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Koala (Phascolarctus cinereus) in natural surroundings. By E. R. Rotherham, F.R.P.S., A.P.S.A.
Exposure details: Rolleiflex camera, electronic flash, Kodak Super-XX film, f/22.

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The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

Ellis Troughton's book, *Furred Animals of Australia*, tells us that this is the Brush or Red-necked Wallaby (*Wallabia rufogrisea*), and that the Tasmanian variety is known as Brush Kangaroo whereas in eastern Queensland it has the sobriquet "Roany". However, in parts of East Gippsland at least, country folk know the little animal as Red Wallaby. It favours lightly forested, flat or undulating country rather than the heavy scrubs and densely clothed mountain slopes, and the western distribution of the animal includes the southern corner of South Australia.

The photograph which is reproduced on the cover was taken one night in March 1936 by Mr. Ray Littlejohns, in the country to the north of Bendigo. The flash equipment used in those days was what we would now regard as most primitive, nevertheless, many very presentable results were obtained from time to time. Some of these form part of an illustrated article entitled "The Bush by Night", which appeared in the issue of the *Victorian Naturalist* (Vol. 55, pp. 3-11) of May 1938.

Editorial :

The Victorian Naturalist—Past and Future

The Field Naturalists Club of Victoria was established 79 years ago, in May 1880, and a few years later it decided to have a regular publication of its own. So in January 1884, there appeared the first issue of our journal, the *Victorian Naturalist*.

The introduction to the original issue told of the intention to publish "a monthly record of work and results, of original papers on Victorian Botany and Zoology, and current notices of the occurrences and habitats of interesting forms". This flavour was preserved for many years, and contributions were made by prominent scientists of the day.

During recent years the situation has changed. The scientists are no longer the prominent members of the F.N.C.V., and a number of more recently established journals provide the medium for publication of their researches. Vital objects of the club are now stated to be the stimulation of interest in natural history and the conservation of our fauna and flora.

It has been decided that a major step towards the achievement of these aims can be made by placing a popular nature magazine in the hands of those who have a general, but not necessarily specialized, interest in the natural phenomena round about them.

It presents readers with something quite different from the previous format. There is a section for school nature study, a page or so for readers' nature notes and queries, and the first units of two features which are to continue in serial form. We shall also have a scientific section to accommodate the material which is of interest to the scientist and the more serious-minded naturalist. As well, records of the activities of the F.N.C.V. are still being published as a service to members, but this is being done under an arrangement somewhat different from that of the past.

With its twenty-four pages, the May 1959 issue is a modest beginning—because the financial resources of the Field Naturalists Club are limited. This time, we must depend on quality rather than quantity. We hope that you will recognize in these pages a sample of something worth developing.

Until a little over five years ago, there was the journal *Wild Life*, the monthly nature magazine edited by the late Crosbie Morrison. The *Victorian Naturalist* could become a successor to that. Increase in circulation should allow us to maintain the quality and, from time to time, to increase permanently the size of our publication.

We ask you therefore not only for your own continued support but for your active assistance in the matter of interesting others in the magazine. For, to a great extent, the publicity which readers can give to the *Victorian Naturalist* will govern its future growth and therefore the success of this venture.

TOADSTOOL PHANTASY

In this refreshing little story we are taken on a nature excursion that is different—into the world of fungi as it is seen by one young child. The narrative is put together and the photographs supplied by

ROBERT D. LEE

Mummy and Daddy, being Field Naturalists, were particularly interested in the different kinds of fungi which were to be found during an outing in the country or even an afternoon's stroll locally, and they frequently brought home examples of them to be identified from books.

Anne, of tender years, was always anxious to look at the illustrations, so, to save any argument while the adults were busy identifying their spoils, she was given a copy, for her own use, of J. H. Willis's *Victorian Toadstools and Mushrooms.* On the next trip to the near country with Mummy, the precious book was tucked tightly under her arm and the toadstools which were found had to be solemnly examined and compared with the illustrations.

"It can't be Laccaria, *it must be* Boletus."

Being unable to read as yet, the printed word naturally meant nothing to Anne, and as each specimen needed a name, suitable ones had to be invented. For instance, when they came across the cumbersome *Boletus* overshadowing a group of the graceful little *Laccaria*, it brought to mind the old ditty, "I'm the king of the castle, you're the dirty rascal". So each was named accordingly.

Our young naturalist had her names for other specimens, too, as well as for illustrations and photographs she had seen. Most of them provided quite a new slant on this branch of botany, but all were strictly appropriate. There was her "Pusher-spoon Fungus". This was from a photo of *Flammula*, a specimen which had been cut through the centre of the cap and down the stem to show the structure of the fruiting body. It bore a striking re-

semblance to the pusher-spoon in the infants' set that she used three times a day, at meal times. Would an adult have thought of the connection? An adult of inquiring turn of mind would be more interested to know that *flammula* is a Latin word meaning "a little flame". Not that the "Pusher-spoon Fungus" looked very flame-like; they were a tawny colour and were found growing on the ground among fallen leaves and twigs. The scientific name, incidentally, is *Flammula californica*, presumably so called because of a close resemblance to a species in that State of the U.S.A.

During a trip to the hills, a group of another kind of "little flame", this time *Flammula excentrica*, was growing on a decaying log. This gave her the idea of oranges; the caps were the right colour and looked just like orange peel, and it reminded her that she had forgotten her drink of orange juice that morning to keep the doctor away, and so they were named "Orange Juice".

Her "Ring-a-rosie" was an impression of the "Fairy Ring Mushroom". One can well imagine a large ring of children romping round, some wanting to move faster than others, bunching up in some parts of the circle and thinning out in others. The scientific name for this mushroom is *Marasmius oreades* and it is one of the several kinds that form "fairy rings" on lawns and open grassy spaces. Notable examples of such growths can be seen on the lawns surrounding the Shrine of Remembrance in Melbourne. It is also common in Britain and Europe where it is used for cooking in various ways or added as flavouring to other dishes.

An uncommon earth-star, known as *Geaster hygrometricus*, gave her a more pleasant impression than that which Mummy and Daddy received. To them, it suggested some sinister creature standing on tip toes waiting to pounce on an unsuspecting victim; but Anne insisted that it was the "Flower Fungus", and who could argue against that when those marked rays spread out like petals? However, she exercised a feminine prerogative and changed her mind later on. On seeing the photograph, she dubbed it "Little Miss Muffet sat on a tuffet".

These earth-stars belong to a large and interesting group called Gasteromycetae (actually meaning "stomach fungi") which includes the common puffballs, earth-stars, basket-fungus

"Little Miss Muffet sat on a tuffet."
An unusual earth-star.

and others of varied shapes, some even resembling sea anemones and starfish. Anne, of course, had not seen any of those as yet, but it is certain she would have had an appropriate name for each.

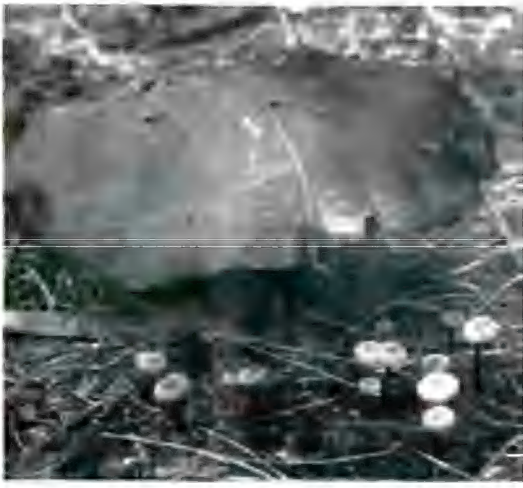
Several photographs of toadstools were printed in oval masks. These were the shape of the hall mirror at home, so they all became the "Mirror Fungi". And her description of the Parasol Mushroom, *Lepiota gracilenta*, really hit the right spot when she called it the "Umbrella Fungus". This is another "toadstool" that is quite as delicious as any real mushroom, a fact that is well known to people who come from Britain or Europe. Anne's specimen was found amongst debris on the forest floor at Kallista in the Dandenong Ranges.

