mount Toole-be-wong, near Healesville, December 5, 1924, new record for Victoria; *Blechnum serrulatum*, Richards, Saw-leaf Gristle-fern, of New South Wales and Queensland, collected at Mount Toole-be-wong, December 1, 1924, also new for Victoria. *Eucalyptus amygdalina*, Labill. Black Peppermint Gum of Victoria and Tasmania, from Mount Toole-be-wong, December 4, 1924, not common in Victoria.

By Mr. H. B. Williamson, F.L.S.—Dried specimen of *Pultenaea D'Altonii*, H.B.W., collected by Dr. Sutton at Brisbane Ranges, October, 1924, previously known only from Nhill, North-West Victoria, collected there by Mr. St. Eloy D'Alton.

After the usual conversazione the meeting terminated.

A Notable Biography.—The recently-issued *Victorian Historical Magazine* for November, 1924, contains the concluding portion of a valuable paper by Mr. Chas. Daley, B.A., F.L.S., on the life of the late Baron Sir Ferdinand von Mueller, K.C.M.G., Government Botanist of Victoria. Nothing so complete in the way of the story of this great scientist's work has hitherto been published. In view of the interest of the subject, the author has arranged for its publication in pamphlet form. Copies will be available in a few days on application to the author (Clarinda Road, Caulfield) at one shilling each.

EXCURSION TO ALTONA.

Notwithstanding threatening weather, ten members took part in the excursion to Altona on Saturday afternoon, 15th November. The first place visited was the old Altona Bay Brown Coal Mine, now showing signs of the years of disuse in the dilapidated housings and rusting machinery. Climbing the mullock dump, access was gained to the landing brace, and from there an extensive view was obtained of the level basalt plains, with three shallow lakes on the north, west and south, in the middle distance. Further away to the south, the irregular outlines of the You Yangs breaks the skyline, while the sea fills the horizon on the east. A line of bores put down between Werribee and Yarraville some years ago disclosed an extensive bed of brown coal; that at Altona, after passing through 20 feet of basalt and about 300 feet of basalt limestone, clay and sand, being reached at 348 feet, and proved a thickness of 74 feet of brown coal. After collecting some specimens of silicified lignite from the old coal dump, a move was made towards the seashore. Some low-bracken-covered sand dunes yielded a few late spring wild-flowers and also some chips of Chert of aboriginal origin. Close to the beach was a dense growth of African Box-thorn, amongst which were many plants of the introduced Evening Primrose, displaying large lemon-yellow flowers. A cold, easterly wind had made the sea rough, and, the tide being full, the breaking waves were churning up the mud and decomposing sea-wrack which, in places, was piled up in thick masses on the beach. The atmosphere being somewhat tainted on this account, no time was lost in attaining a more salubrious neighbourhood, pausing only to examine some plants of the Horn Poppy and the Tamarisk trees that extend all along the foreshore. Beyond the jetty the sea was calmer and the beach cleaner. Several dead specimens of the Port Jackson Shark (Cestracion) were observed, and a freshly-caught one was closely examined to note the peculiar dentation and the two dorsal-fin spines. Bird life was not plentiful, probably on account of the cold wind, the English Skylark being most in evidence. Four Black Swans passed in flight almost overhead, and a few White-fronted Chats were seen. On the sands a couple of Dottrels foraged among the seaweed, and on a small island, formed of large boulders, half-a-dozen Black and Pied Cormorants were roosting.

Near the racecourse a small flock of waders of the Sandpiper family took rapid flight, and the sea marsh was full of starlings. Passing the marshy stretch, where Salicornia, Mesembryanthemum, and other saline plants were luxuriating, an attempt was made to reach the mouth of the Kororoit Creek, where some Mangrove trees still survive, but time would not permit and the party returned to Seaholm station.—A. E. Rodda.

EXCURSION TO BLACK ROCK.

A party of about fifteen members assembled for the excursion to Black Rock on Saturday, 6th December, and were favoured by a fine day. A number of interesting plants were noted, and a profitable afternoon was spent. Above, on the cliffs, the Twiggy Aster, *Olearia ramulosa*, and the Grass Daisy, *Brachycome graminea*, were found in bloom, but no orchids. At the foot of the cliffs the Round-leaf Spear-grass in large, reddish tussocks, and the Coast Saltbush, *Atriplex cinereum*, with whitish foliage, contrasted with the darker green of the Sea Box, *Cynopogon* (*Alyxia*) *buxifolia*, the Coast Beard-heath, *Leucopogon* (*Styphelia*) *Richei*, and the Bower Spinach, *Tetragonia implexicoma*. Two interesting introduced plants, both with whitish foliage, were found at the foot of the cliffs, the Horn-poppy, remarkable for its long horn-like pods, and the Sand Lyme-grass, resembling a large form of Rye-grass. The fleshy foliage which characterises the sea-beach vegetation was exemplified by the Sea Celery, and plants of the Goose-foot family. The tide was very favourable for the investigation of shore life, being very low, and a large extent of Grass-wrack (Zostera) was uncovered. On this link, between the flowering plants and seaweeds, innumerable snails were noted, and several species of Chitons were collected by one of the party. Plants, often submerged by the salt water but now laid bare, were found flowering, such as the Trailing Joint-weed, *Hemichroa* (*Polycnemon*) *pentandra*; Common Sea-heath, *Frankenia pauciflora*; and Creeping Brook-weed, *Samolus repens*, all with white flowers.

I am indebted to Mr. A. E. Rodda for some further notes on the outing. He says:—"Advantage was taken of a very low tide to explore a number of exposed sandbanks and rocks. The rock formation here is highly ferruginous, and contains numerous limonitic concretions, in many strange

shapes, such as rods, tubes and spheres. Some very good examples of "pot holes" caused by the grinding action of loose stones in circular depressions, were noticed. Some of the rocks were almost covered by dense colonies of the tube-building worm (*Serpula*), and specimens of the tiny spiral form (*Spirorbis*) were found on fronds of seaweeds. The loose stones sheltered numerous small crabs, some of which carried masses of minute purple eggs held between the body and tail. Several specimens of a flat planarian worm, resembling pieces of animated kelp, were turned up, and also a few of the sea centipedes (*Nereis*)—an active worm beloved of anglers. In the sand pools, Sea Anemones, of a dull green or grey colour, with banded rays, were numerous, and a few of the black variety were seen. A capture that may prove to be a rarity, since it was new to all who saw it, was a small hairy, reddish-yellow crustacean, resembling a crayfish. Shellfish were in quantity but not quality, only common forms, such as limpets, whelks, zebra and top shells (generally known as periwinkles) were noted. A much greater variety of dead shells could be found amongst the drift material at high-tide mark. Chitons, or mail-fish, were found under stones or in sheltered crevices. Their overlapping valves resemble the joints in suits of armour. On the firm wet sand, strange-looking markings, suggestive of ancient inscriptions, excited our curiosity. These proved to be the tracks of a small white cockle, which ploughed a tiny furrow in the sand. Only one species of sea bird was noted, that being the Pacific gull, in both the mature and immature plumage."

The party returned to town well satisfied with the afternoon's outing.—H. B. Williamson.

A Key to the Eucalypts.—The Minister for Forests of Western Australia has, says the *Australian Forestry Journal* for November, approved of the issue of a key to the Eucalypts. This has been devised by Mr. S. L. Kessell, Conservator of Forests, in conjunction with Mr. C. A. Gardener. The key resembles the Dewey system of library cataloguing, numbers being used, each signifying a different characteristic, the combination of the different numbers indicating a certain species, thus 4268·1354 might stand, say, for *E. regnans*. The key has been devised for the species found in Western Australia; whether it would be applicable to all the species of the genus remains to be seen.

NOTES ON THE COLEOPTERA OF NORTH-WESTERN VICTORIA.

PART XII.

BY J. C. GOUDIE.

(Read before the Field Naturalists' Club of Victoria, 8th December, 1924.)

MORDELLIDÆ.

These singular beetles are easily recognised. They are mostly of small size, black, with white spots and markings; in shape, broadest in front, tapering behind, the tip of the body being produced to a sharp spine. They frequent the blossoms of trees and shrubs, often in large numbers.

4317. *Mordella communis*, Wath.

4324. *M. leucosticta*, Germ.

CANTHARIDÆ.

This family includes slender, graceful beetles, with fairly long antennæ and legs. The head is narrowed behind, forming a distinct neck. They are not often seen in the Mallee country; specimens have been taken flying slowly near the ground, or resting on leaves or grass-stalks.

4357. *Palæstra rubripennis*, Cast. Black, with dark-red, strongly-ribbed elytra. It is nearly three-quarters of an inch long.

4377. *Zonitis lutea*, Macl. Antennæ and legs black; head, prothorax and elytra yellow; half an inch in length. *Z. mystica*, Blackb. Head, antennæ, tarsi and tibiæ black; prothorax and femora (except the tips of latter) yellow; elytra, blue.

4391. *Z. splendida*, Fairm. A fine species. An example taken on the wing near Birchip is half an inch in length. It is much broader than the other local species, the elytra being widest near the apex; black, except elytra, which are metallic green on basal half, purple on remainder.

ŒDEMERIDÆ.

These are long, slender beetles, with soft elytra, having a slight resemblance to some Longicorns met with on flowers and foliage.

4402. *Oxacis (Ananca) australis*, Boisd.
O. picticeps, Lea, Tr. Roy. Soc. S.A., XLI., p. 313.

4407. *Copidita (Ananca) puncta*, W. S. Macl.

CURCULIONIDÆ.

Although much varied in form and size, the beetles of this family are very easily recognised, the well-developed rostrum, on the sides of which are placed the angulated or "elbowed" antennæ, and four-jointed tarsi, being unmistakable characters. It is one of the largest groups of beetles in Australia, over 1200 species appearing in Master's Catalogue, and a great many have since been described by Messrs. Blackburn, Ferguson, Lea and Sloane. Owing to the dull colours and general absence of distinctive markings of the local species, I have refrained from attempting to "describe" them, excepting a few of the more conspicuous. None the less, they are a very interesting group, and some of them remind us of their existence in no uncertain manner, the Apple-root Borer, *Leptops squalidus*(=hopei), and the Grain Weevil, *Calandra granaria*, being familiar examples.

As to their habits, they are all vegetarians, the arboreal species eating the tender bark of the twigs and epidermis of the leaves of their host-plant, while the terrestrial species subsist on grasses, etc.

4423. *Prosaylens convexus*, Germ.
4424. *P. dispar*, Germ.
Titinia bicolor, Blackb.
T. eremita, Blackb.
4464. *T. ignaria*, Pasc.
4551. *Polyphrades longipennis*, Pasc.
Essolithna vittaticeps, Blackb.
4622. *Leptops tribulus*, Fabr.
4596. *L. squalidus*, Boh. =hopei, Fahrs.
4639. *Zephryne (Hyphæria) assimilis*, Pasc.
Z. geometrica, Lea.
4640. *Ethemaia adusta*, Pasc.
4643. *E. sellata*, Pasc.

Sub-Family—AMYCTERIDES.

This is a well-defined group of weevils, characterised by the short, broad rostrum, apterous body, very hard elytra "soldered" together, and the funicle of antennæ six-jointed. Dr. E. W. Ferguson, in his admirable *"Revision of the Amycterides," says that: "All the Amycterides are ground-dwellers, being found under logs and stones, while one or two may be obtained from the roots of grass-trees (*Xanthorrhœa*). They are essentially dry-country insects.

*Proc. Linn. Soc. N.S.W., 1915.

and seem capable of storing up the vegetable material on which they live in their abdominal cavities for long periods.

"In regard to their life-history, we are no further advanced than in Sir William Macleay's day, and nothing is known of the larval or pupal forms of these insects." For the subjoined note on the Mallee species, I am indebted to Dr. Ferguson, whose valuable memoirs have greatly enriched our knowledge of these singular beetles.

"The Amycterid fauna of the Birchip and Sea Lake district is an interesting one. As might be expected from its geographical position, all the species found—or so far recorded from the district—are also inhabitants of South Australia. From this, it follows that the genus Sclerorinus is the one most represented by number of species, there being six representatives of that genus. The district fauna is further of interest in relation to the fauna of the more southerly portions of Victoria, comprised within the Bassian sub-region of Spencer. If we take the genus Sclerorinus we find that it is represented chiefly by species of the tristis type, which are members of the first section of the genus, according to my classification, the exception being *S. sublineatus*, Germar, of which I have a specimen labelled Melbourne. This first section is not represented at all in the Mallee districts, though it is the typical section of the genus, abundantly in South Australia, and apparently of Eyrean origin. From these considerations, it seems that the parts of Victoria comprised within the Bassian sub-region have been populated from the coastal and mountainous regions of South Australia, and not from the more northerly portions of Victoria, belonging to the Eyrean sub-region."

