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PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on Tuesday, 11th April, 1950. The President, Mr. Colin Lewis, presided and about 100 members attended.

The President announced that the 70th Anniversary of the Club would be marked by a Social Evening at Scots Hall on 13th July. He conveyed greetings from Miss Margaret Sarovich (now at Geneva) who, in her letter, tells of Rousseau Island, between two of the busiest bridges across the Rhone, on which that savant used to meditate; she was very excited to find two black swans nesting there.

Members were reminded that nominations for office-bearers during 1950/51 should be in by the next General Meeting.

Mr. Willis gave a report on the splendid work being done by the Native Plants Preservation Group through Miss W. Waddell. In addition to the Longwood and Tallarook areas, 2 acres of land in the near-Melbourne Basalt area has now been fenced in (at the Sydenham Wireless Station). If this is successfully regenerated, the P.M.G. Department has promised to consider the setting aside of more land. Associates have been admitted to the Group from outside the F.N.C., and of the £33 collected so far, £25 has been donated by these interested persons. More support is asked from members of the Club.

The President announced with regret the death of Mr. Neville Cayley, noted ornithologist, also the son of Mr. Bury of Maranoa Gardens (in a motor accident).

Nominations for membership were received for Mr. Roy Cooper of Sydney (Mr. Hanks/Miss Watson) and as Junior Members for John and Joan Garnet (Mr. Ros Garnet/Mr. Colin Lewis).

Mrs. Coleman drew the Club's attention to a news item (in a recent Sydney paper) indicating that many birds were meeting their death on Fort Island, near Sorrento, by falling into an old pit from which they were unable to fly away. Mr. Hanks and Mr. Ron Ferguson stated that this matter had already been reported, by both the R.A.O.U. and the B.O.C., to the Fisheries and Game Department, and also to the Navy Department. It had been promised that the matter would be investigated and, if necessary, rectified.

Miss Adams reported having read in the press that an interesting old tree in the main street of Cairns is to be cut down despite vigorous local protest. Proposed by Mr. Hanks and seconded by Miss R. Chisholm that our Club also send a letter of protest.

BANDING ON THE ISLAND

Miss Ina Watson, who has recently returned from a trip abroad, recounted many interesting experiences when she visited Skokholm Island off the coast of Wales — a famous bird sanctuary. Much important work is being done there for ornithology by a resident Warden, with Assistant, and other interested people who visit and work on the island during the year. Among other research activities are banding, measuring, and recording species and numbers of birds.

Miss Watson's descriptions were accompanied by splendid coloured slides showing the small treeless island, some of its summer flowers, the long netted "drives" to catch birds, and many of the birds themselves. It had been a test of nerve and skill to photograph certain precarious-looking nests, perched high above the ocean. The measure of Members' appreciation could be judged by the hearty applause that followed Miss Watson's talk.

EXHIBITS

Miss G. Auchterlonie: *Dryandra* grown at Narracan.

Mr. Ivor Hammet: Garden-grown native flowers, including *Banksia elegans* (W.A.).

Mr. J. S. Seaton: *Beaufortia sparsa* of Western Australia (Garden-grown).

Mr. H. Stewart: From Mt. Buffalo National Park—fruiting specimens of *Gaultheria appressa*, *Coprosma hirtella* and *Drimys lanceolata*; flowering specimens of *Eucalyptus Dalrympleana*, *Bossiaea foliosa*, *Hovea longifolia* (alpine form), *Grevillea Victoriae*, *Helichrysum Hookeri* and *Leptospermum lanigerum* (form).

ENCOUNTER WITH WEDGE-TAILED EAGLE

(To the Editor)

Sir,—There is much discussion about the ferocity of our noble Wedge-tailed Eagle; but can you tell me of any man or woman who has been attacked by one of these birds? My own experience of many years ago may be worth recording and it occurred while I was a guest of Mr. Samuel Carter at "Glenisla," a station property between the Grampians and Black Range. One day I walked to the nearby Mt. Bepcha—a curious isolated mass of bare sandstone rock—and, while I was on top admiring the scenery, a big eagle came circling close overhead. Suddenly he closed his wings and swooped at me, but I threatened him with my geological hammer and he flew away. Had the eagle come four yards closer, it would probably have knocked me off my perilous perch, for there was nothing to which I could cling. No trees, nor any sign of a nest, were near the scene of this encounter.

Yours, etc.,

W. H. Ferguson, Camberwell.

GEORGE BASS, VICTORIA'S FIRST EXPLORER AND NATURALIST

By EDITH COLEMAN

In this centenary year of Victoria's separation from New South Wales we shall be recalling the work of the pioneers. It will not be forgotten that the first chapter in the history of Victoria was written by the young naval surgeon, George Bass, who, during one of the most daring voyages in the annals of maritime discovery, provided the key which unlocked the south coast of New South Wales, now part of Victoria.

Surgeon George Bass—first naturalist on the Victorian coast.

Cook and Flinders belong to Australia, but Bass is Victoria's first hero. His "Life" should be in every Victorian library; his portrait should hang in our schools, as an inspiration of courage, loyalty and tenacity of purpose. Unfortunately there exists no complete "Life" of this gallant man. His end is veiled in mystery. His journals and most of his letters are lost; but with the few that exist, and long extracts from his journals (quoted by Flinders and Colonel Collins) we are able to piece together the life story, to the time of his disappearance, and to gather from them, and the tributes of his friends, a fair estimate of his character.

It is still hoped that the long, descriptive letters which Bass wrote to his mother, treasured until her death, may one day turn up in some English home. News of them would travel more swiftly round the world than did the news of his greatest discoveries.

EARLY LIFE

His early "Life" is soon told. He was born at Aswarby (Lincolnshire) not far from the home of Flinders, whom he was to meet in the voyage to Australia.

His father, a farmer, died when Bass was a child. His

mother then moved to Boston, a seaport town within six miles of the sea; so that ships and sailors must have been in his blood at a very early age. Boston was situated in a fine agricultural district, and here, doubtless, the farmer's son gleaned the knowledge of soils and pastures which he was to turn to good account in describing those of New South Wales, Victoria and Tasmania.

After leaving school the boy was apprenticed to a surgeon to further his training in medicine. He "finished" at the Boston Hospital, winning his surgeon's diploma "with marked credit." But his heart had been given to the sea. When the merchant ship, in which he held a share, was wrecked, he entered the British Navy as a surgeon.

A SHIP TO REMEMBER

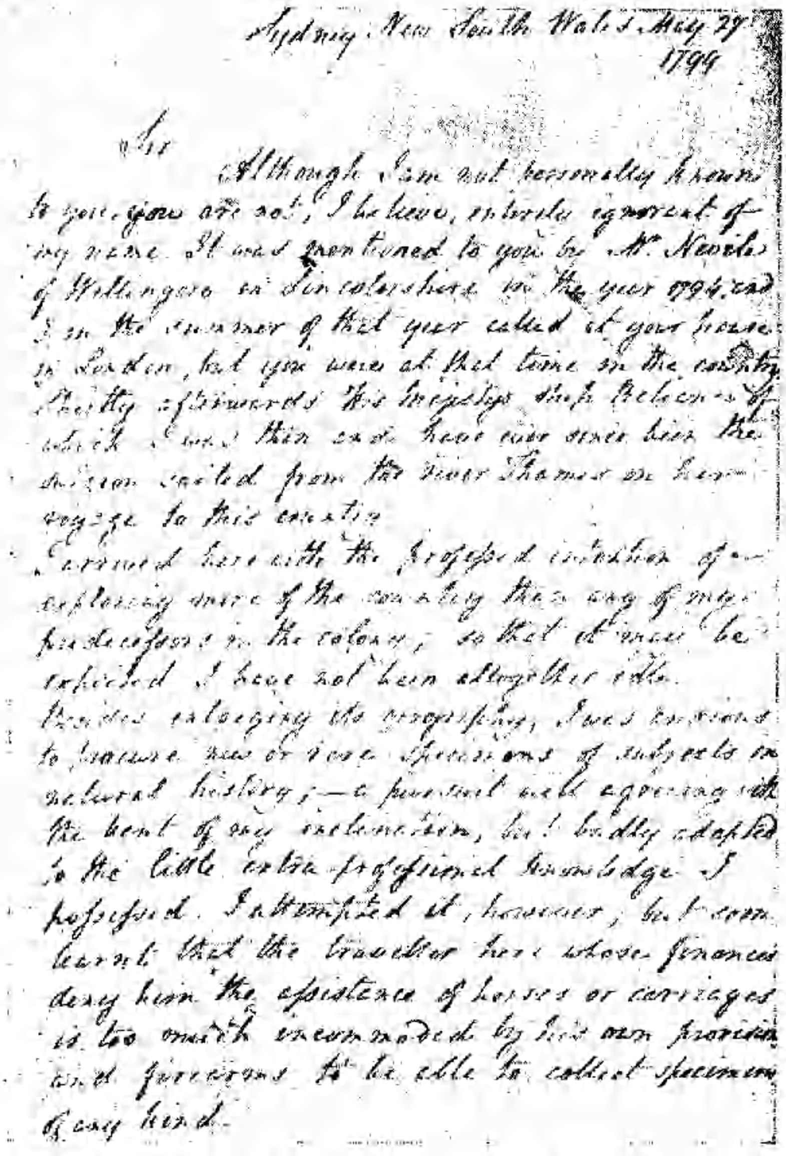
In 1795 H.M.S. *Reliance* sailed to Australia carrying three men whose names are written in Victorian history. They were Governor John Hunter, who was to give Bass a chance to show his mettle, Matthew Flinders and, as surgeon, Bass himself. Second in command was Captain Waterhouse, whose sister, Elizabeth, Bass was later to marry

It was natural that, on the long voyage, Bass and Flinders—also from Lincolnshire and the son of a surgeon — should be drawn together. Both had a passion for maritime discovery, and soon were laying plans for exploring the unknown parts of the N.S.W. coast.

The story of their daring adventures in the little boat *Tom Thumb*, which Bass brought with him in the *Reliance*, and again in a second *Tom Thumb* belongs to New South Wales. They certainly demonstrated to Governor Hunter that these two young naval men were capable of carrying to success the most difficult and dangerous undertakings.

While lengthy repairs to the *Reliance* were under way, energetic Bass could not be idle. He pleaded for service, and the Governor, who described him as "a young man of well-informed mind, of much ability in various ways out of the line of his profession," could not resist. Bass was given an open whaleboat, provisioned for six weeks. His call for volunteers from the King's ship to man her met a ready response, despite the fact that he was a surgeon, not a navigator, and that there were many dangers to be faced, which speaks eloquently of the esteem in which he was held.

His instructions were to examine the coast south of Port Jackson "as far as he could with safety and convenience go."



Sydney New South Wales May 27
1799

Sir

Although I am not personally known to you, you are not, I believe, entirely ignorant of my name. It was mentioned to you by Mr Nevile of Wellingore in Lincolnshire in the year 1794, and I in the summer of that year called at your house in London, but you were at that time in the country. Shortly afterwards His Majesty's ship Reliance of which I was then and have ever since been the surgeon sailed from the River Thames on her voyage to this country.

I arrived here with the professed intention of exploring more of the country than any of my predecessors in the colony, so that it must be expected I have not been altogether idle.

Besides exploring the country, I was desirous to procure new or rare specimens of subjects in natural history;—a pursuit well agreeing with the bent of my inclination, but badly adapted to the little extra-professional knowledge I possessed. I attempted it, however, but soon learnt that the traveller here whose finances deny him the assistance of horses or carriages is too much encumbered by his own provision and firearms to be able to collect specimens of any kind.

First page of holograph letter from Surgeon George Bass to Sir Joseph Banks, May 27, 1799—written from Sydney and mentioning a desire to explore the country.

—By courtesy Mitchell Library, Sydney.

AN EPIC VOYAGE

But Bass hoped to do more than that. He aimed at setting to rest all doubt as to the existence of a strait between New Holland and Van Diemen's Land.

The story of that epic journey in an open boat must never be forgotten. They left Port Jackson on December 3rd, 1797. In the teeth of gale-force winds and buffeting seas that loosened the timbers of their boat, they examined every inlet that would give safe shelter for British ships, in 600 miles of coast, 300 hitherto quite unknown. Bass had intended striking south to the north coast of Van Diemen's Land, but the state of the boat made it imperative to hug the mainland coast-line.

Only blue-water men who know the so-called "Pacific" can fairly gauge the daring of those seven British blue-jackets.

Yachtsmen in modern craft, competing in the 680-mile Sydney to Hobart ocean yacht race, have been baffled by those adverse winds, especially capricious between October and February. In December, 1947, three competitors had to pull out of the race. Seasickness of the navigator put *Nautilus* out of the running as soon as she struck the "rough stuff" east of Gabo Island.

Only last year (October, 1949) smashing seas along the coast drove many modern vessels to shelter behind Wilson's Promontory, as Bass was forced to do; and again, in November, gale-force winds held up the removal of a sick child at the Deal Island lighthouse, about 50 miles off the south-east coast of Victoria.

But those seven lion-hearts had no thought of giving in. Even after a specially rough spell Bass succinctly notes in his journal: "We had a bad night but the excellent qualities of the boat brought us through." On December 19th they turned the corner at Cape Howe and landed at a lagoon 1 mile north of Ram Head, where they took in plenty of water to tide them over a possible shortage along the unknown coast.

They were thus the first British men to set foot on Victorian soil!

On December 21st, a gale set in, and continued for 9 days —a foretaste of many more to follow. Wilson's Promontory (January 2nd) was his first big discovery. (Bass at first thought this was the high land seen by Captain Furneaux in 1773). Fierce winds and breaking seas prevented his landing but he spent some time in examining sea-birds and seals on the nearby rocks.

He was much impressed by this "vast Cape," and described it as "well worthy of being the boundary point of a large strait,

and the corner stone of this great island, New Holland." It was at this point that he had satisfied himself as to the existence of a strait. The rapid tide and long, south-west swell that seemed to be continually rolling upon the coast to the westward, were his proof-assumptive.

In October, 1798, he and Flinders were to offer proof-positive by circumnavigating Van Diemen's Land in the 25-ton sloop *Norfolk*.

It was on one of the small, rocky islands off the Promontory that an incident occurred which revealed the humanity and generosity of Bass and his comrades. Here they discovered seven white men, part of a band of convicts who had escaped from Port Jackson in a stolen boat. While they slept, their companions made off with the boat, leaving them to starve. For five weeks they had subsisted on petrels and an occasional seal. Bass relieved them as well as he could and promised to call again on his return.

WESTERN PORT

His reward came when, on January 5th, he made his richest discovery, and turned into a fine harbour, which he named Western Port. Here bad weather detained him for 13 days. It also prevented him from making as thorough an examination of the surrounding country as he would have wished to do.

He had been away for seven weeks. Provisions were running low. There was his word to the convicts to honour, and, perhaps, more bad weather with constant repairs to his boat.

Had he dared to push on for one more day he and his gallant crew would have discovered Port Phillip. He states that they "very reluctantly" turned the head of the boat homeward. However, he might well have rested on his laurels, for Western Port was a grand discovery.

In his wildest dreams he could not have visualised his "fine harbour" as a naval depot of a great Commonwealth, and himself as the hero of hundreds of lads, some as adventurous, perhaps, as he and his crew, in a naval training school; and ratings passing in and out wearing on their caps the letters H.M.A.S. *Cerberus!* We must never forget that Western Port, like Wilson's Promontory, was Bass's discovery, although it does not bear his name. It was a rich reward for the hardships he and his crew had endured.

When, in 1801, Lieutenant James Grant spent two months in examining and surveying the port, he described it as "capable of containing several hundred sail of ships in perfect security from storms, and will admit of being fortified." (A Russian

warship once spent two days in the port before local authorities were aware of it). French competitors in the race for new discoveries described Western Port as one of the finest harbours it would be possible to find, "possessing all the advantages

Stone cairn at Rhyll, Phillip Island in Bass's Western Port. It commemorates the discovery by Bass in 1798, also visit paid in 1801 by Grant and Murray, the French under Baudin in 1802, by D'Urville in 1826 and the establishment of a British settlement there in 1826.

which will one day make it a precious possession." No wonder Bass was reluctant to turn the boat!

A succession of gales forced him to shelter behind Cape Liptrap and in Sealers' Cove, both of which he named. The time was spent in salting down petrels taken from the little islands. Loyal to his promise, he called for the convicts. He carried five of them to the mainland, gave them a musket, ammunition,

fishing-lines, a compass, food and a cooking kettle, and advised them to keep to the coast. They were also given as many clothes as the crew could spare. Those unhappy men were never again heard of.

The other two convicts, one old and one very sick, were taken into the boat "with the consent of the crew, who readily divided the daily bannock into nine instead of seven."

Eastern gales kept him at Sealers' Cove for six days. He spent the time in examining Wilson's Promontory. He described the shallow soil, as seen with the eyes of a farmer's son, the brushwood, dwarf gum-trees, and vegetation that mostly covered the rocks and "gave a deceitful appearance to the eyes of a distant observer." He visited one of the small islands, seven or eight miles off the promontory, and was the first to describe the seals off the Victorian coast. He saw a few natives who appeared never to have seen white men. Indeed little escaped him in the time he could spare from repairing his boat and salting down petrels and seals, while sheltering from hard weather.

Again and again he was forced to take shelter from gales against which his boat was in no condition to struggle. At last (February 25th, 1798) he reached Port Jackson. It had been a glorious adventure, during which seven British naval men acted as one man.

The theory of a strait had not been promulgated by Bass. Captain Cook in 1770 had written:

> "To the south west of this point (Pt. Hicks) no land was seen . . . and by our longitude . . . the body of Van Diemen's Land ought to have borne due south, and indeed, from the sudden falling of the sea after the wind abated, I had reason to think it did . . . I cannot determine whether it joins V.D.L. or not."

The man to question it more definitely was Captain John Hunter who, returning from the Cape to Port Jackson in 1788, made the following significant observation:

> In passing, at a distance from the coast, between the islands of Schooten and Furneaux and Point Hicks there has been no land seen and from our having felt an easterly set of current from that quarter (north-west) we had an uncommon large sea, there is reason thence to believe that there is in that space either a deep gulf or a strait which may separate V.D.L. from New Holland. (*Historical Journal of the Trans. at Port Jackson and Norfolk Island, 1793.*)

It was also John Hunter, then Governor Hunter, who later named the strait in Bass's honour. Yet, except in seafaring circles, the world hardly realised the far-reaching effects of Bass's gallant exploit.

THE GENUS PHAIUS IN AUSTRALIA

By W. H. NICHOLLS, Melbourne.

1. *PHAIUS TANKERVILLIAE* (Banks in L'Herit) Blume [syn. *Ph. grandifolius* Lour.] is a handsome terrestrial orchid which was originally discovered in China, and was introduced to European cultivation in the year 1778. It is widely distributed in S.E. Asia, extending through Indonesia southward to Australia, where it occurs in the northern, north-eastern and eastern coastal areas and the adjacent islands.

The foliage is prominently ribbed and plaited and is highly ornamental; the radical scapes of large, showy flowers, which are produced in a terminal raceme, often attain a height of 4-5 feet. The plants, which usually occur in great masses, favour wet conditions, and occasionally grow on moist hillsides.

The diameter of an individual flower is usually 3-4 inches, though they have been recorded as reaching a width of fully 7 inches*. The colour varies somewhat, but the sepals and petals are cinnamon-brown inside, white outside, while the labellum, which is tightly tubular or trumpet-shaped, is white, suffused with bright yellow and blotched with dark wine-red or crimson; its widely-expanding lamina is of a soft mauve, or white suffused with mauve, the margins being undulate-crisped and the apex apiculate. The spur is sometimes 1.5 cm. long.

Ph. Tankervilliae is well-illustrated in botanical literature, and a faithful figure may be seen in *Botanical Magazine* (tab. 1924).

Bentham and other eminent botanists had not paid sufficient attention to the columnar structure in Australian forms of *Phaius* (with the exception of R. D. Fitzgerald and F. von Mueller; the former published excellent drawings in colour of two forms).

But the majority of descriptions of Australian plants merely give the length of the column—an unfortunate omission, because herein lie important differentiating specific characters. In true *Ph. Tankervilliae*, the column is very slender and graceful in outline; there exists a prominent rostellum, also there are *no appendages* to the stigmatic opening; furthermore, there appears to be no tendency to produce additional anthers (at least in the writer's experience, after examining abundant material of this orchid which has come to hand over a long period), whereas in two of the forms (to be dealt with later) supplementary anthers are produced with some frequency.

In these other forms there is no evidence of a rostellar appendage; also, the upper margins of the stigmatic cavity are adorned with *two prominent, often greenish-blue, inturned appendages* and

* Orch. Zeyl. III. (1936) 39.

there is no connective disk—so apparent in *Ph. Tankervilliae* and the allied *Ph. Blumei* Lindl. Another distinction is the much more echinulate back of the anther (almost smooth in *Tankervilliae*).

2. *PHAIUS AUSTRALIS* F. v M. was described in *Fragmenta I.* (1858), 42, from material collected by E. Fitzalan on Lady Elliott's Island, Queensland. A careful examination of Mueller's type in the National Herbarium, Melbourne, proved the existence of the appendages (already mentioned) and the absence of any rostellum; the column itself was of stout build. (Only a solitary flower of this type was in fit condition for softening and microscopic inspection).

Abundant fresh material of this undoubtedly valid species was obtained through the generosity of Mrs. Hilda Curtis, of Tambourine North, in southern Queensland. The foliage appears to be of a much deeper green than that obtaining in *Ph. Tankervilliae* and the flowers are coloured differently—sepals and petals more red-brown than cinnamon, with bright yellow veinings, white on the reverse; Labellum not so tightly tubular as in *Ph. Tankervilliae*, deep red-brown inside with abundant bright yellow veins; anterior portion almost chocolate-brown, similarly but more lightly coloured on the outside, the middle lobe shortly acute, the spur much shorter in this species (and its variety *Bernaysii*) than is usual in *Ph. Tankervilliae*.

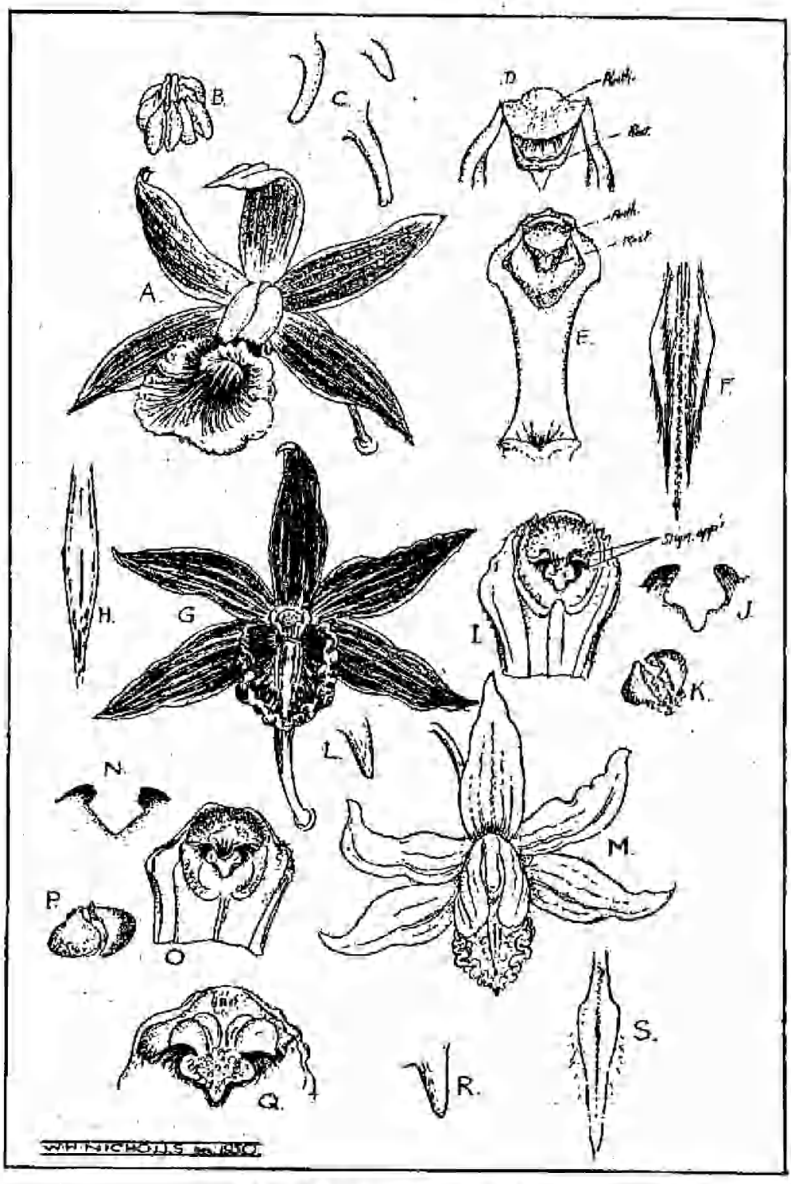
Mueller's species is certainly a good one, and its name should be re-established in botanical literature.

Dr. R. S. Rogers, in his paper on "The Pollinary Mechanism in *Phajus*" (so spelt) in *Trans. Roy. Soc. S. Austr.* xiv. (1921) 264-269, refers to the Australian forms as *Ph. grandifolius* and *Ph. Bernaysii* respectively. He writes:

> The stigmatic cavity (in *Ph. grandifolius*) is V-shaped. In *Ph. Bernaysii* it is quadrilateral in form and very much smaller. The chief difference however, is found in the attachment of the pollinia, which are apparently of the same size in both series, so long as they are uninfluenced by the stigmatic fluid. A careful examination of the material available failed to disclose any evidence of attachment by a dichotomous caudicle; in *Ph. grandifolius* the masses appear to be more or less embedded in a yellow granular matrix of a flocculent nature.

The "*Ph. grandifolius*" referred to above is in reality Mueller's *Ph. australis*, while *Ph. Bernaysii* is the form which will be dealt with later as its variety—a new combination.

In the writer's experience, no definite reliance can be placed on the shape of the stigmatic cavity in either form, for this opening varies considerably according to the degree of growth of the bloom.



For explanation, see page 14

3. *PHAIUS AUSTRALIS* F. v M. var. *BERNAYSII* (F. v. M. ex Reichb. f.) comb. nov.

[Syn. *P. Bernaysii* F. v. M. ex Reichb. f., in *Gard. Chron.* 1873, pp. 361 & 1244.]

This yellow-flowered form is, in present-day literature, more generally regarded as a variety of *Ph. Blumei* Lindl. [i.e., var. *Bernaysii* Reichb. f. (*Bot. Mag.*, tab. 6032)] and was introduced into England from Stradbroke Island, Queensland, in 1873. Originally it was considered a valid species, but there was some confusion over the spelling and authorship of the epithet. On p. 361 of the *Gardener's Chronicle* (March 15, 1873) Reichenbach attributes the epithet to Dr. Rowland and spells it *Berneysii*. A correction is made by L. A. Bernays himself on p. 1244, wherein he states that he collected the original material which Mueller named (without describing) in his honour. Dr. Rowland had merely assisted Bernays by consigning a case of plants from him to Messrs. Veitch & Son.

It was regarded as a good species by Bentham [*Flora Austr'sis*, vi. (1873) 305], Fitzgerald [*Austr. Orch.* 2, Pt. 5, 1892], Rogers [*Trans. Roy. Soc. S. Austr., XIV.* (1921) 268] and recently by T. E. Hunt [*Census Sth. Q'land Orchids* (1947) 12]. F. M. Bailey records it as variety *Bernaysii* of *Ph. grandifolius* Lour [i.e., *Ph. Tankervilliae* (Banks in L'Herit.) Blume]; but with due respect to all these authorities, I consider that it cannot be separated specifically from Mueller's *Ph. australis* — itself quite distinct from *Ph. Tankervilliae* and *Ph. Blumei*.

The variety *Bernaysii* cannot be reconciled with either *Ph. Tankervilliae* or *Ph. Blumei*. The structure of the column is somewhat similar in both these species, but very different in *Ph. australis* F. v. M. and the yellow-flowered variety. The columns in these two forms *do not* possess a prominent rostellum, but both *do* possess the marginal appendages to the stigmatic cavity. The only noteworthy difference between the forms is in the colour of their flowers and in the attachment of the pollen-masses — a particular of little importance when the other and more important details are taken into account.

Variety *Bernaysii* has wholly sulphur yellow flowers — white on the reverse, but the *Botanical Magazine* plate (6032) shows the labellum margined white: Bailey so refers to the colour scheme, but Fitzgerald and Rogers record the colouring as wholly yellow inside and white on the outside. This, however is a moot point, since each refers to the same variety.

F. M. Bailey's var. *Roxonae* of *Ph. grandifolius* Lour. (i.e. *Ph. Tankervilliae*) in the *Q'land Agri. Jour., XXVIII* (1912), 74—the so-called "spotted lily of the Murray River"—apparently

has no existence in fact. Specimens of this ostensible "variety" were received from Mrs. H. Curtis of Tambourine North. Her specimens were all referable to Mueller's *Ph. australis*, their distinctive markings (copious spots) no doubt due to attack by some obscure micro-organism or virus. The column details were exactly as in Mueller's species.

Ph. leucophaeus, F. v M. (*Fragm. IV.* (1863) 163) and *Ph. Carronii*, F. v M. (*Burdekin Exped.*, 19.) are correctly interpreted by Bentham, Bailey and others, as identical with *Ph. grandifolius*, Lour. (i.e., *Ph. Tankervilliae*).

Bailey (*Q'land Fl., V.* (1902) 1544) also records two slight variants under *Ph. grandifolius* (i.e., *Ph. Tankervilliae*) — forma *Idae* and forma *Soutteri*. The former would seem referable to the true *Ph. Tankervilliae* (judging by the particulars of its labellum), and the latter to *Ph. australis*, F. v M., although T. E. Hunt (*Census Sth. Q'land Orchids*, 1947, p. 12) allies them both with *Ph. australis* var. *Bernaysii*.

HABITATS OF THE AUSTRALIAN FORMS OF *PHAIUS*

(Culled from material and other records in the National Herbarium, Melbourne, and also from the author's own material.)

Ph. Tankervilliae: N.Terr.—Without location (Rev. J. Tenison-Woods). N. Q'land.—Bloomfield River (Miss E. Bauer); Rockingham Bay (J. Dallachy).

N.S.W.—Richmond River (Collector?); Tweed River (C. Stuart).

Ph. australis: Q'land.—Lady Elliott's Island (E. Fitzalan, Type); Stockyards, Swan Bay, Stradbroke Is. (Mrs. Hilda Curtis).

N.S.W.—Macleay River (M. Macdonald); Richmond River (? Fawcett).

Ph. australis var *Bernaysii*: Q'land.—Stradbroke Island (L. A. Bernays, Type); Stockyards, Swan Bay, Stradbroke Is. (Mrs. Hilda Curtis).

SYNONYMY

1. *PHAIUS TANKERVILLIAE.*

(Banks in L'Herit.) Blume, *Mus. Bot. Lugd. Bat.* II (1856) 177: *Limodorum Tankervilliae* (*Tancarvilleae in err.*) Banks in L'Herit., *Sert Angl.* (1786-7), 28; Ait., *Hort. Kew*, ed. i, III (1789), 302; *Bletia Tankervilliae* (Banks in L'Herit.) R. Br. in Ait. *Hort. Kew*, ed. ii, V (1813), 205; R. Br. *Bot. Mag.* (1817), t. 1924; Lodd., *Bot. Cab. I* (1817), t. 20; *?Limodorum Incarvillei* Pers., *Syn. Pl.* II (1807), 520; *?Phaius Incarvillei* (Pers.) Kuntze, *Rev. Gen.* (1891), 675; *Phaius grandifolius* Lour., *Fl. Cochinch.* II (1790) [non Lindl., 1828]; Lindl., *Gen. et Sp. Orch.* (1831), 126 (partly); Benth., *Fl. Austr.* VI (1873), 304 (partly); *Ph. leucophæus* F.v.M., *Fragm.* IV (1864), 163; *Ph. Carronii* F.v.M., *Pl. Burdek. Exped.* (1860), 19.

2. *PHAIUS AUSTRALIS.*

F.v.M., *Fragm.* I (1858) 42: *Phaius grandifolius* Bentham, *Fl. Austr.* VI (1873) 304 (partly); FitzG., *Austr. Orch.* II (1893) 5 (partly); Bailey, *Q'land Fl.* V (1902) 1543 (partly); Rogers, *Trans. Roy. Soc. S. Aust.*, XLV (1921) 266 (partly); *Ph. Tankervilliae* Rupp., *Orch. N.S.W.* (1943) 109 (partly); T. E. Hunt, *Census Sth. Q'land. Orchids* (1947) 12 (partly).

3. *PH. AUSTRALIS* F.v.M., var. *BERNAYSII* (F.v.M. ex Reichb.f.) W. H. Nicholls, comb. nov.

Phaius Bernaysii F.v.M. ex Reichb.f., *Gard. Chron.* (1873) 361 and 1244; Benth., *Fl. Austr.* VI (1873) 305; FitzG., *Austr. Orch.* II (1892) t. 5; Rogers, *Trans. Royal Soc. S. Austr.* XLV (1921) 268; T. R. Hunt, *Census Sth Q'land. Orchids* (1947) 12; *Ph. Blumei* Lindl., var *Bernaysii* Reichb.f., *Bot. Mag.* (1873) t. 6032; Bailey, Q'land. Fl. V (1902) 1544.

[The author's grateful thanks are due to the Editor (Mr. J. H. Willis) for his unstinted help in examining material of the various *Phaius* specimens preserved at the National Herbarium, South Yarra.]

KEY TO ILLUSTRATIONS

A. *Phaius Tankervilliae*, flower (typical form); B. Pollinia; C. Basal spur (3 forms); D. Column head, showing anther and rostellum; E. Column from front; F. Labellum plates.

G. *Ph. australis*, flower; H. Labellum plate; I. Column head showing stigma appendages, etc. J. Stigma appendages; K. Pair of pollen masses; L. Basal spur.

M. *Ph. australis*, var *Bernaysii*, flower; N. Stigma appendages; O. Column head, showing stigma appendages, etc. (note the two forms of stigma in figs. N and O); P. Pair of pollen masses; Q. Column head (anther removed) showing stigma appendages and pollinia in position; R. Basal spur; S. Labellum plate.

[For natural sizes, see letterpress.]

COLOURED MONOGRAPH ON ORCHIDS OF AUSTRALIA

The *Georgian House*, Melbourne, has just undertaken to publish Mr. W. H. Nicholls' important manuscripts and superb water-colour delineations of Australian orchids, embodying most of the 600 species to be found throughout the Commonwealth. This project—surely the most ambitious in our botanical history—will extend over about 13 years in some 25 parts of which the first part will appear later in the present year. It is then hoped to produce two parts every year. There will be 48 to 64 pages per part, accompanied by 24 colour plates, each 15" × 10", and the parts will be unbound so that purchasers can have the whole bound into convenient volumes when the work is completed. Full descriptive text and literary references go with the plates.

The work will cost many thousands of pounds to produce and there is to be a strictly limited edition (perhaps 1,000 or 1,500 sets). The price per part will be approximately £7-£10 and intending subscribers are urged to book their orders with distributing firms (e.g. N. H. Seward Pty. Ltd.) without delay, as the anticipated demand abroad will be heavy.

The excellence of Mr. Nicholls' work on *Orchidaceae* is known to every reader of the *Victorian Naturalist*. All fellow members of the Club rejoice with him that the labours of 25 years are now to be crowned with success and made available to the botanical world in a de luxe publication which will have no rival anywhere.

HISTORICAL PAPERS FOR 70TH ANNIVERSARY OF CLUB

During this 70th year of the Club's existence it is hoped to mark the occasion by publication, from time to time, in the *Naturalist* of articles having historical interest. Several have already appeared this year and two more are in hand for future numbers. The editor appeals to members for other papers embracing either Club history or the progress of nature study in our State.

WHAT, WHERE AND WHEN

General Excursions:

Saturday, May 27—Annual Mystery Excursion. Leaders: Mr. and Mrs. D. Lewis. Subject: Come and see—it will be interesting! Walking distance not more than 7 miles. Bring two meals. Nash's bus will leave Batman Avenue at 9 a.m. Fare: 7/6. Bookings with Mrs. D. Lewis, 77 Dendy Street, Brighton, S.5.

Monday, June 12—Kallista and Sherbrooke Forest. Subject: "Lyre Birds." Leader: Mr. A. G. Hooke. Train: 9.18 a.m. Upper Ferntree Gully, then bus to Kallista. Fare: 2nd return U.F.G., 3/1.

Group Fixtures:

Saturday, May 20—Botany Group Excursion to Ringwood. Leader: Mr. Thos. S. Hart, B.A. Further details at General Meeting.

Monday, May 22—Botany Group. Royal Society's Hall, 8 p.m. Monthly Meeting. Subject: Discussion on the Saturday's excursion. Hon. Sec.: Mrs. A. Osborne, 21 Renwick Street, Glen Iris, S.E.6.

Thursday, June 1—Wildflower Garden Section. Royal Society's Hall, 8 p.m. Monthly Meeting. Hon. Sec.: Mr. R. B. Jennison, 3 Linda St., Moreland, N.13.

Friday, June 2—Marine Biology Group. Royal Society's Hall, 7.45 p.m. Monthly Meeting. Hon. Sec.: Miss W. Taylor, 13 Jolimont Square, Jolimont, C.2.

Tuesday, June 6—Native Plants Preservation Group. At home of Miss W. Waddell, 3 Denham Place, Toorak, at 8 p.m.

Tuesday, June 6—Geology Group. Royal Society's Hall, 8 p.m. Monthly Meeting. Subject: "Gem Stones," by Mr. R. Davidson. Hon. Sec.: Mr. A. A. Baker, 53 Carlisle Street, Preston, N.18.

Saturday, June 10—Wildflower Garden Section excursion to the Footscray Gardens. Train: 2.00 p.m. to Footscray, or meet at main entrance at 2.15 p.m.

Saturday, June 17—Geology Group excursion to Warburton-McVeigh's. No. 2 Collecting excursion for National Museum. Subject: Field Study and Fossils. Leaders: Mr. E. D. Gill, Palaeontologist of the National Museum, and Mr. A. A. Baker. Transport details at June Group meeting.

—Jean Blackburn,
Excursion Secretary.
(MB 1657—before 5 p.m.)

HONEY BEE CAUGHT BY MANTIS

Working in the garden recently, I was arrested by a high-pitched sound (almost a cry) of some tiny creature in distress. Investigation disclosed an unfortunate honey bee in the grasp of a praying mantis—standing on hind legs, clasping and unclasping its front legs on the bee's body. Every time it squeezed, the victim "cried" out. I had never seen a bee attacked in this way before; so, unable to bear watching the drama, I carefully loosened the mantis's grip with a closed pair of scissors. It took fright and, losing its balance, fell down; but the bee, now released and apparently unharmed, flew away—much to my delight.

—M. Thornton Salter.

The Victorian Naturalist

Vol. 67.—No. 2 JUNE 8, 1950 No. 798

PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on Monday, May 8, 1950. The President, Mr. Colin Lewis, presided, and about 220 members and friends attended.

A cordial welcome was extended to visitors, who included Miss Everard and Lieut. Byrne of Government House staff, and two Latvian visitors, Mr. Alex Kokle and Mr. Kaminskis.

The Excursion Secretary, Miss Blackburn, advised that a four-day excursion to the Grampians would be held from September 28th to October 2nd, but, owing to difficulties in securing accommodation, intending participants are asked to make their own arrangements in this regard.

The Planting Day at Maranoa Gardens on April 29th had been a great success. About 80 people were present on an afternoon of brilliant sunshine. The Mayor of Camberwell had attended, also Cr. August; a ladies' committee provided afternoon tea. More than 100 seedlings were planted out, and it was noted with satisfaction that those of the last Planting Day are doing well.

Miss Waddell appealed for helpers to join a Working Bee at the enclosed Sanctuary area, Sydenham Wireless Station, on May 13th.

The President announced that the next General Meeting would be held on Tuesday, June 13th, instead of Monday 12th, which is a public holiday.

The following were elected and welcomed to membership:—As Ordinary Members: Miss E. Bates and Mr. R. P. Cooper; and as Junior Members: Miss Joan Garnet and Master John Garnet. Nominations for ordinary membership were received on behalf of Miss E. M. McCullough (Mrs. M. V. Trott/Miss Rita McCormick) and Mr. R. LeRossignol (Mr. Crosbie Morrison/Mr. E. E. Lord).

The Treasurer warned members who had been notified of arrears in subscriptions that, in default of payment, their names would have to be taken off the roll.

Other than the nominations from Council, as printed in the May *Naturalist*, there were no further nominations for office-bearers during the ensuing year; but Mrs. Pinches was nominated as a Council member by Mrs. R. B. Jennison, seconded by Miss I. Dickson, while Mr. V. Hansen wished his nomination to be withdrawn.

SOUTH-WESTERN WANDERINGS

Mr. P. Crosbie Morrison, speaker for the evening, told members many interesting things about the 1947 Russell Grimwade Expedition from Port Lincoln to Perth. The party comprised eight men, each well versed in some branch of Natural History, led by Mr. Russell Grimwade; a crew of four other men attended to the transport and camping arrangements. The expedition travelled approximately 2,000 miles by motor coach, following Eyre's footsteps for the most part—it is of interest that, while Eyre took ten months to cover the distance from Port Lincoln to Albany, the expedition took only ten days! Mr. Morrison, as usual, had some splendid films to show of scenes on the way and of the beautiful Western wildflowers. Of particular interest were impressive seascapes at the head of the Bight and a fire-observation tree in the Karri forest near Pemberton. The observation hut, perched 180 feet from the ground, was reached by a stairway of strong pegs spiralling round the tree at convenient intervals.

Much material was brought back to Melbourne from this expedition and the botanical contributions of Mr. J. H. Willis (now mounted in the National Herbarium, South Yarra) embraced nearly 700 species — the largest single collection of Australian plants to be acquired for Victoria since the time of Baron von Mueller, about a dozen species being new to science.

Mr. Morrison was thanked and applauded for his absorbing talk.

NATURE NOTES

Miss Watson reported having seen recently a small family group of lyrebirds at Sherbrooke—a male, female and one or two immature birds. The older male took no notice of the others until one of the immature birds suddenly started to sing and display; then he immediately offered a challenge and also began displaying to scare off the young rival. For a moment or two they were both displaying together, until finally the old male bird drove the young one well away. Apparently he tolerated the presence of immature birds until the challenge was given by a younger bird, and presumably his latter behaviour exemplified the way birds assert their territorial rights.

Mr. Owen Dawson, a country visitor and keen entomologist, told of having found a lizard's nest containing 59 eggs. He took them home and in due course they hatched into little skinks. He remarked that although he has examined many of these lizards he has never seen one carrying more than four eggs. Was the nest a communal one, or did the same female come back again and again to lay those 59 eggs?

Mr. A. Baker had received from Mr. J. Glover, a member at Wonthaggi, a handsome copper billy-can which Mr. Glover had made himself and presented to the Club in appreciation of the

comradeship he had enjoyed during the Club's Australia Day excursion to Cape Patterson. The billy stands about 12 inches high, and its lid has an embossed border featuring the Club's Correa badge.

Mrs. Lowe reported that a Caulfield resident who keeps bees has lost them in very large numbers through sparrows waiting to catch them as they pause at the entrance to the hive before flying off. He found it necessary to protect them at the entrance with fine wire, and wonders if it is usual for sparrows to take bees.

EXHIBITS

Mr. R. D. Lee: Photographs of Creswick School of Forestry, and a squirrel in the Ballarat Gardens.

Miss Neighbour: Paintings of wildflowers.

Mr. C. J. Gabriel: Series of land and marine *fractured shells*, repaired by the animals inside.

Mr. A. A. Baker: Wood charred by the action of hot volcanic lava from Grange Burn (above Forsyth's, Hamilton), January, 1950.

Mr. J. S. Seaton: *Astroloma conostephioides*, garden grown.

"THE AUSTRALIAN BUSHLAND"

(A Review)

In a book (8½ in. x 5½ in.) exceeding 700 pages and plentifully besprinkled with illustrations, eight in colour, Mr. J. W. Audas, F.L.Sc., has produced a compendium of his fifty years' work as professional botanist and field observer. Most of our State public servants in their retirement are content to rest on their laurels, but not so Mr. Audas, who has chosen to continue serving his public in an honorary capacity. With amazing industry he has dipped deeply into his wide experience and many scattered writings to make an impressive volume which is not only readable, but useful as a work of reference. Younger field naturalists, especially in Victoria, will welcome the inclusion of descriptive matter from many district floras that have appeared in *The Victorian Naturalist* and elsewhere. Perhaps the best chapters in this regard are floral accounts of the Whipstick, the Pyrenees, the Grampians, and other localities of wildflower fame.

The author rounds off his array of botanical knowledge and journeyings with sundry notes on other aspects of Australian natural history—our mammals, birds, insects and aborigines, for example. Historical and exploratory backgrounds also have not been neglected, and Mr. Audas remarks pertinently on conservation and erosion problems. A very gratifying feature, often omitted from books of this nature, is the thorough index, with glossary of botanical terms. One of the late Mrs. Emily H. Pelloe's colour drawings of West Australian wildflowers has been fittingly selected as a jacket illustration, and the publishers, W. A. Hamer Pty. Ltd., are to be commended on the clarity of type and selection of good quality glossy paper.

—H.C.E.S.

NEW RECORD FOR RARE VICTORIAN CLUBMOSS

A notable discovery was made last January near Cope Hut, on the Bogong High Plains, by Mrs. S. C. Dücker (Botany School, University). *Lycopodium scariosum* G. Forst. turned up for the third time in Victoria and the first time this century! Both previous collections came from the Baw Baws.

—J.H.W.

NEW BEES AND WASPS—PART XIII

Analastoroides, A New Genus of Wasp-like Bees

By TARLTON RAYMENT, F.R.Z.S.

DIVISION *COLLETIFORMES*

Family *Hylaeidae*, Subfamily *Hylaeoidinae*

Genus *ANALASTOROIDES*, gen. nov.

Slender black and red almost naked bees, about 11 mm. in length, closely resembling Alastorid wasps, and almost perfectly "mimicking" bees in the genus *Hylaeoides*, but bands of the abdomen are formed of red hair; tegument is not coloured. (Genotype: *A. foveata*, sp. nov.)

Head transverse, with yellow marks on face; facial foveae conspicuous; scapes inserted above middle of face; mandibulae bidentate; labrum a wide oval, with a large median ridge and nodule; four segments in the labial palpus and six in the maxillary palpus; glossa short, wide, and deeply emarginate; paraglossae large; genae well developed.

Prothoracic collar reaching tubercles laterally. Thorax ovate; scutellum large; no elevated area on metathorax.

Abdomen slender, long-ovate, marked with red fasciae of microscopic hair; sternites all simple, without the channel, nodule, and yellowish tegumentary band of *Hylaeoides*.

Legs slender, almost nude, the anterior pair lacking the apical hooks of *Hylaeoides*; hind calcariae finely serrate; strigilis with a spined malus, and a narrow velum; anterior and posterior coxae large and subtriangular.

Wings long, deeply suffused with blackish-purple; nervures strong, radius pointed off the costa, the large second cubital cell receives both recurrents, the second at its posterior fourth, basal not quite straight; pterostigma large; eleven hamuli unevenly spaced. A white line runs from the pterostigma through the cubital cells as in *Halictus peraustralis* Ckll.

Male not known.

Type locality: Jameroo, New South Wales.

ANALASTOROIDES FOVEATA, sp. nov.

TYPE Female—Length 10·5 mm., approximately. Black, with a band of red hair.

Head transverse, bright, a few silvery hairs of microscopic plumosity; face with two large suboval lateral primrose-yellow marks; frons with close, large pyriform punctures; clypeus black, finely aciculate; supraclypeal area elevated, with a fine sulcus that reaches the median ocellus; vertex closely punctured, facial foveae incurving to reach the lateral ocelli as a deep pit; compound eyes

large, converging slightly below; genae well developed, with many large punctures on a lineate sculpture; labrum a wide oval, with a median ridge and a large nodule; mandibulae bidentate, rather short, a few yellowish hairs; antennae black, scape slender.

Prothorax heavy, reaching the tegulae laterally, black; tubercles black; mesothorax all black, excessively closely punctured, practically nude, appearing almost granular; scutellum similar, but anteriorly the puncturing is closer and minute; postscutellum so closely punctured as to appear granular; metathorax with a large enclosed area finely granular; laterally there are a few pale plumose hairs; abdominal dorsal segments black, excessively closely punctured, with numerous appressed black hairs; one and three each with a broad transverse fascia of short moss-like red hair; four to six with straw-coloured hair; ventral segments shining, many punctures, nude, simple.

Legs black, slender, the femora basally and tibiae red, with a few short white hairs; tarsi all of the same width, on the anterior legs the long stiff pale hairs are hooked, as in *Hylaeoides*; claws bifid, reddish; hind calcar finely serrated, amber; tegulae black, with a fringe of white hair.

Wings long, deeply infuscated with iridescent purplish-black; nervures strong, black; the large second cubital cell receiving both recurrent nervures; pterostigma large and black; hamuli unevenly spaced, eleven in number.

Type locality: Jamberoo, New South Wales (alt. 1,600 feet), January 22, 1949; also January, 1950. *Leg.* Norman W. Rodd.

GENOTYPE in the collection of the author.

Allies: *Hylaeoides concinna* Fab., which has abdominal bands of tegumentary colour, with the anterior tibiae armed with large, strong hooks.

On both occasions the females were taken on flowers of *Leptospermum flavescens* var. *grandiflorum*, but no males were observed by the collector.

Discussion

Could mimicry do more?

This new bee (*Analastoroides fovcata*), another known as *Hylaeoides concinna* Fab., and several wasps in the genus *Alastor*, present one of the most remarkable parallels in the insect world. "Mimicry" is often responsible for this phenomenon, but it is surely a misnomer, for it connotes the conscious imitation of a model.

All the insects are feverishly active on hot days; all are of about the same size and slender build; the body-colour is dull black, and the abdomen is ornamented with a spectacular sash of orange-red in brilliant contrast; the "face" has a butter-coloured mark or marks, and the wings are suffused with iridescent blackish-purple.

The insects are almost nude, for the student has to examine them under the microscope before any plumosity can be identified with certainty. None has the equipment for carrying a harvest from the flowers; consequently, the bees have to sweep the pollen into the mouth with the peculiar hooked hairs of the front legs, and carry it home in the honey-sac.

The Alastorid wasps alight on the surface-film of deep water, and take off from it without difficulty. They carry dry earth, and water to moisten the building bricks. The cells are provisioned with small green caterpillars. The red abdominal sash is tegumentary. (For a full account of the biology see *Wild Life*, June, 1940.)

The other bee, *Hylaeoides concinna*, has a similar tegumentary red band on the abdomen, but the shin of the foreleg is armed with a large strong hook. The females construct diaphanous skin cells in plant-tubes, and harvest a store of honey and pollen for their young. The "doorway" is always camouflaged with a delicate "iris" of silk which opens and closes perfectly for the passage of the bee. (A full account of the biology is also given in *Wild Life*.)

The new bee, *Analastoroides foveata*, will readily be confused with that described above, for its flaming red sash is a perfect match, but the colour is in the tegument; surprisingly enough, it is due entirely to hair. There are no hooks on the front shins. The male and the biology of this remarkable bee are unknown.

It is difficult to refrain from postulating that these wasps and the bees had a common ancestor. *Hylaeoides* has a pale band across the belly, but the colour is tegumentary. *Analastoroides* also has a light band, but again it is due to pale hair. Indeed, it would seem that one must be a mutation derived from the other.

Since plumose hairs are the hall-mark of bees the world over, then one postulates that *Hylaeoides* is a mutation that has lost its hair; the hooked shin of the forelegs is certainly a primitive wasp-like character.

The likeness is not merely a superficial one, due to general form and colour, but may be detected in such minutiae as the pattern of the "skin," the thumb-prints, the sculpturing of the black tegument, the slender almost nude legs, the yellow markings on the face and the ventral band.

The several alastorid wasps found in the six States vary in colour, some have ivory-yellow markings, but a *Hylaeoides* also is present, with similar markings. Wherever the alastorids exhibit a difference in colour, the local species of *Hylaeoides* will surely show a corresponding colour scheme.

Certain naturalists claim that the palatable species of insects "mimic" the spectacular garb of the distasteful or dangerous ones, and so escape attacks by insectivorous birds. The alastorid wasps may have a disgusting flavour, and the "disguise" of warning

colours worn by the two bees may afford the honey-gatherers a perfect immunity, but it is difficult to appreciate the necessity for including such microscopical details as the "thumb-prints of the skin" for the perfecting of the disguise. If this interpretation of the observed facts be true, then we have a striking example of Müllerian "mimicry," with the flavoursome "mimic" coloured exactly like the distasteful "model."

Batesian "mimicry" may also be involved—the striking contrast of cinnabar and black being a conspicuous warning to all predators to "keep off the propellers." However, here are the facts; their interpretation is left to the reader.

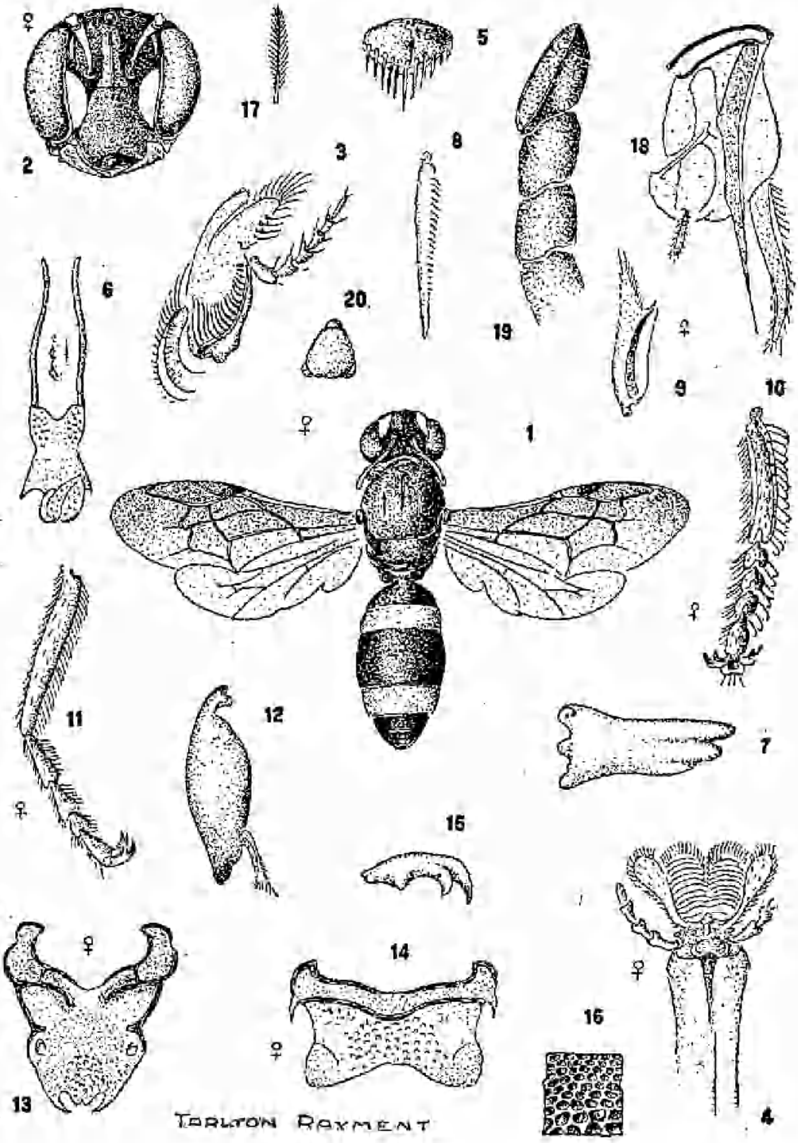
So far as the author has been able to ascertain, there is no record in the literature of the group on physiological "camouflage" in bees, and he was, therefore, somewhat surprised when two students of nature at Black Rock, Victoria, reported that a change of colour takes place in the facial hair of *Paracolletes fervidus* Ckll.

The males have the front of the head-capsule heavily masked with a "mat" of long plumose straw-coloured hair that gleams with the lustre of very shining satin. It is a conspicuous feature that can be observed in an aperture ten feet away, for the circle of the head-capsule, filling any aperture, has the iridescence of a jewel.

These males are remarkable for their habit of sheltering in any available gallery: in a tree, a piece of firewood, a cavity in a brick wall; the Rush brothers actually discovered a male sheltering in the shackle of a spring on an auto-truck, and the bees returned to the same shelter, night after night, for about two months, viz., January and February. These observers found that if a finger be passed over the aperture of the gallery, the satiny yellow of the "face" fades to a dull grey-brown, which renders the insect much less conspicuous in its retreat. They reported that the change of colour is not instantaneous, but develops as a gradual darkening of the hair; nor does the phenomenon disappear suddenly, but rather progressively diminishes, until it finally fades out entirely.

The pigment of the majority of bees is melanin, usually of black, brown or yellow colour, and produced from the amino-acid tyrosine, which results from the action of the enzyme tyrosinase. These actions are brought about during the digestion of protein. The author was able to show that the change in the colour of the bee's hair was not due to melanopores, but to the incidence of light-waves on the numerous hairs.

It should be noted that the phenomenon was observed only in the late afternoon, when the sun was too low to light the apertures, which invariably have an eastern, northern or western aspect, but never a southern one. During the day the bees are absent in the field, and their activities while abroad are unknown, for the "nests" have yet to be discovered.



For explanation, see page 25.

The Rush brothers described the males as being ready to put up a stout front, and a brave defence, sallying from the shelter with a warning buzz to begone. If a twig be inserted in the tube, the male will bite at it pugnaciously, and may even be drawn from the shelter without relaxing his hold.

EXPLANATION OF PLATE

1. Adult female *Analastoroides fovcata* Raym.; legs not shown. 2. Front of head-capsule. 3. Maxilla with large comb and palpus. 4. Glossa and paraglossae. 5. Labrum. 6. Pharyngeal plate. 7. Mandible. 8. Hind calcar. 9. Strigilis. 10. Anterior tarsi. 11. Posterior tarsi. 12. Anterior tibia; note absence of the distal hook. 13. Seventh abdominal sternum. 14. Sixth sternum. 15. Tarsal claw. 16. Sculpture of the scutellum. 17. A tiny plumose hair from abdominal fascia. 18. Sting and gonostylus. 19. Apical segment of flagellum. 20. Myrtaceous pollen-grain taken from abdomen.

EXCURSION TO TRENTHAM

The "Fungus Foray" on April 1, while bringing to light no important discoveries, proved an enjoyable outing for nine members who undertook the journey. A two-mile walk from Trentham Station to the Coliban Falls seemed no distance, through admiration of the numerous magnificent eucalypt specimens lining the road, particularly the Manna Gum (*Eucalyptus viminalis*).

The first fungus collected was *Psalliota campestris*, the common mushroom, but we are afraid the specimens were not used entirely for scientific purposes! The "Fairy Ring" fungus, *Marasmius oreades*, was frequently seen by the roadside, and several definite rings could be traced. The stately Parasol Fungus, *Lepiota gracilenta*, was also fairly common; the elegance and symmetry of this species, and of *L. cristata*, attracted the attention of all, and one excursionist plucked up sufficient courage to eat a sample of the former "Parasol."

Blue Pixies' Parasol, *Mycena interrupta*, and the brilliantly red *Mycena viscido-cruenta* were added to our list; then came *Collybia radicata*, of which we were able to examine the long rooting "shank," *Russula emetica*, *Laccaria laccata*, and *Lactarius deliciosus*. These were the principal agarics, the more noteworthy of other fungi being the beautiful rosulate *Stereum elegans* and little gelatinous *Heterotextus peziaeformis* on damp logs and sticks.

Blanket Fern (*Pleurosorus rutifolius*) was found in several rock crevices near the Falls, and Clustered Everlasting (*Helichrysum semipapposum*) was still in flower.

R. D. LEE.

ANNIVERSARY FUNCTION

The July meeting of the Club, coinciding with the 70th Anniversary, will take the form of a special function at the Scots Church Hall on Thursday, 13th July, at 7.45 p.m. Full details will be announced in the July *Naturalist*.

HONOUR THE BRAVE

By EDITH COLEMAN, Blackburn.

Many good Australians regret that the names of Bass's gallant crew are not individually written on the scroll of fame. Only one, John Thistle, is known. He was with Bass and Flinders in the *Norfolk*, and later with Flinders in the *Investigator*, when he lost his life in tragic circumstances. Bass and Flinders held him in the highest esteem.

That Bass regarded his crew as partners in his great adventure is evident from his journal, in which he used the first person plural. It is always "we", not "I".

It is recorded by Péron that, when the French explorers under Captain Baudin were at Port Jackson in 1802, they saw Bass's whaleboat lying on the shore, "preserved with a kind of religious respect." Small souvenirs were made of its timbers, and a piece of the keel, enclosed in a silver frame, was presented to Captain Baudin by Governor King, as a memorial of "audacious navigation."

In a drawing of Sydney, made by Baudin's artist, the famous whaleboat is shown, stayed up on the sand. An effort should be made to obtain copies of that drawing to hang in our schools. Perhaps it might be saluted on Separation Day? A piece of the boat should certainly be among Victoria's precious possessions.

If the history of our State is ever to be written in new postage stamps, one or more should commemorate the courage of Bass and his crew. Haply his name might be given to some naval institution or a warship. To many admirers of Bass it must ever be a matter for regret that his two Victorian discoveries (as well as the Strait) do not bear his name. Generous Flinders, who was never at Western Port, would have been the first to suggest that the naval depot should honour Bass. Wilson's Promontory was given the name of a London merchant who, it is believed, never even saw it!

Several reasons for this seeming apathy may be offered:

Bass himself sought no recognition. His explorations were made for the sheer love of adventure and a desire to serve his country—he coveted no honours, nor desired fame for himself. He handed over his journal to Governor Hunter, then to Flinders for incorporation in the captain's book, while he got ready for the next adventure, which was to circumnavigate Van Diemen's Land. Again, his notes were passed over to Flinders.

To-day it seems strange that a great effort was not made to keep Bass in Australia for further discovery. The need for such work was stressed by Sir Joseph Banks in a letter to John King of the New South Wales Treasury. He wrote (15/5/1798):

> Although the colony has been possessed more than ten years, the discovery of the interior has been neglected. No one article has been

> discovered by the importation of which the mother country can receive any degree of return for the cost of founding and hitherto maintaining the colony.

In this letter, Sir Joseph conveyed an offer on moderate terms, by Mungo Park, to carry out explorations in Australia—an offer which was declined. Bass himself had realized that an almost virgin field awaited research, and also that few facilities for carrying it out would be offered by the New South Wales administration. In a letter to Sir Joseph from Sydney (May, 1799) he advises him that his whaleboat collection of animals and plants had been destroyed by rain and seas, and that his *Norfolk* collection had now been forwarded to Sir Joseph. After mentioning that he was surgeon on the *Reliance*, he continues:

> I arrived here with the professed intention of exploring more of the country than any of my predecessors in the colony, so that it may be expected I have not been idle. Besides enlarging the geography, I was anxious to procure new or rare specimens of subjects in natural history, a pursuit agreeing well with the bent of my inclination, but badly adapted to the little extra professional knowledge I possessed. I attempted it, however, but soon learned that the traveller here, whose finances deny him the assistance of horses or carriages, is too much incommoded by his own provisions and firearms to collect specimens. To verge the woods in quest of, and to collect, rare subjects has therefore, after many trials, been necessarily relinquished as impracticable.

Bass was too modest in assessing his capabilities. His descriptions of the country, soils and animals are made with precision. That of a wombat, the skull and skin of which he sent to Sir Joseph, was written with surgical exactitude and could hardly be improved upon. It includes the earliest observation of a tail in the very young wombat. How attractively, too, he described the plants of Van Diemen's Land, New South Wales and Victoria:

> Flowering heaths and odoriferous plants that perfume the air with the fragrance of their oils; the soft and exquisite gradation of their tints, for which they are so singularly distinguished.

He thought the New South Wales plants (which then included Victorian) excelled in these qualities, but, he adds, "The two countries present a perfect similarity in this, that the more barren parts are the most adorned."

The farmer's son takes note of the short, nutritious herbage, "better adapted to the bite of small than of large cattle . . . . but the greater part will perhaps turn to more advantage if left for pasturage than if thrown into cultivation. It would be rich as the one, but poor as the other."

It gives one a curious feeling to read those words, penned over 150 years ago, by the heroic surgeon-explorer, and to reflect that such an ardent, able man should have been lost to Australia. From Bass's letter to Sir Joseph Banks, it is obvious that the most pressing needs were set aside by lack of enthusiasm on the part of those in the colony who held the purse-strings.

There is another explanation of the apparent indifference, in the mother land as well as in the colony. War had been declared between England and France in 1793. In 1799 the name of Napoleon, then head of the French Republic, was uppermost in men's minds. To British statesmen, discoveries in a remote colony seemed quite insignificant beside their nearer, graver problems. Writing to Governor Hunter (February, 1799), just after Bass and Flinders had completed the circumnavigation of Van Diemen's Land, Sir Joseph Banks said:

> The political situation is so difficult, and His Majesty's Ministers so fully employed in business of the deepest importance, that it is scarce possible to gain a moment's audience on any subject but those which stand foremost in their minds, and colonies of all kinds are put into the background.

We can thus see why Bass's exploits made so little noise in the world.

His closing years are all too soon told. He went back to England by way of China, as his health demanded a warmer passage. In 1801 he returned to Port Jackson as the "managing owner" of the 140-ton *Venus*, with a cargo of merchandise—and twelve guns, for Britain was still at war. To his brother-in-law he wrote enthusiastically of his ship, "loaded as deep as she can swim, as full as an egg, sound and tight, and bids fair to remain sound much longer than any of her owners."

We read of Bass and his *Venus* carrying a cargo of salt pork to Port Jackson from Tahiti. He left Port Jackson again on February 5th, 1803, and never returned. Nothing definite was ever heard of him, although there were many rumours.

War between Britain and Spain was simmering, but had not been declared. It was reported that Bass, daring as ever, had carried a contraband cargo to Peru, had been captured by the Spaniards, and sent to work in their silver mines; but there does not seem to be any sound evidence to support such a conjecture.

Although lost to the world at an early age, he had crowded into his years more service and adventure than most men who live the full span. His journals, his letters, and those of his friends, reveal him as a man of unbounded courage, a capable leader and a man of high endeavour.

Not only was Bass Victoria's first explorer, but he made the earliest observations on the soils and vegetation of Western Port and Wilson's Promontory, on black swans which he saw in flights of hundreds, and ducks in thousands, and on the seals of Bass Strait, which were then more numerous than they are to-day.

How shall we honour him during this Centenary year of the State he fathered?

Flinders' words are his best memorial, for they are the tribute of one intrepid explorer to another:

A voyage expressly undertaken for discovery, in an open boat, in which 600 miles of coast, mostly in a boisterous climate, was explored has not perhaps its equal in the annals of maritime discovery. The public will award to its high-spirited and able conductor (alas! now no more) an honourable place in the list of those whose ardour stands most conspicuous for the promotion of useful knowledge.

Let us, for this year at least, keep his name in warm remembrance. What a wonderful film his whaleboat voyage would make, with an artist's impression of the coast as it was 150 years ago, the stormy seas, the sea-birds and seals, as depicted by modern photography. It would bring Australia before the world, reach a wider public than any novel, and should win a success to rival "The Overlanders."

AMERICA SETS A NEW RECORD IN PLANT LONGEVITY

Mr. C. E. Lane-Poole (formerly Inspector-General to the Commonwealth Forestry Bureau) has made critical studies on the rate of height growth in *Kingia australis* of Western Australia and finds that this remarkable and archaic liliaceous plant grows approximately one foot each century; this means that specimens over ten feet high (and there are many examples) would exceed 1000 years. On Tambourine Mountain, some 30 miles west of Brisbane, are 20-ft. cycads (*Macrozamia Denisonii*) which must also have lived for a millennium, probably much longer. Apart from the Baobab tree (*Adansonia Gregorii*) of N.W. Australia, whose longevity is great but still purely conjectural, these are the best examples Australia can put forward.

The African Baobab attains vast age, and a specimen 120 feet high with diameter about 30 feet at Quillimane, Angola (S.W. Africa) was estimated to be around 5000 years old (see *Gard. Chron.*, III, p. 494, 1888). Ellsworth Huntington (in *Secret of the Big Trees*) records having counted the rings of a Californian Giant Redwood (*Sequoia gigantea*) and proved it to be 3,150 years old. The celebrated Montezuma Bald Cypress (*Taxodium mucronatum*) at Santa Maria del Tulé, Oaxaca, Mexico, had a circumference of 200 feet in 1892 and, based upon the known diameter increment, was reliably estimated to have attained a minimum age of 4000—most probably much more (see *Gard Chron.*, XII, p. 647, 1892).

These impressive figures, however, pale into utter insignificance before a comparatively recent discovery (1920) near the Juniata River, Pennsylvania, U.S.A. The plant concerned is not even a lofty tree, but a sprawling ground shrub forming dark green carpets seldom higher than two feet. Drs. Coville and E. T. Wherry found that a *single individual* of the Box Huckleberry (*Gaylussacia brachycera*, in the family *Ericaceæ*) actually extended along a slope of the Juniata River for 1¼ miles and, from the calculated rate of growth in this species, could not be less than 13,000 years old—unquestionably the oldest thing now alive on this planet!

Fortunately, the Pennsylvania Department of Forests and Waters has promised to set aside as a permanent preserve the area occupied by this extraordinary plant. A full account of the "biological wonder," which was already ancient before the present redwoods of California had germinated, is given in *Plants and Gardens* (*Brooklyn Botanic Garden Record*) for Autumn, 1949 (Vol. V, n.s., No. 3, p. 166) and a striking photograph portrays the Great Sphinx of Giza alongside our Box Huckleberry, which had a flying start on the sphinx of about 8000 years!

Quis poterit Americanos excellere?

—J.H.W.

THE CHEQUERED STORY OF TWO TASMANIAN MOSSES

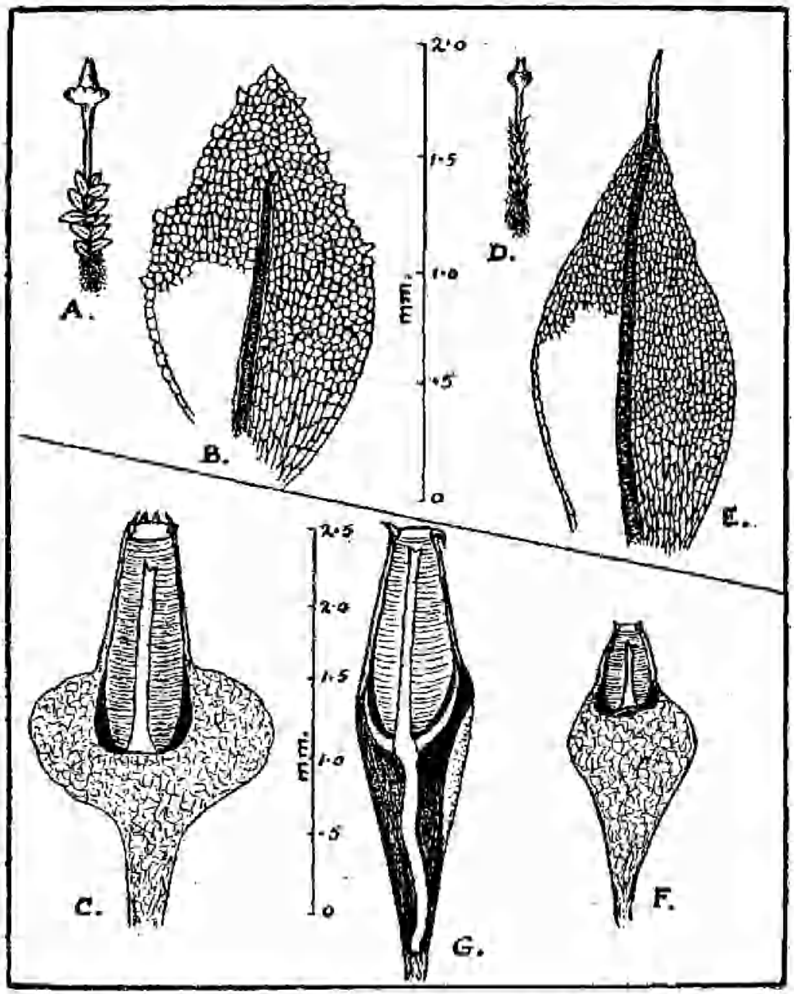
By J. H. WILLIS, National Herbarium, South Yarra.

1. *TAYLORIA GUNNII* (W. Wilson in Hook.) Willis, *comb. nov.*
   [Syn. *Splachnum Gunnii* W. Wilson in Hook., *London Journ. Bot.*, VII, p. 26, T. 1 (1848).]
2. *TAYLORIA TASMANICA* (Hampe) Brotherus, *Nat. Pflanzenfam.*, I: 3, p. 502 (1902).
   [Syn. *Tetraplodon tasmanicus* Hampe, *Linnæa*, 1876, p. 302.]