We decided to "hand her the belt" when she described a photograph of *Collybia radicata*, the "Rooting Shank", a specimen which had been cut down the centre, as the "Whooping-cough injection". If you have memories of visits to the doctor and of the hyperdermic syringe he used, look at the picture on page 42 of Willis's book, and see what you think!

So we have a child's outlook on what some folk regard as a very unattractive subject. Actually, it is a phase of nature study that would be most suitable to bring to a child's notice; in fact, the interest should be there already. Do not most of the pictures in fairy tales have the tiny creatures seated on toadstools, or else these are in the surroundings somewhere? Furthermore, the bright colours and unusual shapes of various fungi must surely give a child pleasure. We certainly have experienced it and could hardly claim to be unique in this respect.

We must warn you, however. Although many toadstools (or mushrooms if you like; there is no basic difference) make good eating, a few are poisonous; and as children cannot be expected to differentiate, they should be taught not to eat any unless under the guidance of adults who know.

When and where does one find toadstools? Although autumn produces by far the most on account of the generally humid conditions, they can be found after rain throughout the year. We have found them from our suburban back-yard to the dry inland of Victoria, and from the cliffs overlooking the sea to the densest parts of the forest. May we suggest that you get to know them better?



"I'm the King of the Castle."
Boletus and *Laccaria.*

SOME UNUSUAL STONE ARTEFACTS

By A. MASSOLA

Double-Edged Axeheads

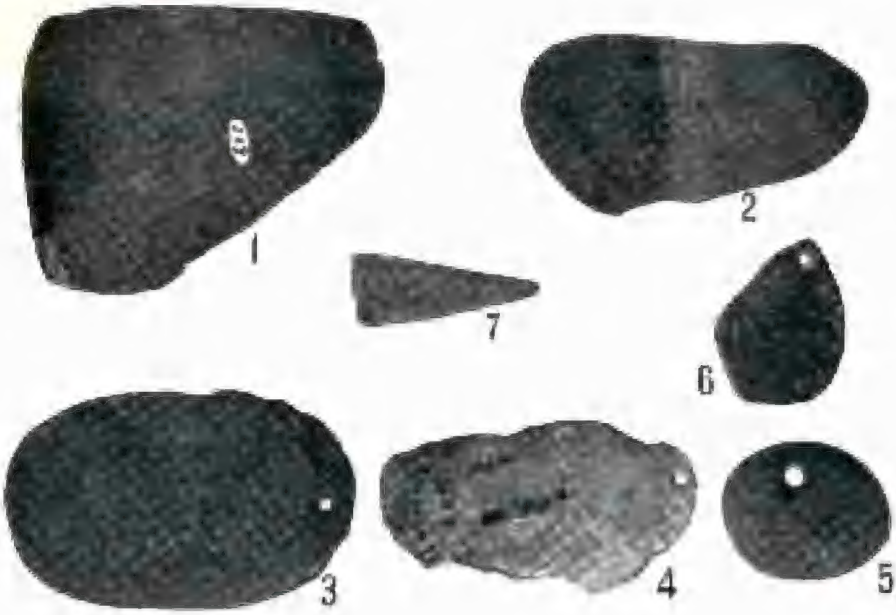
On page 360 of Volume 1 of *The Aborigines of Victoria*, Brough Smyth states, "The Natives of Victoria, according to the information I have obtained, appear to have used the one-edged tomahawk exclusively. I have not found a single example of the two-edged tomahawk in Victoria." Since the publication of this work in 1878, innumerable papers on stone implements have appeared, but, to the present writer's knowledge, not a single reference to a double-edged axehead was ever printed. Two of these implements are now known to exist.

Figure 1 is a natural flake of basalt, 4½ inches long, and 1¼ inches wide at its thickest part, which happens to be the centre. From the centre the flake abruptly thins down to the two ends, forming two cutting edges, one 3¼ inches and the other 1½ inches long. Both these edges have been ground, thus giving rise to a double-edged axehead. There is no indication of the mode of hafting, if it were hafted at all. It was found close to the Maribyrnong River, at Braybrook, and is now in the F. Smith Collection, Mount Dandenong, Victoria.

Figure 2 is a pebble axe, of sedimentary rock, water worn, the two ends of which have been ground into very serviceable cutting edges. The implement is 4½ inches long by 2¼ inches at its widest point, maximum thickness being about ¼ inch. Again, it is impossible to say if it were ever hafted. It was found close to the head waters of the Olinda Creek in the Dandenong Ranges, and is now in the R. Wishart Collection, Kew, Victoria.

Fish-hook File

While in East Gippsland recently, Mr. N. A. Wakefield, editor of this journal, visited Clinton Rocks, about six miles west of Cape Everard and two miles east of Tamboon Inlet. Here he discovered an aboriginal coastal midden which yielded portion of an aboriginal's skeleton, several stone implements, and a bone awl. Amongst the stone implements was a fish-hook file. (See Figure 7.) These are small, flattened cones of sandstone or other abrading stone, used by aborigines in fashioning their shell and bone fish-hooks. Prior to this discovery, they had only been reported as having been used by the coastal aborigines of New South Wales. This one, to the writer's knowledge, is the first found in Victoria, and as such is quite important. It is a connecting link between Twofold Bay, in New South Wales to the east, and Lake Tyres, Victoria, to the west, the two localities nearest to Clinton Rocks from which fish-hooks have been recorded. The present specimen is a flattened fine-grained granite cone 2⅜ inches long, just under one inch wide and ¼ inch thick at the base, tapering to a blunt point, The finding of this specimen



gives rise to the hope of more being found along the East Gippsland coastline, and I would be glad if any such discoveries were reported to the National Museum. This is essential for the completion of distribution maps.

Perforated Stones

The classical example of the perforated stone is the Churinga of Central Australia. These have been described at some length by several writers, and both their technique of manufacture and functional use are well known. It is possible that other suitable stones, not necessarily of a similar form, could have been used for analogous purposes in other regions of Australia; or similarly shaped stones could, conversely, have been used for very dissimilar reasons. They could, for example, have been used as pendants, stone replicas of the well-known bailer shell ornaments. Although none of these stones has ever been described, an occasional one has been reported. Ferguson, for instance, as far back as September 1894, mentioned in the *Victorian Naturalist* (Vol. XI, p. 89) a fragment of basalt which "had indications that the perfect stone had had a hole drilled through it". It was found by him in a hole blown by the wind in the sand near Glenthompson, in the Western District of Victoria. Only four examples of these perforated stones are known to the writer, of which three are in the collection of the National Museum of Victoria and the fourth in the Mildura Art Gallery.

Two of the National Museum's specimens are part of the Lindsay Black Collection, the most extensive of stone implements and artefacts ever assembled from the Darling River region. The fact that there were only two perforated stones in this assemblage of many thousands of specimens proves their rarity.

Figure 3 illustrates an example made from a naturally shaped fragment of micaceous schist, measuring 4½ inches by 2½ inches. It was found at Tooralle, Bourke, New South Wales. As in all the specimens in this series, the hole was artificially made, and shows the "hour-glass" shape, which is peculiar to all aboriginal-made perforations.

Figure 4 represents the other Lindsay Black specimen. This is a fragment of chlorite schist, originally oval in shape, but now much battered. Its original dimensions were probably the same as in the previous example. Again it has been pierced by an hour-glass hole. It was collected at Bililla.

The third example in the National Museum is part of the S. F. Mann Collection. The late S. F. Mann collected assiduously in his home district, Caramut, near Glenthompson, and the majority of his specimens are labelled as having been found there. He did, however, take a trip along the Darling River in 1917, and it is possible that the perforated stone in his collection (Fig. 5) came from there; but it was not labelled. Still, as it is a waterworn pebble of finely grained granite, it is more likely to have originated in western Victoria than the Darling. It measures 2 inches by 1¾ inches, and again the hole is hour-glass shaped. This hole, however, has not been drilled at the end of the longer axis of the oval, as in the other three examples, but on the shorter one. This was possibly to take advantage of a natural cross formed by two quartz veinlets traversing the specimen and thus ornamenting it.