Psalidura flavosetosa, Ferg. Proc. L.S., N.S.W., 1915. p. 561.

This is the largest of the Mallee ground weevils, measuring over an inch in length. The males of this genus have strong anal forceps.

4738. *Talaurinus riverinæ*, Macl.

4753. *T. squamosus*, Macl. A Murray River species.
Sclerorhinus dixoni, Ferg. Proc. Roy. Soc. Vic., 27, p. 253.

4786. *S. germari*, Macl.
S. goudiei, Ferg. l.c., p. 254.

4803. *S. riverinæ*, Macl. = *alternus*, Macl.

4811. *S. sublineatus*, Germ. = *marginatus*, Pasc.

4817. *S. vestitus*, Macl. = *mucronatus*, Macl.

4834. *Acantholophus crenaticollis*, Macl.
4852. *A. planicollis*, Waterh.
4875. *Cubicorrhynchus maculatus*, Macl.
C. taurus, Blackb.
Mythites, sp. Portions of a beetle, evidently belonging to this genus were found at Sea Lake.
4918. *Amorphorrhinus australis*, Germ.

I have found this species at only one locality, viz., near the southern end of Green Lake.

Ophryota nodosa, Blackb.

Though not an Amycterid, this species is taken on the ground, usually under the shelter of a salsolaceous plant known as "Saltweed."

4982. *Oxyops fasciata*, Boisd.
4985. *O. gemella*, Pasc.
4987. *O. irrasa*, Pasc.
O. obscura, Blackb.
O. scoparia, Lea.
O. serricollis, Lea.

The species of Oxyops are convex, rather thick-set, beetles, under half an inch long, fairly common, and taken on Mallee shoots.

Pantoreites major, Lea.
4972. *P. (Oxyops) arctatus*, Pasc.
Syarbis brevicornis, Lea.
S. goudiei, Lea.

These are met with in the porcupine grass country, on the Broom Ti-tree. *P. major* is greyish-brown, with a white vitta on head and prothorax. The elytra have the suture and two lateral vittæ white; it is one-third of an inch in length.

The species of Syarbis are much smaller, very convex, and although the tarsi are not armed with claws, the beetles are able to cling very tightly to the twigs—so much so that shaking will scarcely dislodge them.

5017. *Bryachus squamicollis*, Pasc.
5040. *Strongylorrhinus ochraceus*, Schon.
5067. *Pelororrhinus sparsus*, Germ.
Rhinaria tibialis, Blackb.
5092. *Lixus mastersi*, Pasc.
Orthorrhinus cylindrirostris, Fabr.

Two specimens of *O. cylindrirostris*, taken on "lignum," are very much smaller and paler than southern examples.

Desiantha major, Blackb.
D. parva, Blackb.
D. sericea, Blackb.

These are taken on the ground, under logs, etc., in swampy localities.

Diethusa (Lybœba) fumelica, Lea.
D. pretiosa, Lea.
D. squamivaria, Lea.
D. trifasciata, Lea.

The species of Diethusa are pretty little red and yellow mottled or fasciated weevils, found usually on wattles.

Misophrice, sp. A minute, green-scaled weevil, taken on Casuarina leaves.
Bagous australasiæ, Blackb.
Eristus setosus, Blackb.
Symbathinus squalidus, Blackb.
Antyllis alternatus, Blackb.
Epamœbus ziczac, Lea.
Cyttalia erichsoni. Pasc. A blossom-frequenting species.

5225. *Belus bidentatus*, Don.
5234. *B. filiformis*, Germ.
5253. *B. suturalis*, Boisd.

The species of Belus are long and slender, with thickened front femora, and the elytra produced into a point at the tips. The elytra are usually reddish-brown—in some species spotted or mottled; the ventral surface of body often clothed with white scales. They feed on the bark of various Acacias.

5263. *Isacantha dermestiventris*, Boisd.
5265. *Rhinotia hæmoptera*, Kirby.

These somewhat resemble Belus, but the elytra are not pointed behind. *R. hæmoptera* breeds in the mistletoe, *Loranthus pendulus*. It is five-eighths of an inch long, and is red, with two black vittæ on the prothorax; in some specimens the margin only of prothorax is red.

5302. *Auletes suturalis*, Waterh.
5323. *Læmosaccus electilis*, Pasc.
5330. *L. narinus*, Pasc.
5334. *L. querulus*, Pasc.
5336. *L. subsignatus*, Boh.
L. variabilis, Lea.

The species of Læmosaccus are found mostly on acacias or eucalypts, with the exception of *L. electilis*, which feeds on the Cabbage-bush, *Heterodendron olæfolium*. It is black, with much white about the under-surface, and is about a quarter of an inch long.

5347. *Zeophus storeoides*, Pasc. A small brown curculio, with a long, curved proboscis.
5351. *Haplonyx centralis*, Pasc.
5352. *H. cionoides*, Pasc.
5355. *H. fasciculatus*, Boh.
H. mœstus, Lea.
H. orbiculatus, Lea.
H. serricollis, Lea.
5380. *H. spencei*, Gyll.
H. uniformis, Lea.

The Haplonycides are small, very convex, "dumpy" weevils, found generally on eucalyptus foliage.

Melanterius amplipennis, Lea.
M. cardiopterus, Lea.
5402. *M. vinosus*, Pasc.

The last-named species seems to prefer the umbrella acacia, *A. oswaldi*, as a food-plant. It is dark purplish-red, the elytra strongly punctate, and mottled with yellow, and is about a quarter of an inch in length.

5538. *Metyrus (Cryptorrhynchus) albicollis*, Germ.

This is considered rather a prize by beetle-collectors. It is three-eighths of an inch long. The elytra black, slightly tuberculate. The prothorax, with the exception of a small space in the middle of base, is thickly clothed with white scales, and parts of ventral surface and femora are similarly clothed. It breeds in the stem and larger branches of the Drooping Mistletoe, *Loranthus pendulus*.

Eleagna nodipennis, Lea.
5508. *Chætectetorus clittellæ*, Pasc.
5516. *Achopera lachrymosa*, Pasc.
Calandra granaria, Linn. (introduced).
5601. *C. orizæ*, Linn. (introduced).
Homotrachelus australasiæ, Faust.
Thechia pygmæa, Pasc.
Geosomus macleayi, Faust.

In addition to the above, there are about a dozen unidentified species belonging to various genera, making a total of over 100 species of Curculionidæ.

BUSH PLANTS IN A CITY GARDEN.

The first to respond to the call of spring was the pretty Fringed Heath-Myrtle, *Micromyrtus ciliatus*, which, after sending out its graceful, green, tasselled spikes, bedecked each stalk with its small reddish flowerbuds, which later burgeoned out into clusters of dainty white flowers, tinged with red like the blush on a maiden's cheek. This Micromyrtus from Hall's Gap has bloomed for three years.

The Bushy Heath-Myrtle, *Thryptomene Mitchelliana*, its near relative, now in its third year of vigorous growth, was also putting out its light green foliage, and then more slowly burst into bloom, until, under the genial influence of moisture and sunlight, it became a beautiful shrub, with a profusion of fairy-like white flowers. This year, in our Melbourne streets and suburbs, these graceful sprays have captured the fancy of flower-lovers.

Then the Grampians Fringe-Myrtle, *Calytrix Sullivani*, a beautiful plant, five feet in height, with darker green foliage, also projecting in growth lighter green segments, each laden with closely-packed buds of promise, bloomed coyly at first in its white fringed flowerets, until the rough wooing of a blustering north wind brought in response a quickening of bloom, so that it is now a sight delightful to the eye. This Calytrix is from Stony Creek.

Two years ago I brought, casually, a young plant from the Whipstick Scrub, which had grown well during the last year without blooming. A fortnight ago, it broke into bursting bud, and its delicate pink flowers showed it to be an old friend, the Common Fringe-Myrtle, *Calytrix tetragona*, now a mass of graceful flowering sprays. When the petals fall, the darker calices of the fading blooms, still with their reddish tinge, render its appearance attractive, as in a lesser degree also that of Calytrix Sullivani whilst Micromyrtus and Thryptomene take on also a brownish tinge as the petals fall from the florets.

Grevillea lineuris, a graceful shrub, is covered with its attractive flowers, and will bloom for several months. Just under its shade is a soft-leaved Pultenæa, which has not yet flowered. The Large-leaf Pultenæa, *P. daphnoides*, after blooming freely for two years, died last season. A small plant of Common Heath, *Epacris impressa*, in company with an unrecognised friend, put out a few white flowers. The Long-leaf Waxflower, *Eriostemon myoporoides*, with its urn-like buds, and starry white flowers, makes a pleasant show. Above it grows vigorously a Brachysema, with deep red

pea-flowers, and nearby a little Lemon Crowea, *Asterolasia Muelleri*, transplanted six months ago, from a cool dell in the Plenty Ranges, is showing its yellow blooms for the first time, whilst a fragrant Boronia, by its perfume, invites attention.

Under a sheltering Musk-tree, or Daisy Bush, *Olearia argophylla*, ten feet in height, grow ferns from distant gullies; a young Mountain Pepper, from Warburton; a Gleichenia, or coral fern, from Wallaby Creek; a Creeping Polypody, *Cyclophorus serpens*, from the Cann River; a struggling Golden Shaggy-Pea, *Oxylobium ellipticum*, from near Black Sands Creek. Each bush plant has its own interest, derived from place, incident, or circumstance, e.g., the Musk Daisy-bush, now a sheltering tree, was really a foundling—an uninvited guest. Its foster-mother was a fern brought from a Lorne fern gully. The fern died, and from its remains, Phœnix-like, sprang up the Musk-tree, a monument to its foster-mother.

On the lawn, a Lilly-pilly, *Eugenia Smithii*, gives promise of healthy growth, whilst three Snowy Mint-bushes, *Prostanthera nivea*, from the You Yangs, are sprouting fresh foliage preparatory to blooming in creamy flowers a little later on in the season.

Many of our native plants respond to culture and attention, and an inspection of the Australian section of plants in the Botanical Gradens reveals the variety and the beauty of bush plants that might gladden our home gardens.—C.D.

The Caper White Butterfly.—During the flight of the Caper White Butterfly, *Belenois java teutonia*, around Melbourne last December (1924) I was fortunate in having the opportunity of observing the process of egg-laying by this butterfly on *Capparis spp.* in the University grounds. The elongate fluted eggs when first laid were of a translucent pale-green colour, but later turned orange-yellow. The young twigs and both the upper and lower surfaces of the softer leaves were chosen for egg placing, and the regularity with which the eggs were laid was remarkable. The act of laying each egg took, on an average, four seconds, and the interval of rest between each oviposition was twelve seconds. One of the leaves in the photograph exhibited to-night carries 150 eggs, which, judging by the uniformity of the series, I should say were laid by a single female; another leaf shows 125 eggs in similar uniformity, but time did not permit of determining the

maximum number laid by any one female. One butterfly captured on the wing was placed in captivity, and laid 85 eggs, but this probably would not represent the maximum number. In referring to literature on the subject, I find the following:—Anderson and Spry in *Victorian Butterflies* write: "The eggs are deposited upright in patches of 50 or 60 upon the upper surface of the leaf;" Frogatt, in the *Agricultural Gazette of New South Wales* for 1899, describes them in clusters of from 20 to 40; while Rainbow, in *Australian Butterflies*, says: "There may be a dozen upon a single leaf." The larger numbers of eggs on a single leaf, as observed by me, may be a matter of interest to some. Hatching was observed later, and the mass of little orange-yellow larvae soon demolished the thin pale-greenish egg-shells from which they had hatched. The head of the larva, which is black, was noted to be situated at the apex of the egg, i.e., at the upper end. The adults were very active on the wing, and were apparently feeding on lucerne and other plants. The species of Capparis cannot be determined with accuracy until the flowering season, but one of them has been indentified at the National Herbarium as probably *Capparis Mitchelli*. The trees were planted many years ago by Professor McCoy. Towards the end of the year 1921 larvae and pupae were collected by me from these plants.—JANET W. RAFF, M.Sc., F.E.S., January 12, 1924.