Splachnum Gunnii was described by its author, W. Wilson, as a "very curious moss which may, perhaps, form the type of a new genus." It is also, apparently, a rare species, endemic in Tasmania and restricted to the high-rainfall mountainous region of the west coast—only five collections seem to have been made since Ronald Gunn discovered the type material on a "dead tree-fern, Acheron River" (a tributary of the Jane River, south of Frenchman's Cap) in 1845.

The re-discovery last year of excellent fruiting specimens (in *Nothofagus* forest) on Cradle Mountain, by Miss Coryl Skewes of the National Herbarium staff (South Yarra), was therefore a matter of considerable interest. Upon consulting the references to this moss in literature, however, I was astonished to find how it had been confused with the also uncommon and endemic Hampean species, *Tetraplodon tasmanicus*, type of which came from Lake Pedder, to the north of Port Davey (collected by Schuster in 1875). Both mosses have been referred by various authors to the genera *Splachnum* and *Tetraplodon*, while the latter is treated now as a *Tayloria*. In the hope of resolving, once and for all, the actual generic status of each—by comparing good recent materials—I procured an excellent example of *Tetraplodon tasmanicus* from Adamson's Peak, Tasmania, through the kindness of Miss Winifred M. Curtis, University of Tasmania.

Splachnum Gunnii occurs as spongy bright green *Bryum*-like cushions, 1-3 inches high, on the rotting debris (fern trunks, logs, etc.) of cool mountain rain-forest. The spreading large-celled and almost papillose leaves are coarsely and irregularly toothed toward their broadly acute apices, each tooth being composed of a single marginal and undifferentiated cell; the nerve is lost below the apex. A stout reddish seta swells abruptly into what appears to be a curious, napiform, pallid grey-brown apophysis, which in turn contracts into the darkening, much narrower conical fertile portion of the sporophore; this basal, to ¼-inch-wide, "apophysis" is very much larger than the conical capsule and, in the wrinkled



A—*Tayloria Gunnii* (Hook.) Willis, a leafy shoot with sporophore—approx. nat. size. B—Single median leaf of same, showing cell structure (for size, see accompanying scale). C—Longitudinal section through sporophore, showing capsule (with columella) partly immersed in solid "apophysis" (for size, see scale).

D—*Tayloria tasmanica* (Hampe) Brotherus, a leafy shoot with sporophore—approx. nat. size. E—Single median leaf, showing cell structure and exserted nerve (for size, see scale). F—Longitudinal section through sporophore, showing capsule slightly immersed in solid "apophysis" (for size, see scale).

G—*Tayloria octoblepharis* (Hook.) Mitt., longitudinal section through sporophore for comparison with structure of previous two species—note columella extending through capsule and long hollow apophysis.

dry condition, it becomes almost discoid, the whole somewhat reminiscent of a tall Welsh hat. Peristome teeth are short, broad and erect or incurved—apparently never reflexing as with boreal species of *Splachnum*, a fact that Wilson stresses in his type diagnosis.

Tetraplodon tasmanicus, on the other hand, occurs in tightly-congested masses (doubtless in more exposed situations), about an inch high. Its imbricate entire leaves have acuminate apices, with prominently excurrent nerves, and the unflattened, rather pyriform, apophysate swelling is much smaller—only slightly wider than the capsule. Sculpture of the capsule wall is very similar to that in *S. Gunnii*, and both species have bullate, mealy-looking surface cells which extend almost to the mouth of the capsule in *S. Gunnii*, but are confined to the basal swelling in *T. tasmanicus* so as to give its whole sporophore a banded appearance—dark brown above and grey or whitish below. The stems of the two species are stupose, with the same matted, dark maroon-coloured fibrils.

Let us now tabulate chronologically the references to these Tasmanian endemics in bryological literature:

1848—*Splachnum Gunnii* is described and well figured by W. Wilson in W. J. Hooker's *London Journal of Botany*, VII, p. 26, T. 1.

1860—The description of *S. Gunnii* is repeated and extended in J. D. Hooker's *Flora Tasmaniæ*, II, p. 199, from which we learn that the seta is red.

1876—*Tetraplodon tasmanicus* is introduced as a novelty by E. Hampe in *Linnæa* (p. 302), its affinities with *T. urceolatus* (alpine and subalpine species of Central Europe, Asia and North America) being indicated.

1883—F. v. Mueller publishes (*Trans. and Proc. Royal Soc. Vic.*, XIX, p. 66) a paper entitled "Australian Mosses, enumerated by William Mitten, Esq.," in which the latter bryologist synonymises Hampe's *Tetraplodon tasmanicus* under *Splachnum Gunnii*—presumably without having examined the types of both species.

1886—R. A. Bastow contributes an article, "Tasmanian Mosses" (*Papers and Proc. Royal Soc. Tas.*, p. 77), listing and describing *Splachnum Gunnii*, but completely ignoring the *Tetraplodon* (even in synonymy) as if it had never existed.

1893—W. A. Weymouth discusses the *Splachnum-Tetraplodon* question at some length in "Some Additions to the Moss Flora of Tasmania" (*Papers and Proc. Royal Soc. Tas.*, p. 207). He disagrees with Mitten's "lumping" and writes:

> A comparison of our specimens [of *Tetraplodon tasmanicus*] with *Splachnum Gunnii* of Gunn's collection in this Museum [Hobart] made by Mr. L. Rodway and myself shows that the present moss differs markedly from *S. Gunnii* in its entire instead of denate leaves, the upper obovate-lanceolate with excurrent nerve . . . . ; in its brown seta; in its capsule, which has a subspherical, not an oblate, apophysis; and in its teeth, which are reflexed when dry, not erect.

There are comparative line drawings (T. IV) of both species, executed by L. Rodway, and in addition to the type area at Lake Pedder, two other localities are mentioned for *T. tasmanicus*, viz., Mt. Zeehan (W. V. Fitzgerald, 1892) and Mt. Darwin (T. B. Moore, 1893). In Rodway's later collection from Adamson's Peak the peristome teeth are very much smaller than depicted in his illustration (T. IV).

1897—A. Geheeb (*Revue Bryologique*) supports Weymouth in maintaining the specific and generic distinctiveness of these two mosses.

1902—V. F. Brotherus, who monographed the *Bryales* in Engler's *Natürlichen Pflanzenfamilien*, I: 3, 1901-1909, also retains both species (pp. 502 and 507), placing *Splachnum Gunnii* next to the arctic *S. vasculosum* in section *Ampullaria* of the genus, but transferring *Tetraplodon tasmanicus* to the genus *Tayloria*. He couples the latter with a Fuegian species, *Tayloria mirabilis* (Cordat) Broth., in a section having the "neck inflated like a hypophysis" and makes the following comment:

> The two last-named species deviate from all other *Taylorias* in the white (when dried) hypophysis-like swelling at the neck.

1906—W. W. Watts and T. Whitelegge follow Brotherus in treating *T. tasmanicus* as a *Tayloria* ("Census Muscorum Australiensum" in *Proc. Linn. Soc. N.S.W.*, XXX, p. 108).

1913—L. Rodway ("Tasmanian Bryophyta." Part III, in *Papers and Proc. Royal Soc. Tas.*, p. 200) restores *Tetraplodon tasmanicus* to its original generic position, but spells it "*tasmanicum*." A more surprising move, however, is his treatment of the old *Splachnum Gunnii*, which he also combines under *Tetraplodon*! (incorrectly spelling the epithet "*Gunnianum*"). In listing the localities for *T. tasmanicus*, he omits any reference to the type location or to Mt. Darwin, but mentions Mt. Zeehan, adding also Mt. La Perouse and Adamson's Peak—so, it would seem that Hampe's *Tetraplodon* is at least fairly widespread in far southern Tasmania and present also on the west coast.

1924—In the second enlarged edition of the *Natürlichen Pflanzenfamilien*, I: 3 (p. 339) Brotherus keeps *Tetraplodon tasmanicus* Hampe under *Tayloria* (as in the first edition); but, among the eight recorded species of *Splachnum*, *S. vasculosum* now stands alone (p. 342) and there is no mention whatever of its antipodean cousin *S. Gunnii*—why has our old Tasmanian plant so mysteriously vanished from literature?

For the next quarter of a century apparently nothing has been heard of either species in bryological writings and it is high time that the status of both were settled.

Re-examination of good fruiting material of these two puzzling mosses, particularly a comparison of capsular structure, has convinced me that Rodway was right in regarding them as different species in the one genus (1913). The colouration of short, stoutish seta and of capsule, the whitish minutely bullate surface of the very swollen neck and lower portion of capsule, the cell sculpture of the capsule, the minute peristome teeth, and the depth of the spore mass—all point to a close affinity.

Was Rodway also correct in referring both to *Tetraplodon*? The capsule of that genus surmounts a distinct and apparently always hollowed apophysis (which is never so inflated or distinctly coloured as in *Splachnum*), *T. tasmanicus* can hardly be a true *Tetraplodon*, for its fertile tissue extends down into the enlarged neck, and there is no demarcation between the capsule itself and the apophysis-like swelling which is quite solid—in other words, the capsule is *partly immersed* in the swollen neck.

I believe Brotherus (1902) was justified in placing *T. tasmanicus* among species of *Tayloria*, to share with the Fuegian *T. mirabilis* the unique feature of "a hypophysis-like swelling at the neck"—a *false apophysis*. The common *Tayloria octoblephoris* (Hook.) Mitt. of eastern Australia, New Zealand and subantarctic islands to the south, has a very different sporophore and its apophysis (if typical of most members in this genus) is a long narrow and hollow structure between the capsule and neck of the seta; a slender columella extends through both apophysis and capsule (see illustration). However, can we speak of a "false apophysis" when, by definition, *any* sterile swelling beneath the capsule is really an apophysis?

We now approach the problem of what to do with the old *Splachnum Gunnii*. Did Brotherus latterly find it so awkward to place that, lacking good material for examination, he purposely dropped the species from the second edition of *Pflanzenfamilien*? The very large, solid apophysis-like swelling is surely no more than an exaggerated state of what we find in *Tayloria tasmanica*; thus, to be consistent, one should regard *S. Gunnii* as an even more remarkable species of *Tayloria*.

In a typical *Splachnum* the seta is long, slender and delicate, the capsule seated entirely upon and very distinct from the much inflated apophysis, which is of different colour and texture, while the comparatively long peristome teeth become reflexed when dry. In our Tasmanian *S. Gunnii*, the seta is rigid, short and stoutish, the capsule homogeneous with and partly immersed in the solid "apophysis," and the peristome teeth are very small, remaining erect or incurved.

By making this new combination (avoided by so many notable bryologists in the past), I realize that the circumscription of the genus *Tayloria* will probably need amending. Perhaps the erection of a new subgenus, or even a distinct genus, is desirable to accommodate such species as *T. Gunnii*, which have wide, solid apophyses with bullate surface cells and the capsules partly immersed [cf. *T. octoblepharis* (Hook.) Mitt. with long narrow and quite hollow apophysis]; but I shall have to leave the delimitation of the higher categories to experts in this difficult group—let it now suffice to keep *T. tasmanica* and *T. Gunnii* together as congeners, *Tayloria* being at present the most acceptable genus to hold them. Wilson certainly spoke the truth in calling *Tayloria Gunnii* a "very curious moss"!

A further point of interest arises from the data supplied by Schuster concerning the habitat of his original collection of *Tetraplodon tasmanicus*. The hapto-type label attached to a fruiting fragment in the Melbourne Herbarium reads:

> "Tetraplodon tasmanicus Hpe.
> Ms. [presumably in Hampe's handwriting]
> forest lake Pedda, Tasmaniæ [in Schuster's hand?]
> 1875 . . . . [?] . . . . leg. Schuster."

In the type description itself (*Linnæa*, 1876, p. 302) the same information runs:

> "Mount. tovers Lake Peddu, Tasmaniæ. frustula 1875.
> legit. Schuster."

The version of Dr. Brotherus (see Weymouth in *Papers and Proc. Royal Soc. Tas.*, 1893, p. 207) is:

> "Mt. Towers, Lake Pedder, Tasmania."

Watts and Whitelegge (*Proc. Linn. Soc. N.S.W.*, XXX, p. 108, 1906) render it:

> "Towards Lake Pedder: Schuster, '75."

Obviously these citations all represent attempts to transcribe Schuster's handwriting. The words "forest," "tovers," "Towers" and "towards" (with or without the prefix "Ms." or "Mt.") do rather resemble each other, but the indecipherable word associated with 1875 on the Melbourne Herbarium label couldn't possibly be construed as "*frustula*," which follows the type diagnosis.

WHAT, WHERE AND WHEN

Monday, June 12—Kallista and Sherbrooke Forest. Combined excursion with Hawthorn Junior Club. Subject: "Lyre-birds." Leader: Mr. A. G. Hooke. Nash's bus from Batman Avenue at 9.15 a.m. or Hawthorn Town Hall at 10 a.m. Fare: Adults 6/-, Juniors 2/-. Bookings with Mrs. M. Pinches, 8 Thomas St., Brunswick, N.10. For members travelling by own car or by the 9.18 a.m. train to Upper Ferntree Gully and bus to Kallista, the parties will meet and lunch at Kallista Picnic Ground (right of main road, about ½ mile before Kallista Store). Bring lunch and afternoon tea.

Saturday, July 1—Cave Hill, Lilydale. Subject: "Geology." Leader: Mr. H. E. Preston. Train: 10.8 a.m. from Flinders St. Book 2nd return Lilydale (3/1). Bring one meal.

Saturday, July 15—Mt. Disappointment. Walk along firebreaks to tall timber. Leader: Mr. A. Cobbett. Nash's bus from Batman Avenue at 9 a.m. Fare, 7/6. Bring lunch and afternoon tea. Bookings with Miss M. Elder, 17 Adelaide St., Malvern, S.E.3 (Tel. U 7297).

Preliminary Announcements:

Saturday, August 19—Motor coach trip to Steiglitz district. Leader: Mr. Ivo Hammet. Details in July *Naturalist*. Preliminary bookings with Mr. H. C. E. Stewart, 14 Bayview Terrace, Ascot Vale (Tel. FU 022, extn. 457).

September 28-October 1—Grampians. Leader: Mr. E. E. Lord. Members who desire to join this excursion are asked to contact Miss J. Blackburn (MB 1657) immediately for information regarding accommodation. Combined with this excursion, Mr. A. Cobbett will take a walking party, prepared to camp out at least one night, over Mt. William and the Major Mitchell Plateau.

September 28-October 1—Rushworth. Following a successful visit two years ago, the Club has been invited to arrange another excursion to view the wealth of flora in the district, and latest developments on Growler's Hill. Leader: Mr. J. Ros Garnet, 270 Albion St., West Brunswick, to whom bookings should be addressed.

Group Fixtures:

Saturday, June 17—Geology Group excursion to Warburton-McVeigh's. No. 2 collecting excursion for National Museum. Subject: "Field Study and Fossils." Leaders: Mr. A. D. Gill, Palaeontologist of the National Museum, and Mr. A. A. Baker. Transport details given at June Group meeting.

Saturday, June 17—Botany Group excursion to Sydenham. Subject: Basalt Vegetation along railway line and further work at Sydenham Sanctuary. Train: 9.35 a.m. to St. Albans. Fare, 1/10. General members cordially invited to attend.

Monday, June 26—Botany Group. Royal Society's Hall, 8 p.m. Monthly meeting. Subject: "Basalt Plain Flora." Hon. Sec.: Mrs. A. Osborne, 21 Renwick St., Glen Iris, S.E.6.

Tuesday, July 4—Native Plants Preservation Group. At home of Miss W. Waddell, 3 Denham Place, Toorak, at 8 p.m.

Tuesday, July 4—Geology Group. Royal Society's Hall, 8 p.m. Monthly meeting. Hon. Sec.: Mr. A. A. Baker, 53 Carlisle St., Preston.

Thursday, July 6—Wildflower Garden Section. Royal Society's Hall, 8 p.m. Monthly meeting. Hon. Sec.: Mr. R. B. Jemison, 3 Linda St., Moreland, N.13.

Friday, July 7—Marine Biology Group. Royal Society's Hall, 7.45 p.m. Monthly meeting. Hon. Sec.: Miss W. Taylor, 13 Jolimont Square, Jolimont, C.2.

—Jean Blackburn,
Excursion Secretary.

The Victorian Naturalist

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PROCEEDINGS

The Annual Meeting of the Club was held at the National Herbarium on Tuesday, June 13, 1950, the President, Mr. Colin Lewis, and about 90 members and friends attending.

With regret the President announced the death of Mr. J. A. Ross, and fellow members stood in silence for a minute as a mark of respect.

Members were reminded that the July meeting would take the form of a special Social Evening to celebrate both the incorporation of the Club and our 70th anniversary. The Australian Natural History Medallion for 1949 will be presented then, and it is hoped for a large attendance.

Mr. J. Ros Garnet spoke briefly regarding conditions governing the award of the Medallion, and nominations were invited for the Club's 1950 candidature.

The following were welcomed to the Club as new Ordinary Members: Miss E. M. McCullough and Mr. R. Le Rossignol. Nominations for membership had been received from Mr. Hugh Wilson (Mr. E. S. Hanks/Miss A. B. Adams), Miss Freda Phillips (Mr. Gilbert F. Rogers/Mr. E. E. Lord), Mr. Ralph Field, "Whiora," Tennyson, Victoria (Mr. Ron Ferguson/Mr. Arthur Burke) and, as Junior Members, Misses Beryl and Frances Pinches (Mrs. M. Pinches/Mr. J. Ros Garnet).

ANNUAL REPORT AND BALANCE SHEET

The Hon. Secretary, Mr. H. E. Preston, read the Annual Report, which was received on the motion of Messrs. G. N. Hyam and T. H. Sarovich. Mr. Coghill congratulated the Secretary and members of Council for the good work done by them all during the past year.

The Hon. Treasurer, Mr. E. E. Lord, presented the Annual Balance Sheet and explained a number of items. Its adoption was moved by Mr. Lord and seconded by Mr. A. G. Hooke. As one of the auditors, Mr. Hooke pointed out that Messrs. Moule, Hamilton and Derham, Solicitors, had charged an exceedingly reasonable figure for the costs of incorporation of the Club; he moved that a letter of appreciation be sent through Council. Seconded by Miss Ina Watson and carried enthusiastically.

At this juncture the retiring President, Mr. Colin Lewis, vacated the chair and called upon Mr. E. E. Lord, who was unopposed in

the office of President for the ensuing year, to take charge of the meeting. Mr. Lord paid a tribute to the work Mr. Colin Lewis had done during the past year, and thanked members for the honour accorded himself. He then proceeded with the election of office-bearers for 1950/51, and as no more than sufficient nominations had been received to fill the vacant offices, he had pleasure in declaring those nominees duly elected. [See inside back cover for list.]

For election of the five Council members a ballot was necessary, resulting in the choice of: Dr. M. Chattaway, Miss M. L. Wigan, Messrs. J. Ros Garnet, H. C. E. Stewart, and R. B. Jennison.

Mr. Colin Lewis, in his address as retiring President, spoke on past conservation and literary achievements of the Club, contrasting these with modern opportunities in both spheres. It is hoped later to publish a précis of his address.

EXHIBITS

Miss K. E. Hall (M.C.E.G.G.S.): Collection of botanical specimens brought back from the Northern Territory by air on 4th June, chiefly from Alice Springs, including Corkbark (*Hakea lorea* and *H. intermedia*), Beefwood (*Grevillea striata*), Whitewood (*Atalaya hemiglauca*), Ironwood (*Acacia estrophiolata*), Witchety-wattle (*Acacia Kempeana*), and other *Acacia* species.

Mr. J. S. Seaton: *Leptospermum scoparium*, var. *Lambethi*, *Thryptomene saxicola*, *Astroloma conostephioides* (garden grown).

MESSAGE FROM THE PRESIDENT

With the July meeting the Field Naturalists' Club of Victoria celebrates its Seventieth Anniversary.

Looking back over the years, members may feel justly proud of their association with a body that has seen the acomplishment of so much of its original declared objective. Our Club has more than a record—it has a tradition. Such will be the keynote of the Anniversary Meeting. Two short films and a double presentation will provide an interlude.

Your Council sincerely hope that every member who possibly can will be present on this notable and happy occasion. The doors are open to every one of you, but we are sorry that accommodation cannot be provided for non-members. To those who accepted the invitation to contribute to the special expenses incurred we say—"Thank you."

Anniversary Greetings To You All.

SEVENTIETH ANNUAL REPORT

The year just concluded has been a momentous one in the history of the F.N.C.V. On December 26, 1949, the Club was registered at the Registrar-General's Office as a limited company—not for profit. It is hoped that with the new prestige the Club now commands many worthy projects will be undertaken in the realm of natural history.

The total membership is now 576, including: 20 Honorary, 366 Ordinary, 172 Country, 3 Life, and 15 Junior Members; there are also 14 Subscribers. This means an increase over last year's figure of 30 members. With sincere pleasure the Club elected Miss J. W. Raff as an Honorary Member at the October meeting.

It is with deep regret that we recall the death during the past twelve months of the following Club members: Mrs. G. C. Singleton, Mr. Harold Jenkins, Mr. A. J. Tadgell, Mr. Walter Parr, Mr. A. Grassick, Mr. R. D. Elliott, Mr. J. A. Ross, and Mr. R. Eadie.

The general meetings of the Club continue to receive good support from members. Attendances average 180, while subjects discussed have been varied and usually supplemented with lantern slides or films. Exhibits are still not as prominent or well reported as could be desired, and members are again asked to avail themselves of space in the *Victorian Naturalist* for recording their specimens. The installation of an amplifier has added much to the convenience of members. For the free use of the National Herbarium Lecture Hall the Council's gratitude and deep appreciation is conveyed to Mr. A. W. Jessep, Director, Botanic Gardens and National Herbarium.

Excursions have continued as a prominent feature of Club activities. Under the enterprising guidance of the Excursion Secretary and her committee, many new areas have been visited, e.g., Snob's Creek, Mt. Piper, Mason's Falls, and Anglesea. Camp-outs were held at Cape Patterson and Lake Mountain, while long week-ends were spent at Gellibrand River, Toolangi, Cotac, Upper Murray and Bendigo. Members are urged to make their services available to the Excursion Secretary as leaders.

Five Discussion Groups now hold monthly meetings for specialized study. During the year a Native Plants Preservation Group was inaugurated under the capable leadership of Miss W. Waddell, with Mr. F. Lewis as treasurer, it now has a membership of 29 and 17 Group Associates. The Group is concerned with saving representative areas of native flora in the field and is using every possible means to awaken the public to the urgent need for preservation. Notices have appeared in the daily press, country Field Naturalists' Clubs have been asked to assist, and the help of certain Government departments (e.g., Victorian Railways,

Postmaster-General's Department and Country Roads Board) has been sought. Through Miss Waddell's effort, the Group has had areas at Longwood, Tallarook and Sydenham reserved and fenced, and is now striving for reservations at Anglesea, Boolara, Frankston, Warrandyte and Nunawading.

The Botany Group reports a busy year. Monthly excursions have been conducted to places of botanical interest and where constructive botanical surveys could be made. Principal excursions were to Kallista (noting the number of Slender Tree-ferns there), Somerton, and Bell Bird Park, Ringwood (at the request of the Ringwood Shire Council, who have asked the Group to make a census of the plants there). The Group thanks all members who have helped throughout the year and cordially invites others to join in their outings.

The Wildflower Garden Section has concluded a fairly successful year. Although attendances at meetings have been small, enthusiasm is high, and new and old members of the Club are invited to attend meetings. Talks were given through the year by Mr. McEwan Duncan, Mr. J. Metcalf (Botanic Gardens), Mr. Fred Lewis, Miss Weston, Mr. Stewart and Mr. A. Burke; these have been of considerable assistance to Group members in their work of propagating native plants.

The Marine Biology Group, under the leadership of Mrs. M. E. Freame, with the generous help of Mr. A. J. Swaby, is striving to help those members eager to study marine life; they are encouraged to give talks on a variety of subjects and to discuss researches and problems encountered. The Group has recently acquired a marine tank with ground lens attached, and would welcome any new members.

The Geology Discussion Group reports an exceptionally successful year. Under the leadership of Mr. A. A. Baker, monthly excursions are made to areas that exemplify the subject-matter of the talks given at previous Group meetings. Working in conjunction with Rev. E. D. Gill, Palaeontologist at the Museum, the Group has embarked on special collecting trips and all specimens are donated to the National Museum.

The most important matter with which the National Parks and National Monuments Standing Committee has been concerned was a deputation to the Minister of Lands in September, 1949. A full report of the proceedings may be had from the Librarian for perusal by any interested member. Whilst awaiting governmental action on national parks, the Standing Committee has been occupied with a number of other matters—discussion with the Under-secretary for Lands regarding the future of Tower Hill National Park, the possibility of a permanent reserve in the Mt. Wellington region and another substantial reserve in the Howe Ranges.

Efforts have been made to have the matter of the Lower Glenelg National Forest Reserve finalized. The desirability of amending the Wild Flower and Native Plants Protection Act has also received the attention of the committee. Reference should be made to donations toward the expenses associated with the National Parks Campaign, and in this connection contributions have been received and gratefully acknowledged from the Australian Forest League (£2/2/-) and the Don Caravan Co. (£2/2/-).

The Australian Natural History Medallion for 1949 was awarded to Mrs. Edith Coleman, the first woman to receive this honour. The Club's congratulations are extended to Mrs. Coleman, who is to be presented with the Medallion at the special Club Anniversary Meeting in July.

The cessation of the Council for Scientific Societies through lack of interest by participating bodies is much to be regretted. This council represented many scientific interests and was created shortly after the war as a medium for co-operation among its member societies—towards the goal of a cultural centre, technical library and kindred facilities.

The Record of Research makes little progress. Mr. A. J. Swaby is anxious to record members' investigations—even the simplest report should not be overlooked.

Volume 66 of the Club's journal, *The Victorian Naturalist*, with index, is now complete. For editorial duties our thanks are due to Mr. J. H. Willis, B.Sc., Honorary Editor, and his able assistant, Miss Ina Watson, also to Dr. Margaret Chattaway, who assisted during Miss Watson's six months' absence abroad. The Fungus Handbook has been revised and is now ready for re-publication.

Since last Annual Report the Club has received several donations which are gratefully acknowledged: Mr. G. Coghill, £5, toward the cost of the amplifier; Mr. V. H. and the late Mrs. Blanche Miller, £5/5/-, toward cost of incorporation; Mr. R. Davidson, £1/1/-, also toward incorporation costs.

The Youth Movements Committee reports a successful year at the Hawthorn Junior Club. Mr. and Mrs. J. J. Freame, Miss M. Wigan, Messrs. A. J. Swaby, A. Baker, Ivo Hammet and S. R. Mitchell are to be specially thanked in this regard. The Junior Club is also much indebted to Mr. and Mrs. Paul Fisch for continued support and transport facilities during excursions.

The Maranoa Gardens Advisory Standing Committee has worked on for the improvement of the Gardens. Mr. E. E. Lord was appointed a Trustee of Maranoa Gardens and Dr. W. D. Chapman was elected to fill a vacant position. A highlight of the year's work was the annual Planting Day by members of the Club on April 27th.

(Continued on page 44.)

FIELD NATURALISTS' CLUB OF VICTORIA

STATEMENT OF RECEIPTS AND PAYMENTS FOR 12 MONTHS ENDED 30th APRIL, 1950

GENERAL ACCOUNT

RECEIPTS						EXPENDITURE					
Subscriptions—						*Victorian Naturalist*—					
Arrears	£30	3	9			Printing	£444	0	0		
Current	466	11	0			Illustrating	56	0	0		
Life Membership	5	4	7			Despatching	22	2	0		
				£501	19 4	Index	11	10	0		
Cash Sales of *Victorian Naturalist*				11	9 9					£533	12 0
Advertisements in *Naturalist*				47	17 6	Reprints				5	5 3
Interest received, Library Fund, £50 @ 3½%				1	12 6	Postage				21	4 8
Donations received				0	16 3	General Printing and Stationery				27	13 11
Hire of Printing Blocks				0	10 0	Library				5	3 3
				£564	5 4	Rent, Caretaking and Meetings				23	15 0
Excess of Expenditure over Income for year				81	9 0	Donations				1	1 0
				£645	14 4	General Expenses				27	19 3
										£645	14 4

BUILDING AND CONTINGENCIES ACCOUNT

Balance in Savings Bank at 30/4/49				£193	7 10	Loud Speaker Equipment				£48	17 6
Donations received—						Incorporation Fees				44	5 0
Loud Speaker	£5	0	0			Printing of "Botanical Pioneers"				9	0 0
Incorporation	6	6	0			Printing of Christmas Cards				27	1 8
Interest on Commonwealth Bonds and Current Account	34	19	5			Purchase of Badges				13	16 6
Sale of Publications	4	3	9							£143	0 8
Sale of Badges	5	8	0			Balance in Savings Bank at 30/4/50				119	1 10
Sale of Christmas Cards	12	17	6								
				68	14 8						
				£262	2 6					£262	2 6

LIFE MEMBERSHIP ACCOUNT

Balance in Savings Bank at 30/4/49	£64	0	2	Taken into Ordinary Income of year to 30/4/50	£5	4	7
Interest on Current Account	0	14	5	Balance in Savings Bank to 30/4/50	59	10	0
	£64	14	7		£64	14	7

BALANCE SHEET AS AT 30th APRIL, 1950

Liabilities							Assets						
Building and Contingencies Fund	£1,069	1	10				Bank Current Accounts—Net Balance				£46	8	8
Dudley Best Library Fund	50	0	0				Arrears of Subscriptions, estimated to realize .				75	0	0
				£1,119	1	10	Sundry Debtors				36	0	0
Subscriptions paid in advance—							Stocks on Hand at valuation—						
Ordinary	54	11	4				Publications	£54	5	11			
Life Membership	59	10	0				Badges	42	0	0			
				114	1	4					96	5	11
Excursion Account				57	14	8	Investments—						
Wildflower Protection Group Fund				14	0	0	Dudley Best Library Fund—						
Special Donations in hand				10	10	0	Commonwealth Bonds . ..	£50	0	0			
							Building and Contingencies Fund—						
Surplus of Assets over Liabilities				1,006	6	1	C'wealth Bonds . £950	0	0				
							State Sav. Bank 119	1	10				
								1,069	1	10			
											1,119	1	10
							Library Furniture, Epidiascope, Loud Speaker and Water-colour Paintings, at valuation				948	17	6
				£2,321	13	11					£2,321	13	11

Audited and found correct.
A. S. CHALK
A. G. HOOKE } Hon. Auditors,
13th June, 1950.

E. E. LORD, Hon. Treasurer.

The Library remains in the capable hands of Messrs. A. Burke and R. D. Lee and has served many members. However, its peak of usefulness has not yet been reached and those attending Group meetings are invited to take full advantage of its facilities. Many fine books have been donated during the year and for these we are indebted to Dr. M. Chattaway, Mr. Scott and the Bird Observers' Club. Review copies of several noteworthy monographs and text-books have also been received.

Before closing this report your Council wishes to express gratitude to several persons and institutions for services willingly rendered: to Mr. A. W. Jessep, Director of Botanic Gardens and National Herbarium, for the use of a room at the Herbarium as Council meeting place; to Messrs. Hooke and Chalk for auditing the Club's accounts and for preparing the Club's balance sheet; to Mr. Otto of *The Sun* for help in securing advertisements for the *Victorian Naturalist*; to Mr. F. Cudmore for his help with the Club's Library; to Mr. A. J. Swaby for organizing working-bees at the Royal Society Hall; to the Club's solicitors, Messrs. Moule, Hamilton & Derham, for help in preparing the Club's documents for incorporation; to Brown, Prior Anderson Pty. Ltd. for their continued helpfulness in publishing the *Victorian Naturalist* month by month; to Miss W. Waddell for use of her home as a meeting place for the Native Plants Preservation Group; to the Royal Society of Victoria for use of the lower supper hall in which to store the Club's Library and as a meeting place for Study Groups; and to all who have unselfishly devoted time and energy to furthering the aims and ideals of the Club.

(Signed) Colin Lewis, President.
H. E. Preston, Hon. Secretary.

BLACKBIRD GIVES ALARM

I was recently sitting in sunshine at the bottom of my garden, after a spell of digging. My wife's six Leghorn hens were scratching about, the door of their pen being open. Suddenly a blackbird, out of sight in a tall gum tree about 50 yards away, gave its alarm call. The hens, without waiting to look around, instantly dived with one accord for the shelter of their pen and did not emerge for another ten minutes. The day was a quiet, still day and, so far as I could see, nothing had moved to cause alarm. It struck me as very interesting that these domesticated birds should recognize and respond to the alarm call of a wild bird in this way. Blackbirds, I may say, are very numerous in this district of Toorak.

Fred. Lewis.

ADDITIONS TO THE ORCHIDACEAE OF AUSTRALIA—III

(Two New Species of *Pterostylis* in Victoria)

By W. H. NICHOLLS, Melbourne.

9. *PTEROSTYLIS FISCHII*, sp. nov.

Planta gracilis, glabra, circa 15-20 cm. alta. Folia ad radicem 3 (in meo specimine), elliptico-ovata vel late ovata, petiolata. Bracteae caulis circa 5, sessiliae, acuminatae, circa 0·5-2 cm. longae. Flos solitarius, subgrandis, plagis viridibus et rufis; apex galeae longe filiformis, decurvissimus. Labium inferum erectum, cuneatum, gibbosum, sinu angustato; lobi saepe 3-4 cm. longi, apicem longe filiformes. Labellum mobile unguiculatum, 8 mm. longum, late ovato-lanceolatum, strictum; lamina concava, linea elevata centrale longitudinale; apex obtusus vel obscure-emarginatus; ad basin appendice longa penicillata trifida. Columna circa 12-13 mm. longa, stricta; pars superior alae cuiusque dilatata, dente subulato divaricato; pars inferior oblonga obtusa, margine involuto ciliato. Stigma lanceolata.

A slender glabrous terrestrial herb, about 15-20 cm. high. Radical leaves elliptic-ovate or broadly ovate, petiolate (3 only present in the two specimens seen; these leaf rosettes are distinct from the flowering plant). Stem-bracts about 5, small and leaf-like, sessile, acuminate about 0·5-2 cm. long. Flower solitary, comparatively large, with green and rufous striae on a translucent whitish ground; galea rigidly erect, about 2·5 cm. high, then curved forward to a long abruptly decurved filiform apex (of the dorsal sepal). Conjoined sepals erect, with a narrowly acute sinus, the base projected forward, gibbous and pouch-like; the filiform points erect, embracing the upper portion of the galea and exceeding it by about 2-2·5 cm.

Petals rather short and somewhat blunt, the tips abruptly decurved on each side of the dorsal sepal (in the fresh flower) and almost reaching the lower lip in their sweep. Labellum less than 1 cm. long (*much* shorter than the column), practically straight, broadly ovate-lanceolate, on a comparatively long movable claw (occasionally widely constricted about the middle); lamina deeply concave with a raised longitudinal central ridge with a corresponding narrow groove on the underside; apex obtuse or obscurely emarginate. Column rigidly erect (in the majority of specimens seen), 12-13 mm. long; the upper portion of each wing with a subulate, divergent tooth; the lower wings oblong, rounded, with softly-hairy inturned margins. Stigma lanceolate. Anther with a short point.

Flowering: May.

Habitat: Woodside, Victoria (*leg.* Mr. and Mrs. Paul Fisch and family, May 1949 and May 1950 — HOLO-TYPE and PARA-TYPES in National Herbarium, South Yarra).

I have named this well-defined *Pterostylis* after it finders, the Fisch family of Doncaster, Victoria, who, as worthy members of our Club, have maintained keen interest in the study of our native flora, especially the orchids. Mrs. Fisch discovered the greenhood while holidaying at Woodside in 1949. This year her husband undertook a special excursion there to collect fresh material for detailed investigation. He writes to say:

> It was growing in fairly light forest country, slightly undulating, the soil sandy and overlaying quartz gravel. The colony (one only) was very much scattered on a small rise where there was no undergrowth except the ubiquitous bracken; specimens grew singly or in groups of four or five together (rather similar to the habit of *Pt. revoluta* R.Br.). The exact location is opposite the 10-mile post, on the road from Yarram to Woodside, and about 160 yards into the scrub on the left-hand side of the road.

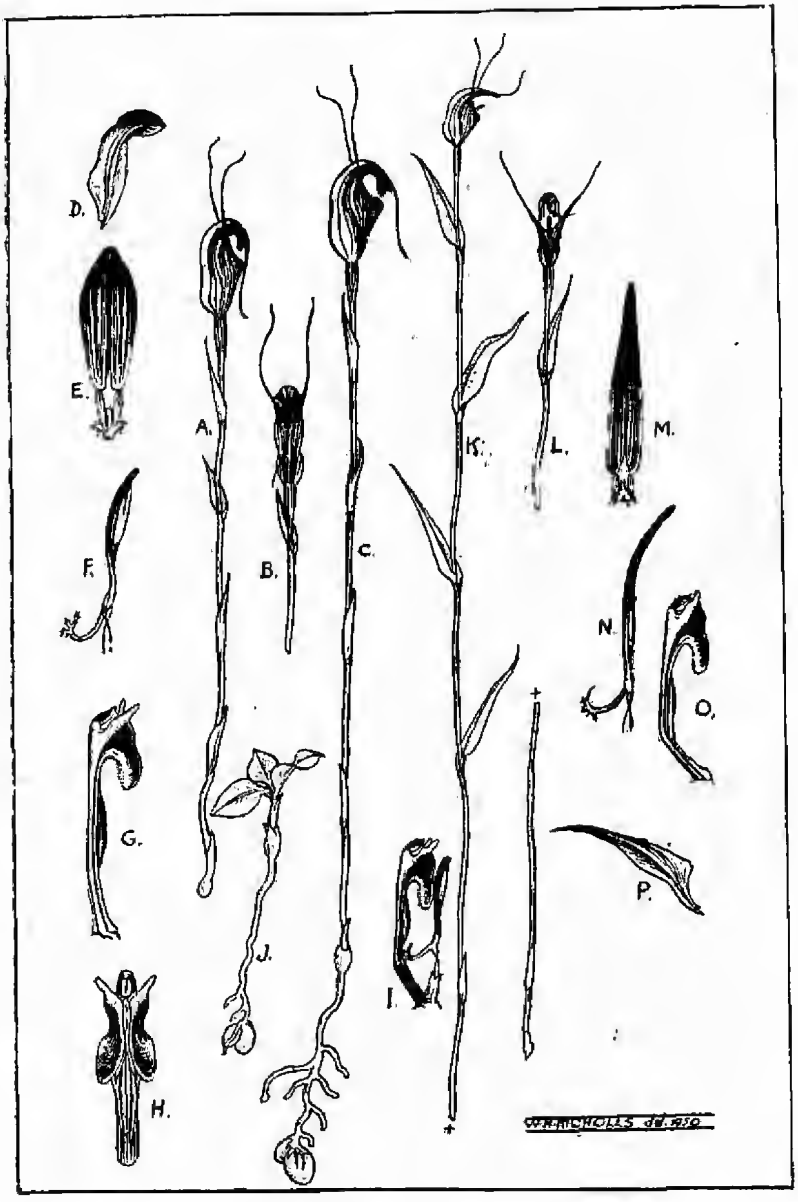
Pterostylis Fischii is a notable addition to the genus and appears to be more closely related to *Pt. obtusa* R.Br. and *Pt. decurva* Rogers than to any other species. Outwardly it resembles *Pt. decurva* in the very long filiform sepal points; however, the labellum is quite different—it is somewhat like (though shorter than) this segment in the Snake Island form of *Pt. obtusa*, but here the resemblance ends. The proud, almost martial bearing of the flower of *Pt. Fischii*—a character lost when the flower is pressed—together with the short, broad labellum, would be sufficient guides to identification in the field.

[Figs. A-J.]

10. *PTEROSTYLIS TENUISSIMA*, *sp. nov.*

Planta tenuissima, glabra, saepe multo attenuata, circa 15-25 cm. alta. Bracteae caulis 5-7, laxe separatae; supremae (3-4) foliaceae, late lanceolatae, amplexicaules, circa 1-3 cm. longae; inferae (2-3) parvae, vaginaceae. Flos unicus, parvus, viridis parce fusce lineatus; galea erecta, 1·3-1·5 cm. longa, gradatim arcuato-curvata, apicem filiformis. Labium inferum erectum cuneatum, sinu palentio; lobis longe filiformibus, galeam multo superantibus. Petala longe acuminata. Labellum mobile, unguiculatum, lanceolatum, sub-curvatum, apicem subacutum; lamina circa 8 mm. longa, in medio linea elevata longitudinale; ad basin appendice curvata, penicillata. Columna circa 9-10 mm. longa, curvata; lobis superioribus olis acutis; lobis inferioribus oblongis obtusis, marginibus involutis ciliatis. Stigma lanceolato. Anthera breviter apiculata.

An extremely slender, often attenuated, glabrous plant, from about 15 to 25 cm. high. Stem bracts 5-7, alternate and widely spaced; the upper ones (3-4) leaf-like and broadly lanceolate,



For explanation, see page 48.

stem-clasping at the base, 1-3 cm. long; the lower ones (2-3) small and sheathing. Flower solitary, small, greenish-white with green (and some darker) longitudinal striae; galea about 1·3-1·5 cm. high, erect, then gracefully curved forward to a filiform apex (8-10 mm.) formed by the acuminate points of the petals and dorsal sepal. Conjoined sepals erect, with a wide V-shaped sinus, the lip protruding; filiform points erect, embracing the galea and exceeding it by about 1·5 cm. Labellum lanceolate, curved, the apex not very acute, on a broad mobile claw; lamina about 8 mm. long, with a raised longitudinal ridge throughout; basal appendage curved, densely penicillate at the apex. Column only slightly longer than labellum, erect, incurved; upper lobes with a short point at each angle, the lower lobes rounded with ciliate margins. Stigma lanceolate. Anther shortly pointed.

Flowering: October.

Habitat: Nelson, far S.W. Victoria (*leg.* Mr. Cliff. Beauglehole, Oct. 1946—TYPE in the National Herbarium, South Yarra).

The finder of this new orchid has supplied the following additional data concerning its occurrence:

> In two locations about two miles apart, viz.: (1) Where "Long Swamp" enters the south-west extremity of the Lagoon (which adjoins Glenelg River), thus approximately one mile south-east of Nelson; it was growing in association with a "Twig-rush" (*Cladium laxum*), which was also a first record for Victoria, but I have since located it over 18 miles farther east, at Johnstone's Creek. (2) Approximately one mile west of Nelson, on the other side of the Glenelg, where several colonies were found in swamps. Both discoveries in mid-October, 1946. As very similar terrain extends for several miles on either side of the Glenelg mouth, it is only to be expected that other colonies exist throughout the region.

Pt. tenuissima is closely allied to *Pt. reflexa* R.Br.—an autumn-flowering species of East Gippsland; it differs chiefly in the comparatively larger stem-leaves (or leaf-like bracts) and stouter pointed labellum; the habit, moreover, is much more attenuated. Neither radical leaves nor tubers were seen, and the foregoing description was taken from herbarium specimens in the possession of Mr. Beauglehole, an indefatigable plant collector, with numerous new discoveries and records to his credit. Type material has been generously donated to and deposited in the Victorian National Herbarium, South Yarra.

[Figs. K-P.]

KEY TO ILLUSTRATIONS

A, B and C—*Pterostylis Fischii*, sp. nov.: D—Petal; E, F—Labellum, from above and side; G—Column, from side; H—Head of column, from front; I—Column and labellum, showing respective sizes; J—Radical leaves.

K, L—*Pt. tenuissima*, sp. nov.; M—Labellum, from above; N—Labellum, from side; O—Column, from side; P—Petal.

(For natural sizes of figures A, B, C, J, K and L, see letterpress; other figures variously enlarged.)

NATURALIST-EXPLORERS OF THE AUSTRALIAN COASTS

By Lionel A. Gilbert, Nabiac, N.S.W.

Our knowledge of all branches of Australian natural history was initiated by the coastal survey expeditions around this continent, both before and after the settlement at Sydney Cove in 1788.

Almost invariably the French expeditions which visited the coasts, and often alarmed the early settlers, brought a naturalist—sometimes a whole scientific staff—and, as a result, works of the greatest importance to natural history were published in Paris. Official British expeditions usually had at least one naturalist. Often the leader of the expedition, or the ship's surgeon, fulfilled duties as naturalist or collector as well, and it was the custom for the Admiralty Instructions to include directions for collecting specimens and natural history data.

William Dampier's government-sponsored expedition to the north-west coast of Australia during 1699, in H.M.S. *Roebuck*, was biologically productive, Dampier himself collecting much data and a number of specimens. He made classifications, wherever possible, and compiled notes to supplement his drawings. Some of these drawings were published in *A Voyage to New Holland* (1703). Dampier's small herbarium is now housed at Oxford University. Of the 40 plant specimens from various countries, 18 were depicted in the published journal, including our well known and now popular Sturt Desert Pea: plates of 5 New Holland birds, 6 fish, a cuttlefish, and several zoological specimens from other areas were also reproduced. Dampier's 17 plant specimens from Australia later proved of value to botanical workers in England, and two of them became the types of species described by Robert Brown.

A Voyage to New Holland abounds in references to natural history. When reading in it of different seaweeds, tiny marine organisms, sea-birds, sea-serpents, seals, whales, porpoises, sharks, and terrestrial plant and animal life, one is amazed that the author of such a fascinating account could ever become involved with the *Cygnet* buccaneers, who finally abandoned him.

Sometimes Dampier's determinations were a little hasty, as in the case of the "hippopotamus" head and bones found within a shark caught at Shark's Bay. Apparently the eleven-foot shark had consumed part of a dugong. However, his interest and enthusiasm were constant, and, for the first time in England, attention was drawn to Australia's living oddities.

Next of the British surveys was that of the eastern coast under Lieut. James Cook in the *Endeavour*, 1770. The contributions made to natural history by this expedition, principally through the energy of Joseph Banks, are too well known for repetition here.

Banks, Solander, and their assistants collected most diligently, and their material was of the greatest value; but, unfortunately, the collections were never thoroughly investigated until long after the voyage. According to John Ellis, F.R.S.:

> No people ever went to sea better fitted out for the purpose of Natural History, or more elegantly. They have a fine library of Natural History, all sorts of machines for catching and preserving insects; all kinds of nets, trawls, drags, and hooks for coral fishing; they have even a curious contrivance of a telescope, by which, put into the water, you can see the bottom at a great depth when it is clear. They have many cases of bottles with ground glass stoppers of several sizes to preserve animals in spirits. They have several sorts of salts to surround the seeds. In short, Solander assured me this expedition would cost Mr. Banks £10,000.

To buy and convert the *Earl of Pembroke* coal-ship into the *Endeavour* discovery-ship cost only £5094, so that Banks's natural history preparations cost about twice as much as the ship itself!

For assistance in collecting, preserving, sketching, etc., Banks took Dr. Daniel Solander (because of his scientific training with Linnaeus), Alexander Buchan, Sydney Parkinson, John Reynolds, Herman Sporing, James Roberts, Peter Briscoe, and two negroes —Thomas Richmond and George Dollin. Unhappily, six of these people (including the two negroes, who were frozen to death) died between January 16, 1769, and January 24, 1771.

Upon the return of the *Endeavour* to England scientists throughout Europe eagerly waited for the publication of the natural history results of this voyage. In the midst of the excitement, Linnaeus heard that Banks was proposing a second expedition before the results of the first had been compiled, so he wrote to Ellis on October 22, 1771:

> This report has affected me so much as almost to deprive me of sleep. How vain are the hopes of man! Whilst the whole botanical world, like myself, has been looking for the most transcendent benefits to our science, from the unrivalled exertions of your countrymen, all their matchless and truly astonishing collection, such as has never been seen before, nor may ever be seen again, is to be put aside untouched, to be thrust into some corner, to become, perhaps, the prey of insects and of destruction.

However, at great expense, Banks was having plant drawings engraved on copper, and botanists everywhere awaited what was to be one of the most valuable botanical publications of all time. But, although the copper plates became more and more numerous, the wonder book itself did not appear. In 1820, half a century after his voyage, Sir Joseph Banks died, his great work still unpublished—his co-worker, Solander, who was to have written the descriptive part of the work, had died 38 years before.

Banks willed "the use and enjoyment" of his "library, herbarium, manuscripts, drawings, copper-plates engraved, and everything

else . . . in . . . collections" to Robert Brown, on whose decease the collections were to be given to the Trustees of the British Museum. Soon after acquiring these, Brown gave them to the nation, and the beautiful copper plates were all but forgotten.

The botanical results of the *Endeavour's* survey were finally published in 1900, with Part I of "Illustrations of the Botany of Captain Cook's Voyage Round the World in H.M.S. *Endeavour*, by the Rt. Honourable Sir Joseph Banks, Bart, K.B., P.R.S., and Dr. Daniel Solander, F.R.S." Banks's original copper plates, specimens and notes were compared, and the results checked in the light of present knowledge by James Britten, of the British Museum. By February, 1905, Britten had brought out the third large demi folio volume. The complete work had about 320 of Banks's plates, with Solander's original Latin notes as descriptions. Locations of specimens were indicated by appended facsimiles of Cook's charts of the coast. Thus the *magnum opus* of the *Endeavour's* botanical discoveries did not appear in published form until 130 years after the expedition, and by that time, of course, other surveys had mapped Australia's coastline and other botanists had described nearly all the plants that Banks originally collected.

As Captain Arthur Phillip was planning ways of establishing his little outpost at Sydney Cove, François de la Pérouse was recuperating his scientific expedition at Botany Bay, where to-day the grave of the naturalist Abbé le Receveur may be seen near the La Pérouse monument. All the natural history material that had been collected was lost with the entire expedition off the New Hebrides group in 1788.

In 1791 the ships *Discovery* and *Chatham*, under Captain George Vancouver, put in at King George's Sound, W.A., where Archibald Menzies, the ships' surgeon and botanist, made extensive collections of plants. Joseph Dalton Hooker paid tribute to these collections, and Robert Brown made use of some of the material for his *Prodromus Florae Novæ-Hollandiæ* (1810).

Between 1791 and 1794, Rear-Admiral Bruni D'Entrecasteaux made a long but fruitless voyage in search of La Pérouse. With the *Récherche* and *Espérance* were the talented naturalists Jacques Julien Labillardière and Claude Antoine Riche. Some interesting plates of Australian plants were included in Labillardière's journal account of the voyage, and one of them features the remarkable fungus *Aseroë rubra*. *Eucalyptus globulus, E. cornuta, Exocarpus cupressiformis, Anigozanthus rufa, Correa reflexa*, and two species of *Banksia* were also portrayed. This journal was published in English in 1800. Four years later, Labillardière published in two quarto volumes his *Novæ-Hollandiæ Plantarum Specimen*.

When the settlement at Sydney Cove had become fairly well established, the British Government commissioned Lieut. Matthew

Flinders to make a cartographical survey of the Australian coasts (1801-'03). Banks arranged for Robert Brown (botanist), Ferdinand Bauer (botanical artist), Peter Good (gardener), and William Westall (artist) to accompany the expedition. Banks's influence can be seen in the Admiralty Instructions to Flinders, June 22, 1801:

> . . . You have been furnished with a plant cabin for the purpose of depositing therein such plants, trees, shrubs, &c., as may be collected during the survey. . . . You are . . . to cause the said cabin to be fitted up by the carpenter on the quarter deck of the sloop you command . . . and you are to cause boxes for containing earth to be made and placed therein, in the same manner as was done in the plant cabin carried out by the *Porpoise* store ship, which plant cabin you will find at Sydney Cove.

The naturalist and gardener were to be given charge of this plant cabin and Flinders was responsible for a shipment of selected plants to the Royal Gardens at Kew. As often as the *Investigator* returned to Port Jackson, Flinders was "to cause the said plants to be deposited in the Governor's garden and under his charge," where the plants were to remain until the return to England. The instructions also directed that the small plant cabin of the *Investigator* should be replaced by the larger one from the *Porpoise* for the return voyage, and in this were to be placed "the plants, trees, shrubs, etc., which may have been collected during the survey, in order to their being brought home to His Majesty."

However, because of the weight of the superstructure, and the earth to be contained, Flinders found it necessary at Port Jackson to reduce the size of the plant cabin to two-thirds of the original, "Mr. Brown being of the opinion it would then contain all the plants likely to be collected in any one absence from Port Jackson."

This modified plant repository, under Brown and his "quiet and able assistant," Peter Good, soon became a place of beauty aboard the sloop, and the stock of quaint plants increased greatly as the coast was carefully surveyed on the voyages between 1801 and 1803. From the Instructions, and other records, it is clear that research in natural history was meant to be an important objective all through the survey, and the expedition had rather wide scope for making collections and careful records.

Peter Good, the botanical gardener, died on June 11, 1803, two days after the *Investigator* returned to Port Jackson from the northern coasts and Timor. Brown's other assistant, Ferdinand Bauer, continued the work and on January 12, 1806, Brown wrote to Sir James E. Smith stating that Bauer "has made about 1600 drawings, all of them accompanied by minute dissections." Ten of Bauer's plates were appended to the folio Atlas of Flinders' *Voyage to Terra Australis* (1814).

There was another naturalist on the scientific staff—John Allen, described as a "miner". Allen, with Brown and Bauer, remained at Port Jackson "to prosecute their researches in natural history," while Flinders (his old *Investigator* now condemned) left for England in the *Porpoise* on August 10, 1803. He hoped to obtain another ship from the Admiralty in which to complete his survey, particularly of the north-west coasts missed during the detour to Timor.

Much natural history material was loaded on the *Porpoise* and she sailed in company with the *Cato* and *Bridgewater*. A week later, the first two ships were wrecked off the Queensland coast. Flinders describes what happened to the geographical and natural history collections, firstly at Sydney:

> Amongst other preparations for the voyage, a green house was set up on the quarter deck of that ship (*Porpoise*) and the plants collected in the *Investigator* from the south-east and the north coasts of Terra Australis were deposited in it, to be conveyed to His Majesty's botanical garden at Kew; and as we had had the misfortune to lose the gardener of the expedition, and Mr. Brown, the naturalist, remained behind, a man from Port Jackson was engaged to take care of the plants during the passage.

Of the wreck, and its effects, Flinders remarks:

> My books, charts and papers had suffered much damage from the top of the cabin being displaced when the mizen mast fell; all such papers as chanced to be loose on the night of the shipwreck were then washed away by the surfs, and amongst them a chart of the west side of the Gulf of Carpentaria and part of the North Coast upon which I had been occupied in the afternoon. Part of my small library shared the same fate; but the rest of the charts, with my log and bearing books and astronomical observations, were all saved, though some of them in a wet and shattered state. The rare plants collected on different parts of the south, the east and north coasts of Terra Australis, for His Majesty's botanic garden at Kew, and which were in a flourishing state before the shipwreck, were totally destroyed by the salt water; as were the dried specimens of plants. Fortunately, the naturalist and natural-history painter, who remained at Port Jackson, had put on board only a small part of their collection of specimens, the great mass with the preserved birds, quadrupeds, and insects being kept for a future opportunity. Mr. Westall, the landscape painter, had his sketches and drawings wetted and partly destroyed in his cabin; and my little collection in mineralogy and conchology was much defaced, and one-half lost.

The stretch of coastline in the north-west remained uncharted during Flinders' eight years of imprisonment on Mauritius, and he died in 1814 before he could (had health permitted) return to complete the work. The British Government was anxious to have the survey completed, particularly as French expeditions, e.g. Baudin's, which Flinders had encountered, were becoming rather frequent—albeit they were of a purely scientific nature, nominally at least, and always carried a well chosen staff of naturalists.

(To be continued.)

EASTER EXCURSION TO GELLIBRAND RIVER, OTWAYS

GENERAL REPORT

By R. S. Chisholm

Eight club members attended the Easter excursion (April 7-10) to Gellibrand River, "Gateway to the Otways," half of the party travelling by train to Colac and thence by bus and car to "Wonga Wonga" Guest Ranch, where the whole party was accommodated. Mr. Strickland proved to be a most interesting and informative host, and the "Wonga" fare left nothing to be desired.

"Wonga Wonga" is an extensive property, picturesquely situated at a high level, with fine views over the long, roughly-parallel ridges of the Otway Ranges, blue in the distance, and nearer showing as heavily timbered. Down in the gullies were creeks, with many ferns amongst the scrub. Timber cutting has been extensive, but many acres appear still to be virgin bush. Every morning the valleys visible from the homestead were filled with cloud, while the long tops of the ranges were in clear sunlight; so early-risers saw a "mystic lake" effect as they looked down on the clouds, which soon rolled away, affording glimpses of the Gellibrand River, fringed with trees. There is a firewatcher's tower on the property. The upper staging was locked, but from the lower steps very extensive views could be obtained, and one could do "aerial prospecting" for mushrooms in sheep pastures around the foot of the tower, thus saving much time in gathering them later.

Kangaroos and wallabies abound in the forests; rabbits, alas, are also plentiful—we hoped that the wedge-tailed eagles observed there were taking toll of them. Of the bird-life, one noted the Wonga Pigeon (after which, presumably, the place is named), several kinds of parrots (including the Green Mountain Parrot), Kookaburra, White-backed Magpie, Magpie-Lark, White-browed Honey-eater, wrens, thrushes, and the introduced blackbird. Bird-life in the gullies appeared less abundant and varied than in gullies of the Dandenongs. Plenty of blackfish and trout are reported for the streams, but we made no attempt to observe aquatic life at first hand.

Several eucalypts and wattles were noted, also such typical rain-forest gully plants as dogwood, musk, hazel, tea-tree, tree-ferns, water-ferns, and maiden-hair. Naturally, at this time of year, little vegetation was in flower, but out-of-season blossoms were noted on the Prickly Mosses (*Acacia verticillata*) and on a low-growing Olearia; the Hyacinth Orchid and pink Centaury were still in bloom, while red and white heath (*Epacris impressa*) was just beginning its long flowering period.

St. John's Wort and an exotic heath seemed to be gaining a hold in scrubby country nearer the homestead. As the ground was very damp from recent rains and mountain mist, there was much growth of moss and many colourful species of fungi.

The car party of four made a return journey via Red Rock, Colac, Beeac, Inverleigh and Geelong, passing through a very interesting volcanic region where stories in the rocks may be so clearly read.

GEOLOGICAL REPORT

By F. A. Cudmore

In Tertiary times the high land in the Otway Peninsula was an island, composed of Jurassic rocks. Tertiary clays, marls and limestones were deposited all around it. These may be seen to-day at Torquay, Point Addis, Anglesea, Airey's Inlet and Cape Patton to the north-east of Cape Otway, while on the north-west of that cape are beds near Point Flinders, Castle Cove and other exposures on the Aire Coast. In the north the sediments

have been covered by basalt but can be seen at Murgheboluc, Inverleigh, Shelford, Kawarren and Camperdown.

"Wonga" lies near the northern edge of the Jurassic rocks which may be seen in the last three miles of road. Soft coal occurs on the property. We visited Kawarren, five miles north of Gellibrand, where there is a quarry in the yellow Tertiary limestones. They are horizontal beds lying along the north side of the valley of the Porcupine Creek, which runs into the Gellibrand River. A depth of 40 feet is visible in the quarry which is worked by Messrs. Alkemade Bros. for the production of lime. The stone is a mass of small organisms, but larger forms occur. Many were collected, mainly lamp shells (brachiopods), sea-urchins (echinoids), fan-shells (pectens), and calcareous sponges. The claws of a large crab were found. The party is indebted to Mr. Alkemade for permission to visit this interesting spot.

On Easter Sunday the writer and his son John crossed the Otways by car and collected more Tertiary fossils at Castle Cove, discovered by Wilkinson of the Old Geological Survey in 1866. In the afternoon, after a 2½-miles walk from the bridge across the Aire River, the richly fossiliferous clays near Point Flinders were reached. These were also discovered by Wilkinson, and even to-day they are still rather inaccessible. An adventurous return was made after dark across the coastal dune rocks.

When leaving "Wonga" the party visited Red Rock, north of Colac, an old volcano now surrounded by lakes in small craters and in depressions formed by subsidence after the eruptive period. Several quarries exposed layers of coarse and fine ashes from the volcano, together with numerous ejected boulders. Beneath the foot of earth on top of these beds were found two aboriginal implements, which will be presented to the National Museum. After admiring the extensive view from the peak of Red Rock the party returned by a road through numerous lava flows.

THE PASSING OF A STEREOSCOPIC ARTIST

Timothy Green—businessman, naturalist, photographer and horticulturist—died on December 5, 1949, in his ninetieth year. Son of a nurseryman, he grew up under strict Victorian discipline. A brother still runs the old nursery business at Settle, Yorkshire, England.

The late Mr. Green was one of the most versatile men one could hope to meet. I first made his acquaintance about 1920, when he began his orchid photography, and often visited him subsequently at John Danks and Sons, where he was advertising expert for some 25 years. He produced many beautiful catalogues for this firm, and was latterly presented with an inscribed gold medal, as a memento of faithful service.

Mr. Green was a quaintly old-fashioned English gentleman, whom the years altered very little in appearance. Topped with a "pork-pie" hat and clad in a very long coat, with special pockets to hold full-plate slides, lenses, cameras and other equipment, he seemed almost as broad as tall. Once, when he was thus garbed during a visit to my home, my mother packed two dozen large lemons into his various pockets. I shall never forget the parting: he presented a grotesque nodular appearance, from stem to stern!

With his trim Van Dyck beard, a charming smile, a sense of humour and quick retort, this thick-set little man travelled over a great part of Australia, taking hundreds of stereoscopic pictures on each trip. I have spent many pleasant hours running through them, Timothy acting as a talking machine. Through his photographs I have toured New South Wales, Queensland,

Central Australia, Wilson's Promontory, the Bogong High Plains, and many places of interest in Victoria. He had more than a thousand pictures of floral scenery; some of the best will be kept in the National Herbarium at South Yarra.

The secretary of a very successful John Danks football team, requiring a photograph, once requested his help. Disdainfully he looked them up and down and then replied: "When I go into the field with a camera, I take God's own flowers, not a mob of jumping hyenas!" His was a life for more serious things, and his beauty of mind, nobility and strength of character were more complete than in most men. Many of us can remember our journeys with delight, but he always fixed his pleasures by skilful photography and shared them with friends at home and the children attending local schools.

The late Timothy Green.

He was a confirmed bachelor and his study was a large room packed with cameras, enlargers, lantern slides, photographs and books. He was also a keen gardener, raising many plants in glass frames and constantly forwarding seeds to his brother in England.

From 1920 Green specialized in orchid photography and devoted most of his leisure hours to that art. Many of his pictures appear in this journal (e.g., Oct. 1925, Aug. 1926, Feb. 1934) and are of scientific importance. He not only photographed orchids *in situ*, but brought them indoors and made dissections to show the structures necessary for determination. When Mrs. Ethel M. Eaves, a devoted friend and fellow orchidologist, visited England she exhibited some of his work to Sir Arthur Hill, Director of the Royal Botanic Gardens, Kew. In response Sir Arthur wrote that he had seen the samples and, realizing their scientific value, had decided to purchase a set of negatives and prints. These are now housed in the Kew Herbarium Library. As a very loyal Englishman, you can imagine the pleasure he received in making such a contribution to his homeland.

Mr. Charles Barrett (*Vict. Nat.*, L, p. 225, 1934) gives praise in an article entitled "Orchid Picture Gallery" as follows: "Unique is often a word misused, but in writing of Mr. T. Green's collection of stereo-photographs of Australian orchids, its use is justified." This wonderful picture gallery of our favourite wild flowers is the only one of its kind in the world, and is likely to remain unique. A collection of about 1200 photographs (in 1934), it included studies of many Victorian species.

This account would be incomplete without mention of his thirty years of happy home life spent with Mrs. R. Giles and her daughter May, who cared for him. I bow to the memory of an outstanding photographer and naturalist, a true Englishman and a staunch friend. He did much to advertise Australian scenery and to increase the knowledge of our native flowers.

P. F. Morris.

"CLASSIFICATION OF ANIMALS"

Based upon a series of lectures to Zoology students at the University of St. Andrew's, Scotland, a small book was published last year by Dr. W. T. Calman, C.B., D.Sc., LL.D., F.R.S. (formerly Keeper of Zoology, British Museum) in Methuen's series of Monographs on Biological Subjects. Although written primarily for the guidance of systematic zoologists, this modest work is no less commendable to the budding botanist—there are sections on general classification, units of classification and the species concept, the higher categories, nomenclature, types, the International Code, descriptive method, key construction, etc.

In his introductory the author states that "many whose interests are in other branches of the science have a very low opinion of the systematist's work, and, if systematics is confined to mere mechanical naming and listing of animal forms, their opinion cannot be disputed . . . . facts laboriously gathered by the systematist must prove their value before his work can deserve the name of 'scientific research'." Some of the ways in which such work *is* justified, particularly in the ecological and evolutionary spheres, are then expounded.

The problem of defining a *species*, which has troubled naturalists for at least 300 years, is discussed in Chapter III. Every term in any such definition is subject to exceptions and qualifications and, although Dr. Calman doesn't go as far as to deny the factual existence of a "species," we are left with the empirical fact that the majority of animals, both living and extinct, may be sorted into separate kinds—distinguishable by differences in structure, colour, etc., and not linked by intermediate forms; these are the "good species," but there is also a considerable minority for which specific discrimination seems well-nigh impossible, so imperceptibly do their characters grade and merge from one to another.

In the infra-specific category Dr. Calman strongly advocates that the term *variety* be scrapped; it has been used in so many different senses (for colour forms, geographical races, mere freaks—and even more promiscuously by botanical workers) that it no longer has any precise meaning at all. Often a taxonomist creates a "variety" when he is uncertain whether his specimens belong to a different species or not! The only infra-specific category now recognized by the International Commission on Zoological Nomenclature is the *subspecies*.

Chapter VI (on descriptions, diagnoses and keys) is salutary and at the outset we are emphatically reminded that, "in the present state of our knowledge, the mere establishment of new species can only rarely be regarded as a serious contribution to science." Dr. Calman goes on to say: "The number of species that have already been named and more or less described is estimated to approach a million. A very large number, possibly a majority of these, however, are very imperfectly known, their relations with other species have not been determined, and even their distinctiveness is far from certain. The most urgent task confronting the systematist . . . . is not that of adding to the number of named species, but that of revising and putting in order the species that are supposed to be already 'known'."

In all descriptions of new species, the *first essential* is to enumerate those features in which the new entity differs from species of the genus already known, and how true the author's complaint that "too many systematists content themselves with drawing up a 'full' description of the specimens before them, leaving it to their unfortunate successors to extract from a mass of irrelevant details the really distinctive characters of the species"!

Lucid line drawings are recommended for illustration of original or revised descriptions, "with attention to precision rather than to artistic merit," also really good photographs; but bad photographs can be quite misleading, and

although "the camera cannot lie," it is "often exceedingly difficult to get it to speak the truth"! Drawings to be reduced or enlarged for publication should always be accompanied by a line-scale drawn on the same paper—any misrepresentation of size is thereby avoided.

The Classification of Animals has only 50 pages of letterpress and no illustrations. It is to be regretted that this handy little volume bears the rather astronomical Australian price of 7/-. Obtainable from Hicks, Smith and Wright, Publishers, 23 McKillop Street, Melbourne.

J. H. Willis.

OTHER BOOK REVIEWS

By H. C. E. Stewart

(1) Part III of *Drawings of British Plants*, by Stella Ross-Craig, F.L.S., of the Royal Botanic Gardens, Kew, is to hand from the publishers, G. Bell & Sons, Ltd., London. In this part, 77 species of the *Cruciferae* are dealt with, and the drawings of these are of the high order which characterizes Parts I and II, previously reviewed. The clarity and directness of Miss Ross-Craig's scientific delineations render a text unnecessary.

As represented in Great Britain and in Australia, the *Cruciferae* is a group of plants that has evolved to its present status through climatic influences and by invasion from other lands. Such cosmopolitan species as *Rorippa islandica* (Yellow Swamp-cress), *Barbarea vulgaris* (Winter-cress) and *Cakile maritima* (Sea Rocket) are doubtless wanderers that have also become indigenous in the Antipodes. *Alyssum maritimum*, *Brassica oleracea*, and *Capsella bursa-pastoris*, among the figures, are familiar introductions to Australia. Many of the *Cruciferae* have been cultivated to form important diet vegetables—cabbage, turnip, radish, cress, and mustard—whilst there are the ornamental garden subjects of Stock, Sweet Alyssum, Candytuft, and Wallflower. British wildings in this widely distributed group are undoubtedly progenitors of some of these.

Of special interest is the "London Rocket," *Sisymbrium Irio*, for it is one of the lowly wild plants that "came back" very profusely after war bombing had reduced many London buildings to heaps of rubble. This yellow weed expresses something of the renewal of the tenacious British spirit; it is now familiar in many parts of Victoria, e.g. Mildura district.

(2) The Gould League of Bird Lovers of Victoria has issued *The Bird Lover, 1949*. This second official publication of the League is designed in scope and quality to advance materially the knowledge of our native birds among Australia's younger generation. The various articles are a happy blend of contributions from leading bird men and from juvenile members of the League. Sketches by the children, photographs and colour plates, make up an impressive gallery of illustrations. The modest charge of sixpence should ensure a wide sale of the publication.

(3) The Bird Observers' Club of Victoria has with commendable enterprise sponsored a *Field Guide to the Hawks of Australia*, written by H. T. Condon, ornithologist to the South Australian Museum. The growing band of bird watchers will welcome this valuable aid in identifying our diurnal birds of prey. Succinct notes on size of species, wing span, colour description and phases of plumage, manner of flight, calls, and occurrence, are clearly set out, together with diagrammatic illustrations by the author. The booklet will also render a service to the man on the land, as a means to ready recognition of the place of hawks in Nature, thus reducing indiscriminate shooting of these birds on sight. Many of the so-called "birds of prey" are useful agents in destroying vermin and eating carrion, consequently friends of the farmer. Therefore adequate protection for them must be demanded.

A BRITISH WIND CHART

(THE BEAUFORT SCALE WITH PROBABLE EQUIVALENTS)

Wind Force No.	Miles per Hour	General Description of Wind	Coast Use	Inland Use
0	calm	nil	sea like glass	smoke rises vertically
1	2 to 3	light air	small boats just have steerage way	direction of wind shown by smoke drift, not by vanes
2	4 to 7	breeze light	sails fill, way on boats 2 m.p.h.	vanes move, wind felt on face, leaves rustle
3	8 to 12	gentle breeze	sailing boats career, speed 4 m.p.h.	small twigs in motion, flags extended, ripples on water
4	13 to 18	moderate breeze	good sailing breeze, Puffins glide, white horses on sea	small branches move, gulls glide, dust rises
5	19 to 24	fresh breeze	sailing boats shorten sail, sea begin to form white-topped waves	crested wavelets on inland waters; small birds seek ground shelter; trees in leaf sway
6	25 to 31	strong breeze	double reef sails; care required when sailing	telegraph wires whistle, difficult to hold umbrellas
7	32 to 38	moderate gale	small craft lie to, gulls plane or sail	inconvenience felt when walking; birds shelter in garden; whole trees in motion
8	40 to 46	fresh gale (1)	sailing boats make harbour	branches snap off trees; small birds vanish; progress generally impeded
9	47 to 54	strong gale (2)	sea rough; gannets still fish	pots and roofing slates removed; no birds fly if possible
10	55 to 63	whole gale	sea like mountains, vessels run for shelter	seldom experienced inland
11	67 to 75	storm	sea becomes grave for 'those who go down to the sea in ships'	widespread damage
12	above 75	hurricane	just hope for the best!	??? boy, oh boy!

The above was on the notice board at Skokholm Island bird observing station (Wales) and was copied with the permission of the Warden.

INA WATSON.

INTRODUCTION OF STARLINGS

I recently came across an old newspaper cutting with the following announcement:

"The death has occurred (9/4/1939) of Mr. John Charles Bendall, of Footscray, aged 88 years. Mr. Bendall came to Victoria from Somerset 72 years ago with Mr. Thomas Austin, who introduced starlings into Australia. Mr. Bendall, as a lad, was in charge of the birds on the voyage out . . . ."

If this statement be true, then simple arithmetic places the arrival of the starling in the year 1867—not long after the introduction of the rabbit pest.

M. THORNTON SALTER.

WHAT, WHERE AND WHEN

General Excursions:

Saturday, July 15—Mt. Disappointment. Walk along firebreaks to tall timber. Leader: Mr. A. Cobbett. Nash's bus from Batman Avenue at 9 a.m. Fare, 7/6. Bring lunch and afternoon tea. Bookings with Miss M. Elder, 17 Adelaide St., Malvern, S.E.3 (tel. U 7297).

Saturday, July 29—National Museum. Subject: Birds. An afternoon with Mr. Warren Hitchcock, Ornithologist at the Museum. Meet at entrance to the Museum at 2.15 p.m. Names to be forwarded to Miss M. L. Wigan, 15 Lambert Road, Toorak.

Saturday, August 19—Steiglitz and Moorabool River Gorge. Subject: Botany and General. Leader: Mr. Ivo C. Hammet. Motor coach trip of 150 miles, leaving Batman Avenue at 8.30 a.m. Bring two meals. Bookings (fare 17/6) with Mr. H. C. Stewart, 14 Bayview Terrace, Ascot Vale (tel. FU 022, extn. 457).