The fourth example illustrated (Figure 6) belongs to the Mildura Art Gallery, where it was noticed by the author, and is described here by permission of the Director of that Institution (Mr. Van Hattum). It is a pear-shaped fragment of micaceous schist reduced to its present size by grinding. The measurements are 2¼ inches by 1¾ inches. The hour-glass hole is drilled at its apex. It was presented to the Mildura Gallery by Dr. G. Murray Blair, President of the Gallery Society, having been obtained by him at Pooncarie, on the Darling River.

By Jean Galbraith

Silver Wattle—*Acacia dealbata*

"Grey winter hath gone like a wearisome guest
And behold, for repayment
September comes in with the wind of the west
And the spring in her raiment."

In Australia, that spring raiment is wattle bloom, especially the blossom of Silver Wattle, touching the stream-side trees with gold in July, cascading over them in August and September, and in October reaching the mountain gullies where this wattle grows into tall trees.

Yet Silver Wattle is only one of over eighty species which are native to Victoria. Every one of these is beautiful, every one is worth knowing, and during the coming months we shall meet some of them and get to know them by name.

It is not very difficult to recognize most of our wattles, because they can be separated into several easily-distinguished groups.

Silver Wattle belongs to the group with feathery or bipinnate (twice divided) leaves. In Victoria there are seven feather-leaf species, three of them are trees, three are tall shrubs, and one is quite dwarf. One of the trees is *Acacia decurrens*, with bright yellow blossom and dark green leaves with widely-spaced leaflets; and the second tree is Black Wattle, which has pale primrose blossom in late spring. The third is our Silver Wattle, lover of streams and cool gullies and hillsides, with dusty-green leaves and the leaflets almost touching edge to edge.

← *Silver Wattle at Cann River.*

Silver Wattle leaves are minutely downy, and the down, which is visible with a magnifying glass, gives a silvery dustiness to the foliage. One can hardly call it silver, and the name may possibly come from the silvery patches on the tree's otherwise dark green bark.

In blossom time the leaves are hidden by clouds of living gold, for the finger-like racemes with their "bobbles" alternately on this side and the other, are so abundant that one rarely sees their slenderness.

Every golden ball is a cluster of minute yellow flowers, each with a halo of stamens tipped with their sacs of pollen; and after the flowers have gone, the tree is hung with clusters of straight purple-brown pods, lumpy with the seeds within.

Silver Wattles are husky trees of twenty, thirty or forty feet in the lowlands, but they may be a hundred feet high in the mountain gullies amongst blackwoods and columnar gums. They are found in all districts of Victoria except the dry north-west, and also in New South Wales and Queensland.

The colour of the blossom varies from clear lemon-yellow to bright gold on different trees. It is September's colour, September's flower, that comes with the first cuckoo's song, waking spring in the heart.

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

You might consider that your observations are of no importance, but in many cases they would be very interesting to others, and sometimes they might even provide a definite contribution to general nature knowledge. We can give you a very good illustration:

The story dates back to 1938, and its setting was beyond Orbost, at a small rural school in the far-eastern corner of Victoria. It was winter and there had been a fall of snow. One of the pupils picked up a bird which had perished and brought it along to school. It was looked up in a reference book and found to be a species called the Spangled Drongo, then it was discarded. Many years later the teacher found out that the species had been noted in this State only three or four times before, and that the only Victorian specimen of it in existence is one which was collected in 1885. Alas! Your editor was that school teacher.

The moral, of course, is to send along specimens and notes that you think could be of some interest or value.

Mimicry of Bower-bird

From Mrs. Joyce Hodge of "Poorinda", W Tree, via Buchan, comes this account of visitors to the garden:

"Probably owing to the dry season, the Satin Bower-birds have flocked to feed on the white berries of *Notelaea ligustrina* in our garden and we have had plenty of opportunity to listen to them mimicking other birds. We noted the calls of the Kookaburra, Crimson Rosella, King Parrot, Crescent Honeyeater, Lyrebird, White-eared Honeyeater, Grey Thrush, Magpie, White-browed Scrub-wren, Red

Wattle-bird and White-throated Tree-creeper."

In the *Victorian Naturalist* of December 1956, you may read of a Satin Bower-bird that visited a Melbourne suburban garden, and *its* repertoire included the calls of Gang-gang Cockatoo, Australian Raven and Koala. Bower-birds are certainly master mimics.

Notes from Mount Hotham

The Hodges are an observant family, with a desire to really understand what they see. Peter, one of the boys, provides us with these notes from the eastern highlands of Victoria:

"We had an interesting trip over Hotham Heights last week. I was surprised to find that a ridge of volcanic rock ran right up to the top. Most of the top was covered in dense, small-growing shrubs—*Orites*, *Boronia algida*, *Prostanthera cuneata*, *Pleurandropsis*, *Westringia senifolia*, Mountain Hovea, *Epacris paludosa*, a few grevilleas and so forth. I am enclosing specimens of two grevilleas as we are not sure which ones they are.

"I saw only a few birds there, one being the Olive Whistler, which I didn't expect to see so high up."

There are several isolated occurrences of volcanic rock to the west of the Omeo area; it is what is known as Older Basalt, the same formation as the country between W Tree and Wulgulmerang.

The grevillea which has small needle-pointed leaves with three parallel ribs is a Tasmanian variety of the Alpine Grevillea. This form is known as *G. australis* var. *montana*, and it has been found on Mount Feathertop, too. The other specimen is of one of the many variations of Royal Grevillea (*G. victoriae*).

Powerful Owl at Mallacoota

From Mr. W. Hunter, a surveyor of East Gippsland, we receive some interesting notes from time to time. Here is an extract from one of his recent letters from Mallacoota:

"Late one morning, towards mid-day, I was strolling along the bank of Davis Creek not far from here—certainly not a scrubby nor a heavily-shaded place. And in a light patch of low black-wattle trees I suddenly came almost face to face with a big owl perched less than ten feet above the ground and not much more than that away from me. I am pretty sure that it must have seen me though it remained quite still. It wasn't until I eventually moved closer to it that it flew away. I am quite sure that it was a Powerful Owl. As well as its size—almost if not quite two feet long—its colour and markings were just as described in Leach's *Australian Bird Book*, the blackish-brown barring of the whitish underparts being a bit uneven though definite. The strongest impression I got of the bird I saw—in full daylight, of course—was the size of its greeny-yellow eyes; they seemed to me to be enormous even for an owl."

Yes, there is no doubt that the bird was the Powerful Owl, a species inhabiting the heavy forest areas of the State and uncommon enough to make your observations of more than passing interest.

Nature Study for Schools

By Norman Wakefield

It is most appropriate that there should be liaison, through this magazine, between the Field Naturalists Club of Victoria and those teachers who are concerned with the development of nature study as a subject of the school curriculum. One of the major objects of the Naturalists Club is to stimulate interest in natural history, and it is the presence of this feature that determines the success of the subject at school.

In many cases, nature study is the "Cinderella" of the curriculum, mainly perhaps because a proportion of teachers feel that their lack of extensive knowledge in this field makes it difficult or impossible for them to develop the subject satisfactorily. The purpose of the series "Nature Study for Schools" is first to present some considerations that may assist in the approach to the subject, then to go into matters of organization, and finally to provide monthly notes on seasonal and general topics.

The New Nature Study Course

Several years ago, the Victorian Education Department convened a small revision committee to consider the subject, and the results were published recently under the title, *Course of Study for Primary Schools, Nature Study, 1956.*

The "General Notes on the Course" give a concise statement of the aims and then set out in both theoretical and practical detail the methods by which the subject should be developed. The fundamental principles are best indicated by quoting four sentences from the General Notes:

"The learning of facts is incidental to the creation of the proper attitude to nature study.

"This attitude is developed through continuity of observation in the child's immediate environment.

"Education of children's curiosity in their natural environment and fostering a love of nature cannot be achieved through a series of set lessons, systematically arranged and taken indoors.

"What the child finds out for himself is the vital feature of any observation, and care should be taken to avoid telling him something that he has a right to discover for himself."