WHY BIRDS BECOME EXTINCT.—That many more birds will vanish from the face of the earth as time goes on seems inevitable. In the *Australian Museum Magazine* for October, Mr. Tom Iredale tells the tales of the tragedies which have occurred around Australia. The first visitors to Norfolk Island and Lord Howe Island, those two lovely spots in the ocean a few days sail east of Sydney, once possessed a wealth of bird-life of various kinds, but as Mr. Iredale remarks, the birds were "good to eat," hence their disappearance. The same diminution of bird-life is going on in New Zealand, though there it is attributed more to the introduction of foreign birds and mammals. Australia has, so far, only a small list of extinct birds, but no doubt others will follow the fate of the Kangaroo Island Emu, and its relatives in King Island and Tasmania. Of these, only a few skins and skeletons are known to exist, accompanied by drawings made during the early voyages of discovery. Let us be up and doing, and see that our Lyre-bird does not follow.

The Victorian Naturalist

Vol. XLI—No. 11. MARCH 5, 1925. No. 495.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Horticultural Society's Hall on Monday, 9th February, 1925.

The President, Mr. J. Searle, occupied the chair, and about fifty members and visitors were present.

CORRESPONDENCE.

From the Victorian Bush Nursing Association thanking the Club for its donation of £55 to the funds of the Association, being half of the proceeds of the Wild Flower Exhibition held in October last, and inviting the Club to nominate two members for the life membership of the Association.

The Hon. Secretary announced that the Committee had nominated Miss Amy Fuller and Mrs. E. Coleman for life membership of the Association, and that the nominations had been accepted. Miss Fuller wrote returning thanks for the honor done her.

REPORTS.

A report of the excursion to Queen's Park, Moonee Ponds, for pond-life, on Saturday, 17th January, was given by the leader, Mr. J. Stickland, who reported an interesting afternoon. A large number of forms had been obtained, though none were of particular rarity.

A report of the excursion to the Oakleigh Golf Links on Saturday, 31st January, was given by the leader, Mr. H. B. Williamson, F.L.S., who said that a fair number of members had spent a very pleasant afternoon in inspecting the great variety of Australian trees and shrubs which had been planted about the Club's property.

On the motion of Messrs. C. Daley, F.L.S., and F. Pitcher, it was decided to send to the Golf Club, through Mr. C. C. Plante, a letter of appreciation of its efforts to foster the growing of Australian vegetation for decorative purposes.

A report of the excursion to Ferntree Gully on Saturday, 7th February, was given by the leader, Mr. C. Oke, who stated that only a few members made the trip, and that the results in the way of entomology were not very important.

ELECTION OF MEMBERS.

On a ballot being taken, Miss A. Robertson, Presbyterian Ladies' College, East Melbourne; Mr. Harold R. Clark, 27 Moorehouse Street, East Camberwell; and Mr. J. de L. Forth, 476 Collins Street, Melbourne, were duly elected members of the Club.

GENERAL BUSINESS.

The President, on behalf of the Club, wished Mrs. Thompson *bon voyage* on her projected trip to England, where she intended to spend about twelve months; and expressed the pleasure of the members at the presence of Mr. A. E. Keep on his return to Melbourne after his European holiday.

The President offered the Club's congratulations (*in absentia*) to Mr. G. A. Waterhouse, B.E., F.L.S., on his obtaining the degree of Doctor of Science.

Mr. G. Coghill called attention to the unsatisfactory state of the finances of the Club, and said that the subscription of 15/- per annum, which was sufficient years ago, was now too small to maintain the Club in an efficient state, and gave notice that he would move at a special meeting of the Club, to be called for the purpose, that the annual subscription be raised to 20/-.

Some little discussion ensued, and it was generally agreed that some such step was desirable.

Mr. E. E. Pescott, F.L.S., referred to Mr. Daley's recent contribution to the literature relating to the late Baron von Mueller, K.C.M.G., for many years Government Botanist of Victoria, and one of the leading botanists of the world, the centenary of whose birth would occur on 10th June next. He considered that the Club, which, in its early days had been greatly helped by the late Baron, should in some way celebrate the centenary, and asked the Committee to consider the suggestion.

The chairman replied that the matter had been mentioned at the last meeting of the Committee, but a definite scheme had not yet been drafted.

A vote of thanks was carried to the Victorian Horticultural Society for having allowed the Club the use of its hall during the carrying out of renovations at the Royal Society's rooms.

PAPER READ.

By Messrs. E. E. Pescott, F.L.S., and C. French, junr., entitled "The Orchids of the Ringwood and Healesville Hills."

In view of the fact that owing to the spread of habitations, cultivation, or grazing, localities once abounding in orchids and other wild-flowers can no longer be regarded as good collecting grounds, the authors submitted their paper as one of a short series detailing experiences of thirty years orchid collecting around the metropolis. In this the hilly country around Box Hill, Ringwood, Lilydale, and thence to the Dandenongs and Healesville, was dealt with. The paper was well illustrated with lantern slides of many of the species mentioned, and was accompanied by a list of species and localities for publication and record.

Messrs. Williamson, Barnard, Coghill and Searle, spoke to the paper.

EXHIBITS.

By Mr. A. S. Blake.—Flowering branch of the Western Australian gum, *Eucalyptus macrocarpa*, grown at Ivanhoe.

[These were exceptionally fine, measuring nearly two and a half inches across. Ed. *Vic. Nat.*]

By Mr. F. Cudmore.—Large fossil shell, *Voluta Mortoni* Tate, from the tertiary (Balcombian) of Grice's Creek, Frankston; recorded in Dennant's and Kitson's list only from Muddy Creek, Hamilton, Vic. (Balcombian), and from Table Cape, Tasmania (Janjukian).

By Miss C. C. Currie.—Flowers of orchids, *Cryptostylis leptochila*, Small Tongue-orchid, and *Spiranthes australis*, Austral Lady's Tresses; Larva of Cole's Gum Moth, *Chelypteryx Colesi;* and piece of Messmate timber containing larva of a longicorn beetle, all from Lardner, Gippsland.

By Mr. C. French.—Nine coloured drawings of Grampians orchids by Mr. W. Foster.

By Mr. L. Hodgson.—Twenty-one photographs taken during the excursion to National Park, Wilson's Promontory.

By Mr. J. Leslie.—Dried specimens from Tasmania illustrating gradation of *Eucalyptus Risdoni* from *E. amygdalina;* three Victorian specimens showing variability in *Eucalyptus amygdalina*, Lab.

By Mr. E. E. Pescott, F.L.S.—Flowers of the Queensland terrestrial orchid, *Calanthe veratrifolia*, R. Br., from pot-grown specimen grown at Camberwell.

By Mr. A. K. Rolda.—Carapace of Box Tortoise, from South Africa.

By Mr. J. Wilcox.—Flowers of New South Wales Christmas-bush, *Ceratophyllum gummiferum*, grown at Camberwell.

The following exhibits should have been included in the January list on page 188:—By Mr. J. Leslie.—Dried plant specimens collected on National Park excursion, including White Kunzea, *K. corifolia*, Reichb. (new divisional record); Austral Trefoil, *Lotus australis;* Paper-flower, *Thomasia petalocalyx*; Fieldia, *Fieldia australis;* and Forest Speedwell, *Senecio odoratus*.

Seasonal Records.—The "Nature Notes" column in the *Argus* often contains notes which are helpful to the student of bird or insect life. For instance, on several occasions lately the Orchid Papilio butterfly has been mentioned from various parts of the State; without such records this butterfly would have been regarded as very rare in Victoria, but so many notices appear to indicate that with the increase of citrus cultivation, this fine butterfly is likely to be more seen.

EXCURSION TO THE NATIONAL PARK.

The fifth Club excursion to the National Park, Wilson's Promontory, took place during the first week of the New Year. The party consisted of Mr. and Mrs. L. Hodgson, Mr. and Mrs. V. Miller, Miss L. McMahon, and Messrs. K. Hatfield, T. J. James, J. R. Leslie, C. Ralph, and C. Daley (leader), six of whom were members of the party for the 1923 excursion. It was greatly regretted that, owing to illness, Mr. J. A. Kershaw, secretary to the Park Committee, was unable to go as leader, but, notwithstanding the mutual disappointment thereat, Mr. Kershaw had made suitable preliminary arrangements for the visit, the offer of a Foster Motor Co. to take the party by motor-waggon from Foster to the Darby River being accepted.

However, on a trial trip about ten days before New Year's Day, the motor-waggon got into unstable sand almost within sight of its destination, was overwhelmed by the incoming tide, and definitely put out of action. The company then arranged to take the party through in a capacious cream waggon. Finally, two days before departure, a telegram arrived from the Chalet directing us to disentrain at Fish Creek. On arrival there we found that two waggonettes were to convey us via Shallow Inlet and the beach route

Leaving town by the early train on New Year's morning, we arrived at Fish Creek (99 miles) soon after noon. After a somewhat hasty dinner, tidal conditions necessitating speed, we set off for Fishermen's Camp, about 12 miles distant. The road leads through the hills west of the Hoddle Range, the hills as usual being almost bereft of their natural forest protection, presenting, in some cases, a picture of blank desolation. Not far out, in a Blue-gum by the road side, we saw a Koala with her young one in close embrace, unconcernedly viewing our passage. After leaving the hills behind, the Waratah Bay road passed south-west over wind swept heathy country, the vegetaton being low and scrubby. A dwarf Eucalypt met with proved to be *E. Kitsoniana*. The Common Heath, *Epacris impressa*, the Scented Paperbark, *Melaleuca squarrosa*, the Coast Tea-tree, *Leptospermum laevigatum*, the Small Grass-tree, *Xanthorrhoea minor*, the Long Purple-Flag, *Patersonia longiscapa*, were observed in flower; and generally, the dwarfish flora was that of a sandy and exposed coastal moor. In the moister places there were patches of twisted Eucalypts, Acacias, Casuarinas, and Banksias of medium height. No doubt, in springtime there would be a great profusion of flowers on this heathy country. Approaching the coast, a divergence was made from the Waratah Road. Along the creek the vegetation grew more thickly and the timber more robust in habit the Coast Banksia, *B. integrifolia*, growing well.

At Fishermen's Camp were six saddle-horses, which had been ridden from the Promontory by returning visitors of the Walkers' Club, so six of us mounted, the remaining four proceeding with the luggage in the two vehicles. Fish Creek here embouches to the sea. Although we had come at a good pace from our starting point, the tide was setting in, and it would take all our time to reach the Darby, via the beach. Shallow Inlet is fitly named, and a favourite fishing ground. For the most part the shallows are increasing, the sea-front being partly reclaimed, as sand-stay vegetation, even if a tuft of grass, gets a footing, and assists as a slight barrier against the tidal action, thus helping to encroach upon the sea. In other places the sea is wearing away the shore, as is evident by the number of up-rooted Banksias washed out from their hold on the coastal hummocks. Thus the age-long processes of wearing down and building up are continuously in operation. In many places along this coast is a black, peaty deposit of uncertain age and varying depth, probably

the bottom of efficient morasses or swamps of considerable extent—a further indication of encroachment by the ocean on the uncertain land surface of this coast

Another feature is the very great extent of wind-blown sand hummocks stretching inland, amid which is a succession of "kitchen middens," the coastal vicinity being formerly a source of abundant food supply to the aborigines. Here and there in the shallows are extensive deposits of shells washed in by the tides. At some parts of Shallow Inlet the ocean must, at low tide, be distant about a mile from its position at high tide. Here was seen a large dead seal, which had been stranded high and dry on the shore.

Our race against the tide was lost, for before we could reach the cliffs, north of the Darby River, the waves were at their base, so that we had to turn into the scrub between some sand hills, and, by a lengthened route, make our way to the entrance-gate of the Park, and thence by the road to the Chalet over the Darby Bridge. Passing over the open downs within the enclosure, we saw two flocks of Emus grazing, about a dozen birds in all, some of large size. This part of the Park is their favorite haunt. Approaching the Darby Bridge, we passed the camp of the walkers and tourists, eighteen of whom had gone to the Promontory on Xmas Day by the coast in the cream waggon, provided in lieu of the motor-waggon, which they had assisted in salvaging *en route*. We arrived about 6.30 p.m., and found the Chalet full, the single members of our party having to sleep in the Rest House near the Bridge, as on the previous excursion. Details in regard to the Promontory have been given in the report of the 1923 visit (Vic. Nat., March, 1924, vol. XL, p. 212), and much information in regard to previous excursions is available in previous volumes of the *Naturalist*.