Preliminary Announcements:

September 28-October 1—Excursions to the Grampians and to Rushworth. For details refer to "What, Where and When" in June issue.

Group Fixtures:

Monday, July 24—Botany Discussion Group. Royal Society's Hall, 8 p.m. Monthly meeting. Subject: Flora along the Broadmeadows railway line; Mr. R. D. Lee. Hon. Sec.: Mrs. A. Osborne, 21 Renwick St., Glen Iris, S.E.6.

Saturday, July 29—Botany Group excursion to Broadmeadows. Leader: Mr. R. D. Lee. Train: 1.16 p.m. from Flinders St. Book 2nd return Broadmeadows.

Tuesday, August 1—Native Plants Preservation Group. At home of Miss W. Waddell, 3 Denham Place, Toorak, at 8 p.m.

Tuesday, August 1—Geology Discussion Group. Royal Society's Hall, 8 p.m. Monthly meeting. Hon. Sec.: Mr. A. A. Baker, 53 Carlisle St., Preston.

Thursday, August 3—Wildflower Garden Section. Royal Society's Hall, 8 p.m. Monthly meeting. Hon. Sec.: Mr. R. B. Jennison, 3 Linda St., Moreland, N.13.

Friday, August 4—Marine Biology Group. Royal Society's Hall, 7.45 p.m. Monthly meeting. Hon. Sec.: Miss W. Taylor, 13 Jolimont Square, Jolimont, C.2.

—Jean Blackburn,
Excursion Secretary.

A FEMINIST MOVEMENT

The Field Naturalists' Club of Victoria at present includes three women members who have each created a precedent. Miss M. L. Wigan was the first woman to be President of the Bird Observers' Club (1932-'33, 1933-'34); Miss Ina Watson was first woman President of our Field Naturalists' Club (1947-'48), and now Mrs. Edith Coleman is the first woman to receive the coveted Natural History Medallion (1949).

—L. Y.

The Victorian Naturalist

Vol 67.—No. 4 AUGUST 3, 1950 No. 800

PROCEEDINGS

It is recorded with pleasure that the Governor of Victoria, His Excellency **General Sir Dallas Brooks,** K.C.B., C.M.G., D.S.O., has conferred his Patronage on the Club.

The monthly meeting on July 13 was held at Scots Hall, Russell Street, Melbourne, in celebration of the 70th anniversary of the Club. A very brief preliminary session dealt only with the minutes of the previous meeting and the election of new members, of whom the following were welcomed into the Club (on the motion of Messrs. G. Coghill and V. Miller):—Ordinary Members: Misses Freda Phillips and Lila White, Mr. Hugh Wilson and Mr. H. P. Weller; Country Member: Mr. Ralph Field; Junior Members: Misses Beryl and Frances Pinches.

The General Meeting was then closed and members were provided with a special souvenir Anniversary Programme for the evening.

Among the guests present were Mr. and Mrs. Charles Barrett, Messrs. Geo. Coghill, V. H. Miller and T. S. Hart (Honorary Members), Mrs. E. and Miss D. Coleman, Mr. D. Butcher (Director of Fisheries and Game), Mr. McNally (Fauna Biologist), Mr. and Mrs. A. G. Hooke, Mr. and Mrs. C. Bryant, Mr. R. T. Littlejohns, Professor J. S. Turner, Dr. R. R. Wettenhall, Mr. and Mrs. J. Hardy (representing Brown, Prior, Anderson), also representatives from the Wattle League, Bird Observers' Club, Microscopical Society, Royal Australasian Ornithologists' Union and the Leach Memorial Club.

Apologies: The President read a letter from His Excellency the Governor regretting that His Excellency was unable to attend, but that he was very pleased to grant his patronage to the Club. Apologies were also received from Sir John Latham, Sir John Medley, Mr. Crosbie Morrison, Mr. J. W. Audas, Mr. and Mrs. Gabriel, Mr. Charles French, Mr. C. S. Mansbridge, Mr. Arthur Mattingley, Mr. and Mrs. E. E. Pescott, and Mr. R. T. M. Pescott (Director, National Museum).

Two congratulatory telegrams were received—one from the Ararat Field Naturalists' Club conveying congratulations and also

best wishes to Mrs. Coleman, and one from Mr. and Mrs. Stan Colliver (Brisbane).

Brief addresses were given by the following speakers, whose remarks are published elsewhere in the journal:

Mr. Geo. Coghill—"Stalwarts of the Past."
Mr. J. H. Willis—"A Botanical Retrospect."
Miss Ina Watson—"The Club and Zoology."
Miss Loris Neil—"Past Geologists of the Club."
Mr. E. E. Lord—"The Outlook for the Future."

Mr. Fred. Lewis showed a very fine cine-film in colour of the Phillip Island fauna (penguins and seals), and later Mr. R. T. Littlejohns showed some remarkable "close-ups" of the Mistletoe Bird, illustrating how mistletoe seeds are distributed by these swift-moving and gloriously coloured creatures.

During the evening the Australian Natural History Medallion for 1949 was presented by Professor Turner to Mrs. Edith Coleman for her outstanding work in the field of natural history. Later, Mr. Charles Bryant formally presented Mr. E. E. Lord (President) with the Certificate of Incorporation of the Club.

An excellent supper and conversazione ended a very pleasant and memorable evening, for which tasteful floral decorations of Victorian wildflowers were in the capable hands of Miss M. L. Wigan, Messrs. Ivo Hammet and J. Seaton.

Exhibits included a good selection of photographs (from various members of long-standing), illustrating early Club gatherings and excursion features; also the Club's numerous publications and over 50 books on natural history by past and present members.

CLUB STALWARTS OF THE PAST

Mr. Geo. Coghill, who joined the Club in 1882, gave a reminiscent talk on past stalwarts. He mentioned that the first meeting was held in the Temperance Hall, when *Mr. F. G. A. Barnard* was elected secretary, and Mr. Coghill assistant secretary. Mr. Barnard later took on the editorship of the journal, when he rendered wonderful service. He was the first man to bring to light the flora of Ararat and later explored the Buffalo Plateau with *Dr. C. S. Sutton.*

Mr. J. Gabriel (senior) was on the committee for many years. *Professor Baldwin Spencer* was the man who probably did most to lift the Club. *Mr. G. A. Keartland,* another fine worker, went with Professor Spencer into the centre of Australia. *Dr. J. Leach* was President of the Club for two years and did much for the Club. *Mr. Charles Barrett* was also a former Editor and President, who, as Mr. Coghill whimsically remarked, would not abide by the rules of the Club, so the rules had to be altered to suit Mr. Barrett!

The *Botanical Gardens staff* had always been of great assistance to the Club. Outstanding among its officials in this respect were *Mr. P. R. H. St. John, Mr. F. Pitcher* and *Mr. C. French* (senior). *Mr. Dudley Best*, a business man, was also a great worker.

Mr. D. Le Souef, of the Zoological Gardens, an authority on snakes and other reptiles, was another good friend. And then there were *Mr. H. B. Williamson, Mr. J. A. Kershaw* and *Mr. E. E. Pescott*, who did outstanding work in the success of wild-flower shows.

Mr. Coghill, in conclusion, emphasized the valuable co-operation that the Club had always received from the Directors of the Botanic Gardens, the Museum and Zoological Gardens. They had all helped to make the F.N.C.V. what it is today.

PAST GEOLOGISTS OF THE CLUB

By Loris Neil

In the 1880's the Club always held an excursion on November 9th to mark the Prince of Wales' birthday. The one in 1885 was to Lal Lal, geology being the principal interest—so notices said—and we have a full description of how participating members arrived by train. They were met by the President of the Ballarat F.N. Club, who was mounted on a piebald pony and accompanied by a piper who piped rousing music all the way to Moorabool Falls. Buggies were provided for lady members of the party, but they chose to walk the three miles on such a glorious morning.

Lunch was taken at the Falls, and although rocks were examined and the geological structure explained by the lecturer in geology from the Ballarat School of Mines, the report says that:

> Geologists tapped not only rocks but bottles of claret, the entomologists carved hams, the botanists were busy with sandwiches and then the young, and not so young too, were tempted to dance to the piper's tune.

Although subsequent geological excursions were not such colourful, gay gatherings, much interesting and valuable work has been done by many people.

In one of the earliest journals (1884) Rev. Creswell wrote a description of his visit to Kilcunda coal mine, whither he travelled by rail, coach and steamer. The report gives evidence of very careful observation.

Mr. John Dennant, while travelling through Victoria on business trips, found great interest and pleasure in studying the local geology and passed on that interest to Club members.

Mr. C. C. Brittlebank introduced our excursion parties to the fascinating Bacchus Marsh-Werribee Gorge area, which he knew like a book; indeed, he was the first to make known the evidences of glaciation for which this region has become almost world famous.

Mr. T. S. Hart, then on the staff of the Ballarat School of Mines and still with us, gave many absorbing talks to the Club, with

sound practical advice on how to procure, handle and store specimens—we all know how easy it always is to break the best fossil when trying to chip it out of the rocky matrix. Mr. Hart must have started many a young geologist on the right track; his papers, "Notes on a Visit to Tower Hill, Koroit," and "Tuffs of Lake Burrumbeet" (both in January, 1901), are excellent reading.

According to earliest reports, Lilydale, Royal Park and Dight's Falls at Studley Park were favourite excursion places, and it is good to know that we still visit these localities to read again the same wonderful story (perhaps in more detail) that those first Club members enjoyed so long ago. There was not any textbook of our local geology then and the lack proved a serious handicap; but the F.N.C. was fortunate to have in its ranks several remarkable and outstanding people who did much to remedy the situation.

Hall, Pritchard and Chapman were a brilliant triad. Mr. T. S. Hall's *Victorian Hill and Dale,* which appeared in 1909, is delightfully written and the author was ever ready to help and encourage the beginner—his grandson is at present a most enthusiastic member of our Hawthorn Junior F.N.C. Mr. Hall urged the Club to persuade the Railways Commissioners not to cover the faces of excellent rock sections in cuttings with creeping plants, and they agreed to leave a dozen selected places unplanted.

Dr. G. B. Pritchard's *Geology of Melbourne* explained the nature and origin of rocks at a number of places around the metropolis. Both Mr. Hall and Dr. Pritchard went on many Club excursions.

In the early 1900's Frederick Chapman's name appears frequently in pages of the *Naturalist*. He must have been like the late J. Gabriel, for he always seemed to bring along some specimen of interest and made it the subject of such a vivid commentary that members were inspired to learn more about the exhibit. Chapman's *Book of Fossils* is invaluable to the budding palaeontologist. After a long term as palaeontologist to the National Museum, Mr. Chapman became the first Commonwealth Palaeontologist, but he always found the time to delve into new branches of geological research—he often told stories of excellent work done by very busy people, and his own writings were legion (mostly in the *Proceedings* of the Victorian Royal Society).

Hall, Pritchard and Chapman together built up immense collections of fossils, including important species which they named and described; these specimens are to be found in the museums of Melbourne and Canberra. Mr. Chapman had a placard hanging in his museum office- "Label it now, for tomorrow you will have forgotten." What better advice for any collector to follow?

Mr. R. Keble has made a special study of rivers and their effect on the landscape. In one notable talk to our Club he related how

the tower on Arthur's Seat (now 900 feet above sea level) is built upon an old river bed.

During more recent years came people whom we all know. Mr. A. L. Scott went to New Zealand for a holiday and, reading the paper he delivered to the Club upon return (June, 1923), I feel sure he missed little of geological significance in the districts through which he passed. He has led many excursions and is still an active member of our Geology Group.

Mr. S. R. Mitchell and the late Mr. W. J. Parr have contributed much in specialized fields of study. Stan Colliver has set a splendid example in enthusiastic collection and systematic arrangement and labelling of all his specimens, including that of a fossil whale and a minute shell named in his honour. It is hard to gauge the value of the informal gatherings held every month for years in the Collivers' home at Essendon—so hospitably thrown open to enthusiasts of the Club, and of particular enjoyment to those of us having geological leanings.

Now the F.N.C. has grown so big that we have instituted a Group system within its framework. The first Group (Geological) came into being in 1946, largely through the untiring efforts of Mr. Alf. Baker; he has been its inspiration ever since, and interest is stimulated by such experts as the Rev. E. D. Gill (honorary palaeontologist at the National Museum), whose recent excellent contributions in the *Naturalist* are well known to all.

A BOTANICAL RETROSPECT

(F.N.C.V., 1880-1950)

By J. H. Willis

Since coming into existence seventy years ago the F.N.C.V. has developed a botanical tradition of which it need certainly not be ashamed. Indeed, the history of systematic botany in Victoria from 1880 is largely the history of the Field Naturalists' Club as recorded, first in the *Southern Science Record* and then (since 1883) in our own journal, the *Victorian Naturalist*.

The first article in Part 1 of the *Southern Science Record*, Dec., 1880, is an account of Victorian ferns (continued in subsequent parts) by the late Charles French, Senr.—the Club's founder, while the very first article to appear in the *Victorian Naturalist* (Jan., 1884) is another by the same naturalist, who commences an excellent series of papers on the orchids of the Colony. Baron Sir Ferdinand von Mueller followed Mr. French with the second paper in that first number of our journal.

Such a botanical bias, initiated so long ago, has been maintained, and today we find orchid papers still figuring prominently in the *Victorian Naturalist*—not always, I fear, to the entire satisfaction of our non-botanical readers!

A year after the *Naturalist* began, the first new species of plant was described, in January, 1885, by Baron von Mueller—it was a West Australian Fan-flower, *Scævola Brookeana*. Thereafter, hardly a month went by without some important contribution from the Baron's pen. At the time of his death in October, 1896, he had described no less than 121 new species (an average of one every month) and five new genera in the pages of the *Naturalist*; these hitherto unknown flowering plants came from various parts of Australia and from Papua, and first among *Orchidaceæ* was the extraordinary Elbow Orchid, *Spiculæa Huntiana*—described in April, 1889, from Mt. Tingiringi on the N.S.W.-E. Vic. borderline.

Apart from the Rev. F. R. M. Wilson, who described over 40 Victorian lichens as new to science in 1889, no other authority published any novelties in the *Naturalist* during this twelve-year period—apparently one dared not be so presumptuous while the Baron was still alive! As might be expected, a few of the Baron's numerous species have since been proved synonymous with ones described previously by other systematists.

Undoubtedly the most sensational discovery that Mueller published (March, 1887), a plant that engrossed and excited him for days, was our one and only native *Rhododendron*—*R. Lochæ*, from Mt. Bellenden Ker, near Cairns, North Queensland. This had been collected by W. A. Sayer (a cousin of the Frenches), and if any member relish an adventuresome story let him read Sayer's account (*Vict. Nat.*, July, 1887) of the two trips he made to Bellenden Ker summit within a fortnight—the first ascent by a white man of this highest Queensland mountain. Other noteworthy species published by Mueller include the North Queensland Kauri, *Agathis Palmerstonii* (July, 1891), the West Australian Cabbage Palm, *Livistona Alfredii* (Nov., 1892), and *Grevillea Williamsonii* (Dec., 1893)—a remarkable Grampians endemic, now presumed extinct.

With the passing of the great Baron, Messrs. Luehmann, Reader and Maiden came forward to describe their respective "finds" in the *Naturalist*; but the consistency of recording and the number of new entities fell away, so that in twelve years after Mueller's decease only 28 new species (also eight new varieties) had been made known—*cf.* 121 for the same period before. From 1906, the records of systematic research waned still further and a long quiescence ensued, interrupted only by uninspiring lists of species found on various excursions and, occasionally, by more elaborate compilations for localities of particular interest (e.g., the Alps, Grampians, Wilson's Promontory, etc.) — did Professor A. J. Ewart "steal" the new discoveries of our botanical members, for incorporation in his various contributions to the Royal Society of Victoria?

For the fifteen years after August, 1906, the *Naturalist* contains original descriptions of only *one* new species (a microscopic flagellate alga) and *three* new varieties of flowering plants. But in this epoch the zoologists were more active and many diagnoses of new birds, fish, crustacea and insects appeared in the pages of the journal. The long botanical silence was broken by Mr. J. W. Audas with his publication of the endemic Grampians shrub *Trymalium ramosissimum*, in August, 1921, and from then onward systematic papers acquired momentum—now they appear regularly again, almost every month.

Back in 1884, Dr. Dobson—then President of the F.N.C. and Law lecturer at the Melbourne University—urged publication of a handy Dichotomous Key to the Victorian flora. Baron von Mueller immediately acted upon Dr. Dobson's suggestion and produced his well-known *Key to the System of Victorian Plants*, 1885/8.

Past editors of the *Naturalist* (particularly Messrs. A. H. S. Lucas and F. G. A. Barnard) did much to advance botanical effort in Victoria. Mr. Barnard's paper at the Club's meeting in September, 1906, was entitled "Are Popular Names for Our Native Plants Desirable?" and this inspired the formation of a Plant Names Committee which began work at once under the leadership of Professor Ewart (just arrived in Australia). The Club's Plant Census of February, 1922 (revised six years later) represents the consummation of that hard-working committee.

Dr. C. S. Sutton, in his "Sandringham Flora" (May, 1911), set a high standard for the floristic treatment of an area with well-defined soil and climatic features. This was followed (December, 1916-January, 1917) by his "Keilor Plains Flora," which mapped and listed the newer basalt vegetation surrounding Melbourne's north and western suburbs. Both papers are valuable as records of what existed prior to the vast increase in housing, and consequent wholesale destruction of native plants, over Greater Melbourne during the past 40 years. Meanwhile, similar work had been done farther afield by St. Eloy D'Alton ("Flora of the Little Desert," August, 1913) and A. D. Hardy ("The Mallee: Ouyen to Pinaroo," January, 1914); Mr. Hardy's paper is undoubtedly the best one we have on Mallee vegetation and is delightfully readable. In February, 1924, came D. J. Paton's excellent "Whipstick Flora," and A. J. Tadgell provided a "Mt. Bogong Flora" in considerable detail six months later. These are our outstanding regional surveys, are still consulted, and deserve to have been made the subject of special booklets.

J. G. O'Donoghue's rambles in the Lerderderg Gorge (*Vict. Nat.*, Feb., 1911), Brisbane Ranges (Feb., 1910; Jan., 1913), Kulkyne Forest (May, 1915), and Mallee Plains (May, 1916)

are first-rate entertainment, with a background of accurate botanical observation. It is sad to reflect that this energetic secretary of the Club should have died at the untimely age of 44 in April, 1917.

One cannot avoid a thrill when reading accounts of long excursions in the earlier days of the F.N.C., e.g., Sir Baldwin Spencer's report (May-June, 1889) of the exploratory "Trip to Croajingalong." The itinerary, between Orbost and Bendock (including Goonmirk and Mt. Ellery), occupied three weeks, and Spencer's five curious lithographs of Cabbage Palms, etc., are unique among the numerous illustrations in our journal. As a direct result of this expedition and report, the Minister of Lands took steps to have the whole of the Cabbage-tree Creek palms permanently reserved.

It had been arranged that, contemporaneous with the major overland trek through East Gippsland to the N.S.W. boundary, a second party should examine in greater detail the neighbourhood of Orbost. Rev. F. R. M. Wilson records (August, 1889) with quaint humour his arrival at Bairnsdale—the sole participating member of the Orbost excursion party! He "did not lose courage; but, forming himself into a forlorn hope, began the assault." Mr. A. J. Campbell (a local member who had arranged to meet the excursionists) stood his ground at the Orbost coach stop for several hours; but the solitary and much belated participant received a hearty welcome and was hospitably entertained for a week. Rev. Wilson was guided personally to all the likely spots for lichens in and around Orbost, and among his large collection on this occasion was a species and a variety new to science.

Then there were the famous Bass Strait expeditions to King Island, Furneaux Group and Kent Group—all with lists of plants identified by the Baron. The narrative (March, 1891) of a tramp from Marysville over the mountains to the Yarra Falls (near the Baw Baws) by six members, who encountered soaking rain for days on end, reads like a fantasy in contrast with modern excursions in parlor coaches, along C.R.B. highways!

The spice of disagreement and repartee is not wanting from pages of the *Naturalist* — even our phytologists occasionally expressed their differences colourfully. None was more an individualist than Professor A. J. Ewart, who, soon after landing among us, criticized C. Walter for his misleading "new records" of plants that were *not* new to Victoria. The latter gentleman naturally took umbrage and responded with some heat (October, 1907)—strangely enough, Walter died the day after his reply to Ewart was published.

In August, 1935, the Professor took W. F. Blakely to task for imperfections in *A Key to the Eucalypts*, 1934; he deprecated the bases of classification (almost entirely on anthers), the multiplicity

of "species" and the innumerable name changes. Blakely's lengthy retort (October, 1935) is masterly; he has an intelligent answer for all of his critic's arguments and observes that "because Professor Ewart is a professor of botany, it is not to say he is also an authority on eucalypts." Ewart wrote an even stronger letter the next month, and your then Editor almost began to weigh up the possibilities of a libel suit! Mr. C. T. White, Government Botanist at Brisbane, defended Blakely's opinions in a letter full of wisdom (December, 1935).

Of book reviews, we have the eulogistic, the non-committal and the defamatory kinds. One of the most delicious ever published in the *Naturalist* is that of February, 1911, concerning W. R. Guilfoyle's posthumous volume, *Australian Plants, suitable for Gardens, Parks, Timber Reserves, etc.* Here are a few pungent sentences from the two-page tirade:

> It were better this long-promised volume had not been written. . . . it is perfectly useless to the average nature lover. To call it a companion volume to Messrs. Lucas and Le Souef's *Animals of Australia* is putting the latter in very poor company. . . . . To list such plants as Minute Pimpernel, Sheep's Burr, Lady's Mantle, etc., as worthy of cultivation is surely the height of absurdity. . . . . The majority of illustrations are too indefinite to be of any value, ... that of [Cootamundra Wattle] might easily pass for a double-flowered Spiræa. The eucalypts are represented by a series of pictures which are little better than caricatures. . . . . We regret that publishers of such high repute as Messrs. Whitcombe and Tombs should be associated with a work which . . . . will only add to the difficulties of Australian plant lovers.

It may be invidious to single out a period of time, or an individual's work, for special comment; but I shall always look upon the decade 1926-36 as our high-water mark in botanical achievement. During those years, Mr. E. E. Pescott published in the *Naturalist* his descriptions and photographs that became the *Orchids of Victoria* (1928), while H. B. Williamson wrote his most helpful illustrated articles on our ferns (paving the way for the Fern Handbook of 1934), our lilies and our aquatic plants —popular guides that have few rivals anywhere in Australian literature. Some attractive colour plates on fungal subjects (with explanatory text) appeared in 1932 and 1934, the journal for April, being enlarged and devoted entirely to Victorian fungi.

Mrs. Edith Coleman's amazing discoveries of the pollination processes in certain orchids (notably *Cryptostylis*, and also *Diuris, Prasophyllum, Pterostylis* and *Spiranthes*) made breathless reading from 1930. Dr. Francis Lloyd's intriguing papers on Australian bladderworts (*Utricularia*) were a highlight in Volume 53 of the journal, not to mention an address he gave our Club, freely illustrating his remarks on the Utricularian insect-catching bladders with blackboard sketches of elaborate mouse-traps!—one of the *most* amusing, yet enlightening, meetings we have ever

enjoyed. Mr. W. H. Nicholls made many contributions (with exquisite line drawings) descriptive of Australian *Orchidaceæ* in the late 1920's and 30's—he is still "going strong".

Shall we witness such a golden age of literary effort again?

N. A. Wakefield's published researches on East Gippsland ferns, during the recent 1940's, are of first importance and it is a pity indeed that they had not preceded the writing of R. W. Bond's Fern Handbook, to which many alterations and additions are now necessary.

No evaluation of botanical effort until now should ignore the meritorious work of our honorary lanternist, Mr. H. T. Reeves. He began photographing the Australian native flora about 1937 and has built up a gallery of hand-coloured pictures which are unsurpassed for variety and excellence of preparation, many being the only portraits in existence of the rare subjects featured. These pictures are so well known to Victorian nature students as to make any present eulogy superfluous; they have been exhibited in various Australian galleries and are now acclaimed abroad. Some of the best studies have been reproduced as black-and-whites in our *Naturalist*.

Mr. Reeves has also executed a set of superbly coloured lantern slides, featuring literally hundreds of Victorian and West Australian flowers (many *in situ*, with associate bushland plants and local scenery). These are in constant demand as illustrative material for lectures and are always very willingly loaned to those who respect their worth. The botanical outlook will ever be bright while we number among our members such eminent and unselfish artists as "Bert" Reeves.

In conclusion let me mention the endeavours at present being made by Miss Winifred Waddell to save for posterity sample areas of the Victorian countryside as Nature made it. We are already too late in some districts that were once a botanist's paradise (thanks to firing, clearing, building, rabbits, weed encroachment and vandalism, but mostly apathy!), yet future plant-lovers will look back on the boundless enthusiasm of Miss Waddell, and the Native Plants Preservation Group that she has established, with gratitude—her accomplishments to date, and against terrific odds, are beyond praise.

THE CLUB AND ZOOLOGY

By INA WATSON

Thinking back to the early days of the Club, we cannot but be struck by the fact that the founders of the F.N.C.V. were men of high standing in their chosen spheres of natural science.

The first President, in 1880, was a most distinguished citizen of the State. Professor (afterwards Sir) Frederick McCoy, K.C.M.G., M.A., D.Sc., F.R.S., occupied the Chair of Natural

Science at the Melbourne University. He is well known for his palaeontological researches, and author of *Prodromus of the Zoology of Victoria*. He was the first Director of our Museum, and to him must go the credit of collecting, determining and describing a large portion of its contents. He set a high standard for the Club in the world of zoology.

It is impossible to outline the work of the Club in that field in a short space, and therefore for the obvious omissions and shortcomings of this review I apologise.

Before mentioning work done by Club members in the various sections of zoology, attention should be drawn to several expeditions made by the Club in the early days. These included King Island and the Furneaux Group, Croajingalong, the country at the back of Woods Point, and to Wilson's Promontory; the latter subsequently, on the initiative of the Club, was made a National Park. Little was known of much of this country at that time, and members did good work in describing the natural features they found.

Arachnidae

Spiders have been one of the least popular natural history studies among Club members. In 1933, L. S. G. Butler published an article on common spiders round Melbourne, which was the only popular work published up to that date. We have had fine observations and work done by Charles Barrett, Mrs. Coleman, who has traced through the life story of several of our well known species, and A. P. and R. A. Dunn. Mr. R. Dunn is continuing the work; he has recently described new species of spiders and harvestmen, and has been appointed Hon. Arachnologist to the Museum.

Ethnology

Australia contains the most primitive of the living races of man, and it is no wonder that the aborigine has been the subject of study by members. A. S. Kenyon, S. R. Mitchell, and C. P. Mountford have recorded some of their strange customs and traditions, and G. N. Hyam has written of their native foods. The work of Baldwin Spencer in this field is known throughout the world.

Professor of Biology at the University of Melbourne, Sir Baldwin Spencer was President of our Club several times, and a member for 42 years. He succeeded Sir Frederick McCoy as Director of the Museum. (Incidentally, he was the first to describe the giant earth worm, *Megascolides australis*.)

Ornithology

This study has now become specifically catered for by the Royal Australasian Ornithologists' Union and other clubs. The Union was formed in 1900, but prior to that date much of the work of the

well known bird men was published through our journal. There was Keartland, after whom the Grey-headed Honey-eater (*Ptilotis keartlandii*) was named. Member of the famous Horn expedition to Central Australia, and collector of that symphony of colours, the Princess Parakeet, he was President of the Club for several years. Sir Baldwin Spencer described the extinct King Island Emu in 1906, and Jackson, Campbell (A. J.) and North described the nest and eggs of such rare birds as the Rufous Scrub-bird and the Helmeted Honey-eater, the first egg of the latter being collected by Campbell at the first camp-out of the Club at ~~Beaconsfield~~ in 1884. An *Australian Bird Book* by J. A. Leach (President in 1912) is still the most widely used handbook for field workers, at least in Victoria.

Marine and Pond Life, Crustacea, etc.

In 1885, one of our members, O. A. Sayce, described a new crustacean from a tiny creek at Box Hill—a creek long since disappeared into an underground drain in an area now settled with suburban dwellings. This was the famous *Koonunga cursor*, a "new form of freshwater crustacean differing so much from allied forms that it had to have not only a new genus, but a new family." It resembled the famous *Anaspides* shrimp of Tasmania, but was even more primitive. It was a living representative of fossils found in the coal seams of England. This was a discovery of outstanding interest.

John Searle was also an authority on crustacea, and discovered a number of new ones, *Holonicus searlii* being named after him.

A. D. Hardy did much work on the freshwater *algae*, on which he is an authority.

Shells were the special study of J. Gabriel and J. Gatliff, and later C. J. Gabriel, author of our present handbook *Victorian Seashells* and Hon. Conchologist to the Museum. Notable contributors have been Miss Joyce Allan of the Sydney Museum, and Mrs. J. J. Freame, present leader of the Marine Biology Group. (Although the members of the group look consistently, none of them has been lucky enough to find a pearl in a freshwater mussel, as Mrs. Freame did in 1934!)

Mammals

The records of the fauna of Victoria have been greatly augmented by members. There was a notable issue of the *Naturalist* in 1934, with authoritative articles on various aspects of the life of the koala. More recently, there is the splendid and practical work in the breeding of some of our rarer native animals by David Fleay. His *We Breed the Platypus* has become one of the Club's handbooks. Charles Barrett wrote about that little-known marsupial from Western Australia—the Banded Anteater. Our present Vice-President, Fred Lewis, late Chief Inspector of Fisheries and

Game, has contributed detailed articles to the *Naturalist*, and field observations bringing new facts to light have been made by a number of members.

Entomology

Beginning with the founder, Charles French, first Government Economic Entomologist, and his son Charles French, Junior, who later occupied the same position, this subject has engaged the attention of more members than any other branch of zoology in the past. There was J. A. Kershaw, Director of the Museum, and Waterhouse and Lyell, authors of *Butterflies of Australia*. Mr. Lyell subsequently presented his magnificent collection of butterflies to the Museum. Miss Janet Raff, first woman to be on the committee of our Club, reported from time to time on her work, and, amongst many others, the names of Burns, Clark (for his work on ants), and Lower (on moths).

Tarlton Rayment is still systematically working out the life-histories of our little-known native bees.

J. Searle, who was known as the City Naturalist for his articles describing the various insects which he found in his city office, deserves special mention. His flashes of humour are delightful. For example, describing a wasp he had captured on his office window, he concludes: "But like many another who left rural delights for the lure of the city, alcohol and the bottle ended his career."

Mrs. Coleman must be mentioned here also, as in most other fields of natural history, for her thoughtful articles and accurate and careful observations.

Reptilia

Again not what one might call a "popular" study among members, but some have fallen to the charms of the snakes and lizards. Amongst these are H. W. Davey, C. W. Brazenor, J. A. Kershaw, and D. Le Souef (who, incidentally, describing the Club's visit to the islands of the Furneaux Group in 1902, mentioned a woman who said her family had killed 900 tiger snakes on the island in the one year!), and again, David Fleay. Trevor Hunt's quick reference *Key to the Snakes of Australia* is one of the handbooks published by the Club at present.

One aspect of the work of the Club which I feel should receive special mention under the heading of zoology is the popularizing of natural history, and in this regard three names stand out pre-eminently—Charles Barrett, Alex Chisholm, and P. Crosbie Morrison. All have been Presidents of the Club, and all have done great work in interesting the general public in the wealth of our natural history heritage by articles, books and broadcasting.

And what is the present position of the Club in the field of zoology?

In 1902, T. S. Hall, in a presidential address, said: "We number amongst us nearly all those who are doing original work in zoology, botany and geology in the State." This is the day of the specialist, and while it is not possible now for the Club to contain all the vast number of workers in the field, we still enjoy cordial and co-operative relations with the relevant departments at the University and with the Museum and other clubs. We still have among our ranks a number of the "professional" men of science—men whose interest in the job overflows and floods their spare time—who are willing to share their knowledge with us. Most important of all, the Club remains the place where the newcomer can gain an introduction into the rich wonder of the natural world around us, and where he can meet members with similar interests, where his questions can get the simple answers which are sometimes so difficult to find in textbooks.

Quoting Mr. Hall again, "We are before all, a 'popular' scientific club, and in our own line we do work no other Victorian society can do." (that still holds true because few other clubs have such wide natural history interests) "but there are depths of natural science which it is not advisable for us to deal with—branches which require much preliminary training and study to master, and in some of these branches many of our members who first devoted their attention to science in our ranks are now recognized authorities." I have mentioned some of them—S. R. Mitchell, C. J. Gabriel, R. A. Dunn, to quote a few, all of whom are honorary specialists in their subjects attached to the Museum.

Another President, P. Crosbie Morrison, said in 1943: "The specialist is needed more than ever he was, but the study of nature today, guided by great thinkers, holds the greatest rewards of happiness and hope in store for the man who can see nature not most minutely but most widely."

In this particular aspect of the work, not only of zoology, but of natural history generally, the high position won for the Club in the early days by its notable members has never been assailed, and it is in this, as well as in the watching brief it holds for the protection of our flora and fauna, that the Club makes it most valuable contribution to the good of the community.

THE OUTLOOK FOR THE FUTURE

By E. E. Lord (President)

Our Club was founded not much more than forty years after the first white man settled in Melbourne, and only thirty years after Separation and the gold rush. Here is its record in a few words: Growing up slowly with the young State; assisting in the study and recording of numerous species of plants and fauna; ceaselessly urging their protection, and becoming increasingly aware of the

over-all need for conserving the wild life of this country. Of recent years we have seen this need intensify—and become a problem, a problem that admits of no ready solution. And we ask with anxiety, "What *can* be done to preserve our natural heritage before it is too late, before it has gone for ever?"

Do you think I overdraw the picture? Then open the door and look around. Is this the country it used to be? Or has a great change taken place? What, really, are we now?

From an unknown colony, and then a self-governing Dominion, Australia has suddenly become an important factor in world politics—a vast food and clothes producer in a world of a teeming population, a strategic centre in a political line-up. And on every hand a call to hold this country for ourselves, for the way of living we have built up. There is but one course open: Australia must be filled with people—the best we can get, and quickly.

What does all this mean to natural history, and to the Field Naturalists' Club? Everything. It means that during the next fifty years we are going to see a population of perhaps fifty millions. We are going to see the putting to use of every possible bit of our land—right to the Centre, and right to the northern coasts.

If this Club is going to be a factor of any account in the preservation of the fauna and flora of the country, instead of just a group of people who spend their time in the study of birds and wildflowers (and I do not say this unkindly), then there *must* be a rapid awakening to reality, the commencement of planning on a scale never before conceived.

Our Committee on National Parks and Memorials has, during the past two years, shown what can be done in advising and assisting the legislature of the State. The Club must proceed to formulate a long-term policy, and make it known. It must appeal for funds to carry out such a policy—big funds, or grants. It must recognize that only paid officers, and a city office, not to mention branch offices, can effect this. If the National Rose Society can, even now, pay its executive officer a salary in the object of fostering the study and culture of the rose (and all credit to them for so doing), what of the responsibility of an organization charged with the study and preservation of tens of thousands of species of the country's indigenous life?

How can we do this? How can we possibly finance such a task? (We have just realized that we can no longer stage a Wild Nature Show in the manner of fifteen years ago without the risk of a big loss.)

The only way we can face the real task that lies ahead is with strong financial backing. And where are such funds to come from? One source is bequests. Bequests of big money. An investment of £25,000 would ensure an annual income of £1000—£20 a week,

—little enough. An alternative, of course, would be a government grant of such an income. A corporate body with the declared objectives of this Club has a perfect right to expect such support. Have we any among us who could will substantial funds to this Club? Others we have had, who now no longer have the opportunity.

Assuming the means, then what is the course before us? What is the duty of the Club of the future? It would be required to assert itself by published propaganda and by public meetings. It would need to call for large-scale reservations of land throughout not only this State, but throughout Australia. (In the wider field it should receive the support of all other natural history organizations.) It would initiate plantings in such reserves on a very large scale. It would educate municipalities, and private and public bodies, to recognize the value of our indigenous flora for parks, reserves, highway and private planting. It would organize seed collection, exchange and distribution to all parts of the world. It would popularize the study and value of native flowers and trees like the magnificent publications of the Swiss on their alpine flora, and the effective propaganda of other countries that have so awakened. Think of our birds; our kangaroos, koalas, and smaller marsupials, fascinating beyond words; the echidna, the platypus; our reptiles, penguins, lyre-birds; the marine life of the Barrier; life in the Red Centre, the tropics and the Alps. These, as well as our soil and our mineral resources, are Australia's assets. Let us preserve them, and use them aright.

And this cannot be done without vision, organization and means. In the vast flood of a new population, the Field Naturalist of the future faces an almost frightening task—the task of guarding a national asset for a world to come. We have seen the destruction to our own time and the pace is accelerating. Are there men and women in this Club big enough to meet this future?

DEATH OF CHARLES HAMILTON FRENCH

Within four days after the 70th Anniversary celebration, which he had so anxiously hoped to attend, Mr. Chas. French, Jnr., passed away at a private hospital in Deepdene (July 17th). Born on June 10th, 1868, he had just entered his 83rd year, and his decease has deeply touched the wide circle of F.N.C. members and friends who knew him.

No Victorian naturalist had a longer association with our Club; he witnessed its foundation in his father's home and linked up actively himself in July, 1883. Having worked for 13 years under Baron von Mueller, the late Mr. French was on intimate terms with that great scientist—his passing now removes another of the very few who still remember Mueller with personal affection, perhaps the one who knew "The Baron" best.

A large, representative gathering of F.N.C.V. officers and members attended the funeral at Burwood cemetery, and it is hoped soon to publish some account in the *Naturalist* of Mr. French's life and work.

NATURALIST-EXPLORERS OF THE AUSTRALIAN COASTS

By LIONEL A. GILBERT, Nabiac, N.S.W.

(Continued from p. 53, July number)

Between December 22, 1817, and April 25, 1822, Captain Phillip Parker King, son of Governor Philip Gidley King, made surveys in the *Mermaid* and later in the *Bathurst*. His attention was naturally drawn to the north-west coast and he took with him Allan Cunningham, the celebrated botanist, who wrote: "I was most happy and desirous to obey an instruction I received from the Right Honourable Sir Joseph Banks, on behalf of the Government, directing me to place myself under the orders of Captain P. P. King." So began five long and difficult, yet very productive, voyages around our coasts.

King, the two mates (John Septimus Roe and Frederick Bidwell) and botanist Allan Cunningham collected a miscellany of specimens between them. There were 14 birds, 7 fish, 9 reptiles (including the Frilled Lizard, *Chlamydosaurus kingii* Gray), 6 mammals, 111 molluscs, 4 arachnids, 188 insects, and 28 species of echinoderms, several sponges and coelenterates, as well as many geological and botanical specimens. Most of these were new to science. However King, himself a naturalist of considerable standing, apologised for the collections:

> The very few specimens that are now offered to the world were procured as leisure and opportunity offered; but many interesting and extremely curious subjects were in fact obliged to be left behind from want of room, and from our not possessing apparatus for collecting and preserving them.

What could not King have done with equipment such as the *Endeavour* had carried? His geological specimens were compared with those collected by Robert Brown during the *Investigator* surveys.

The combined voyages of the *Investigator*, *Mermaid* and *Bathurst* had yielded a vast amount of material, especially in the more popular field of botany. However, there were still coastal regions which merited further examination, particularly the dangerous reef areas along the North Queensland coast.

H.M.S. *Beagle*, under Captain Fitzroy, left Devonport for a South Sea expedition on December 27, 1831. Her naturalist was no other than the great Charles Darwin. The *Beagle* anchored in Port Jackson on January 12, 1836, and to-day in front of the beautiful fernery at Bathurst Park there is a brass plate inscribed: "This city was the objective and terminal point of the only inland journey in Australia made by Charles Darwin in January, 1836." Darwin also visited and commented upon King George's Sound in the south-west of the continent.

During the same year, Captain George Grey and Lieut. Lushington made a proposal to the British Government to explore certain coastal and interior portions of Australia's western seaboard, which "had remained unvisited and unknown." A search was to be made for a large waterway which might open up the interior of the west. The Government approved this proposal, and Grey and his party also sailed in the *Beagle*, under Captain Wickham on July 5, 1837. The surgeon and naturalist to Grey's party was a Mr. Walker and one of the seamen, Thomas Ruston, had previously been on the *Mermaid*. From Cape Town to Hanover Bay (W.A.), Grey transferred to the *Lynher*. Various workers, notably Adam White, John E. Gray and John Gould, provided a most valuable natural history appendix to Grey's journal—itself a work of anthropological and biological importance.

In the meantime, the *Beagle* had continued on her voyage "for the purpose of exploring certain parts of the north-west coast of New Holland, and of surveying the best channels in the straits of Bass and Torres." One of the instructions was to "collect every fact which can throw any light on the subject" of the formation of coral atolls.

The *Beagle's* second survey lasted from 1837 until 1843, and during this period thorough investigations were made around the western and northern coasts, in Bass and Torres Straits. The officers of the ship collected 140 birds during the voyages, and these were classified by John Gould. In addition, fish, reptiles and insects were collected, and classified by John Richardson, John E. Gray, Adam White and Edward Doubleday. In 1841, Captain Wickham retired, owing to ill-health, and Captain J. Lort Stokes took over command. Allan Cunningham was to have joined this survey also, but his health was failing and he ultimately died in 1839 with the intention unfulfilled. In his stead, Mr. Bynoe, the ship's surgeon, made valuable collections of plants, and these were preserved in Sir William Hooker's herbarium.

Contemporaneous with the *Beagle's* latter voyages was an Antarctic expedition under Sir James Ross, whose ships *Erebus* and *Terror* visited Hobart in August, 1840, and remained in Tasmanian waters for three months. During that period, Dr. Lyall and Sir Joseph Dalton Hooker (son of Sir William Hooker) made very extensive collections of plants. The following year, the expedition re-visited Hobart and then proceeded to Port Jackson, where the collections were enlarged. Ross's voyages provided our first accurate information on the natural history of Australia's Antarctic dependencies.

Between 1842 and 1846 another survey expedition was operating, mainly in the Arafura Sea, around New Guinea, Torres Strait, and along the North Queensland coast. The ships were H.M.S. *Fly*

and *Bramble,* commanded by Captain F. P. Blackwood. J. Beete Jukes, a geologist, was official naturalist and he later wrote up the narrative of the survey. John Macgillivray, the Earl of Derby's zoologist, also accompanied the party.

Attention was devoted to comparative linguistics, and vocabularies of various dialects were compiled. Dugong bones, sea snakes, crustaceans, starfish and molluscs were collected, and these were investigated by three of the usual team of experts in that period—Professor Richard Owen, J. E. Gray and Adam White.

Although the areas of uncharted reefs and coasts were now shrinking, the survey voyages of H.M.S. *Fly* were followed up immediately. Between 1846 and 1850, H.M.S. *Rattlesnake,* under Captain Owen Stanley, made further investigations in the Great Barrier Reef and Torres Strait regions. The naturalist to this expedition was John Macgillivray, and a famous biologist, Thomas Henry Huxley, was assistant-surgeon. At the untimely death of Owen Stanley, in March, 1850, Lieut. C. B. Yule took command, and Macgillivray wrote the official narrative.

The *Rattlesnake* has an interesting association with Australian land exploration, for she accompanied the *Tam O'Shanter* carrying Edmund Kennedy and his party to Rockingham Bay in 1848. Huxley went with Kennedy on a five-day preparatory journey, and would gladly have joined the land party, but this was disallowed. No doubt the shore and rain-forest life were of absorbing interest to Huxley, Macgillivray, Thomas Wall and William Carron during those few days when the naturalists were able to ramble together.

Continuing her third cruise, the *Rattlesnake* left Rockingham Bay, while Huxley and Macgillivray added much to their collections. Detailed accounts of the Polyzoa and zoophytes were later compiled by George Busk, and appended to the narrative, together with lists of birds, molluscs, insects and crustaceans. Thomas Huxley also wrote an account of the voyage in diary form, but this was not published until 1935, by his grandson, J. Huxley. There seems to have been some difference of opinion between Huxley and the official naturalist and chronicler, Macgillivray.

As the narrative did not appear until 1852, people were becoming impatient, and in July, 1851, Huxley said: "I have not now the slightest faith that the book will come out at all—and if it does, the name of that disreputable scamp will be enough to damn it . . ."! Yet when the book did eventually appear, Huxley considered it "very creditable," even though he thought his illustrations had been "murdered . . . in the engraving." William Carron, the botanist (one of the three survivors of Kennedy's party) appended a valuable account of his phytological explorations.

Later, John Macgillivray was naturalist to another survey expedition around selected parts of the coast—this time in H.M.S. *Herald,* under Captain Denham. A botanical collector also accompanied the expedition.

Thus ended the principal surveys of the Australian coast, although occasional parties have since visited certain limited areas.

As for marine biology, the surveys made in comparatively recent years by such men as Dr. Sir Joseph Verco (1851-1933) were of great moment. During the Christmas vacations between 1890 and 1912, Sir Joseph, with Dr. Torr and others, made dredging expeditions in South Australian waters. Several vessels were employed at different times—*Adonis, Mermaid, Vigilant,* and others. Two years after Verco's last expedition in the Government trawler *Endeavour,* 1912, the vessel was lost with all hands. Verco made an interesting entry at St. Francis Island in the Bight:

> . . . About 15 or 20 years ago (i.e., in the 1880's) Mr. Arnold picked up an ancient flint lock pistol. Knowing nothing of Nuyts', Flinders' or Baudin's visit, it was not regarded as of any special interest, and being quite useless was thrown on one side and lost again. But last year (1908), between our visits, his son, Francis, . . . found among the rocks on the shore of Petrel Bay a rusty bayonet blade. The socket which fitted around the muzzle of the gun was missing, as though it had been broken off. It is evidently of ancient date from its shape. It is long and narrow, of triangular section, two of the faces being concave, and the third flat. We dredged the bay, but did not recover anything lost overboard from the *Investigator* or the *Géographe*—not even an anchor.

Did the naturalists of those old survey expeditions carry muskets?

(Concluded.)

HONEY BEES AND MANTIDS

I was interested in the recent paragraph by M. Thornton Salter on the above matter. The "high-pitched sound (almost a cry)" of the bee was no doubt caused by the high vibration of the wings in its effort to escape from the grip of the mantis. There was an exceptionally large number of mantids in my garden last summer and I have been interested in the insects on which they feed. My experience is that well over 50 per cent. of their food consists of honey bees. Herewith is a photograph of a mantis feeding on a bee which it has caught.

—F. LEWIS.

FURTHER NOTES ON THE BADGER CREEK PLATYPUSES

By DAVID FLEAY, Healesville, Vic.

Much water has flowed under the bridges since Jack and Jill, notable platypuses, were set up in a special breeding platypussary at the Healesville Sanctuary. Jill was found on dry land as a thin and hungry baby in February, 1938, and Jack was captured in Badger Creek, also as a youngster, at the time of the great fires in January, 1939.

Jill died at the end of 1947, failing by a little over a month to complete ten years in captivity, though her actual life span totalled, fairly accurately, ten years and two months. Jack, the father animal, and Corrie (an abbreviation of the aboriginal name "Coranderrk"), the six and a half years old daughter, still survive and are in fine fettle.

All things considered, particularly Jack's sleek and robust physique—he would be now at least eleven and a half years of age—and the fact of the Philadelphia Zoo's longevity record of 45 years or more for a spiny ant-eater (*Tachyglossus aculeatus*),[1] an animal which I inspected personally in 1947, there seems fairly good evidence indicating unusual longevity among monotremes. In fact it is possible that here is a hitherto unrecognized factor with an important bearing on the remarkable survival of such low-degree, slow breeding and altogether archaic mammals into modern days. How strongly they contrast, for instance, with marsupial carnivores such as the dasyures (native cats)! Specimens of *Dasyurus quoll* are senile at four years and, in spite of a comparatively rapid rate of increase (up to eight young each year), this species goes under very rapidly with the spread of settlement and outbreaks of endemic disease. Individuals that survive may frequently be beyond the reproductive age and this is a state of affairs that I consider has contributed greatly towards the total disappearance of once common dasyures over a large part of their original range.

It is undeniably obvious that the platypus and echidna rate of increase is slow but sure and somewhat comparable to that of the long-lived larger birds of prey, where one or two offspring may be raised annually over a period of a great many years.

Returning to the case of Jill and her death at ten years, it should be mentioned that she suffered a severe setback when spurred by Jack in the winter of 1946, and from that time on special treatment had been the order of the day.[2]

From December, 1947, until mid-May, 1948, Jack had a taste of the wild life, while at large in the Watts River (Healesville), and with the plentiful food always available in that stream this duck-bill was an even finer animal at the time of recapture than when liberated. Normally verging on 4 lbs., he weighed 4 lbs.

2 oz. on May 15, 1948, and was picked up on this date at the onset of the series of irregular hibernating periods characteristic of Victorian platypuses between the months of May and September. In captivity platypuses sleep as a rule in wooden "tunnels" with little in the way of adequate insulation from extremes of outside temperatures. Consequently, consistent conditions are not present and, most important of all, food is not always as plentiful in pre-winter months as one could wish it to be, and therefore condition —an essential preliminary to hibernation in the wild—is not so readily acquired. However, thanks to access to abundant food in the river, Jack, at the time of his return (15/5/48) was definitely in superb condition. His tail, in which the fatty reserves are mainly stored, was almost as wide as his body. His behaviour from that time on proved instructive, for though there were three irregularly spaced periods of true hibernation between early June and mid-August, the animal slept normally throughout day time and, in addition, for a good portion of the nights as well, coming out for an aquatic excursion and meal for a mere two hours or less from midnight onwards.

The three true periods of hibernation were of an average duration of 120 hours, when Jack's temperature dropped practically to that of his surroundings and he could be picked up as a stiff and rather rigidly rolled-up ball. His eyes remained shut and the only protest was a prolonged, slow tempo, and extremely loud variation of his normal "clucky hen" growl, but now sounding more like the shrill whimpering of a puppy. The platypus looked as if dead, and his respirations were so slow and periodic as to be scarcely noticeable. It was obvious that but for his establishment in a wooden platypussary the period of hibernation would have approximated closely to those observed in the case of Jill when she lived underground within the large bank of "set" earth throughout the year 1943. [See table of hibernation, "Observations on the Breeding of the Platypus in Captivity," *Vic. Naturalist* reprint, p. 5, or *We Breed the Platypus*, p. 22.]

The behaviour of Jack following his return from the wild on the verge of the hibernation time and in correct hibernating condition also bore instructively on previously written paragraphs about this same duck-bill from *We Breed the Platypus*, p. 23:

> He had not been permitted to enter the bank of earth. He showed no inclination to hibernate . . . . did not come out to feed during daylight, and fed as usual throughout the nights. I am not inferring that the male platypus does not indulge in periods of winter hibernation. Jack has never done so, but it must be remembered that he has not been permitted to excavate his own burrows. The adult male platypus is also more difficult to observe in the wild state than the female, for these big "old men" are far more suspicious and retiring than the females.

The platypus "Jack", held by Mr. Dunbavin Butcher, Director of the Fisheries and Game Department, at Badger Creek Sanctuary, August, 1949. (Length: 21 in.; weight: 4 lbs. 2 oz.)

The cost of Jack's upkeep, always a financial problem in the case of a large platypus, was shouldered from May, 1948, until August, 1949, by Mr. Edward B. Green of Brighton, who has done much to assist work on life histories at the Sir Colin Mackenzie Sanctuary, and thanks to this indispensable aid the duck-bill is now back in the Sanctuary platypussary, neighbouring his daughter Corrie, and being cared for by the Director, Mr. J. M. Pinches.

Though Jill's successful hatching and rearing of her offspring Corrie has been chronicled in natural history publications, it has not been recorded so far that in 1945 a second nesting event took place. On July 13th of that year Jack was returned to Jill's platypussary, following the removal of Corrie in case her father harmed her. Jill herself appeared to be somewhat nervous of Jack, and for some weeks reversed her usual habit of feeding during daylight in order to avoid him. She retired to the earthen burrowing yard towards dusk, when, of course, Jack came out to put in a platypus's normal nocturnal feeding period in the water.

During the day he slept as usual in the wooden grass-lined tunnels situated between the swimming pool and burrowing bank. The platypus pairing season in Victoria lies between mid-September and mid-October, and at this period of the year when the necessity for handling Jack arose extreme caution was necessary because of his uncertain seasonal temper and the serious consequences of any misadventure with his spurs.

Jill had gradually become friendlier with her mate and pairing occurred on October 1st, 1945. On this ocasion more detailed observations of the procedure were possible than in 1943 (see *We Breed the Platypus*, chapter 4). Courting play had been observed for a week or so previously when Jack seized the end of Jill's tail in his bill, followed by the two animals swimming tandem in slow processional circles for three and four minutes at a time. At 2 p.m. on October 1st the animals had come out into the water of their own accord during daylight and were frisking about one another, Jack seizing Jill and caressing her all over with his large rubbery bill. Soon the platypuses were fast, remaining so for ten minutes, now floundering at opposite extremes with one animal right-side-up above water and the other under, with ventral surface showing. The submerged animal would eventually come up gasping for air. Each occasionally caressed the other's bill. Jill, being much the smaller and lighter animal, was largely the victim of the reversed submerging process.

From October 1st onward, as observed in 1943, Jill prepared for her intense incubation period by feeding all day long and into the night, for days on end. From October 10-13, she let up on this continuous feeding to gather floating eucalypt leaves from the water and to make countless journeys from the pool to her newly excavated nesting chamber with her tail hooked about loads of the nesting material. These leaves were essentially soaking wet to serve the function of maintaining the humidity of the incubation chamber during the hatching process. Sometimes Jill's tail was so loaded with leaves that she became jammed in the tunnels and burrows; but no material discarded in this way was ever gathered. Once more it was thoroughly obvious that every nesting item was collected in the water.

Jack, of course, had been removed from this particular platypussary within three days of the pairing process, for the mother platypus normally gets away by herself to excavate a nesting burrow and carry out her maternal duties. From October 13th to October 15th Jill fed steadily and solidly, disappearing finally on the evening of the 15th—just ten days earlier in the month than she had done in 1943. Ensconced in her self-sealed nursery, she presumably laid her first and second eggs that night.

In the case of this nesting event, however, there were four good reasons for arresting the hatching process before its completion. Firstly, as far as was possible, fairly detailed notes of nesting habits and the rearing of the young platypus had been obtained in 1943. Secondly, with Corrie now fully grown, it was not practicable to go to the expense of obtaining the truly colossal amount of food necessary to feed more than three members of the species. At the time, at least 25/- to 30/- a day was being spent in obtaining 1,500 earthworms, 80 yabbies (burrowing crustaceans) and four eggs daily. Thirdly, it seemed worthwhile discovering whether, on the removal of eggs after some days' incubation, Jill would nest again that same season. Finally, with the eggs removed at a definite stage, in this case five days, or approximately 108 hours, they would be extremely useful for sectioning purposes, considering that the fairly exact periods of incubation and gestation were known, whereas hitherto, eggs obtained from nests in river banks have been merely conjectural as to age. (This work is being done.)

Digging, then, on October 20th along the course of the burrow towards the terminal chamber, three "pugs" or powdered earth blocks manufactured by Jill were encountered between the outer entrance and the nest. Jill herself was naturally aggravated by the breaking up of her labour of love, and growled shrilly and petulantly. *She was not in any state of dormancy as has been suggested for brooding platypuses in the past.* In fact she was extremely alert and active on being disturbed from her rolled over attitude about the two slightly stained tortoise-like eggs, characteristically stuck one to the other as occurs immediately on being laid in a viscid state.

Though Jack and Jill were again domiciled together immediately after the taking of the nest and eggs, and though very carefully tended as to variety of diet, no further pairing or attempts at nesting were observed that season.

Various conclusions deduced from the data gathered from the 1943-44 breeding event were published earlier and it is unnecessary to recapitulate. Subsequently Professor J. P. Hill, eminent student of monotreme embryology, studied the collected facts and wrote from London submitting suggestions for consideration and criticism. Briefly they are:

A. *The gestation period*: Probably 12-14 days. Coitus October 11th. Egg laid October 25th-26th? The time of fertilization is uncertain, for it may occur several days after coitus. Broom (*Proc. Linn. Soc. N.S.W.*) concluded that in echidna the gestation time (that between coitus and egg laying) is 28 days, but the 1943-44 Healesville platypus observations indicate that in Broom's echidna case there must have been a very considerable interval between coitus and fertilization—possibly as much as 14 days.

B. *Incubation period*: October 27th-November 7/8th = 12 days. The lower limit of 7 days is considered by Professor Hill to be too short and the upper one of 10 barely long enough to allow for the early embryo in the new-laid egg to attain the stage of the young one ready to hatch. (Investigations on the stage of Jill's 1945 eggs may shed some light on the period that elapses between egg laying and emergence of young). The smallest nestling platypus examined by Professor Hill measured 16·5 mm. in crown-rump length and the smallest echidna from the pouch 12·5 mm.

C. *Lactation*: Professor Hill comments on the interesting fact that the lactation period in the monotreme is approximately the same as in such marsupials as Dasyurus (four months) and Didelphys (three months). He stresses the need for microscopic examination of the platypus mammary glands at the egg hatching stage to clear up Harry Burrell's assertion that the milk glands do not function for some days after the young are hatched. Professor Hill believes it possible that at first a clear fluid may be secreted, not therefore readily visible. He quotes Kershaw's observation of one of two recently hatched young platypuses clinging to the hair of the mammary area.

1. The Philadelphia echidna was received at that institution from Australia on October 3rd, 1903, and at the time I visited the animal (1947) it was 44 years old and in splendid condition. It is known throughout zoological institutions throughout the United States. With no reports to the contrary, this specimen is presumably still living. It is crepuscular and nocturnal in its excursions and has no access to sunlight.

2. In the winter of 1946 Jill experienced the severe setback already referred to, which nearly cost her her life and is in itself an incident somewhat remarkable in giving some idea of the effects of platypus venom on a platypus. Then, for the first observed occasion in Jack and Jill's eight-year period of partnership, Jack unexpectedly attacked his mate, driving his ½-inch long ankle spurs into the flanks of her body. The effects of the venom injected were nearly fatal, for Jill's body became swollen and rigid and she could scarcely drag herself on to landing platforms. In addition, she practically lost the power of movement in her back legs. Her appetite fell away and the usually sprightly little creature lost condition rapidly. She became so sick and helpless that it was necessary to keep her all day long packed in dry grass inside a small box placed on warm pipes. She was permitted to enter the water tank only for feeding purposes after dark and then was able to chew only the smallest and most delicate items. Even

these aquatic periods were necessarily brief for the simple reason that the sick animal was not secreting the natural oil that usually prevents a platypus's fur from becoming thoroughly wet. Thus Jill soon became water-logged, chilled and wretched, with the inevitable reaction in a sick platypus of pathetic efforts to preen the fur by scratching aimlessly and persistently with claws of the back feet. However, by means of careful supervision and in slow stages, Jill recovered. Never afterward was she domiciled with Jack, and added care was necessary in the provision of comfortable quarters and in the type of food selected for her.

In case there should be somewhere in Australia a preserved platypus nestling, at approximately the 10-inch head to tail length, such a specimen, which possesses at that stage calcified teeth, is badly wanted by the Royal College of Surgeons Museum. The only example in England was destroyed when this famous institution suffered bomb damage during the war.

SUMMARY OF PRESIDENTIAL ADDRESS, JUNE 13, 1950

By Colin Lewis

It is one of the functions of a retiring President that he should conduct a periodical "shaking up" of the Club for its own good. In doing so, I wish to draw your attention principally to the future, but will first refer briefly to the past and the present.

About two years ago, I commenced to read all the numbers of the *Victorian Naturalist* that I had not previously read, and I have now almost completed that task. The reward of such a study is a fine perspective with which to view the whole of our Club's activities. I have, more than ever, a high regard for the founders and early members of the Club, many of whom were the recognized authorities in their respective branches of natural history.

My outlook is influenced by the intimate knowledge I acquire of the country-side through travelling the roads almost daily. We are *field* naturalists, and what have we done in the field that is truly outstanding and well known to the public?

Individually, we have accomplished much, but what has the Club done?

Glance at our objects and see what our past achievements have been. Our principal object is to stimulate interest and promote the study of natural history. The publication of the *Victorian Naturalist* continuously over the last 66 years is a fine achievement, but it does not materially help to carry out that first objective, since the standard of our journal is necessarily high and difficult for beginners.

Our second object, the protection of fauna and flora, has been carried out as well as is possible with regard to fauna, due to the co-operation of the Fisheries and Game Department, but our flora is still almost without protection. Our *Wild-flower and Native Plants Protection Act* is a difficult Act to enforce and is adminis-

tered by the Forests Department, the actions of which do not always coincide with the best interests of our flora, more particularly flora other than that occurring in forests.

Our meetings have been devoted too consistently to "picture shows" of general interest. We need more symposia, such as we had recently when a number of members spoke for only a few minutes on a variety of subjects.

When our Club was founded Victoria was known for its prodigality, but today that has changed and we are now having to "fight" to preserve remnants of what we had. Many districts have nothing left to show what the country-side looked like once, and many have never been the subject of any detailed description or work by us.

The Club is undoubtedly largely responsible for the reservation of many of our so-called national parks and reserves, and we must, at all costs, see that they are not lost to the people.

The public is not generally interested in our country-side, largely because they do not appreciate it. We must educate people everywhere to appreciate Nature.

One of our members, Miss W. Waddell, has done much for the people (and us) by having small areas of flora protected; but these areas may, when Miss Waddell is no longer able to take an interest in them, deteriorate or disappear.

Between our past achievements and future prospects there have been two missing links—(1) permanency, (2) publicity. We now have, through our incorporation, the former and we may, through using the wide powers it gives us, achieve the latter. If the Club were now, even at this late stage, to purchase or acquire control of (as a committee of management) a reserve and develop it as we could, we would then have for all time a site for Club activities —a field example of what we are doing for public enjoyment and education and a project of unlimited publicity value.

Our new rules give us the power to do this and we must do it in the interest of the Club. I venture to suggest that should such a plan become an accomplished fact, our Club will never look back.

KOALAS IN MORNINGTON DISTRICT

Some years ago about 80 koalas were released on the Mornington Peninsula and are apparently increasing. Early this July one visited our garden and sat in a tea-tree all the afternoon—so close that we could have touched him. Next day he was still nearby, in another street. Koalas are often seen in streets or gardens near the town; but, as there are no Manna Gums about there, we are wondering what other trees provide them with food.

IDA F. KNOX.

As we go to press, word has been received that *Victorian Wildflowers*, by Miss Jean Galbraith, has just been published. Price approximately 12/6.

A PLEA FOR SPIDERS

By R. A. Dunn

(Hon. Arachnologist, National Museum, Melbourne)

To the great majority of people, spiders are horrid creatures, and are to be shunned and feared. Not only is there a belief that they are eager to bite, but it is also believed that their bites are very venomous.

It is a fact that responsibility for human deaths has been attributed to three of our Australian spiders—the Sydney Funnel-web (*Atrax robustus*), the Northern Funnel-web (*Atrax formidabilis*) and the Red-back (*Latrodectus hasseltii*). Fortunately the first two of these seem to be restricted to the coastal regions of New South Wales, but the Red-back has a much wider habitat, its range extending from New Zealand to Arabia. The effects of the bites of these spiders have been so widely publicised, both in scientific circles and the popular press, that one is left with the impression that all spiders are extremely venomous, and all of their more or less innocent relations are condemned accordingly. Although there are one or two others that should be considered as potentially dangerous, the fallacy of judging all by the misdeeds of a few is well exemplified here, for Australia has at least ten spiders that have no poison glands at all!

The general aversion in which spiders are held seems to be more deeply seated than would appear from a casual enquiry. Their ability to move quickly, and thus disconcertingly to the unexpectant observer, is probably a more valid reason. The large Huntsman spiders—those that are, quite wrongly, called "Tarentulas"—seem to be amongst the most strongly disliked of all our spiders. Yet they are harmless to humans, and even if one resents undue interference sufficiently to bite, no one has suffered any adverse effect. They are, moreover, useful destroyers of insect pests, and so should be numbered amongst man's friends. A glimpse of one of these spiders scuttling across the wall of a house is sometimes startling until one's eyes focus properly and recognition ensues. The speed and unexpectedness of the movement often arouses an instinctive feeling of repugnance, sometimes culminating in an undeserved execution, notwithstanding their value.

Another fallacy is the popular belief that the females always eat the males as a conclusion to their mating. While this may happen occasionally, it is rather the rare exception to the general rule. The female can always recognize the male either by sight or by her chemotactic senses, and can moderate her behaviour accordingly. It is a fact that in some cases the sexes may live together in perfect harmony for some considerable time after mating. Most of the fatalities take place towards the end of the mating season, at the time when the male is losing much of his vitality and would

soon die a natural death in any case. Rather than be wasted or eaten by other animals, a wise provision of nature demands that his body be used as food for his own species.

Even if the spider be convicted of cannibalism, infanticide is not one of her failings. The mother-spider, with her self-sacrificing devotion to her young, sets a standard of which even humans would be unashamed. On two occasions I have had the White-tail Spider (*Lampona cylindrata*) under observation, but have never seen the lenticular egg-sac left unattended by the mother. When the young are hatched and are able to care for themselves, however, she leaves them to their own devices and resumes her hunting. What makes this normal happening so remarkable is that she apparently has a taste for other spiders, as I recently saw one enter the web of an *Ixeuticus* sp., obviously with the intention of dining upon the occupant.

Much is unknown about the more intimate habits of many of our commonest spiders. If only that widespread antipathy could be overcome, interest in spiders would surge ahead, for their many novel and unique habits would ensure a more appreciable following of field naturalists.

Australia has the spiders, but where are the naturalists?

BLANK PAGES IN JOURNAL FOR JULY

Your editors feel that an explanation is due concerning two blank leaves inside the back cover of the July *Naturalist*—particularly as space is so valuable and must be filled to the limit. A 28-page issue had been arranged, necessitating the use of three separate printing presses; but, through an unforeseen exigency at the last moment, one press was not available and the only alternatives were to run a 32-page journal *with four pages blank*, or to delete four pages of the type already set up and paginated (a difficult matter). As the less of two evils, the former course was adopted, even if quite without precedent in our Club's history.

No effort will be spared to avoid such a situation in the future and it is suggested that metropolitan members bring their July *Naturalists* to a future meeting and utilize the blank spaces for Anniversary autographs by fellow members.

LIST OF MEMBERS

As it is ten years since the last list was issued, the Council intends to print another in approximately three months' time. To make it as complete as possible, please advise the Treasurer (Miss N. Fletcher) of any alteration in address, and also of your special interests in Natural History.

TWENTY-FIVE YEARS AGO

The Editor said—"Notes from the field and study are desired. Country members especially, are invited to contribute from their stores of natural history knowledge. Record your observations for the benefit of others. A 'par.' may be made as interesting as a paper. Specialists could give us glimpses of their subjects—not general summaries, but notes that are 'new' to the majority of nature lovers. Hints for the novice from veteran students and collectors will be acceptable."

We are still saying it! —The Editors.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium, on Monday, August 14, 1950. The President, Mr. E. E. Lord, and about 200 members and friends attended.

The President expressed the profound sorrow of members at the death of Mr. Charles French, Jun., former Government Entomologist, and a very valued member of the Club since 1883. He also regretfully announced the death of Miss Cruickshank and the loss suffered by Mr. H. C. E. Stewart in the death of his sister. Members stood in silence for one minute as a mark of respect.

Miss B. J. Nielson was elected and welcomed as a new Ordinary Member, and, the following nominations were received: as Hon. Member, Dr. R. R. Wettenhall (Mr. E. E. Lord/Mr. J. R. Garnet); as Ord. Members, Miss Muriel Haigh (Miss Stock/Mr. Yeats); and Mr. G. B. Morris (Miss Stock/Mr. Yeats).

Mr. F. Lewis gave a favourable report on the Wild Flowers Preservation Group and appealed for members' support—firstly, in advice of any areas suitable for reservation for native flora; secondly, for help in removing weeds on the Sydenham reserve, and also for finance to assist in fencing off such areas.

Mr. Burston drew attention to reports appearing in the daily papers and in *Walkabout* regarding National Parks and asked what the Club was doing in the matter. The President replied that the Club was doing a great deal and that a report on the recent work of the National Parks Standing Committee would be made to members at an early date.

The President expressed on behalf of members their great pleasure at the award, in June, of M.B.E. (Military Division) which had been conferred on the son of Mr. C. J. Gabriel.

VICTORIAN MALLEE

The lecturer for the evening was Dr. R. T. Patton, who gave a very interesting and informative lecture on the Victorian Mallee, which covers an area of some 11,000,000 acres—approximately one-fifth of the entire State. Dr. Patton described two distinct types of sand ridges—the red sand of the Mildura district, blown from Central Australia, and the white sand areas, which obviously came from the south-west. There were also salt lakes, under the crust of which was oozy mud. Six main types of vegetation exist in the area, each with distinct characteristics, showing the effect

of the severe climate. The intimate relationship which exists between plant formation and the environment was stressed, and also the fact that unless the flora of this district is protected, all our efforts to preserve the fauna will be useless. If the high sand ridges could be preserved in their natural state, much of our erosion troubles would be prevented.

Dr. Patton exhibited a splendid collection of pressed Mallee flora together with representative soil types and a sample of actual sandstone rock— a rare occurrence in the Mallee.

MORE WILDFLOWER SANCTUARIES

Anglesea

The C.R.B. has secured two wayside gardens on the Great Ocean Road, one at the Torquay turn-off and another near the entrance to the Scout's Camp. In the camp area itself, Mr. Hurst has enclosed about an acre; he has provided numbered metal stakes and placed them near the plants whose names can then be found from a list. It seems reasonable to hope that his generosity will give some of the boys a real interest in our flowers.

Exclusive of grasses, about seventy species were noted in May in the three sanctuaries. Of orchids the only species identified with certainty are *Eriochilus*, *Leptoceras* and *Acianthus exsertus*. As the enclosures were completed early in June, probably many names will be added in the spring —as at Tallarook and Longwood last year.

Some of the species protected are: *Schoenus breviculmis, Lepidosperma semiteres, Casuarina distyla, Persoonia juniperina, Acacia cuaveolens, Pultenaea humilis, Dillwynia glaberrima, Gompholobium minus, Daviesia brevifolia, Sphaerolobium zonaeum, Correa speciosa* (red and green), *Brademeyera calymega, Spyridium vexilliferum, Cryptandra amara, Hibbertia acicularis, Viola Sieberiana, Pimelea octophylla, P. spathulata, Platysace heterophylla, Xanthosia pusilla, Lissanthe, Brunonia, Ixodia, Olearia teretifolia, Helichrysum obtusifolium.*

When the Shire of Barrabool has completed two small enclosures in the township, there will be one or two additions including *Bartlingia sessiliflora, Muehlenbeckia adpressa, Scaevola microcarpa.*

Nunawading

A fine patch of *Glossadia* observed last spring at the north end of Springvale Road has been enclosed by the City Council.

The June census shows that this little sanctuary (about 30 yards by 10 yards) contains more than 50 species, including six other orchids. Protection of the orchids has secured a typical sample of woodland country.

The presence of *Xanthorrhoea minor* gives an opportunity to suggest the use of the native name "Toolimerin" instead of the somewhat misleading Small Grass-tree. The *Essendon Gazette* draws attention to the fact that Tullamarine takes its name from this plant; was it also once abundant in that district?

Maribyrnong River

Keilor Shire Council is sympathetically inclined toward the permanent reservation and fencing of about 5 acres on the south bank of Maribyrnong River (half a mile above the high railway bridge and about two miles N.E. of St. Albans). This land contains a most remarkable survival of Mallee vegetation—*Cassia, Zygophyllum, Myoporum*, etc.—which is well known to Club botanists; but its resumption from private ownership will involve some cost. Are any members willing to show the extent of their interest by backing up the Keilor Council with an offer of financial assistance, if need be?

—W. Waddell.

THE AUSTRALIAN NATURAL HISTORY MEDALLION

A SURVEY OF THE FIRST DECADE

By J. ROS GARNET.

It is hardly surprising that the study of natural history should play a prominent part in the lives of so many Australians, for the very beginnings of Australia's settlement by white people were

The Medallion, based upon a design by Robin Croll
(Photo. by courtesy *Wild Life*.)

linked with scientific exploration and natural history surveys. Australia was the land of opportunity, for adventure and discovery. Those with even little learning in natural science often became naturalists, either by force of circumstance or through an impelling desire to learn something about the curious and unfamiliar plants and animals that surrounded them.

Exploration, in those early days, meant rather more than just mapping new areas and defining new overland routes—observations of topography, climate, geology, animal life and vegetation were rarely neglected and records show how much these pioneer explorers contributed to the annals of the natural history of our country. In a land where novelty abounded there soon arose societies where men could gather to discuss those matters of common scientific interest and among such groups were born our Royal Societies, the Linnean Society of New South Wales and the Field Naturalists' Club of Victoria—to name but a few.

The published transactions and proceedings of these bodies are a rich storehouse of knowledge and they constitute a splendid record of the observations of scientists and naturalists during the past one hundred years, although the story they tell is scarcely known to the average present-day Australian.