The main body of the course sets out a suggestion of basic ideas which it is considered should form part of a child's general understanding at the various grade levels. That this is not a prescriptive list of matters to be taught is indicated by such instructions as:

"Establishment of these ideas should come about through observation of many examples, not through direct teaching."

The first appendix to the course lists again sections which appear under grade headings and provides specific references to sources of information and also suggestions for individual and group activity in connection

with observations. Finally, lists of reference books are set out, with a precise indication of the utility of each.

The 1956 Nature Study Course has been compiled as a practical handbook on the subject, not simply as an indication of what should be treated.

The Teacher's Role

Although it is stated that "the learning of facts is incidental to the creation of the proper attitude", it is not only true but quite understandable that development of the observational approach results in a much wider knowledge in the field of nature study than would a series of formal lessons on the subject. This is not a new idea. In *Australian Nature Studies*, published in 1922, Dr. J. A. Leach addressed this remark to teachers:

"If pupils discover things you know nothing about, be happy . . . for . . . the best teacher of nature study is the one whose pupils furthest outrun him. Enjoy the work, and let your pupils run on."

Leach said, too, that "if the work is a pleasure to all concerned, it cannot be wrong; if not a pleasure, it cannot be right". If nature study is to be a success, it is essential that pupils have an enthusiastic interest in the natural phenomena round about them; and the initiation and/or the fostering of this is the major task of the teacher.

When this approach is established, and observational contact with the environment is producing abundant material upon which discussion and activity work can be based, there comes the problem of provision of common names for the things with which the pupils and teacher are dealing. This introduces the second phase of the teacher's role.

Few teachers are experts in branches of natural history, and therefore the 1956 Nature Study Course was compiled partly as a reference, to point to sources of information on the various topics. The two appendices in particular are designed to serve this purpose.

The function of any nature study reference book should not be to teach children the characteristics of animals or plants, for those are things that they have a right to discover by observation. The teacher, however, may profit by such book information and thus be better able to guide his pupils' observational work along profitable channels. Other than this, the function of a reference book should be to provide popular (or vernacular) names for species or groups so that they can be discussed with facility.

It is pointed out in the general notes on the course that specimens for identification and other queries may be addressed to the Science Departments of Primary Teachers' Colleges. This magazine provides like facilities through its columns.

At the end of each volume of the *Naturalist* there will be an index covering the contents of the twelve parts, so keep each month's issue as a contribution towards a set of useful reference books for your school library.

Next month: The organization of reference collections.

THE BOGONG HIGH PLAINS

Over the Christmas-New Year period of last summer, forty members of the Field Naturalists Club of Victoria took part in an excursion to alpine parts of north-eastern Victoria. With their experiences as the basis, an account of this area will appear in monthly instalments in the Naturalist. *It is appropriate that the narrator should be both the leader of the excursion and the president of the club.*

Here is what amounts to a preface to the series told by

J. ROS GARNET

The account of the F.N.C.V. trip to the Bogong High Plains is being written with an ulterior motive. As well as recording a day to day journal of events in the Club's 10-day excursion during the summer holidays of 1958-59, it should serve to focus the attention of those to whom the region is *terra incognita* on a supremely scenic and scientifically as well as, yes, economically interesting region of Victoria.

Some years ago the Parliamentary State Development Committee, on completion of a long enquiry into the national parks of Victoria, included in its report a recommendation that an alpine national park should be established in the State. The committee envisaged the proposed park as including the whole of the north-eastern highlands and extending north-east to the border to link it with Kosciusko State Park of New South Wales. The proposal was imaginative but possibly not altogether practicable. An alpine national park is, none the less, an asset which Victorians should strive to possess and now is the time when they should be planning for its establishment.

A glance at a map will show that most of Victoria's highest mountains are concentrated in a relatively small area. Here is a list of them showing the altitudes in feet above sea level as determined by the most recent survey:

Bogong	6516
Feathertop	6307
Nelson North	6181
Nelson	6175
Fainter South	6157
Loch	6152
Hotham	6101
Niggerhead	6048
McKay	6045
Fainter	6028
Cope	6026
Spion Kopje	6025

Either mingled with or not very far from this nest of alps are other, mainly lesser eminences:

Cobberas	6030
Buller	5923
Jim	5916
Stirling	5900
Higginbotham	5870
Gibbo	5764
Wills	5758
Howitt	5718
Bundarrah	5653
The Horn (Buffalo)	5652
The Bluff	5650
Speculation	5650
Basalt Hill	5625
Magdala	5600
Blowhard	5505
Little Bogong	5460
Koonika	5400
Cobbler	5349

Some of these highlands are unoccupied Crown land, others are included in large reserves of state forest under the control of the Forests Commission; yet others are water supply catch-

ments administered by the State Rivers and Water Supply Commission or else the Metropolitan Board of Works.

Perhaps it is fortunate that the Bogong High Plains come under the jurisdiction of the State Electricity Commission, for this part of the State could be the gateway to the proposed great Alpine National Park. Through the S.E.C. the people of Victoria have invested a huge sum in developing the region—fine access roads have been laid down as well as plenty of easily negotiable tracks. Tourists and visitors are already catered for at Bright and adjacent towns in the valleys below, at Mount Beauty at the foot of Bogong and, near the tops, at the Falls Creek ski village. When the S.E.C. has finished its programme of works it should be feasible for it to hand over to the National Parks Authority responsibility for the management and further development of the High Plains.

The power generating installations would, naturally enough, remain in the control of the Commission, but there seems no reason why the people of the State and a potentially vast army of tourists from further afield should not be free to enjoy the magnificent scenery which is, even now, available to a limited number.

These High Plains are but one of several such "plains" to be found in the north-eastern highlands of Victoria, but they have a special interest inasmuch as their altitude exceeds that of all others in the State. No other region of the alps is so easily accessible to visitors and tourists; in few other places is there such potential for an easy transition from a land of winter sports to summer recreations.

The Rocky Valley lake, which is to come into existence before the end of this year, can be viewed as an enhancement to the scene just as Lake Catani on Mount Buffalo adds charm to an already famous beauty spot.

Let us hope that, in a time not far ahead, the trails along the ridges of the mountains and into their loveliest valleys will be well defined and furnished with well-kept huts and hostels for the use of those who would see, beyond the sphere of urban settlement, something fundamental of the land in which we live.

News and Notes

Natural History Medallion

Congratulations are extended to our veteran member, Mr. C. J. Gabriel, on his being awarded the Australian Natural History Medallion for 1958. Mr. Gabriel joined the F.N.C.V. in 1900, and he wrote one of the club's earlier booklets, *Victorian Sea Shells*, now unfortunately out of print. The medallion will be presented at one of the forthcoming club meetings.

Crosbie Morrison Memorial

On April 24 last, the Trustees of the National Museum launched an appeal aimed at raising at least £20,000 to establish a memorial to the late Philip Crosbie Morrison. Club members may receive circulars about this, and a further statement will appear in the June *Naturalist*.

Field Naturalists Club of Victoria

General Meeting—April 13, 1959

About 120 members and friends gathered in the lecture hall of the National Herbarium on the occasion of the club's April general meeting. Visitors included Dr. H. Eichler of the Adelaide Botanic Garden and Mrs. Crosbie Morrison. Those present stood and observed a minute's silence as a tribute to the memory of an old member, Mrs. S. I. Bayley, who passed away recently.

Mr. A. J. Swaby was appointed a delegate to the A.N.Z. A.A.S. conference to be held in Perth in August next, but two more representatives are needed from the club.

It was reported that, following the discussion last month of possible resumption of sealing on Macquarie Island, letters had been sent to various newspapers, politicians and natural history societies. However, it is probable that the Tasmanian Government will not allow such operations.

Mr. Garnet mentioned that a new organization had been formed, the "Fauna Protection Council", to attempt to curb the destruction and export of native animal life. Members are asked to inform the council of any relevant matters that may come to their notice.

Honorary Membership of the F.N.C.V. was conferred on Mr. P. F. Morris in recognition of his forty years' membership, and on Miss Jean Galbraith, authoress of *Wildflowers of Victoria*, for her services to natural history and to the club.