We were not able to break any new ground, but had daily excursions to some of the sandy bays, buttressed headlands, open moors, or timbered slopes. An enjoyable and interesting trip was made to Lilly-pilly Gully, with its shady groves and clear sparkling streams, in which the mountain trout disported themselves. Lilly-pillies, *Eugenia Smithii*, are exceedingly numerous; from seedlings a few inches high up to veterans of great age and size, with trunks beset with mosses and polypodies. The chief excursion undertaken was to Sealers' Cove, a distance of about twelve miles; again a most delightful experience, not only for the

variety in types of country passed over, but also for the luxuriance and attractiveness of the flora on the eastern slope of the Park. After passing through the dense Hazel, *Pomaderris apetala*, thickets on the saddle between the Wilson Range and Mount Ramsay, we found the track, although noticeably drier than the year before, in very good order, the encroaching Sword-grass being kept well in hand and the obstructions removed. The slopes of the ranges, which form an amphitheatre enclosing and sheltering the Cove, are densely clothed with vegetation, Pteridophyta being specially noticeable, nearly every fern in the census being well represented; Mosses also were very numerous. Amid the characteristic fern-gully vegetation were some handsome trees of the Myrtle-Beech, *Nothofagus Cunninghamii*.

One is puzzled at the abundance of dead tree-trunks of great height which occur in this area. Were they killed by fire as the ranger opines, or have they, after unusually rapid or abnormal growth to maturity, died slowly from the top, having exhausted both their available nourishment and their vitality? Support is given to the latter theory from the fact that where any fairly high-living gum-trees still remain, the top branches are dead. The scores of huge tree-trunks which lie uprooted also show, on examination, a shallow and seemingly inefficient root system in proportion to the extreme height and bulk of the trees. Granite ranges do not give the security for firm rooting which is so necessary for very lofty trees, growing on such steep slopes; hence the tendency to crash downwards which is a feature of this area. We camped for the night at the Cove. The beach is a good one for shells of many species. Sealers' Creek has a considerable volume of water, its basin being extensive and the watershed high. It rises near Mount Latrobe, 2434 feet, with an affluent from Mount Wilson, 2350 feet, thus draining an area of about ten square miles, having a good rainfall. Mountain trout and blackfish are in this stream, and with tidal interchange salt-water fish will be found near its mouth. Directly east of the Cove, on the horizon, lie four islands, one of which, Cliffy Island, has a lighthouse. We also saw a red light to the south-east of the Cove, but were unable to determine its cause. After a short though pleasant sojourn at this attractive haven, we left next day, and returned in good time to the Chalet.

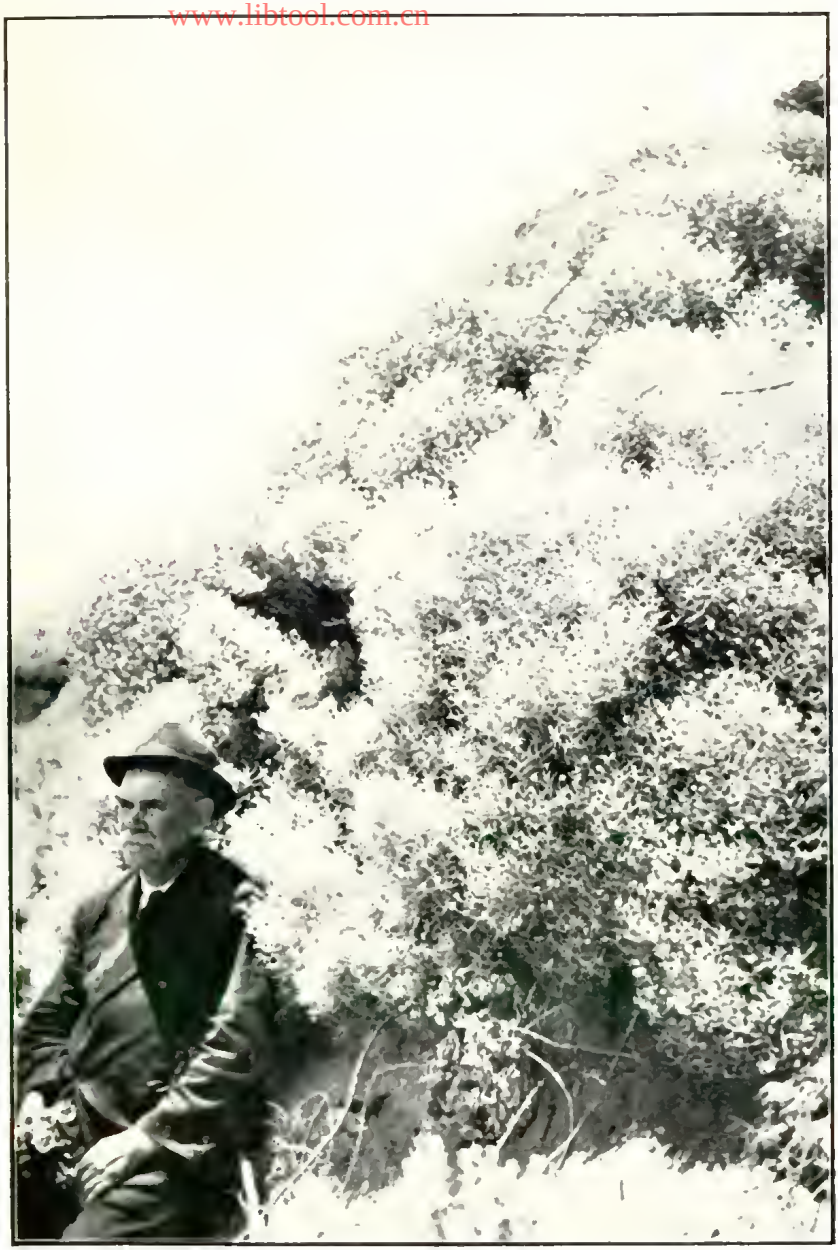
The weather had been delightful, but on Wednesday a misty rain fell, and the projected excursion to Norman Bay, into which Tidal River flows, was abandoned for two shorter

excursions closer at hand. On one of these we went south along the summit of the ranges, west of the Darby saddle, through the fine Casuarina groves, and amid huge granite boulders. Fine views of the Inlet, and of the picturesque western coast and islands are here obtained. We then took a cut through thick scrub to the little bay on the northern side of the track to Tongue Point. The tide being fully out, opportunity was taken to examine with interest the abundant shore-life left in the deeper holes among the granite outliers.

On Thursday morning, 8th January, with an outgoing tide, after an early start, a safe return to Fish Creek was made. The great extent of sand surface at Shallow Inlet, left by the receding tide, was now very evident. Four of the party, however, stayed until Friday in order to make an excursion on horseback to Oberon Bay. It was rather disappointing to see so little wild-life in the National Park. No kangaroos were visible. The Koalas seem to be fairly numerous, about a dozen in all, including two babies in arms being observed. An Echidna was seen by one of the party. Black-backed Wallabies occasionally bounded into and out of view. A few rabbits and a fox showed as unwelcome intruders. Two or three snakes, copperheads and one brown snake, were reported, whilst small lizards were numerous. Bird life was well represented. Flocks of vociferous White and of Black Cockatoos were frequently seen and heard, whilst Wattle-birds, Derwent-jackasses, Lories, and Pennant-parrots haunted the Banksias and coastal scrub. At early morn near the Rest House the tuneful and varied notes of many birds were heard from daybreak onwards—a pleasing relief from the raucous cries of city milkmen at dawn. A Derwent-jackass and a Whip-bird, respectively, gave daily exhibitions of their vocal powers, near the Rest House, both at the opening and close of day.

Evidently the flowering season was about a month earlier at the Park this year compared with last, for many plants in bloom last year at this time had passed that stage. About eighty species were noticed in flower, as against one hundred and four last year. The introduced Purple Senecio, *S. elegans*, with single and also double flowers on the same stems, was one of the first to attract the eye; White Kunzea, *K. corifolia*, and the Coast Tea-tree, *Leptospermum laevigatum*, were in full bloom. Austral Trefoil, *Lotus australis*, and Purple Swainson Pea, *S. lessertifolia*, were conspicuous in flower and pods. Myrtle Acacia, *A. myrtifolia*, scantily

PLATE VI.



CUSHION-BUSH, *Calocephalus Brownii*
With C. Daley, F.L.S., leader.

bloomed, and the Coast Acacia, *A. sophorae*, and the Spike Acacia, *A. oxycedrus*, were in the fruiting stage. Sweet Bursaria, *B. spinosa*, and the pretty Paper-flower, *Thomasia petalocalyx*, the latter abundant on the Tongue-Point track, were flowering well. Olearias were mostly in seed; a few Composites in bloom. The Pale-fruit Ballart, *Exocarpus stricta*, with its berry-like fruits, made an attractive show. Bidgee-Widgee was a constant annoyance, its brown balls of hooked seeds pertinaciously clinging to one's nether garments. Coast Beard-heath, *Leucopogon Richei*, provided with its fruit an abundance of food for the birds. At Scalers' Cove, the vegetation under exceptional conditions for growth, is unusually vigorous. Specially noticeable were the very fine foliage and flowers of the Grass Trigger-plant, *Stylidium graminifolium*, with an unusual number of blooms, excellent in colouring, and of very robust habit. Its fine appearance would seem to promise distinct improvement if placed under expert cultivation as a garden plant. The Scented Fan-flower, *Scaevola suaveolens*, was exceptionally fine in leaf and flower. Another species of unusual size and attractiveness was the Forest Groundsel, *Senecio velleioides*, the Saw Groundsel, *S. vagus*, and the Scented Groundsel, *S. odoratus*, also showed similar characteristics. Of Orchids, a single specimen of the Hyacinth Orchid, *Dipodium punctatum*, and one of the Potato Orchid, *Gastrodia sesamoides*, were seen, the later a very fine plant two feet high with about twenty flowers on the stem. Most of the moisture loving plants had passed the flowering stage, but *Viminaria denudata* still showed its golden sprays. The Banksias, of which four representatives grow at the Promontory, were much admired, and seem to have ideal conditions for growth. The Cushion-bush, *Calocephalus Brownii*, was in many places close to the sea, quite luxurious, as the accompanying illustration shows.

Every day was well occupied in the open, the variety of scenery by sea and shore, on the timbered ridges, in fern-clad gullies, by shaded mountain creeks, on the heathland, and over sandy, stony, gritty or carpeted, leaf-strewn tracks, in touch with nature, animate and inanimate, being a source of continual interest to us. In regard to the fauna, that which left the most lasting impression upon us was the Sandfly, *Ceratopogon molestes*, unobtrusive but effective in its operations. It was in its thousands near the Darby, and very aggressive. The accommodation at the Chalet was

very satisfactory, and the popularity of the National Park as a tourist resort is greatly increasing. Despite mosquitoes, March flies and sand-flies—minor discomforts—we had a very interesting and pleasant excursion. Owing to delay in definitely marking out a route, the construction of a road through the isthmus has not yet been taken in hand. Only a good road and increased accommodation are required to ensure the popularity of the National Park for visitors. Rest Houses are to be erected at Sealers' Cove, Titania Creek, and Oberon Bay. These will be of material advantage to campers. Tracks, generally, are good. Bad Saddle might to advantage be regraded. The planting of some quick-growing gums for shade and shelter near the Chalet would be an advantage, and relieve the bareness. A good boat on the Darby is badly needed. Members visiting the National Park can be assured of every attention to their needs, and riding and pack-horses are always available for long journeys.—CHAS. DALEY.

EXCURSION TO QUEEN'S PARK, MOONEE PONDS.

About a dozen members and others visited Queen's Park on Saturday, 17th January, in search of pond organisms. Although the material collected was fairly good, some interesting protozoa obtained on a previous visit were wanting on this occasion. The extensive lily-pond was the first scene of operations, and most of numerous forms noted were obtained there, protozoa being in the majority. A red Stentor, although doubtless *S. igneus*, differed considerably from the type as figured in Kent's "Manual," being much longer in proportion to its breadth. It was very numerous. Three species of the genus Trachelomonas were found, one bearing a remarkable resemblance to a floating bottle being specially interesting. This I take to be a very large form of *T. cylindrica*, Ehr. It is seemingly generally to be had in this pond, although far from common. A small gathering of moss (Fimaria) from near the water's edge yielded representatives of three genera of Rhizopoda and a large variety of diatoms. The large lake in the Park received attention next, and proved to be swarming with Entomostraca, a large form of *Daphnia carinata* being very plentiful. In this lake we were surprised to find a number of colonies of the free-swimming rotifer, *Lacinularia elliptica*, Shep., the water being practically devoid of vegetation. The Rhizopoda, *Difflugia lobostoma*, Leidy, was found in some sediment

taken from the bottom of the lily-pond. The weather being delightful, a very pleasant afternoon was spent.—J. STICKLAND.