In 1939, Mr. J. K. Moir, a Melbourne gentleman well known for his interest in Australiana and the fine arts, suggested the establishment of a periodical award for outstanding achievement in the field of natural history, and it was largely through his personal efforts that the Australian Natural History Medallion came into being. At Mr. Moir's request the F.N.C.V. convened a meeting of representatives of a number of organizations, whose interests, in one way or another, were linked with natural history, to discuss the proposal and formulate a code of rules for its operation.

It was finally agreed that the award should be conferred annually, should take the form of a bronze medallion, and should be presented to the person deemed to have made the most outstanding contribution to Australian natural history. Mr. Moir, whose only stipulation was that the design chosen should be subject to his approval, undertook to meet the cost—not only of the design, but of the die and, during his lifetime, of each medallion struck.

The F.N.C.V. has assumed responsibility for the machinery of this award and, on the death of the sponsor for providing the Medallion itself. As will be seen from the accompanying illustration, the artistry of the design lies in its simplicity and its striking aboriginal motif. It is of interest to recall that it was submitted by Robin Croll, son of R. H. Croll, both of whom were for years, members of this Club, the father being President in 1938.

The rules governing the Award have been modified from time to time, the last alteration occurring in 1947 when they were completely revised. In their present form the rules preserve the original intention, while assuring smoother operation of the machinery clauses—simplified or expanded accordingly.

More than thirty organizations throughout the Commonwealth have now interested themselves in this award and the way remains open for others who have not yet participated to do so by the simple procedure of applying through the Honorary Secretary of the Field Naturalists' Club of Victoria.

In June every year, each participating society may nominate one individual whom it considers is deserving of the Award. Such individual *need not be associated in any way with the Society which sponsors him.* His nomination is forwarded to the Honorary Secretary of the F.N.C.V. who, by virtue of his office in the convening body, is the permanent Secretary of what is known as the Medallion General Committee.

Each participating society, at the same time as it makes its nomination, appoints its representative to act on this General Committee, the function of which, under the present rules, is to consider applications by organizations desiring to nominate candidates, to supervise the procedure relating to the Award, to vary, rescind or amend the rules and, at intervals of two years, to replace three retiring members of a panel of seven assessors known as the Award Committee.

This panel is composed of people who need not necessarily be members of the Medallion General Committee nor are they required to represent any of the participating societies. Its sole function is to make the Award after full examination and consideration of all the evidence, documentary or otherwise, relating to the several nominations accepted by the Medallion General Committee. Since each nomination stands for three consecutive years, this can be a formidable task because the status of each nominee, in his particular field of endeavour, is generally so high as to make the final selection a matter of considerable debate.

Immediately following the assembly of the Medallion General Committee—usually in the first week in July, if it is necessary for it to meet—its Secretary convenes the first meeting of the Award Committee or makes such arrangements as will ensure that the relevant documents are placed before it on or before the 14th of July. Thereafter the Award Committee may make its own arrangements, its work for a particular year being completed when it has informed the Secretary of the F.N.C.V. of its final decision. He then, on behalf of the General Committee, advises the winner and his sponsors and makes such other arrangements as may be necessary.

With 1950 begins the Award's second decade of existence. The tenth anniversary was celebrated, somewhat belatedly it is true, by the announcement that the honour has been bestowed for the first time, upon a woman, Mrs. Edith Coleman. It seems fitting that this record of the origin and development of Australia's foremost natural history award should conclude with a survey of those great naturalists whose reputation and achievements have already won for them the Australian Natural History Medallion.

1. ALEX. H. CHISHOLM was nominated for the first medallion, awarded in *1940*, by the Ararat Field Naturalists' Club, the Bird Observers' Club, the Bread and Cheese Club, the Gould

League of Bird Lovers of Victoria and the Field Naturalists' Club of Victoria.

Chisholm is a man of many parts—journalist, editor, author, lecturer, and field naturalist—and, although his special fancy is ornithology, his interests are wide enough to have led him into all sorts of by-ways of natural history. His writings, both scientific and popular, have been always a source of instruction and enjoyment to people throughout the Commonwealth and to his efforts and personal influence the cause of nature protection and preservation owes much.

In recognition of his pre-eminence in the exposition of bird lore he has been the recipient of Fellowships in both Australian and overseas organizations.

2. The *1941* Award went to the nominee of the Microscopical Society of Victoria, FREDERICK CHAPMAN, a man whose life work lay among the stones and bones of Australian natural history. There have been few with such a wide knowledge of the geology and palaeontology of the Commonwealth as had Chapman. He travelled extensively and recorded his observations in innumerable papers which are notable for their insight and clear exposition. His broadcast talks and popular writings, as in his book *Open Air Studies in Australia*, have been the delight of thousands of Australians who otherwise might never have realized that geology and fossils could provide such a "lively" and fascinating study.

Sir Edgeworth David once said of him, "No man since the time of Robert Etheridge, Jun., has more enriched our knowledge of the past forms of life in Australia and adjacent regions than has Chapman whose ability is matched to a marvellous industry . . . ."

3. DAVID FLEAY, the winner in *1942*, is a naturalist of very different character. Few men in so few years of life have added more to our knowledge of the life histories and habits of Australian fauna. His articles in newspapers, magazines and the journals of natural history societies—notably those which have appeared in the *Victorian Naturalist*—have been an outstanding contribution to the spread of this knowledge, and the great value of his work in the Australian Section of the Melbourne Zoological Gardens and later, in the Sir Colin Mackenzie Native Fauna Sanctuary at Badger Creek, Healesville, fully justified the confidence of the nominating bodies—the Gould League of Bird Lovers of Victoria and the F.N.C.V.—that he well merited the Award.

4. The same two organizations nominated the winner of the *1943* Medallion, MAJOR H. W. WILSON. Wilson's claim to eminence in the realm of natural history differs strikingly from that of men such as Chisholm, Chapman and Fleay. He was pre-eminently a teacher. Through him many young men and women in the State Education Service have developed something more

than a tolerant view of nature study as an approach to a way of life. They have gone out to their schools with a much livelier appreciation of its value to the school child and, in later life, to the citizen. Where the influence of most of us is felt little beyond the walls of our homes, Wilson's extended (and, we hope, always will extend) to the multitude of boys and girls who pass through our schools.

5. In *1944* the F.N.C.V. nominated J. M. BLACK, a man whose contribution to botany has been astonishingly prolific. His *Flora of South Australia*– a monumental work which is now in its second revised edition–is known wherever botanists gather and to them it is something more than a mere reference work. Black, now in his 96th year and still actively working, is one of a band of naturalists whose works are nearly as well known overseas as they are in Australia, and it was a happy choice that made him the recipient of the fifth Medallion.

One of his lesser known accomplishments is reflected in his published studies of the vocabularies and phonetics of several languages of South Australian native tribes.

6. The sixth Award, that for *1945*, went to C. P. MOUNTFORD, nominee of both the Bread and Cheese Club and the F.N.C.V. Mountford belongs to that somewhat select company which has devoted itself to ethnology (of the Australian aborigine). His travels have taken him to the remote and less known parts of Australia, searching for detailed knowledge of the blackfellow's way of life. His books, camera studies and lectures have marked him as a keen and accurate observer and a sympathetic student of native ways. The ethnological studies of Mountford, perhaps more than those of any of his contemporaries, have presented the Australian aborigine in a manner readily comprehended by the non-specialist. His eminence in his chosen field has, since 1945, brought him further honours both here and abroad, including Fellowships of the Royal Geographical Society and Royal Anthropological Institute.

7. The nominee by the Royal Society of Queensland—HEBER LONGMAN, one-time Director of the Queensland Museum – was chosen for the *1946* Award. In addition to a lifetime devotion to the task of popularizing nature study and natural history by writings and lectures, his studies on vertebrate palaeontology have assured him of a high reputation beyond the borders of his home State. Whenever conversation centres on those giant marsupials which roamed Australia in ancient times, wherever dinosaurs are mentioned, inevitably the name of Heber Longman will slip into the discussion. Through his active association with scientific and natural history societies in Queensland, the people of that State have come to recognize, with growing appreciation, the need for adequate wild life conservation and protection.

8. The *1947* Medallion was bestowed upon P. CROSBIE MORRISON who was the nominee of no less than four societies —the Barrier Field Naturalists' Club of Broken Hill, the Microscopical Society of Victoria, the Leach Memorial Club and the Australian Forest League. Crosbie Morrison is surely a household name throughout Australia— and wherever else the radio carries his voice or in whatever place his nature magazine *Wild Life* penetrates. It seems necessary only to add that the steady development of a national conscience in the matter of nature protection and wild life conservation owes much to his scientific approach and infectious enthusiasm for his subject.

9. The ninth member of our series is LUDWIG GLAUERT of Western Australia, to whom the Medallion was awarded in *1948*. Nominated by the Royal Society of Western Australia and the Western Australian Naturalists' Club, Glauert is a zoologist and palaeontologist who, during his long association with the Western Australian Museum, has been the foremost exponent of natural history in that State. His major academic studies have been concerned with the extinct mammals of the South-west, but almost as important have been his contributions to the knowledge of the State's living vertebrate fauna. Through the medium of regular and frequent wireless broadcasts, museum classes, public lectures and field excursions, his influence has been a powerful force in advancing the cause of nature study and it is to him that many people owe the inspiration that has dedicated them to a scientific career.

10. So to the *1949* Award, and the bestowal of the Medallion on the first woman, Mrs. Edith Coleman who was nominated by the F.N.C.V. (See page 99 for an account of her activities, with recent portrait.)

The first ten years have passed. There are still many naturalists, as yet unhonoured and unsung, who have (to quote the long Rule 17 which governs the award of the Australian Natural History Medallion):

> . . . increased popular or scientific knowledge of Australian flora and/or fauna including man or have assisted notably in the protection or propagation of Australian flora and/or fauna or have discovered new species of importance or have devoted considerable time and care to the study of any phase of Australian natural history or have performed definite service by the publication of articles or books or by photography or pictorial art or by any other means approved by the Award Committee.

What names will be written in the record of the next years? Of course it is idle to guess; but, whoever they may be, we may rest assured that they will be of those no less worthy of honoured remembrance than the ten who have gone before.

PLATE I

MRS. EDITH COLEMAN of Blackburn,
Australian Natural History Medallioniste, 1949
(Photo. by courtesy Miss D. Coleman, featuring a bowl of *Angelica*, grown by her mother.)

FIRST LADY RECIPIENT OF NATURAL HISTORY MEDALLION—MRS. EDITH COLEMAN

The F.N.C.V. noted with pleasure that one of its members had again been the successful candidate for the Australian Natural History Medallion, but this pleasure was heightened by the fact that a very worthy lady would receive the 1949 award—the first of her sex to do so. No member of the Club has a more distinguished record than Mrs. Edith Coleman, and the volume and variety of her writing simply astounds one; she has a genius for accurate scientific observation, which is imparted in delightfully readable, descriptive phrases that bespeak also a wide knowledge of classical literature.

Arriving here as a girl from Surrey, England, she early succumbed to the spell of the Australian bush and, after a period of teaching in Victorian schools, became an ardent nature student herself. Mrs. Coleman joined the F.N.C.V. on September 11, 1922, and the *selfsame evening* read a paper—"Some Autumn Orchids" (published, Dec. 1922). From then onward, she has been a constant contributor to the *Naturalist*—probably the greatest—and more than once the "editorial cupboard" would have been bare of MS. material had Mrs. Coleman not come to light with some absorbing article.

Up to the present time Mrs. Coleman has written no fewer than 135 articles and notes for our journal—an average of five every year for the past 27 years. These embrace: 36 papers on birds (frogmouths, wood-swallows, budgerigars, and the use of aromatic herbs for nesting material), 33 on orchids (including descriptions of four new species—Sept. 1928, Feb. 1930, Dec. 1931, Feb. 1933), 21 on general botany (with many pollination studies in such genera as *Hakea, Nerium, Asclepias, Araujia, Salvia, Arum, Alocasia, Zantedeschia*, etc.), 17 on insects (with special reference to *Orthoptera*—phasmids, crickets and grasshoppers), 8 on spiders, and a number on such other diverse subjects as echidnas (the incomparable stories of "Stickles" and "Prickles" under domestication), possums, bats, fish, molluscs, obituaries of departed naturalists, etc. Most contributions are illustrated by the authoress's own lucid photographs or by neat line-drawings from the pen of her talented daughter Dorothy.

It would be impossible to select from such prodigal writings the more important ones for special mention—each has distinctive merit—but five papers to the *Naturalist* (May 1926, April 1928, July 1929, April 1930, June 1933) on pollination in the orchid genus *Cryptostylis* are of outstanding interest and created a stir in botanical circles abroad. Papers have been published from time to time in the London *Journal of Botany*, London *Orchid Review*, *Australian Orchid Review* and *Australian Zoologist*.

Other valuable writings are a frequent feature in the *Australasian Journal of Pharmacy*, mostly on medicinal herbs which Mrs. Coleman grows in her extensive garden at Blackburn. During World War II she made over £100 for the local Red Cross by harvesting and selling the seeds of *Angelica* to business firms. Many popular articles have been contributed to the *Age, Argus, School Paper, Wild Life, Woman's Mirror*, etc., dealing with eucalypts, wattles, bush flowers and animals—all with a view to encouraging the public in conservation and protection of our wild life. *Come Back in Wattle Time* is a charming book that appeared in 1930.

The Red Cross, League of Youth, Visual Education, and Mitcham Naturalists' Club have each benefited by Mrs. Coleman's active participation. For many years she organized attractive orchid exhibits at the F.N.C.V. flower shows and gave lecturettes in which the need for careful limited picking was emphasized—it was stressed that the bulbs should *not* be uprooted or disturbed in these popular wildflowers, all of which are on the protected list. Detailed information and sound advice have always been given most kindly and freely by Mrs. Coleman to any inquirer, and her resources of general natural history knowledge are almost encyclopaedic.

Her own amazing achievements can hardly be considered apart from the sympathetic collaboration of her daughter, Miss Dorothy Coleman; indeed many of the best articles are the result of joint effort, the younger lady embellishing them with life-like sketches or confirmatory observations. Miss Coleman made botanical history by locating the rare, saprophytic "Fairy Lanterns" (*Thismia Rodwayi*) in Sherbrooke Forest—the only higher flowering plant known to spend its whole existence under the ground in Victoria (see *Vict. Nat.*, Jan. 1936, Jan. 1941).

—J.H.W.

SUDDEN DEATH OF CYRIL T. WHITE

It is with profound regret that we record the death (through a heart seizure), on August 16, of Mr. Cyril T. White, who had held the office of Queensland Government Botanist since 1917, and our sincere sympathy is extended to his wife and family.

Mr. White was among the very foremost of Australian botanists and he probably knew our tropical rain-forests better than any other man; his passing is a calamity.

He always took a keen interest in the affairs of the F.N.C.V., making a number of useful contributions to the *Victorian Naturalist*. His writings for the journal of our sister Club in Brisbane, are almost legion and he had at various times occupied the positions of President, Secretary, and Treasurer to the Queensland Naturalists' Club—all with singular ability and discretion.

In 1946 he was awarded the Mueller Memorial Medal by the Australian and New Zealand Association for the Advancement of Science (see reference, *Vict. Nat.*, Nov. 1946, p. 164), and this year he was our own Club's nominee for the Australian Natural History Medallion.

Mr. White was to have visited Melbourne early next year, on his way to the Royal Botanic Gardens at Kew, where he intended to make extensive systematic researches into problems concerning the Australian flora.

NEW BEES AND WASPS — PART XIV

Three New Bees in the Genus *Cladocerapis*, and Their Rôle in the Pollination of Several *Persoonia* Species ("Geebungs")

By TARLTON RAYMENT, F.R.Z.S.

CLADOCERAPIS COLMANI, sp. nov.

TYPE, Female—Length 10 mm., approx. Black, shining, with an obscure purplish lustre.

Head transverse, hirsute; face coarsely but sparsely punctured at sides; frons rising to a sharp carina, which extends half-way down the clypeus; clypeus and supraclypeal area fused, polished, in the form characteristic of this genus; vertex coarsely punctured, with a few long black hairs; compound eyes black, converging slightly below; genae with fine punctures, and long loose silvery plumose hair; labrum black; mandibulae black; antennae black, flagellum light-brown beneath, obscurely red at apex.

Prothorax black, not visible from above; pleura with long loose silvery hair; tubercles black, with white hair; mesothorax and scutellum polished, pilose, scattered large punctures and a few minute ones around the margin, some smoky moss-like hair laterally; postscutellum with some black hair; metathorax shining, with an enclosed area, median transverse keel and numerous striae, white plumose hairs laterally; abdominal dorsal segments polished, with numerous coarse and fine punctures, scattered on tergite 1, hind margins narrowly golden in tegument, much smoky hair at apex, and a dark plate; ventral segments black, no fringes of hair, but closely covered with short forked hairs.

Legs with much silvery plumose hair, but on the outer surface of the hind tibia the scopa is dark-smoky; tarsi with yellowish hair; claws reddish; hind calcar reddish, closely long pectinate; tegulae polished, black, lighter margin.

Wings dusky; nervures black; second cubital cell contracted at apex, receiving second recurrent nervure at its distal third; pterostigma blackish; hamuli ten, moderately developed.

(All the females were heavily laden with sub-triangular yellow pollen-grains, many with tubules, from *Persoonia lanceolata*.)

ALLOTYPE, Male—Length 9 mm. Very like the female, but easily distinguished from *C. bipectinatus* Ckll. by the sub-moniliform flagellum. The clypeus of *C. bipectinatus* is more closely punctured than that of the new species, while its flagellum has the two basal segments masked in a peculiar manner, for they are intensely black where divided diagonally from the greyish-brown of the other segments. The pore-organs appear to be different on these black portions. This feature is also present on the females.

The compound eyes have a number of microscopic, almost stellate, hairs issuing from between the facets. *C. colmani* is more closely punctured on the mesothorax; and the hind margins of the tergites are broadly depressed.

Locality: Females—Narrabeen, New South Wales, March, 1947, *leg.* Phillip Colman; males—Lane Cove, Sydney, N.S.W., Jan. 26, 1946, *leg.* Norman W. Rodd. (Males and females taken over flowers of *Persoonia salicina* and *P. lanceolata*.)

TYPE and ALLOTYPE in the collection of the author.

On Nov. 10, 1945, Norman Rodd took a number of males and females of typical *C. bipectinatus* at Patonga Beach, Broken Bay, New South Wales; these were hovering over *Persoonia*.

Allies: Close to *C. bipectinatus* Ckll., which has many more coarse punctures on the margin of the polished area of the clypeus, and lacks the close striae of the metathorax; *C. heronii* Raym. is easily known by its sericeous abdomen; *C. plumosus* Raym. has a polished scutellum with one or two coarse punctures, a dull punctured abdomen with wide bands of thin white hair, sericeous margins of the tergites, and the mesothorax tomentose; *C. woyensis* Raym. has a sericeous abdomen, while the clypeal area is quite flat, impunctate, and highly polished.

C. HACKERI, sp. nov.

Specimens from the Queensland Museum, 9 mm. in length and labelled "*C. bipectinatus*", are nearer to *C. plumosus*, but they are slender, much smaller insects, with a sericeous abdomen. This species has ferruginous tegulae, and is easily separated by the scattered punctures of medium size on the polished mesothorax; the metathoracic area is polished, with a high fine transverse carina as in *bipectinatus*; the nervures of the wings are pale-sepia.

Locality: Bribie Island, Queensland, Dec., 1920, *leg.* Henry Hacker.

TYPE and ALLOTYPE in the collection of the author, the male from the same locality being only 7 mm. long, with submoniliform antennae.

C. PERSOONIAE, sp. nov.

These bees are very close to *C. colmani*, but are quite distinct, and easily separated by the sculpture on the metathorax, where the small enclosed area is smooth (it is larger, and closely transversely lineate in *colmani*).

The smooth area bears a closer resemblance to that in *C. bipectinatus* Ckll., but it is small and triangular in *C. persooniae* and narrowly transverse in *bipectinatus*. In *C. heroni* Raym. the small triangular area of the metathorax is microscopically trans-

versely lineate; there are fine transverse rugae in *C. wayensis* Raym., but that bee has a sericeous abdomen, not polished as in the other species. *C. hackeri* Raym. is a very small bee from Queensland (described above).

The drab hair of the mesothoracic disc is more conspicuous in *C. persooniae*, but the males have copious white hair over the face. The concave polished areas of the frons, reaching to the level of the anterior ocellus, are more conspicuous in *colmani*, but they have large punctures in *persooniae*; the clypeus is slightly concave in *colmani*, but it has a distinct wide median rise in *persooniae*.

C. persooniae also approaches *C. plumosus* described from Victoria, but this is a larger species, with a very different flat clypeal structure, although it has similar hooked red spines on the anterior tarsi.

The flagella of the male *C. persooniae* are not pectinate as in the unique *C. bipectinatus*, but are only sub-moniliform.

The pygidial plate differs in all these females.

Locality: Jamberoo (alt. 1,600 ft.), New South Wales, Jan., 1950, *leg.* Norman W. Rodd.

Notes on the Biology

Males and females were taken on flowers of *Persoonia mollis*, and the collector excavated a large colony in red volcanic ground. The shafts went down often to a depth of 35 cm., but usually to about 25 cm., and the pear-shaped skin cells measured 15 mm. at the long axis and 7 mm. at the short; the moist pollen-pudding is spherical, with the characteristic odour of the flowers. The larvae do not differ from the typical form, and the several cells are shut off from the main shaft by earthen plugs, so that the architecture differs from that of *C. colmani*. Hordes of parasitic wasps, one very close to *Labium rufiscutum* Cushman, and the other a large red Evanid, ranged to and fro over the shafts.

GROSS MORPHOLOGY OF CLADOCERAPIS

Cladocerapis is plainly close to *Paracolletes*, but these hitherto rare bees are easily distinguished from all other *Colletiformes* by the peculiar structure of the fused supra-clypeal plate and the clypeus. This area, shaped more or less like the figure 8, is extremely smooth and polished, and may be identified without a lens. Taxonomic references to the Genotype are as follows:

Lamprocolletes bipectinatus Smith, in *Trans. Ent. Soc. Lond., Proc.*, p. 31, 1856 (female); also Vol. III, p. 57, 1862 (male).

Cladocerapis bipectinatus Ckll., Genotype, in *Ann. Mag. Nat. Hist.* (7), xvi, p. 393, 1905.

The genus was founded on the extraordinary flagellum of one species, the male of *C. bipectinatus* (Sm.). Smith had said of his specimen, taken near Sydney: "This remarkable bee is still unique

in the British Museum. The beautiful ramose antennae of the male presents perhaps the most remarkable example of the organs known in the entire tribe of the *Aculeata*; such an extraordinary departure from the normal form of antennae could scarcely have been looked for in the *Apidae*, and if met with at all might with much greater probability have been expected to occur amongst the *Tenthredinidae*."

The founding of the genus on the character of one male is unfortunate, because the several other males in my collection possess only the plain sub-moniliform flagellum so typical of the *Apoidea*, whereas the flattened and fused plates of the "face" is a character common to all, both male and female.

The facies is that of the typical Colletid bee, for the insects are shining bright, and hairy, some 10 mm. in length. All of the described species are jet-black. The males are a trifle smaller.

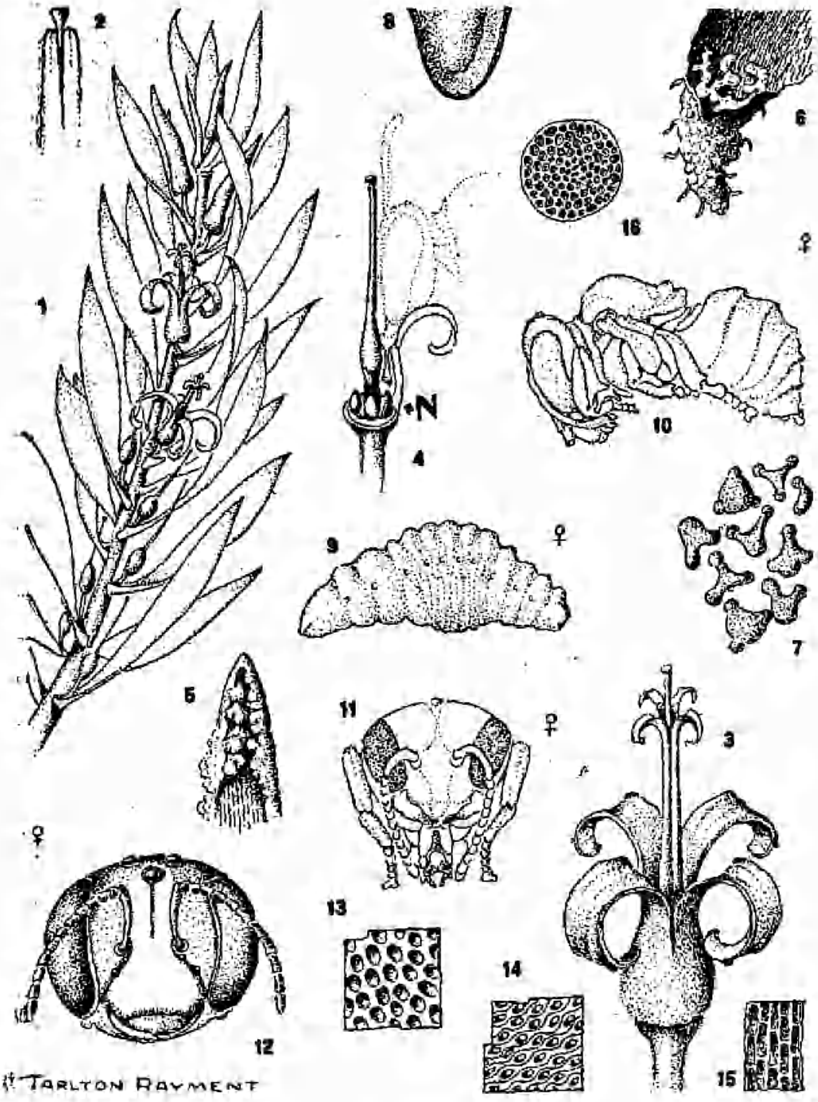
The head is slightly wider than long, and the vertex narrowly developed, with the ocelli in a low triangle. The genae are small, but the compound eyes well developed; the labrum is a long narrow oval in form, and the mandibles are bi-dentate. The mouth-parts are typical of the *Colletiformes*, the glossa being short and extremely broad in both sexes, with very large paraglossae; there are four segments in the labial palpus, and six in the maxillary palpus.

As already stated, the flagellum of one male, *C. bipectinatus*, is so extraordinary that it deserves special attention. It would appear that of all the *Apoidea* this male alone has retained the gene or genes for ramose segments of some Protohymenopteron, although such structures are common in the saw-fly *Pterogophorus cinctus* Klugg. Each flattened antennal segment of *C. bipectinatus* exhibits a number of remarkable processes, the form of which suggests microscopic palm trees, but their function is not known.

The prothorax is poorly developed, and not visible from above, but the mesothorax disc is oval, polished, with scattered punctures round the margin, a medium amount of plumose hair, usually white and black; these details will apply equally to the scutellum and the post-scutellum. The metathorax has an enclosed area, shining, evenly polished, with a transverse keel, with or without striae. The pleura is covered with much long plumose hair.

The terga are shining, mostly well punctured, although those of *C. hackeri* and *C. heronii* have a sericeous lustre, and there are no marked bands of hair. The apex of the abdomen bears a small distinctive plate; the sterna have only weak fringes, and so little pollen is carried there.

The legs are stout and hairy, especially the posterior pair, which are clothed with heavy scopae of forked hairs, usually white, with some blackish on the outer "face". The bulk of the pollen is carried on the femur and tibia of the hind leg.



Illust. 1—for explanation, see p. 111.

The hind calcar is prominent, and finely long-pectinate, as is the case in Smith's genus *Lamprocolletes*. This comb-like structure is common to many earth-digging bees; a form with fewer but stouter teeth is found in the quite different genus *Halictus*. (For a discussion on the evolution of the pecten of the honey-bee from the calcar of the wild-bees, see Rayment, 1935.)

The wings have a pointed radial and three cubital cells, the small second cubital usually receiving the first recurrent nervure at or near its middle. The eight or nine hamuli are not particularly well developed, and the pterostigma is not conspicuous.

NOTES ON HABITAT

"I am eight years old, and like collecting insects," wrote Master Phillip Colman, of Narrabeen, New South Wales. "The bees which I am posting to you were caught in our garden, where they have a nest. Will you please tell me their name?"

Narrabeen might be regarded as an outlying village of Manly, some sixteen or so miles north-east of Sydney, and directly on the Pacific coast. Narrabeen Lagoon is hard by the beach and connected to the sea by a narrow channel, so that the village is set on low ground, but once the long bridge of the highway is crossed, the contour rises abruptly to a rocky "head", a formation very characteristic of the eastern coast-line of New South Wales.

Geologically, Narrabeen is mentioned in the textbooks for its series of shales, which have been derived from volcanic beds, consequently the soil of the district supports a varied flora. The soil about the home of Phillip Colman, which is only some 20 feet or so above sea-level, and not more than 200 yards from the surf, has been cultivated, and the top layer is greyish and sandy and quite free of any stones, but the subsoil is reddish-brown in colour. The bees' shafts were numerous on the east and north sides of the house, with greatest concentration on the south. Norman Rodd endeavoured to count them, but made a conservative estimate of over 1,000 nests in the colony.

FLORA

The shales have a characteristic flora, and since they are enriched by volcanic beds, the soil is better than that of the acid siliceous shales. Trees are not conspicuous, but there are many shrubby plants, such as *Grevillea*, *Hakea*, *Banksia* and *Persoonia* (commonly known as the "Geebung").

The plants mentioned above are all in the Family *Proteaceæ*, but the flower of *Persoonia* has a straight pistil (not recurved, or looped, as in the other genera). The *Persoonia* fruit is a drupe, greenish when young, but later becoming purplish in colour.

Bees Endemic to Persoonia

These stiff, rather leathery, Australian plants are singularly adapted to arid conditions, for even on the hottest day the foliage remains green, and does not wilt under heat. *Persoonia* differs from *Banksia, Grevillea, Hakea* and *Lomatia* in its rigid pistil, which stands up straight from the ovary stalk to support the stigma at the apex, and the long anthers are close about the pistil, leaving only the stigmatic area clear. There are no "Shepherd's Crooks" due to the bowing of the pistil while the stigma is still tightly clasped by the staminate petals, as in the other four genera. The four sections of the corolla are pointed and recurved. At the base of the ovary stalk are four globular nectaries (elevated on short stalks) which yield nectar freely.

In the presence of a unique structure in a flower, it is wise to seek some unusual characters in the pollinating agent, which in this case is *Cladocerapis*. The remarkable feature of this bee is the polished area of its "face", and the function is evident. On my asking Norman Rodd to observe the bees at work on the flower, he said:

> I have often observed these bees at Lane Cove, Sydney, collecting pollen from the "Geebung", and was struck by the very interesting method employed for collecting the pollen-grains. The females alight on the recurved petals of the corolla, and at once push both front legs down the inside surface of the anthers in order to scrape off the pollen. The front legs are then withdrawn and cleaned on the back legs in the usual manner. Occasionally the head is thrust into the corolla for a sip of nectar, and no doubt the polished frons assists in decreasing the coëfficient of friction, this making it easier to push aside the stiff petals and withdraw the head.

The section of the flower (No. 3, Illust. 1) shows how perfectly the head of the "Geebung" bee is adapted to the size and conformation of the blossom, and it will be readily appreciated that a rough clypeus, adorned with much plumose hair, would put any bee at a serious disadvantage when visiting these plants. The honey-bee *Apis* makes only clumsy efforts to harvest the pollen and nectar; the blue-banded *Anthophora* is more dexterous, but does not, however, equal the efficiency of *Cladocerapis*.

All of the pollen-grains removed by the author from the scopae of numerous females of *Cladocerapis* appear to have been collected from *Persoonia* species. Even the Victorian females, *C. plumosus* Rayn., carried pollen from *Persoonia juniperina*.

Rodd says: "I am sure I have taken both sexes of *Cladocerapis* flying about the flowers of the "Geebung", so I climbed to a small plateau at the back of Phillip Colman's house, and found large areas of the plant *Persoonia lanceolata*, which had just finished flowering. The flowering period had begun in January, and ended with March."

Cladocerapis is closely associated with the "Geebung"—the bees are endemic to it—and Rodd's accurate observation in the field has revealed the method of pollination, and the function of the polished plate in this process.

ARCHITECTURE

Phillip Colman's father says that, at the height of the season, he had counted 36 shafts over an area a yard square. In April, at the close of the season, another observer counted six shafts in an area of six square inches.

The task of excavating successfully the nest of an earth-digging bee is beyond the capacity of a boy aged eight, no matter how keen he might be; consequently, I had to call upon someone of more mature experience, and Norman Rodd, who has assisted in the study of other native bees, kindly responded.

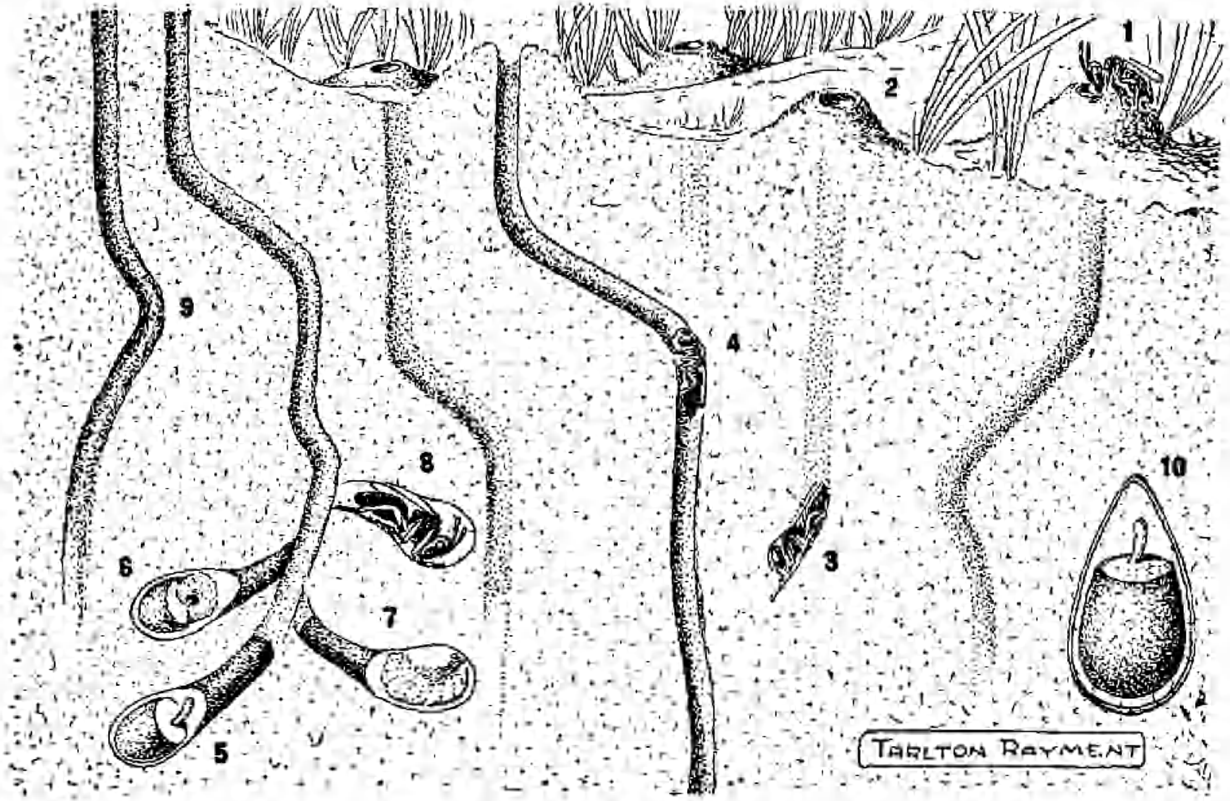
My assistants found that the mouth of the shaft is surrounded by a reddish-brown "volcano", about 3 cm. high, and typical of *Paracolletes* and *Halictus*; it is certainly formed by the throwing up of the "spoil" from excavations in the subsoil. As in the crater of *Paracolletes*, the damp spoil soon dries, and is then dispersed by wind and rain. The entrance is steep, not "funnelled" out. The main shaft, with a diameter of 5 mm., goes down almost vertically for a few centimetres, then bends at an angle for a similar distance. At a depth of about 80 cm. in the brown subsoil there is a short series of "drives" or lateral galleries, each terminating in a pear-shaped cell.

So far as my correspondents could determine, the short galleries had been filled in with soil, after each of the cells had been provisioned with a batter pudding and an egg. There could not, of course, be any progressive feeding, and the original soft pollen-pudding is the sole food provided for the larval bee.

All the larvae were found at the levels stated, and the main shaft is not closed. There is no doubt that the Colletid bees sink deep to ensure the correct degree of humidity for the larvae. Fundamentally, the architecture of *Cladocerapis* does not differ from that of *Paracolletes*.

Describing the shaft, Norman Rodd says: "At first it goes down vertically, but then drives at an angle for approximately 8 cm. before it returns to the vertical. The soil is practically free of pebbles and other obstructions, but there is invariably a few departures from the vertical during the descent, and it is difficult to find a reason for the bees' choice."

The pear-shaped cells measure 12 mm. at the long axis and 5-7 mm. at the short, and are lined out with a silvery colloidal membrane—quite pliable in new cells, but becoming hard and brittle with age.



Illust. 2—for explanation, see p. 111.

LARVAL DEVELOPMENT

"It would appear," the observer wrote, "that the larval period is very protracted, for the pupal stage is of short duration, a mere couple of weeks. I found a fully pigmented pupa on February 28, 1948, and it shed its final skin as I was taking it home. This would be about the last of the over-wintered brood. At that date many females were digging, and some were carrying heavy loads of yellowish pollen from the *Persoonia*, and a few males were flying about these plants, but the bulk of the males were darting over plants of *Duranta repens*, now and then visiting the flowers, although no females were present."

In April, 1947, fully developed larvae measured 8-10 mm. in length, with a diameter at the widest segments of 3-5 mm. Five of the median segments are much narrower, and developed in a peculiar manner; there are ten pairs of spiracles, a larval character of the *Apoidea*, the colour being dull-yellow. One of the young larvae, taken on February 28, 1948, had just consumed the remnants of its provisions.

ONE GENERATION

There is only one brood for the season, and a check of dates on the several collections shows that both sexes are a-wing in mid-summer; the flying period is synchronized with the flowering of the Geebung, namely, the three warm months. In the case of *C. colmani*, the last of the pupae were pigmented about February 28, 1948.

Specimens of *Cladocerapis* in the author's collection were taken on the following dates: Patonga, N.S.W., Nov. 10, 1945; Lane Cove, Dec. 10, 1944; Woy Woy, March 3, 1933; Narrabeen, Feb. 28, 1948; Monbulk, Vic., Jan. 18, 1929; Bribie Island, Q., Dec., 1920; Jamberoo, N.S.W., Jan., 1950.

Twelve weeks allow sufficient time for the female to mate, excavate the main shaft (to a depth of, say, three feet), complete the several pear-shaped cells and the short lateral galleries, weave the colloidal cell-lining, gather the soft pollen-puddings, deposit an egg on each, and seal the cells. It is an extremely busy quarter of the year.

However, all the adult bees have disappeared by April. The larvae are then fully-fed, yellowish in colour, and lie quiescent in their natal cradles over the winter, waiting metamorphosis in the following summer.

The order of events does not differ materially from the habit of *Paracolletes* such as *P. tuberculatus*, the larvae of which show a similar yellowish colour, with the median segments very conspicuous indeed.

These are the first "nests" to be described, consequently the details are given at some length. The research was assisted by a grant from the Trustees of the Commonwealth Science and Industry Endowment Fund.

REFERENCE

Rayment, Tarlton: *A Cluster of Bees*, pp. 157, 201, 517 (1935).

KEY TO ILLUSTRATIONS

Illust. 1 (p. 105):

1. A twig of "Geebung", *Persoonia lanceolata*, with buds and flowers.
2. The flower differs from those of *Grevillea*, *Hakea*, and *Banksia* by the erect pistil with the anthers clasped closely about it.
3. The stiff leathery flower with petals and anthers recurved.
4. Part section of a flower showing the bee's mirror-like clypeus sliding down against the smooth pistil; "N" marks the position of the nectaries.
5. Tip of the unopened petal.
6. Tip of the open petal, showing the fleshy processes.
7. Various views of wet pollen-grains of *Persoonia lanceolata*.
8. Portion of the pygidial plate of a female *Cladocerapis colmani* Rayn.
9. An older larva as it passes through the winter.
10. Pupa just before pigmentation begins.
11. Oblique ventral view of head of pupa, showing the development of the mouth-parts and the colouring of the compound eyes.
12. Front of head-capsule of female *Cladocerapis colmani* Rayn. (hairs not shown).
13. Punctation of tergites of abdomen of *C. bipectinatus* (Sm.) Ckll.
14. Granular punctation of *C. hackeri* Rayn.
15. Loose cell-structure of pistil of *Persoonia* flower which the pollen-tubule penetrates as it grows down to enter the ovum. Longitudinal section.
16. Transverse section of the pistil.

Illust. 2 (p. 109)—Graphic section of shafts of *Cladocerapis colmani* (sp. nov.) showing:

1. Female about to descend shaft.
2. The tumuli are not "funnelled" like those of *Halictus*.
3. Female sinking her shaft.
4. Female taking soil to the surface.
5. Cell with batter pudding and egg.
6. Larva feeding on the pudding.
7. Full-grown larva.
8. Female "licking" on the colloidal membrane to line the cell.
9. The shafts always "wind" more or less as they go down.
10. Inset: Colloidal lining of the cell, with batter pudding and an egg (much enlarged).

MARSUPIAL MOUSE AT SYDENHAM

A marsupial mouse (*Sminthopsis* sp.) has been noted recently in the fenced reserve for native flora at Sydenham. It was located beneath a basalt boulder—a bright-eyed, silver-grey animal about the size of a household mouse. These little creatures are carnivorous and nocturnal in habit, the males being very rarely seen; as is usual, the Sydenham example was a female.

—K. W. Atkins.

EXCURSION TO MOUNT PIPER, NEAR BROADFORD
(March 18, 1950)

By A. W. BURSTON

Mr. T. Bryan reported to the Geology Group that the Mount Piper outing was marred by wet weather, which reduced visibility. After all excursionists had viewed Mount Fraser, with its breached cone and crater lake, the Hume and Hovell monument and Pretty Sally Hill *en route*, the geologists and botanists separated. Those interested in geology visited first a basalt hill to the south-east of Mount Piper. There they found that, on the eastern side, 250 feet of basalt rests on a base of quartzite, while on the western side the base of the basalt (also on quartzite) is at a higher level; evidence suggests that a crater was originally present.

Mount Piper, examined next, consists mainly of angular broken quartz reefs. On the northern side a mine tunnel had been driven 350 feet into the hill. A well-rounded basaltic hill some two miles north of Mount Piper was also visited and seen to be composed of a compact type of basalt, without any scoria. No evidence of a crater was observed, but it is likely that this hill originated as a lava vent. The lava sheet between it and Mount Piper is generally thin, with several inliers of older rock showing here and there.

The following notes, which I prepared for the information of members attending this excursion, may be of some interest to those who visit the area on future occasions:

GENERAL REMARKS ON THE PHYSIOGRAPHY AND GEOLOGY OF MOUNT PIPER

Mount Piper is a prominent, timbered hill about 2½ miles west of Broadford. As seen from the Hume Highway and other viewpoints from the east (and west), it presents a striking, rather conical appearance, so much so that its shape used to be quoted as characterizing an extinct volcano. It must have been seen by the Hume and Hovell expedition of 1824, when Mount Disappointment (2,601 ft.) was climbed and named on their journey between the Hume (now Murray) River and Hovell's Creek, near Corio Bay.

Its name is said to perpetuate that of an aboriginal attendant of Major Mitchell, who crossed the Goulburn at Mitchelltown in 1836. Other pioneering and geodetic surveys over Mounts Disappointment and William(son) (2,639 ft.) are claimed for Dr. Neumayer. The writer vividly recalls observing Mount Piper from several vantage points between Mounts Disappointment and Hickey (2,654 ft.), which bear between S.E. and N.E. from the first-named peak.

In an early geological progress report (No. 2, pp. 121-125) by William Nicholas (28.9.1874) he described some geological features of the country near Mount Piper. He examined the country near the railway line, between Seymour and Kilmore. In a railway cutting near Tallarook was found an Upper Silurian fossil shell. Strikes in the sandstone strata between Tallarook and Broadford vary between N.N.E. and N.W., while dips vary between 40° W. and 70° N.W.; but few fossils were seen by him in the railway cuttings.

Basalt overlies the country between Sunday and Sugarloaf Creeks, and as far as Mollison's Creek; then S.W. to near the source of Sugarloaf Creek, and S. to half a mile N.E. of Mount Piper.

The basalt plain to N.W. of Broadford rises steeply from Sunday Creek at the base, to a height of 100 ft., and overlies indurated slate in the bed of Dry Creek.

At the S.E. extremity of the basalt, near the junction of Dry and Sunday Creeks, the surface of the plain is "stepped" by subsidence, and the nearest shelf or steppe is opposite a wall of columnar basalt; others are less columnar, more like rubble walls, and all face S.E., some being under-cut by Dry Creek.

The basalt escarpments grow less steep to the west, away from Dry Creek, until they undulate down to underlying sandstone hills about half a mile from Mount Piper.

Mount Piper, seen in the distance, was marked on an old geologic sketch map as an extinct volcano. As viewed from S. and E., and N. and W., it is conical in form, and was locally called "Sugarloaf Hill". Its ascent from the S. is less steep, with a hump about two-thirds of the way to its summit. No scoria or signs of volcanic origin were found near the hump, which is formed of hard sandstone, capped with huge masses of quartz.

Farther up, the hillside is covered with quartz, the sandstone *in situ* being permeated by small quartz veins; the top of the hill is capped with large blocks of quartz, resting on sandstone, intersected by a network of thin quartz veins. (Quartz crystals are numerous.) The quartz rocks bear N.N.W., but with no walls such as bound a reef, and no slate; it was the only quartz seen by Nicholas *in situ*. The quartz did not continue S. down the hillside below the hump, nor outcrop in low sandstone hills to S.S.E. or N.N.E., for some miles traversed by him. The quartz capping is thus isolated, the singular preservation of the hill from denudation being due to this capping, or "blow of quartz".

This monumental conical hill, rising 750 feet (above Dry Creek) to an elevation of 1,449 feet above sea-level, towers above all hills distant up to eight miles or more, and proves that the denudation around was of vast extent, prior to the overflow of basalt, near Mount Piper. (This may be likened to a huge "residual", of the type left as a guide to the volume of earth excavated from borrow-pits to build railway embankments.)

From its top there is a commanding view over land nearby, and of tiers of hills to the more distant mountains. (A small "look-out" platform, alongside a galvanized iron shed connected by telephone with Broadford, is made use of, when required for "fire-spotting". No drinking water is available on the summit, nor in adjacent watercourses.)

Hereunder is an incomplete list of places possibly visible from Mount Piper, with their approximate elevations (above sea-level), bearings and distances from the "look-out":

Location	*Height* (Feet)	*Bearing* (Degrees)	*Distance* (Miles)
Mount Hope	1,025	33	7
Tallarook	585	35	9½
Breech Peak	1,609	44	9
Mount Hickey	2,654	76	8½
Broadford	725	92	2½
Mount Disappointment	2,601	134	17
Heathcote Junction	1,145	173	11½
Kilmore East	908	192	6
Kilmore	1,213	206	7
Camel's Hump	3,317	243	25
Mount William	2,639	265	11½

Location	*Height* (Feet)	*Bearing* (Degrees)	*Distance* (Miles)
High Camp	1,021	285	7
Mount Koala	1,885	306	17
Pyalong	815	309	10
Tooborac	1,031	314	16
Mount Lookout	1,598	316	13
Chapman's Hill	1,344	329	10
Glenaroua	784	340	7
Vickery's Hill	1,055	346	8½
Heywood's Hill	1,056	359	10

Nicholas observed, but did not visit, a round hill about two miles S.W., which is elevated above the surrounding land, and held (in that spring of 1874) a small basin of water; this appeared to him to be the only likely vent of the basalt flow. More than 75 years later, this suggestion was confirmed by the writer, on a further helpful visit with fellow-members Messrs. A. A. Baker and T. Bryan (geologists) and A. J. Swaby (botanist), when we examined a rushy swamp in a shallow crater-like depression on this volcanic hill.

To conclude references to Nicholas' report, no quartz veins nor fossils were seen by him in railway cuttings between Broadford and Kilmore, but in a quarry S. of the latter town he found some Upper Silurian fossils, in indurated slate.

The round hill recorded by Nicholas is not to be confused with Round Hill, so named on the Tallarook military sheet. This is at 1,012 feet elevation, and about 2¼ miles to N.E. of Mount Piper, and may also have been a source of adjacent volcanic rock, but was not visited by us.

The visit by our party, just alluded to, revealed that soil of volcanic origin extended W. from the round hill (of similar elevation—slightly over 1,000 feet) noted by Nicholas in 1874, across an old (N. and S.) road, past a small basalt quarry, where it occurred alongside quartzitic blocks, resting on Silurian bedrock, and marking the divide between headwaters of Hamilton and Cameron Creeks.

The siliceous conglomerate hereabouts is regarded by Mr. W. Baragwanath, geological consultant, as the oldest of Tertiary formations. He also suggested that trilobites may be found in the main road cutting to the S.W. of Broadford.

The tunnel in the steep N. slope of Mount Piper penetrates the hard rocky shell, and extends S. for several hundred feet, but does not appear rich in minerals; nor does a shallow shaft below extensive quartz outcrops to the E.

Appended are notes kindly contributed by Messrs. A. A. Baker (on geology) and A. J. Swaby (on botany). Further botanical and other data may also be gleaned from copies of the *Victorian Naturalist*, such as: "Notes on a Visit to Mount Piper," by Messrs. F. G. A. Barnard and C. French, Jnr. (Vol. XXIX, No. 12, April, 1913), also "A Sketch of the Keilor Plains Flora," by Dr. C. S. Sutton (Vol. XXXIII, Nos. 8 and 9, December 1916 and January 1917).

Acknowledgements for facilitating the arrangements in connection with this trip are also due to Misses J. Blackburn (secretary) and M. Elder, and to Mr. H. C. E. Stewart of the Excursions Committee.

(To be continued)

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on Monday, September 11, 1950. The President, Mr. E. E. Lord, was in the chair, and about 150 members and friends attended.

The President expressed the regret of members at the recent death of Mr. C. T. White, Government Botanist of Queensland, and also the death of the wife of Mr. A. S. Chalk, a past president of this Club.

The following were elected to membership and warmly welcomed by the President: As Honorary Member, Dr. R. R. Wettenhall; as Ordinary Members, Misses M. Haigh and M. Stewart, Messrs. W. H. Bridges, G. B. Morris and D. F. Crosby; and as Country Member, Mr. J. French.

Nominations for membership were: Mr. H. S. Begbie (Mr. A. E. Carter/Mr. R. C. Walters); as Country Members, Messrs. A. K. Sheldon, Lilydale, and K. R. Morrison, Wodonga (Mr. A. F. Sheldon/Mr. A. J. Swaby); and as Junior Member, Master D. Bloomfield (Mr. C. Ralph/Mr. E. E. Lord).

The President drew attention to the publications on sale in the hall, with special reference to the Club's Christmas card. Miss J. Galbraith's book on wild flowers is now obtainable at booksellers.

Miss Waddell appealed for donations toward the expense of reserving areas of native flora as sanctuaries.

The President announced that an exhibit of garden-grown native flora by Mr. Ivo Hammet at a recent show of the Royal Horticultural Society had been awarded the A.M. (Award of Merit).

SYMPOSIUM ON WOOD

This unusual feature was arranged by Dr. Margaret Chattaway who, as the opening speaker, described how, by an ingenious card system, it was possible to identify timbers (once recorded in the system) by an examination of their microscopic details. Miss R. Griffen then traced the history of paper from the original papyrus to the use of parchment, made from linen and cotton fibres, and finally to its present manufacture from wood fibre. Miss Griffen ably described with the aid of lantern slides the different stages in the process from wood fibre to the finished product. It was considered at one time that our own eucalypts were not fit for

papermaking, but war had forced us to experiment, and it was now found that, when mixed with the longer-fibred woods from overseas, our woods can be made into very good paper.

Miss N. Robinson gave an interesting dissertation on fungi, which were considered under three classes: those attacking living trees, those on dead wood, and the ones occurring in the timber of buildings. Fungi cannot grow without moisture and they must also have air. With a timber moisture content below 20% fungi cannot grow at all, and growth falls away again at moisture contents exceeding 80%.

Mr. R. W. Bond spoke on the destructiveness of termites and beetles. Termites build nests below the ground which are very difficult to locate. The pinhole beetles bore straight holes which show no dust, but fungi are often present in the holes. They do very little harm to the wood. The *Anobium* or furniture beetles like green timber and work in moist conditions; they cannot live in dry timber. The larvae do most of the damage, leaving a fine gritty dust. Control of this beetle is simple, but it should be treated at once. The *Lyctus* beetle is found in the sap wood only and is often encountered in new houses. It works in dry timber and shows a very fine powder, but does little harm.

Some good exhibits illustrated these lecturettes—the card identification system; samples of wood showing the great difference in weight of certain varieties; paper in the making, also the finished article; fungi and decayed wood; timber which had been attacked by beetles. The President thanked the speakers for their informative addresses.

EXHIBITS

Mr. J. S. Seaton: Collection of New South Wales wild flowers kindly sent by Mr. G. C. Singleton of Sydney to stimulate interest in native plant culture, viz.: *Boronia pinnata, B. serrulata, B. thujona, B. ledifolia, Grevillea buxifolia, Epacris microphylla, Eriostemon buxifolius, Telopea speciosissima, Crowea saligna, Styphelia triflora.* (These specimens were also displayed at the September meeting of the Botany Group.)

Mrs. P. Fisch: *Boronia cærulescens* and *Eucalyptus Preissiana* (garden-grown).

Miss G. Auchterlonie: *Clianthus speciosus* (garden-grown at Narracan).

Mr. A. Savage: *Grevillea rosmarinifolia* (Hurstbridge form), *Phebalium obcordatum, Boronia denticera* (garden-grown).

Miss G. Neighbour: Mistletoe growing on a cherry plum tree in Brighton.

Mr. C. J. Gabriel: Marine shells—*Janthina communis* Lam. (Lord Howe Island) and *J. globosa* Swain (New South Wales).

Mr. H. C. E. Stewart: A rare Victorian shrub that is holding its own in the Bendigo Whipstick area, *Phebalium obcordatum.*

The President appealed to all members exhibiting specimens to make a practice of handing full written particulars to the Exhibit Stewards, who are appointed for that purpose. Entry in the *Naturalist* is thereby assured.

THE HISTORY OF INCORPORATION OF THE F.N.C.V.

By J. Ros GARNET

In 1880, the founders of the Field Naturalists' Club met together and drew up a code of rules for the proper management of the infant club, and as the years went by these rules were amended from time to time to meet new situations as they arose. Such changes were the reflection of a sturdy and lively development that has taken place almost continuously since that notable year.

In recent times, it was felt that much could be done for the cause of nature preservation if the Club were able to accept trustee responsibilities. Until 1950 there existed no satisfactory machinery for the Club to hold and manage any properties on a permanent basis. Formerly, its trustees were the President and Vice-Presidents for the time being, and they, of course, are subject to annual election. In matters affecting the Club these officers were responsible only to its members and in such circumstances it would have been highly unlikely, if not impracticable, that the Club would have assumed the permanent trusteeship of, say, an area of land for the preservation of flora or fauna or of some special natural feature. By accepting such a trust it would have assumed a number of responsibilities to the Crown.

Thus if the Club failed, in respect of such property, to pay the appropriate taxes and rates or neglected to destroy vermin or noxious weeds, its trustees personally would have been the individuals liable to penalties of the law—a situation which no president or vice-president would have cared to contemplate with equanimity!

There have been occasions when the Club has had to refuse to accept intended benefactions simply because acceptance would have involved the Club in the expense associated with the periodical registration of a succession of trustees in addition to that required for payment of any essential maintenance work or managerial assistance that might be necessary. At no time has the Club's financial status been adequate for such ventures. The best it has been able to do has been to use its not inconsiderable influence in persuading public bodies to spend public money in maintaining parks, gardens and reserves with due regard to the preservation, cultivation or propagation of our Australian wild life—and there is a limit to what can be achieved in this way.

One could quote other legal disabilities under which the Club has operated over the years. Many members will be surprised to know that our respected member and one-time President, Mr. G. N. Hyam, is recognized by the Postmaster-General's Department as the owner of the *Victorian Naturalist*. When it was decided to register the *Naturalist* as a periodical for the purpose of distributing it at postal concession rates, some individual had

to be nominated as the owner or person responsible for the journal. Thus it came about that Mr. Hyam, as President and trustee, kindly assumed the role. Until such time as Mr. Hyam objects, he alone will suffer any penalties that could be incurred by infringement of a postal regulation, for instance.

It was realized that the best interests of the Club would be served by forming it into a limited liability, non-profit company—a body registered and legally incorporated under the Companies Act. This opinion was strengthened by the knowledge that a substantial estate, now held by the Public Trustee, is ultimately to be used for the furtherance of the protection of nature and a corporate body would have far better legal claim than a private society to any benefactions arising therefrom.

Early in 1948, during the presidency of Miss Ina Watson, a sub-committee comprising the President, the Secretary (Mr. F. S. Colliver) and the Treasurer (Mr. E. E. Lord), with Messrs. A. H. Chisholm, A. G. Hooke and G. N. Hyam as co-opted members, was appointed to revise the rules of the Club and report on the desirability of incorporation. The sub-committee recommended incorporation and submitted a set of rules which were intended to provide a basis for the preparation of the Articles of Association. Both the recommendation and the revised rules were adopted by the Annual General Meeting of June, 1948.

In December, 1948, Mr. Charles Bryant, of the legal firm of Moule, Hamilton and Derham, was commissioned to effect the Club's incorporation. The choice of Mr. Bryant was a particularly fortunate one since, in addition to his legal experience in these matters, he is a naturalist of note and one well able to interpret the requirements of the Club. To Mr. J. R. Garnet, who was now the President of the Club, fell the task of indicating these requirements and suggesting any future contingencies which might arise and for which provision should be made.

By June, 1949, the first draft of the Memorandum and Articles was ready for examination and, acting on behalf of Mr. C. F. Lewis, who had succeeded him as President, Mr. Garnet conferred with Mr. Bryant and together they carefully studied the draft. Although confident that it covered all of the Club's present and predictable future requirements, Mr. Garnet desired that the President and members of Council should examine the draft thoroughly before final legal action was taken. Council subsequently delegated this task to a committee comprising the President, Secretary (Mr. H. E. Preston), Treasurer (Mr. E. E. Lord), one of the Club's auditors (Mr. A. G. Hooke) and Mr. J. R. Garnet (ex officio member of Council). The draft as amended by this committee was adopted by Council and passed under the legal processes of incorporation.

The President was able to announce at the General Meeting in February, 1950, that all formalities had been completed and the F.N.C.V. was henceforth an incorporated body. It will be noted that this significant event in the Club's history by chance coincides with its seventieth anniversary year.

In the *Victorian Naturalist* of May, 1948, there appeared a statement setting out the advantages to the Club through incorporation. Since the Memorandum and Articles are now in the hands of members as a supplement to this present issue, members may be interested to have brought to their notice some of the items in these two documents which are important and of immediate concern to them.

The Memorandum of Association

In ten clauses, this document defines the objects and powers of the Club, states the activities upon which it may embark, outlines the responsibilities of members and limits their liability in the event of the Club being wound up. Its final clause establishes the Club's registered office, for the use of which the permission of the Royal Society of Victoria was sought and graciously granted.

The Articles of Association

These constitute a lengthy document which governs the administration of the Club. In general the Articles embody the rules, as revised and adopted in June, 1948, but it should be pointed out that the legal requirements of registration as a non-profit, limited liability company necessitated some modification or extension of the 1948 rules with consequent changes in administrative procedure. Members and officers of the Club should give due attention to such changes. The following notes and comments relate to such Articles as appear to have some immediate interest to members and should be taken as nothing more than an interpretation of, *not* a substitute for, the Articles referred to:

1. By Article 3, membership of the Club is limited to 1200—a figure selected by Council in view of the fact that the registration fee is in proportion to the registered membership limit. The number can be altered by legal process on payment of the appropriate fee.

2. In Article 5, the class of member designated "Country, Interstate and Overseas" in the 1948 rules is replaced by the traditional and equally significant term "Country". Its restoration was accepted by Council on the advice of Mr. Bryant and accepted the more willingly because of its long and honoured Club usage.

3. It will be observed that Article 6 does something that, curiously enough, our past rules never did. It defines an Ordinary Member. Hitherto an Ordinary Member was defined by inference only.

Nowhere in the Articles is reference made to the actual amounts payable by members as annual subscriptions. These amounts are to be fixed by the Club, or by the Council acting on its behalf, and thus become the subject of a Club by-law. That part of the Club's 1948 rules which relate to subscription rates is still valid and will remain so until such time as it is superseded by a new by-law. The conditions relating to the payment of subscriptions are laid down in Articles 11, 12 and 13.

4. As suggested above, the Council may make by-laws for the effective management of the Club in accordance with Article 76. It has power to alter or repeal any of them; but in practice the Council, in seeking to establish any new principle or vary any established custom, would seek the authority of the voting members of the Club.

5. To conform to the Act under which registration has been effected, provision must be made for *all* but Junior Members to exercise the right to vote at meetings. Articles 27 and 28 make this provision by instituting voting by proxy. A member, knowing he will be unable to attend in person to vote at a General Meeting, may appoint as his proxy a member who will be present. The proxy could be a personal friend or an officer of the Club. Proxy voting imposes an obligation on the Club to give proper notice of any matters that are to be subject to vote or ballot.

6. Some of the apparent difficulties associated with the serving of proper notices of meetings to members can be met by the use of by-laws. The time and place and the general order of business can be laid down by by-law to supplement Article 14 which prescribes the date for each ordinary meeting.

Should some emergency require the abandonment or a change in either the date, time or place of meeting, provision is made in Article 74 for notice by advertisement in a Melbourne daily paper.

7. What were formerly called Special General Meetings are now referred to as Extraordinary General Meetings and they would be held for the purpose of debating special resolutions which affect the Club as a corporate body or whose import concerns the whole of the membership. The machinery of editing, printing and publishing the *Naturalist* makes it imperative that notice of any such motion or resolution which is to be listed on the business paper for debate must be given *two months* in advance of the meeting at which it is intended the matter should be voted upon.

Thus, as an example, notice of motion given at the March General Meeting would be printed in the April *Naturalist* and reach country members in distant centres in plenty of time to give them the statutory twenty-one days' notice of the Club's intention to debate the matter at the May meeting. These hitherto disfranchised members are, in this way, given an opportunity of

exercising their right to vote by either attending in person or appointing a proxy.

8. The Annual General Meeting is, by definition, an Ordinary Meeting, but of a special kind that requires twenty-one days' notice to be given to members. One of its purposes is to provide for the election of office-bearers and councillors for the ensuing year. If the names of the candidates are to be made known to all members who may wish to vote they will now have to be published in the May *Naturalist*, and nominations, therefore, will have to be called at the April meeting.

9. In our former rules there was no provision for a quorum at a General Meeting. The Companies Act requires that there be a stated minimum number of members present in person to transact business, and thirty was chosen as being a number that might be expected to attend under the most adverse circumstances.

10. Article 39 introduces a new principle into the operation of the Council, viz., the provision for the appointment of a proxy by a councillor who finds himself unable to attend a Council meeting. The appointment must be for a stated occasion or occasions and addressed to the Secretary in writing. Article 22 still makes it necessary that a quorum shall be nine members present in person.

11. The powers and duties of the managing body of the Club—the Council—are stated in the Articles. However, the powers of the General Meeting of members transcends that of the Council and by giving proper notice of motion in accordance with Articles 16, 18, 21 and 22 it may direct the Council or veto any of its actions provided such veto or direction are in accordance with law.

12. Article 80 prescribes the procedure that must be followed before alteration can be effected in the Articles of Association.

13. Article 43 provides for a contingency which perhaps was not contemplated seventy years ago and which our published rules hitherto have never really recognized—namely, the formation of groups, sections and branches. Affiliation with other organizations is provided for in Article 44.

14. The section relating to borrowing powers (Articles 45 to 48 inclusive) is there because it has long been anticipated that some day the Club may see fit to possess its own clubrooms, library and lecture hall.

15. The common seal referred to in Article 56 need be nothing more elaborate than a rubber stamp bearing the name of the Club and the words "Common Seal". Its imprint is affixed only to legal instruments or documents of special significance.

16. Article 77, concerning the disposition of such assets as may remain after winding up the affairs of the Club, is a wise provision, as it removes all possibility of any member or group of members attempting to bring about the liquidation of the Club for his or their private advantage.

17. Article 78 is important inasmuch as it absolves individual officers from personal liability for any losses suffered by the Club which are the result of action authorized by the Club, unless, of course, they result from the dishonesty of the individual concerned.

18. Article 79 provides for the indemnity of any member or servant of the Club—a provision to which no member is likely to object, when it is realized that the administration of the Club is now, and in the future is still likely to be, in the hands of honorary officers who may not be versed in the intricacies of company law.

The Club's new structure, inevitably, will make greater demands on its officers—particularly on the Secretary, who, as the public officer, will have to see that the affairs of the Club are conducted in accordance with the Articles of Association. To enable him to do this conscientiously and effectively, so that some private leisure may remain, it is certain that all members will be ever ready and willing to assist to the best of their individual ability and in every possible way.

DEATH OF DR. CHARLES STANDFORD SUTTON

On September 20th, the Club was bereft of another of its oldest and most revered members. Dr. Sutton had been a member for almost fifty years, having joined in November, 1900. He was elected to honorary membership at the Diamond Jubilee meeting in June, 1940, but for several years past had been unable to attend meetings through failing health.

President for 1915/1916, Honorary Librarian for nineteen years (June, 1924-June, 1943), acting Editor on several occasions and a member of the Plant Names Committee from its inception (August, 1907) to June, 1943, Dr. Sutton was one of the most active, dependable workers the Club has known. He led numerous excursions and contributed several informative papers to the journal, the more outstanding ones being (in chronological order):

Among the Alpine Flowers (in collaboration with F. G. A. Barnard—May, 1903), *A Botanical Collector in the Mallee* (March, 1906), *A Botanist at Mt. Buller* (Feb., 1907), *Notes on the Sandringham Flora* (May, 1911), *A Sketch of the Keilor Plains Flora* (Dec., 1916, Jan., 1917), *On the Growth of the Sea Tassell, Ruppia maritima* (Sept., 1919), *Cradle Mountain and its Flora* (Nov., 1923).

As will be noted from the above writings, the late Dr. Sutton's interests were largely botanical. He travelled in many parts of our State and made the genus *Eucalyptus* his chief study—at the time of his death he was engaged on an ambitious work embracing the distribution of all Australian eucalypts. His private collection of dried plants was handed over to the National Herbarium earlier this year, through the courtesy of Mr. Don Greenwood; together with the recently acquired Tadgell collection, it now forms a valuable adjunct to that large repertory.

Ready sympathy from all friends in the F.N.C.V. is extended to his widow, sons and daughters.

—J.H.W.

As this issue goes to press, we regret to announce the death (on October 1st) of our esteemed Honorary Member, Mr. A. H. E. Mattingley.

FOSSIL PLANTS IN BASALT AT MARIBYRNONG, VICTORIA

By Edmund D. Gill, Palaeontologist, National Museum; and Alfred A. Baker, Leader F.N.C.V. Geology Group.

Having found an unusual occurrence of fossil plants associated with the base of the lowest lava flow at the basalt quarries at Maribyrnong (a suburb of Melbourne), Mr. J. A. Blackburn kindly reported it to the writers, who thereupon studied the occurrence and prepared this note.

The general geology of the area concerned has been mapped by the Geological Survey in Quarter Sheet 1 N.W., in the Geological Map of Melbourne (published by the Mines Department) and by Keble and Macpherson (1946, fig. 6). About half a mile south of Raleigh's Road, the Maribyrnong River is constricted at what Keble and Macpherson have named the Ascot Vale Gap. On the edge of the basaltic plateau on the west side of the river are the quarries whence came the specimens described (see Fig. 1).

Infilled Tertiary Valley

In early Tertiary times, a deep valley existed in this area, down which ran an ancient river—the Melbourne River (Gill 1949). This was largely infilled with Older Basalt, which in turn was eroded, then covered with ferruginous sands and gravels (partly marine, and partly estuarine to fluviatile) now called the Sandringham Sands (Gill 1950). Upon these ferruginous sands, also somewhat eroded, were deposited the freshwater beds found under the basalt at the Maribyrnong quarries. The basalt was shown to be post-Kalimnan by Hills (1939), and Keble and Macpherson (1946) have suggested a Middle Pleistocene age for it.

In the vicinity of the quarries, two exposures of the sub-basaltic deposits are to be seen, viz.:

1. At a quarry on the west side of Gordon Street (Fig. 1, locs. D, E), 1730′ S. of Raleigh's Road, a vertical thickness of some 16 feet of whitish siliceous sands and gravels can be examined. The sands predominate, but at the north end of the face a gravel band exists about two-thirds of the way up, with pebbles reaching 1½″ in diameter, but mostly less. The band is thin and slightly ferruginous, and cross-bedding is present. As the band is followed northerly along the quarry face it cuts out, but appears to be connected with another band 5 feet lower, which varies from 1″ to 2′ 6″ in thickness and dips away to the south. Pebbles of milky quartz of about ½″ diameter are common and some are 1½″ across; current bedding is present. The deposit represents deposition in a river attaining fairly high current velocities. In the type of sedimentation, and in the almost complete absence of ferruginous matter, the rock contrasts strongly

with the Sandringham Sands formation as seen at various places on the opposite side of the river. It is therefore concluded that a valley was cut in the Sandringham Sands, and then fluviatile sands and gravels deposited therein. A small trench was dug above the quarry in an effort to elucidate the relationships of these beds to the basalt. Dark grey sands were encountered, and then

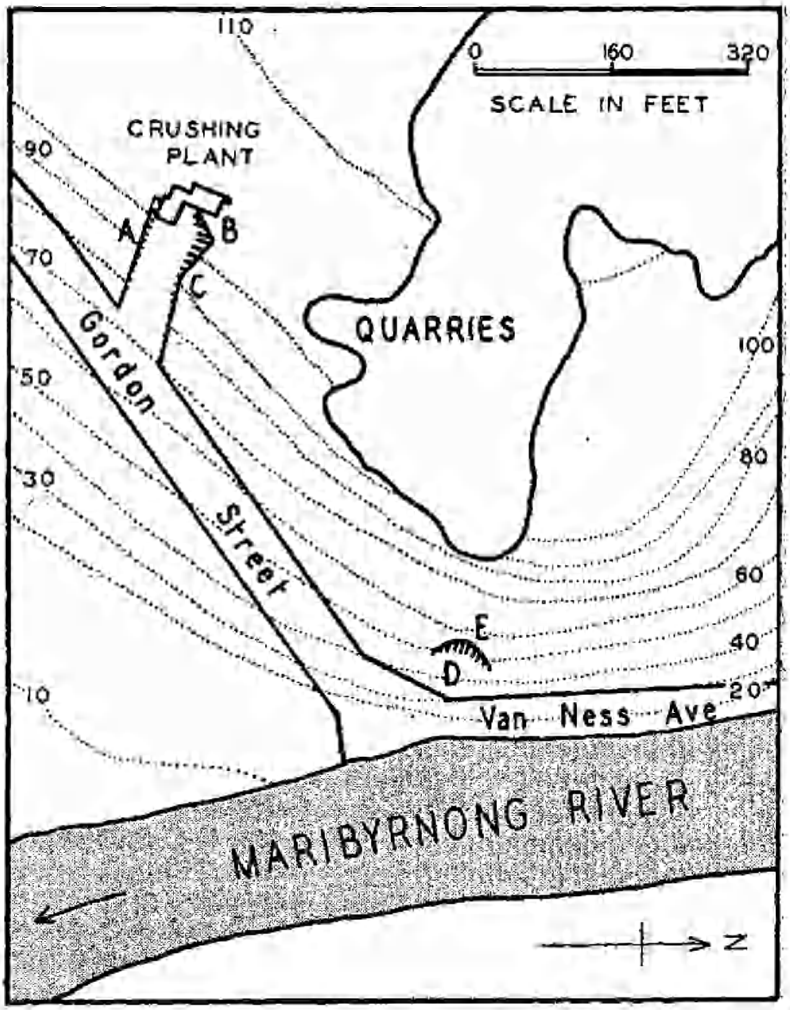

FIG. 1

Locality plan showing the occurrence of fossil *?Casuarina* in sub-basaltic sediments. Based on a Melbourne and Metropolitan Board of Works plan.

basalt pebbles. This level, 48·5′ above datum,* is approximately the base of the basalt at this point.