Following the approval of their nominations by council, the following were elected as members of the F.N.C.V.:

Mrs. Winifred Wilkins, Mr. Alan Dowse, Mr. D. E. Briggs, Mr. P. Ewer and Miss Jean Fitzgerald (metropolitan), Miss C. C. Currie (country) and Misses Jane and Clara Elizabeth Wilkins (junior).

The main item of the evening was an illustrated talk on Macquarie Island by Mr. N. J. Favaloro of Mildura. The speaker described its physical features, the A.N.A.R.E. base, the island's vegetation and the species of seals, penquins, albatrosses and other bird life. The colour slides of the penguin rookeries in particular were excellent. Mr. Favaloro was thanked enthusiastically for his informative lecture.

Botany Group—April 17, 1959

It was reported that a model of the proposed botany group stand for the spring nature show at the Hawthorn Town Hall had been submitted to the show committee and approved. It was agreed that the next step should be the compilation of a list of exhibits and the collecting and preservation of specimens.

Mr. Tinckam showed colour films which he had taken on trips in various parts of New South Wales. A highlight was a canoe journey down the Murray River, and he illustrated this with typical river scenery including the red gum forests about the Barmah Lakes.

Attention is directed to the next meeting, on Friday, May

15, when Mr. W. L. Williams will be the speaker.

Nominations for Office-bearers for 1959-60

President—Mr. D. E. McInnes
Vice-Presidents—Dr. W. Geroe, Mr. E. S. Hanks
Hon. Secretary—Mr. E. H. Coghill
Hon. Asst. Secretary—Miss L. M. White
Hon. Treasurer—Mr. A. G. Hooke
Hon. Asst. Treasurer—Miss M. Butchart
Hon. Editor—Mr. N. A. Wakefield
Hon. Asst. Editor—Mr. W. F. Seed
Hon. Librarian—Miss M. Argo
Hon. Asst. Librarian—Mr. J. H. Quirk
Excursion Secretary — Miss M. Allender
Auditors—Messrs. R. Davidson and W. J. Evans
Council—Mr. A. J. Fairhall, Mr. K. C. Halafoff, Miss M. J. Lester, Mrs. A. Osborne, Miss F. Phillips, Miss K. Thomas and Mr. W. L. Williams.

Microscopical Group—March 7, 1959

The subject for the meeting was "The Preparation and Mounting of Chemical Crystals". Dr. R. M. Wishart gave a talk on the practical aspect, and Mr. Paul Genery on the theoretical side. The evening was well rounded off by Mr. C. S. Middleton showing numerous slides on the screen by means of his polarizing projector. Mr. Middleton will give a lecture entitled "Mainly About Microscopes" at the group meeting in May.

Geology Discussion Group—April 7, 1959

Mr. R. Davidson presided at the meeting, and nineteen members attended. A report was given of the Broadmeadows excursion of March 7, in which eleven of the group took part. In the eastern branch of Moonee Ponds Creek an example of recent rock-building was in evidence, where re-deposition of limestone with pieces of Silurian sandstone and the brackish-water gastropod *Coxiella* was seen. The party observed the dykes of aplite which traverse the exposed surface of the granitic rock (Adamellite) of Gellibrand Hill; and they visited a small quarry where blocks were obtained for many of Melbourne's early buildings.

Mr. Baker gave the talk for the evening on "Water". He explained the classification into meteoric (of the atmosphere), cosmic (associated with meteorites), juvenile (derived from magmas) and volcanic. Many other phases were discussed, including the hydrological cycle, in which water performs the important geological processes of earth sculpture and soil making.

Exhibits included cut and polished chalcedony from Heathcote (Mr. Cobbett), siliceous rocks from Central Australia (Mrs. Salau), basalt from Spotswood at twelve feet below sea level (Mr. Blackburn), granitic rock and morion from Beechworth (Miss Fox), photographs of the Portland bore and silicified wood from Queensland (Mr. Davidson), and calcite crystals from Broken Hill and pyrite from Wittenoon Gorge (Mr. Bairnstow).

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The edible Parasol Mushroom, **Lepiota gracilenta.** Photographed at Kallista, Victoria, by Robert D. Lee

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The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

The Olive-backed Oriole (*Oriolus sagittatus*) is a local migrant, spending the warmer part of the year in southern Australia and the cooler season in the north. It is a little larger than a blackbird, olive-green on the back and head, with brown wings and tail, the under-parts whitish with short dark streaks, and the beak and eyes red. The orioles are fond of soft fruits and will raid figs and other orchard trees, but their diet includes insects as well. The photograph reproduced on the cover was taken at Mitcham, a Melbourne suburb, in 1944, by Mr. Chas. E. Bryant, editor of *The Emu*. The picture accompanied an article on the bird, which appeared in the February 1945 issue of the *Victorian Naturalist* (Vol 61, pp. 172-5).

Did You Know?

THE FORESTS COMMISSION

has taken further steps towards the reservation of areas of State Forest for the preservation of native flora and fauna and for the education and enjoyment of the public.

The reservations to be developed and managed by the Commission are grouped under the following categories—

- ## *Forest Parks*

  . . . major areas similar to National Parks—example:
  SHERBROOKE FOREST PARK

- ## *Scenic Reserves*

  . . . minor areas developed by walking tracks and picnic grounds—example:
  YOU YANGS SCENIC RESERVE
  VICTORIA MILL SCENIC RESERVE

- ## *Roadside Reserves*

  . . . strips of forest bordering roads where fireplaces would be built—example:
  MYERS CREEK ROADSIDE RESERVE

- ## *Alpine Resorts*

  . . . areas within the snow belt set aside for villages and ski-ing—example:
  MT. BULLER ALPINE RESORT

These recreational areas require protection from damage and fire

We rely on *Your Co-operation —*

Thank You!

Message from the F.N.C.V. President:

Philip Crosbie Morrison Memorial Appeal

At the inaugural lecture of the 1959 winter series at the National Museum on Friday, 24th April, an appeal was launched for funds to establish a memorial to the late Philip Crosbie Morrison.

The Chairman of Trustees of the Museum (Mr. George Finlay) announced that the appeal would close on the 31st July next and, before that date, it was expected that at least £20,000 would be received from his many friends and admirers.

There is a number of organizations which will have a particular interest in this appeal, for more than one reason. Their objectives were those of Crosbie Morrison, their interests were his, their love of the Australian scene, its flora and its fauna, were his. All of them would be happy to know that they had shared in the creation of a permanent memorial to a man who had given so generously of his time and energy to the cause of nature protection in our uniquely-endowed country.

The Trustees of the National Museum want to establish a Morrison Memorial Wing to the new National Museum which is to be built in the Domain, and this wing will be designed to provide accommodation for those clubs and societies concerned with Australian nature studies, wild life preservation and scenery protection. The memorial wing would be their common meeting place, their club rooms where could be stored their archives and records, where would be housed their libraries, where could be held their council or committee meetings and their joint conferences.

Members of the Field Naturalists Club and its associates and well-wishers will, I feel sure, need no urging to support this appeal, for Crosbie Morrison was one of us and he, as much as any of us, felt the need for just such a meeting place as is now to be his own memorial.

I would like contributions from Victorian naturalists to be significant and, therefore, commend this appeal to all our members and their friends. When forwarding a contribution would you insert, after your name, the name or initials of the organization with which you would prefer to be identified? Even if you are inclined to give anonymously would you please still do that? Our Honorary Treasurer would be happy to receive all contributions and, from time to time during the appeal, remit them to the Trustees of the Museum as coming from members of the F.N.C.V. (or whatever organization you choose to designate). All donations of £1 and upwards to the fund are allowable deductions from income tax and an official receipt will be issued by the Museum Trustees.

J. ROS GARNET

THE CAMERA AND THE NATURALIST

By
EDWARD R. ROTHERAM
F.R.P.S., A.P.S.A.