EXCURSION TO OAKLEIGH GOLF LINKS.

An enjoyable time was spent at the Metropolitan Golf Links at Oakleigh by members who attended the excursion on the afternoon of Saturday, 31st January. The party was received by Mr. Shaw, the manager and secretary, who escorted the visitors round the grounds, and it was soon realised by them that the Golf Club was doing a great deal towards fostering the planting of Australian trees and shrubs. In all parts of the 166 acres these were to be seen, some being in bloom. The tree that attracted the most attention was the West Australian Crimson-flowering Gum, *Eucalyptus ficifolia*, many specimens of which were conspicuous among the native scrub. The glory of them all was to be seen in the splendid specimen in front of the Club House. This tree, which is thought to be the finest in Australia, is worth going a long way to see. It was not quite in full bloom, but members who saw it on that day can well believe that the beautiful coloured plate that appeared in the "Gum Tree" last year is a faithful representation of it as it would appear a fortnight later. All the local native plants outside the fairways and greens are protected, and, in spring, should present a fine show of bloom. A few were found still flowering, such as two of the Guinea flowers, the Tufted Grass-Lily (*Stypandra*), the Golden Goodia, the Blue-spike Milkwort, and a few others. Mr. St. John directed the attention of the party to twenty-five species of Acacias and eight of Eucalypts, several of which were in bloom, viz.: *Acacia pruinosa, decurrens* var. *mollis, elata, rhetinodes, linearis, Eucalyptus ficifolia, calophylla* (both in various shades of colour), *botryoides* and the local *viminalis* and *ovata*. The fine avenue of *Cupressus macrocarpus* of North America, leading from the gate, and the beautiful *Carissa grandiflora* and *Virgilia capensis* were much admired. After the ramble, the members of the party were invited to afternoon tea, at which Mr. Shaw was accorded a hearty vote of thanks for his hospitality, on the motion of Messrs. C. Daley and F. Pitcher, both of whom congratulated the Club on the fine work it is doing in popularising the growth of Australian ornamental vegetation.—H. B. WILLIAMSON.

SOME VICTORIAN HOLIDAYS.

By A. L. Scott.

(Read before the Field Naturalists' Club of Victoria, 15th January, 1925)

The slides which I am about to show you to-night represent the cream of the photographs taken during the holidays of many years.

Early in 1923 a friend and myself agreed that for our next holidays we would attempt the walk across the Baw Baws, from Warburton to Walhalla. We were able to obtain simultaneous leave in December. Shortly before the date upon which we had arranged to start, we were informed by the tourist authorities that the track was in a bad condition, and were advised to wait for a month or so until repairs had been effected. We decided to risk it, but we took extra provisions in case of trouble. We thought we had arranged for a vehicle to take us the twenty miles between Warburton and McVeigh's, but it failed to materialise; however, we were given a lift for some miles in a motor by some Board of Works officials. They landed us at a "glue-pot" near the O'Shannassy works, and we humped our swags on to Walsh's Creek (McVeigh's).

Next day we followed the track up the Yarra valley, crossing Alderman's Creek, and lunching in a delightful spot alongside the clear waters of the Yarra some distance beyond Contention Creek, where a little mining was at one time carried on. Long years ago, before this track was opened up, I was one of a party that made an attempt to reach the Yarra Falls, and return to Melbourne during the four days of the Christmas holidays. We attempted then to follow ridges, but got into difficulties somewhere in the direction of Mount Horsfall. We were wise enough to abandon the attempt and return the way we had come, otherwise a rescue party might have been required.

We have the track now, and on this occasion reached the "Falls" hut in nice time to get dried and have tea by the light of our fire. For we had experienced soaking rain for some miles, and the fern fronds had unladen some of the moisture they carried on to our clothing. Next day we visited the Falls, which are situated on Fall's Creek, some little distance from the Yarra, taking things easily in anticipation of trouble. There was a storm that night, but the morning broke fine, and we had no more rain until

after our return to Melbourne. The crossing at Fall's Creek is a lovely spot, but from there for some miles the track is a perfect switch-back. Looking back on that day's walk, I know we must have had considerable stretches of clear track, but I see it as a nightmare of steep uphill pinches and interminable scrambling over logs—logs of all sizes, sometimes almost too big to climb over, sometimes singly like the giant shown, sometimes in twos and threes or even fours and fives, sometimes like a giant's ill-made piece of corduroy. Neither of us are particularly young, and neither had been "on the wallaby" since before the war. Needless to say we were thankful to reach the Whitelaw hut in time to draw our water before dark.

This hut, as you will see by the slide, was decidedly ramshackle. So we decided if rain came on during the night we would shift our bedding to under the table. We had seen much beautiful forest scenery during the day. The crossing over the head waters of the Yarra was extremely beautiful, while at the Thompson bridge one had a strong feeling that there should be a country town within a mile or so. Probably its comparatively open situation, combined with the camping ground and a plentiful display of old Kodak cartons, caused this idea. At the Whitelaw hut (4800 ft.), we had a fine but cold night, and next day we found snow in places along the track. We made our lunch tea with melted snow, succeeded in crossing the swamps without much difficulty, and reached the Erica hut in good time. From there the panorama is magnificent and strongly reminded us of the views at Mt. Buffalo, the granite tors strengthening the resemblance. The magnificent forest-clad descent of Mount Erica marked the end of the interest of the trip. From there to the beautiful valley in which Walhalla lies there is little of interest but the signposts, which were often conspicuous by their absence. This is a defect which should be remedied. It cost us much heartburning and a couple of hour's delay, and doubtless other tourists have had similar experiences. Since our trip I understand the track has been greatly improved, and the huts replaced by new structures. Perhaps signposts have been put at each point where the timber tramway cuts the tourist track.

Another improvement which would be appreciated by visitors would be the erection of signposts at those picturesque creeks, not marked on the map in spite of their beauty, which are crossed between Contention Creek and

the Fall's but. They should show the name of the Creek and the distances to Fall's Creek and McVeigh's respectively. The Tourist Bureau authorities are always willing to supply maps of any portion of the State for which they have been published, and to add any other information which they happen to possess.

Our southern coast contains scenery of quite a different character to what I have just shown. From Geelong to Koroit was covered by two trips, one, a lone hand, from Geelong to Lorne, and the other with "billy" and swag and a companion from Koroit to Lorne. I arrived at Geelong late one evening, having travelled nearly all day, tired and hungry. I slept the sleep of the just, and next morning sallied forth to see the queen city of Corio in a whirling dust storm, soon to be followed by heavy rain, which presently blew over and was followed by clear watery sunlight. Barwon Heads, at the end of the first stage of my journey, looked clean and attractive, the fishing boats at the mouth of the river making a pretty picture; but it seemed a deserted village. A solitary smoke led me to a store, where accommodation was enquired for. The hotel was suggested. "Is it not shut up for the season?" Oh, no, only like every place else, it has been shut up for the dust storm." Thither the traveller hastened, anticipating dinner and other comforts. The comforts were there all right, but no dinner, only tea.

Next day, along the coast towards Torquay was desolate in the extreme. Damp sand sizzled against one's leggings with a steady drone. Blank sea to the left and high sand-hills to the right. Twice I essayed these, but the dismal spectacle of sand-buried fences and bleak lands, together with the annoyance of a dry sand blast in the face, drove me back to the luxury of the beach. To add to the cheerfulness of this uncheerful spin, there lay in one place the mast of a sizeable vessel, a ketch I think, and in another, the half of a fishing boat. At picturesque Torquay no warm dinner awaited me, only a common or garden tea. From the uplands beyond, on looking back, one has a splendid view of Port Phillip Heads and Cape Schanck, while a pleasant bush walk led me into Anglesea, shortly after the departure of the coach. I enquired for dinner. "Very sorry," said my hostess, "we only have lunch." However, that lunch was better than many meals served under the more ambitious title. After lunch my hostess directed me to the old coach road towards Lorne, and a section of that

walk sticks in my memory. The track was through a carpet of wild flowers, while the high ridge along which it ran commanded, on one side, a view of distant hills, and, on the other, the deep blue of the ocean, in which, to my mystification, sailed glorious purple patches. Later, I found that these were the reflections of the great wool-pack clouds sailing across the bright blue sky.

That night, at Anderson's, at Airey's Inlet, they showed me the Lonsdale and Schanck lights, forty miles away. The next afternoon I reached Lorne, and in the morning a guest of the house very kindly took me to the "Sanctuary" before breakfast, and I afterwards joined a picnic party and visited the Phantom Falls and other beauty spots before catching the coach for Dean's Marsh, and thence to town by train.

The following year our journey was from Koroit to Lorne so as to include Tower Hill. Near Nirranda we camped by a sea cliff. There was a handy waterhole and a broken fence. "We will show them at home how a tent should be pitched, and we will photo it to-morrow." Never put off, etc. Before midnight we had dressed again and packed our swags, and were sitting wondering whether the gale would carry our borrowed tent into the sea. When morning came it still stood. The fence had saved it, but we did not take that photo, it looked too disconsolate.

The views, you will notice, show some interesting examples of coastal weathering. How the joints in the rocks help the sea in its work of destruction, and how, in spite of the fury of the waves and their undermining action, there are places where the wind and rain are more destructive than the ocean. The coast hereabouts has been a graveyard for ships in the olden days. The story of the "Loch Ard" is well-known, but there were many others—the "Fiji," the "Marie Gabriel," the "Eric the Red," etc. Near Moonlight Head the tertiary coastal plains give way to the mesozoic of Lorne, with its rounded hills falling right down to the sea.

On the western side of the Otway the cliffs are grander and more forbidding than those of the famous watering place. Being unable to get the desired view of Moonlight Head in the camera with the ordinary lens, I fell back on that friend of our childhood days, the pin-hole, with some success, as you will notice. These beaches are very treacherous, and visitors would do well to make enquiries as to places of ascent and descent, and keep a look out for "king" waves. After wading the Aire River mid-thigh deep, we

picked up the track to the Otway lighthouse, threading our way through interminable sandhills. Here we got a friendly welcome, and, after seeing the sights, departed with some of the best bread in our packs we had ever tasted. We camped that night in the shelter of the tea-tree, and next day dined at Apollo Bay, reaching the Kennet River by nightfall. Between Rivernook and the Joanna, and again near Apollo Bay, we learned the real significance of the word "mud." Thence we went by the beach as far as the Cumberland River. Between the Jamieson Creek and the Cumberland the beach is under water at high tide. It is rough but picturesque, and well worth seeing, but visitors should be sure of the tides, and not venture there alone. From the Cumberland we took the track over the hills into Lorne, where we spent another very interesting week.

With the hope that the Wandong district may prove interesting enough to provide an excursion locality for week-end trips, I give a few slides of an outing there, from which you can perhaps judge of its capabilities. With the addition of a camera to one's packages, nature lovers can add greatly to the interest of their holidays away from home, and bring back vivid recollections of many happy hours spent in mountain glen or by the sad sea waves.

[The author exhibited a fine series of lantern slides depicting scenes in different parts of the State. *Ed. Vic. Nat.*].

LIFE OF BARON VON MUELLER.—The reprints of this article referred to in the last *Naturalist* have been delayed in the press, and will be forwarded to applicants as early as possible. Copies will be obtainable, as before stated, on receipt of one shilling; postage, one penny extra.

THE DEMAND FOR WOOD.—The president of the American Tree Association, Mr. C. L. Pack, speaking at Washington, U.S.A., recently, says that now is the time to interest people in timber growing, which must shortly become an important industry, as natural supplies are fast diminishing. The United States alone uses eight million tons of paper, made from wood pulp, yearly. This is a serious drain on its resources, and it has been calculated that the world uses 4,675,650,000,000 wooden matches yearly, for which £40,000,000 are paid. Some reader may have the patience to work out the weight of wood, in the matches used daily, as a change from the weariness of cross-word puzzles.

The Victorian Naturalist

VOL. XLI—No. 12. APRIL 16, 1925. No. 496.

FIELD NATURALISTS' CLUB OF VICTORIA.

A special meeting of the Club was held at the Royal Society's Hall on Monday, 9th March, 1925.

The President, Mr. J. Searle, occupied the chair, and about fifty members were present.