Fossil Flood Plain

2. An excavation made for the loading of trucks with screenings (Fig. 1, locs. A-C) reveals the base of the basalt, below which is an approximately horizontal bed of grey silt or fine sand 2′ 6″ thick, and below that again a similarly disposed bed of reddish sandy clay of unknown thickness, but exceeding 4′ 6″ thick (Fig. 2). The sandy upper bed is brittle, but a hammer leaves smooth shiny marks on the clayey lower bed. The sharp break between the two beds, and the change from finer sediments below to coarser above, suggests some kind of sedimentational change or diastem between them. The dark colour of the upper bed is due to the presence of iron in the reduced state and/or organic matter. The material turns pink on heating. The red colour of the lower bed is due to ferric iron, and the sediments must therefore have been exposed to the oxidizing effect of air. So there must have been a sedimentational break before the overlying sands were deposited. For the clays to be oxidized, the water must have been drained from them, and so the admission of air made possible. This appears to necessitate a lowering of the water table by the relative lowering of the river level, and likewise the deposition of the grey sands would involve a relative rising of the river level.

The positions of the base of the basalt and the base of the grey sand relative to datum are as follow:

	Loc. A	Loc. B	Loc. C
Base of basalt	78·3′	76·4′	76·7′
Base of grey sand	75·8′	73·8′	74·3′

This shows that the grey bed dips very slightly N.N.E., but the fall is so small that the bed looks level to the eye. The figures also show the thickness of the bed to be constant over the area concerned. The line of contact of the grey clayey sand with the red sandy clay underneath is very regular.

Fossil ?Casuarina

In the upper bed have been found a number of pieces of woody plant material, and three of these are particularly interesting in that they were not only imbedded in the silt but also taken up into the basalt flow, and deflected by its movement. One of these is figured herewith (Fig. 2), and Mr. J. H. Willis of the National Herbarium, having kindly examined the wood for us, stated that the wood structure is reminiscent of *Casuarina*. It is remarkable that the basalt was plastic enough to take up the plant, and yet

*Levels in this paper are based on the Melbourne and Metropolitan Board of Works datum, which is 0·19 feet below Admiralty datum.

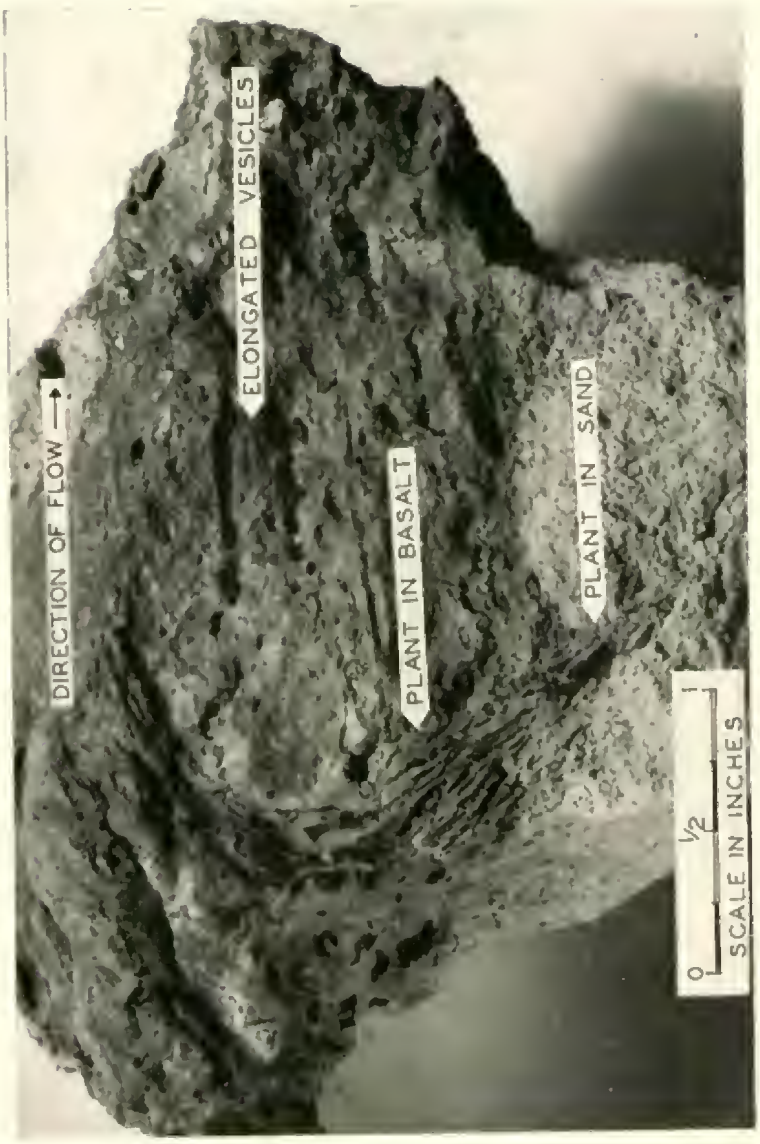

Fig. 2

?*Casuarina* in position of growth caught up in the base of a basalt flow. Nat. Mus. Reg. No. 14895.

not hot enough to destroy it. Some pieces of plant taken right up into the flow have been carbonized, but there are many pieces near the base of the flow which apparently have been little altered. The fact that the plant depicted (Fig. 2) was deflected by the movement of the basalt, but not uprooted, proves that the lava had come almost to a standstill.

Fossil Flood Plain

For about 18″ above its base, the basalt is very vesicular, much more so than higher up, and the vesicles include large ones up to 2″ long, so apparently the ground was wet, causing steam bubbles in the basalt. Heat would be lost from the basalt in turning water

FIG. 3.—Section at locality B.

to steam, and so help to develop a chilled border phase in which woody plants could survive. The unoxidized condition of the sub-basaltic silts, the fact that they are flat, and the presence of plants in them, indicates that they constituted a fluviatile flood plain which was wet at the time of the extrusion of the basalt.

It can be seen from Fig. 2 that the direction of the elongation of the vesicles in the basalt, and the direction of deflection of the plant, show the way in which the basalt was flowing at that point. This was measured while the plant was still *in situ*, and found to be N. 60° W. This indicates the direction of flow of the basalt at that point, but not necessarily the general direction of the movement of the flow. Some of the vesicles in the basalt are ⌈-shaped, due apparently to bubbles of steam rising through the basalt and then being reflected by its differential forward movement.

Thus the colour and texture of the sub-basaltic silt, the presence of plants in position of growth, and the condition and content of

the basalt enable one to reconstruct the ecological situation before the arrival of the lava flow. Deane (1904), Patterson (1935), and Patton (1936) have recorded *Casuarina* from Tertiary rocks in Victoria, while Chapman (1905, 1914) and Armitage (1910) have reported *Casuarina* associated with Newer Basalt at Yandoit, Clifton Hill, and Burnley.

Age of Plants and Basalt

As the basalt overran the plants in their position of growth, the age of the plants and of the basalt is the same. Underlying the basalt and the sub-basaltic fluviatile deposits are the highly ferruginous sands and gravels of the Sandringham Sands formation (Gill 1950), whose various marine faunas have been given ages ranging from Middle Miocene to Lower Pliocene. This formation was eroded after emergence, and a valley formed in which the sub-basaltic sediments were deposited.

On the other hand, since the lava was extruded, a valley has been cut through the basalt, the sub-basaltic deposits, the Sandringham Sands, the Older Basalt and underlying sediments into the Silurian bedrock. Under the influence of Pleistocene low sea levels, this valley was cut far below present sea level, and so the valley is Pleistocene in age. In this valley occur Holocene and probably late Pleistocene emerged marine shell beds. The fossil plants and the basalt are therefore somewhat younger than the Lower Pliocene Sandringham Sands, and older than the Pleistocene valley. Keble (1946) considers the basalt to be Middle Pleistocene in age.

During the Pleistocene there were considerable changes in sea level, both higher and lower (Zeuner 1945), but the presence of *?Casuarina* at Maribyrnong proves that at the time of growth there was no sea high enough to affect this land plant. No faulting of consequence is known to have affected this area since the basalt was extruded, and if any movement did occur it was downward. A cross-section of the valley suggests that the thalweg of the river was of the order of 40 feet above present sea level at the time the basalt was extruded. That no deep valley had been cut in the comparatively easily eroded Sandringham Sands suggests that the river was not rejuvenated by any Pleistocene low sea level before the basalt was extruded.

The age of the plants and of the basalt is thus probably either lower or (at latest) middle Pleistocene.

Acknowledgements

We are indebted to Mr. J. A. Blackburn for drawing our attention to this occurrence, and for surveying the levels; to Mr. T. C. Bryan for field photographs; and to Mr. L. A. Baillôt of the Melbourne Technical College for the photograph of the fossil

(Fig. 2). Mr. J. J. Jenkin of the National Museum made the chemical tests involved.

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NEW MEMBERSHIP LIST

The Treasurer (Miss N. Fletcher) again appeals to members for information regarding any changes in address and also concerning special interests in Natural History, so that the preparatory typing for a revised, up-to-date membership list may be commenced without further delay.

SANDSTORMS OVER MELBOURNE A CENTURY AGO

It is, I think, generally believed that severe sandstorms in the vicinity of Melbourne did not occur until the last decade or so and that, in the past, they were rare and did not assume serious proportions.

Two interesting references to sandstorms very early in the settlement of this country may be indicative of little change.

The first reference is from *Georgiana's Journal* by Hugh McCrae, written by Georgiana McCrae at the McCrae's home, "Mayfield," near Mayfield Street, Abbotsford (of today) on January 14th, 1845:

"Clouds of sand darkening the sky, and penetrating the house; then rain at night."

The other reference is from a report by Ludwig Becker, Government Meteorologist, of November 9th, 1856:

"Ships out at sea, far from the coast, felt the dust; and one vessel in the bay, 12 miles from land, had quantities of gravel and sand blown on board."

C. F. Lewis.

EXCURSION TO MOUNT PIPER, NEAR BROADFORD
(March 18, 1950)

(Continued from p. 114, September number)

GEOLOGICAL NOTES EN ROUTE TO MOUNT PIPER

By A. A. Baker

Leave Melbourne city—built on Silurian rocks, sandstones and shales (age—approximately 300 million years).

Through suburbs of Brunswick and Coburg, built on lava which overflowed the Silurian (middle Tertiary—age approximately 20 million years).

To Campbellfield, where clay quarries can be seen alongside highway (used for brickmaking, they are of Pleistocene Age—about one million years).

Continuing on towards Wallan, the lava plain continues and the gentle slope is noticeable when looking out the rear of the bus.

Just past Beveridge, on the right, is Mount Fraser, the nearest volcanic crater to Melbourne; the breached side faces the highway. A monument to Major Mitchell is erected at this spot.

Through Wallan, and the climb over the Great Dividing Range, called Pretty Sally's Hill, which is composed of Silurian sandstones.

Suggested stop here for a view of the extensive basalt plains extending to the coastline 35 miles away, and the remnant volcanic hills in the distance.

Downhill towards Kilmore, lava flows can be seen in the road cuttings and quarries; one just through the township shows column formation (on the right side). Another monument, further on, erected in memory of Mr. Beahne.

Then on to the gap in the ranges, where fossils can be found in the steeply dipping Silurian sandstones.

Suggested stop here for a panoramic view of Mount Piper and surrounding district.

Mount Piper—1,449 feet above sea-level, but only about 750 feet above surrounding country; the base is composed of typical Silurian sandstones, much iron-stained and with mica flakes. At about two-thirds up, there occurs a fracture zone, where the rock has been broken into angular fragments and the inter-spaces filled with silica in solution, as quartz (termed faul breccia). Quartz crystals are common.

An excellent view from the look-out reveals the extensive erosion that has taken place since Silurian times.

Towards the south can be seen a low round hill, with a small crater, which is volcanic, while the rocks between the Mount and this volcanic mound are silicified conglomerates and quartzites.

The Mount was at one time worked for gold, but without success.

PLANTS ON MOUNT PIPER AND VICINITY

By A. J. Swaby

1. *Eucalyptus viminalis* (Manna Gum)—Paired, stalkless, narrow, tapering juvenile leaves. Buds mostly in threes, forming a cross. Bark, here, smooth and white.
2. *E. camaldulensis* (River Red Gum)—Smooth bark. Spiked caps.
3. *E. macrorrhyncha* (Red Stringy-bark) — Stringy, furrowed bark. Spiked caps.
4. *E. obliqua* (Messmate Stringy-bark)—Felted stringy bark. Rounded dotted caps.
5. *E. melliodora* (Yellow Box) — Juvenile leaves bluish, oval; adult, bright, narrow, drooping. Bark matter, slaty. Loose cluster of thin-stalked buds.
6. *E. hemiphloia* (Grey Box)—Juvenile leaves rounded, paired, bluish; adult, coarse, dull. Grey matted bark, flaking small. Ascending branches the rule. Cone caps.

7. *E. polyanthemos* (Red Box)—Rounded, bluish leaves. Grey matted bark. Flower clusters many, standing well out from leaves.

8. *E. oleosphora* (Long-leaf Box)—Juvenile leaves round, paired, bluish; adult, coarse, long, tapering, broadest near base. Cluster-stalks flat, buds stalkless, angular, with paler, wider caps. Bark rougher than other boxes; but even large branches smooth.

9. *E. sideroxylon* (Red Ironbark)—Black, rough, deeply furrowed bark, with many dark-red kino cells. Grey leaves. Lemon-shaped buds with long stalks.

10. *Acacia melanoxylon* (Blackwood)—Broad, blunt, straight phyllodes with several parallel "nerves". Buds in autumn, winter; flowers in spring; fruit ripe January. Seed-stalk orange, making double "horse-shoe".

11. *Acacia implexa* (Lightwood)—Curved, pointed phyllodes, with several parallel "nerves". Buds in spring; flowers in summer. No "horse-shoes".

12. *A. mollissima* (Black Wattle)—Bipinnate leaves, with over 20 leaflets in a row; no silver. Young tips yellowish. Flowers pale, late spring, sickly sweet. (Moist slopes.)

13. *A. dealbata* (Silver Wattle)—Bipinnate leaves, over 20 leaflets. Young tips and branchlets whitish. Buds, autumn and winter; flowers, golden in early spring. Broad pods ripe early summer, brown. (Wet places.)

14. *A. acinacea* (Gold-dust Wattle)—Small shrub. Phyllodes about ½ inch, one nerve, broader toward tip, slightly curved, often a gland near tip.

15. *A. aculeatissima* (Thin-leaf Wattle)—Prostrate. Narrow phyllodes, hairy margin, narrowed, sharp points. Flowers in spring; long reddish slender stalks.

16. *A. pycnantha* (Golden Wattle)—Broad phyllodes, central nerve and side nerves. Narrow pods distinguish from *A. falciformis*; often otherwise very similar.

17. *A. diffusa* [or — ?]—If one species, it is very variable in form and time of flowering. Slender, waving shrub, with scattered needles standing straight out.

18. *Grevillea alpina* (Mountain Grevillea)—Here erect and narrow. (Grampians, prostrate.) Leaves oval, hairy both sides. Hypogynous gland (below ovary) very prominent; base of flower not oblique on stalk.

19. *Hibbertia linearis*, var. *obtusifolia* (Showy Guinea-flower)—Grey, hairy leaves, much broader and longer than normal. Many stamens surrounding pistil.

20. *Exocarpus cupressiformis* (Cherry Ballart)—A tree like a cypress. Fruit-stalk red and juicy; fruit, a green nut.

21. A *Correa*, undetermined, is there.

22. Plants of *Asterolasia Muelleri* (Lemon Star-bush), much cropped, may also be observed.

At a time of the year when very few plants are in flower, the 22 trees and shrubs named above are easily recognizable and useful as subjects for study. Messrs. F. G. A. Barnard and C. French visited Mount Piper in October, 1912—a much more propitious season for botanizing—and their report (*Vict. Nat.*, XXIX, pp. 186-89, April, 1913) shows that, in addition to the species numbered 14, 15, 16, 18 and 19 above, the following plants were also collected on and near the Mount:

Ophioglossum coriaceum
Asplenium flabellifolium
Pleurosorus rutifolius
Cheilanthes tenuifolia
Microtis atrata
Caladenia Patersonii
Caladenia carnea
Glossodia major
Acianthus reniformis
Pterostylis cycnocephala
Daviesia latifolia
Dillwynia parvifolia
Stackhousia monogyna
**Epacris impressa*
Veronica perfoliata
Microseris scapigera

*Special comment was made on the heath that grew over parts of Mount Piper and had white flowers of unusually large size.

MEMOIRS OF OUR NATIONAL MUSEUM

The dates on several papers in the recent issue of the *Memoirs* indicate a prolonged hiatus in publication of the series—Gill's paper is dated 1947. The exigencies of war no doubt contributed to the long delay.

Issue No. 16 of the *Memoirs* contains seven excellent papers, and, since separates of these may be obtained free of charge on application to the Director, a mere resumé of the contents is sufficient to bring them under the notice of students of natural history.

It is often forgotten that a museum is very much more than a mere collection of specimens, which alone make it a comprehensive store-house of knowledge; it has a far more noble function, and that is (as the Smithsonian Institute's motto proudly claims) "The Diffusion of that Knowledge Among Men."

Director R. T. M. Pescott must, therefore, be congratulated on his policy of more frequent publication, for thereby the *Memoirs* will diffuse knowledge among men far overseas, and the influence of the Museum be more widely extended. Museums should not be static fossils, but living dynamic educators of mankind—all mankind.

R. A. Dunn contributes a short paper on those small but interesting arachnids, the whip-scorpions, whose long slender appendages are responsible for their vernacular name. Several new entities are described for the first time.

An echinoid from the Tertiary (Janjukian) of South Australia is dealt with by H. Barraclough Fell, and the clear half-tone illustration of structural details will assist the student to recognize this hitherto undescribed fossil.

The paper on the Physiography and Palaeogeography of the River Yarra, by Edmund D. Gill, is illustrated with ten diagrams which will help the reader, who is not a geologist, to appreciate better the remarkable birth and "senescence" of the Yarra River. Personally, I found this paper of exceptional interest.

A short paper in French, *Sur Quelques Pauropodes D'Australie*, by Paul Remy, University of Nancy, describes several new species of *MYRIAPODA* —many-legged creatures with short and curiously modified antennae. The small collection was loaned by Professor O. W. Tiegs, University of Melbourne, to whom one of the new species is dedicated (*Stylopauropus tiegsi*). These strange small animals were found among decomposing vegetable matter in gardens.

R. R. Foster, Canterbury Museum, New Zealand, contributes a paper on Australian *Opiliones*, and describes a new Subfamily, *Megalopsalinae*, of the *PHALANGIIDAE*, and seven new species. The excessively long chelicerae or grasping pincers of these small "harvestmen" are indeed remarkable. One of the new species, *Spinicrus stewarti*, is dedicated to H. E. C. Stewart, ex-president of the Club, and a collector of several novelties at Mount Buffalo.

A second paper by Edmund Gill, Palaeontologist at the Museum, deals with Devonian Fossils from Sandy's Creek, Gippsland, Victoria. The fossils include plant-stems, solitary corals and crinoids, mostly in casts and moulds in an exceedingly fine sandstone.

Plant remains from Lilydale, Victoria, are described by Dr. Isabel Cookson, University of Melbourne, and represent the Yeringian Series, which have been correlated by Chapman and Thomas with the Upper Ludlow of Britain.

This issue, dated December, 1949, is in good clear type on, I should think, Australian paper, and the "line" reproduction of the text-figures is very clear. The half-tone reproductions of photographs of crinoids, by L. A. Baillôt, are printed on art paper, and warrant special mention, for fossils are difficult subjects in the best of circumstances.

—Tarlton Rayment.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on Monday, October 9, 1950. The President, Mr. E. E. Lord was in the chair, and about 170 members and friends attended.

The President welcomed Miss Osborne, a member of the Royal Society for the Protection of Birds in England, who was visiting Melbourne. Miss Osborne thanked the President and said she was very impressed by the bird life she had seen in this country. Mr. C. C. Singleton, Mrs. P. Messmer and Miss Weymouth, visitors from the N.S.W. Naturalists' Club, who had attended a recent excursion to the Grampians, were also given a cordial welcome.

News of the deaths of two highly esteemed Honorary Members was received with deep regret. Dr. C. S. Sutton, a member for almost fifty years, and Mr. A. H. E. Mattingley, have passed away since the September meeting. Regret was also expressed at the death of Mrs. Blackbourn, a late member of the Club.

The Horticultural Society of Canberra had asked for donations of wild flowers for a show on November 18, and members were also reminded of a similar request from the Royal Society of South Australia.

A letter was received from the Director of the Museum announcing publication of a hand-book on the mammals of Victoria, at 7/6. Members were asked to purchase their copies through the Museum direct. A review copy had already been lodged with the Editor.

Mr. A. Swaby reported a very successful excursion to Maranoa Gardens (about 120 members attending) and commented on the excellent display of flora there at present; a N.S.W. Waratah in bloom was particularly attractive. Mr. A. Cobbett reported on the trip to Mt. William and the Major Mitchell plateau. The flowers had been somewhat disappointing, but he thought this was due to our visit being rather early for such an altitude (to 3,800 ft.). Stunted trees of White Sallee (*Eucalyptus pauciflora*) were noted on the plateau—apparently a new record for the Grampians. Mr. G. C. Singleton, N.S.W. visitor, was delighted at the display of wild flowers near Hall's Gap in the Grampians and was very impressed at the grandeur of these mountains which he described as the garden spot of Eastern Australia.

The Ararat Club has asked for co-operation in their protest at the indiscriminate picking of wild flowers. The President asked all members who could do so to attend a meeting at Mechanics Hall, Olinda, protesting against the destruction of vegetation in the Dandenongs. Prof. J. S. Turner would be chairman.

New Ordinary Members elected were: Mrs. H. Bowen, Mrs O. Mellor, Miss N. Macdonald, Messrs. H. S. Begbie, A. K. Sheldon and K. R. Morrison, and as Junior Member: Master D. Blomfield.

Nominations were received on behalf of the following: as Ordinary Members, Miss Mabel Horner (Mrs. R. W. McKellar/Mr. A. J. Swaby), Mr. A. W. Gordon (Mr. A. P. Dunn/Mr. R. A. Dunn), Mr. V. K. Yeats (Mr. Crosbie Morrison/Mr. H. Preston); and as Country Member, Mrs. A. Neven, Rocky Hill, via Smeaton (Mr. H. Preston/Mr. E. E. Lord).

The President announced that Notice of Motion would be given at next meeting for the adoption of By-laws in connection with the Articles of Association just published.

Mr. Jennison reported that the next meeting of the Wild Flowers Garden Group would be on December 7; there will be no November meeting.

BOTANICAL SYMPOSIUM

The principal item for the evening was provided by the Botany Group, with Miss C. M. S. Gamble as compere.

Mr. R. D. Lee opened with a talk on Seaweeds illustrated with lantern slides. Their value for medical purposes, use in foods and in cosmetics was stressed; but very important now is their use as a medium in the preparation of vaccines. Seaweeds act in the sea much as other plants do on land—by taking in carbon dioxide and exhaling oxygen, thus keeping the water pure for sea life.

Miss V. Balaam gave a delightfully humorous and interesting chat on many species of fungi, which was illustrated with epidiascope pictures.

Mr. J. H. Willis spoke on ferns and club mosses, of which there are some 10,000 species. New Guinea is richest in ferns which thrive in its moist warm climate. Australia's few ferns mostly occur round the Eastern coastline, although some species are to be found in arid situations and on exposed mountain peaks. The speaker touched on the life history of a typical fern, with its conspicuous "alternation of generations."

Mrs. A. Osborne chose for her subject the weeds in her garden, and it was surprising to hear of the number of different species she had discovered. Her interesting talk was supplemented by a variety of named specimens.

Slides of wild flowers, from photographs taken by Mr. H. T. Reeves, were then shown; in the unavoidable absence of Mr. Reeves, Mr. Ivo Hammet described the slides, each subject being suitable for garden culture.

The concluding portion of the symposium was a series of questions and answers. The questions were asked by Miss Gamble and answered by members of the Botany Group:

Question 1—*What native plant is most productive of seed?* Mrs. J. Pinches decided this was the Mountain Ash because of its great age, immense size and prodigious number of flowers to the tree.

The next query went to Mr. J. Ros. Garnet who described *how to distinguish an orchid from other plants.*

Mr. J. H. Willis was asked *what was the difference between a shrub and a herb.* His answer, in short, was that the herb has a soft juicy stem, whereas the shrub is always a woody perennial.

Mr. A. N. Usher explained *how to distinguish a composite from other flowering plants.*

Mr. R. B. Jennison described the *different ways in which a flowering plant can be pollinated*—by insects, birds, wind, water, and self fertilization.

In conclusion, Mr. Willis explained the *reasons for the changes in plant names.* In different parts of the world a plant had often been given different names, and in order to achieve uniformity it was necessary to adopt the first name validly published—going back no earlier than 1753, when Linnaeus brought out his famous *Species Plantarum.* Conversely, the same name must *not* be applied to two different plants, and where this has occurred the last named must be given a new name.

EXHIBITS

Mr. R. Garnet: Photographs, drawings and pressed specimens of Greenhood orchids (*Pterostylis*); also photographs of other wild flowers. Mr. V. H. Miller: Cultivated orchids.

Miss V. Balaam: Fungi collected at the Brisbane Ranges (*Boletus luteus, Morchella conica, Omphalia chromacea*).

Mr. H. C. E. Stewart: Pressed specimen of *Eriostemon obovalis*, double-flowering and garden grown originally from Diamond Hill, Bendigo.

Mr. R. D. Lee: Mounted seaweed specimens (*Caulerpa Brownii, C. hypnoides, Curdiea laciniata, Hymenocladia polymorpha, Monospora australis, Heterosiphonia Gunniana, Wrangelia clavigera, Ballotia eriophorum, Corallina Cuvieri, Hennedya crispa, Peyssonelia australia*).

Mrs. A. Osborne: Garden weeds, including *Cryptostemma calendulaceum, Polygonum aviculare, Oxalis incarnata, Anagallis arvensis, Cerastium glomeratum, Stellaria media, Plantago coronopus, Plantago lanceolata, Chenopodium album, Euphoroia peplus, Taraxacum officinale, Stachys arvensis, Oxalis corniculata, Rumex acetosella, Sochus oleraceus, Tumaria officinalis, Lythrum Hyssopifolia.*

Mr. R. Savage: Some 60 species of garden grown spring flowers.

Mr. I. Hammett: Display of spring flowers.

Miss E. Macfie: Specimens of various corals (early development of *Porites*) Mushroom Coral, (*Madrepoda* varieties) also *Turbo marmoratus* Linn. (Green or Pearl Snail Shell from China).

Mr. J. S. Seaton: *Platytheca verticillata*, a blue flower from Western Australia, suitable for garden culture.

NANKEEN KESTRELS AND RAT

A rat was seen running along the cement cornice of a factory building near Melbourne, about 40 feet above the street. Two kestrels appeared suddenly and swooped down—one in front of and one after the rat. The latter bird was successful and circled around several times, holding its captive firmly in the talons.—Alex McKenzie (Glenhuntly).

FROM ALICE SPRINGS TO DARWIN

By JOE MOLLISON

Late in April, I returned from a month's wanderings in the Northern Territory, having travelled from Adelaide to Alice Springs by plane. The checkerboad pattern of the rich soil immediately north of Adelaide gave way to very arid country after the plane passed Spencer's Gulf. The country south of Oodnadatta was brown, but north of that town it became red. "The Alice" is a colourful, neat and attractive town, hemmed in by rocky hills, with the magnificent Macdonnell Ranges in the background.

Gap in the Ranges near Alice Springs The "ghost" form of River Red Gum in lower picture. (Photos. by author.)

The Euro or Roan Wallaroo (*Osphranter erubescens*) abounds in the nearby hills. Early one morning I saw a Euro hop the full length of the main street. Hawks hover constantly overhead and Ring-necked Parrots and Crested pigeons are to be seen in the ghost gums. There are two eucalyptus trees known as "ghost gums" in Central Australia. One is a form of the River Red Gum, *E. camaldulensis*. This tree grows to a great size and is found mainly in flat country. The real "ghost gum," a comparatively small slender tree, is a variety of *E. papuana;* it favors higher land than *E. camaldulensis*.

I camped for four days at Simpson's Gap, 15 miles from Alice Springs. The massive red walls towering up into the blue, were an awe-inspiring sight, and the sandy soil (a vivid red) formed a striking contrast to the snow white gums, while the brilliant sunshine and cloudless blue sky of the Centre added to the beauty of the panorama. In the sandy bed of a river near the Gap (there was no water in it, of course!) *E. camaldulensis* grew in abundance. I camped under one of these gnarled gums: they looked very beautiful in the moonlight.

During daytime the weather was hot, but the vicinity of the Gap itself always seemed to be cool. Almost perpendicular walls shut out the sun, and water in the rock pools was icy cold. Tadpoles of one of the three burrowing frogs in the Northern Territory,

and a small water snail inhabited these pools. Eagles soared high over the Gap, and I also saw a number of Apostle Birds, Finches, and Black Cockatoos. Once when I was lying down with a ground sheet over my face to ward off the flies, two crows started cawing hopefully in the tree above me. The flies were very troublesome indeed: the only time when they were not bad was in the early morning and at night—when it was cool. I saw three Sand Goannas (*Varanus gouldii*) but although I chased them, they soon outdistanced me. The speed of these beautifully marked desert reptiles is extraordinary. They seem literally to fly over the ground. These goannas make burrows in the sand and are not arboreal. They prey on the smaller lizards. Thorny Acacias, Hakeas and Mulga were plentiful as also were clumps of the needle-sharp spinifex. Although very little rain had fallen in the Alice Springs district last summer, the spinifex was quite green but it contains an inflammable resin and a clump which I lit blazed fiercely.

Returning to Alice Springs, I met Miss O. M. Pink, a student of anthropology, who lived for four years with the Wilebree tribe at the Granites, 400 miles north-west of Alice Springs. Miss Pink has an interesting ethnological collection, which includes fine examples of woomeras and beaked boomerangs made from mulga, also shields made from the soft wood of the Bean Tree (*Erythrina vespertilio*). In summer this tree is covered with orange pods containing red beans half an inch long. One of the exhibits was a gin's necklace made from these beans.

Spears, both barbed and shovel-nosed types, have a prominent place in Miss Pink's museum. I was particularly interested in the heavy fighting sticks for both men and women. Made from mulga, these smooth, round weapons are about a yard long. I also saw toy beaked boomerangs, play shields for picaninnies and slightly larger weapons for older children to kill small animals. Other interesting exhibits were stone fighting picks or waranbas, and one fearsome looking modern version with a long steel blade. I tried on a gin's headdress made from about 30 split Euro bones. The bones, six inches in length, were attached by spinifex resin to string made from human hair. When jangled together they sound like the music of the xylophone. A fringe like that of a travelling rug, made from the fur of the rock-haunting Ringtail Possum (*Petropseudes dahli*) was shown to me. It is worn across the chest and is the only clothing the Wilebree gins wear. Even then it is only worn in cold weather!

On April 9 I left Alice Springs by bus for Darwin. The 963-mile journey takes three days and for almost half the way, the Stuart Highway runs through typical Central Australian desert. Mountains provided a welcome change of scenery. Central Mount Stuart is particularly impressive. This well known landmark is very smooth and worn in appearance.

After twelve hours' travelling we reached Banka Banka, where

we spent the night. Old Army buildings have been converted into a reasonably comfortable cafe and hostel. A married couple who have the true pioneering spirit, run the place. They are by no means isolated, for even in the wet season, there is always traffic passing through. In the dry season, of course, this hard working couple are kept busy providing huge meals of steak and eggs for hungry tourists and truck drivers. Early next morning we set off for Mataranka. Travelling through the Territory, one gets the impression that it is an empty country. The tiny settlements along the highway are all about 60 or 70 miles apart, and in between there are no signs of habitation; no houses or fences. Occasionally, Myall blacks, naked and armed with spears, come down to the highway.

Numerous birds of prey were seen from the bus, including the Grey Falcon (*Falco hypoleucus*), the Black Falcon (*Falco subniger*), and the Goshawk (*Astur fasciatus*). Occasionally, I saw a Plumed Pigeon (*Lophophaps plumifera*). Known also as the Plumed Bronzewing and Spinifex Pigeon, this attractive little bird frequents mining caps at Tennant Creek. The pigeons are easily tamed and are fed by the miners.

Hot and dusty Tennant Creek is the third largest town in the Territory—it has the only mines in the world where gold is extracted from iron ore; it also has something of a Wild West atmosphere. Water is a serious problem for all water used in the town has to be carted from bores, seven miles away. After we left Newcastle Waters, the desert country gave way to forests and tall waving grass, through which we travelled all the way to Darwin.

I saw several Northern Rosellas (*Platycercus venustus*). It is an attractive bird with black head, white cheek and speckled breast. A particularly interesting Finch, which I also observed near Darwin, was the Painted Finch (*Poephila gouldiae*). The white bill, black head, blue throat, yellow breast and reddish wings of this very beautiful little bird provide a remarkable contrasting colour scheme.

At Darwin I obtained several specimens of the Banded Cockroach (*Cosmozosteris zonata*). The three white bands on this cockroach resemble an aboriginal motif. I also found a number of black and gold mottled beetles (*Aspidomorpha maculatissima*). Having acquired a didjerydoo—five feet long, seven inches in diameter, and painted at each end with alternate white and yellow spots—I prevailed upon a Chinese-Aborigine half-caste, to blow into this hollow musical instrument. He produced a lively, rhythmic chant. However, I heard quite a different sound—a wailing dirge—issuing from a smaller didjerydoo being played in a black's camp.

Many Darwin houses harbour the Velvet Gecko (*Oedura marmorata*). Members of this genus have very soft bodies and smooth skins which are so translucent that the blood shows through, producing a pink colour. The toes of the Velvet Gecko are expanded

discs surmounted by tiny claws which are a great aid in climbing. The little lizards—not more than six inches in length—scamper about the ceiling with great agility. At a Darwin hotel I was able to watch some of them in action. As soon as the lights were switched on and the insect hordes gathered, they would take up their position on the ceiling. For a time they remained motionless —then suddenly they would dart forward and scoop up an insect: occasionally their surprisingly loud and rather shrill call was heard. The title of Barking Gecko is claimed by a different genus (*Gymnodactylus milusii*), but nevertheless many people call *O. marmorata* by that name.

Although the wet season was over, I found Darwin very hot. When the town is replanned it is to be hoped that the need for shady trees in the streets will not be overlooked. It is comparatively easy to hitch-hike in the Territory so, after spending three days in Darwin, I travelled to Adelaide River (72 miles south) by truck. The beautiful Adelaide River crosses the highway a few hundred yards from the "township." The banks of the stream are lined with thick tropical vegetation in which Paper-bark, screw-pines and bamboo predominate. In shallow sections the current is swift, but there are many quiet reaches that are fairly deep. Some lovely dragon-flies flit about the river; the wings of one species are pale-blue, others red and others again, red and black.

While I was writing at night in the local café, a large green friendly tree-frog (*Hyla caerulea*), with skin like satin and shining black eyes hopped on to the table. He quickly gulped down some moths and beetles that I caught for him. Frogs come into the café every night and wax fat on the insects attracted by the lights.

Situated on the top of a low hill—a few hundred yards from the highway—is a concrete, bomb-proof telephone exchange that has long since fallen into disuse. It was a fantastic, eerie sort of place. Mud nests of mason wasps, almost as hard as the concrete itself, were plentiful. I saw several large nests of *Abispa ephippium*, a handsome orange and black wasp. The smaller nests of a related species were like perfectly shaped bottles, only an inch long. Bats hung from the ceiling, looking like giant brown spiders. There were, of course, plenty of spiders, too. I caught a plump velvet gecko as it climbed up the wall. I spent one night in the old exchange, and was quite glad to move down to the more comfortable quarters of the Commonwealth Railways next day.

The fireflies at Adelaide River are fascinating to watch at night. They glow in the darkness like bright sparks and flash off and on. One day I heard a strange bird call—rather like a hoarse croak. I was unable to see the bird, but on making inquiries, I discovered that it was the Blue-winged Kookaburra (*Dacelo leachi*). It was hardly surprising that I should fail to recognize the call of this bird, as it in no way resembles the hearty laugh of the southern kookaburra.

At the former army farm at Adelaide River, I made the acquaintance of Jimmy, a tame Magpie Goose (*Anseranas semipalmata*). Jimmy is something of a character, and is on very friendly terms with the lessees of the farm. But his best friend is the farm's dog; the pair are nearly always together. Jimmy is two years old and was hatched from a clutch of six eggs, brought to the farm by an aborigine—placed in the sun, they hatched in a few days. Four of the goslings killed each other (a common practice of this species, apparently) and of the two that survived, one was accidentally drowned. When strangers are about Jimmy always gives the alarm. He has to be watched when hen eggs are being gathered, otherwise he is apt to carry off a dozen, one by one, arrange them in a circle, and sit on them! Jimmy bullies the domestic ducks, and "rough-and-tumbles" with the cat, in which the dog invariably joins, are frequent. Altogether, he is a remarkable bird.

After spending four very enjoyable days at Adelaide River, I travelled by train and truck to Mataranka. The train which was supposed to leave at 8.15 did not leave until midnight. I arrived at Mataranka at 2 a.m. and camped beside the railway station—merely a wooden shed—until daylight. I was cheered when I awoke by the melodious singing of the Grey Butcher-bird (*Cracticus torquatus*) perched on the station roof above my head. I stayed for three days at Mataranka and then hitch-hiked to Elliott; a long day's run. Important development schemes are in hand at Elliott, but at present there is not even a hotel there, so I rolled out my sleeping bag beside the road, and after yarning to two aborigines for some time, I got under the net and tried to sleep. But I found it impossible—the mosquitoes made so much noise. It was also a cold night, so at about 3 a.m. I lit a fire and sat by it for some hours. By dawn, I felt and looked rather like a "hobo." However, after a substantial breakfast at the café, I once more piled my luggage on a truck and proceeded to Tennant Creek.

I spent a night at Tennant Creek and, the following morning, saw two very interesting pet Molochs or Mountain Devils (*Moloch horridus*). They are owned by a café proprietor, and are each tethered by about 15 feet of string to an empty beer bottle. This ingenious arrangement seems to be quite satisfactory to the slow moving Molochs. After the café is closed they amble about and find their own food. Occasionally they are placed in a saucer of water, which they soak up like blotting paper. No pets could be less troublesome or more treasured by their owner. Their aplomb is something to marvel at. I received the impression that, from a Moloch's viewpoint, human beings are of little importance. When placed on the café counter the lizards remained quite still; indeed it was difficult to believe they were alive.

In the late afternoon of the following day I left Tennant Creek by truck for Alice Springs. The yellow blossom of *Acacia lysiphloia* seemed to cover the desert like a carpet. The phyllodes of many

desert Acacias are of the 'pine needle' type, such as *A. luerrsenii*. *A. lysiphloia* has flat phyllodes, but they are very small, while *A. cowleana* has long, flat, comparatively broad ones. Another species had striking foliage—as if covered with silver paint.

Travelling along the highway at night, one sees many kangaroos and wallabies crossing the road. We hit one kangaroo and narrowly missed several others. The numbers killed by trucks every week must run into hundreds—they are just left on the road for crows and hawks to feed on. It is not always possible for truck drivers to avoid them; often I think they do not try, but in a country where kangaroo hunting is a highly paid occupation, it is not regarded very seriously. At present, so far as I am aware, there is no adequate protection of any kind for native fauna in the Territory. This is a question that will need immediate consideration, if there is any great increase in population in the area—or many interesting forms of life are doomed to extinction.

We camped at Connor's Well, 60 miles from Alice Springs, and as the truck roared off in the early morning, I had an excellent view of the Hartz Range, whose beauty in the pale light of dawn was breathtaking. On arrival at the "Alice," I went for a short walk with Jockey Jim, an aboriginal friend of Miss Pink's who, as his name implies, is a jockey. He soon located and dug out three Netted Dragons (*Amphibolurus reticulatus*), although their shallow burrows twist and turn. He told me of a trip he planned to make shortly east of Alice Springs in search of dingo scalps, for which a substantial bonus is paid. He is devoted to his young wife and two young children who were to accompany him on "walkabout" too. Echidna, which is said to resemble pork, was to figure prominently on the menu. On my return to Melbourne, I presented the Netted Dragons and Gecko to the Healesville Sanctuary.

A DELIGHTFUL BLUE FLOWER FOR THE AUSTRALIAN GARDEN

(Platytheca verticillata of Western Australia)

In September 1948 I collected plants of *Platytheca verticillata* some miles out of Perth and these have been grown successfully by a number of native plant enthusiasts, both in the city and country.

This western relative of the Pink-bells (*Tetratheca*) grows about two feet high, has fine whorled heath-like foliage and beautiful blue or purplish flowers which may be seen almost throughout the year.

Reports regarding its cultivation under widely differing climates and soil conditions confirm the adaptability of the species. There seems little doubt that, with its excellent form, foliage and remarkably long flowering period, it is destined to prove an outstanding introduction for garden culture.

Another West Australian species, *Tetratheca viminea* is noteworthy because it has flowered in Melbourne gardens continuously for two years.

—J. S. Seaton.

SOME FACTORS RELATING TO THE SURVIVAL, OR OTHERWISE, OF THE LOWAN OR MALLEE FOWL (LEIPOA OCELLATA)

By FRED. LEWIS, Melbourne.

There are three species of mound builders native to Australia—the Scrub Fowl and Brush Turkey in the north, and the Lowan in the south. Of the three the last-named appears to be in grave danger of extinction in the not very distant future. In this paper I propose to set out what, in my opinion, are some of the more important factors leading to this very undesirable state of affairs.

The Lowan or Mallee Fowl, as the latter name implies, is a native of Mallee country; but H. H. Finlayson in his admirable little book *The Red Centre* mentions that he found them breeding amongst the mulga scrubs. I have travelled through a good deal of this type of country in Central Australia, and must confess that I have never seen or heard of the Lowan there. Generally speaking it must be admitted that the Mallee country is their principal habitat.

A pair of Lowans at their mound in the Mallee scrub.

Mallee consists of dwarf eucalypts (there are several species) flourishing in north-west Victoria, S.W. New South Wales and across South Australia, with a recurrence beyond the Nullarbor Plain in Western Australia—in a fairly hot portion of the continent having low rainfall (10"-20"). Once the Mallee scrub is cleared, birds disappear; they do not seem able to live outside their usual habitat. Most of the Mallee country in Victoria has already been cleared for wheat growing, the part now remaining being, generally speaking, of so little value as arable land that it is not worth clearing.

This poor country, being all Crown land, is utilized however for several purposes. Much of it is leased to graziers, who run sheep on it and pay only a trifling annual rental. To get a better return, these graziers burn the country every now and then and this effectually drives out the Lowans. It takes three or four years for the Mallee to recover from a burning and the birds may be just coming back when another fire goes through the country—started of course "by accident"—and so another large slice of mallee is rendered useless for the Lowan.

Further areas of mallee are leased to eucalyptus oil distillers and these people are also a menace to the Lowan. In order to get young shoots and suckers, which have a higher oil content than the mature leaves, they cut down the trees. This action reduces the cover and shelter which the Lowan needs and no birds will breed in such areas.

Another menace is the rabbit trapper, who makes holes in the netting fences and places his traps there. The Lowan can fly if necessary, but prefers to remain on the ground and will go through these holes, thus getting caught in the rabbit traps.

The fox is now abundant all through the Mallee country and is blamed for taking eggs from the mounds. My experience is that foxes are innocent of this (local farmers are the principal culprits); but I have an idea that young birds just hatched must fall an easy prey.

The conditions described above apply to Victoria, but from inquiries in New South Wales, South Australia and Western Australia, I do not think they are ever any better. As a matter of fact, Lowans are understood to be extremely rare if not extinct in New South Wales and Western Australia; they are by no means abundant in South Australia. Now what are *we* going to do about it?

The large Wyperfeld National Park was proclaimed mainly to preserve the Lowan. I have been over the greater part of this Reserve many times but Lowans are not at all plentiful there. Most of the area is not suitable as a breeding place for these birds. There is a fairly large area around Hattah which has been reserved as a National Forest and strict sanctuary. In this a few birds breed. Generally speaking, however, the position of the Lowan is really serious and I am full of pessimism regarding its future.

ELTHAM EXCURSION

The birds co-operated nobly for the Saturday afternoon outing to Eltham on October 14, and the thirty members who came had good opportunities to see the Olive-backed Oriole (and nest), Pallid and Horsefield Bronze Cuckoos, Rufous Whistler and various other species.

Spring flowers and spring sunshine completed the requirements for a happy afternoon.

—I.M.W.

WHY STUDY ORCHIDS?

By W. H. Nicholls, Melbourne.

One of the most treasured letters in my possession, and one that shaped my final decision to take up the study of our native orchids as a life-time hobby, came in 1923 from the late Dr. Richard S. Rogers—that fine old man of Australian Orchidology who passed away, revered and covered with honours, in 1942. His kindly advice and encouragement have meant much to me, and he so eloquently justifies the spirit of inquiry—of pure scientific research for its own sake—that his words are worth sharing with all Australian naturalists. The following quotation from Dr. Rogers' letter is therefore published as a historical contribution to our journal during this 70th anniversary year of the F.N.C.V.

Of what use is the study of orchids? The same question might be asked with regard to the study of many other families of plants or, in fact, with regard to numerous studies in pure science, the advantageous results of which are not obvious to the average man in the street.

To the true student, such a question is of little moment. He pursues his studies, feeling sure that any iota, which he may be able to add to the sum of human knowledge, will find some useful application as time goes on. Many such results are indirect, assisting and facilitating as they do research in other branches of botany or in other departments of science, e.g., the immense attention, devoted by Darwin and others to the fertilization of orchids, gave a tremendous impetus to the study of fertilization in other plants and has rendered possible such an economic triumph as pertains to our knowledge of the method of fertilization in the Smyrna Fig, which has brought millions of pounds into the coffers of a number of countries on this old globe.

Then again, by the study of the distribution of plants and animals, former land connections between continents and other land masses have been largely determined. It is of supreme importance that we should be acquainted with the facts concerning such connections, because many economic problems depend for their solution upon such knowledge. In many tropical countries contiguous to Australia, e.g., New Guinea, Java and others, orchids constitute the largest portion of the flora, and consequently it is most desirable that this family should receive particular attention, as the data so obtained become important checks to data obtained from zoological and geological sources.

It is only very short-sighted people who discount the value of a scientific hobby because it has been unproductive of any economic application in the past and may remain unproductive, so far as their limited vision is concerned, in the future. In comparatively few of the world's most revolutionary discoveries, have the problems at first presented themselves, in their economic aspects, to the minds of their investigators. They have originated from the study of pure science, without any ulterior object than the deep interest which such a study inspires. This is true of X-rays, electricity, with the telephone and telegraph and other countless applications, all of which had their beginnings in such apparently trifling and purposeless investigations as your work in orchids. It is obvious that the *study* and *research* must precede the possible application. Many lines of research have led their investigators down apparently blind alleys, from which they have occasionally emerged into a great light.

There have been but few direct economic consequences from the study of orchids in the past. Perhaps the most important has been the dis-

covery of vanilla, which is no mean industry. Where it may lead in the future, it is very difficult to conceive. There are decided possibilities, for instance, in the investigation of the relationship which exists between many (if not all) orchids and certain root fungi. It is conceivable that this may throw some light upon the difficult problem of immunity in disease.

Under any circumstances, such a hobby is a wholesome healthy one, adding a deep interest and charm to life, as well as a piquant "set-off" to the drab monotony of our daily routine. Don't give it up!

POLE BRANDING

Did you know that, for some years now, each new electric light or power pole erected has been branded?

Set deeply into a circular depression, at a height of about 5 feet, is a metal plate branded in the manner indicated (at left).

This gives the following information:

S.E.C.	State Electricity Commission,
40	Height of pole (complete — including length below ground surface),
T.W.	Type of timber (see below),
49	Year timber cut (not necessarily erected).

Mr. D. Tonkin, the Officer of the Commission who showed the marking to several members recently, has given the following list of initials of the various types of Australian timber used, and the State of origin:

I.B.—Iron Bark (two types, grey and red—Vic. and N.S.W.)
G.B.—Grey Box (Vic. and N.S.W.)
T.W.—Tallow Wood (N.S.W.)
W.M.—White Mahogany (N.S.W.).
G.G.—Grey Gum (N.S.W.)
B.B.—Black Butt (N.S.W.)
M.M.—Messmate (Vic. and N.S.W.)
W.S.B.—White Stringy Bark (Vic. and N.S.W.)
Y.S.B.—Yellow Stringy Bark (Vic. and N.S.W.)
B.W.—Blood Wood (N.S.W.)

—I.M.W.

TREE PLANTING ON HIGHWAYS

With a view to encouraging the planting of larger quantities of eucalypts on our highways, I sought the help of the C.R.B. in planting several miles of Calder Highway (in close proximity to Gisborne) with a number of different eucalypts. The species which proved outstanding were: Manna Gum, Yellow Gum and Peppermint—all indigenous to the district and destined to blend harmoniously with the surroundings. These trees are planted chiefly on the west side of Calder Highway (29, 30 and 31 mile posts). Cost of the scheme was undertaken by public subscription, Gisborne Shire Council and myself.

Those eucalypts which did not prove successful have been replanted with Ash, Scarlet Oak and Elm. The highway was planted 20 years ago and promises to become a good asset. Consideration should be given by councillors to the beautification of our highways by planting more of our eucalypts on 2- and 3-chain roads. Lessons may be learned from Great Britain, Canada, U.S.A. and New Zealand in planting indigenous trees. Visitors from abroad are at a loss to understand why the *Eucalyptus* Group has not received more attention in its homeland.

—James Railton.

THE LATE CHARLES HAMILTON FRENCH

By E. E. Pescott

Charles French, Junior, as we knew him, was born at South Yarra in June, 1868, and died in July, 1950, after a long residence at Canterbury. (See note in *Vict. Nat.*, Aug. 1950, p. 76), his wife having predeceased him in April, 1949. He was a son of our founder, Charles French the First, from

CHARLES FRENCH, JNR.
An informal snapshot, at Frankston, 1945.
Photo. by courtesy *Wild Life*.

whom he inherited his natural history instincts. He was a born naturalist, with an amazing general knowledge of Australian plants, birds, reptiles, insects, aboriginal artefacts, etc.—all came under his purview.

After leaving school, Charles French, Jnr., entered the office of Mr. Patey, a solicitor in Collins Street; and also a Life Member of this Club. Later he worked for Dr. Blair of Collins Street. But natural history was ever before him and he soon found more congenial employment on the staff of the National Herbarium (then called the "Phytologic Museum of Melbourne") as a junior assistant under Baron von Mueller; his brother George also went to work there as Mueller's messenger.

A good all-round knowledge of botany had been acquired from his father, who was formerly Mueller's label writer and classifier of plants at the Botanic Gardens, and young Charles always willingly helped his father in this work. While at the Gardens, the French father became a keen student of entomology and quite early made a fine collection of insect specimens.

Charles Jnr. assisted the Baron for 13 years and during that period (until the latter's death in 1896) he travelled in almost every portion of the Colony, always making extensive collections for the Herbarium. He also brought back many entomological specimens for his father, and so amassed a store of information in this science. Indeed, whatever he saw that might interest some specialist, he put it in his bag, making his friends—particularly those in the Club—very happy.

Later, Charles Snr. was appointed Government Entomologist (1889) and part of his work was to administer the newly passed Vegetation Diseases Act. Charles Jnr. was appointed the first Inspector, later to become, as the work extended, Assistant Government Entomologist. Upon the retirement of his father (1908) he in turn became Government Entomologist and some years afterwards, when his great friend, the late C. C. Brittlebank, retired, he was promoted to Biologist in the Department of Agriculture—a position he held until 1933, when he retired full of honour and respect.

In the pre-Club days—and I have referred to this before (see *Vict. Nat.*, May, 1940, p. 4)—regular Sunday meetings of half-a-dozen naturalists would take place at the South Yarra home in Anderson Street, and these enthusiasts would tell tales of their last week's collectings. The boy Charles was always present, absorbing what he could, and when a meeting to discuss the formation of a Naturalists' Club was held, he was there too. He accompanied his father to the first meeting of our Club, held at the Melbourne Athenaeum on May 17th, 1880 (*Southern Science Record*, I, p. 11, Dec., 1880), but was not allowed to join at once, since his father thought him too young; so he did not have the honour of becoming an original member. After joining up in July, 1883, he remained faithful right to the end, being worthily elected to Honorary Membership in August, 1937.

During his Herbarium days he was a staunch personal friend of the great Baron, who affectionately called him "Sharley", and "Sharley" had many fond and amusing tales to tell about the Baron, his work and idiosyncrasies. The young assistant had a flair for remembering scientific names and in this regard could rarely be "floored". In addition, his extensive travelling brought him in demand. On one occasion Professor Baldwin Spencer asked him to keep a look out for aboriginal mounds in the north of the State. Having seen some, Charley went back there and, after some days' digging, brought two dozen skulls, other bones and about 50 stone axes to the Melbourne Museum.

He was particularly helpful to me in my orchid collecting. On many occasions we tramped the bush to orchid localities, and he never failed to spy out what we were looking for—except once. We were the only collectors who knew of a fine patch of that rare and lovely bluish-green Sun-orchid, *Thelymitra epipactoides*—in the heaths at Cheltenham. Unfortunately, he had shown this patch to a friend, and next year there were none left. The

"friend" had returned, carefully marked the plants, and come back later to dig up all the tubers, which were sold to someone in England!

Charles wrote little. His few notes in the *Victorian Naturalist* were mainly on orchid localities and on native insects that had become pests, but in February and March, 1943, he contributed a series of entertaining reminiscenes, "Tales told in Club." His information was mostly distributed in letters and in personal talks; but he always gave it very freely and happily. For a number of years he lectured on Entomology to agricultural students at the Melbourne University and also at the Burnley School of Horticulture. Since his retirement 17 years ago he had undertaken the naming of many mounted botanical collections sent in by country schools to the State Schools' Nursery, Oakleigh; doubtful specimens were always referred to the National Herbarium for identification. He found much pleasure in tending several glasshouses where orchids and begonias grew; choice fuchsias, roses and new tea-tree hybrids were also among the many flowers that flourished in his garden at Dudley Parade, Canterbury.

He provided numerous collectings for the Waite Agricultural Institute, South Australia. Large numbers of plant specimens went from time to time to our National Herbarium, where his books and magazines were recently donated by the family. Some of his earliest orchid and fungal specimens were accompanied by life-like sketches in colour.

I first met Charley French in 1899. Kindred interests made us pals at once, the friendship deepening as the years passed. And now, after a wonderfully full life, he has gone; but we shall remember him as everybody's comrade and the enemy of none. I am grateful for the privilege of paying this tribute—that of an old friend.

PLOVER'S UNUSUAL NESTING SITE

Early in June I noticed that a Spur-winged Plover had nested beside the railway track, between Miram and Kaniva on the main line to Adelaide. The site selected for a nest was only about 5 feet from the rails. There were four eggs in the nest. Every time a train approached, no matter at what hour, the plover would be facing it. When the train was about 50 yards away, the mother bird would stand erect over the nest, with outstretched wings and head thrust forward facing the engine. As the train roared past, she would turn around in order still to face the engine. She did not appear to worry about trucks or carriages—only engines. Then she would settle down, as much as to say, "Well, I got rid of *that* one." About the first week in July, this brave bird had disappeared, presumably the eggs had hatched and the young birds gone. Is this early for a plover to nest? The spot chosen was certainly a strange one.

—E. T. MUIR.

TREE PLANTING

The Forests Commission of Victoria has published a useful bulletin "The Selection, Propagation and Planting of Trees in the Country Districts of Victoria" which should be of special interest to members of the Club interested in planting their own properties or in connection with the Club's group planting activities. Native and exotic trees and some shrubs are classified in relation to their suitability for the different rainfall zones of the State, together with a good non-technical description of many species. Practical hints on propagation and planting are included. The booklet may be obtained for 1/- from the Commission's Head Office, Public Buildings, Treasury Place, Melbourne.

The "Save the Forests Campaign Council" of which the Club is a constituent member, also has a number of free leaflets on tree-raising from seed, planting and after care, including one on tree growing in dry areas. These may be had at the Council's office, Temple Court, 422 Collins Street, Melbourne.

—G.N.H.

CORREAS IN THE U.S.A.

(Extract from *Horticulture*, Journal of the Massachusetts Horticultural Society, July 1949)

When, upon the heels of the January freeze, I went into the garden to check damage, I found every Correa as chipper as ever and blooming merrily. These evergreen Australian shrubs have been slow getting into circulation; but, now that at least five Correa species are in the trade, there is no reason for their disuse. *Correa pulchella*, with pink bells, is the earliest to bloom, coming into flower in October and keeping it up well into spring. As far as I know it is the most adaptable of the lot for it thrives under various conditions and can be used in many ways. I keep the branches of mine reduced and train it up a trellis. I have one neighbour who uses her *C. pulchella* as a magnificent pot plant, and another who grows her as a wide low specimen plant near the lawn.

Correa magnifica, said by some authorities to be *C. ferruginea*, makes a dense five foot bush eight feet across. It has chartreuse flower tubes and is foliaged to the ground with thick leathery leaves, dark green above and covered beneath with bronze fuzz. My *C. magnifica* has never been watered; it has been blooming for two months. The flowers of *C. Harrisi* and of *C. speciosa ventricosa* are dark rhodonite red and those of the latter are tipped with green. *C. neglecta*, just introduced, is a joy; its fat bells flare, like those of *C. pulchella*, and are of pure scarlet. My seven-inch plant is full of bloom.

All Correa bells are divided at the tip into four pointed divisions. The bells of the few species in the Californian trade are rough (like the finest grade of sandpaper) outside, smooth inside, and emerge from bright green calyces which look like neat skullcaps. The species differ in the flare—or lack of flare—of the bell, in the colour of leaf and habit of growth. They do not require over-watered.

—G. N. Hyam.

[Apart from *Correa pulchella*, described in 1824, and *C. neglecta* (1939) which is synonymous with it, the remaining plants (*magnifica*, *ferruginea* and *Harrisii*) are not true botanical species, but forms of garden origin which were first cultivated in England and illustrated in Paxton's *Magazine of Botany* during the 1840's. It is of interest to know these are still popular in the U.S.A.—Ed.]

FLOWERING OF BLACKWOODS

Have any other members noticed how profusely Blackwoods flowered this spring?

During the four years we have lived in the Gippsland Hills (in the neighbourhood of Yinnar-Boolarra-Mirboo) we have found these most beautiful of native trees a source of interest and delight at all seasons. Single specimens growing in the open paddocks are beautifully proportioned parkland trees, while those of the steep mountain gullies are tall, slender and graceful, the trunks sometimes still enfolding portions of the treefern on which their seed first took root.

In other years only a tree here and there seemed to bloom, the pale blossom being almost unnoticeable at a distance. During August of this year (they were fading by late September) the creeks and roadsides became long lines of bright blossom, scarcely a tree missing out. Surely there will be a "bumper" harvest of seed!

This has been an abnormally dry winter and the people of the hills believe that heavy blooming of the Blackwoods presages a drought.

—E. Lyndon.
Yinnar.

WHAT, WHERE AND WHEN

Reminder:

Saturday, November 11—Woodend to Macedon. Five mile walk. Subject: Railway Reserve Flora and Birds. Leaders: Mr. and Mrs. D. Lewis. Train from Spencer Street, 9.20 a.m. Book 2nd return Woodend, fare 11/3. Bring two meals.

General Excursions:

Saturday to Sunday, November 25-26—Cape Woolamai (Phillip Island). Subject: "Arrival of Mutton Birds after dusk." Parlour Coach from Batman Avenue, 1.15 p.m. Saturday, return to city 6.30 p.m. Sunday. Fare 27/-. Overnight accommodation for a limited number, but it will be necessary for the majority to arrange to camp, which will be at Cape Woolamai. Campers provide four meals, others three; and each should bring a good torch and strong, warm clothing. Tour of Phillip Island on the Sunday. Coach and accommodation bookings with Mr. H. C. Stewart, 14 Bayview Terrace, Ascot Vale. (Tel.: FU 022. Extn. 457). Enquiries re camp with Miss J. Blackburn, 4 Allenby Avenue, Glen Iris. (Tel.: MB 1657.)

Saturday, December 2—Somerton, Mt. Gellibrand, Broadmeadows. Seven mile walk. Subject: Botany and Geology (also of Historic interest). Leader: Mr. K. Atkins. Fawkner-Somerton train from Flinders Street at 9.28 a.m. Book 2nd single to Somerton. Bring lunch and afternoon tea. (The leader will meet the party at Fawkner.)

Group Fixtures:

Saturday, November 18—Marine Biology Excursion to Beaumaris. Leader: Mr. A. J. Swaby. Meet at Surf Avenue bus stop at 2 p.m. (Train to Sandringham, then Beaumaris bus.) Bring old shoes for wading. Visitors cordially welcome.

Saturday, November 25—Botany Group Excursion to Mt. Morton. Leader: Miss Argo. Train: 9.18 a.m. to Ferntree Gully, then bus to South Belgrave. Bring meals.

Monday, November 27—Botany Discussion Group. Royal Society's Hall, 8 p.m. Monthly meeting—5 minute talks by members. Hon. Sec.: Mrs. A. Osborne, 21 Renwick St., Glen Iris, S.E.6.

Friday, December 1—Marine Biology Group. Royal Society's Hall, 7.45 p.m. Monthly Meeting. Hon. Sec.: Miss C. Walker, 530 Burwood Road, Hawthorn, E.2. (Tel.: WA 3167.)

Tuesday, December 5—Native Plants Preservation Group. At home of Miss W. Waddell, 3 Denham Place, Toorak, at 8 p.m.

Tuesday, December 5—Geology Discussion Group. Royal Society's Hall, 8 p.m. Monthly meeting. Subject: "Geological Pot-pourri", contributed by members. Hon. Sec.: Mr. A. A. Baker, 53 Carlisle Street, Preston.

Thursday, December 7—Wildflower Garden Section. Royal Society's Hall, 8 p.m. Hon. Sec.: Mr. R. B. Jennison, c/o Brooklea Post Office, Geelong Road, West Footscray.

Saturday, December 9—Geology Discussion Group excursion to Moonee Ponds Creek. Meet at bridge (Ormond Road/Brunswick Road) at 2.30 p.m. Take Essendon Tram to Ormond Road, Ascot Vale, and walk down Ormond Road to bridge. Subject: Silurian Fossils. Leader: Mr. A. A. Baker.

—J. Blackburn,
Excursion Secretary.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on Monday, November 13, 1950. The President, Mr. E. E. Lord, was in the chair and about 200 members and friends attended.

Mr. A. Swaby reported on a specimen of *Leptospermum*, grown by Mr. Nethercote. This plant is a hybrid between *L. laevigatum* and *L. Nicholii*. The tree is 10 ft. to 12 ft. high and the bark is that of *L. laevigatum*. The President, in commenting, stated that this fine specimen showed how our tea-trees can be worked on and made to produce some very beautiful forms. A great deal of work can be done in the growing and hybridizing of our native flora.

New members elected were:—*Ordinary*: Miss M. Horner, Miss V. Goldsmith, Mr. A. W. Garden, Mrs. V. K. Yeats. *Country*: Mrs. A Neven.

The following nomination was received:—*Ordinary*: Mr. Gordon Bowden, Ellesmere Parade, Rosanna. (Miss A. M. Burton/Mr. A. Burke).

Miss Waddell reported that Mr. Richard Kent of Maryborough is very interested in the formation of a local sanctuary, and would be glad to hear of anyone in the district willing to support the project.

The speaker for the evening was Mr. P. G. Law, Chief of the Antarctic Division of the Department of External Affairs, who, in his short address prior to the showing of the films on Heard Island, told us that Heard and Macquarie Islands act as the only sanctuaries in the Southern Ocean for sea life. Very little land life exists. The first film, in black and white, was taken by the two young geologists of the party and showed some outstanding photography. The fearlessness of the birds enabled some remarkable close-ups to be taken of their quaint antics and nesting habits. The colour film, shown later, emphasized the beauty of these birds, particularly the orange crested macaroni penguins and the king penguins and the graceful lines of the wandering albatross in flight.

A vote of thanks to Mr. Law and to one of the photographers who was present, was moved by Mr. F. Lewis and seconded by Mrs. Hanks.

EXHIBITS

Mr. W. Haase: Grampians flowers—*Pultenaea subalpina (rosea), Colectasia cyanea, Boronia pilosa, Boronia pinnata, Melaleuca decussata, Conospermum Mitchelli, Bauera sessiliflora, Grevillea oleoides, Lhotzqya alpestris, Thryptomene calycina, Micromyrtus ciliatus.*

Mr. A. Swaby: *Leptospermum* grown by Mr. Nethercote. A hybrid between *L. laevigatum* and *L. Nicholii.*

Mr. R. Garnet: Awned seeds of the Storksbill (introduced plant *Erodium cicutarium*) showing the habit of coiling spirally when dry and straightening when moist.

Mr. R. Atkins: Plants from Sydney area. *Actinotus helianthi, Boronia serrulata, Eriostemon lanceolatus, Sowerbaea juncea, Styphelia triflora.*

Mr. J. S. Seaton: *Verticordia plumosa* (garden grown).

Mr. R. D. Lee: Photos taken on the Longwood/Tallarook excursion; members at Longwood reserve; section of the reserve; *Cheiranthera linearis, Goodenia geniculata, Drosera glanduligera, Dilwynia floribunda, Diuris sulphurea.*

Mr. C. J. Gabriel: Victorian Cowrie shells—*Umbilia hesitata* Iredale, *Trivia merces* Iredale, *Cypraea angustata* Gmel. and varieties.

Miss E. Macfie: Two varieties of *Avicula* or Pearl Oyster from which the finest pearls are taken. *Pinna carnea*—Fan shell. One of the few species of shell that are of a cellular structure.

LYRE-BIRD "STALKING" IN MID-SUMMER

On January 29, 1950, with great determination to give an Englishman the best possible impressions of our country, we planned to visit Sherbrooke Forest and see the lyre-birds. The day dawned hot and stifling, and it seemed foolhardy to pursue our plans; but, with the hope of some relief from the heat, we set out. After one fruitless "stalk" it was decided to have lunch by the bridge at the falls.

We had just settled down when, not a yard from our visitor, there stood a hen bird. It seemed like wishful thinking, but she stayed foraging round our camp for nearly five minutes, quite unafraid, though spurning all proffered titbits of meat. Presently the cock came to join his mate and offspring (also present at a short distance) and we were privileged to witness a continuous five-minute recital and parade of his new season's finery (unfortunately, not spread).

Although it is rather unusual to hear these birds so well in late summer, Mr. Chisholm thinks that, having just grown in his plumage after the October moult, the cock was feeling in fine fettle, while the hen, having no domestic ties, would be less prone to anxiety.

—DAWN WESTON.

. . . We so seldom recognize Nature as life. When someone, or luck, does us an ill turn, or when we are just, but not kind, to others we say "That's life."

But life is the hard, potent seed of a tree, life is the tilt of a buzzard's wing. Life is the womb; life is the out-reaching, knowledgeable tendril of the grapevine. Life is thrush-song after rain, the rippling of a muscle under the seal's wet fur. It is anything living, but not the man-made troubles we call by that name.

From *Singing in the Wilderness*, by Donald Culross Peattie.

SAVE THE SEALS—PART I

By EDITH COLEMAN, Blackburn

Introductory

If any apology be needed for trespassing upon the marine zoologists' "field" the poet James Montgomery offers it:

> . . . Creation teems with life
> From the gay flies that people the sunbeam
> To the huge whale whose home is in the deep.
> And the wise elephant that shades him in the forest.

It seems impossible for the nature lover to confine his interests to one field! But, indeed, it *is* time that every naturalist should take up the cause of our seals. Having seen those at Seal Rocks (Western Port) and watched at close quarters a stray seal disporting for five days about some rocks near the Cowes jetty, as well as the apparently happy captives of our Aquarium, it came as a surprise to read "Seals and walruses make up a separate order, of little concern in nature study." (Leach's *Nature Study*, p. 306). Although Dr. Leach was dealing with classification, the last six words will surprise all who are familiar with the anatomy of the seal—its perfect adaptation for aquatic life and the capture of sea food; its development from a land animal, so clearly written on its webbed fin-feet; nostrils that close underwater permitting it to swim for long periods without respiration; the ease and grace with which it still uses its hands and feet in the manner of its land-bound ancestors.

"The living platypus, echidna, koala and kookaburra have done more to make Australia known abroad than any politician living or dead." (*Argus*, 3/1/36). The seal should be added to the list of Australia's animal ambassadors. The chief reason that so few people have made a close study of the seal lies in its inaccessibility. A visit to the Aquarium reveals its beauty, its dexterity in two elements, its dog-like friendliness, its mild, trusting eyes and its frolicsome ways, even in confinement, where, of necessity, life is a long-drawn question "between a meal and a meal."

Unafraid of us they gambol in and out of the pool, their streamlined bodies making torpedo-like dives, to reappear on the surface many yards away. Then they haul out to continue their frolics on "land," playing like dogs, with open mouths pretending to bite; chasing each other with surprising swiftness until one, losing its foothold, will finish the race by sliding, just as swiftly, on its stomach —skylarking as though on the rocks of their natural habitats. This is not morbid anatomy, but a study of the living seal.

It will be seen that there really is no excuse for not knowing the seal. We should be able to supplement this observation of the living animal with some knowledge of its anatomy derived from museum specimens. I found none in our Melbourne Museum. In

1882 Sir Frederick McCoy wrote of having placed there male and female adults and a pup. Possibly methods of preserving the skins were not then perfected.

According to Professor F. Wood Jones, writing in 1925, "the specimens of our fur seal in the museums of Australia are altogether insufficient, although countless thousands of skins have been exported, it would be difficult to procure in the scientific institutions of the Commonwealth enough material to make a satisfactory scientific examination of the animal as a species." This lack has probably been attended to since the above was written.

But it is only in the water that one fully realizes the beauty and grace of the seal. Said Kipling's Eddi, with his mouth full of rock-cod caught by Meon's seal: "Surely God has made the seal the loveliest of His creatures in the water. Look how Padda breasts the current! He stands up to it like a rock."

Feeding Habits

We have much to learn about the habits of seals. Apart from a few fish, cephalopods, an occasional crayfish and as much flesh as they can break from the detested stingray, we know little of their food preferences; yet it may be assumed that many other creatures are eaten, possibly also sea-grass or other sea flora. Pebbles and quite large stones up to the size of a tennis ball are sometimes found in the stomach. It is surmised that they serve a digestive purpose, perhaps to break up fish-bones, so that digestive juices may more readily act on them, just as small stones and grit in the gizzards of birds are said to grind up corn.

The pet hares of the poet Cowper greedily ate sand when he placed a jar of it in their houses. Certain birds eat feathers. The British grebe, according to Colonel Rankin, feeds feathers to its young, probably to line the gut and reduce risk of perforation by fish bones; or as a strainer, or even to supply ergosterol which elaborates vitamins. Mr. Henderson, keeper of the seals at our Aquarium, suggests that the stones are inadvertently scooped up, with a fish, from the sea-bed. He very kindly placed some stones in the seals' enclosure in order to note their re-action, but so far they have evinced no interest in them.

We may, however, find a parallel in the earth-eating habits of animals, and even of some primitive people, apparently to supply something lacking in the diet. During investigations made at Seal Rocks by Mr. F. Lewis, then Inspector of Fisheries and Game, an old male and a young seal were killed. The stomach of the old one was full of fluid only, and that of the other contained merely a few bunches of red worms.

According to Mr. Lewis "huge heaps of barracoota bones may be seen on Seal Rocks, and from this it is apparent that one of the principal sources of their food is the shoals of barracoota so common in the Strait." This suggests that seals carried fish to

Above: "Sally," a South Australian seal at Koala Park, Adelaide, would follow the keeper at feeding time.
Below: A stray seal, from Seal Rocks, played and fed about Cowes Jetty for five days. He taught an admiring crowd much about the ways of seals.

the Rocks to consume, but our fur seals appear to feed only in the water. Is it not possible that sea-birds were responsible for those heaps of bones?

The Aquarium seals do not care for barracoota; they prefer salmon-trout which are cut up and tossed to them in the pools. Mullet are swallowed whole. If fed with a fish too big to swallow they hold it with their sharp seizing-teeth and shake it, until a piece is broken off. When Padda the tame seal was brought outside, and offered a mullet of the same size as those fed to him in the water, he could not swallow it although he made several attempts, then dropped it on the ground and left it. A mullet seized in the sea would probably be tossed up and caught head first, water on its skin aiding the swallowing.

Hood and Harp seals, which breed only on ice floes, may bring fish to a floe to consume. I have seen a picture of one with its foot on a fish, as if it were tearing flesh from it.

It must be a strange experience for seals to be transferred from buoyant sea-water to fresh-water pools. In natural conditions much seawater would be gulped down with the fish. The authorities at the Aquarium kindly placed a large bowl of fresh sea-water in the seals' enclosure. Mrs. Green, Secretary and Manager, reported (22/6/50) that they had been closely observing the seals' reactions. "They make no attempt to drink the water, although they are quite interested in taking fish from it." Mr. Lewis saw a big seal lapping up sea-water like a dog.