Soon after the chemical magic of photography became known in the 1840s, naturalists realized that this new medium could be of great assistance to them, but it was not until the late 1860s that equipment and materials enabled photographers to operate in the field. Flowers and plants were popular subjects, animals were more difficult, for exposures of several seconds were required. Records indicate that a Mr. Haes took stereopictures of a lion in the London Zoological Gardens in 1864 with 11-second exposures. During the same decade a M. Duvette of Amines sent to many exhibitions a photomicrograph, made of many enlarged sections of a flea. "It was an enormous enlargement which was sufficient to give anyone qualms."

The world about us is full of wonderful things and the technical difficulties that faced photographers of almost a century ago no longer exist. The world of nature, in which myriads of creatures live their lives, is a fascinating world to explore with a camera. There is never a shortage of subjects—plants, trees and the hosts of insects that frequent them, birds, mammals, reptiles, fish and the microscopic plants and creatures almost invisible to the human eye all await exploration by the camera-equipped naturalist.

Any camera can be used to record natural history subjects, but, as a great number of the possibilities are relatively small, it becomes necessary to be able to focus the camera at short distances. This requirement automatically rules out the use of those that will not focus to distances of less than three feet or so.

Even with normal cameras an additional method to allow close focusing is necessary. For the camera with a lens which cannot be removed, additional (or "supplementary") lenses can be used to allow focusing to within a few inches of the subject. These vary in price but local products are not usually very expensive. They are slipped over the normal lens mounting and the photographs require no additional exposure —a +1 lens usually allows focusing to within 19 to 20 inches, a +2 lens will permit the photographer to record subjects 10½ to 11 inches in front of his camera.

By far the best type of camera for the serious natural history photographer is the single lens reflex. The lens image is reflected on to a mirror inclined at 45 degrees and this image is projected on to a ground glass so the photographer sees his picture all the time. When the shutter is released the mirror is sprung out of the way and the picture recorded on the film. Thus the photographer can see the picture up to the instant it is taken.

Seals on Lady Julia Percy Island near Portland.

Almost all of these cameras have removable lenses allowing the photographer to use extension tubes or bellows so that the lens can be moved further forward when it is desired to photograph small objects. Using lenses of varying focal lengths with these types of cameras is also of great advantage. Most cameras are fitted with a standard lens which records subjects in front of it in a 50-degree to 65-degree arc. As the focal length of the lens is increased the angle over which the photograph is recorded becomes less, thus only a small area of the scene fills the negative. The telephoto or long focus lens is used when distant objects are to be photographed, for instance a hawk or eagle at its nest. Bellows, extension tubes or supplementary lenses are used when photographing small subjects such as insects.

There are a number of these single lens reflex cameras on the market today and they vary in size from the relatively large 3¼ x 4¼ inch negative produced by the Graflex camera to the 1 x 1½ inch format of the 35 millimetre cameras. The old-fashioned stand cameras, bulky and slow to operate, are still preferred by many serious photographers. The choice of camera depends largely on the work you desire it to do.

With recent advances in film manufacture, there is little that 35 mm. cameras cannot accomplish. These take film of standard motion picture size and their smallness makes them easy to carry.

Photography requires that the person using the camera knows its abilities and limitations, and to acquire this knowledge it is often necessary to read some suitable books. There should be a place in every naturalist-photographer's library for the following:

Nature and Camera, by Oliver G. Pike.

Bird Photography, by John Warham.

Zoological Photography in Practice, by H. B. Scott.

Insects Close Up, by Edward S. Ross.

With these books as guides, many of the problems and pitfalls that can occur in nature photography may be avoided, and you will also have a good collection of natural history photographs to give you a standard at which to aim.

Today the ready availability of colour film and the fact that the world of nature is colourful leads many people to ignore completely the field of black and white photography. This, however, is still vitally important, for most articles are illustrated by it owing to the high cost of reproducing colour photographs.

The photographer should always watch the background of the picture, keeping it as unobtrusive as possible so that the main subject is not lost in a mass of unnecessary detail. Where possible, photograph in the field; but in any case keep the picture looking authentic. Patience is a prerequisite of nature photography, so be prepared to spend hours getting one picture.

When you have your pictures do not be afraid to let others see them. There are three annual photographic exhibitions conducted in Australia in which nature prints and nature slides are shown. If you submit work to these exhibitions it competes with that of photographers from other parts of the world and if any of your entries are accepted you know your work is up to world standard.

As your interest in the photographic recording of nature increases you will no doubt gradually acquire additional equipment. Buy only that which you know you will use, look after it and your camera, and you will enjoy your nature excursions more than ever because you will bring back with you a permanent record of them.

Gum Emperor Caterpillar.

Photography by the Author.

← Tiger Snake.

Baron von Mueller gave us *BLACKBERRIES!*

Since white man came first to Australia, just over 171 years ago, he has wrought many changes in the countryside. Mostly this has been done for economic reasons, but many unexpected developments have come about due to the upsetting of the balance of nature. During the last century, many people made it quite a hobby to attempt to introduce alien fauna and flora into this country. In early issues of the *Victorian Naturalist* we read of the activities of the "Acclimatization Society", and we may thank the enthusiasm of this body and persons with similar interests for many of what are now proclaimed as noxious weeds and vermin.

A small chapter of this story of misplaced zeal is indicated in a letter sent to us by Mr. B. Tindale of Yarra Junction. It reads thus:

While discussing the difficulty of eradicating blackberries, Mrs. James Fraser of Wesburn mentioned to me that, when a girl, she worked for the late Mr. Panton, Police Magistrate, after whom Panton's Gap near Healesville is named. Mr. Panton, she said, often had an old gentleman with him who used to spend a good deal of his time searching for plants in the bush. "He used," she recalled, "always to carry a packet of blackberry seeds with him, and whenever he boiled his billy, he scattered a few round the ashes of his fire. He said the poor people in time to come would bless him for his thoughtfulness." She added: "I wish he could come and see them now!"

"Would he by any chance be Baron von Mueller?" I asked. "Yes," she said, "that was his name. He was a dear old chap, but he evidently had no idea of what the blackberry could do."

Nature Study for Schools

By Norman Wakefield

ORGANIZATION OF REFERENCE COLLECTIONS

The notes which are given here are supplementary to relevent sections of the *Course of Study for Primary Schools—Nature Study, 1956*, published recently by the Victorian Education Department. Copies are issued to all Victorian state primary schools, and they may be obtained for sixpence each from the Government Printer, Melbourne.

In Appendix I of this booklet, under the heading "References and Suggestions for Activities", some notes are given as to collections which may be organized, particularly in connexion with nature study in grade six. These suggestions apply to pupil activity—work that may be done by individuals or else by groups.

In this article consideration is to be given to the getting together of collections which should bemaintained and augmented over the years, as the permanent property of the grade or school concerned, in order to provide an on-the-spot reference to the names of species of the locality.

In this section of last month's *Naturalist*, the problem of the provision of vernacular or "common" names was touched upon. It is obvious that a plant or animal can hardly be discussed or otherwise treated in school nature study when there is not available for it some specific or group name.

As nature study is based on the observation of local material, there will constantly crop up the problem of identification of specimens. Reference books help with this, but very often they are not suitable for children's use and the teacher has not sufficient time to make full use of them. Furthermore, much material can be named only by reference to such authorities as officers of the National Museum. Very often the result is that no name is obtained for something that could have been discussed with great interest, or else the identification arrives too late to be of more than slight retrospective interest.

Consideration of these points makes very obvious the value of sets of specimens in reference collections. They represent in aggregate the results of correspondence with various authorities and the study of textbooks; they apply to local material, covering this progressively more and more as time goes on; and they keep readily available for present teachers and pupils results of the efforts of predecessors over past years. Thus the problem of identification is reduced to a minimum, and time saved may be utilized elsewhere.

A collection put together for the purpose indicated above should be regarded as the property of the school and not be taken away by a teacher who transfers to another post. The reasons for this are that the material is most appropriate as a reference in the area which

provided it, and there should be a correspondingly appropriate suite in the other school, anyway.

Many teachers who have interests in branches of natural history or who wish to develop such, will compile their own private collections. These they will take with them from place to place and in most cases will use them also as references in connexion with school work. Such projects are highly recommendable but they should not be allowed to sidetrack in any way the attention which needs to be paid to the building up of the school sets of material.