The Chairman stated that the meeting had been called by the Committee to consider proposed alterations to the rule relating to subscriptions.

Mr. G. Coghill moved: "That in Rule 4—subscriptions—the word 'fifteen' in clause (b), ordinary members, be altered to read 'twenty,' and if this be agreed to, consequent alterations be made in the rates of subscription for country members and associates." Seconded by Mr. F. G. A. Barnard.

Messrs. H. B. Williamson, C. Lambert and F. Pitcher supported the motion, which was carried unanimously.

Mr. G. Coghill moved: "That the subscription for country members be increased to twelve shillings and sixpence, and that clause (c) be altered accordingly." Seconded by Mr. H. B. Williamson and carried.

Mr. G. Coghill moved: "That the subscription for associate members remain as at present." Seconded by Mr. C. Oke, and carried.

The special meeting then closed.

ORDINARY MEETING.

CORRESPONDENCE.

The Chairman read a letter received by the Committee from the Hon. Editor, Mr. F. G. A. Barnard, tendering his resignation of the position, which he had held continuously for a period of thirty-two years, and stating that he would bring out the April number of the *Naturalist*, the concluding issue of the current volume.

The Chairman said that the resignation had been accepted by the committee with very great regret. Mr. Barnard's services had been of great value to the Club, and he trusted someone would come forward to fill the vacancy.

Dr. Sutton moved a hearty vote of thanks to Mr. Barnard for his long service, and congratulated him on the very fine

journal he had given to the Club for so many years. The motion was seconded by the Chairman, and carried unanimously.

Mr. Barnard responded, and thanked the members for their very kind appreciation of his work.

Mr. F. Pitcher moved: "That the Committee frame a suitable resolution expressing the Club's indebtedness to Mr. Barnard for his valuable services for so long a term; such resolution to be recorded in the minute-book of the Club." This was seconded by Mr. A. E. Rodda, and carried unanimously.

The Chairman said it would be necessary to appoint an Editor, whose duties would commence with the first number of the new volume—May, 1925.

Dr. Sutton proposed that Mr. Chas. Barrett, C.M.Z.S., be Hon. Editor. Seconded by Mr. P. R. H. St. John. There being no other nomination, Mr. Barrett was declared duly elected.

Mr. Barrett returned thanks for the honour done him, and said that, with the help of the members, he hoped to be able to produce a satisfactory journal.

REPORT.

A report of the excursion to the Botanic Gardens on Saturday, 14th February, was given by the leader, Mr. P. R. H. St. John, who said that there was a large attendance of members. The afternoon had been devoted to an inspection of the various conifers in the Gardens. Of this group of trees there is a very fine representative collection, including, perhaps, the finest specimen of the New Zealand Kauri Pine to be found growing outside New Zealand. A short lecturette on the subject had been given explanatory of the trees seen.

A vote of thanks was passed to Mrs. St. John for her hospitality on the occasion.

PAPERS READ.

1. By Mr. C. Oke, entitled "New Australian Coleoptera" (Part I).

The author recorded as new a species of Aphodius belonging to the family Scarabidæ, and several Pselaphidæ belonging to the genera Sagola Rybaxis, Tmesiphorus, and Narcodes. He also proposed a new genus, Chalcotarsus, to include a species which cannot be placed in any existing tribe of the family defined by Raffray, consequently the name Chalcotarsini had been selected for a new tribe.

2. By Mr. C. D'Alton, entitled "Plants and Shrubs peculiar to the Grampians."

The paper was read by Mr. H. B. Williamson, in the absence of the author, who in a series of interesting notes mentioned the most important plants, which are found only in the Grampians.

Dr. Sutton, Messrs. H. B. Williamson, F. G. A. Barnard and J. Searle contributed to a short discussion on the paper.

EXHIBITS.

By Miss E. C. Cameron—Marine shells, *Venus lamellata*, from Bridport, Tas., and *Solen vaginoides*, from Brown's River, Tasmania.

By Mr. F. Chapman, A.L.S.—Flowers of *Grevillea asplenifolia*, grown at Balwyn. Plant purchased at Wildflower Exhibition, October, 1922.

By Miss C. C. Currie—Mounted specimen of Swift.

By Mr. V. Miller—Pod of Match-box Bean, *Entanda scandens*, from Queensland, about 18 inches long; aboriginal stone axe; quartzite from Devon, England.

By Mr. C. Oke—Twenty specimens of Beetle, *Stigmodera variabilis*, Don, showing remarkable variations as to colour, markings and size.

By Mr. A. E. Rodda—Specimen showing attachment of young Mistletoe plant, Loranthus sp., to end of a small branch of a Eucalypt.

After the usual conversazione the meeting terminated.

EDITORIAL.

With this number of the *Naturalist* I relinquish, with some regret, my post as Editor. During the long years I have followed the varying fortunes of our publication I have derived much pleasure from my association with it, and have made many lasting friends, and possibly some enemies, whom I know not. The duties of the position have become more exacting as the years passed, and, not being a man of leisure, there seemed to be no other alternative than to ask some one else to take up the reins; after a long run like this a change also is likely to be of advantage. I trust my successor will receive the support which such a position demands, and that it may be many years before the final issue of our Club's journal is printed.—F. G. A. Barnard.

THE SCIENTIFIC NAME OF OUR CLUB'S BADGE.

The name of the shell adopted some years ago as the badge of the Field Naturalists' Club of Victoria has long been known as Nassa fasciata, the Banded Nassa. This name seemed so appropriate that we feel we would like to retain it. But this the priority critics will not allow. And quite a storm in the nomenclatorial tea-cup has lately raged over the innocent little shell.

As far back as 1799 similar generic forms to ours were named Nassa by Lamarck; but Bolten, only one year before Lamarck (1798), named another shell, not congeneric, as Nassa. Therefore, a later generic name to fit our species has to be sought. This later name is found in Dumeril's Nassarius, 1806, and this, therefore, satisfies the demands of priority.

The controversy, however, does not end here, for the Nassa of Lamarck included a section, Alectrion, made later by Montfort (1810), to denote similar forms to the above; but this has been regarded by most authors merely as a subgeneric name. Unfortunately other authors desire to place our southern forms in Alectrion as a genus rather than in Nassarius. Hedley, Gatliff and Gabriel, however, uphold Nassarius.

As regards the trivial name, "fasciata" (i.e., banded), this also cannot be retained under priority rules. The original reference is to Lamarck's "Buccinum fasciatum" (1822). But here comes the difficulty; O. F. Müller (1774) had already described a different mollusc as "Buccinum fasciatum," which interesting but disturbing fact is pointed out by Iredale (Trans. N.Z. Inst., Vol. XLVII, 1915, p. 467). Iredale therefore proposes "victorianus" as a new name, and remarks, *loc. cit.*, under "Alectrion victorianus, nom. nov." "I believe this shell is the badge of the Field Naturalists' Club of Victoria, and for this reason have formed the above specific name."

After duly considering the claims of other authorities, the present writer cannot see from the above evidence any valid reason why our well-known shell should not be referred to as Nassarius victorianus, Iredale sp.—Frederick Chapman.

THIRTY YEARS' ORCHID COLLECTING.

PAPER I.

ORCHIDS OF THE HILLS AND MOUNTAINS.

By E. E. PESCOTT, F.L.S., AND C. FRENCH, JNR.

[*Introductory Note.*—No keener collectors of orchids have been known in this State than the two French's—father and son. When travelling facilities were rare, they walked for miles in different parts of the State, and were well-known as authorities on this family of plants. They would take the train to Box Hill, walk out through Ringwood, Belgrave and the Dandenongs in search of these flowers. No walk was too far for them when in quest of orchids. C. French, Senr., recorded his observations in the "Southern Science Record," and in the early volumes of the "Victorian Naturalist," forty years ago. He was the first to cultivate these orchids, and had a fine collection growing in pots in the Melbourne Botanic Gardens, where he was employed in those days. C. French, Jun., is known more for his collections and records, his first paper being a record of collections, published in 1895.—E.E.P.]

The rapid expansion of the suburbs of Melbourne, the modern facilities for quick transit, and the extension of homes to the mountain areas, are factors in the difficulty of orchid collecting in these modern times. In the days of collecting of C. French, Senr., orchids were collected in the Botanic Gardens domain and in Caulfield racecourse; Richmond, Hawthorn, Kew, Elsternwick, Caulfield and Brighton yielded their treasures also. Now these districts are thickly populated, and easily-reached localities no longer exist.

The difficulties connected with early orchid collecting included the difficulty of nomenclature. No real authority existed here, and local botanists were more interested in the conspicuous and hardier types of plants. Thus it is not surprising to find that *Pterostylis Taveyana* was collected by C. French, Senr., at "Gypsy Village," now Cheltenham, in 1887, but was not recognised as new, being classed as *P. reflexa*. Also, *Corysanthes bicalcarata* was collected by us at Healesville many years ago, and was named, by authority, as *C. pruinosa*. In 1892, C. French, Jnr., collected, on the Baw Baws, a *Caladenia*, which was named as a mountain variety of *C. carnea*. Now this flower has been re-collected on the same mountains, and is to be given specific rank.

This paper notes the orchids collected in a series of districts, more or less hilly, extending from Box Hill, through Blackburn and Ringwood, including Warrandyte, to the Dandenong Ranges; and then through Croydon to Warburton and Healesville. In the table attached localities are

given, with the name as a centre of a large radius; thus Ringwood would include Mitcham, and so on.

During the years under review we have collected, in these districts, 95 species out of the 135 species recorded for the State. Mueller's "Key" records 73 species, and of the many species since added to the list, quite a number of these have been listed as a result of our activities. This 95 species does not include varieties; many colour and other varieties have been so collected. Our best "bag" was taken a few years ago at Ringwood, when we collected 25 species in full flower, several other species being noted in foliage as well. This locality is now being sub-divided for country homes.

SARCOCHILUS.—The one local species of this epiphytic genus, *S. parviflorus*, is still to be collected at Fern Tree Gully, Bayswater and Belgrave. In one gully, about six years ago, we saw a Blackwood tree carrying, in September, nearly one hundred flower spikes. This year (1925) we collected five plants in full flower, early in January, in a Belgrave gully. It would seem as if, in the cooler gullies, the flowering season is much later than those facing north or west. This species is not at all particular as to its host. We have collected it here on Blackwood, Musk, Sassafras, Pittosporum, Blanket-leaf and Eucalyptus.

DIURIS and GASTRODIA.—Observations extending over several years lead us to conclude that these fleshy-rooted, leafless species do not flower for some time after gathering. A fine healthy spike of *Gastrodia sesamoides* was collected in 1923. In 1924 and 1925 the spot was revisited, but no flowering growth was noted. This orchid, like *Sarcochilus parviflorus*, flowers late in cool areas; it is to be collected in Sherbrooke Gully in January, while it is an October to November flower in warmer spots.

CRYPTOSTYLIS and SPIRANTHES.—These fleshy-rooted, leafy orchids are becoming rare. *Cryptostylis leptochila* was known at Belgrave, and always yielded a few flowers annually; but this year the Roads Board graded the road and deposited the clay on top of our patch. Thus it is lost for all time. Similarly our locality at Woori Yallock, which yielded a hundred spikes of *Spiranthes australis* a few years ago, has become a stock paddock, and our orchids are gone.

PRASOPHYLLUM.—This genus yielded us that species rare at any time, *P. flavum*, at Belgrave. Its yellow flowers, conspicuous in New Year, are easily seen; but it has only been recorded half a dozen times for Victoria.

We could never forget the day when we found two new species at Ringwood, growing in the same paddock—one green and the other with a large white labellum. The white

one was determined as *P. odoratum*, var *album*, new for Victoria; and the green one was new to science (see Fig. 4). At our request, Dr. R. S. Rogers named this *P. Brainei*, in honour of Mr. A. B. Braine, who had done us a similar honour a few years previously.

On the same day a fine clump of six stems of *P. Frenchii* was discovered, new for this district. This was a notable day, for we also found *Acianthus caudatus* (see Fig. 3) in the same locality; this orchid never having been recorded nearer to Melbourne than Healesville, where it grew abundantly.

Prasophyllum alpinum was collected many years ago in various localities. This species is sometimes united by botanists with *P. fuscum*. In "Flora Australiensis," Bentham remarks that *P. fuscum* has free sepals, though other botanists differ. He also repeats Gunn's observation, that *P. fuscum* is inodorous, while *P. alpinum* is strongly fragrant. Here, we find that *P. fuscum* is always sweetly fragrant.