At Sorrento, when Mr. W. Roe and two other adults were fishing from rocks off Jubilee Point, they saw a seal dive three times, each time bringing up a fish about the size of a mullet, which it tossed into the air, caught and swallowed. On the fourth dive it came to the surface with a fair-sized crayfish which was tossed and swallowed in the same way. Said Mr. Roe: "If any one had told me that a seal could swallow a crayfish I should not have believed it." However, Tasmanian fisherman have complained that eighty per cent of underweight crayfish turned out of the pots are destroyed by seals before they reach the sea-floor.

A fisherman at Seal Rocks reported having seen a seal throwing into the air a stingray until it came to pieces. (*Fishes of Australia*, Whitley, 1940.)

Professor Wood Jones watched for hours a seal playing with a large *Fiddler* (Stingray family). The seal seized hold of some part of the Fiddler and shook it, as a dog shakes a rat. As the heavy Fiddler was flung away some chunk was ripped from its body. The seal then circled round the sinking Fiddler and repeated the performance. In these instances the seal was tossing the fish, not to swallow, but to break pieces from it.

Time and patience are exhausted in training "performing" seals, yet nothing a seal can learn from man is as marvellous as its own

natural actions, seen even in an aquarium. With a few rocky "outcrops" placed around the pools, the seals will teach us that man himself has much to learn from seals.

A Lesson from America

"Some extra pesos line the pockets of a few Mexicans and the escutcheon of man's trusteeship of wild life on this planet has received another bar sinister."

Thus wrote Professor W. Beebe, when he learned, that, for a consideration, the Mexican powers had rescinded their protection over the sea-lions of San Benito, and that they had all been slaughtered for canned dog food. Those sea lions had worn smooth the rocks on which they had clambered for centuries—worn down and polished the sharpest out-croppings. Now nothing was left of them on the island but hides and skeletons.

"It may be," said Professor Beebe, "that a remnant of the seals escaped, and, with the unconquerable faith in life and existence with which we like to endow the splendid vitality of wild creatures, may again creep fearfully out upon land and try to re-instate themselves, to bring forth their babies, and to enjoy life, freedom and the pursuit of happiness as they know it,"—a forlorn hope as Professor Beebe well knew.

The fur seals of Guadalupe, which had probably lived on the island for at least fifty million years, were slaughtered and rendered nearly extinct within 40 years. "Two hundred thousand were slaughtered on the island," said Prof. Beebe, "to protect our grandmothers from chilblains, till nothing was left of them but a few skulls in museums, and an ancient moth-eaten cloak in some forgotten attic."

Professor Beebe's indictment applies to the white inhabitants of Australia who permitted ruthless and useless slaughter of one of our greatest living assets. Although the aborigine speared seals for food and oil, his depredations, owing to his nomadic habits and primitive weapons, made little difference to the seal population. Their merciless slaughter by the white man must have startled him, who killed to eat, not for sport, and who practised a restraint that enabled him to exist in an admittedly hard land. Every seal nursery in the world tells the same sorry tale of man's barbarism and greed.

Before dealing with the history of our own seals let me briefly relate the story of the loot and ruin of North Pacific seals, and their too-tardy rehabilitation. The habits and life processes of these seals differ little from our own. Although the skins of Australian fur seals cannot compete with those of the North Pacific, in view of the present world need for oil and skins, and the periodical demands of fisherman that the number of our seals should be reduced, the story offers a lesson by which we may perhaps profit. It should, at least, be widely known.

Massacre of North Pacific Seals

The following abridged notes are taken from the *Pacific Historical Review* 1935.

By the year 1911 the North Pacific fur seal was little more than a reminder of the greed and rapacity of man. The magnificent herd on the Pribilof Islands had been reduced from approximately four millions in 1867 to a rapidly dwindling 100,000. A parallel decimation had occurred in Russia's Commander Islands, the only other important seal rookery in the North Pacific.

At the rate of slaughter it would be only a matter of a few years before the fur seal, one of the most beautiful of wild creatures, would become practically extinct. The story of how the herd was saved and rehabilitated by the North Pacific Sealing Convention of 1911, should be known wherever seals abound. "This Convention was a major victory in the struggle for the conservation of natural resources, a triumph for diplomacy, and a landmark in the history of international co-operation."

It was estimated that not more than one male seal in 100 was necessary for the propagation of the herd, and that a judicious elimination of a large number of bachelor seals is biologically unobjectionable, and at the same time commercially desirable. On land it was easy to identify unnecessary males, but between 1881-1882 pelagic sealing developed, i.e., killing floating or swimming seals, in which condition it was impossible to distinguish the sexes; so that 80 per cent of those killed were females, which range further for food than males, and because of regulated land-killing, there were more of them. Most of these females were not only in calf again, but had left in the nurseries a nursing pup which would now starve to death.

In 1896 G. A. Clark counted 16,000 starving pups on two islands of the Pribilofs. Moreover, half the seals that were shot from pelagic schooners (Canadian and American) swam away mortally wounded, and their bodies were not recovered. Land sealing operations in the Pribilofs were conducted by U.S.A. under carefully regulated government control; but pelagic sealers operated outside the three mile radius.

America finally took the extreme position that, since the seals bred in American territory, they were American property, and seized pelagic schooners operating in the high seas. Britain protested, and the questions were referred to a tribunal which sat in Paris in 1893. The decision was on every count against U.S.A. The tribunal, however, laid down rules which it was believed would prevent extermination of the seals, among them, a close season of three months, use of fire arms forbidden, pelagic schooners not to approach within 60 miles of the rookeries.

But female seals ranged beyond 60 miles. Spears were used, which were silent and more deadly, and the close season proved to be at the wrong time of the year. In 1897 U.S.A. took up the

matter of pelagic sealing with Great Britain in earnest, and passed a law forbidding its own citizens to engage in it. This virtually gave Canadians a monopoly of pelagic sealing!

Then Japanese pelagic sealers appeared in great numbers off the Pribilofs, and as they were not bound by the decision in operation between Great Britain and U.S.A. they could use firearms and operate in the close season. At one period 25 Japanese pelagic schooners with 810 men and 210 small boats were operating. There was wholesale butchery just outside the three mile line, and the herd seemed doomed. Japanese schooners were often seized and warning shots were fired. When crews of four Japanese schooners landed on the Pribilof nurseries and began slaughtering the seals, five of the poachers were killed, two wounded and 12 were taken prisoner. Japan made no protest, although things were unpleasant.

In 1897 Japan, Russia and U.S.A. sent representatives to a joint conference in Washington, and three powers agreed to prohibit pelagic sealing if Great Britain would come into the agreement. This, influenced by Canadian protests, she refused to do, although she could not fail to see that pelagic sealing was self-destructive. London was the seal dressing and dyeing centre of the world. Extermination of the American herd would end a profitable business.

The North Pacific Sealing Convention of 1911 prohibited pelagic sealing by citizens or subjects of the signatory nations. As a result, it was now in the interests of the four powers, Japan, Russia, Great Britain and America to work for the preservation of fur seals. To compensate, U.S.A. agreed to give Great Britain 15 per cent of the sealskins obtained in the Pribilofs and a similar share to Japan.

The Convention had shown that pelagic sealing, only, was the curse of the fur seal. Within one year after cessation of the practice, the Pribilof herds had increased, especially the female seals. By 1932 the 100,000 seals of 1911 had increased to 1,219,000. Yet in that same year 49,336 superfluous males were killed and their skins sold. All parties gained by the Convention. Japanese and pelagic sealers were compensated for discontinuing an industry that would inevitably have ended within a few years!

Hood and Harp Sealing

Referring to the killing of pups, one must mention the Hood and Harp seals which live in the open seas, resorting to Arctic ice floes for breeding. The long established Hood and Harp fisheries are based on the taking of pups. Very few adults are taken as they take to the water at the approach of hunters. The extremely fat, nursing young are unable to leave the floes on which they were born. The average annual catch of these seals from 1860-1930 was 196,019; 223,708 were taken in 1934, and the annual catch has exceeded half a million in certain years.

According to C. H. Townsend (*Science* 1934) the survival of great numbers of breeding seals has sufficed for the notably prolonged maintenance of the fishery. Mr. Townsend, who has records dating back to 1795, says that, with no heavier killing than that of the past decade the fishery may last indefinitely.

I do not know whether Professor Beebe's books are in the F.N.C. library. I hope so, for his nature-writing is a warm living thing. His descriptions are wrapped about with few of those technicalities that are anathema to the average nature lover. The living creature was more to him than any museum of herbarium specimens, and because he studied them at close quarters his descriptions have all the fascination of the living creature.

(To be continued.)

MIMICRY OF LYRE-BIRDS

By Fred. Lewis

Most people who have studied the lyre-birds in Sherbrooke forest, near Melbourne, are, I think, firmly of the opinion that the male birds confine their mimicry to bird songs and other calls of the forest and do not copy sounds emanating from or associated with human beings.

Some people, however, claim to have heard the birds mimicking such sounds as wood chopping, dogs barking, chains rattling, whistles, etc.; but the birds of Sherbrooke, so far as I know, have never been heard to copy any of these.

It was with great interest, therefore, that I read a letter in a recent issue of the *A.B.C. Weekly* from a young correspondent who lives in the McPherson ranges of Southern Queensland. These ranges mark the northernmost limit of the lyre-birds' habitat, the species here being *Menura alberti*, while the southern one is known as *M. novae-hollandiae*. The habits of the two species are very similar, although their appearance is rather different.

I wrote to the A.B.C.'s correspondent and have now received some very interesting information from the girl's mother, who states that some time ago men went into the scrub on ranges near their home, where lyre-birds are very plentiful, and began chopping down trees. Two or three weeks after these men had left the district, lyre-birds were heard imitating the sounds of chopping wood and whistling. My correspondent says the mimicry was faultless and the birds even changed their tone to suit the cutting of the different timbers in that district; even barking dogs were copied.

When the birds were disturbed they changed over to the cry of bower-birds and parrots before becoming silent. They are heard in the morning and late afternoon during the months of May to August inclusive. The Chief Forestry officer of the district told my informant that lyre-birds are very numerous in the Lamington National Park, situated in the McPherson Ranges south of Brisbane and adjoining the border of New South Wales.

I have another record (from South Gippsland in Victoria) of lyre-birds imitating whistles. My informant is a young farmer who worked on a timber mill in the hills. In order to get the logs across a deep gully, the mill workers arranged a "flying-fox" and a system of whistles—one to stop, two to haul, and so on. All went well at first; but one day the work became disorganized because of incorrect whistle signals. Mutual recriminations led to arguments and a serious accident was only averted because one of the party, perhaps more observant than his fellows, woke up to the fact that a male lyre-bird in the vicinity had taken to mimicking the signal whistles of the mill!

NOTES ON BLUE-FLOWERED WATER-LILIES

By G. H. Fetherston, Canberra.

Does *Nymphaea stellata* really occur in Australia?

Baron von Mueller and Bentham identified Australian material with this oriental species, and later Ewart[8] (probably following their identifications) did the same. Other botanists have stated that *N. stellata* occurs in Africa, while other again claim that it occurs in tropical Asia and the Archipelago as far south as Java. The type came from S.W. India and, before proceeding further, let me quote the original description of *Nymphaea stellata* by Willdenow (in *Linnaei Spec. Plant.* II, p. 1153, 1799*):

> "N. foliis cordatis integerrimis, lobis divaricatis, acutis, calyce acuto tetraphyllo petalis acutis longiore. W.
> Citambel. *Rheed. mal.* II, p. 53 t. 27.
> Sternförmige Seerose, W.
> *Habitat in* Malabariae *aquis.* 4."

The genus *Nymphaea* is, to say the least, a difficult one. Species have been established on slight variations in colour and form, and it is often very hard to arrive at a suitable method of discriminating those "species"—a difficulty admitted by various authorities from time to time.

Before 1900, there was a tendency among British botanists to include *all* blue water-lilies under the name of *"N. stellata,"* while many foreign explorer-naturalists, especially in Africa, were inclined to call each variation a "new species." Thus, the original *N. stellata* has acquired many synonyms[8] and has been much confused with the North African *N. cærulea* and South African *N. capensis*.

H. Conard[7], L. H. Bailey[6], and later K. Domin[10] have all attempted to elucidate the genus, with some emphasis on blue-flowered species. *N. stellata* has been variously described as having dark blue, light blue, purple, pink and white flowers, and at the same time with leaves varying considerably in shape and colour on the under-side. It has been described as either fragrant or inodorous. The plant must therefore be extremely variable—provided that one and the same species has been described by different writers.

Without considering the species, there are several forms of blue water-lilies known to exist in Australia. Flowers vary in colour from dark to pale blue and almost to white (or, at least, a whitish-blue); sometimes they are large (up to a foot in diameter), at other times only a few inches across—and sometimes fragrant. The blooms may float or be carried well above the water, and the number of petals may vary considerably. In addition, the leaves

*Conrad[7] gives the date of Willdenow's *Species Plantarum* II as 1797, but an original copy in the Melbourne National Herbarium definitely bears the date 1799.

differ much in size and may have entire or conspicuously incised margins. The leaf shape may also vary somewhat, and these water-lilies may be found in habitats ranging from slow-running streams to deep lagoons.

It is certain that one distinctive species occurs in Australia, viz. *N. gigantea*, the very large blue-flowered *Nymphæa*, which is placed in a special sub-genus (*ANECPHYA*) on account of the absence of carpellary styles and anther appendages. Its flowers, however, have been recorded as varying from dark blue to light blue; there is also on record a smaller variety *N.g. violacea* with dark purplish-blue petals, and a variety *Hudsoniana* which was said to be a cross *with N. Stellata*, but, according to L. H. Bailey,[9] it is evidently only a *N. gigantea* seedling. Bailey gives specific rank to *N. violacea* and admits a white variety, a smaller specimen of which was confused by F. von Mueller with *N. tetragona*. Conard[7] queries the existence of genuine *N. tetragona* in Australia, yet the only collection bearing that name in Melbourne Herbarium (from Barron River, North Queensland, collected by W. Sayer, 1886) is a very good match for *N. tetragona*, var. *angusta* (syn. *N. pygmæa* Ait.) as occurring in the Himalayan region—but this little North Queensland plant has *blue* petals, instead of the pure white ones of *tetragona!*

Consultation with the *Chromosome Atlas*[12] shows that the chromosome number of *N. stellata* is 28 (where x = 7 or 14)and it is interesting to note that *N. capensis* (also a blue-flowered species) has the same number of chromosomes. On the other hand, *N. gigantea* has a chromosome number of 224 and is obviously a polyploid form. If such wide variation exists between two major species, *N. stellata* and *N. gigantea*, it is reasonable to expect that intermediate forms exist also, especially in Australia.

This fact of polyploidy in the species gives rise to some speculation into the origin of *N. gigantea*. Can it be simply a polyploid of *N. stellata* or some other species? The peculiar style and anther characters of *gigantea* would seem to negative such a possibility. Moreover, the chromosome number appears to be a definite guide in identifying this species and will probably prove useful in the identification of any intermediate forms, should these exist.

L. Gilbert[13] writes of *Nymphæa* species: ". . . pale and dark blue with some almost white . . . of about 4 in. to 6 in. across, many-petalled and most fragrant . . . . There was a small, dark blue type which seemed limited to the rivers," referring to Southport and environs and Manton River, N. Territory.

At Coomallie Creek, N.T., in 1943, I recorded a species known locally as "Darwin Violets." This was a small, light blue (varying to almost white) *Nymphæa* with an intense fragrance of violets, hence the name. This species does not appear to have been recorded

Nymphæa gigantea Hook., from Northern Territory—a well prepared collection in the Melbourne Herbarium. Note absence of anther appendages and of styles on the radiating carpels.

(Photo.: H. T. Reeves)

in any botanical works, but I imagine it to be quite a distinctive one. Owing to the contingencies of the war, I did not preserve a specimen and the plant has never been identified botanically.

Examination of material in the various Australian herbaria throws very little light on this problem, for the genus is poorly represented in collections. Reference to botanical gardens for botanical information has shown most small blue-flowered water lilies to be labelled "*N. stellata*" and these have varied somewhat in habit. Herbarium specimens labelled "*N. stellata*" do not agree in all details with descriptions of the typical S.E. Asian plant and it is probable therefore that these so-called "*N. stellata*" are referable to other blue-flowered *Nymphæa* from various parts of Australia.

Of all attempts so far to straighten out the taxonomy and nomenclature of blue water-lilies, the monograph of Conard[7] is unquestionably the best. He examined copious living material over four years and studied all available types in Kew and elsewhere. He restricted *N. stellata* to tropical Asian and Indonesian distribution (extending to Java and the Philippines)—the sole blue species of that region—and he records one species for Australia and New Guinea, viz. *N. gigantea*, also its small variety *violacea*. The var. *violacea* has a long synonymy and had been treated as a distinct species under the following names: *N. Banksii*, *N. serrata*, *N. repanda*, *N. versicolor*, *N. stellata* (but not of Willdenow) and *N. Brownii* Bailey[6].

The exact relationships between the many colour and habit forms of Australian *Nymphæa* can only be discovered by careful field work. There also appears to be some scope for research into the chemical-botanical environment of our water-lilies. So far as I have been able to ascertain, there have been no chemical analyses of the water and soil in areas where various colour forms of *N. stellata* or *N. gigantea* are known to occur. It is an established fact that the colour variations of the garden hydrangea—from pink through mauve to blue—are attributable to minor elements in the soil and to the *pH* of the soil. Possibly the colour forms of a blue-flowered *Nymphæa* are affected in the same way.

It is not suggested that one should even attempt to define the limits of a species on theoretical grounds; but, in view of the evidence submitted, is it not possible that the true *N. stellata* might also exist in Australia? Our far northern areas share many species in common with India and Indonesia—why not a blue *Nymphæa*? Blue water-lilies are to be found in all continents except Europe and South America, and, of the eight species in Conard's monograph[7], five are restricted to Africa. The accompanying key is based on the characters outlined by Conard.

KEY TO THE BLUE SPECIES OF NYMPHAEA

(Adapted from H. S. Conard's Monograph, "The Waterlilies," *Carnegie Institution Publication* No. 4, 1905.)

Carpels without styles; stamens exceeding 300; anthers with only minute appendages or none at all; petals 18-50 . . . . . *N. gigantea* and var. *violacea* (Australia and New Guinea)

Carpellary styles present, stamens less than 200; anthers with conspicuous appendages.

Leaves conspicuously denate or crenate.

Petals 11-14; stamens 33-55; leaves pink or blue violet beneath . . . . . *N. stellata* and var. *cyanea* (India, Java, Borneo, Philippines)

Petals 20-30; stamens 150-275; leaves green on both sides . . . . . *N. capensis* and var. *madagascariensis* and var. *zanzibariensis* (South and East Africa and Madagascar)

Leaves entire or almost so.

Mature leaves bulbiferous . . . . . *N. micrantha* (West Africa)

Mature leaves never bulbiferous.

Petals 5-10; stamens 10-16 (very small plant) *N. heudelotii* (West Africa)

Petals 12-20; stamens exceeding 50.

Petals obtuse; anther appendages minute . . *N. elegans* (Texas and Mexico to Guatemala)

Petals acute; anther appendages long and slender.

Stamens 50-75; leaves green beneath, with purple spots . . . . . *N. caerulea* (North and Central Africa)

Stamens about 100; leaves purplish to deep royal purple on the underside . . . . . *N. calliantha* (Central and S.W. Africa)

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ORCHIDS OF EAST GIPPSLAND

By N. A. WAKEFIELD, Cann River

The list of Orchid species known to occur in East Gippsland was last brought up to date in a short paper in this journal in January 1949. A back reference was published there, indicating other reports on the subject; so that a complete list for the district is available to the orchid student.

The recent publication of two new species, and the finding of some additional material, should be noted to bring the subject completely up-to-date.

Dendrobium speciosum, far from being rare, is extremely abundant in parts of the granites of the Genoa area and the Howe Ranges. There is one small patch on Devonian sandstone near the Upper Genoa River, and the species is reported to be at Buldah and Wingan Inlet.

Dendrobium striatum is widespread and abundant on rock outcrops of the Cann-Genoa district, and is scattered thence in numerous localities as far west as Suggan Buggan and the Mitchell River.

Sarcochilus falcatus is doomed to extinction at Noorinbee, as the jungles on the Cann River flats fall to the march of progress; so it is very gratifying to know that this gem of our flora is to be found elsewhere in Victoria. It flourishes in an almost inaccessible valley, completely surrounded by the spurs of the Howe Ranges, some miles from the one isolated farm east of Mallacoota Inlet.

Sarcanthus tridentatus is very plentiful in several heavy jungles of Southern Croajingolong, but is not known from west of the Snowy River.

Prasophyllum Rogersii has been recorded once only in Victoria, by Mrs. V. H. Miller at Mallacoota. (See *Vic. Nat.*, Vol. 57, p. 206.)

Prasophyllum appendiculatum (*Vic. Nat.*, Vol. 66, p. 212), inhabits the *Xanthorrhœa* country near Cann and Genoa, and will most likely occur in adjoining parts of New South Wales.

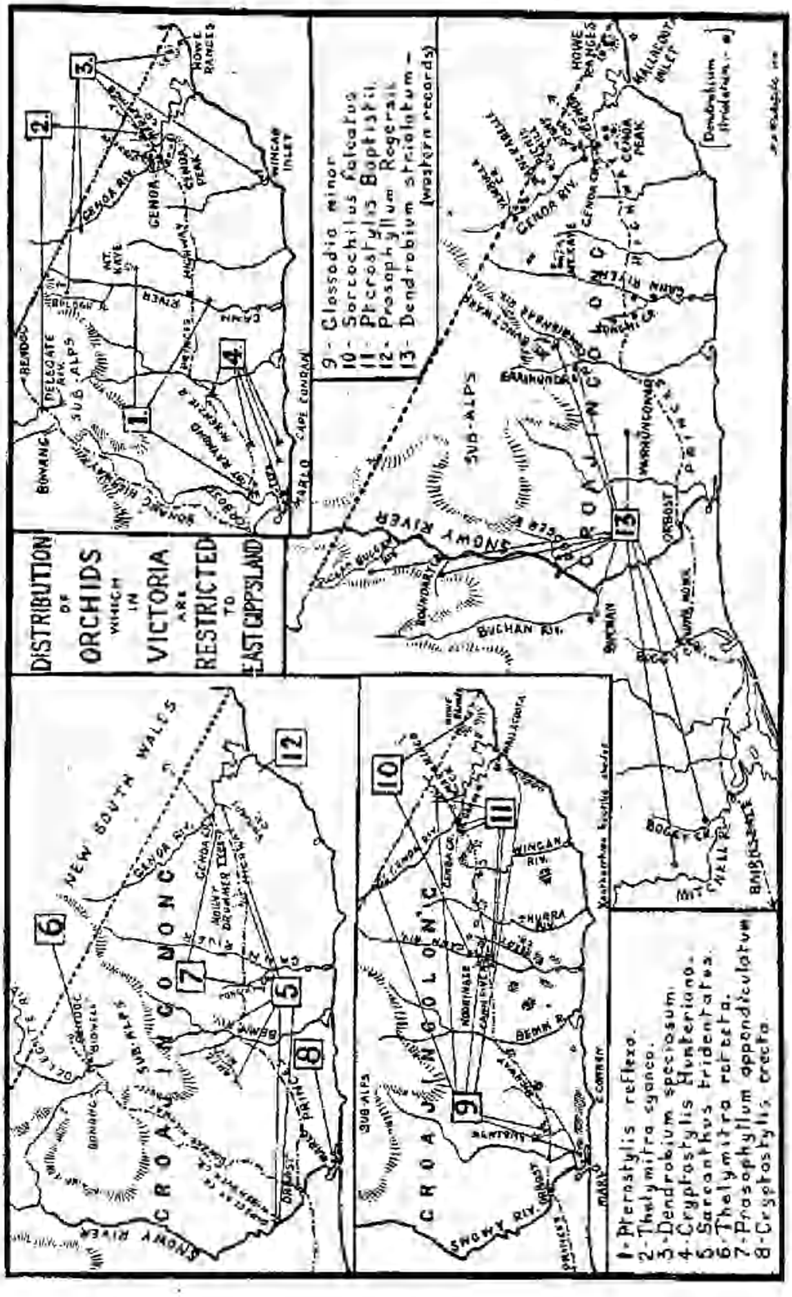
Prasophyllum alpinum (Syn. *P. Tadgellianum*), is very abundant in the Cobberas-Nunniong area from 4,000 to 6,000 feet.

Prasophyllum Brainei was found at Marlo by Mr. F. Robbins in October 1937, but the specimen remained unrecorded until Mr. W. H. Nicholls identified it quite recently.

Prasophyllum flavum is subalpine at Bidwell, on the Upper Delegate River.

Prasophyllum Suttonii flowers in late January in the Cobboras Mountains, at from 4,500 to 6,000 feet.

Thelymitra irregularis (see *Vic. Nat.*, Vol. 63, p. 206), is not uncommon in the moist sedgy heaths at Reedy Creek, near Cann


DISTRIBUTION
OF
ORCHIDS
WHICH
IN
VICTORIA
ARE
RESTRICTED
TO
EAST GIPPSLAND
1- Pterostylis reflexa.
2- Thelymitra cyanea.
3- Dendrobium speciosum.
4- Cryptostylis Hunteriana.
5- Sarcanthus tridentatus.
6- Thelymitra retecta.
7- Prasophyllum appendiculatum.
8- Cryptostylis erecta.
9- Glossodia minor
10- Sarcochilus falcatus
11- Pterostylis Baptistii
12- Prasophyllum Rogersii
13- Dendrobium striolatum — (western records)
NEW SOUTH WALES
SNOWY RIVER
SUB-ALPS
CROAJINGOLONG

River, where it is associated with several other species of its genus.

Thelymitra Matthewsii is scattered in the granitic gravels of the Cann River and Genoa districts.

Thelymitra retecta, reported in *Vic. Nat.*, Vol. 66, p. 225, was first discovered by Miss Alexander, a Bendoc schoolgirl. The first and second specimens were in firm grassy ground bordering the Sphagnum bog at Bidwell, and a third specimen was found by Mr. J. H. Willis in the moss-bed.

Spiculæa Huntiana: In view of the list of localities recently published in *Vic. Nat.*, Vol. 64, p. 246, it should be noted that this quaint orchid occurs also at Orbost (N.S.W.), Bendoc (W. Hunter) and Mallacoota (Miss Ruth Clark).

"*Spiculæa irritabilis*" should be deleted from all Victorian lists. In the 1928 F.N.C.V. *Census*, it is listed as "E., 1 spm.". It appears that the specimen concerned was never preserved. It was recorded thus on the authority of Mr. Chas. French, who remembered the Baron's excitement when a single specimen of "Drakæa" came to hand from East Gippsland. Unless a mistake in locality was made, it is more than likely that the true identity of the specimen was *Spiculæa Huntiana*, then an undescribed species, rather than the superficially similar northern species.

Glossodia minor is not rare in the district, as it occurs in vast numbers throughout the range of the *Xanthorrhoea hastilis* country from Marlo to the border.

Caladenia variabilis (*Vic. Nat.*, Vol 66, p. 223), occurs on the Marlo heathlands, where two typical specimens wer collected in 1938. It is evident however that the species is connected with the eastern form of *C. cardiochila*; but even so, the recognition of this form as a species is undoubtedly justified, and is a step farther towards a workable classification of a very difficult group.

Cryptostylis: It is worth recording that, although much similar country has been explored farther east, *C. erecta* has not been found in Victoria other than near Marlo, and *C. Hunteriana* in only two additional localities, both by the highway, near Bellbird and at McKenzie River.

We now know of 113 East Gippsland orchids, representing all but one of the 25 Victorian genera. The largest groups are *Pterostylis* (22), *Caladenia* (18), *Prasophyllum* (16) and *Thelymitra* (13). Two species are endemic to the area, and 11 others are not found elsewhere in Victoria.

The accompanying maps show the complete known Victorian distributions of the 13 orchid species which in this State are restricted to East Gippsland. All except six of the locality records which are marked on these maps are from the writer's observations, and the type localities of the two endemic species are indicated.

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PROCEEDINGS

The monthly meetings of the Club was held at the National Herbarium on Monday, December 11, 1950, the President, Mr. E. E. Lord and about 120 members and friends attending.

News of the death of Mr. Gilbert Rodger of Hall's Gap was received with deep regret.

The President explained the reason for non-arrival of *Naturalists* to some members. Honorary Officers of the Club were doing all they could, but the company responsible for stencilling and checking the wrappers was suffering from labour shortages and would rectify the position as soon as possible. Members failing to receive their *Victorian Naturalist* are asked to advise either the Treasurer, Librarian or Secretary, but not the Editor.

Christmas Greetings were received from Mr. and Mrs. F. S. Colliver, of Brisbane, Queensland.

MEMBERS' NIGHT

Club members had been asked to bring nature notes and be prepared to speak briefly on some topic of particular interest to them.

Miss Ina Watson opened with a talk on "Cuckoos" and described the mating habits of the large Channel-billed species.

Mr. C. J. Gabriel remarked on three species of "Worm Shells." At the request of Mrs. Sarovich, Mr. Gabriel commented on poisonous Cone Shells, describing the method of attack and symptoms leading to the death of a victim.

Miss N. Fletcher's nature note came in the form of questions and answers about the nature and breeding habits of the Fairy Penguin.

Mr. H. C. E. Stewart outlined points of interest in two recent club excursions, with descriptions of the flora on the Ben Cairn and Mount Donna Buang sub-alpine area, also the "penguin parade" at Phillip Island.

Mr. C. Lewis recounted his successes and failures in trying to grow the coastal Wedding Bush.

Mr. R. D. Lee stressed the fact that a naturalist is never "stumped" for interest anywhere and illustrated this by projected photos. of flowers, birds, reptiles, shells and seaweeds within a small area at Sorrento.

Miss J. W. Raff gave lively descriptions of the Sea-horse, Pipe-fish, Acorn Barnacle and swim bladder of certain fish.

Mr. J. Ros Garnet described with drawings the pollination of Cinnamon Bells (Potato Orchid) by bees of the genus *Exoneura*.

Mr. A. A. Baker brought the evening's subject to a close with an account of the formation of "Graphic Granite"—a very interesting and attractive whitish rock with stratified blackish markings, reminiscent of Babylonic cuneiform characters.

EXHIBITS

Miss J. W. Raff: Dried specimens of (a) Acorn Barnacles, (b) Swim-bladder of Fish, (c) Sea-horse (*Hippocampus*).

Mr. A. A. Baker: Graphic Granite from near Balmoral, Western Victoria.

Mr. C. J. Gabriel: *Humphreysia strangei* Add. (Victoria); *Gastrochaena tasmanica* T.Wds. (Victoria); *Dacosta australis* Sowebry (N.S.W.).

Mr. J. S. Seaton: *Anigozanthos Manglesii* grown by Mr. R. A. Hart of Caulfield—one specimen with a double flower; *Kunzea sericea* (Garden grown).

Mr. H. C. E. Stewart: *Wittsteinia saccinacea* ("Baw-Baw Berry") from Mount Donna Buang, near summit; *Phebalium squamulosum* ("Scaly Phebalium") from the road near Ben Cairn; *Pterostylis longifolia* ("Tall Greenhood"), and *Grevillea alpina* ("Mountain Grevillea"), both collected by Mr. Frank Hobson from Mount Buffalo National Park and new records for the area.

Mr. K. Atkins: *Mesomeuron Scortechinii*, a woody climber which grows in the scrubs around Brisbane and is at present flowering at the Melbourne Botanical Gardens the first time for many years.

Mrs. S. I. Bayley: *Alectryon subcinereus* ("Smooth Rambutan"), a very rare Victorian tree with only one or two specimens now known to be growing native in the extreme east of the State.

Mr. J. H. Willis: A Recent fossil mosaic of acorn barnacles and serpula, cemented into thin sheets between horizontal slabs of granitic rock at Middle Island, Recherche Archipelago, W.A.

Mr. T. S. Hart: Variations in foliage and floral parts of the Elderberry Panax (*Tieghemopanax sambucifolius*) from a Croydon garden; the "stinkhorn" fungus *Anthurus Archeri* from a lawn at Croydon.

DEATH TRAPS ON FORT ISLAND

Since there has been no further reference to Mrs. Edith Coleman's statement in the May *Naturalist* that the old gun pits on Fort Island were proving death traps to sea birds, it may be of interest to know that as far back as February, 1948, Mr. H. E. Tarr reported to the Council of the Royal Australasian Ornithologists Union that heavy mortality was occurring on the Island through birds entering the concrete gun pits and being unable to get out again. This matter was referred to the Port Officer of Victoria who replied that the Army would assume responsibility for covering the magazine chambers on the Island, but in August the Secretary of Public works informed the Council of the R.A.O.U. that the work of closing entrances to the gun pits on Fort Island had been completed and that 2-inch mesh chain wire, supplied by the Army, had been used. Since then no further information has been received as to conditions on the island.

—D. J. Dickison.

SAVE THE SEALS—PART II

By Edith Coleman, Blackburn.

History of the Seal in Australian Waters

The time will come when the civilised man will feel that the rights of every living creature on the earth are as sacred as his own. Anything short of this cannot be perfect civilization.

(David Starr Jordan.)

The history of Australian seals makes sorry reading. When the white man came to Australia he found them abundant off the coasts, from Port Stephen, north of Sydney, around the southern coasts to the Abrolhos in Western Australia, on the Tasmanian coast, and as far south as Macquarie Island. To-day they are restricted in Victorian waters to a few rocky islands of Bass Strait, the largest colonies being at Seal Rocks (Western Port) and Lady Julia Percy Island off Port Fairy. (See F. Lewis in *Vict. Nat.*, June 1942, p. 24.)

For how many centuries had they clambered over their beloved rocks in comparative safety, for, except man, they have few enemies? Professor F. Wood Jones writes (*Mammals S. Aust.*, III, 1925): "When unmolested, seals are naturally friendly to man, and they show a dog-like aptitude for human society."

In 1802 Péron, the medical naturalist of the *Geographe*, examined the islands of Bass Strait. When he landed at King Island a sudden gale drove his ship to sea, where it was lost for fifteen days. Despite violent storms and illness, he spent those days in collecting mollusca and zoophytes, and in studying the "gigantic" seals which assembled in thousands on the coasts. Where now are those gigantic elephant seals? Even the ones on Macquarie Island are threatened!

Seals in great numbers were seen in 1798 by Bass, who was able, on his epic voyage, to eke out his dwindling provisions with seal flesh. French and American vessels were sealing in Bass Strait soon after his return to Port Jackson. Nearly a million are said to have been killed in ten years. Bass and Flinders carried to London a cargo of 6,000 seals, and "single ships carried up to 100,000 skins many of which rotted, not being properly preserved." (Troughton.)

Seal skins are tanned by a special process. Part of a skin, taken from a dead seal at Sorrento, tanned in the ordinary way, had become moist and mildewed two years later. The thickness of the skin suggested that it should be useful for leather.

Bass was greatly impressed with the possibilities of sealing as a commercial enterprise. He found no inhabitants on Wilson's Promontory. Four small barren islands, seven or eight miles north-east from Sealer's Cove, were all frequented by seals. He visited the northernmost—"about 13 miles in circumference, ascending from the shore to a hill of moderate elevation in the centre."

Neither tree nor shrub grew on it, but the surface was covered with tufts of coarse grass amongst which the seals had made paths and petrels their burrows. There was plenty of water and drift-wood for fires "to render down any amount of blubber."

In 1801 James Grant visited Western Port, and found the rocky islands covered with seals of large size, nearly equal to that of a bullock. He said, "I judged them to be of that species of seal called by the fishermen, sea-elephant."

Between 1801-1815 there were 180 sealers operating in Bass Strait. We shall draw a veil over their methods. John Rintoul, in *History of Esperance*, 1946, records that in October 1835, "two lads accompanied a party of sealers along the southern coast (W. Aust.), and becoming disgusted with the depravity and barbarity of their companions, ran away from them when about 400 miles to the east of Albany. They trailed along the coast . . . and after severe privations . . . reached Albany." Governor King informed Captain Collins that a settlement had not been formed at King Island, as settlers would be likely to drive away the sea-elephants for which the place was resorted by sealers.

In 1825, when Hovell was sent with Captain Wetherell, convicts and soldiers to Western Port for a proposed settlement, he found European sealers on Phillip Island. Clad in sealskins and living in huts, they had with them native women taken from the mainland. The settlement was removed in 1828, and the sealers were conveyed to Port Jackson.

Flinders found the beaches of Flinders Island (S.A.) frequented by seals "of the hair kind." A family of four or five with as many pups, were lying asleep at every two or three hundred yards. "Their security was such that I approached several families very closely without disturbing them." Besides Hair-seals, Flinders saw a seal very different from the others. "Its flippers behind were doubled and the fore flippers were smaller and closer to the head. The hair was shorter and of a bluish-grey; the nose flat and broad, and there was at least treble fat. I never saw a sea-elephant, but this might be a young female." That "treble fat" led to the great destruction of those seals.

At Kangaroo Island Flinders found seals and kangaroos dwelling amicably together on the shore. He wrote:

> Never, perhaps, has the dominion possessed here by the seal and the kangaroo been invaded. The report of a gun would bring out two or three seals from under bushes considerably further from the water-side. The seal seemed to be the much more discerning animal, for its actions bespoke a knowledge of our not being kangaroos, whereas the kangaroos not infrequently appeared to consider us to be seals.

He thought the tameness of the seals on the shore meant no natives or other men to molest them. Unfortunately seals seem to forget man's barbarism and return to the very spot where they have suffered indescribable atrocities.

At Seal Island, Flinders killed a few seals on the shore, and at Lucky Bay (W.A.), he discovered that seals have other enemies besides man. His crew took a large shark, and in its stomach was a "tolerably large" seal, bitten in two, with half a spear sticking into it, with which it had probably been speared by natives. Near King George's Sound he saw a large eagle's nest, and in it were disgorged pellets containing hair of seals, as well as bones of small mammals, such as are cast up by owls.

Labillardière found seals to be common on islands of the Récherche Archipelago in Dec. 1792, but it is doubtful whether they occur in large numbers there now; the West. Australian Government affords nominal protection during the five summer months (Nov. 1—March 31). About 1870 the Dempster brothers of Esperance were collecting seal skins which "abounded in the Récherche Archipelago, fair skins being worth about 30/- each" (*History of Esperance*, 1946.)

The Case For and Against our Seals

As our largest seal rookeries are near important fishing grounds, the Government has been harrassed from time to time by complaints of fishermen that seals rob and tear their nets, interfere with crayfish-pots and take heavy toll of edible fish; and from time to time the Government has wavered, or given way to demands that the number of seals should be reduced. Professor Wood Jones wrote (1925): "Were the last seal to be slaughtered, the fishermen would probably see no increase in the abundance of fish . . . . It is probably true to say that more fish are eaten by fish than by any other animal."

In order to investigate the matter, Mr. F. Lewis, with Mr. W. Kennon of Cowes spent a day at Seal Rocks (Dec. 1928). They anchored within 100 yards of the Rocks, and fishing with lines, three of them caught fifty parrot fish in fifteen minutes, although seals were swimming about them all the time. Crayfish-pots had not been interfered with by seals. Five were lifted for a catch of two dozen crayfish. Only small seals could get into the pots, and these, being unable to get out would be drowned.

The men landed on the Rocks at 9 a.m. It was estimated that there were about 1,000 seal pups, some sleeping, some in rock pools. (This was the breeding season.) Mr. Lewis thought that the skins of the young seals would "make up well" being of a silvery-grey, soft and silky to the touch. The result of his investigations was in favour of the seals; the accounts of their depredations had been exaggerated. He did not think that, at the time, there was justification for wholesale slaughter. He added:

> The matter should be watched, and if in the future the seals show signs of becoming too plentiful and invading bays and harbours, and if it be found that the present system cannot cope with the matter, the

> rookeries should be visited by officers of the Department, during the breeding season, and the numbers reduced by the killing of a certain proportion of the pups, and if possible, the surplus young males. (*Vic. Nat.*, Jan., 1940.)

Unfortunately, the young males would take to the water, resulting in more seals being wounded than were killed. The "present system" to which I think Mr. Lewis alludes, is still in force, i.e., fishermen are permitted to shoot any seals interfering with their fishing operations — and, as this may mean pelagic shooting, naturalists do not look on it with favour. Seals are difficult to shoot at long range, and many are merely wounded. It is hoped however that no shooting would ever be allowed during the breeding season, and that no pups would be slaughtered—which would cause terrible suffering to the mother seals.

"It is said that there is no maternal affection so intense as that of a mother seal, and I do not know any animal which moans in a more human way" wrote Lockley (1938) of the grey seals on Ramsay Island, west of England. As he listened to the moaning of mother seals, who had lost their pups in a terrible storm, he thought that if those who had carried out, or condoned the shooting of seals, recently reported in Cornwall and Ireland, could hear that terrible "human" wail of despair, they would never cause suffering to this inoffensive beast.

Said Dr. Fraser Darling: "There is no creature born, even among the great apes, which more resembles a human baby in its ways and cries than a baby seal; I have even seen one holding its fingers in its mouth." (*Naturalist on Rona*, 1939.) Play between mother seals and pups is a most beautiful thing to see. Dr. Darling's little child played among them. "The seal mother, after the calf is fed, turns round a little and scratches the baby on the back with her hand, all the way up to the head which she fondles"—moreover, "seals are among the few creatures that, like men, weep under the influence of great emotion." Again let me quote Professor F. Wood Jones (*Mammals of S. Aust.*, 1925):

> Pups are only permitted by their mothers to go to the sea when they are grown to a fair size. Even then, the first visit to the sea is a period of great anxiety for the mother. The pup is coaxed into the water, and guided by the mother's flippers, takes its first swim. Its every action is directed by the mother, and whenever it becomes too enterprising she keeps to its seaward side to head it back to land again. The whole business is as pretty a demonstration of maternal care among the mammals as could well be witnessed.

Let us not support the killing of pups, nor of irresponsible shooting of young males. It is a matter for the Government to solve on humane lines. The V.N. Club protested strongly when sanction was given by the Chief Secretary for the slaughter of 1,000 seals. (*Vic. Nat.*, Dec. 1941.) Fortunately the terms of the contract were such that no tenders were received for the shooting.

It was not forgotten by Phillip Island residents that, when the

Argyle Government granted permission for an experiment, 100 seals were killed and 400 wounded, coming ashore in summer to putrefy on the beaches.

When, in June, 1949, it was reported that, for the first time in 40 years, professional fishermen were to kill 2,000 seals, the public read the press announcement in block capitals: SEALS ARE FAIR GAME AGAIN, which surely would not tend to stress the value of one of our best animal assets.

Four days later (16/6/49) the Director of Fisheries and Game, in a fauna survey, is reported to have stated that "public opinion, and not prosecution, is protecting Victoria's animals." He added, "Seals have been protected for 40 years and are surviving well. There is no seal trade." Protected! The word seems ironical. There is no reference to the impending slaughter, which a Phillip Island resident tells me, did not take place. It was understood that the cost of obtaining the seals was not commensurate with the return offered.

In his fauna survey, Mr. Butcher stated that "the population (of seals) is nowhere near as large as popularly imagined," which suggests that, as usual, the number of seals had been greatly exaggerated. In November, 1949, during the breeding season, when the herds are at their "peak," Mr. Henderson saw very few seals at Seal Rocks. He had difficulty in netting six for the Aquarium.

Views of Professional Fishermen

The shortage of fish in Western Port is a perennial subject. It crops up periodically with fierce vigour—always with the seals as scapegoat. It dies down, presumably when migrating fish return to waters which they have temporarily deserted. In normal times our seas teem with fish, sufficient for seals and people. A safe balance is kept by the migrating habits of both fish and seals. It is pleasant to know that fair-minded fishermen are now ready to acquit the seals of disturbing this balance.

The subject was recently taken up in the *Peninsula Post* (March 15). In an editorial it was stated that, according to an old Hastings fisherman, Mr. J. Barclay, in early days there were thousands more seals on Seal Rocks than in recent times, and *fish were more numerous*. (Italics mine, E.C.) "As regards portion of Western Port, fish do not seem so plentiful as they once were. The theory is held that, as the navy practises gunnery exercises in the area, explosions of shells cause sound tremors, inducing fish to shift." To this (April 5), an expert fisherman, Mr. J. King of Tankerton, has a ready response. His views are based on those of old-time fishermen as well as his own:

> Fifty years ago, the sea-floor of Western Port carried a beautiful crop of sea-grass to a depth of up to 4 or 5 feet. This was inducive to the never-ending supply of marine life upon which numerous varieties of

edible fishes subsisted—a bounteous supply of fish being maintained over a long period.

Then, from causes unknown, the grasses withered and died out. Coinciding with this the fish-supply declined. Science says that, by the use of fertilizer on the sea floor in land-locked waters, the vigorous growth of grass has been produced; that abundant grass produces abundant marine life on which fishes feed. It confirms what was known here fifty years ago.

The claim of the late Mr. J. Barclay that thousands more seals existed in the days of a plentiful fish supply is the logical result of that supply. The seal colony of Seal Rocks will have its numbers governed by the quantity of food within reasonable distance. When the seals began to raid fisherman's nets it coincided with a lean fish period. Such conditions are the fore-runners to mass-migration.

The claim that the seal colony is responsible for decline of Western Port from a fisherman's paradise to a comparative "wash out" will not survive impartial examination. Right down the years, top-line Hastings seine fishermen rated Cat Bay as one of the best grounds in Western Port. It is within a stone's throw of the Rocks. Seal Rocks were once reckoned the best pike-hooking ground in Western Port, and most of the fish were taken near the rocks, even when seals were numerous.

Gunnery exercise at Flinders Naval Depot was unknown till the outbreak of the last war, but Western Port was already a "wash out" twenty years before.

Replying to Mr. King (April 12) another expert, Mr. H. J. Francis, does not agree that there was a bounteous supply of fish 50-80 years ago. He says:

About 60 years ago all the fish, for some unknown reason, left Western Port and those engaged in the industry could not make a living here. Many fishermen left. Those remaining went shark fishing and were paid so much per foot. (Under 18 inches did not count by the Government of the day.) In my long experience I have seen many changes in Western Port. At one time whiting were so scarce that, in winter fishing, it was rare to see one in the nets. We were lucky to get a dozen for the week, and were paid a standing price of 2/6 each. [Whiting are sold in Melbourne to-day at 8/- per lb. E.C.] Then all of a sudden, the whiting returned and good catches were taken for many years. Strangers too, were very plentiful; they left the bay and did not return for many years. [Strangers are a small, sweet fish not unlike mullet in appearance. E.C.] Old fishermen maintained that the cause of grass disappearing was the huge deposit of silt and sludge spread all over the bay by drains from Koweerup Swamp, when they were opened into the head of the bay. Half of Western Port was ruined, and still is.

Regarding seals, Mr. Bill Kennon's father camped on Seal Rocks in 1869. He said there were not more than 20 seals on the Rocks. To-day fishermen estimate the number at 20,000. [Compare with Mr. Henderson's report. E.C.] Commenting on the letter of Mr. Francis, Mr. King says (13/4/50). *When my old friend, Mr. Francis, tells us there was a fish shortage in Western Port 80 years ago, and that there were only 20 seals on the Rocks at that time, it seems to me that he has acquitted the seals.* [Italics mine. E.C.]

Mr. King later quotes some significant passages from the letter of another professional fisherman. "The real cause of the decline is that amateur fishermen now over-run the bay," and according to another expert:

The shortage of fish in the markets is due not so much to the decline of the bay as to decline in methods. Twenty years ago we worked and

lived on the job and made the fullest use of our time. Now the industry is manned by "feather-bed fishermen" who sleep at home every night and return next day when the sun shines. Boating parties (of amateurs) covering three months in the year return a golden harvest to the fisherman, out of all proportion to the quantity of fish caught. [The fishermen are wise enough not to take these amateur parties to their pet grounds! E.C.] This subsidy enables fishermen to "take the knocks" in the remaining nine months and average a higher return than they could hope for without the parties of amateur fishermen.

Comment seems unnecessary. We may at least congratulate Messrs. Francis and King on their restrained and reasonable statements of the case, as they view it.

Support for Theory of Migration

Two recent records strongly support the theory of fish-migration as a cause of shortage or abundance. It was reported, 12/6/50, that Sandringham fishermen had caught seven tons of pilchards and anchovy ("white-bait") used for making fish paste. They had located a huge school and netted them as they gathered round a 3,000 candle-power light lowered into the water—a catch worth £200. A photograph of it was given.

Another report, 22/6/50. At the week-end, fishermen caught tons of flathead in the Bay, more than had been seen for forty years. Four members of the Abbotsford Angling Club caught 32 dozen weighing up to 3 pounds each. The smallest catch was 84 pounds caught by one man in a row-boat, 200 yards off shore. (At this date flathead were sold at 3/- per pound at Sorrento and Melbourne.) In past times there have been records of huge shoals of flathead caught at Sandringham.

Acquittal of the seals on Lady Julia Percy Island comes from an ornithologist, Mr. Harold Tarr, who camped on the island for two weeks during November and December, 1949 (the breeding period). He estimated the number of seals at 2,000. After spending an hour with two fishermen drifting over a reef on the eastern side, 8/12/49, during which period they caught four boxes of "sweep" (trumpeter), he wondered, if the seals are so detrimental to the living of the fishermen hereabouts, how come the fish to be so plentiful at the seals' front door! There were also sea lions on the island.

SYDENHAM SANCTUARY FOR FLOWERS OF THE BASALT

The Native Plants Preservation Group will be very grateful for seeds of any of the following species: *Lotus australis, Helipterum anthemoides, A. corymbiflorum, Trichinium macrocephalum, Eutaxia microphylla* (prostrate form), *Dillwynia cinerascens, Leiptorrhynchus elongatus, Pelargonium Rodneyanum, Wahlenbergia, consimilis* (tall form), *Cynoglossum suaveolens, Callitris glauca* (Murray Pine), *Dichanthium sericeum* (Blue Grass), *Stackhousia monogyna, Pimelea curviflora, P. serpyllifolia* (dwarf basalt form), *Rutidosis leptorrhynchoides* and *Minuria leptophylla.*

—W. Waddell.

ABNORMAL INSECT NUMBERS—PART I

By C. E. CHADWICK, Department of Agriculture, Sydney.

Even the most unobservant have at times found, to their regret, that various species of insects may increase to abnormal numbers. Just what causes these fluctuations is not always obvious, but climatic conditions, abundance of food, absence of natural enemies, etc., may be contributing factors. Although they are of considerable interest, especially in the case of economic species, these fluctuations often go unrecorded.

The following records are compiled from various sources. In some cases, in the absence of more precise records, newspaper reports have been quoted. These are of varying degrees of reliability, and are quoted on a qualitative rather than a quantitative basis. All verbatim quotations obviously are not in complete harmony and they must be accepted with appropriate reserve.

The oleander butterfly *Euploea core corinna* Macl. is much more abundant in some years than in others. Although Waterhouse (1932) states that it is common from Sydney to Cape York, the islands of Torres Strait, Port Darwin and Wyndham, it is only found as far south as Sydney in occasional years. A few specimens collected around Sydney in the summer of 1906-7 are in collections in Sydney; Waterhouse (1932) recorded specimens at Sydney in the summer of 1917-18 and a specimen collected at Palm Beach in December 1933 is in the Australian Museum collection.

During the summer of 1947-48 the insect was very common in New South Wales and attracted attention, mainly because of its beautiful pupa, which is mostly bright silver or golden in colour with black markings. It was recorded as far west as Dubbo, Young, Wagga, and Albury in this State, also at Tallangatta (*Wild Life* 1948A) and Red Cliffs (*Wild Life* 1948B) in Victoria.

The butterfly was common at Wollongong in mid-February 1948 and the last specimen, a male, was collected on June 14 resting with its wings closed and body vertical in the top of a turpentine tree (*Syncarpia laurifolia*) about 4 ft. high. When picked up in the fingers it protruded two structures (*androconia*) each consisting of a bunch of yellow hairs, one from each side of the posterior end of the abdomen.

Apparently some specimens exceeded their normal southern distribution early in 1950 as a number of pupae, parasitised by a Tachinid fly, were recorded from Newcastle in March. Also on April 5 a battered male was collected at Wollongong, but apart from another specimen seen on the same day, no other oleander butterflies were seen during the summer.

It has been suggested (*Wild Life* 1948C) that the butterflies migrate south in favourable seasons and that no stage of the insect can withstand frosts; consequently no further butterflies should occur until conditions are advantageous for another migration.

Newspaper reports give some facts in relation to large numbers of insects being seen in the latter part of 1948, e.g. "Great swarms of unidentified insects have been encountered by the flying-boat Australia on her two latest Tasman crossings. On her way back to Auckland to-day and when bound for Sydney on Thursday, the aircraft flew through a cloud of insects in such vast numbers that the plane took two or three minutes to regain clear air. The insects were first seen on Thursday (September 30) when the plane was at 2,000 ft., about 100 miles from the Australian coast. This morning the plane was 200 miles from Sydney at 5,000 feet when it met the swarm. The pilot opened the cockpit window and tried to catch some of the insects for identification but failed" (Sydney *Sun*, 2/10/1948).

Again, it was said "Millions of tiny flying insects are attacking Queensland to-day from Maryborough to the southern border. In Brisbane, women had to leave the washtubs, to do battle with the invaders. The insects—like fruit flies—clung to people's clothing, and got in motorists' eyes, causing traffic delays. Said a New Farm woman, "They sting and tickle at the same time'." (Sydney *Sun*, 4/10/1948).

Whilst no identification could be attempted on this information, the possibility of the insects being aphids could not be ruled out.

Towards the end of September, aphids began to appear in large numbers, e.g., on 20th they were reported as being very numerous in clovers and trefoils in the Moree district. In October, great numbers appeared in various parts of the State. According to Allman (1949), *Aphis gossypii* Glover was the chief aphid concerned, but other species were involved. *A. rumicis* Linn. was identified from Boambee, Bellingen and Nambucca Heads on the Central Coast, where beans were badly infested, but tomatoes and cucurbits also suffered.

On Saturday 9, great numbers of aphids (*?Aphis* sp.) were observed between Wollongong and Austinmer and for some days they were common around Dapto where they damaged beans.

Aphids in large numbers were reported from many parts of New South Wales at that time. At Nyngan they were very plentiful in the trefoil and other herbage early in October, but they were killed off by very dry weather. Other places reporting plague numbers included Inverell, Glen Innes, Guyra, Armidale, Kempsey, Maitland, Gosford, Morrisset, Blacktown, Minto, Campbelltown, Oberon, Lithgow, Orange, Wilcannia, Bega and Cooma.

In the Sydney metropolitan area the newspapers made the best of the news. Dealing with Saturday 9, one report said, "Millions of flying insects swarmed over the city and suburbs yesterday afternoon. They caused a traffic jam at King's Cross, and forced motor cyclists to dismount. The insects swarmed over North Sydney Station, drove Stationmaster Les. Rich from his office. A cloud

of insects formed a black coat on fresh paintwork on the Salvation Army citadel in Wilga Street, and spoiled two other houses in Wilga Street which the owners were painting. The insects swarmed over Sydney between noon and 4 p.m., but heavy rainstorms had washed most of them away by 6 p.m. Pedestrians ran for shelter into shops and doorways, when the insects descended at King's Cross. Traffic police organized pedestrians across the road in groups to avoid the insects. Before they reached the shelter of shops many people were completely covered with insects. Railway porters at North Sydney filled 6 cornsacks with dead insects before they completely cleared out the office of Stationmaster Rich. One of the porters said yesterday that the insects were attracted into the office by a sweet-smelling sticky chemical in a first-aid kit.

"'The insects were so thick I could not see the opposite wall of Mr. Rich's office, 15 feet away,' the porter said. 'They choked our nostrils, ears, eyes and crawled in hundreds in our clothing, until we had to evacuate the office. We sprayed the office half an hour later with solyptol solution. Then we were almost knee-deep in dead insects.'

"Porters at Central and North Sydney railway stations said yesterday they had to brush swarms of insects off the price index boards before they could see the fares. Mr. W. H. Sessions, of Wilga Street, said Burwood Road was black with insects for 500 yards when he walked to the bus stop at 4 p.m. yesterday." (*Sunday Telegraph*, 10/10/1948).

Unfortunately no entomologist saw the "six cornsacks" of aphids, but obviously there were many insects present. It was also reported that, at a Double Bay hotel, "drinkers put handkerchiefs over their glasses to stop them from falling into their drinks. Swarms of the insects were reported in Rockdale, Darlinghurst, Vaucluse, Newtown and city areas." (*Sun*, 10/10/1948).

The following is a report of Sunday's events in Sydney. "Swarms of small flying insects troubled surfers at Sydney beaches yesterday. The insects were most troublesome at Clovelly and Bronte. Attendants in the surf club casualty room at Clovelly removed insects from the eyes and ears of more than 150 people. The captain of Clovelly Surf Club (Kevin Bottomley) said last night, 'The insects worried people on the beach here all day. They got into eyes, ears and mouths. They stuck to people who had sun-tan lotion on their skin. They seemed to be attracted to white clothing, and settled so thickly on my white shorts that the shorts looked black.'" (*Telegraph*, 11/10/1948).

As the insects appeared on Saturday and Sunday, they were not identified by entomologists until the Monday and so were dubbed "mystery insects" in the press.

For some weeks after this, aphids continued to attack beans and other crops and caused much damage. However, they had practically disappeared from the metropolitan area by about the middle

of November. Westerly winds and dust storms helped to disperse them.

However, aphids again appeared in 1949: "Huge swarms of tiny black aphis (the plural is aphids), winged insect pests have invaded the city and environs. The insects are attacking market garden crops, ruining paintwork and cloying the mouths and noses of workers and residents. Almost to the day a year ago, on October 11, the black aphis swarms invaded the metropolitan area." (*The Daily Mirror*, 13/10/1949). This time, however, the infestation was much less serious. [Incidentally the terms aphid (singular) and aphids (plural) are considered correct for these insects, and the use of the word *Aphis* should be restricted to references to the genus, in the opinion of an aphidologist.]

Newspaper reports are quoted verbatim and the author takes no responsibility for inconsistencies or inaccuracies.

In passing it seems worth while quoting an earlier report relating to aphids or green fly in England: "With what Londoners describe as a 'heat wave'—although the temperature in the last few days has never been above 76—London has been subjected to a plague of the green fly, swarms of which have been sweeping through city streets smothering pedestrians, penetrating vehicles, and business premises, and compelling motorists to use windscreen wipers. A slight breeze after sunset yesterday drove off many of the swarms, but a return to sultry weather this morning found the small invaders back in force." (*Sydney Morning Herald*, 27/6/1945).

In October also, large numbers of the common yellow and black banded hover fly *Xanthogramma grandicornis* Macq. were noted. On 10th large numbers of the fly were frequenting the flowers of *Quintinia Sieberi* at Carrington Falls, but the numbers could hardly be called abnormally large. Exceptional numbers were reported at Hexham, near Newcastle on 18th and at Mittagong, Nyngan and Warren on 26th. On 29th of the month a correspondent wrote that at Kotara (Newcastle) they had "been moving northwards against a headwind for the past few days. All the honey-bearing flowers have been alive with them. Many have been caught by the tongue while getting honey. Many were caught in the oleander." The fly was also present at Orange at this time and was reported at Combara near Coonamble on November 1.

On Saturday, November 6, the writer observed enormous numbers of the fly when travelling on the eastern side of the train between the suburbs of Chatswood and North Sydney shortly after 9 a.m. The direction of flight was apparently parallel with the railway line, i.e. towards the north-west. At Chatswood the flight continued until at least 3.30 p.m., and here the general direction of flight appeared to be in a west to north-westerly direction, although the presence of houses could possibly have caused some confusion. According to the Meteorological Bureau the wind at Observatory Park was north-west from 9 a.m. to 11.15 a.m. and north-east from

then till 3.30 p.m.; the temperature was 77° F. at 9 a.m., rising to 81° F. at 11 a.m. and fluctuating until it was 76° at 4 p.m.

On the following day large numbers of the fly were observed in the bush at Heathcote, in National Park. The fly continued to be present in large numbers in the city area for some time longer, and two ladybird beetles were also seen. *Coccinella repanda* Thun., a common yellow and black species, and *Scymnus notescens* Blkb., a very small black and red species, which is much less common, appeared in unusual numbers in the metropolitan area. Many specimens of *S. notescens* Blkb. were obtained from a passion vine at Chatswood. A specimen was recorded from Mt. Keira on October 26.

In November large numbers of *X. grandicornis* Macq. were seen on garden flowers in the Wollongong district and swarms occurred at Gerringong. Mr. Walsh reported that numbers of the fly and ladybirds were drowned in the swimming pool at Mt. Keira Scout Camp, and that many dead flies were found in soft drink bottles; living specimens of *Coccinella repanda* Thun. were seen there on 13. In the first week-end in November, Mr. E. McNamara observed great numbers of hover flies travelling from east to west with the prevailing wind at Condeaux River. On November 14, on the southern end of Perkins Island (I.), off Port Kembla, hundreds of these hover flies were again seen and dozens of dead *C. repanda* Thun. were found washed up among the rocks on the beach on the western side of the same island. The ladybird was also noted from Gerringong.

During this month numerous ladybirds were reported on beaches, viz., steel blue species (*?Orcus*) at Wamberal, and large numbers were washed up on the beach at Maroubra.

Like the aphids, the flies and the ladybirds gradually diminished in numbers. As the larvae of the fly and both larvae and adult ladybirds feed on aphids, it was assumed that abnormally favourable conditions enabled the rapid multiplication of the aphids, which in their turn provided abundant food for their predators, which rapidly reduced them. The exhaustion of their food supplies soon resulted in a return to normal numbers of predators.

Large numbers of flies appeared in the Newcastle district about four years before that, as is shown by the following report. "Tens of millions of flies with yellow-banded bellies and transparent wings swarmed through Newcastle. The flies are about twice the size of the ordinary house fly. They get into food, tea and coffee, and the eyes, ears, and mouths of adults and children. Kitchens, dining-rooms, business offices, and bedrooms swarmed with them. They did not sting—merely irritated. Three weeks ago Newcastle suffered a similar plague. The earlier plague lasted for about three days, and then the flies disappeared . . . . Museum Entomologist (Mr. A. Musgrave) said the flies probably were 'Hover' flies. They are a useful insect, and feed on aphids, Mr. Musgrave said."

(Broken Hill *Barrier Miner*, 10/11/1944). Although a determination could not be made without actually seeing specimens, it is highly likely that *Xanthogramma grandicornis* Macq. would again be the species concerned.

Plagues of thrips occur every now and again. In September, 1928 they caused some concern to the National Rose Society of New South Wales; they were developing rapidly, especially in the western suburbs. "It was stated that the heavy growth of weeds, caused by the abnormally wet autumn, and the absence of frost during the past winter, had provided favourable conditions for the development of the pest in its earlier stages. Unless rain fell before the end of the month serious loss would be caused by thrips." (*Sydney Morning Herald*, 21/9/1928).

In October, 1945, thrips described as "plague thrips (*Thrips imaginis* Bagn.)" arrived in Sydney in pestilential form. "Attracted to light-coloured flowers particularly—though they do not despise deep reds—they strip the colour-tissue and suck the sap, particularly of petal edges and rosebud points. A brown ragged mass is the aftermath of their attentions." (*Sydney Morning Herald*, 20/10/1945).

The weed web moth (*Loxostege affinitalis* Led.) was prevalent in March and April 1939 in many inland areas where pastures were attacked (Anon 1939). It was reported to be exceptionally numerous in central-western N.S.W. in March 1941. Although the moths are not uncommon in ordinary seasons, in general great numbers only occur after heavy rain, which ensures plenty of weeds and herbage. (*Sydney Morning Herald*, 5/3/1941).

In some years the bush fly (*Musca vetustissima* Wlk.) is abnormally common. It appeared in Wollongong, in Sydney and suburbs and in other places in the latter part of 1945, arriving first in Sydney towards the end of October. This fly is somewhat smaller than the house fly, and unlike it, does not enter houses. It will settle in dozens on one's back, preferring dark, to light clothes.

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THE LATE PROFESSOR OAKES AMES (1874-1950)

By Edith Coleman, Blackburn.

Orchidologists throughout the world mourn the death of Professor Oakes Ames on April 28th at North Easton, Mass., U.S.A. For 50 years he was closely associated with Harvard University, as scholar, teacher and administrator. Orchids were his chief study. Said P. C. Mangeldorf in a biographical sketch for a commemorative volume of Oakes Ames (1948):

> "The *Orchidaceae* was but poorly understood when Oakes Ames began his systematic studies. Today, and in no small measure because of his work, the species of the *Orchidaceae* have probably been more thoroughly studied than those of any of the larger plant families."

The late Professor Oakes Ames —his wife's favourite portrait.

Oakes Ames himself described over 1,000 new species. Between 1898 and 1947 he published over 300 botanical papers, dealing chiefly with orchids. They appeared every year, with only two short breaks, beginning with seventeen; 62 papers were published in 1900.

He did fine work on the orchids of Borneo and the Philippines, to cite only two of his many fields. "The literature of the orchids of the Philippines remained in a state of hopeless confusion until 1915 when Professor Oakes Ames placed it on a sound and scientific basis." (Dr. R. S. Rogers, M.A., M.D., D.Sc.) These were dealt with in "*Orchidaceae*," Fascicles 5 and 6 (1915, 1920) and in "New and Noteworthy Orchids," 1923.

In the extensive botany of Borneo, Oakes Ames listed 87 genera of orchids and over 800 species. In 1921 the Straits Branch of the Royal Asiatic Society devoted a special issue of their journal to a "Bibliographic Enumeration of Bornean Plants." Seventy-one pages of this were devoted to orchids by Oakes Ames.

He early realized the value of good illustrations:

> "A careful drawing more quickly brings to mind the character of a plant than does the most skilful and lucid word picture, especially when the distinctions an author may wish to accentuate are subtle, or based on comparative values." (*Orchidaceae*, Fasc. I, 1905.)

In this respect Oakes Ames had the co-operation of his wife, "foremost botanical artist of the time." Of her drawings, many reproduced by the famous Merrymount Press, Boston, it was said: "They are the perfect flowering of Art, Science and Philosophy." Fascicles V and VI (*Orchidaceae*) are illustrated with no less than 42 of her beautfiul etchings. Oakes Ames acknowledged his debt in the dedication of Fasc. V—"To Blanche Ames-Ames, Wife, Colleague, Playfellow." That he himself possessed a ready pencil is shown in delicate delineations signed with the familiar "A" encircled by "O".

As early as 1908 Professor Ames ventured to challenge the view of Pfitzer (1887) that the vegetative parts of the orchid are the most reliable for a natural classification of the genera: "The vegetative parts are, however, frequently the most puzzling to interpret correctly. Vegetative variations may arise which disturb materially a system of classification based almost exclusively upon vegetative parts."

Touching on the tendency to make genera on rather narrower lines than prevailed when Bentham and Hooker published their *Genera Plantarum*, and to disregard the sub-genus, he says:

> "The advocates of this tendency use a variety of arguments to defend their practice, one being that large genera are unwieldy and difficult to monograph, and that careful cleavage along sub-generic lines . . . will hasten the arrival of that taxonomic stability which, in the final analysis, must rest on conscientious monographic work."

His views on the increase of synonyms will find an echo in many hearts: "Conservative systematists view with justifiable horror and distress the multiplication of synonyms that has attended recent activities in species making." He admits that his paper ("*Pogonia* and its Allies") may annoy those who are weary of nomenclatorial instability, which seems more and more inseparable from systematic botany, and that his paper may seem to be an attempt to justify a modern tendency that is positively dangerous in the realm of taxonomy; but he shows by seven plates of "commendable completeness" every structural character that seems important in the contemplation of generic cleavage. In 1938 Oakes Ames' herbarium of over 64,000 specimens (including many types) was presented to Harvard University, with an endowment fund to provide for its maintenance, and for further research in the *Orchidaceae*.

Economic botany, including medical botany, was another almost life-long study of Oakes Ames. His herbarium of economic plants and library of economic botany (over 16,000 books) is the world's most complete in that field. I am informed that the National Herbarium, South Yarra, has the seven Fascicles (separate volumes) of his *Studies in the Family Orchidaceae*, 1905-1922, succeeded by ten parts of the *Schedulae Orchidianae*, also a complete set of *Harvard Museum Leaflets* (1932 to date) in which many of his new species are described.

In the bibliography appended to one of Oakes Ames' papers there are no less than fifteen references to articles published in the *Victorian Naturalist*, which he always read with keen interest—indeed, no one else has done so much to make our journal known in the United States.

NATIVE PLANTS FOR GARDENS

It seems remarkable that many of our outstanding native plants have been practically ignored for garden culture and one wonders if they must be cultivated in some other country before they are appreciated here. This happened with the Blue Lace Flower (*Trachymene coerulea*) which did not find favour in Australia until it had become very popular in America. With its graceful foliage and long stems of beautiful blue flowers eminently suitable for cutting, this plant has much to recommend it, but there are others with equal claims to popularity.

The *Ajuga australis*, which is very hardy, is one that deserves greater recognition, for it is most floriferous over a long period and has the added advantage that plants may be obtained with either blue, pink or purple flowers. Another splendid native plant, *Brunonia australis*, with long stems of azure blue "pom-pom" flowers, would be ideal for a front border. Both plants would prove excellent subjects for selective propagation by seed.

—J. S. Seaton, Caulfield.

PARMELIA AUSTRALIENSIS Cromb.

By P. Bibby, National Herbarium, South Yarra.

Recently I received from the Botanical State Collection, Munich, by favor of Professor Suessenguth a photostat and a small piece of the type of *Parmelia convoluta* Krempelh.—Central Australia, E. Giles—and noticed its similarity to the lichen *Parmelia australiensis* Cromb. Apparently Krempelhuber was aware of this also, for in *Verhandl. der Kaiserl-konigl. Zool.-Bot. Gesell. Wien* 337 (1880) he remarks "*Parmelia australiensis* Cromb. scheint hierher zu gehören und ist vielleicht mit unserer *Parmelia convoluta* identisch".

Miss Eardley of the University of Adelaide sent me specimens of *P. australiensis* obtained in the Koonamore Vegetation Reserve, South Australia. These have been identified at Kew, England and presumably compared with R. Brown's type in the British Museum. Furthermore, Paulson in *Journ. Bot.* 68: 129 (1930) considers the Koonamore specimens to be the same as R. Brown's material (*vide* his Plate 592).

Specimens have been received also from J. H. Willis collected at Thurla, five miles west of Red Cliffs, N.W. Victoria, growing on Mallee sand.

As no fruiting material has been found, one must rely on the morphology of the thallus. Hand sections made of all the above material reveal no essential differences whatsoever. The thallus is approximately 1 mm. thick and the underneath surface is brown, sparingly covered with hyaline rhizinae about 2-2½ mm. long. The chemical reactions were the same in all cases (K, yellow; C, none; K + C, reddish). In view of this it must be assumed that the above two species are the same.

The full synonymy is therefore:

Parmelia australiensis Cromb., *Journ. Linn. Soc.*, 17: 395 (1879).

Parmelia convoluta Krempelh., *Verhandl. der Kaiserl-konigl. Zool.-Bot. Gesell. Wien* 337 (1880).

Parmelia subaustraliensis Gyeln., *Repert. Sp. Nov. Veg.* (Fedde) 29: 156 1931).

Parmelia vagans Nyl. f. *convoluta* Gyeln., *Ann. Mus. Nat. Hungar* 30: 127 (1936).

Localities:

Mt. Wellington ("Table Mt.") Tasmania, R. Brown (type); Central Australia, E. Giles; Koonamore Vegetation Reserve, South Australia, E. Eardley; Thurla, North West Victoria, J. H. Willis.

The type locality is open to grave doubt, as is also the case in some of Brown's other lichens enumerated by Crombie. Reference to articles on the ecology of the two regions recorded for this species—wet montane and desert—show that the climate is entirely dissimilar. Mt. Wellington rises to a height of 4,000 ft. and has a yearly rainfall of 55 inches and is for most of the year snow covered. Mean temperatures range from 40-50 degrees.[1] In contrast, Central Australia is distinctly arid, with its rainfall of 10 inches or less and frequent drought periods, also evaporation is as high as 82 inches. Here the mean temperature range is 46-74 degrees.[2]

Knowing how very specific most lichens are to environment, I deem it most unlikely that Brown found his specimen *Parmelia australiensis* on Mt. Wellington, and even more unlikely on rocks (as stated). This area has since been extensively botanised, especially by the lichenologists Wilson and Bastow, who certainly would have found the species had it occurred.

Of the list given by Crombie, others which occur on the red sand of the eremean areas of Australia are *Chondropsis* (*Parmeliopsis*) *xenoviridis*, *Lecidea crystallifera* and *Lecidea decipiens*.

My belief is, that Brown made collections of desert lichens en route from West Australia to Memory Cove, South Australia, but inadvertently put Tasmanian localities on the labels.

1. D. Martin, *Proc. Roy. Soc. Tas.*, 97 (1936).
2. Osborn, Wood, Paltridge, *Proc. Linn. Soc. N.S.W.*, 60: 192 (1935).

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PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on Monday, January 8, 1951, the President, Mr. E. E. Lord and about 150 members and friends attending.