The opening sentence in the 1956 course indicates that nature study should be a "practical living experience for every pupil". Reference collections can in no way replace the local fauna and flora, observation of which is the basis of the subject. These are at best nothing more than lifeless items kept to assist in identifying living things.

Dr. J. A. Leach, in commenting on collections in *Australian Nature Studies*, declared that "unless a collection can be properly maintained and kept in order, it is better that no collection should be formed". This principle cannot be emphasized too strongly, for sets of drab and broken material will quite understandably create an antipathy in the minds of normal children towards the subject.

With this in mind, that a specimen should not be kept unless it is attractive and reasonably lifelike, and remembering that material is meant to stand up to many years' use, teacher and pupils can use their initiative and ingenuity as far as actual methods of preservation are concerned. Procedure will be governed mainly by local conditions, and experience will suggest improvements in technique; but there are a number of simple suggestions that can be made which may help the less experienced to avoid numerous pitfalls and thus to ensure more gratifying results for the efforts.

Collections of Flowering Plants

General procedure is set out at the end of Chapter XV of *Australian Nature Studies*. Relevant to this the following comments should prove useful:

Collect enough material to represent the species sufficiently for identification purposes. Normally this means pieces bearing foliage and flowers, but such items as fruit (i.e. "seed boxes") may be appropriate, too. Trim the material so that excessive overlapping of parts is avoided, for the final result should be of minimum thickness. Units which will not press flat should be excluded; these may be represented by drawings or else kept in suitable containers; for example, gum-nuts may be put in matchboxes.

A satisfactory collecting portfolio is a magazine with newsprint type of paper between two sheets of 3-ply or heavy strawboard held together tightly by stout string or cord. With this, the pressing process is begun immediately and most hard-leaved plants will dry satisfactorily if left in the portfolio in a warm dry place for several days. This procedure saves time and is useful moreover for flowers with flimsy

petals which tend to shrivel if removed from one paper to another before they are quite dry.

Flowers and foliage, even of the most delicate nature, may be kept fresh for a few days if placed with a few drops of water in an almost air-tight container such as a tin or plastic bag.

If material is not dried *completely* before mounting, not only will the moisture wrinkle the mount but moulds are likely to attack them. Porous paper, not glazed, is necessary for drying and pressing, and specimens with excessive moisture-content, such as succulents and water-plants, and any that were wet when collected, must have the papers changed as Leach suggests. In some cases, it is first necessary to dip a specimen in boiling water for a few seconds to kill it and prevent growth and even continuation of flowering in the press.

It is practically essential to mount each species in its own individual folder. This allows re-arrangement of specimens, addition of further ones in their appropriate groups, temporary removal for use elsewhere, and the replacement of damaged or obsolete examples. The ideal mount is a manilla folder, with the specimen attached to the right side. Gummed paper should be used, and for this purpose the edges of sheets of postage stamps may often be obtained in quantity through a co-operative local postal official. But avoid plastic tapes unless satisfied that the adhesive compound will not eventually "run" and stick also to the opposite sheet.

On the left side should appear the data relevent to the specimen: name, date when found, locality, collector's name, and brief notes on characteristics other than those the specimen itself demonstrates. Further suggestions may be found on page 18 of the 1956 course of study.

It is a good idea to give each species a serial number when it is collected. If a specimen is sent away to be named, such number serves to identify the duplicates which are retained for the school collection and other purposes. Numbering serves too to indicate for instance that seed-cases in a match-box are of the same species as foliage and flower in a folder.

Sporing Plants

Some fungi, such as polypores (bracket fungi, etc.) are tough or rigid and will retain their shape and colour without any special treatment. These may be kept in boxes, but it is essential that such should be dust-proof, otherwise the material will soon become drab and unattractive.

Most fungi, however, have a very high water content and will shrivel away to almost nothing when dried. If these are to be preserved, a suitable method is to "pickle" them in methylated spirits in suitable transparent glass bottles or screw-top jars.

With seaweeds, a particularly attractive and interesting collection may be made by a simple technique. The material is collected from rock pools or the flotsam left on the beach by tides and is placed in a jar or bucket of water. It is sorted out and the desired pieces put through several rinsings of fresh water to

remove all traces of salt. It will be seen that, out of water, the finer specimens are shapeless blobs, but when immersed, even the most intricately branched fan out perfectly into their natural shapes.

Place a specimen in a shallow dish of water, immerse a sheet of white cartridge paper beneath it, and very gently work the latter upwards. With a little practice the water can be made to run off, leaving the seaweed spread out satisfactorily on the paper. Excess water is judiciously blotted off and the sheets then laid out to begin drying, being interleaved later with sheets of blotting or newspaper. It is usually necessary to place cheese-cloth over each specimen until the drying is completed, and with this method, papers need to be changed at intervals.

Most seaweeds have an outer coating of mucilage which results in them adhering permanently to the paper; and the red, green or brown colours are retained indefinitely in the tissue.

This technique applies to the fragile forms, and usually the more delicate the subject the more attractive is the result. Species of robust growth are washed free of salt, dried by pressing between cheese-cloth and absorbent paper, then stuck in folios as are the higher plants.

Mosses and ferns, too, should be simply dried by pressing, and some lichens are satisfactorily dealt with in like manner. However, many lichens are bulky and brittle and so cannot be pressed, but, as they will not shrivel, they may be kept in boxes.

(Continued next month)

Letter to Editor

Dear Sir,

I view with apprehension the banding of lyrebird chicks at Sherbrooke. Four were ringed last year and it is intended to continue the plan for several years.

It is known that the mother lyrebirds resent any interference with their chicks and many of them have been known to change nesting sites in such cases or even to abandon an area altogether. The ringing therefore may drive more lyrebirds out of Sherbrooke.

Banding of lyrebirds in a public park often full of visitors also presents the danger that some of them, seeing people interfering with nests, may follow their example. Such cases have occurred in the past and resulted in the death of chicks.

The conversion of Sherbrooke into an "open air laboratory" and flooding it with ringed lyrebirds deprives the forest of its virgin charm and greatly diminishes its value as a world-known tourist attraction. The initiators of that unfortunate scheme have overlooked this aspect, banding even the chicks in the most frequently visited areas like the Firebreak and Clematis Avenue, where the ringed chicks can be seen now, to the dismay of all genuine nature lovers who don't want to see Sherbrooke converted into a lyrebird farm or a wild zoo.

I fail to see why unfortunate Sherbrooke was selected as a victim for experiments, while other areas in the hills, including adjoining Monbulk Forest, relatively unknown to tourists, could provide the same facilities for observation on movements of ringed birds.

The immediate transfer of the activities of the banding team, even to Monbulk Forest, and a strict ban on further banding of Sherbrooke birds, is the only way to stop this vandalic spoliation of one of Victoria's greatest treasures.

Yours faithfully,

K. C. HALAFOFF.

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

Moths from Camberwell

Wendy Parsons and Sandra Sonnenberg send two specimens from Camberwell Girls' High School—an adult insect which came from a caterpillar which "had orange and black stripes and did not eat grass", and an example of a red caterpillar of which they say:

This kind has been found in our school grounds for two successive summers. It is usually about 2½ inches long and is very active. We have tried to see if it wanted to burrow, but it did not go under the earth we put for it in a box. We could not find anything it would eat.

The adult insect is a Tiger Moth (*Nyctemera amica*), the larvae of which eat the leaves of various plants of the family Compositae and often attack cinerarias in the garden. As to the red caterpillar, it belongs to one of the Wood Moth group, probably of the genus *Xyleutes*, which bore into wattles and eucalypts.

Thornbills as Fly-catchers

An interesting observation comes from Mr. W. Hunter of Mallacoota:

Recently, one late afternoon of a warm April day, I noticed some buff-tailed thornbills catching flying insects. From a small tree close to my house, seven or eight of the birds were making short individual flights, some of them up to four or five yards from the tree, to which each bird returned with its capture, apparently in order to de-wing the insect before eating it. Actually all that I ever saw of the insects was occasionally a gauzy wing during this process; they were invisible to me in the air, and were not hovering in a "cloud" as some small flying insects do. It is, as far as I can recall, the only time that I have seen any thornbill getting its food on the wing; but those buff-tails were as proficient as any fly-catcher could have been, even allowing for the probability that their quarry may have been poor fliers among the winged insects.