Thelymitra.—On the day previously mentioned we also collected *Thelymitra pauciflora*, which has a new record for this State. A week later we found this "new" species at Cheltenham, Ringwood, and indeed many of the lower localities from Box Hill onwards, are abundant in Thelymitras, the more abundant species being *T. aristata*, *T. antennifera*, *T. flexuosa*, *T. carnea*, *T. ixioides* and *T. longifolia*. On a few occasions *T. grandiflora* has been found.

Microtis.—For years only two species of this genus were found here—*M. porrifolia* and *M. elata*. Later, *M. parviflora* was added. For years a Microtis was very abundant in several localities, which was labelled as *M. porrifolia*. Recently its variation was noted, and was named *M. oblonga*, on account of the shape of the labellum.

The periodic disappearance of orchids is often a matter for comment. In December, 1923, we observed *M. oblonga* by thousands, of all heights—some two or three inches tall, others nearly two feet—for miles along one of the tracks to Sherbrooke Falls. In the Belgrave district, too, that orchid was quite common during the same season.

These localities were visited in the next season, December, 1924, when it was found that this species was exceedingly rare, only a few scattered plants being found.

In the Sherbrooke Gully, in January last, an unusual orchid was observed growing upon a tree fern, about eight feet from the ground. There were two plants. Another plant was observed in a similar position, on a fern, about half a mile away from the others. The three plants were

growing on the western side of the ferns. It took some time to determine that they were either *Prasophyllum* or *Microtis*, as they were not in flower. They were probably *Microtis oblonga*, as that species is common on the hillsides of the gully, facing the ferns, and they were probably the produce of seeds which may have been blown over by the wind. This is one of the rare occasions that we can definitely assume the growth of orchids from seed, and we think it is the first record of a *Microtis* being an epiphyte.

CORYSANTHES.—This genus has yielded us four species, two of which are commonly epiphytes. *Corysanthes pruinosa* and *C. fimbriata* are often found on tree ferns in the gullies. They possess, along with *Chiloglottis*, the peculiar property of prolonging the flower stem (peduncle) after flowering. At the flowering stage, the flower stems of these orchids are usually not one inch in length. After fertilisation, the flower stem begins to elongate, and the capsule increases in size. Before the capsule dehisces and scatters the seed, the stems are frequently nine or ten inches in length. Nature has possibly given the plants this gift, in order that the seed may be scattered far and wide, as the seed capsule sways in the wind.

C. bicalcarata was collected at the Blacks' Spur; and an exciting "catch" was made at Fernshawe, when *C. unguiculata* was found in 1897, an interesting record of this species being found in a mountain area.

CALADENIA.—This genus provides us with some interesting recollections. One has previously been referred to in regard to *Caladenia Cairnsiana*. (See Vict. Nat., Vol. 37, p. 108.)

Many years ago, Baron von Mueller proposed to combine many forms, including *Caladenia Patersoni*, into one species, to be called *C. pulcherrima*. Thus, the species now known as *C. clavigera* was included in this group, subsequently being grouped with *C. Patersoni*. It has since been restored to specific rank. This species we have often collected in the hill country. This is also the case with *C. reticulata*. This species we collected fifteen years ago at Evelyn, as one of the varieties of *C. Patersoni*. It was found last year at Belgrave.

Caladenia alba is one of the rarities, and is referred to in the above-mentioned paper.

CHILOGLOTTIS.—The hill species of this genus are interesting as being both epiphitic and terrestrial. *C. Gunnii* is usually terrestrial, and *C. Mulleri* epiphytic. Occasionally the former is found growing on tree ferns; the latter has always been known as epiphytic until January, 1925, when we found two large colonies growing as terrestrial at the head of Sherbrooke Gully. These two species have the property of

PLATE VII

Fig. 2.—RED TONGUE GREENHOOD, *Pterostylis decurva*, ROGERS.

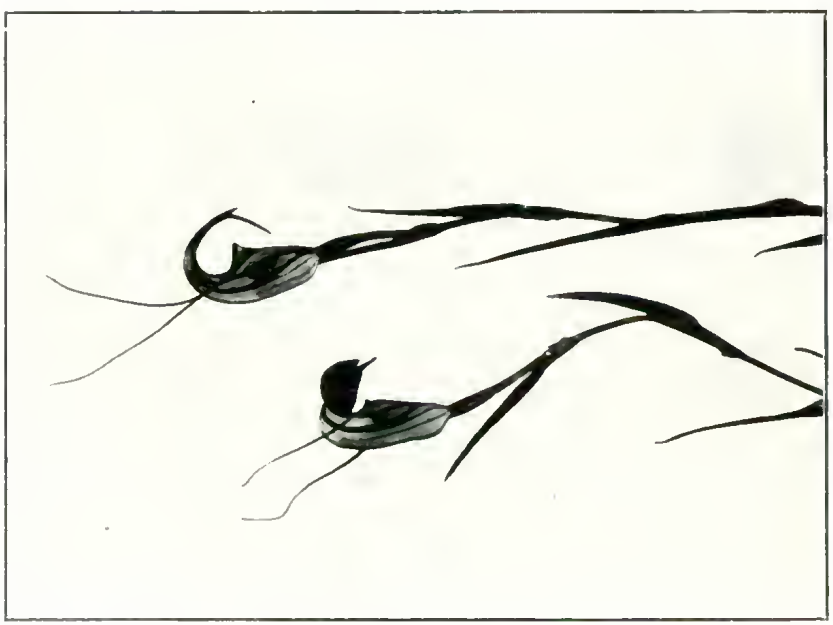


Fig. 1.—LONG TONGUE GREENHOOD, *Pterostylis grandiflora*, R.Br.

Fig. 3.—MAYFLY ORCHID, *Acianthus caudatus*, R.Br.

(Negatives by E. E. Pescott)

Fig. 4.—GREEN LEEK ORCHID, *Prasophyllum Brainei*, Rogers, and SWEET LEEK ORCHID (var.), *Prasophyllum odoratum* var. *album*, Rogers.

prolongation of the leaf stems, but usually only when growing on tree ferns. In the two large terrestrial colonies of *C. Muelleri* found this year, not one of the fruiting specimens made any attempt to increase the length of its stem. *C. diphylla* (*reflexa*) was found at Fernshawe many years ago.

For years we collected *Diuris palachila* as a yellow form of *D. maculata*. Subsequently it was found to be another species.

PTEROSTYLIS.—This wonderful genus has provided us with many changes and surprises. Many years ago, *P. cucullata* was found and named. Then it was lost. In later years a tall, large-flowered orchid was collected, which the Baron named as *P. cucullata*, but which was really a new species. After this, the true *P. cucullata* was again collected, but not recognised; so the Baron named it *P. MacKibbini*—a second name for the one plant. Meantime Mr. C. French, Jnr., collected in the ranges a slender, smaller-flowered species, which the Baron named *P. cucullata*, var. *Alpina*.

It took years to find someone who would unravel the obvious tangle. Subsequently Dr. Rogers restored *P. MacKibbini* as *P. cucullata*. The usurping species was named *P. falcata*, and its alpine form, *P. alpina*. At Healesville, on the spot where the new reservoir is being built, we could always rely on getting one or two blooms each season; but a few years ago we were astonished to find a spot on Dandenong Creek where hundreds were in full flower. One albino plant was noted.

Another "find" was the astonishing appearance of *P. vittata* at Healesville. This is purely a coastal form, and is rarely found in the hill country.

Another surprise was the finding at Belgrave of *P. grandiflora* (see Fig. 1), a species that had been "lost" for years. The beautiful *P. decurva* is one of the latest new species (see Fig. 2). Its dainty, slender form, combined with the delicate colour and rich red tongue, make it a much-desired flower. Mr. Alister Burns first directed our attention to this species, having seen it at Fern Tree Gully. It was missed for years on account of its late flowering season, being at its best in December and January.

The table following indicates the localities in which we have collected these and other orchids. We make an earnest appeal to orchid collectors and lovers not to unduly gather the flowers. They are fragile plants, and are fast disappearing. We should consider them as an heritage, rather than as a personal gift, doing all we can to protect them and pass them on to others in years to come.

ABBREVIATIONS OF LOCALITIES

Bayswater—Bays.
Belgrave—Bel.
Black Spur—B. Spur.
Box Hill—B.H.
Croydon—Croy.
Dandenong Ranges—Dand R.
Evelyn—Ev.
Fernshawe—Fern.

	Scientific Name.	Common Name
1	Sarcochilus parviflorus (Lindl.)	Small Sarcochilus
2	Dipodium punctatum (R.Br.)	Hyacinth Orchid
3	Gastrodia sesamoides (R.Br.)	Potato Orchid
4	Prasophyllum Archeri (Hk.f.)	Archer Leek-orchid
5	,, Brainei (Rogers)	Green-lipped Orchid
6	,, brevilabre (Hk.fil)	Short-lipped Orchid
7	,, despectans (Hk.f.)	Tiny Leek-orchid
8	,, flavum (R.Br.)	Yellow Leek-orchid
9	,, fuscum (R.Br.)	Tawny Leek-orchid
10	,, Frenchii (Fv.M.)	Stout Leek-orchid
11	,, nigricans, (R.Br.)	Dark Leek-orchid
12	,, odoratum (Rogers)	Sweet Leek-orchid
13	,, patens (R.Br.)	Pale Leek-orchid
14	,, intricatum (C.Stuart)	Elfin Leek-orchid
15	,, australe (R.Br.)	Austral Leek-orchid
16	,, elatum (R.Br.)	Tall Leek-orchid
17	,, alpinum (R.Br.)	Alpine Leek-orchid
18	Calochilus campestris (R.Br.)	Peaked Beard-orchid
19	,, Robertsoni (Bth.)	Brown-beards
20	Thelymitra aristata (Lindl.)	Scented Sun-orchid
21	,, antennifera (Hk.f.)	Rabbit-ears
22	,, carnea (R.Br.)	Pink Sun-orchid
23	,, flexuosa (Endl.)	Twisted Sun-orchid
24	,, grandiflora (Fitz.)	Great Sun-orchid
25	,, ixioides (Sw.)	Dotted Sun-orchid
26	,, longifolia (R. and G. Forster)	Common Sun-orchid
27	,, Macmillani (Fv.M.)	Salmon Sun-orchid
28	,, pauciflora (R.Br.)	Slender Sun-orchid
29	,, canaliculata (R.Br.)	Pale Sun-orchid
30	Microtis porrifolia (R.Br.)	Common Leek-orchid
31	,, atrata (Lindl.)	Swamp Leek-orchid
32	,, parviflora (R.Br.)	Slender Leek-orchid
33	,, oblonga (Rogers)	Broad-tongue Leek-orchid
34	Caleana major (R.Br.)	Large Duck-orchid
35	Corysanthes pruinosa (R.Cunn.)	Large Helmet-orchid
36	,, bicalcarata (R.Br.)	Spurred Helmet-orchid
37	,, fimbriata (R.Br.)	Fringed Helmet-orchid
38	,, unguiculata (R.Br.)	Small Helmet-orchid
39	Acianthus exsertus (R.Br.)	Mosquito Orchid
40	,, caudatus (R.Br.)	Mayfly Orchid
41	Cyrtostylis reniformis (R.Br.)	Gnat Orchid
42	Lyperanthus suaveolens (R.Br.)	Brown-beaks
43	Eriochilus autumnalis (R.Br.)	Parson's Bands

ABBREVIATIONS OF LOCALITIES

Fern Tree Gully—F.T. Gully
Healesville—Heal.
Mooroolbark—Moorol.
Ringwood—Ring.
Wandin—Wand.
Warburton—Warb.
Warrandyte—Warr.
Woori Yallock—Woori Yal.

Localities.

1 Dand. Rges., Bel., F.T. Gully, B. Spur, Bays.
2 B.H., Croy., Heal., Ring., Dand. R., Warr., Ev. Wand.
3 B.H., Croy., Heal., Bays., Ring., Dand. R., Warr., Wand. Fern.
4 Ring., Croy., Heal., Warb., Warr.
5 Ring., Bays.
6 Heal.
7 Ring., Bays., Heal., Croy., Warr., Dand. R.
8 Bel.
9 Bel., Ring., Warb., Heal., Dand. R., Warr.
10 Bays., Ring.
11 Bays., Ring., Croy., Heal., Warr.
12 Bays., Ring., Croy., Heal.
13 Bays., Ring., Croy., Heal., Fern., Dand. R., Warr.
14 Bays., Ring., Croy., Heal., Warr.
15 Heal.
16 Ring.
17 Ring., Dand. R.
18 Box Hill, Croy., Bays., Ring., F.T. Gully, Bel., Heal., Fern.
19 Box Hill, Croy., Bays., Ring., F.T. Gully, Bel., Heal., Fern., Dand. R., Warr.
20 B.H., Croy., Ring., Heal., Warb., Warr., Fern.
21 Ring., Bays., Mitcham, Warr., Heal.
22 Ring., Bays., Croy., Heal., Warr.
23 Ring., Bays., Croy., Heal., Warr.
24 Ring.
25 Ring., Bays., Croy., Heal., Warr., Fern.
26 Ring., Bays., Croy., Heal., Warr.