The President welcomed several visitors to the Club, among whom were Mr. and Mrs. Noel Lothian of Adelaide and Mrs. D. Sides who recently returned from England. It was reported that Miss D. Collier is ill in Royal Melbourne Hospital and would be pleased to see Club members.

Mr. G. H. Beswick, 282 George St., Sydney, was proposed as a country member (Mr. A. Burke, Mr. H. E. Preston).

DISCUSSION ON THE COMMENCEMENT OF A BIOLOGICAL FLORA FOR VICTORIA

It had been suggested by Professor J. S. Turner and Dr. A. S. Watt of the Melbourne University that the Club, together with other scientific bodies, might help the professional Botanist to collect data and assist in working out the ecological status of our native plants—in a manner similar to that being undertaken by ecologists in Britain.

With this in view, Professor Turner opened the discussion, emphasizing the need for ecological surveys and indicating what had already been achieved by amateur botanists.

Dr. A. S. Watt outlined the scope of such work and suggested that a set of questions be drawn up and various observers interested in a certain species or group of plants asked to co-operate by listing information in conformity with the general plan—Name, distribution, soil factors, flowering and seeding habits, insect visitors, etc. At the conclusion of Dr. Watt's remarks some discussion took place and members showed enthusiastic interest in the proposal. Mr. Lord assured the speakers of the Club's willingness to help in any way and indicated that further talks for specific instruction would be arranged. A vote of thanks was accorded the distinguished speakers, on the motion of Mr. Hooke and Miss Ina Watson.

It is hoped to publish a complete report on this meeting in a subsequent issue of the journal.

EXHIBITS

Mr. C. J. Gabriel: Marine shell from Mauritius, *Pedum spondyloidewm*.

Miss E. Raff: Flowers of Blue Lace-flower (*Trachymene caerulea*)—a garden grown native of West Australia.

Mr. J. S. Seaton: *Beaufortia sparsa* (flowering about a month early), *Ceratopetalum gummiferum*, *Verticordia densiflora*—all garden grown.

Mr. K. Atkins: *Diploglottis Cunninghamii*, "Native Tamarind"—a large tree from the tropical scrubs of Queensland: the amber coloured juicy fruit has an agreeable acid flavour and makes an excellent jam. (Specimen from a plant labelled *D. australis* in the Botanic Gardens.)

HYBRID BETWEEN LYREBIRD AND COMMON FOWL

In the *Victorian Naturalist* for June, 1946, I asked for further information regarding a statement in the *Agricultural Magazine* in 1904 that the late A. W. Milligan claimed to have bred hybrids between the Lyrebird and the common fowl and that he had exhibited them at the Victorian Poultry Show "many years ago."

To this query the then editor, Mr. A. H. Chisholm, appended some notes referring to a claim by one W. R. Pennycock that hybrids between a Lyrebird and a game fowl had occurred in the Twofold Bay district of New South Wales about 1892. Pennycock had also made the statement that a friend at Eden had previously seen a brood of such hybrids "at a lonely farm on the edge of a great fern gully."

Then, in the *Victorian Naturalist* for February, 1950, Mr. Chisholm drew attention to the statement by J. G. O'Donoghue in the issue for May, 1914 (page 15) that Milligan had bred his hybrids about 1896, when he was living at Traralgon, and that Milligan had successfully reared two generations at the time he (Milligan) broke up his home and removed to Western Australia.

Lately, in looking through the eighth volume of *The Emu* (1909), I noticed that at the Eighth Congress of the R.A.O.U., held in Melbourne in 1909, Mr. C. W. Maclean exhibited "a rough skin of apparently a hybrid between a Lyrebird and an Andalusian Fowl." Ornithologists of the time appear to have been very remiss in not solving this puzzle; it will, I have no doubt, be agreed nowadays that statements of the nature I have recorded should not be allowed to stand unquestioned. May I again suggest that some Melbourne naturalist will investigate further.

H. M. Whittell.

Bridgetown, W.A.

CULTIVATION OF NATIVE PLANTS

(To the Editor)

Sir,—A short article, "Native Plants for Gardens," appearing in the January issue was written some time ago and an amending note regarding two of the species referred to would now seem desirable.

Further experience in growing Blue Pincushion (*Brunonia australis*) and Bugle (*Ajuga australis*) suggests that these have not proved really satisfactory for general garden culture. Although the *Brunonia* has a wide geographical range, some condition present in its natural habitat seems necessary before it can be coaxed to flourish. Several gardeners have raised it successfully from seed and I am told that there was once a fine Pincushion border in the Melbourne Botanic Gardens.

There is a wide field open for research, especially in soil requirements, before some of our most attractive native flowers can be introduced for general cultivation.

J. S. Seaton.

A REPORT ON THE DEPUTATION OF SEPTEMBER 22nd, 1949, CONCERNING VICTORIAN NATIONAL PARKS AND NATIONAL MONUMENTS

(Report No. 3 of the National Parks and National Monuments Standing Committee)

Through the good offices of the Hon. C. E. Isaac, M.L.C. (Honorary Director of the "Save the Forests Campaign" and member of the F.N.C.V.), Mr. Crosbie Morrison, Mr. Fred. Lewis and Mr. J. Ros Garnet were enabled to meet the then Premier (Mr. T. Hollway), Mrs. Hollway, the Minister of Forests (Mr. A. H. Dennett) and the Minister of Water Supply (Mr. H. E. Bolte) at an informal luncheon during which many matters relating to National Parks and National Monuments were discussed.

Although the Premier and his Ministers were in complete sympathy with the proposals put forward, it was suggested that the best course to be followed would be to refer the matter for full examination to the Parliamentary State Development Committee. Nevertheless the Premier consented to receive a deputation from organizations interested in the welfare of the State's National Parks, and indicated that he would be prepared to receive the deputation at an early date.

Following this meeting the State National Parks and National Monuments Committee met and discussed the organization of the deputation which was scheduled (by arrangement with the Premier) for September 13th, 1949. A circular was duplicated and despatched to all interested parties, but this task had just been completed when a telegram from the Premier's Office notified a change in date to September 22nd. This necessitated the preparation and despatch of a fresh circular.

On Monday, September 12th, Mr. Isaac arranged a further luncheon at Parliament House and on this occasion Mr. Morrison and Mr. Garnet were able to meet and discuss the substance of the forthcoming deputation with the Minister for Lands (Mr. R. C. Guthrie), the Secretary for Lands (Mr. Hunter), the Speaker of the Legislative Assembly (Sir Thomas Maltby) and several other interested members, including the Chairman of the Parliamentary State Development Committee (Mr. R. K. Whately), and the former Chairman (Col. J. A. Hipworth).

On this occasion also the several members expressed their interest in the proposals and the Speaker was, without difficulty, persuaded to accept responsibility for introducing the deputation. Opportunity was taken by Mr. Garnet to discuss Tower Hill National Park with the Secretary for Lands and with him was left, for more leisurely consideration, the National Parks Committee's file relating to Tower Hill—a step which may result in action

being taken to stop some of the abuses now being perpetrated by its Committee of Management, the Koroit Borough Council.

During the general discussion Mr. Hunter expressed the opinion that he, privately, could see no reason why a National Parks Authority should not be set up, but agreed with the Minister that it could only be created after consultation with those other Ministers and their Departments who were likely to be involved, e.g., the Departments of Fisheries and Game, Forests, Water Supply, and Lands, and their Ministerial Heads. All present agreed that the proposals should be the subject of a special enquiry by the Parliamentary State Development Committee to whom all interested parties would have an opportunity of expressing their views and submitting evidence.

On the same day Messrs. Morrison and Garnet completed arrangements for the deputation, the addresses and supporting statements which it was intended should be delivered during the deputation; these were edited and dovetailed to conform to a carefully chosen pattern.

As finally arranged the deputation took place in the Premier's Room at Parliament House at 10.00 a.m. on Thursday, 22nd September, 1949. A number of members of the House had been invited to be present including the Leader of the Opposition (Mr. McDonald) and the Leader of the Labour Party (Mr. Cain), but none was observed to be in attendance. Representatives of the Australian Broadcasting Commission and the metropolitan and provincial daily papers were present together with some twenty people as speakers or observers.

The earlier informal discussion with the Minister for Lands had been most fortunate, since the Premier was unable to attend and he had asked Mr. Guthrie to deputize for him. The Speaker, in introducing the deputation, said that the participating organizations were representative of all natural history and allied Societies in Victoria, bush walking and ski clubs, the National Fitness Council, Town and Country Planning Association, etc., and had the support of the Royal Automobile Club of Victoria and the Country Women's Association. It would be hard to find a more worthy and self-sacrificing body of people.

Mr. P. Crosbie Morrison, in delivering the leading address, presented the main points arising from the recommendations of the National Parks and National Monuments Conference of December, 1948. He stated that although the Deputation was small, it included the direct representatives of more than 100,000 Victorians, and represented, indirectly, many times that number of people who are concerned about the preservation of the unique features of our fauna and flora and of our Victorian countryside. He had the honour to be Chairman of a committee elected by

delegates of all the natural history, bush walking, and similar organizations in this State.

The committee had been charged with the task of investigating the present condition of National Parks in Victoria and the best method of preserving and maintaining them in the future. Members of the Deputation were very grateful for the opportunity of presenting the committee's findings to the Government with a request for action with as little delay as possible.

Briefly, *the Deputation asked for a State authority to control National Parks, and for finances from general revenue to provide for their maintenance.*

He referred to National Parks in the wide sense, to include permanent reservations of land for the purpose of preserving samples of the countryside in their natural state for the benefit of future generations, for the protection of the habitats of native fauna, for the perpetuation of specific native plants which are confined to limited areas (and which would be in danger of extermination if there were no such reserves) and for the preservation of any other natural features—including geological ones—which, in the opinion of those authorities best able to judge, should be preserved in their natural condition.

Obviously, he said, there should be several categories of national parks. First, those which may be properly developed as resorts for recreation in natural surroundings, with access roads, camping and parking facilities; places where parents may take their children and say, "Look, this is a sample of *our* country—your country—as nature made it." The Premier would agree that the most potent factor in the development of an Australian spirit among our own rising generation, and also among those who are now adopting this as their country, is intimate contact with the unspoiled Australian bush.

Next, there must be areas of *limited access*, and these should serve rather the creature life which we desire to perpetuate, than the human recreational element. In such regions there should be no roads—only bridle tracks and paths for foot-walkers. We have very strict laws relating to the protection of native fauna, but many of our creatures are doomed, in spite of legal protection, unless we can provide protection for their natural environment—places where they can live and breed unmolested. With the encroachment of settlement such natural surroundings are becoming more and more restricted, and the prevalence of rabbits, foxes, and feral cats is making their lives even more precarious.

Finally, for the conservation of species that stand in danger of extinction, it may be necessary to provide closed areas (without even bridle tracks) to which entry may be gained only by special permit.

Mr. Morrison stated that we have already in Victoria 16 or 17 reserves. Two of them, Wyperfeld National Park in the Wimmera-

Mallee border country, covering 138,700 acres, and Wilson's Promontory National Park, covering 102,379 acres, are spacious, but most of the remainder are small. The total area of lands reserved as national parks in Victoria is a little more than 300,000 acres (i.e., just under 500 square miles). To the unthinking, this acreage may sound impressive, but one recalls that a brand of exceptionally pure soap used to be advertised as 99 and 44-100th per cent pure. The percentage of the area of the State of Victoria at present reserved for the purposes mentioned (National Parks) is *slightly less* than the amount of impurity in that very pure product. In plain language, it is negligible—only 0.5 per cent of our total area. A much more generous reservation of virgin country is urgently required if those purposes are going to be properly served. Of the tiny area already reserved, much is failing in its purpose because of lack of funds for maintenance and control or for lack of recognition of the real purpose of the reservation.

Mr. Morrison quoted two instances to illustrate this point, viz., Tower Hill and Kinglake. Tower Hill National Park at Koroit was reserved years ago, on the representations of geologists, to preserve one of the world's most remarkable volcanic craters, complete with scoria and all the classical text-book features of a crater—it is almost diagrammatic. The local Borough Council was appointed as the Committee of Management (each National Park is nominally controlled by a committee consisting of public spirited citizens acting in an entirely honorary capacity), and in recent years this Council has attempted to "develop" the area as a people's playground. At one stage the internal slopes of the crater were being "improved" to provide a track for motor-cycle racing, and funds for the "improvements" were being raised by quarrying road-metal from the very feature the park was created to preserve.

The second instance related to a very conscientious committee of management of the Kinglake National Park which, unable to obtain funds for maintaining and supervision from any other source, has been compelled to sacrifice part of its forest to sell as firewood to provide money for the protection of the rest. He explained that the Chairman of that committee of management was at present abroad, otherwise he would have been present at this Deputation.

Continuing, Mr. Morrison said that, in all features desirable in National Parks, Victoria is far behind some of the other States—notably Queensland and Tasmania. One of the principal difficulties is that there is no statutory provision for the supply of funds for the maintenance of National Parks, except where they can be shown capable of development as ultimately self-supporting or revenue-producing tourist resorts. Faced with these findings, his committee had been commissioned to present to the Government a series of resolutions of which he proposed to read a condensation

(as follows), the full text being already in the hands of the Premier and the Minister:

1. That the Victorian Government be asked to enact legislation to ensure adequate control and management of Victoria's National Parks and Reserves of like nature.
2. That all the several types and classes of reserve dedicated to the use of the public and the protection of nature and to the preservation of historic, scenic and natural monuments be defined in and covered by the Act.
3. That the projected Act provide for the creation of a single corporate National Parks Authority to administer such control and management.
4. That the Authority be endowed with the requisite funds from general revenue to administer the Act effectively.
5. That the Authority consist of five members, one to be full-time Chairman appointed by the Government, and four other expert members to be paid for attendances only, and appointed by the Government from nominees recommended by—(a) the committees of management of the individual national parks, (b) natural history organizations, (c) educational bodies, and (d) recreational bodies.
6. That members be appointed for a limited tenure (say 5 years) with eligibility for re-appointment and provision, in the first instance, for retirement by rotation to achieve continuity of policy.
7. That the functions of the National Parks Authority be—
   (a) To develop a general policy concerning National Parks and National Monuments.
   (b) To recommend the acquisition and proclamation as a National Park or Reserve of any object, site and/or area which, in its opinion, should be so reserved in the interest of posterity.
   (c) To take such action as it may consider necessary for the preservation and development of all National Parks under its control.
   (d) To appoint such personnel as is required to carry out the detailed supervision and development of the National Parks.
   (e) To maintain overall supervision of detailed work carried out by Committees of Management.
   (f) To control membership of Committees of Management under prescribed rules.
   (g) To report annually to Parliament.

   (While most of the Committees of Management work conscientiously and wisely, there are some burdened with members who have long been unfitted by age or infirmity, and some do not even meet now—so the parks under their nominal control have actually no supervision whatever.)
8. That the present system of appointment and functioning of Committees of Management of our National Parks and Reserves be retained but modified to provide for—
   (a) Limitation of tenure to 5 years with the right of eligibility for re-appointment.
   (b) One representative of the local governing body or bodies of the district within whose boundaries the Reserve is situated.
   (c) One representative of a Government Department.
   (d) The selection by the Authority of appointees from a panel of names submitted by interested organizations or groups of citizens.
9. That the functions of the Committee of Management of the National Parks and Reserves under the control of the Authority be—

(a) To ensure the preservation and to promote the development of the Reserve under their charge in conformity with the general policy formulated by the National Parks Authority.
(b) To control and direct such personnel as are allotted to them.
(c) To regulate traffic and control camping in the Parks and to collect charges for the various facilities (parking, camping, etc.).
(d) To report annually to the National Parks Authority.
(e) To carry out such other duties as may be delegated to them by the National Parks Authority.

Concluding, Mr. Morrison said that the Premier might wonder why some of the interested Government Departments were not represented at the Deputation. All the Departments—except, he believed, the Treasury—were invited to send representatives to the recent conference, and most of them were represented. Several of them asked, however, to be permitted to remain as observers only, in case they might be embarrassed by any criticism of their departments in subsequent proceedings. They had not been neglected, and he felt that they were behind the Deputation in the desire to find a better footing for our National Parks. Their exclusion from the Deputation has been purely to leave them free from any possible embarrassment.

Mr. J. Ros Garnet, who was introduced by Mr. Morrison, said that he spoke as a scientist whose interests covered several fields of biology, and as the immediate Past President of the Field Naturalists Club of Victoria—now in its 70th year of existence. The Club's members had consistently influenced the public in matters pertaining to the preservation of our Australian flora and fauna, of this State's scenic treasures, of our national natural monuments and National Parks. He also addressed Mr. Guthrie as Honorary Secretary of the Club's National Parks and National Monuments Committee and as Honorary Secretary of the National Parks and National Monuments Standing Committee which was set up by a Conference of delegates from 26 Associations, Clubs and Societies, Committees of Management of several of our National Parks and a number of Government instrumentalities, all of which had demonstrated their interest.

The total membership of these 26 private associations is not easily determined, but if weight of numbers has any meaning in supporting the representations, Mr. Garnet said that among them all will be found responsible men and women from all parts of Victoria, numbering many thousands and including folk from all walks of life, whose interests range from those of recreation—walkers and skiers, motorists and campers—through scientists and naturalists to educationists and specialists in such matters as forestry, water supply and soil conservation. All have shown their anxiety to preserve National Parks.

Investigations indicate that Victorians are regrettably lagging in the matter of scientific control of National Parks. Restricting

comparisons to National Parks within Australia, Victoria's are at a distinct disadvantage as compared with, say, those 229 in Queensland or even with the one magnificent National Park near Sydney or several in Tasmania.

In Victoria a National Park has no legal status, and it is believed that this should be immediately corrected. Properly and legally defined by Statute, reserves of this type would receive the public recognition they deserve for what, in effect, they are—"Places dedicated in perpetuity for the edification, education and enjoyment of the people of all time and for the preservation of nature, our Australian flora and fauna and sites that are supreme in scenic, scientific or aesthetic value."

If the wisdom of taking this first step were conceded and legal status established and defined, it will be essential for the welfare of National Parks and, indeed, for the welfare of the whole State and its people, that they be put on a proper basis, and it was submitted that this can best be effected economically by implementing the resolutions of the Conference mentioned above.

Mr. Garnet said that the Conference was quite definite that present administration is unsuited to the magnitude of the task and to the quite specialized requirements of technical administration. At the present time many of our most magnificent National Reserves are ultimately controlled by the Department of Lands and Survey—a Department whose personnel are, as is well known, already overtaxed in the administration of its multitudinous affairs. The Act under which it operates does not embrace all those things that should be done to ensure the permanent welfare of all our National Parks and all those places worthy of recognition as National Monuments.

Part 12 of the 1928 Land Act makes it quite clear that the Lands Department can achieve a reasonable measure of success in studying the welfare of places of this type *only* if they are recognized tourist resorts—in other words, if they are potentially and immediately productive of revenue. Some of the reserves, as they are now managed, are incapable of returning any substantial amount of revenue from tourists, and as a consequence the Parks have to submit to such devices as grazing or timber-logging to raise what little revenue is available.

Continuing, Mr. Garnet endorsed Mr. Morrison's remarks concerning Tower Hill and Kinglake. One could add similar instances from most National Parks in Victoria. A glaring example is the grazing on Mount Buffalo National Park, on an area that contains wildflower species found nowhere else in the world. It was not claimed that grazing should be entirely eliminated from all National Parks—that is one of the matters which only the proposed statutory Authority can decide, on the merits of each individual area.

If Victorians are to retain and preserve places notable for their special scenic, historic or scientific interest, then all such places must be put under the full control of a single competent authority. Committees of management are at present often restricted and have no recognized source of technical information; their trusts are generally administered in a way that is hampered by lack of money and, often enough, by lack of knowledge.

Accepting the postulate that our National Parks are primarily centres of nature preservation and, secondly and as a consequence, places of special interest to the people whether sightseers, scientists, or nature lovers, it will be easily understood that such places *do* require very special attention and management—not at all identical with that given to a purely recreational area or a Botanical or Zoological Garden. That is why the Deputation stressed the need for an Authority comprising representatives of a diversity of interests, and why it was believed that the system of Committees of Management should, while being retained, be modified considerably. Each National Park should be allotted one or more permanent trained rangers so that a system of cadet or trainee rangers be introduced. It was suggested that the facilities of both the Forests Commission and the Department of Fisheries and Game could be used for this purpose.

The whole proposal hinges on the provision of adequate finance. In the past the people to whom these Parks belong have had little financial interest in them. If they are to be conducted in a manner which will interest and attract all sections of the Community, then the people must be prepared to finance their development or, where development is undesirable, their supervision and protection as sanctuaries. Buchan Caves National Park provides an example of a place amenable to development as a tourist show place. The Park is controlled entirely by the Lands Department. During the year 1946-47, for example, an expediture of £2,500 permitted an income of revenue amounting to £3,000, so even a modest expenditure on a well managed National Park may show dividends in cash. Wyperfeld National Park, on the other hand, exemplifies an area which should not be expected to produce revenue in return for an annual endowment. It is essentially a centre of wild life preservation, soil conservation and biological research. In between these two extremes we possess areas which can be made, by judicious expenditure, highly attractive to tourists and visitors from within Australia and from overseas. This aspect has been explored and found lucrative by Queensland, which now has its many National Parks under uniform and expert control and Queenslanders are exceedingly jealous of their welfare.

Mr. Garnet urged that Mr. Guthrie and the Government see fit to lay the foundation to a sound policy in regard to Victoria's National Parks and National Monuments and create

and endow our own National Trust. It could safely be predicted that Victoria will lose nothing, and stand to gain much, by such a step.

Mr. Fred. Lewis then spoke as a Vice-President of the Field Naturalists Club of Victoria, a member of the Committee of Management of two of our National Parks, and the retired head of the Fisheries and Game Department for over thirty years. In the latter capacity he had also been in close touch with the management of most of the National Parks in Victoria. Every responsible citizen of this State knows that, for the proper development of Victoria, it is essential to make the utmost use of our land. This utilization often necessitates the draining of swamps, the cutting down of trees, the opening up of the country and consequent spread of settlement. Disastrous effects are thereby made upon the habitats of much native fauna. For instance, the clearing of the Mallee for wheat growing, not alone in Victoria but right across Australia in the Mallee belt, has almost exterminated the Lowan or Mallee Fowl—the only mould-builder native to Southern Australia.

He said that the spread of settlement cannot, and should not, be stopped if the State is to progress, but that is no reason for allowing a unique fauna to perish from the earth. Already in Victoria's comparatively short history several species have entirely disappeared from our State. He imagined that the Premier is fully cognizant of the unique nature of the Australian fauna, of the interest shown therein by many other nations of the world, and would, therefore, realize the wisdom and advisability of conservation measures. No game laws ever made can conserve birds and other animals *when their habitat is destroyed*, but suitable areas reserved in primitive condition are the answer to the problem. The proclaiming of National Parks and appointment of Committees of Management are not enough. Without effective supervision, and he emphasized "effective," these Parks are the happy hunting ground of poachers. The Reserves being in their natural condition, of course attract the native animals which have been driven away from the cleared areas and are thus an easy prey. The big Wyperfeld National Park in the Mallee was reserved primarily to preserve the Lowan and some of our most beautiful and rare Parrots and Cockatoos. One of these, the Regent Parrot, commonly known as the "Smoker," may have become extinct in this State had it not been for this National Park; but because of the lack of effective supervision, the Park is raided every Spring by people in search of young birds. This instance is typical of many in our National Parks. The remedy is obvious.

Continuing, Mr. Lewis said that the big National Parks of the U.S.A. and South Africa are known the world over. Not only do

they attract an immense tourist traffic, which brings good money into the country, but because they are well managed and properly supervised they fulfil their primary purpose of conserving the fauna native to the country. He hoped that the Government will be able to accede to the wishes of the Deputation.

Mr. T. W. Mitchell, M.L.A., spoke as representing the Youth Hostels Association. He invited attention to the importance of our national reserves in connection with the activities of youth organizations and with the health of the youth of the nation, and added that a country has only been what its traditions have inspired. There could be no finer way of explaining the Australian tradition to young people than one based on the beauties of our land. He appealed to the Government to provide opportunities for extending that tradition by ensuring that these natural beauties are preserved not only for now but for all time.

Mr. T. G. Patterson said that the Royal Automobile Club of Victoria is behind the movement and pointed out that not one of the organizations represented has any financial "axe to grind." What the Deputation seeks will not mean a penny in their pockets but rather the preservation of Victoria's fauna and flora. He offered the opinion that our national parks deserved the expenditure of considerable sums of money if they were to serve, in any degree, as centres of attraction to overseas and local tourists.

[In the absence of Mr. C. E. Bryant, who was to have represented the R.A.O.U. and bird-lovers generally, Mr. Morrison indicated that the tenor of his remarks would have shown the urgent need for the provision of more and better distributed close sanctuaries for our native birds as a major contribution to the biological balance of the State's fauna.]

Mr. E. G. Stewart, introduced as Honorary Secretary of the Federation of Victorian Walking Clubs, said that he could speak for at least 2,500 individuals. In addition, he felt that he expressed the views of many thousands of otherwise mute members of the public—people unconnected with any organization of the kind here represented—who frequently visit our more accessible National Parks and who fully appreciate their existence.

A few years ago, bushlands in their natural condition were very widespread in this State and large areas existed quite close to Melbourne. Because of natural development and land settlement, such areas have shrunk considerably and are now doing so with alarming rapidity. Those areas which have been reserved for the use and enjoyment of the people thus become more and more valuable, as they retain in some degree their original attractiveness before the onsweep of land settlement.

Mr. Stewart stated that the Dandenong Ranges 50 years ago was a primeval forest with every possible natural attraction—great

trees and wonderful fern-gullies, teeming with bird and animal life. Now, with a few notable and all-too-minute exceptions, the whole area had become almost an outer suburb of Melbourne. Some public spirited and far sighted people did urge large scale reservations in the area many years ago, but were disregarded as impractical idealists.

Reservation and reclamation policy had been neglected by Governments for many years, it would bring general prestige to any Government that took the constructive action now suggested and would stand as a monument for all time.

Mr. P. E. Hull, representing the skiers of Victoria (some 26 ski-ing clubs have a combined membership of more than 2,100), said his Federation of Victorian Ski Clubs supports the idea of a National Parks Authority which, it believes, can bring much-needed finance and co-ordination to the management of the tourist attractions that exist in some of our Parks. The Federation wanted uniformity in the control of the State's alpine reserves and he referred to the disadvantages of divided control such as now existed in the Kosciusko State Park in New South Wales.

At the conclusion of Mr. Hull's address Mr. Isaac was invited to sum up and, in doing so, he commended the proposals to the Minister and the Government. He stated as a personal view that he believed the representations now made by the Deputation should be referred, as a matter of urgency, to Parliament's State Development Committee.

The Minister, in terminating the deputation, thanked the speakers for presenting their case so well, adding that he was most impressed by the size and variety of interests the Deputation had represented. He would certainly recommend that the matter be submitted for further and detailed enquiry in the way suggested by Mr. Isaac and he assured those present of the sympathetic interest of both the Premier, himself, and many other members in the welfare of the State's National Parks.

Among those present to support the Deputation were representatives of the Bird Observers' Club (Miss M. L. Wigan), National Publicity Association (Mr. John Bechervaise), Victorian Mountain Tramping Club (Mr. C. A. H. Wood), Melbourne Bush Walkers (Mr. N. Richards), Forest League (Mr. A. D. Hardy), Town and Country Planning Association of Victoria (Mr. A. R. Henderson), Wyperfeld National Park Committee of Management (Mr. I. F. McLaren), Ararat Field Naturalists' Club and Anthropological Society of Victoria (Mr. G. N. Hyam), Bendigo Field Naturalists' Club (Mr. H. C. E. Stewart), National Fitness Council and Churchill National Park Committee of Management (Dr. A. G. Scholes), the Gould League of Bird Lovers and the Victorian Education Department (Mr. J. Gainy).

At the commencement of proceedings several documents were submitted to the Minister, among them being a statement of the nine resolutions which the National Parks and National Monuments Conference of December, 1948, had endorsed with the direction that they be brought to the notice of the Government by deputation (see *Victorian Naturalist*, vol. 66, May, 1949, pp. 6-8). At earlier informal talks with the Premier and Ministers opportunity had been taken to distribute copies of the Report of June, 1948, "National Parks and National Reserves in Victoria," the "Proceedings of the 3rd Session of Conference, Dec., 1948," a reprint of the "Report of the F.N.C.V. Standing Committee on National Parks and National Monuments" (*Vict. Nat.*, May, 1949), and the *Naturalist* of August, 1949, containing the Presidential Address, "Preservation of Nature and the F.N.C.V."

Following the deputation, a suggestion was made privately to Messrs. Morrison and Garnet by Mr. Isaac (to whom is due, in no small measure, the present success of the campaign) that a public meeting in the Melbourne Town Hall should be arranged to publicize our National Parks and the associated campaign. He believed that such a meeting, if well organized and made attractive by the exhibition of suitable "stills," films and slides, with authoritative commentaries, could do much to win active public support for the campaign.

J. Ros Garnet, Secretary.

BLOWFLY'S ACTIVITY UNDER WATER

On December 18 I put a freshly-cleaned rabbit into a dish of salty water to soak. There were some blowflies about, so I covered the rabbit with at least two inches of water to protect it. Later, the dish was inspected, as blood in the water seemed to have attracted some flies. A blowfly was found struggling on the surface of the water. Out of disgust I casually hit the fly, which promptly took a bubble of air with it and settled on the rabbit. Once here, the fly acted quite naturally—it preened its wings, turned its head, and rubbed its legs. The outer layers of tissue around the rabbit's body are rather adhesive, and it soon became apparent that the blowfly was ensnared in these. Now quite intrigued, I freed the fly, under water, expecting that the air bubble on the thorax would cause the insect to float. However, the fly was still quite unmoved by its underwater habitat and walked along the rabbit's body, then underneath, where it was shadowed. Some short time elapsed, and the fly re-appeared, then became limp, and floated exhausted to the surface. As a larva was protruding from the abdomen when the fly was taken out of the dish, the undersurface of the rabbit was examined, and there were three live and very active larvae, about ¼ inch long already at work on the outer flesh! Far from hindering the blowfly, the casual hit helped it in its purpose of blowing the meat even though it was submerged in salty water.

Lionel Gilbert,
Nabiac, N.S.W.

PLATE II

Above—"Snake Hole" in Everard Ranges (haunt of the local tribe's mythical serpent).

Below—Unusual candelabra-like growth in the fungus *Ganoderma polymorphum* (from a well on Everard Park).

Photos.: R. C. Seeger

THE NORTH-WEST CORNER OF SOUTH AUSTRALIA

(A recent visit to the Everard and Musgrave Ranges, with notes on previous expeditions.)

By PROFESSOR J. B. CLELAND, Adelaide.

Mr. R. C. Seeger, partly on behalf of the Anthropological Society of Victoria, organized a small expedition to visit the Everard and Musgrave Ranges in April 1950. This Society had been left a moderate sum of money to be used in some way, at its discretion, for the welfare of the natives. It was thought that one of the best ways of achieving this object would be to provide wells for the natives who still live a nomadic life in the Native Reserve at the north-west corner of South Australia. As Honorary Secretary of the Society, Mr. Seeger wished to make a visit and explore the possibilities. Other main features of this trip were the collecting of botanical material and photography to cover natural history and the doings of the native population.

The party, comprising Mr. R. C. Seeger as leader, Mr. E. E. Lord, Mr. W. Parkin, Dr. E. Couper Black and Professor J. B. Cleland, left Adelaide on Thursday, April 6, for Port Pirie and Port Augusta. From recent rains the country was in great fettle from the Pitchi-Ritchi Pass in the Flinders Ranges nearly to Oodnadatta. Owing to recent wash-aways being repaired, the train had to proceed very slowly in places after leaving Hawker. In the Pitchi-Ritchi pass many *Crinum* lilies and a *Nicotiana* could be seen in flower. The rest of the journey was notable on account of the luxuriant vegetation—*Chenopodiaceæ*, *Cruciferæ*, *Aizoaceæ*, *Leguminosæ* and *Malvaceæ* were particularly noticeable. On the return journey, water could be seen from the train in Lake Eyre South, with a flotilla of pelicans cruising on it. Oodnadatta was not reached until about 1 a.m. on Saturday morning, owing to the caution required over recently repaired portions of the permanent way. Saturday was spent at Oodnadatta, in the morning by visits to the Police Station and Mission; in the afternoon by a walk to the Neales, a watercourse passing near the township.

The party left by Mr. W. Lennon's truck with his help as driver on Sunday morning, April 9. Miss Breadon invited us to lunch at Todmorden on the Alberga (56 miles). In the afternoon, with her we visited Alleumba Water Hole on the Coongra and then went on to camp amongst dry Dead-finish (*Acacia tetragonophylla*), some ten miles or so from Lambinna. Lambinna Station (97 miles) was washed away in a great flood that came down a tributary creek as it poured over the flood-plain to enter the Alberga. The site of the house was passed next morning and Granite Downs (159 miles) reached before lunch. The run from there was through Mt. Chandler Well to Everard Park where we were very hospitably received by Mr. and Mrs. Bradey. Tuesday, April 11, was spent visiting the hill-slopes round the Station and

in the afternoon by going with Mr. Bradey to see that all the wells were functioning. We ascended Mt. Ilbillie on April 13.

The party left for Ernabella on Saturday morning, April 15, reaching Kenmore Park about lunch time and the Mission late in the afternoon. Here the Rev. and Mrs. Trudinger and staff very kindly looked after us. Mt. Woodroffe was climbed on April 18. The party returned to Ernabella next day and journeyed on to Upgan Downs on the Officer, passing through Glen Ferdinand.

The return journey from Ernabella was commenced on Saturday, April 22. We camped ten miles beyond Everard Park that night

Everard landscape—mountain-side and mulga plain.
Photo.: R. C. Seeger

and made Todmorden by dusk next day; Miss Breadon very kindly put us all up for the night. We reached Oodnadatta by midday on Monday, packed our specimens that afternoon, joined the train about 5 a.m. on Tuesday and reached Adelaide late on Wednesday evening, April 26.

Natural History Observations and Collections

Botanical collecting, in view of Mr. J. M. Black's Revision of his *Flora of South Australia,* was one of the main objectives of this trip. Apart from the specimens taken by the writer, Mr. Lord did not lose an opportunity to collect plants; two sets of his dried material (about 200 species) have gone to enhance the Botanical Gardens Herbarium, Adelaide, and the Melbourne Herbarium.

Another important feature was the collection of samples from the natives for blood grouping by the Commonwealth Serum Institute and for the Wassermann reaction in yaws, testing their taste for phenyl-thio-urea and collecting examples of hair for Professor Birdsell in Boston, as well as enquiries on behalf of the Aborigines Protection Board.

Bird observations were thus considerably pushed into the background and no specimens were collected. Wood duck were seen by some members on Alleumba Waterhole. We ascended Mt. Ilbillie (3,000 ft.) in the Everard Ranges and to do so, over the

Aborigines at Everard Park Station.
Photo.: R. C. Seeger

rough and huge granite boulders, discarded all superfluous weight, including the shot gun. Near the termination of our descent into the valley leading down to Snake Rock Hole and towards dusk, a dove was disturbed from among the *Triodia* tussocks and it perched on top of one for a short while—I could not recognize any spots and the shape seemed more rotund and less elongated than might be expected, but I presume this must have been *Geopelia cuneata* which Captain White had not seen farther west than a hundred miles from Oodnadatta. In the same locality we caught a glimpse of an *Amytornis*. In the garden at Everard Downs, a Bower Bird was disturbed.

The climbing of Mt. Woodroffe (5,000 ft.) was a tiring and toilsome undertaking on account of the steepness and growth of prickly grass. The mountain side is strewn with boulders and stones of all sizes, some loose, and is covered with "spinifex" (*Triodia*) tufts, the sharp points of whose knitting-needle-like leaves penetrated the clothing around our legs, leaving a multitude of punctures, many bristling with *Triodia* points, with the shins feeling like stubbly beard. Here again all unnecessary weight had been discarded, and the gun left behind. Not far from the summit, a pair of *Amytornis* were disturbed and followed; they took frequent glimpses at me from the tops of the tussocks and I reciprocated. These birds seemed rather dark in colour. Several unusual plants, including a *Dianella* (unfortunately not in bloom) were there and the views from the summit were repayment for our climb—Ayers Rock could just be seen far to the north-west, now projecting above the intervening hills that had served to hide it.

As we slowly limped across the plain at the foot of Mt. Woodroffe towards our camp, top-knot pigeons rose one after the other from amongst the *Triodia* tufts to the number, it seemed, of thirty or forty. Occasionally a pigeon was seen on the ground between the tufts, when its crest could be distinctly observed and its colour appeared dark; the birds made the usual "whirr" like that of a tense fence-wire pulled and released and, though I had some doubt at the time, I think now that these birds must have been *Ocyphaps lophotes*. An Emu was noted in the distance as we approached Oodnadatta. On the return journey, as the train passed close to South Lake Eyre, numbers of pelicans could be seen on the water.

Inland Skies and Weather

The climate in the north and north-west of South Australia during autumn and spring, and even in winter, is delightful on the whole. The days are usually sunny and mild to almost warm, but the night may be very cold. Between Liddle's Hill and Ayers Rock, a hundred miles north, I have known the temperature to fall as low as 14 deg. F. Though good rains of an inch do not occur every year, I have encountered them on two of the three occasions when I have been in these parts—Aug., 1933, and Aug., 1945.

On the first occasion, heavy rain was preceded by mists in the Musgrave Ranges, so that these rugged spinifex-covered hills looked more like the Highlands of Scotland with their heather than any other part of Australia known to me. The second occasion was my first visit to the Everard Ranges: we had arrived late at night from Ernabella and next day nothing could be seen of the hills, as they were all hidden in mist to their bases. On both occasions, the parties only just reached Oodnadatta in time before extensive flooding of the country made travelling temporarily impossible.

Camping in the open at night with no canopy, save the brilliance of the stars or the pale light of the moon, is ever a delight in these

regions, provided there is no rain. The sunsets and the sunrises, with often a few high-level clouds about, are a riot of delicate shades of red, indigo, orange and yellow. As daylight ends, with the sun well below the western horizon, a band of indigo appears in the east and rapidly increases in size—it is the shadow of the earth on the fine particles of dust that have been reflecting the sun's rays and so giving the glowing tints of colour; it is night chasing day. Again, at dawn—and all are up early in the outdoor life of the interior—the process is reversed. The gorgeous brilliance of the coming sunrise drives westward the shadow of the night, again appearing as an indigo band of rapidly diminishing size.

With field-glasses, the details of the starry mazes are more clearly made out. In Orion's Sword can be seen a cluster of stars. With the naked eye, great stars near the horizon blaze alternately red and blue as the light from them passes through regions of warmer or cooler air. Here is the scene set to view shooting stars and to be the first to see the arrival of new comets. We heard of a hole in the ground in low hills not far from Todmorden where, a native said, "a star had tumbled down."

(To be continued.)

MELBOURNE'S MANGROVES ARE DEAD!

Stark tragedy has robbed Melbourne of one—perhaps the most interesting—of its distinctive plant communities. The quarter-mile, uninterrupted line of healthy White Mangroves fringing the southern bank of Kororoit Creek (east of the old Williamstown race-course) has been a popular Club excursion site for many years, and its fascination never palled [see account in this journal of June, 1944, p. 41]. I have on several occasions escorted interstate botanists there, and astonishment was always expressed at the occurrence of this curiously isolated tropical element so near the heart of our city—only 6 miles distant.

On a recent inspection with two other keen members of the Native Plants Preservation Group—enthusiastic to have this unspoiled area of salt-marsh declared a sanctuary—I looked in vain for that familiar line of dark umbrageous greenery along the Kororoit. Was my vision defective? At the creek I stood completely dumbfounded, gaping with incredulity at the spectral scene before us. Every one of the but recently vigorous trees was either dead or fast dying, and most were defoliated.

The cause? There was not the slightest sign of interference by vandals or by migrants from the nearby race-course hostel, and surely there had not been any epidemic disease among mangroves, nor a sudden change in water levels at this corner of the Bay during the last year or two. Damage by poisonous effluents in the creek water seems to be a logical conjecture, and if the Vacuum Oil Company's Altona refinery upstream be responsible then industry has exacted a terrific and unnecessary toll from Nature.

Wherever the blame lies, our mangroves have now gone beyond recall and it is doubtful whether the Native Plants Preservation Group could have done much to save them. I do not believe they can ever re-establish, and in future the Melbourne botanist and nature lover will need to travel beyond Port Phillip to see a living mangrove tree. The remainder of the salt-marsh at Kororoit Creek mouth is in good condition and I hope our Plants Preservation Group will move early to have this tongue of Crown Land declared a strict sanctuary.

J. H. WILLIS.

PROPOSED NEW GENUS OF ORCHIDS

(To accommodate the remarkable Australian epiphyte, *Sarcochilus dilatatiflorus* F. Muell. ex Benth., *Flora Aust.*, VI, p. 292, 1873)

By the REV. H. M. R. RUPP, Northbridge, N.S.W.

RHINERRHIZA, gen. nov.

Plantae epiphyticae caulis brevissimis. Rhizomata serpentia, numerosa, robusta, semicylindrica, asperrima, scobinae simulia. Folia 3-5, late oblonga, aspera siccaque, 6-12 cm. longa. Racemi sub foliis emergentes. Flores fugaces, 6-60, aurantiaci notationibus rubris. Sepala petalaque fere aequalia, angustissima vel filiformia, 3-4 cm. longa. Labellum trilobatum, comparate parvissimum, album; lobi laterales erecti, intus ad fibram striati. Saccus ad lobi intermedii basem parvus, sulcatus. Columna brevissima robustaque; rostellum comparate magnum; stigma aliquantum cordiforme. Pollinia 2, saepe profunde fissa.

Epiphytes with short stems. Roots creeping, numerous, robust, semi-cylindrical, papillose-rough, resembling a rasp. Leaves 3 to 5, broadly oblong, harsh and dry in texture, 6 to 12 cm. long. Racemes arising below the leaves. Flowers fugacious, 6 to about 60, orange with red dots and splashes. Sepals and petals approximately equal, very narrow or filiform, 3 to 4 cm. long. Labellum trilobate, very small for the size of the flower, white; lateral lobes erect, with horizontal reddish striae inside at the back. Labellar sac at the base of the middle lobe small, scarcely protruding, furrowed. Column very short and stout; rostellum relatively large; stigma somewhat cordiform. Pollinia 2, often deeply split.

There being at present only one species, *R. dilatatiflora*, its description is covered by that of the genus. The plant is figured (over the name *Sarcochilus dilatatiflorus*) in Fitzgerald's *Australian Orchids*, I, 6; in *Gems of the Bush* (Barrett and Nicholls), p. 8; and in *Orchids of New South Wales* (Rupp), p. 133.

Habitat: Rain forests on the coastal side of the Dividing Range in northern New South Wales and southern Queensland. I can find no records of its occurrence south of the Hunter Valley in the former State; in Queensland it does not appear to extend into the tropics, but is known from around Gympie and is frequent to at least 20 miles N.W. of Maryborough. Within these limits it is not a rare orchid. Apart from eucalypts, it does not seem to be particular about its hosts. The largest plants I have ever seen were growing on *Eugenia ventenatii* along the banks of the Myall River above Bulahdelah, N.S.W.

DISCUSSION

Sarcochilus, the largest genus in the Tribe *Sarcanthinae*, has always presented difficulties to the taxonomist. A number of species formerly included in it have been transferred to other genera; but it is by no means easy to define satisfactorily the distinctive characters which have been deemed sufficiently important,

to call for generic separation of these closely allied orchids. Because of this, the present paper will probably meet with some adverse criticism, inasmuch as its proposes not only to remove from *Sarcochilus* an Australian species which has been allowed to remain in that genus for nearly 80 years but, further, to establish this species as the type of a new genus, to which at present no other species can be admitted. My proposal is that Mueller's *Sarcochilus divitiflorus* shall be known in future as *Rhinerrhiza divitiflora*.

But before proceeding to discuss this transfer, I must indicate as clearly as I can the distinguishing characteristics of the genus *Sarcochilus* as I understand them.

With few exceptions, the species are comparatively small plants, either epiphytic on trees or shrubs, or more rarely attached to cliffs or rocks. Individual flowers are not large, but the racemes are often showy and attractive; among Australian species the majority are fragrant. The perianth segments (in Australia) are approximately equal in length (from 5 mm. to 2·5 cm.), and are relatively broad, at least in their distal half, and either obtuse or very shortly acute. The labellum is trilobate, and is articulate on the column-foot; it is devoid of a basal spur, but the very short middle lobe is saccate at its base, and this labellar sac (sometimes called a spur) protrudes rather conspicuously in front. It is hollow, and is not closed by a large callus as in the allied genus *Sarcanthus*. The lateral lobes of the labellum are erect, and in most Australian species are lined inside with perpendicular striae. The column is wingless and rather short, but is produced below into a long foot, to which the lateral sepals are adnate. The number of the pollinia is variously given as 2 to 4; there appears to be some confusion here, possibly due to the former inclusion in this genus of some species which do not belong to it. Fitzgerald shows 2 in all his illustrations of *Sarcochilus* species (but see below in regard to his plate of *S. divitiflorus*). J. J. Smith and Oakes Ames, in describing certain New Guinea and Philippine species respectively, give the pollinia as 2; and I think we should take this as the correct number for the true *Sarcochilus*.

The plants are furnished with an extensive root system. In those species which are strictly epiphytic on trees or shrubs, the roots are filiform; but in the rock-dwelling plants they are somewhat thicker. In both cases they are quite smooth. Stems in most species are short. Leaves vary from linear to lanceolate-falcate, and are of soft texture and semi-succulent.

Now let us consider the plant hitherto known as *S. divitiflorus*. Mueller alludes to it in *Fragm.*, IX (1875), 50; i.e., two years after it had been described by Bentham in the *Flora Australiensis*. Bentham obtained the name from Mueller's herbarium material, and he observes: "I have only seen racemes and loose leaves of

this remarkably distinct species." It is regrettable that better material was not available for him; but this plant is restricted to the rain forests of northern New South Wales and southern Queensland—areas which were difficult of access in those days. Fitzgerald, however, undoubtedly collected living specimens; and he accepted the plant without demur (see *Austr. Orch.*, I, 6 (1880)) as a Sarcochilus. It should be remembered, however, that this genus at that time was rather loosely defined, and included a number of species which have since been removed from it. For instance, among Australian orchids alone the following species were all at one time or another included in *Sarcochilus*: *Chiloschista phyllorrhiza*, *Thrixspermum platystachys*, *Bulbophyllum Newportii*, *Sarcanthus tridentatus*, *S. Beckleri*, and *Taeniophyllum Muelleri*.

The plant now under discussion certainly differs widely, in important respects, from any *Sarcochilus* which complies with the generic description outlined above. Outstanding distinctive characters are as follow:

1. *Roots* stout, semi-cylindrical, very papillose-rough, resembling a rasp. ("Raspy-root" is a vernacular name for it; and the new generic name, *Rhinerrhiza* is the Greek equivalent for this.)
2. *Leaves* very broad, harsh and dry in texture, and never semi-succulent.
3. *Flowering habit.* The buds of the racemes remain very diminutive, and apparently quiescent, for months; but within a week of their expansion they suddenly develop very rapidly, enlarging and becoming elongate. Usually the buds of the whole raceme, numbering from about 6 to as many as 60, *expand simultaneously in one night.* But the opened flowers are very fugacious, and within 48 hours (or less in warm weather) all are withered, most of them falling off. In many-flowered racemes, two or three buds occasionally remain undeveloped for as much as a fortnight after the main flowering, when they develop and wither normally. In large plants with a number of racemes, it is not uncommon for all the racemes to open their flowers simultaneously. The plant is then a striking and beautiful sight; but the vision is of very brief duration. This remarkable flowering habit has no parallel among Australian species of *Sarcochilus*.
4. *Sepals and petals narrow-linear*, tapering and filiform towards the tips, 3-4 cm. long, bright orange with numerous red dots and splashes. Both in form and colour scheme this perianth is entirely unlike that of any other *Sarcochilus*.
5. *Labellum* very diminutive in relation to the size of the flower, white; but the lateral lobes are *transversely* striated with red

inside at the back. The labellar sac is extremely short, scarcely protruding in front, where it is furrowed.

6. *Column* very stout and short; the *rostellum* relatively large and conspicuous. The *pollinia* are rather difficult to be sure about; in the majority of flowers examined there are 2; but they are generally deeply split or divided, sometimes giving the impression that there are 4. Fitzgerald's plate, *l.c.*, seems to me capable of an ambiguous interpretation in this respect.

It will be clear from what has been said above that this orchid is, as Bentham observed, "a remarkably distinct species." I do not know of any publication in which its peculiarities have been previously discussed. The chief reasons for this silence probably lie in its restricted habitat and the fugacious nature of its flowers. True, it has a range of more than 500 miles north from the Hunter Valley in New South Wales; but it is essentially a brush forest orchid, and is never seen in open forest country. Moreover, unless one has plants in cultivation, observation of the flowers is by no means easy. You cannot rely on them for more than 24 hours or so; and if you do not hit the right day they are gone for another year. I know this from experience, for I have lived in two districts where this orchid was by no means rare; yet I found that the only way to be sure of observing the flowering habit was to grow plants at home. They are not difficult to cultivate; I had three plants, on a piece of the branch on which I found them, for over twenty years.

It may be objected that many striking differences occur between species of other genera, which have not called for such drastic treatment as is proposed here. My reply is that such differences frequently *have* prompted the very course I am taking in this case—the removal of species which "do not fit", to other genera. I do not like the establishment of a monotypic genus, though I plead guilty of having done it twice before. But if it is found that a species will not fit satisfactorily into the framework of the genus where it was first placed, and if there is no other recognized genus which will accommodate its peculiar characteristics, I see no alternative.

In polymorphous genera like *Dendrobium* or *Caladenia*, it is true that one does find great differences between species. Compare, for instance, *Dendrobium falcorostrum* with *D. tenuissimum*; or *Caladenia lobata* with *C. aurantiaca*. But in these cases both species, despite their dissimilarity, do fit into the framework of *Dendrobium* and *Caladenia* respectively. In the present instance, I submit that the plant concerned will not fit into the framework of *Sarcochilus*, which as it is now understood can scarcely be termed a polymorphous genus. But could not that framework be enlarged so as to accommodate our plant? Well, if we are to do that for one plant, why not for others? Where is the line to be

drawn? It seems to me simpler, and less liable to lead to confusion, to remove the anomalous species and give it a new status. I hope therefore that the proposal here made will prove acceptable, and that this peculiar and very distinctive Australian orchid will in future be recognized as *Rhinerrhiza divitiflora*.

I wish to acknowledge the assistance of Messrs. Trevor Hunt of Ipswich and Warren Abell of Kingaroy, Queensland, and of H. K. W. Mair, at the New South Wales National Herbarium, in working out the transfer of this orchid and in supplying information as to its northern distribution.

"COLLECTING MOTHS AND BUTTERFLIES"

This book, by Ian Harman, is more than a mere handbook on collecting insects. The author stresses the fact that entomology is no longer a matter of wholesale collection and classification; it is study of the *living creature*—the pattern of its life, its part in the world of nature. This is a more important function of entomology than the examination of dead bodies, however attractively mounted.

To this end he describes how moths and butterflies may be bred, and watched from egg to perfect insect. The structure of egg, larva and perfect insect is described in non-technical terms and we are told how to look for all of these.

The author relates many little-known facts, all of interest to the novice. For instance, "Woolly-bears" (larvae of the Tiger-moth) are nearly always badly parasitized by ichneumons. By breeding them from eggs they are secure from attacks, and more perfect insects are obtained.

Remarkable methods of pupation in moths and butterflies, and their wonderful emergence as perfect insect, are fully described. A chapter deals with equipment for collecting, preserving and storing specimens, and is illustrated by easily grasped diagrams.

It is easy to obtain eggs from captive moths, but to induce butterflies to deposit them, sunshine is needed. A muslin-covered cage over a food plant set in a pot will serve if placed in the sun. Larvae may be reared on a growing branch by "sleeving", i.e., covering with a muslin sleeve, tied at both ends to prevent escape. A list of food plants is given, leaves of which should be fed dry; wet leaves cause internal trouble.

A fascinating chapter is devoted to collecting at night. The author writes of his delight in wandering woodland paths when dusk has fallen, and all is quiet, except for the cry of owl, or nightjar, and the soft movements of creatures of darkness.

The author describes a method of capturing moths by "sugaring". A bait of brown sugar, or molasses and beer, with a teaspoonful of rum or methylated spirits, is spread on the trunks of trees, and to this moths are attracted soon after dusk. Moths at the sugar are a fascinating sight; their eyes gleam like tiny jewels when light from the collector's lamp falls on them. They often fall intoxicated to the base of the tree, or into a net placed there!

It is pleasant to learn that attracting males by means of a caged female is considered unsportsmanlike. A calendar showing what species may be sought each month, and an index, complete a thoroughly useful little book, most of which will be useful also to Australian collectors, although English insects are featured. Included are 23 beautiful photographs of moths and butterflies, and 16 drawings in the text, all prepared by the author.

EDITH COLEMAN.

GREVILLEA ANETHIFOLIA

One of the rarest of our *Grevillea* species, *G. anethifolia* R.Br., was rediscovered in October, 1948, by my brother, Peter, and myself on the railway enclosure about 12 miles on the Weethalle side of Rankins Springs. This locality is west of Wyalong in south-western N.S.W. Subsequently (April, 1950) we found colonies along the railway east of Rankins Springs in several places. Growing in red, sandy loam this species seems normally to propagate by means of underground stolons. Every few feet the main roots throw up a small shoot and a small clump soon becomes a large colony. Of course, seeds may germinate when conditions are favourable; but in two visits to the locality no seedlings were seen.

Of small stature (2-2½ feet high), *G. anethifolia* literally covers itself with white or creamy flowers in October and November. The flowers appear in dense heads across the tops of the plants. The rigid, rather prickly foliage reminds one somewhat of *G. triternata* of central-western N.S.W., but this latter species is neither so compact nor so floriferous and, as Bentham points out, the floral arrangement is entirely dissimilar. The plant associates of this rare species are very interesting and include the green-flowered form of *Prostanthera microphylla* which, according to Mr. J. H. Willis of Melbourne Herbarium, has been for a long time mistaken for *P. chlorantha*, also *P. aspalathoides*, *Halgania cyanea* and a lovely *Grevillea* which is evidently a narrow leaved form of *G. rosmarinifolia*. There are also suites of species, comprising such genera as *Pimelea*, *Dampiera*, *Helichrysum*, *Helipterum* and *Goodenia*.

The botanical description appearing in Bentham's *Flora Australiensis* is appended:

"A shrub with the foliage of *G. triternata*, but with very different flowers, the branches shortly pubescent, the foliage glabrous. Leaves once, twice or three times divided into narrow-linear almost terete rigid divaricate pungent pointed segments, singly or doubly grooved, the whole leaf under two inches long. Racemes short, dense, axillary or terminal. Pedicels glabrous, one or two lines long. Perianth glabrous, slender, straight or nearly so, 2½ lines long the limb globular. Torus straight. Gland prominent, semi-annular. Ovary glabrous on long slender stipes; style much dilated and flattened except at the base; stigmatic cone surrounded by a prominent margin."

The habitat is given as N.S.W. Rare, in the barren, flat country near Peel's Range. I am unable to find this locality marked on any of my maps, but presume it to be part of the Lachlan Range system.

["Peel's Range" is situated near the present Naradhan, a few miles south of Lake Cargelligo.—Ed.]

Measurements taken of green material show that the average length of the leaves is a line more than an inch, with a width of ¼ inch. The longest leaf seen was 1½ inches. Compare this with the average length of 2½ inches and a similar breadth of an average specimen of *G. triternata* and it will readily be seen that, even without flowers for a guide, there is little chance of confusion. The average length of the leaf segment of *G. anethifolia* is 5 lines, against 10 lines in *G. triternata*.

The writer would be very glad to receive any other reports of the occurrence of *G. anethifolia*.

—G. W. Althofer,
Dripstone, N.S.W.

ERRATA

In *Vict. Nat.* for December 1950, the following mis-spellings call for correction: p. 162 (3rd line), read "*Lhotzkya*" (not "*Lhotsqya*"); p. 160 (10th line of "Save the Seals"), read "or" (not "of"); p. 161 (2nd last line), read "Conard" (not "Conrad"); p. 166 (14th line of "Orchids of E. Gippsland"), read "*Dendrobium striolatum*" (not "*striolatum*").

WHAT, WHERE AND WHEN

General Excursions:

Saturday, February 17—Loch River Valley and Noojee. Subject: "Mountain Gully Flora." Leader: Mr. W. Hasse. 200-mile parlour coach trip via Warburton, McVeigh's Road, Loch River, Noojee and Warragul. Coach leaves Batman Avenue at 8.00 a.m. Bring one meal (tea available at Warragul). Bookings, fare £1, with Mr. H. C. Stewart, 14 Bayview Terrace, Ascot Vale (FU 1096). Preliminary bookings must be confirmed at February meeting.

Saturday, March 3—Frankston Reservoir area. Subject: "Geology and General." Leader: Mr. A. W. Burston. Train: 9.10 a.m. Frankston from Flinders Street, then walk 3 miles. Fares: 2nd return Frankston, 4/3. Bring lunch and afternoon tea.

March 10-12 (*Labour Day Week-end*)—Paynesville, Gippsland Lakes, Sperm Whale Head. The itinerary is: Leave Melbourne *Friday 9th* by 6 p.m. train to Bairnsdale, then bus to Paynesville where accommodation is available at Swansea Guest House *Saturday 10th*—Cruise on Lake Victoria, visiting Sperm Whale Head, Lakes National Park, and the 90 mile beach. *Sunday 11th*—Cruise Newlands Back Water and Forges Creek; walking tour of Raymond Island under direction of Mr. C. Watson, Secretary of the Island's Trust. *Monday 12th*—Leave Paynesville on return at 10.30 a.m. Costs: Train and bus fares, approx. £2.10.0; accomm. £1.17.6; Hire of launch, £4.10.0 per day for 15 passengers or £3 per day for 20 passengers. Names, with £1 deposits, to the leader—Mr. R. B. Jennison, Brooklea P.O., Geelong Road, West Footscray.

March 22-26 (*Easter*)—Wandiligong, via Bright. Limited shared accommodation at country house for small party. 18/- per day. Leaders: Miss M. L. Wigan and Mrs. E. Watson. Train: 4.15 p.m. (Thursday 22nd) to Wangaratta and service bus. Further details from Mr. H. C. Stewart, 14 Bayview Terrace, Ascot Vale (FU 1096).

Preliminary Announcement:

Wyperfeld National Park: In September it is proposed to have an extended excursion to this National Park situated in the Mallee. The dates will co-incide with the Park's Committee annual visit and inspection, and the party will be conducted by the members of that Committee. Rainbow is the nearest railway station, but as this is 20 miles from the Park, the excursion's committee would like to arrange it by private car (this would also make possible an interesting detour through the Grampians on the return route). The camping facilities in the Park include a large, well-appointed hut for cooking and eating, with tank and well water. Tents would be required. Limited hotel accommodation available at Rainbow for those able to drive out each day. Names (and cars) to Miss M. Elder, 17 Adelaide Street, Malvern (U 7297).

Group Fixtures:

Tuesday, February 20—Native Plants Preservation Group. At home of Miss W. Waddell, 3 Denham Place, Tootak, at 8 p.m.

Monday, February 26—Botany Discussion Group. Royal Society's Hall, 8 p.m. Monthly Meeting. Subject: "Sedges." Hon. Sec. Mrs. A. Osborne, 21 Renwick Street, Glen Iris, S.E.6. *The Botany Discussion Group's monthly excursion will be announced at February General Meeting.*

Friday, March 2—Marine Biology Group, Royal Society's Hall, 7.45 p.m. Monthly Meeting. Hon. Sec.: Miss C. Walker, 538 Burwood Road, Hawthorn, E.2 (Tel.: WA 3167).

Tuesday, March 6—Geology Discussion Group. Royal Society's Hall, 8 p.m. Subject: "Fossil Invertebrata—their Life and Form." First Group—"The Foraminifera." Lecture by Mr. A. A. Baker. Hon. Sec. Mr. A. A. Baker, 53 Carlisle Street, Preston. *Geology Discussion Group's monthly excursion will be announced at the Group's monthly meeting.*

—J. Blackburn, Excursions Secretary.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on Monday, February 12, 1951, the President, Mr. E. E. Lord, and about 180 members and friends attending.

The President welcomed visitors to the Club, among whom was Professor Ark, from the U.S.A.

Members learnt with regret of two resignations from the Club's Council. Mr. J. H. Willis has had to surrender the position of Hon. Editor, and Miss I. Watson, Asst. Editor, has consented to edit the *Victorian Naturalist* until new officers are elected in June. Miss A. M. Burton has also been obliged to relinquish her position as Asst. Secretary. The President conveyed the Club's sincere thanks to Miss Burton and Mr. Willis for their past services.

It was reported that Mr. W. H. Nicholls is ill and hope was expressed for his quick recovery.

The President announced that Mr. B. C. Cotton, eminent South Australian conchologist, had been awarded the Australian Natural History Medallion for 1950.

Mr. G. H. Beswick was elected as a country member of the Club.

AUSTRALIAN TREES AND THE BIRDS WHICH FREQUENT THEM

Mr. E. S. Hanks gave an informative address on many species of Australian eucalypts. With the aid of coloured slides prepared from many of his own photographs, Mr. Hanks discussed the interesting points for identification of the eucalypts and blended his botanical remarks with ornithological references, indicating the birds that frequent these trees. He vividly described their nesting and breeding habits, emphasizing the need for active preservation of our native flora. Mr. Hanks impressed members with the fact that any subject cannot be studied alone, with a total disregard for other sciences—to glean a fuller understanding of one's own subject, some ecological study should be undertaken.

EXHIBITS

Miss J. W. Raff: Larva of the Wanderer Butterfly, collected from a Swan Plant at Hawthorn East (this butterfly has spread to Australia from North America, where it is known as the Monarch); hips of *Rosa rugosa* from the Footscray Gardens; *Equisetum* (Horse-tail), the highest development of cryptogams, having many similarities to our *Casuarina* species; leaves of Nardoo (*Marsilia Drummondii*).

THE NORTH-WEST CORNER OF SOUTH AUSTRALIA

(A recent visit to the Everard and Musgrave Ranges, with notes on previous expeditions.)

By PROFESSOR J. B. CLELAND, Adelaide.

(Continued from previous issue)

Historical Notes (to 1900)

Our trip covered the area between Oodnadatta and the Everard Ranges (200+ miles west) and the Musgrave Ranges, nearly 300 miles north-west. It may be of interest to give a short resumé of the explorations previously made in this region.

John McDouall Stuart, before he crossed the continent in 1862, had made several previous explorations toward the centre of Australia. In 1859, or before that date, he had reached the Neales, watercourses that pass within a mile of Oodnadatta. In 1860 he had followed up the Neales, crossed over north to the Hamilton and made his way up to the centre of the continent. John Ross in August, 1870, from Mount Margaret (the Peake), south of Oodnadatta, commenced choosing the route to be taken by the Overland Telegraph Line, which was completed two years later.

The opening of the Telegraph Line led to a series of further explorations westward of it. Thus Giles in 1872 left Charlotte Waters for Chambers Pillar and working westwards named Mount Olga and found Lake Amadeus. Colonel Warburton on April 15, 1873, left Alice Springs for Central Mount Stuart on his famous journey to the Oakover River in North-west Australia.

W. C. Gosse (Report and Diary of Mr. W. C. Gosse's Central and Western Exploring Expedition, 1873. *South Australian Parliamentary Paper* No. 48, 1874) left Alice Springs on April 23, 1873, with his brother Henry Gosse as collector, made his way to the Reynolds Range, about forty miles south of Central Mount Stuart, and then followed the Lander. Seeing some red-crested cockatoos (Major Mitchell presumably), he named Cockatoo Creek. He then made his way south, reaching Mount Liebig and Haast's Bluff and passing through the Macdonnell Ranges, camping at Glen Edith.

Still keeping south he came to what he calls George Giles Range [George Gill's Range] and then saw Mt. Olga and named Mt. Conner. A hill east of Mt. Olga as he approached "presented a most peculiar appearance, the upper portion being covered with holes or caves." His description continues: "When I got clear of the sandhills, and was only two miles distant, and the hill, for the first time, coming fairly in view, what was my astonishment to find it was *one immense rock* rising abruptly from the plain; the holes I had noticed were caused by the water in some places forming immense

caves . . . . I have named this Ayers Rock, after Sir Henry Ayers." Next day, Sunday, July 20, Gosse "rode round the foot of the rock in search of a place to ascend" and writes—

> Seeing a spur less abrupt than the rest of the rock, I left the camels, and after walking and scrambling two miles barefooted, over sharp rocks, succeeded in reaching the summit, and had a view that repaid me for my trouble . . . . The top is covered with small holes in the rock, varying in size from two to twelve feet in diameter, all partly filled with water . . . . High ranges south-east, south and south-west, with sandhills between. The one south-east I have named after His Excellency, Governor Musgrave; and a high point in same, bearing 141°, Mount Woodroffe, after the Surveyor-General (George Woodroffe Goyder). This is a high mass of granite, the surface of which has been honey-combed, and is decomposing, 1,100 feet above surrounding country, two miles in length (east and west), and one mile wide (not a mile wide) rising abruptly from the plain . . . . This rock is certainly the most wonderful natural feature I have ever seen. What a grand sight this must present in the wet season; waterfalls in every direction.

Gosse brought up his party and camped at Ayers Rock. On August 9, he was at Mount Olga. Near Stevenson's Peak he found quandong trees loaded with ripe fruit, the first he had ever seen, some one and a half inches in diameter. Approaching the Mann Ranges, which he named on August 14, he passed over "sandy ground with beautiful grass and herbs . . . more the gay appearance of a flower garden than pasture land." There were vetch (*Swainsona*) and wild geranium (*Erodium cygnorum*). This was the best country he had seen since leaving the good land north of Adelaide. By a running creek in the Mann Ranges he noted some gums with very dark purple leaves.

On August 23, he named the Deering Hills and the Tomkinson Ranges. Desert oaks were seen near Trew's Gap. At the Tomkinson Ranges he noticed "some tall mulga growing, something like pines, with straight barrels, and the branches about thirty feet from the ground; height from forty-five to fifty feet." Near the boundary of the Province he notes mulga, acacias, mallee, grevillea and quandong trees in fruit. Passing into Western Australia, he named the Cavanagh and Barrow Ranges and a high point on the latter Mount Squires. Amongst some spinifex (*Triodia*) sandhills near this Mount he found a mallee with yellow and red flowers measuring three inches in diameter (*?Euc. pyriformis*).

Gosse commenced his return journey from the Cavanagh Ranges on September 22, taking a slightly different route and naming the Blyth Ranges. In the Mann Ranges the party found some Grevillea flowers "lying about, which the natives must have brought from some distance to eat at the water"—probably the racemes of *Hakea lorea* and its relatives (corkwoods) which furnish considerable nectar. The natives had burnt large patches of the country and some parts burnt previously looked very green. In the Musgrave Ranges, the mulga scrub was burning and trees were falling

Pitjandjara girl (*Purkinja*) at Ernabella.

in all directions. A creek with a running stream had high bulrushes. On October 2, near Mount Morris in the Musgrave Ranges, Gosse was very surprised to come upon the horse-tracks of Giles' party and noted in his diary: "This is very annoying, as they appear to come from the Neales, the route I had chosen by which to return to the telegraph line. I shall now have to try the north side of the range." As the route that Giles was expected to follow must have been known to Gosse, this surprise and annoyance are hard to explain.

Gosse followed then the north side of the Musgrave Ranges, naming Mitchell's Nob north of Mt. Woodroffe, and Mt. Everard after the Hon. William Everard. On November 6, he came upon

two of Giles' camps and next day named the Marryat, presumably after Dean Marryat of Adelaide. On November 12, he discovered the Agnes and, afterwards, the junction of these two creeks; he called the main watercourse the Alberga. On November 15, he met with natives who had heard of the "white-fellow Wheelbarrow curteyahba" (the overland telegraph line). Following the the Alberga down, they came to Olarinna Well and then Appatinna Waterhole. Finally the party crossed north to the Hamilton and so to the telegraph line.

E. Giles and **W. H. Tietkens** with twenty-four horses on August 4, 1873, left Ross Waterhole at the junction of the Stevenson and Alberga Creeks near the Overland Telegraph Line and zig-zagged westwards, not far from the boundary with the Northern Territory to the Anthony and Ayers ranges which Giles named. On August 27, Giles discovered a creek meandering through the dense wilderness, having splendid timber along it with upright elegant stems supporting umbrageous tops. "On each side of the creek was a strip of open ground, so richly grassed and so beautifully decked with flowers, that it seemed like suddenly escaping from purgatory into paradise, when emerging from the recesses of this dense scrub to the banks of this beautiful creek." Three days later, on Tietkens' birthday, the whole party were brought to this spot and Giles named it Tietkens' Birthday Creek. On August 31, Giles and Tietkens rode over to a high mountain, which the leader called Mt. Carnarvon or the Sentinel because, as he quoted:

"The mountain there did stand
To sentinel enchanted land."

The mountain was like a stupendous turtle-back, of a conglomerate granite. From its top, an extensive view was obtained. To the north-westward was a flat-topped hill which later proved to be the Mt. Conner discovered by Gosse just two months before. "To the south and at a considerable distance lay another range of considerable length, apparently of some altitude. This I have named the Everard Range, after the Hon. William Everard." By boiling water, they estimated the height of Mt. Carnarvon as 3,790 feet. Two days later, the party ascended the creek. "The country along its valley was excellent, and the scenery most beautiful, pine clad, red and rocky hills being scattered about in all directions; while further to the west and south-west the high, bold and very rugged chain rose into peaks and points." When they camped beside the creek "in the background were the high and pointed peaks of the main-chain, from which sloped a delightful green valley, through which the creek meandered, here and there winding around the front of little pine-clad hills of unvarying red colour, whilst the earth from which they sprang was covered with a carpet of

verdure and vegetation of almost every imaginable hue." On September 4, the party found themselves:

> Upon the reedy banks of a fast flowing stream, whose murmuring waters, ever rushing idly and unheeded on, were now for the first time disclosed to the delighted eyes of their discoverer . . . . Everything was of the best kind here—timber, water, grass and mountains. In all my wanderings over thousands of miles in Australia, I never saw a more delightful and fanciful region than this . . . . We saw several fine pools and ponds, where the reeds opened in the channel, and we flushed up several flocks of ducks.

Giles intended to call this mountain chain "The Ferdinand Chain," but found when he returned to civilization that Gosse, from the top of Ayers Rock on July 20, had forestalled him and given the name of Musgrave Ranges to these mountains. However, Giles was able to call the valley "Glen Ferdinand," the creek "The Ferdinand," and a tall mountain adjacent "Mount Ferdinand"—all obviously after Baron von Mueller—and in Glen Ferdinand is situated Ernabella.

Continuing westerly, the party were attacked by natives on Officer Creek, named by Giles. Mount Davenport was named after the Hon. (later Sir) Samuel Davenport of Adelaide. How delighted Giles was with the country in the western part of these ranges is shown by such names as Fairies' Glen, Titania's Spring and Mt. Oberon. As the party emerged from the ranges, Mt. Olga of Giles' earlier expedition was about fifty miles away and to this the party made their way. Here, on September 14, Giles writes:

> Mr. Tietkens pointed out to me the track of a dray or waggon, also of horses and camels. I knew at once that they must be Mr. Gosse's but I was perfectly dumbfounded at their appearance here; . . . for I knew that Mr. Gosse had left the Telegraph Line many hundreds of miles to the north of my starting-point; and as the line from Mount Olga to the Murchison had been officially pointed out to me, and as I had understood that Mr. Gosse was to penetrate the country north of the Macdonnell Range, and being so excellently equipped to traverse any region, it was no wonder that I was astonished at the appearance of those tracks. I was not only astonished—I had reason to be annoyed as well—because, as the Government Expedition had come down to this mountain, and was now travelling in advance of me, on the only line of country that seemed traversable—that is to say—along the line of range now lying south and south-westward from here, it had probably more than a month's start of me."

Giles now moved south-westward to the Mann Ranges, just named by Gosse, and then to the Tomkinson and Cavanagh Ranges over the border. He discovered farther west still the Colonel's Range of his map, named after Colonel Warburton and now called the Warburton Range, and penetrated some considerable way farther into impossible country. He now retraced his steps to Fort Mueller in the Cavanagh Range and then journeyed north, finding the Rawlinson Range with Lake Christopher at its western end and beyond this losing Gibson in what became

PLATE III

Ernabella Creek (the "Glen Ferdinand" of Giles)

Photo: R. A. [illegible]

known as Gibson's Desert. Returning eastwards he named the Petermann Ranges, visited Mt. Olga again and then went to Ayers Rock and Mt. Conner, crossed the east end of Lake Amadeus and finally proceeded north to the George Gill, Krichauff and Macdonnell Ranges and so to Chambers Pillar and the Overland Telegraph Line.

In May, 1875, Giles with Tietkens and Young and camels left Beltana; they made their way through Ooldea to Queen Victoria Springs, thence to Mt. Churchman and on to Perth. Leaving Perth on January 13, 1876, Giles returned to South Australia, accompanied by Young, Alec Ross and Nicholls, by following up the Ashburton and then making east. The party reached the Rawlinson and Petermann ranges in July, passing on to the Musgraves and reaching Glen Ferdinand. He followed down the Ferdinand channel southwards (now called the Officer in this part of its course), describing the country as "good, grassy, nearly level, with low, sandy mulga ridges, fit for stock of any kind." (*Australia Twice Traversed* II, p. 327, 1889).

The Officer passes south to the west of the Everards and Giles made his way across to visit these ranges. The outlying hills he describes as "Very peculiar, bare, red granite mounds, being the most extraordinary ranges one could possibly imagine . . . . They have thousands of acres of bare rock, piled up into mountainous shapes and lay in isolated masses, forming something like a broken circle, all round a central and higher mass. They have valleys filled with scrub between each section. Numerous rocky glens and gorges were seen, having various kinds of shrubs and low trees growing in the interstices of the rocks."

Apparently Giles camped and watered his camels at the Snake Rock Hole, by which we commenced our ascent of Mount Illhillie, as it was on the northern face of the highest hill in a small gum-creek, and the party had to roll boulders of rock out of the way to give the camels a drink. Visiting another water on the south side of this high hill they found "the whole space round the foot of the rocks . . . choked up with a thick and vigorous growth of the native fig-trees which grow somewhat like banyan-trees, except that suckers do not descend from the upper branches and take root in the ground alongside the parent stem; but the roots of this tree run along the rocks to find crevices with soil, and then a fresh growth springs up; in general, it does not grow very high, twenty feet is about the limit." At this spot six years later, in December, 1882, Giles was attacked by natives. He seems to have given a good deal of provocation by treating his native visitors in rather a high-handed way.

The plants collected by Giles on his various expeditions were identified by Baron von Mueller. Those for 1872, 1873 and 1874 appear as an appendix to Giles' *Geographic Travels in Central Australia*. Going through the list one finds many of the localities

to be in Western or Central Australia and thus beyond the area with which we are concerned. Other plants are recorded as "between the Alberga and Mt. Olga" so that it is impossible to know whether the locality was or was not in South Australia. *Loranthus Exocarpi* is given for the Musgrave Ranges. *Dodonaea microzyga* F.v.M. is known, says von Mueller, from the Neale River (*Plants of Stuart's Expedition*, 1862, p. 12). *Eremophila Berryi* is given for the Musgrave Ranges, collected by Gosse. The record of the Cycad *Encephalartos Macdonellii* "on Neale's River, found by J. M. Stuart" must surely be a wrong locality, unless there is another Neale farther north. *Callitris verrucosa* [= *C. glauca?*] is given for the Musgrave Ranges.

Sonchus oleraceus was found by Giles to be "abundant on the banks of the Finke River, towards its source." Near Stevenson's Creek and Lake Wilson in the neighbourhood of the Mann Ranges, Giles records on September 27, 1873 (*Geographic Travels*, p. 99), running water in a creek whose channel "was set with reeds and great quantities of enormous thistles." My copy has been annotated by Giles who has inserted the word "sow." Giles calls these thistles "Sonchus oleraceous" in republishing this journey in *Australia Twice Traversed* (1, p. 195). These records are of great interest, meaning either that the Sow Thistle became dispersed throughout Australia far in advance of other introductions—which with its feathery seeds might well be the case—or that we possess forms or varieties of this species that were indigenous and were here before Europeans came. There is some reason to think that one luxuriant variety with long narrow leaves in southern South Australia may be a native.

Somewhere near the Rawlinson Ranges and Mount Barlee on Desolation Creek (January, 1874), Giles' horse became entangled in dense vegetation "whose roots, planted in rich and oozy soil, induced the tops of this peculiar plant to grow ten, twelve and fifteen feet high. It has a nasty gummy, sticky feel when touched, and emitted a strong, coarse odour of peppermint. The botanical name of the plant is *Stemodia viscosa.*" (*Australia Twice Traversed*, 1, p. 273). Other waters contained this plant, which Giles described at being "of a dark-green colour, of a pulpy nature, with a thick leaf and bears a minute violet-coloured flower." As we met with *Stemodia viscosa* in both the Everard and Musgrave Ranges and found it a lowly, sticky plant, only a few inches high, evidently Giles had made a mistake in identification. It seems more likely that his plant was *Mentha australis* which we found growing in the Neales near Oodnadatta and which has a peppermint smell, but heights of 10 and 15 feet seem fantastic.

The plants collected by Giles in his 1876 expedition were described by von Mueller in the *Journal of Botany* xv, 1877, pp. 269, 300, 344. Nearly all the plants were collected between Ooldea

and the border and in Western Australia. There are only two records for our area.

John Forrest with his brother Alexander and horses left Champion Bay on March 18, 1874. The party followed up the Murchison and then struck across for South Australia. After many hardships they picked up Giles' Warburton Range, and thence passed on to the Cavanagh Range, locating some of Gosse's camps, and then through the Musgraves to the Alberga and so to the Peake. His *Exploration in Australia* gives no description of the country with which we are concerned, already travelled over by Gosse.

In the late 80's and early 90's, a second wave of exploration of the North-west of the Province occurred. It began with **J. Carruthers** in 1888 (Reports from J. Carruthers of his Triangulation of Portions of the North-west of South Australia. Brief Report on Country triangulated in Everard, Musgrave, Mann and Tomkinson ranges and Deering Hills during the years 1888, 1889 and 1890. *South Australian Parliamentary Papers*, No. 179, 1892). He commenced on May 7, his first camp being at Macumba. He then went up the Alberga and formed a camp on Alleumba Waterhole on Coongra Creek. His next depot was at Indulkana Soakage, Mt. Chandler. In the Musgrave Ranges he uses the native name Ernabella and notes that there were few natives here on account of the presence of Cootachies (devils) in the waters and caves. He completed his triangulation in February, 1890.

Carruthers noted the presence of domestic cats throughout the whole country, even to Mt. Aloysius and thirty miles beyond the Western Australian boundary. These must have played havoc with the bird life. Emus and native pheasants (*Leipoa*) were plentiful. The Everard Ranges he describes as "chiefly composed of red granite and covered with spinifex (i.e., *Triodia*), a few pines, stunted gums, and blood woods. The country between the Everard and Musgrave ranges is principally sandy, with patches of large mulga, spinifex flats, salt and cotton-bush flats, geranium [i.e., *Erodium cygnorum*] and wild vetch [*Swainsona*]; there are also a few sandhills but to no extent."

In the Musgrave Ranges, geranium, vetch and patches of salt and cotton-bush grow luxuriantly on the flats. From the top of Mt. Woodroffe "a magnificent view can be obtained. Ayers Rock, about ninety miles to the north-west can be dimly seen, and Mt. Connor [*sic*, should be Conner], a most conspicuous feature to the north, rising abruptly above a sea of mulga, the country between being level and apparently sandy." Large Casuarina trees (*C. Decaisneana*) were noted between the Mann and Musgrave Ranges.

Carruthers made a further triangulation in 1891-2 (Brief Report of Country triangulated South of the Everard and Musgrave ranges during the years 1891-92). He left Oodnadatta on August

2, 1891, going to Alleumba Waterhole and then Indulkana. Oolarinna, south of Indulkana and the Everards was visited. Mitchell and other grasses grow on the tableland country. West of the Everard Ranges the country showed Mulga, scrub and wire grasses (*Aristida*), tussock grass, parakeelya, sage-bush and patches of saltbush. He camped at Oolparinka Spring at the foot of Mt. Davenport in the Musgrave Ranges; in the sandhill country south of it several camels were poisoned by what was considered to be *Myoporum deserti* but was really *Duboisia Hopwoodii* which is superficially very like it. Carruthers has references to poplars (*Codonocarpus*), kurrajongs (*Brachychiton Gregorii*) and quandongs (*Eucarya acuminata*). He returned to Oodnadatta on July 7, 1892.

W. H. Tietkens in 1889 (*Journal of the Central Australian Exploring Expedition, 1889, under the command of W. H. Tietkens;* Government Printer, Adelaide, 1891) left Bond Springs, north of Alice Springs and proceeded westwards, naming the Cleland Hills, north of L. Amadeus, and penetrating into Western Australia. He next proceeded south a little and then turned east naming Mt. Currie, which we thought we might have seen from the top of Mt. Woodroffe, and on June 10, he had Mt. Olga in view. "Seen for the first time from any point, this mountain must always strike the traveller as being a strange and wonderful object, and our wonder and amazement increases as it is approached." On Sunday, July 7, camped beside a stream at the foot of Mt. Olga, he imagines "what a cool, clean retreat this must be from the blinding rays of the summer's sun" and quotes from Isaiah (XXXII, 2): "The shadow of a great rock in a weary land."

The Elder Exploring Expedition, under the command of **David Lindsay** and with Richard Helms as Naturalist, left Warina on May 2, 1891, followed Chambers pad and road nearly to Chambers Bluff and then travelled straight to the Everard Ranges, distant about thirty-six miles. Mt. Illillie, the highest point in these ranges, was the official starting point of the Expedition which proceeded due west, discovering the Birksgate Range (named after Sir Thomas Elder's residence at Glen Osmond) and passing the Blyth, Cavanagh and Barrow Ranges to the border; the itinerary was then south-westerly to Queen Victoria Spring, Fraser Range, Lake Lefroy and Southern Cross.

They found the country in the neighbourhood of the Everard Ranges in good condition from recent rains. From the top of a low granite hill on the way to the Everards, the view, says Lindsay, "reminded me of the Barrier Reef scenery, the mulga representing the sea, and the hills, rising abruptly from the mulga, looked like the islands!" Lindsay with three companions rode along the south foot of the Range and "in two miles passed the

Soakage, the water now running strongly down a gum creek out of a fine gorge. Lindsay continues:

> Two miles farther on we left our camels and ascended Mt. Ilbillie, which is a grand bare granite peak, with very broken and rough granite hills, gorges, ravines and precipices, with streams of water in every gully; mosses, ferns, rushes, mulga, tea-tree, acacia, numerous flowering shrubs, scented grasses [*Andropogon exaltatus*, leaves scented], patches of *Triodia irritans*, whitegum trees in the ravines and creeks; height above sea level 3,010 feet, above plain 1,000 feet. It occupied us one hour to climb to the summit; a very fine view was obtained. The next day these hills were covered with mist till 2 in the afternoon.

A native who visited them was accompanied by a boy, aged about 14, "whose hair was very light coloured, probably by the use of ashes." Passing west of the Everards, Lindsay notes sandy country with mulga, brooms [*Templetonia egena*], acacias, currant bush [? *Plectronia latifolia*], roly-poly [*Salsola*], spear grass [probably *Aristida*] and a luxuriant crop of herbs. The Officer Creek, which Lindsay called the Ferdinand (a tributary of the Officer), coming from the Musgrave Ranges and passing south to end in "swamps", they found a channel two chains wide but in times of heavy flood, six chains. Before reaching it they passed high mulga, acacia, grevillea, a few clumps of mallee and good grass. Fresh emu and kangaroo tracks were numerous.

The plants were identified by Baron von Mueller (*Trans. Roy. Soc. S.A.*, XVI, 1896, p. 333). The only new species for South Australia was *Capsella villosula* (*Cruciferae*), and *Cyperus laevigatus* was a new record. There were 18 new species discovered in the Western Australian country traversed. Most of the plants collected were from the latter State, but a number are recorded from Arkaringa Valley and the Everards. Dr. (later Sir) E. C. Stirling and A. Zietz dealt with the mammals, birds and reptiles. The expedition brought back 18 skins, 2 skeletons, 8 nests and 16 eggs. Notes are given on ten birds. Two specimens of *Orcoica* were collected at the Barrow Range because the natives distinguished them by different names but the authors considered that one was merely the immature stage of the other which conformed with the adult *O. cristata*. Three males of the beautiful bower-bird (*Chlamydera guttata*) were secured in the Barrow Range. A male bird of *Cinclosoma castanotum* in spirit and nest and egg of this species was brought back from the Victoria Desert and another nest and two eggs from south of the Everard Range.

S. G. Hübbe commanded an expedition during 1895-6 in search of a stock route from South to Western Australia (Journal of the *Stock Route Expedition from South to Western Australia, 1895-6, under Command of S. G. Hübbe*). He left Oodnadatta on November 11, 1895, with camels; followed the Neales, reached the Alberga and passed on to Coongra Creek where, near Alleumba Waterhole, he mentions another, 20 chains long and seven feet

deep, with numerous teal, black duck, wood duck, widgeon and native hens on and around it. He continued westerly to Lambinna, Mt. Chandler and Moorilyanna and then across to the Musgraves at Ernabella in Glen Ferdinand.

During the journey there are frequent references to *Euphorbia Drummondii* as a camel poison—as this is a prostrate plant, and hardly likely to be eaten by camels, perhaps the erect *E. clutioides* is meant. Hübbe gives careful and full descriptions of the vegetation, more particularly from the point of view of stock feed and of course pays particular attention to the waters and their possible permanency. He mentions seeing his first cork-wood (*Hakea lorea* probably) since leaving the Macdonnell Ranges; he saw abundant bean trees [*Erythrina?*] and Leichhardt lilies [*Crinum flaccidum*] near the Alberga; often the roly-poly [*Salsola*], prickly acacia [*A. Victoriæ*], Portulaca and titree [tea tree, *Melaleuca*].

From January 31 to March 20, 1896, the main party was camped at Owallinna in the Musgrave Ranges awaiting stores from Oodnadatta. His Diary was not published between these dates but from the original, in the possession of his daughter, Mrs. A. A. Simpson, it is interesting to note that Carr Boyd and Breadon passed through on behalf of a syndicate to the Mann and Tomkinson Ranges.

(To be concluded.)

MORE FORKED SPLEENWORT

The rare *Asplenium praemorsum*, found by members of the Portland Field Naturalists' Club near Tyrendarra in August, 1949, is in danger of destruction because it grows where stones are being taken for road and harbour works. There are thousands of acres of similar country between Mt. Eccles and Tyrendarra, and the fern might grow in any cave over a distance of eighteen miles.

Early last November C. Beauglehole, P. Finck and the writer went to some very rocky country on the eastern bank of Darlot's Creek, below the old Condah Mission Station. Here we were fortunate to find several clumps of Forked Spleenwort growing in terrain exactly similar to that of the Tyrendarra specimens, i.e., in cracks on the rock faces of deep longitudinal clefts which split the basalt barriers. In no other kind of cave or depression does the Spleenwort seem to grow.

Permanent preservation should be assured here, as the locality is far off the beaten track, wild, inaccessible and lonely; also there are sure to be other patches in the thousands of barriers that we have not explored. In the same cave we found Tender Brake (*Pteris tremula*), Delicate Rue Fern (*Anogramma leptophylla*), Necklace Fern (*Asplenium flabellifolium*) and Sickle Fern (*Pellaea falcata*)—the latter with some fronds up to three feet in length. A notable botanical find was of two bushes of Shiny Cassinia (*C. longifolia*) breaking into full bloom, just off the road about two miles north of Tyrendarra. This shrub had never been seen previously by us in the Portland District. Though not setting out to observe birds, we recorded 53 species during the day.

NOEL F. LEARMONTH,
Portland.

A NEW GEOGRAPHICAL RACE OF AN AUSTRALIAN BUTTERFLY

By D. F. Crosby, A.E.S.

Family LYCAENIDAE

Subfamily Lucinae

PARALUCIA AENEA LUCIDA, *subsp. nov.*

MALE

Upperside: Forewing dark brown; a broad central bright coppery area including lower half of cell and reaching dorsum; cilia brown with tips whitish.

Hindwing dark brown with a prominent bright coppery area nearly reaching base and bounded by vein 4, extending almost to vein 6 near termen above, by vein 1a below, and by a dark brown narrow band at the termen; two prominent terminal lunular dark brown spots; cilia brown with tips prominently white.

The colour of the copper areas is brighter than in the typical race.

Underside: Forewing pale brown, two spots in cell, two spots below cell, spot at end of cell, a band of discal spots pale brown narrowly edged dark brown.

Hindwing pale brown; a spot in cell, a post cellular, a discal and a subterminal, curved series of irregular spots, pale brown, narrowly edged dark brown; a terminal brown line.

FEMALE

Upperside: Forewing as in male; termen strongly convex, copper area slightly paler and more ovoid.

Hindwing as in male but termen more convex; copper area rarely extending almost to base and variable in extent; veins 2, 3, and 4 coppery; two, sometimes three, lunular prominent dark brown subterminal spots.

Underside: As in male, but colour orange brown.

Type Locality: Eltham-Greensborough district, Victoria.

Types: In collection of author.

Discussion

It was found that male specimens of *P. aenea* from the Eltham-Greensborough district were distinctly brighter than those of all other localities, due to the well defined bright patch of coppery scales on the hindwing above. Comparison of typical males from that district with one identical to the type of *P. aenea* Miskin, 1890, in the Queensland Museum showed that this difference was most pronounced. The male from south Queensland mentioned above, kindly loaned by the Queensland Museum, is shown in Fig. 1 on the accompanying plate.

In general the male hindwing (above) of the typical race from south Queensland has only an ill-defined central copper area, often reduced to a mere suffusion of copper scales, which grades into the brown of the rest of the wing. This is in contrast to the hindwing of *lucida* males, where the coppery colour is sharply defined. The brown area is thus confined to the apical quarter of the wing, above vein 4. There is, without exception, always a small upward extension of the copper area almost to vein 6 near the termen. Furthermore, the extent of the copper area is absolutely constant in the *lucida* race but is very variable in the typical race.

Whereas the area of copper scales is constant in the males, it varies considerably in the females. Some are very bright and correspond to the males, but others have the copper area cut short by an enlargement of the basal brown area outwards; however the copper colour is, in these cases,

continued along the veins 2, 3 and 4. Reference to the plate shows the two types of females. Fig. 7 shows a typical light one, with copper patch extending almost to the base, whilst Fig. 8 shows a typical dark form with large dark area extending from base, and the copper colour remaining on the three veins. Fig. 6 is of a typical male, but its different angle to the camera has resulted in poor definition of the copper area.

There are no apparent constant differences between the male and female undersides of the new race and those of the typical race.

The species has been found from southern Queensland to central Victoria, and there are records from Bowen (Miskin), Millmerran, Gayndah, Eidsvold, Brisbane and Killarney in Queensland; Manning River, Armidale, Sydney, Merriangle, Wingham, Narrabeen and the Blue Mountains in New South Wales; and Keilor, Castlemaine, Dimboola, Kiata and Nowa Nowa in Victoria. Of specimens examined, only the males from Dimboola and Kiata approach those of the *lucida* race. Exceptionally dark males are taken at Nowa Nowa and these are *P. aenea aenea* Miskin. One of these is figured (Fig. 3), as is also a small example from Blackheath, Blue Mountains. It seems that the typical race extends from south Queensland to the Lakes Entrance district of eastern Victoria and also inland in the Blue Mountains. Further work is necessary to determine the distribution of the new race. Anderson and Spry (1893) record the species from the Goulburn Valley and it may prove that the race in that district is *lucida*.

The larvae feed on *Bursaria spinosa*, usually when it is growing in dry localities, and are generally found below ground level on the stem or roots. There are almost always a few small ants in attendance. The larvae also pupate in these positions. The larvae and pupae are very similar both in form and habits to those of *P. aurifer* Blanchard. At Eltham the first imagoes emerge usually during the first week of December and specimens are most numerous at about Christmas time, after which they gradually diminish. Occasional specimens may be taken early in February.

Acknowledgments

The author sincerely wishes to thank Mr. G. Mack, Director of the Queensland Museum, for his courtesy in loaning a male specimen which corresponded with the type of *P. aenea* Miskin, in that Museum. He also thanks Messrs. F. E. Wilson and J. M. Landy for advice and loan of material, and Messrs. V. Smith and C. Fraser for notes and general information.

Bibliography

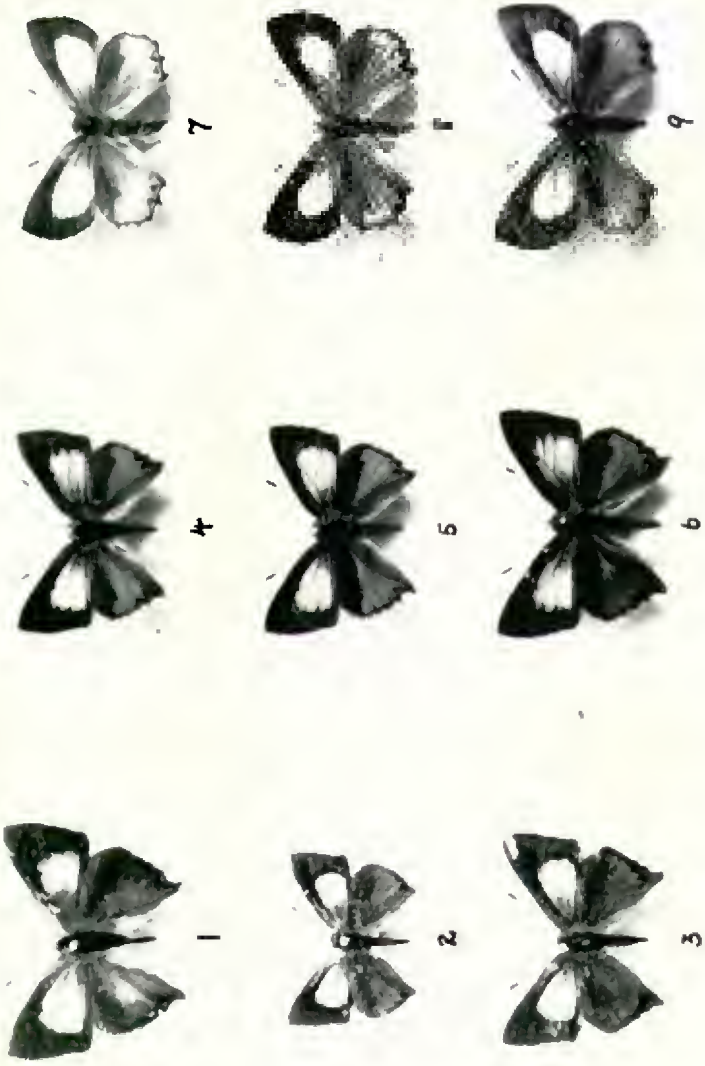
1. *Proc. Lin. Soc. N.S.W.*, 2nd series, Vol. V, 1890. W. H. Miskin, "Descriptions of Hitherto Undescribed Australian Lepidoptera."
2. *Victorian Butterflies*—Anderson and Spry, 1893.
3. *Australian Butterflies*—Waterhouse and Lyell, 1914.
4. *What Butterfly Is That?*—Waterhouse, 1932.

Explanation of Plate

Fig. 1. Male *P. aenea* Miskin, corresponding to type from National Park, Queensland (8.3.'29).
2. Small male *P. aenea* from Blackheath, Blue Mountains, N.S.W. (18.2.'41).
3. Dark male of *P. aenea* from Nowa Nowa, Victoria (5.2.'49).
4, 5 and 6. Typical males of *P. aenea lucida*, subsp. nov., from Eltham, Victoria (23.12.'49).
7. Light form of female of *P. aenea lucida* from Eltham (26.12.'49).
8. Dark form of female of *P. aenea lucida* from Eltham (20.12.'49).
9. Female of *P. aenea aenea* from Nowa Nowa, Victoria (15.2.'49).

Ms. received for publication, Nov. 1950.

PLATE IV



Forms of male and female butterflies, *Paradelia argus*.
(For explanation of plate, see p. 226.)

CHANGES IN THE NOMENCLATURE OF CERTAIN INSECTS AND ARACHNIDS

List 1

By C. E. CHADWICK, Department of Agriculture, Sydney.

The number of described species of the Class *Insecta* greatly exceeds the total number of known species of all other animals combined, and vast numbers of undescribed species still exist. It is therefore not to be wondered that the classification, description and nomenclature of this enormous group should present many difficulties and that, with workers in various parts of the world and a diversity of publications and languages, some errors should occur. It is naturally very difficult for any entomologist to keep in touch with developments in the taxonomy of groups other than those in which he is especially interested, the result being that even otherwise reliable text-books may be out of date in matters of nomenclature. Names may become out of date in various ways, e.g., by the splitting of genera (e.g., *Caligula*), by an earlier description being overlooked (e.g., *Amblypelta nitida* Stal), by the sexes being described as different species (e.g., *Idolothrips marginatus* Hal.), by misidentification (*Anodontonyx tetricus* Blkb.), etc.

The following list (far from complete) has been compiled from some of these changes. The insects and arachnids mentioned are well known, usually of economic or general biological interest, and as a rule no attempt has been made to include all known synonyms for each species. A number of other changes will be noted in future lists.

Present Name	Synonyms	Authority, Remarks, etc.
THYSANOPTERA		
Idolothrips marginatus Hal. [female]	*I. spectrum* Hal. [male]	Kelly, R., and Mayne, R. J. B. (1924). *The Australian Thrips. A Monograph of the Order Thysanoptera in Australia*, p. 71. The Giant Thrips.
HEMIPTERA		
Amblypelta nitida Stal. (1873)	*Pendulinus intescens* Dist. (1911)	Chadwick, C. E. (1948). Notes and Exhibits. *Proc. Linn. Soc. N.S.W.*, LXXIII (5-6), xlvi-xlvii, 24th Nov., 1948. Fruit Pitting Bug.
Oechalia schellembergii (Guer.)	*Pentatoma consociale* Boisd. *Oechalia consociatis* Boisd.	Guerin's illustrations of *Pentatoma schellembergii* in *Voy. Coquille*, 1831, appeared before description of *Pentatoma consociale* Boisd. in *Voy. Astrol. Ent.*, II, 630, pl. II, f. 9. (1818.)
Piliocnemidia spp.	*Ptilocnemus* spp.	Kirkaldy, G. W. (1902). Miscellanea Rhynchotalia No. 3. *The Entomologist*, 35, 136-138. Reduviidae: "Feathery-Legged Bugs."
Tricentemia serripilosa Stal. (1873)	*T. bifasciata* Kirk. (1905) *T. lantanae* Dist. (1907)	Drake, C. J., and Poor, M. E. (1943). Fijian *Tingitidae* in *Occasional Papers of Bernice P. Bishop Museum*, Honolulu, Hawaii, XVII, 15 (March), 191-205. The lantana bug.
COLEOPTERA		
Anodontonyx marina Arrow		Arrow, G. J. (1932). A few new species of Melolonthine *Coleoptera*. *Ann. Mag. Nat. Hist.*, Ser. 10, Vol. IX, 189-197, Feb. 1932. *A. tetricus* Blkb. was a wrong identification. Wheat Root Grub.
Anthrenus verbasci (L.)	*A. varius* F.	Armstrong, J. W. T. (1945). On Australian *Dermestidae*, Part IV. *Proc. Linn. Soc. N.S.W.*, LXX (1-2), 42-52, May 1945. Museum Beetle.
Baryopadus spp.	*Leptops* spp.	McKeown, K. C. (1939). A Note on the Synonymy of *Leptops* (Coleoptera: Curculionidae). *Proc. Linn. Soc. N.S.W.*, LXIV (3-4), 408.

Present Name	Synonyms	Authority, Remarks, etc.
COLEOPTERA		
Carpophilus hemipterus (L.)	*C. aterrimus* Macl.	Hinton, H. E. (1945). *Monograph of the Beetles Associated with Stored Products*, I, 87, 1945. A Dried Fruit Beetle.
Dermestes ater DeG. (1774) *maculatus* DeG. (1774)	*D. cadaverinus* F. (1775) *D. vulpinus* F. (1775)	Barber, H. S. (1942). "Some Synonymy of *Dermestes* (Coleoptera)." *Bull. Brooklyn. Ent. Soc.*, XXXVII (5), 174-176; 1942. (Skin and Hide Beetles, Carpet Beetles.)
Dermolepida albohirtum (Waterh.)	*Lepidoderma albohirtum* Waterh.	Arrow, G. J. (1941). Some undescribed species of Melolonthid Coleoptera from Western New Guinea and the Adjacent Islands of Waigeu and Japen. *Ann. Mag. Nat. Hist.* (11), 10, No. 41, 448-464. Greyback Cockchafer.
Gibbium psylloides (Czenp.)	*Scotias psylloides* Czenp. *Ptinus scotias* F.	Hinton, H. E. (1941). The *Ptinidae* of Economic Importance. *Bull. Ent. Res.* XXXI (4), 331-381, Jan. 1941.
Maleuterpes spinipes Blkb.	*Prosayleus phytolymus* Oll. *Maleuterpes phytolymus* Oll.	In 1929 the British Museum received a pair from Lea labelled "*Maleuterpes spinipes Blkb.* = *Prosayleus phytolymus* Oll." (Letter W. J. Hall, 2/5/50). Dicky Rice Weevil.
Mezium americanum (Lap.)	*Gibbium americanum* Lap.	Hinton, H. E. (1941). The *Ptinidae* of Economic Importance. *Bull. Ent. Res.*, XXXI (4), 331-381, Jan. 1941.
Monolepta australis (Jac.)	*M. rosea* Blkb.	Weise, J. (1924). *Coleopterorum Catalogus*, Pars 78, *Chrysomelidae, Galerucinae*, p. 165, 1924. Yellow Monolepta Beetle.
Rhabdoscelus obscurus (Boisd.)	*Rhabdocnemis obscura* Boisd.	Marshall, G. A. K. (1943). New Indian *Curculionidae* (Col.). *Ann. Mag. Nat. Hist.* (11), 10, No. 62, 105-129. Cane beetle borer.
HYMENOPTERA		
Apis mellifera L. (1758)	*A. mellifica* L. (1761)	Richards, O. W. (1935). Notes on the Nomenclature of *Aculeate Hymenoptera*, with special reference to British genera and species. *Trans. R. Ent. Soc. Lond.*, LXXXIII (1), 143-176. The Hive Bee.
DIPTERA		
Calliphora augur (F.)	*Musca augur* F. *C. augur* F. *C. oceaniae* R-D. *C. laterolis* Macq. *C. dorsalis* Wlk. *C. bicolor* Big. *C. dichromata* Big. *C. xanthoria* Big. *C. selasoma* Erickson	Patton, W. S. (1925). Diptera of Medical and Veterinary Importance, II. *Philip. Journ. Sci.*, 27, No. 3, 397-411. Hardy, G. H. (1937). Notes on Genus *Calliphora* (Diptera). Classification, Synonymy, Distribution and Phylogeny. *Proc. Linn. Soc. N.S.W.*, LXII (1-2), 17-26. Lesser brown blowfly.
stygia (F.)	*Musca stygia* F. *C. villosa* Des. *Musca laemica* Wlk. *C. stygia* Schiner.	Hardy, G. H. (1930). The Queensland species of *Calliphora*, Subgenus *Neopollenia*. *Bull. Ent. Res.* XXI (4), 441-448, Dec. 1930.
Chrysomyia rufifacies (Macq.)	*Lucilia rufifacies* Macq. *Calliphora rufifacies* Macq. *Pycnosoma rufifacies* Macq. *Chrysomyia albiceps* Wied. *C. albiceps* var. *putoria* Wied. *C. albiceps* var. *rufifacies* Macq.	Holdaway, F. G. (1933). The Synonymy and Distribution of *Chrysomyia rufifacies* (Macq.), an Australian Sheep Blowfly. *Bull. Ent. Res.* XXIV, iv, 549-560, Dec. 1933.

Present Name	Synonyms	Authority, Remarks, etc.
DIPTERA		
Chrysomyia rufifacies (Macq.) (continued)	*Somomyia safranea* Big. *S. melanifera* Big. *Lucilia ispida* Erich. *? L. tasmaniensis* Macq. *? Compsomyia tasmaniensis* Macq.	
SIPHONAPTERA		
Ctenocephalides canis (Curt.) [Dog Flea]	*Ctenocephalus canis* Curt.	Stiles, C. W., and Collins, B. J. (1930). *Ctenocephalides*, New genus of Fleas (Type *Pulex canis*), *Publ. Hlth. Rep.*, XLV, No. 23, 1308-1310, 6th June, 1930.
felis (Bouché) [Cat Flea]	*felis* Bouché	
LEPIDOPTERA		
Caligula cucalypti (Sc.)	*Antheraea eucalypti* Sc.	Seitz, A. (1926). *Macrolepidoptera of the World*, X, 514-515 (26.6.26) . . . The Emperor Gum Moth . . . All Australian species of *Antheraea* now transferred to *Caligula*.
Ciania ignobilis (Wlk.)	*Eutrometa ignobilis* Wlk.	Meyrick, E., and Lower, O. B. (1907). Revision of the Australian *Psychidae*. *Trans. Roy. Soc. S. Austr.*, XXXI, 192-208, 1907. The Faggot Case Moth.
Eutrometa fervens (Wlk.)	*Opsirhina fervens* Wlk. *Lebeda obscura* Wlk. *L. saturata* Wlk. *Eutrometa despecta* Wlk. *Pinara fervens* Wlk.	Turner, A. J. (1924). Revision of Australian Lepidoptera. *Lasiocampidae*. *Proc. Linn. Soc. N.S.W.*, XLIX, 4 (Dec.), 397-428.
Euploea core corinna Macl.	*Euploea corinna corinna* Macl.	Corbet, A. S. (1942). Revisional Notes on the Genus *Euploea* F. *Ann. Mag. Nat. Hist.* (11), IX, 52, 253-267, 1942. The Oleander Butterfly.
Heliothis armigera (Hubn.)	*H. obsoleta* F.	Tams, W. H. T. (1935). *Insects of Samoa*, III (4), *Heterocera*, 196-7, 1935. The Heliothis Caterpillar.
Hyalarcta huebneri (Wwd.)	*Oiketicus huebneri* Wwd. *carcyi* Macalister	Turner, A. J. (1947). Revision of the Australian *Psychidae* (Lepidoptera). *Proc. Roy. Soc. Q'land.*, LVII (1), 57-64, 1947. The Leaf Case-Moth.
nigrescens (Dbld.)	*Thyridopteryx nigrescens* Dbld. *Oiketicus Herrichii* Wwd. *Hyalarcta ptiloclada* Meyr. and Low.	Turner, A. J. (1947). Revision of the Australian *Psychidae* (Lepidoptera). *Proc. Roy. Soc. Q'land.* LVII (1), 57-64, 1947. The Ribbed Case Moth.
Hymenia recurvalis (F.)	*Phalaena recurvalis* F. (1775) *Pyralis fascialis* Cram. (1782) *Hymenia fascialis* Cram.	Klima, A. (1939). *Pyralidae, Pyraustinae*, in *Lepidopterorum Catalogus*, Pars 89, 31-32, 1939. The Beet Webworm.
Lewinibombyx lewinae (Lew.)	*Bombyx lewinae* Lew. *Clisiocampa lewinae* Lew. *Panocela transiens* Wlk. *Thaumatopoea lewinii* H.Sch. *Orcta sobria* Wlk.	Turner, A. J. (1922). Revision of Australian Lepidoptera. *Saturniadae, Bombycidae, Eupterotidae, Notodontidae*. *Proc. Linn. Soc. N.S.W.*, XLVII (3), 348-390, Sept. 1922. Strand, E. (1929). *Lymantriidae* in Seitz' *Macrolepidoptera of the World*, Vol. X, Section II, p. 381. Lewin's bag shelter moth.

Present Name	Synonyms	Authority, Remarks, etc.
LEPIDOPTERA		
Lewinibombyx lewinae (Lew.) (continued)	*Eriogaster simplex* Wlk. *Naprepa pilosa* Wlk. *N. hirta* Wlk. *Trilocha rufescens* Wlk. *Semuta prisca* Wlk. *Panacela lewinae* Lew. *Ocinara lewinae* Lew.	
Oeceticus elongatus Saund.	*Oiketicus saundersi* Wwd. *Malura elongata* McCoy	Meyrick, E., and Lower, O. B. (1907). Revision of the Australian *Psychidae*. *Trans. Roy. Soc. S. Austr.*, XXXI, 192-208, 1907. Saunders' Case Moth.
ARACHNIDA		
Missulena occatoria Walckr.	*Eriodon occatorium* Lucas *formidabile* Camb. *rubrocapitatum* Auss. *semicoccineum* Simon *Actinopus formosus* Rainb. *M. (Eriodon) occatoria* Hogg *Missulena rubrocapitata* R. and P. *formidobile* R. and P.	Womersley, H. (1943). A Revision of the spiders of the Genus *Missulena* Walckenaer, 1805. *Rec. S. Auster. Mus.*, VII (3), 249-269, May 30th, 1943.

CURRENT BOOKS REVIEWED

1. *Drawings of British Plants*, Part IV

The herculean task on which Stella Ross-Craig, F.L.S., of the Royal Botanic Gardens, Kew, is engaged in depicting British wildflowers has been advanced by the publication of a fourth part (published by G. Bell and Sons, Ltd., London). Five botanical orders are covered in this latest issue—*Resedaceae, Cistaceae, Violaceae, Polygalaceae,* and *Frankeniaceae*. Miss Ross-Craig's excellent standard of delineation, commented upon previously (*Vict. Nat.*, July 1950, p. 58), is maintained in each of the 26 species dealt with. Despite the austerities imposed by strictly scientific lines, flowers like the Rock-roses and Violas are invested with charm.

The *Violaceae* and *Polygalaceae* have representatives in our Australian native flora, but British violets embrace only herbaceous examples. The Antipodean *Violaceae*, however, includes woody as well as herbaceous species. The sole species illustrated in *Frankeniaceae* (*Frankenia laevis*, "Sea-heath") is closely related to our familiar *F. pauciflora* of Australian salt marshes, but has much smaller leaves and flowers.

2. *Mammals of Victoria*

In this "Handbook No. 1 of the National Museum of Victoria" we have a "must" for all keen Victorian field naturalists. With life-like pen drawings, the artist, George J. Browning, enhances Mr. C. W. Brazenor's authoritative textual treatment, necessarily compressed, of all the native Victorian mammals, in a handy-sized, very moderately priced book.

H. C. E. STEWART.

The Victorian Naturalist

Vol. 67—No. 12 APRIL 6, 1951 No. 808

PROCEEDINGS

The monthly meeting of the Club was held at the National Herbarium on Monday, March 12th, 1951, the President, Mr. E. E. Lord, and about 100 members attending. As it was Labour Day holiday, many members were away.

The President announced with regret the death on the 10th inst. of Mr. W. H. Nicholls, and members stood in silence for a minute in tribute.

Mr. D. K. P. Abazawardana and Miss A. Barrowman were elected and welcomed as members.

The President requested that nominations for office-bearers for the new Club year be handed in that evening, in writing.

The lecturer for the evening was Mr. Paul Fisch. A precis of his talk "Victorian Byways" appears elsewhere.

Mr. H. C. E. Stewart expressed regret for the failure of the Loch excursion owing to the bus breaking down and recorded the thanks of members to Mr. and Mrs. Beamish for their help in the emergency.

The President read letters from the Chairman of the Forest Commission and the Minister of Forests re the reported alienation of 1,000 acres of Forest Land in the Kulkyne Reserve, northern Victoria, for farms, and appealed to members of the club to take a more active part in the work to prevent further destruction of the natural wealth of the State.

EXHIBITS

Mr. J. Ros Garnet: Red-backed Spider (*Latrodectus hasselti*) and egg cases.

Mrs. M. Pinches: Flowers, foliage and root of white mangrove (*Avicennia officinalis*).

Mr. J. Seaton: *Beaufortia sparsa* and *Lambertia formosa*, garden grown.

Mr. H. C. E. Stewart: Very large juvenile leaves of Messmate (*Eucalyptus obliqua*).

NATURE NOTES

BIRDS IN PARKS.—Miss Wigan reported that in her usual survey of Melbourne's Parks she had noticed some birds missing this year. No White-faced Herons were seen at Wattle Park, the Nankeen Night Herons are not in their usual place at the Botanic Gardens and the Night Herons and Pied Cormorants are absent from Queen's Park.

Mr. Stewart suggested that the number of carnivals with firework displays held at Queen's Park were responsible.

HOARY-HEADED GREBES.—Miss Watson reported the great increase in numbers of this species at the Altona Salt Works recently. They had obviously been driven in to shelter from the severe storm experienced in the middle of February.

THE NORTH-WEST CORNER OF SOUTH AUSTRALIA

(A recent visit to the Everard and Musgrave Ranges, with notes on previous expeditions.)

By PROFESSOR J. B. CLELAND, Adelaide.

(Continued from previous issue)

Some Twentieth Century Visitors

The most important ornithological contribution on the north-west was that of Captain S. A. White when he accompanied R. Lockhart Jack's geological expedition in 1914. (*Trans. and Proc. Roy. Soc. of S.A.*, XXXIX, 1915, p. 707). The party left Oodnadatta on June 20, reached Todmorden on the Alberga, went up this to Coongra Creek and on to Lambinna and so, like others, to Indulkana. Extensive collecting was made in the Everard and Musgrave Ranges. Ernabella Waterhole was found dry. Captain White was able to list 94 species of birds, *Aphelocephala pectoralis* being rediscovered.

The 200 species of plants collected by Captain White were identified by Mr. J. M. Black who described as new: *Triodia irritata* (which he has now reduced to a synonym of *T. irritans*), *Menkea hispidula*, *Ptorigeron cylindriceps* and *Toxanthus Whitei*. A new variety of *Nicotiana suaveolens* which he called *excelsior* was later raised to specific rank.

In 1933 the Seventh Expedition of the Board for Anthropological Research of the University of Adelaide visited Ernabella. As a result, one of us (J.B.C.) published a paper entitled "The Botanical Features between Oodnadatta and Ernabella in the Musgrave Ranges with a locality list of Plants . . . ." (*Trans. Roy. Soc. of S.A.*, LX, 1936, p. 114). This consists of a description of the country traversed and a list of 322 species of plants with four varieties in addition collected on that trip or on previous ones to the north-west of this State. The grasses numbered 35 with one variety in addition, *Cyperaceæ* 8, *Chenopodiaceæ* 39, with two varieties, *Cruciferæ* 13, Acacias 13 with one variety, other Legumes 15, *Malvaceæ* 12, *Eremophillas* 10 with one variety, and *Compositæ* 65 with one variety additional.

In 1935, H. H. Finlayson published *The Red Centre*, a magnificent description of the heart of Australia and its native men and beasts. Finlayson had spent six weeks with Ernabella as his headquarters and made excursions from it over a radius of three hundred miles. He points out that the peculiar feature of the Musgrave landscapes was the great development of grasslands. "In amongst the hills, and frequently enclosed on all sides and accessible only through rocky passes, are little plains of varying extent, and broad valleys, entirely free from bush growth, but with an even carpet of grasses and trees." This description of

Henderson's Rock Hole — about a third of the way up Mt. Woodroffe, Musgrave Ranges.

Photo: R. C. Seeger.

Mount Olga, seen against the evening sky from Ayers Rock twenty miles away, is a classic:

> In the finished symmetry of its domes it is beautiful at all times; but now the sunset washes upon it a miracle of colour, and it glows a luminous blue against an orange field, like some great mosque lit up from within. Five times I saw the sun set beyond Mt. Olga, but in five hundred times it would not pall. It is the most delicate sight in all the land.

Ayers Rock, he records, is one and three-fifths of a mile long from east to west, seven-eighths of a mile wide and eleven hundred feet high (i.e. above the plain); these descriptions of Ayers Rock and Mount Olga are very true.

J. Neil McGilp in August, 1943 (*S.A. Ornithologist*, XVII, March, 1944, p. 21), visited Granite Downs and the Everard Ranges to study bird life. In the introduction to his account of the 92 species of birds he records on this trip, he has given a good general description of the vegetation after a good season. Young mulga was seen in numbers on Lambinna flat. He was particularly struck by the small trees of the native *Pittosporum* with its yellow fruits and white stems. He points out that the solid masses of rocks forming Mount Ilbillie and its associate peaks throw off a large volume of water after even light showers, so that there is a luxuriant growth of shrubs on their lower levels.

He saw *Tecoma doratoxylon* with its cream-coloured bell-shaped flowers, streaked in russet-brown, and records how the natives straighten its canes in hot ashes to make light spears which are very true in flight. The Western Bower-bird is very fond of the Native Figs. McGilp saw the native tobacco (*Nicotiana excelsior*), mentions two edible native plums, the fruits of *Santalum lanceolatum* and the Emu Bush (which is *Eremophila longifolia*) and refers to the grasses and saltbushes. The Ghost Gums he mentions are a white-stemmed variety of the River Red Gum (*Eucalyptus camaldulensis*, syn. *E. rostrata*) peculiar to the north and centre, and not the true Ghost Gum (*E. papuana* var. *Apparrerinja*) of the Macdonnell Ranges.

Do Kangaroos, Wallabies, Emus and other Game Require Permanent Water?

This question has arisen in connection with the suggestion to sink wells in the Native Reserve in the Musgraves so that in times of drought the natives can obtain water when the rock holes are dry. Game could not get at the water unless it were run into a trough. It would be no good supplying water for the aborigines if there were no game for them to live on. I cannot get reliable information as to whether kangaroos, euros, and wallabies must have access to water. Emus often come to drink. How long can they carry on when the waters dry up?

One may meet with small birds miles away from known waters, as between Liddle's Hill and Ayers Rock. Here it is possible they may get occasionally a little moisture from dews, even in warm weather, but they may have to rely on the moisture in the insects and vegetable products they consume for the replenishment of their water supplies. Birds are economical for water loss as their urinary secretion is almost dry.

Dangers to the Bird Population

The natives, of course, eat every bird they can obtain and their eggs at any stage of incubation. The leaves of *Duboisia Hopwoodii* (often by mistake on the part of the early explorers spoken of as *Myoporum deserti*, which it resembles) are used by the natives

for adding to water to stupefy emus when they come to drink. The plant is dreaded as a camel poison. On the Mulligan in South-west Queensland it is collected, dried and used by the natives for chewing and is traded south as far as the Flinders Ranges as the true pituri. In the Musgrave and Macdonnell Ranges, species of true tobacco (e.g., *Nicotiana excelsior*) are chewed. Everywhere in Central Australia the willie-wagtail is detested by the natives because they believe it listens to tales in the camps and then passes them abroad.

Carruthers noted feral cats as being common in 1888 to 1892 in the North-west. These must have led to the destruction of many birds, even though young rabbits may be easier prey. Foxes, which I believe occur in this area, must be responsible for a great diminution in the ground-frequenting birds. The destruction of vegetation in the neighbourhood of waters by cattle, and especially sheep and goats, must reduce the cover and feeding grounds that so many birds require. Fortunately some portions of the Everard and Musgrave Ranges are so rocky and steep that cattle cannot go up them, though sheep could do so. It will be a great pity if stock, especially sheep, make this country eventually almost a desert. Alleumba and Ernabella Waterholes were at one time surrounded by much vegetation. Now except for a few Red Gums and herbs they are desolate places, devoid of plant cover.

Introduced Plants

I have recorded the Sow-thistle (*Sonchus oleraceus*) and the Prickly Sow-thistle (*S. asper*) for Ernabella in 1933. On a visit to Ernabella in August, 1945, I came upon plants of the beautiful reddish *Rumex roseus* on several hills in the neighbourhood. This plant established itself in a gorge north of Beltana more than twenty-five years ago. It eventually dominated the vegetation and is now extensively distributed in the Flinders Ranges. Its colourful appearance has prompted seeds to be taken away and planted in many station gardens. Fortunately it seems to have some fodder value, even when dry (?) but it may displace better fodder plants. Doubtless its arrival in the Ernabella district has been in this way and not by pure chance in goods and packages.

The Pie Melon (*Citrullus vulgaris*) was seen growing as far as Everard Peak. One of our party will remember well its intensely bitter taste! Nevertheless, cattle eat it and must presumably be responsible for the spread of its seed.

A single plant of the goosefoot, *Chenopodium murale*, had come up in the garden at Everard Peak. A plant of *Xanthium spinosum* (Bathurst Burr) was also seen at Oodnadatta.

Thus in spite of stocking for sixty years or more, very few plants not native to Australia have really established themselves in our far north.

Poison Plants

Duboisia Hopwoodii, the "Pituri" of the Georgiana in south-west Queensland, occurs between the Musgrave and Everard Ranges. It is used by the natives for putting in water-holes to stupefy emus, but apparently is not used, or at least not used alone, for chewing. The references by Giles to poisoning of camels by *Myoporum deserti* in the country south of the Musgrave Ranges is a mistake for *Duboisia*—the two shrubs resemble each other.

Hübbe, on the way out to the Musgraves, was often in apprehension that his camels would be poisoned by *Euphorbia Drummondii*; as this is a small and very prostrate herb, one could think beneath the notice of a camel, perhaps he really means *E. clutioides* or *E. wheeleri*.

Having heard of a rumour from my youth that *Isotoma petræa* was probably poisonous, I was on the lookout for this plant, hoping to take some back to Adelaide for alkaloid tests by Drs. Badger and Human. When some was found at Betty's Well in the Everard Ranges, a native with us gave us its name as "duniwari", adding "like pituri, mingil" (the native name for *Nicotiana excelsior*), adding "strong one (adult). Might kill 'um. Make 'um drunk. Mix a little with pituri! It alone may kill 'um, kill 'um properly." This last phrase, "kill 'um properly" is of interest. In Central Australian pigeon English as used by the natives, "kill" only means to hit, as with a stick. To die is to "finish"—"him finished." So the term used here really means that he would die. Drs. Badger and Human have found promising amounts of an alkaloid and are desirous of obtaining much more material to determine its nature and properties.

Baron von Mueller states, in his account of the botany of Giles' 1876 expedition, that *Gyrostemon ramulosus* was, according to Giles, poisonous to camels. We did not come upon this species which, on the top of red sand-ridges in Central Australia, is a picturesque shrub.

Burnt and Dead Mulga

Much mulga country was passed over after leaving Todmorden, and we frequently came upon extensive areas where it was all, or nearly all, dead. Some stems were standing and others had fallen. The marks of fire could be seen on many of the stumps and thicker branches. Our guide, Lennon, said that the devastation was attributed to a great fire that had ranged over the country, coming from the Western Australian side, in the 1920's. As dead or burnt mulga had been recorded by some of the early explorers (e.g., Giles, Hübbe, S. A. White) preceding this period, it is probable that fires of greater or less extent have occurred from time to time, having been deliberately or accidentally started by the natives. With a dry spell after a good season, there may be much dry herbage and grass (e.g., Mulga Grass, *Aristida arenaria*) amongst the mulga.

so that extensive spread and destruction may result. In the Everard and Musgrave Ranges we saw frequent patches of burnt *Triodia* amongst the rocks on the slopes of the hills, where the natives had been burning out rock wallabies (*Petrogale lateralis*). Some of these fires had severely scorched bloodwoods and other trees.

Very few Acacias give rise to suckers which may establish a grove. *Ac. salicina*, the "Broughton Willow", is one such, differing in this respect from its close relative *Ac. ligulata*. In the flats between the range north and east of Ernabella, a conspicuous

Mt. Speck, Musgrave Ranges (at sunset).
Photo: R. C. Seeger.

feature was an *Acacia* growing in colonies, occupying a few square yards up to probably half an acre in size—evidently due to suckering. This "Colonial Acacia", as we called it, was not in flower but some pods were obtained. It has not yet been identified with certainty.

The Effects of Stocking

The effect of stocking with cattle has been to eat out the vegetation around all available natural waters and wells. Thus Allemba Water Hole on Coongra Creek and Ernabella Water Hole are now destitute of shrubs, though the Red Gums remain. After floods there is a considerable growth of short-lived annuals and minute

ephemerals (e.g. some *Cyperaceae*, small grasses and Composites) soon to be eaten out by stock. Giles and others describe Ernabella Water Hole as having abundant rushes round its edge. Cattle can roam from water farther than sheep but do not crop so closely.

As the various forms of mulga (*Acacia aneura* and its varieties and allies) are eaten by stock, but with a preference for some forms over others, these trees near sources of water are much mutilated and seedlings have little chance of survival. McGill was agreeably surprised to see many young mulgas near the Everard Ranges. Some of the more desirable kinds have the branches actually horned down by cattle. On the journey out to the Everards, Lemmon, our driver, pointed out several different kinds of mulga, indicating one, a tall one, particularly as being relished. Without pods it is difficult to recognize the species of mulga and none had fruits on during our visit and only an occasional one was in flower. Most of these shrubby trees, however, seemed to be forms of *A. aneura*. The var. *latifolia* could be readily recognized. Another form has nearly horizontal branches when young.

The Umbrella Mulga (*Acacia brachystachya*), a large shrub with drooping branches and narrow-linear thick phyllodes 5 to 18 cms. long, occurs in the Everard Ranges but we have not notes on its edibility. *A. signata*, a shrubby species with broad phyllodes which have resinous edges, extends from Moorilyanna, its type locality, to the Everards, favouring rocky out-crops and does not seem to be eaten out; perhaps it is protected by the habitat. *A. Kempeana*, the Witchetty Bush (as its roots often contain a large edible grub) is found in the Musgrave Ranges; but again, we do not know its palatability. Ironwoods (*A. estrophiolata*) seem to have survived any depredations by cattle.

Sheep, being much closer feeders than cattle and having only a few miles radius from water, can be very disastrous. In the immediate vicinity of a well on the north side of Mt. Woodroffe, much of a colony of Old-man Saltbush (*Atriplex nummularia*) has been destroyed, presumably from the feeding of sheep.

The Sense of Taste in Anthropology and Botany

Human beings can be divided into two groups—those who find phenyl-thiocarbamide bitter and those who consider it tasteless. The Commonwealth Serum Laboratories supplied us with sets of paper impregnated with this substance for testing on the natives. Of 32 natives so tested at Ernabella, 23 found it bitter and 9 apparently tasted nothing. The former readily revealed themselves by spitting vigorously three times—the latter made only a single formal spit. One member of our own party belonged to this group.

Tasting chewed leaves and fruits is sometimes of use botanically, but must be indulged in with care. Another member of our party regretted the suggestion of tasting the wild introduced Pie Melon —the number of his spits was not recorded! The seedlings of

certain families have often a characteristic taste that reveals the family to which the sample belongs; for instance, Crucifers usually, perhaps always, have a turnipy or cabbage-like taste, while young Umbelliferæ suggest parsley or fennel. Among fungi, the Agarics and Boleti are always worth tasting with due circumspection. Some species of *Lactarius* (rigid brittle gills and a juice often milky) have an intensely peppery taste, the tongue tingling for long afterwards—as is the case with Aconite root.

The Scents of Plants

For several years I have been recording the presence or absence of scents in flowers (and leaves and stems). Even roots are sometimes worth smelling—the nitrogen-fixing nodules on legumes (on some species at least) have a peculiar characteristic odour when crushed. The smell of the crushed leaves of plants not in flower, or even of seedlings, often furnishes a clue as to the family to which the species belongs (e.g., *Rutaceæ, Umbelliferæ, Myrtaceæ*).

During the recent trip, a few further records were made. The crushed leaves of the grass *Cymbopogon exaltatus* has a strong citronella perfume. A large shrubby yellowish-green intricately branched *Prostanthera*, not yet identified but in seed, grew in a depression on a sloping granite surface on the hill overlooking Everard Peak—its leaves had a delightful rather thyme-like scent when crushed. *Philotus* (*Trichinium*) *nobilis* (*e*) at Ernabella had quite fragrant flowers. *Pt.* (*T.*) *alopecuroideus* (*m*) was moderately fragrant. *Pt. helipteroides* had some slight fragrance but in *Pt. Gaudichaudii* there was only a doubtful faint scent. The Ironwood (*Acacia estrophiolata*), in flower at Everard Peak, had fragrant blossoms, but the scent was not like that of our ordinary Golden Wattle.

The Air-Field at Oodnadatta as a Flora Reserve

We were much struck by the way in which the undershrubs, herbs and grasses were returning and flourishing almost luxuriantly in this ample fenced-in air-field. As goats and stock roam over the adjacent commonage, the contrast between the two was very noticeable. There should be no need for this vegetation to be interfered with. The authorities, however, might have it pointed out to them how valuable such areas are as showing some of the features of the original flora and as being a seeding ground for grasses and herbs to colonise adjacent parts. It would be of interest to ascertain what other air-fields in Australia can serve the purpose of conserving the original flora of their neighbourhood. Since railway lines in the Far North are not fenced, there is no protection along them against grazing.

Botanical Traverses by Motor Car

During the last twenty years or more, on various expeditions into Central Australia or the northern part of South Australia, it has been my custom to record in pencil as one went along (preferably in the front seat of the car or truck) the kind of country passed through with its vegetation and bird-life. These wayside notes have later been written up and made available to Professor Prescott of the Waite Agricultural Institute, who has filed typed copies for future reference if necessary. Some of these traverses were made use of, I believe, in his Vegetation Map of Australia.

Quite a large amount of useful information can be obtained in this way. Some previous knowledge of the flora is obviously of great advantage. In an entirely new terrain, provisional identifications would be difficult or impossible—for instance, by an English botanist making his first visit to our Interior. If a speedometer is available, the mileage can be registered; but if not the time-intervals of ten minutes or a quarter of an hour can be recorded, the distance being between two points.

During the present trip, such a record was attempted and only an occasional word has been so joltingly written as to be illegible. As I visited the same country in 1945, an example is first given of my notes made then:

EVERARD PARK TO CHANDLER WELL—35 miles.

11 a.m.—More or less drizzling. Mists hiding the mountains. Great rock masses. *Eremophila*. Figs. Mulga. *Trichinium alopecuroideum* (feed for cattle). Yellow *Helipterum*. *Cassia*. *Ac. ligulata*.

Travelling east—Open mulga. *Trich. Corymbosum*. *Helipterum floribundum*. Cattle.

5 miles—Mulga. *Cassia*. Yellow composites. *Helip. stipitatum*. Young mulga. *Brunonia*. Tufts of grass. Open mulga. Pink *Helipterum*. *Trich. alopecuroideum*. Tufts of grass.

The following is from the record of the present trip:

CAMP, 90 MILES WEST OF OODNADATTA

April 10, Easter Monday, 8 a.m.—Gravelly plain. Dead-finish, *Kochia*, Mitchell Grass. *Cassia eremophila*. Rises with mulga. Kangaroo Grass.

Enneapogon. Lambinna bore. (Mulga said to have been burnt in 1926 from W.A. side). Gibber rises.

91 miles—Gate. Lambinna Soak. Stony Creek. Gibber rise. *Eremophila*. Mulga. Large red gums on Alberga, many young red gums. Low hill on s.

93 miles—Rocky rise with mulga. Then flat. Pie Melon (eaten by cattle but very bitter; galahs eat seeds). Low grass. Tall mulga (good feed; horned cattle pull branches down). Mulga plain, low grasses.

96 miles—Gate. Bare plain. Stony rise with mulga, *Cassia*, Dead-finish. Dead mulga. *Eremophila*. *Hakea lorea*. *Plectronia latifolia*. *Spartothamnus* (shrub with black fruits).

(Concluded.)

VALE, WILLIAM HENRY NICHOLLS

(July 23, 1885 — March 10, 1951)

Whenever an Australian orchid is discussed, the name of Nicholls comes automatically to mind. Since Mueller's and Fitzgerald's day, there have been three outstanding figures in Australian orchidology — Rogers, Rupp and Nicholls; it would be invidious to compare their works, which are known and acclaimed throughout the botanical world.

Will. Nicholls, however, dwelt among us in Victoria, enjoyed innumerable rambles with fellow naturalists here, and endeared himself to all. Naturally a retiring, almost shy man, he seldom spoke at meetings and shrank from delivering an address; yet his wide experiences of mountain and dale, over half a century, had stored up a rich fund of anecdote — it is a thousand pities they never saw print. While tramping with him through the bush I have listened by the hour to stirring tales of marathon walks, cattle-men's lonely huts, encounters with strange peoples, of snakes, hidden waterfalls, alpine sunrises, mystic lakes and frosty nights endured under the stars with neither tent nor blanket. These adventures were usually incidental to the discovery of some orchid prize, for orchids were the omnipresent, underlying theme of his life — he lived to unravel their relationships, delighting in the exquisite colours and infinite variety of form displayed by these quaint flowers.

Until the last few years, when several novelties began to reach him from remote parts of the State that he could not then visit, Nicholls claimed to have collected personally *all* but half a dozen of the 100 species of Victorian *Orchidaceae*. These provided the basic material for his first colour delineations; but soon he had friendly contacts in every State who sent him living specimens to work on. So the scope of his hobby widened to include the Commonwealth (except New Guinea) and he set himself to figure and describe *every* Australian orchid. Only fresh plants were ever painted and, if some rare tropical epiphyte arrived without flowers, it was immediately installed in his small glasshouse and coaxed to bloom — in this way a number of undescribed species came to light and, when he died, Mr. Nicholls was the only person who had seen their flowers.

I marvelled at his eyesight and patience in dealing with microscopically-flowered subjects, like *Taeniophyllum* or *Oberonia* — each individual bloom of pin-head size, so delicate that the mere touch of a dissecting needle might squash and ruin its floral parts. Yet this critical work was carried out, usually during a few minutes snatched from the luncheon hours of busy week-days, and then by means of a strong lens in one hand and a pencil or paint brush in the other.

With only a primary education at Macarthur Street State School, Ballarat (his father, Charles T. Nicholls, was a Ballarat school teacher), young Nicholls taught himself drawing and painting; in middle age he acquired a smattering of Latin, sufficient to draw up his own diagnosis of the many new orchids that he published. We are fortunate to have so much of this excellent original work in the *Victorian Naturalist*, his chief medium of expression, and the journal's prestige has been heightened thereby. Since the appearance of his first paper — on the "Propagation of our Pterostyles" (December, 1925) — no year has passed without some important article from Nicholls' pen.

In the decade before April, 1950, he wrote 41 papers for the *Naturalist*, and his total for the past quarter of a century must be about one hundred. Articles also appeared frequently in the Queensland

The late W. H. Nicholls

(Photo. by courtesy of Mrs. E. A. Brown).

and North Queensland *Naturalists* and the *Australian Orchid Review*. One of his most popular contributions, "Australian Orchids," ran to 56 pages in the *Sun Nature Book*, No. 5 (*Gems of the Bush*, 1934); there were three beautiful colour plates, 140 line drawings and photographs, and a mine of information on the species illustrated — all for the ridiculous sum of sixpence! But that was before the financial depression had lifted.

From 1927, Nicholls faced years of severe privation and had to abandon his book-binding business. At length he found congenial employment in the Footscray Municipal gardens, as propagator and landscape artist. His home garden was a model of neatness and good taste; I never saw a single weed in it.

In earlier years, our friend was an ardent cyclist, travelling the length and breadth of the State in this way. At one period he used to ride between Melbourne and Ballarat every week-end, and that was in the days before evenly graded bitumin C.R.B. roads—sometimes there would be punctures all the way and an arrival in the small hours of the morning, wet through.

Then there were his mountaineering days, when he tramped the Otway Ranges and eastern highlands—Baw Baws, Mt. Wellington, Howitt, Cobbler and the Barry Mountains. I doubt if any other "Barry Mountaineer" has beaten his record of 2½ days for the wild stretch between Speculation and St. Bernard (it took me twice as long). On these hikes he had a passion for photographing waterfalls and bush huts, and he actually discovered several sizeable falls that were previously unknown (e.g., one in the Acheron-Cumberland region). Articles describing his trips in the *Herald*, *Australasian* and other papers always brought in a few welcome pounds. His initiation to the Baw Baws was a blizzard at night: he and his mate were lucky enough to stumble against the Whitelaw Hut, drenched to the skin, exhausted, near frozen and with no dry matches; inside the hut they groped around in pitch darkness, found a matchbox and, with the solitary match it contained, kindled a fire—life began again!

Nicholls was an accomplished photographer, as his many flower portraits in *Wild Life* and elsewhere bear eloquent witness. Some of the best studies were made in the last five years, during his two visits to Western Australia in the springtimes of 1946 and 1948. Thither he had gone under a grant from the Maud Gibson Trust (Melbourne Botanic Gardens) to make drawings on the spot (and collections) of endemic and very localised orchids, to fill up the gaps in his gallery of Western Species; he trudged miles over sun-baked ironstone ridges, across sand plains and through swamps, and there were very few orchids between Perth and Albany that eluded his eagle eye. He cherished hopes of visiting the Blue Mountains—home of so many pygmy autumn 'prasophylls' and 'double-tails' (*Diuris*) — also north Queensland where new epiphytes are still turning up, but illness prevented the realisation of these plans.

The botanical world is fortunate in that all arrangements for publishing his *opus magnum*, the "Orchids of Australia," in about 24 parts, had been completed last year; but it is pathetic that the author of so great a work, after waiting half a life-time to see the fruition of his labour, should die before Part I was off the press. The monograph will go on, posthumously, and, after reproduction, each of the 500 original paintings (in natural size) will most probably go to augment those literary and pictorial gems already housed in the National Herbarium at South Yarra—Mr Nicholls donated his orchid collection of some 5,000 dried specimens to that institution in 1946.

→ Georgian House

It is but rarely that the scientific specialist combines illustrative genius with physical prowess and a charming disposition: W. H. Nicholls *was* such a man. The Field Naturalists' Club will never seem quite the same to many of us now he is gone, but we say "thank you" for such a record of sterling service and pass on our deepest sympathy to his four married children and his widow—herself a daughter of the late veteran orchidologist, A. B. Braine.

J. H. Willis.

Orchids of Australia (complete edition) was published by Thomas Nelson (Aust.) in 1969.

VICTORIAN BY-WAYS

(Talk to Members of the Field Naturalists' Club on Monday, March 12, 1951).

By Paul Fiscu

Tonight I propose to relate to you some of the observations and finds we have made on holiday camping trips and later also illustrate them with photographs. As many of the features on my slides belong to the realm of geology, and since geology (that is, the study of the earth's crust) is of such fundamental importance, I propose to start off with a ramble into the geological history of Victoria.

Victoria is built on rocks of two types, the crystalline or Primary rocks which are represented by the granites and lavas and the Sedimentary or Secondary rocks which are stratified and contain fossils; these are represented by conglomerate sand and mudstones, limestones, brown and black coal.

When one encounters these different rocks in the field, at once the questions crop up: what are they? how are they formed? and how old are they?

To explain those queries I can think of no better aid than the geological time-scale devised by the late Dr. Singleton. The experts can now tell the age of rocks quite accurately by the radioactive minerals they contain. The element uranium disintegrates at an even rate and the end-product is lead. By determining the contents of uranium and lead in a given rock their relative quantity indicates how long the process of disintegration has lasted; in other words, reveal the age of that rock. Dr. Singleton used the height of the Century Building (some 180 feet) for comparison with the age of the Earth, allowing 10 million years for each foot of height. The main part of the building (132 feet) represents the most ancient era of the Earth's geological history, lasting some 1,320 million years. Then the first 30 feet of the tower are occupied by the Paleozoic era, the 300 million years of ancient life. Then follows the Mesozoic era lasting 160 million years and which may be termed the "middle ages" of the Earth's history. The primitive forms of life of the Paleozic era had to make room for more developed form of animals and plant life: the last four feet of the tower represent the 40 million years of the Tertiary era when the modern organisms living on the earth were developed. A matchbox placed on the top of the building would represent approximately one million years — about the time man has existed on the Earth, the thickness of a visiting card (one hundredth of an inch), placed on top of the match box represented the 8,000 years of historical time; and finally, a cigarette paper of one thousandth of an inch thickness, would represent the time elapsed since 1066!

Mesozoic

Since we have now the successive periods of the Earth's geological history set out, I suggest that we very briefly touch on the major events —

The foundation of Victoria is composed of Sedimentary rocks of Ordovician, Silurian and Devonian age. Delicate impressions in Ordovician mudstones of graptolites and trilobites give their age away. Although these sediments were laid down horizontally in layers, subsequent earth movements, caused by the shrinkage of the Earth's crust, forced these rocks into folds. The Devonian Period was also characterised by big igneous intrusions that formed the batholiths of

Mt. Buffalo, Baw Baw, etc., and volcanic eruptions formed the lava flows of which the Dandenong Range and Mt. Donna Buang are composed. During the Carboniferous Period the sediments of the Grampian sandstone were deposited.

The last of the periods of the Palæozic Division is the Permo-Carboniferous one. At Bacchus Marsh and Dereel, near Heathcote, we can also find evidence of the great Permo Carboniferous Ice Age. The most important and extensive depositions of the Mesozoic Division occuring in Victoria are the Jurassic Sandstones that build up the South Gippsland and Otway Ranges. At Wonthaggi these sediments contain black coal deposits and provide this State with its only supplies. Unfortunately these rock strata are very much faulted and consequently make coalmining more hazardous.

The last of the great Divisions is the Tertiary. These Tertiary Rocks are extensive in Victoria and include sediments containing leaf beds, lava flows (older Basalts) fossiliferous marine clays and limestones, and, what is perhaps the most remarkable feature, enormous deposits of brown coal, probably the thickest brown coal seams in the world. It might be interesting to mention here, that the birth of the mighty Alpine ranges of Europe took place as late as early Tertiary Time.

The million years (represented on Dr. Singleton's scale by the matchbox) remain to be considered. They are called the Pleistocene period and are characterised by extensive volcanic activities in Victoria, represented by the newer Basalts of Keilor Plains, Western District, etc. Europe at this age was invaded several times by advancing ice sheets from the Alps as well as the Scandinavian Highlands and so eventually the Tertiary Flora and Fauna was wiped out completely. While the northern Hemisphere experienced extensive Glaciation, Australia also went through a period of decreased temperature. The Kosciusko plateau formed a permanent Ice Field with glaciers creeping down the valleys. After the retreat of the glaciers the plants that restocked the Continent migrated mainly from the north east. I mention this because it might explain the extraordinary vigour or most of the European flora. (I am thinking of the experiences we have here in Australia with the imported European plants that acclimatise and spread so well).

To come back to the Pleistocene Ice Age of Europe, the retreating glaciers left vast amounts of rock material that was picked up and transported from the mountain ranges of the Ice Field. This material, composed of many different types of rocks, from big boulders down to the finest rock flour, is now the source of extremely fertile soil. So when one notices the big yields of farm produce in most European countries, and the capacity of the soil to carry large populations, one has to thank the Pleistocene glacial activities.

It is the mineral content of the decomposing rocks that determine the quality of the soil and, ultimately, that of the plant life. A good illustration of this is provided when one travels from Warrandyte to Kangaroo Ground. First one has the very poor vegetation on sandstone of the Silurian age; while the hill of Kangaroo Ground has a cropping of Older Basalt providing a rich volcanic soil that always grows dark green crops.

Here is the amazing master plan of the earth's history: to enable the human race of today to live in comfort, immense "power reservoirs" in the form of coal and oil deposits have been created back in the Carboniferous, Jurassic and Oligocene Periods; fertile soils have been formed by volcanic and glacial activities, and, finally, useful plants and animals evolved.

LAND BIRDS AT SEA

One autumn night, with a cold north-easter blowing, I was standing with my collar up and sou'wester pulled well down, when a starling alighted on my shoulder and crept under my sou'wester, where it stayed for a minute or two until a movement of my head scared it off.

On another occasion one settled on the bracket which holds the whistle to the funnel, and went to sleep. Soon afterwards we ran into a patch of fog and had to blow the whistle at half-minute intervals. Everyone was surprised to see the bird remain on its perch only a foot or so below the outlet of the whistle, looking up at the plume of steam. In an attempt to get a photograph of this unusual occurrence, I climbed on to the "monkey island" above the bridge for a near view, but the noise was so deafening that I had to get away quickly as I feared injury to my ear-drums. Did the first blast on the whistle rupture the bird's ear-drums, we wondered, and render it totally deaf? After remaining on its perch for several minutes, it flew away quite strongly.

H. H. Goodchild.

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RESIGNATION OF SECRETARY

At the last meeting of Council the resignation of Mr. H. Preston as Secretary was received with regret. Mr. Preston finds he can no longer carry the heavy duties of secretary in addition to his other work. He has given generously to the Club of his time and interests and members and Council are deeply grateful to him for his help over the past years.

CUTTINGS FROM AGONIS FLEXUOSA VARIEGATA

The Chief Propagator at the Botanic Gardens, Melbourne, is pleased to report that he has at length succeeded in raising a few plants from cuttings of one of the most beautiful of all Australian plants — *Agonis flexuosa variegata*, the graceful Willow Myrtle of Western Australia.

The original plant is in the garden of a Mr. Paine at Toorak, Victoria. Although half eaten by an elephant* a few years ago, it is still in a healthy condition.

It is believed that Hodgin's Nurseries of Essendon had first call on the plant, stocks of which were obtained by the method of in-arching. Propagation by cuttings has been tried on many occasions without success. Is this the first time this plant has been grown by this method?

A. Burke.

*No explanation of the presence of the elephant in the garden at Toorak is offered. We understand that the animal was borrowed by the R.A.A.F., probably from the Zoo, for purposes unknown. Any further information on the subject would be welcome.—Editor.

DRAGON-FLIES ON THE WING

October 6-13, 1950, was a week of intense dragon-fly activity in the Melbourne Domain, thousands of these large fleet insects whizzing through the air during daylight hours — apparently they had just emerged from the nearby Botanic Garden lakes. Then they waned in numbers, but reappeared in force during a heat wave on December 19. There was a final "flutter," but with much reduced numbers, on March 5, 1951.

—J.H.W.