27 Ring., Warr.
28 Ring., F.T. Gully.
29 Ring., Bays.
30 All districts.
31 All districts.
32 Ring., Heal.
33 Heal., Dand. R.
34 Ring., Heal.
35 Ring., Heal., Fern., and Fern Gullies.
36 Fern., Heal.
37 Fern Gullies.
38 Heal., Fern.
39 Ring., Heal., Warr., Fern.
40 Ring., Heal., Warb., Fern.
41 Ring., Heal., Ranges.
42 Ring., Warr., Bel.
43 All districts.

	Scientific Name.	Common Name
44	Caladenia alba (R.Br.)	White Caladenia
45	,, cucullata (Fitz.)	Hooded Caladenia
46	,, congesta (R.Br.)	Black-tongue Caladenia
47	,, cærulea (R.Br.)	Blue Caladenia
48	,, cordiformis (Rogers)	Small Spider-orchid
49	,, carnea (R.Br.)	Pink Fingers
50	,, deformis (R.Br.)	Blue Fairies
51	,, dilatata (R.Br.)	Fringed Spider-orchid
52	,, latifolia (R.Br.)	Pink Fairies
53	,, Menziesii (R.Br.)	Hare Orchid
54	,, Patersoni (R.Br.)	Common Spider-orchid
55	,, testacea (R.Br.)	Musky Caladenia
56	,, clavigera (A.Cunn.)	Clubbed Spider-orchid
57	,, reticulata (Fitz.)	Veined Caladenia
58	Chiloglottis reflexa (Cheel.)	Autumn Bird-orchid
59	,, Gunni (Lindley)	Common Bird-orchid
60	,, Muelleri (Fitz.)	Green Bird-orchid
61	Glossodia major (R.Br.)	Wax-lip Orchid
62	Diuris alba (R.Br.)	White Diuris
63	,, punctata (Sm.)	Purple Diuris
64	,, palustris (Lindl.)	Swamp Diuris
65	,, maculata (Sm.)	Leopard Orchid
66	,, palachila (Rogers)	Broad-lip Diuris
67	,, pedunculata (R.Br.)	Snake Orchid
68	,, sulphurea (R.Br.)	Tiger Orchid
69	,, longifolia (R.Br.)	Tall Diuris
70	Orthoceras strictum (R.Br.)	Horned Orchid
71	Cryptostylis leptochila (F.vM.)	Small Tongue-orchid
72	,, longifolia (R.Br.)	Large Tongue-orchid
73	Spiranthes australis (Lindl.)	Austral Lady's-Tresses
74	Pterostylis alpina (Rogers)	Alpine Greenhood
75	,, acuminata (R.Br.)	Pointed Greenhood
76	,, barbata (Lindl.)	Bearded Greenhood
77	,, concinna (R.Br.)	Trim Greenhood
78	,, curta (R.Br.)	Blunt Greenhood
79	,, alata (Reich.)	Purplish Greenhood
80	,, decurva (Rogers)	Red-tongue Greenhood
81	,, falcata (Rogers)	Sickle Greenhood
82	,, longifolia (R.Br.)	Tall Greenhood
83	,, Mitchelli (Lindl.)	Mitchell Greenhood
84	,, nutans (R.Br.)	Nodding Greenhood
85	,, nana (R.Br.)	Dwarf Greenhood
86	,, obtusa (R.Br.)	Blunt-tongue Greenhood
87	,, pedunculata (R.Br.)	Maroon-hood
88	,, parviflora (R.Br.)	Tiny Greenhood
89	,, rufa (R.Br.)	Rusty-hood
90	,, grandiflora (R.Br.)	Long-tongue Greenhood
91	,, vittata (Lindl.)	Banded Greenhood
92	,, furcata (Lindl.)	Forked Greenhood
93	,, pusilla (Rogers)	Ruddy-hood
94	,, reflexa (R.Br.)	Striped Greenhood
95	,, revoluta (R.Br.)	Autumn Greenhood

Localities.

44 Near Croy.
45 Dand. R., Heal.
46 Ring., Croy., Heal., Bays., Ranges.
47 Warr.
48 Ring., Heal., Fern.
49 All districts.
50 Ring., Croy., Heal., Warb.
51 All districts.
52 Ring., Bel.
53 Ring., Moorool., Warb., Heal., Bel., Wand., Ev., Dand. R., Fern.
54 All districts.
55 Ring., Moorool, Croy., Heal., B.H., All districts.
56 Bays., Bel.
57 Bel.
58 Ring., Heal., Fern.
59 Ring., Heal., Bel., Dand. R., B.H., Warr., Fern.
60 Heal., Bel., Emerald, Gemb., B. Spur.
61 All districts.
62 Croy.
63 Ring., Heal., Moorool, B.H.
64 Ring., Croy., Warr., Woori Yall.
65 All districts.
66 F.T. Gully.
67 All districts.
68 B.H., Croy., Heal., Warb., Heal., Warr.
69 All districts.
70 Ring., Bays.
71 Dand. R., Bel., Gemb., Emerald, F.T. Gully.
72 All districts.
73 Yarra Glen, Woori Yall., Heal.
74 Dand. R., Heal., Ring., B. Spur, Emerald, Aura, Fern.
75 Heal., Steele's Ck.
76 Ring., Warr., Bays.
77 Ring.
78 Ring., Warr., Heal., Dand. R., Fern., B.H.
79 F.T. Gully.
80 Bel., F.T. Gully, Ring.
81 Ring., Heal., Warr., Lil., Bays., Warr., Fern., Dand. R.
82 All districts.
83 Warr.
84 All districts.
85 Ring.
86 Warr., F.T. Gully.
87 Ring., Heal., Bay., Croy., Warb.
88 All districts.
89 Warr., Warb., Dand. R.
90 Bel.

91 Heal.
92 Aura.
93 Box Hill to Bays.
94 Ring., F.T. Gully.
95 Ring., Bays.

[The paper was illustrated by lantern slides, depicting many of the above species.—Ed. *Vict. Nat.*]

"THE TRANS-AUSTRALIAN WONDERLAND."—Some months ago, June, 1924, a notice appeared in these pages of the first edition of Mr. A. C. Bolam's booklet dealing with the natural history of the Ooldea district, and it must be very gratifying to the author that he has been compelled, by the demand for his little volume, to issue a third and enlarged edition. The present volume extends to one hundred and ten pages, and is cloth bound, so that it is a 'worth-while addition to one's bookshelf. We congratulate Mr. Bolam on the interest he has created in this out-of-the-way, but interesting, district. The Ooldea district, situated on the Trans-Continental line just on the eastern edge of the great Nullabor plain, some 427 miles west of Port Augusta, and politically still in South Australia, has been fortunate in having had such a man stationed within its boundaries, and the world is the gainer by the fact that Mr. Bolam had enough interest in what he saw to put his observations into writing, and afterwards into print. Such actions deserve commendation whenever met with, and no matter how trifling, add to the gradual accumulation of human knowledge. From the illustrations one would not think that such fascinating notes could be gathered together, and the author deserves all the more credit for his success, for it must be remembered that such notes can only be result of years of observation and study. Another fact which adds to the wonder of the story is the absence of water in the district, for no such thing as a stream or lagoon exists for hundreds of miles in any direction. The rainfall is less than ten inches per annum, and disappears into the soil directly it falls. At certain places there are "soaks," where water can be got by those who know how, but where do the birds and animals of the district derive the moisture they require to keep body and soul together? The climate is naturally dry, with cool nights, and is not difficult to bear. Owing to the radiation of heat being so rapid, and the absence of clouds and other causes detrimental to the formation of dew, the air at night remains calm, saturation takes place quickly and dew is precipitated. The vegetation, such as saltbush, bluebush, etc., absorbs dew quickly, and thus gets its necessary moisture as much from the air as from the ground. The animals of the district, in like manner, utilise the dew by licking it off the leaves of the plants and shrubs. Considerable space is given to remarks on the aboriginals, and the author remarks on wonderful powers of vision they

possess. No white man, not even an old sea captain, he says, can approach a black in keenness of sight. A native can see the smoke of a locomotive forty-five miles away; this is partly due to the extreme clearness of the atmosphere, more pronounced at certain seasons of the year. The book is well illustrated, and nature-lovers will find in it a mine of interesting information.

The Diprotodon.—Many parts of the world have furnished remains of gigantic animals which once inhabited that particular region, and not to be behindhand in that respect, Australia has supplied the world with remains of the Diprotodon, the largest marsupial known to have existed. The *Australian Museum Magazine* for October last reproduces a photograph of a group of Diprotodons recently set up in the American Museum of Natural History, in New York. The animals, in their restored form, look like huge wombats. It is more than ninety years since the first fragments of the bones of these gigantic animals were found in the Wellington Caves, New South Wales. At that time scientists were in doubt as to the actual shape of the animal, but all doubts were set at rest some few years ago by the finding of a wonderful deposit of Diprotodon remains at Lake Callabonna, in South Australia, about 600 miles north of Adelaide. These were embedded in the mud of a salt lagoon about three feet below the surface. Hundreds of more or less complete skeletons were dug out under the supervision of the late Professor Stirling, Director of the South Australian Museum. It is supposed that the animals became bogged in the soft mud, probably when seeking water during a dry season. From the bones found, which included those of the feet, which had hitherto been missing, this last find enabled a complete skeleton to be set up, and the animal restored to something like its original appearance. Casts were sent to various museums, hence the group in the New York institution. The name Diprotodon is derived from the fact that the animal was remarkable for its front teeth, and the discovery of food remains at Callabonna shows that it lived on saltbush and other shrubs resembling those growing in the district to-day. Remains of the Diprotodon have been found in other States, but nowhere in such quantity as at Lake Callabonna.

CORRECTIONS.—The following corrections should be made in the article "Around Noojee" in the January *Naturalist*:—

Page 168 line 4 from bottom — For "*stipoides*" read "*juncea.*"
" 170 " 20—For "*uniformis*" read "*reniformis.*"
" 170 " 16 from bottom — For "*Leycesitra*" read "*Leycesteria.*"
" 172 " 10—For "*P. Lawrenciana*" read "*C. Lawrenciana.*"
" 173 " 14 from bottom — For "*fergineum*" read "*ferrugineum.*"
" 173 " 12 from bottom — For "heteraphylly" read "heterophylly."
" 176 " 22—For "Pattersonii" read "Patersonii."
" 176 " 25—For "Lanceolatum" read "lanceolatum."
" 176 " 35—For "grammitidis" read "gramitidis."
" 176 " 37—For "circinnata," read "circinata."
" 176 " 7 from bottom—For LYCOPODINACEÆ" read "PSILOTACEÆ."
" 177 " 3—For "Juncea" read "juncea."
" 177 " 10—For "F.V.M." read "F.v.M.," also in other places.
" 177 " 17—For "GLYPERACEÆ" read "CYPERACEÆ."
" 177 " 7 from bottom—For "bufenius" read "bufonius."
" 178 " 9—For "Chorysanthes" read "Corysanthes."
" 179 " 2—For "Stonecap" read "Stonecrop."
" 179 " 15—For "sanquisorbæ" read "sanguisorbæ."
" 180 " 4 from bottom — For "HALORAGEÆ" read "HALORRHAGIDACEÆ."
" 180 " 3 from bottom — For "Haloragis" read "Halorrhagis."
" 182 " 15 from bottom — For "Clearia" read "Olearia."
" 182 " 12-14 from bottom—For "C." read "O."
" 183 " 6—For "velleoides" read "velleioides."
" 183 " 16 from bottom—For "Leycestria" read "Leycesteria."
" 183 " 11 from bottom—For "Golden Crown Grass" read "Silt Grass."

NOTE.—In many cases hyphens have been inserted in the wrong places, e.g., page 182, "Musk-Daisy Bush" should read "Musk Daisy-bush."