These comments are very much to the point. Perusal of several authoritative works on ornitho-

logy shows that thornbills forage for their food on the ground or else fossick about the bark and foliage of trees and shrubs.

The only indication that was found of aerial hunting by any member of this group is contained in comments on the Buff-tailed Thornbill in *Wild Life*, March 1950, page 131, where Mr. Roy P. Cooper writes:

> Most of the food is obtained from the lower foliage, limbs or the trunks of trees; also from low bushes or from the ground. It moves rapidly about and will often dart up into the air for a few feet from the ground to capture a moth which it has disturbed.

The Tailed Spider

Mrs. Hodge, of W Tree in Gippsland, writes as follows:

> "Two spiders which look like anything but spiders have built webs in the *Grevillea juniperina*. They are fawn in colour with tapering bodies which end in three spines, approximately one inch total length. A 'rod' of solid silk is anchored to a branch with dried flowers mixed in silk, and the lower end of this, where the creature hides, reaches to the centre of the main web. The rod on one was about five inches long and the other only half that length. I would like to know if this feature is merely an effective piece of camouflage or if it has some purpose in the domestic arrangements. I presume this is *Arachnura higginsi*."

Yes, the name is correct, and the species is usually known as the Tailed Spider. It is found in many gardens during the autumn and has attracted much comment.

The "rod" of silk and debris is actually a string of egg-sacs. These are usually at intervals of about half an inch and each contains about sixty eggs, so the five-inch one would eventually produce a family of about 600 young spiders.

There is a chapter about *Arachnura* in the book *Australian Spiders*, by Keith C. McKeown. (This book is not available just at present, but is being reprinted.)

The Flower of Grevillea

Mrs. Hodge asks too for information about the "unorthodox" floral parts of grevilleas.

In the grevillea flower, the corolla has four lobes, and on the inside of the tip of each of these a stamen is attached. It is a case of fusion of the filaments to the corolla, resulting in what botanists call "epipetalous stamens". In the family Proteaceae, this form of flower is a feature of several other genera, too, including *Banksia*, *Lomatia*, *Telopea* (Waratah) and *Hakea*.

Dolomedes, the Water Spider

From Mr. C. J. Dell, Head Teacher of the Narracan State School in Gippsland, comes a specimen (alive) of a quite handsome spider. It has a leg span of about two inches, is brown in general colour and there is a whitish longitudinal stripe on each side of the cephalothorax. Mr. Dell wrote that "it was found *in* the creek—swimming and *diving* quite happily". Its name is *Dolomedes*; it is able to run on the water, its legs making little dimples but not breaking the surface tension. It lives on aquatic animal life such as tadpoles and tiny fish, and is apparently fairly widespread in Victoria. One may observe the species at places along the Yarra, and on the margins of the Snowy River it is particularly abundant.

By Jean Galbraith

Golden Wattle — *Acacia pycnantha*

If Silver Wattle is the most widespread of our feather-leaf species, Golden Wattle is probably the most widespread of those with flat, leaf-like phyllodes, at least amongst trees.

Wherever there is dry stony ground, especially on hillsides, Golden Wattle is likely to be. While variable in size, it is usually a small tree, lightly and loosely branched, with a bloom on its smooth, green or reddish stems. The bright foliage, though dark green at maturity, is touched with yellow and bronze when young, and it varies in different localities from broadly ovate phyllodes (two inches or more in width) to sickle-shaped ones not more than half an inch wide. These are always curved and this distinguishes Golden Wattle from many with straight phyllodes.

September is the main flowering season, and the golden balls of blossom are large and bright, in tangled clusters held above the leaves. The term "leaves" is used for convenience. The true leaves of Golden Wattle come out from between the seed-leaves like folded feathers, but when the seedling has only half a dozen leaves the mid-ribs begin to flatten, the pinnate "feathers" tend to disappear, and soon the baby is provided with very efficient substitutes, looking much like gum leaves but which are really winged leaf-stalks known as phyllodes. This foliage, broad and smooth and equally shiny on both sides, marks Golden Wattle as a member of the second and largest group, the "phyllodinous" wattles, which have either flat or needle-like foliage.

The phyllodinous species are divided into two smaller groups: those with many main nerves in each phyllode and those with one. Golden Wattle has one. The group with a single vein, or nerve, is divided into those with flowers in balls (heads) and those with flowers in cylinders (spikes). Golden Wattle has spherical heads.

There are four species which are small trees and have curved single-nerve phyllodes, but two of these have grey-green foliage, and one, the shrubby *A. rubida*, has small heads of blossom that would hardly be mistaken for the large, fragrant heads of *A. pycnantha*.

You may be sure that, if you find a small *Acacia* tree with broad, ovate or sickle-shaped foliage and large, fragrant, deep-golden flowers, you have our Golden Wattle "that clothes with grace the haughty-featured hills". Underneath (where there is seldom undergrowth) orchids bloom amongst the fallen leaves, and the trees shed such abundant seed that bronzewing pigeons come to feast on it.

Golden Wattle near Dandenong.
Photo: N. A. Wakefield

THE BOGONG HIGH PLAINS

This is the second instalment of what is to be a series of articles dealing with the F.N.C.V. excursion, during the summer of 1958–59, to the Bogong area of north-eastern Victoria.

By J. Ros Garnet

Introduction

The selection of the Bogong High Plains for the club's extended excursion during the summer holidays from December 26, 1958, to January 4, 1959, was a peculiarly felicitous one for which the excursions' committee, and especially its secretary, are accorded the thanks of the forty people who took part in it.

In years gone by the summer holiday excursion was organized as a "camp out" during which members did indeed live under canvas. Such events were thus generally restricted to the more youthful and the more adventurous among the elders who were prepared to forego home comforts and risk the aftermath of a week or so of contact with the good earth—hard, soft, wet or dry, as the locality and the weather may have dictated.

The spread of settlement and developmental works at all points of the Victorian compass have tended rather to alter circumstances. To pursue field studies of the kind undertaken by our members one can now, if one chooses, arrange for fast motor transport to the selected area and, often enough, be sure of finding comfortable accommodation at a point from which one can explore the countryside for miles around and where no one need worry overmuch about the possibilities of pneumonia, lumbago, or other minor hazards of camping out.

On this occasion our party availed itself of both of these services. One of McKenzie's motor coaches was chartered and Hymans' Grand Coeur Chalet at Falls Creek booked to accommodate us all. No doubt the acknowledged pleasure and enjoyment of participants can be credited, to a large extent, to the cheery co-operation of the 'bus driver, Lloyd Gill, and the friendly hospitality of "Bob" Hymans, who was our host at the chalet.

The charm of the north-eastern alps was acknowledged more than a century ago when Mueller, in the years 1852-53, undertook his classic botanical exploration of the high mountains of Victoria. In the years that followed others were attracted to these remote parts, in search of rich pastures, of holdings for their cattle runs, of a route from Sydney through to Gippsland, of gold and other minerals.

The studies of James Stirling in the 1880s added much to the accumulating knowledge of the region. In a series of papers published in various journals he dealt with its geology, physiography, botany, meteorology and general ecology. His reports encouraged others to continue the studies, and among them were several members of the Field Naturalists Club of Victoria, in-

cluding Dr. C. S. Sutton and Mr. A. J. Tadgell. While Dr. J. F. Wilkinson was popularizing Mount Buffalo as a tourist resort other men were quietly exploring the charms of the alps, following cattlemen's trails over hundreds of square miles of territory. For decades the mountains had furnished summer pasture for cattle and, if the cattlemen did nothing else to the advantage of the alps, they can be commended for the part they played in opening up the region to bushwalkers and those that chose to follow the mountain trails. These, in the height of summer, wandered on foot or on horseback to places which, to most Victorians, were but names on a map. The suggestion that the alps could be something more than a feeding ground for Herefords began to be voiced soon after the end of the first world war.

The walkers found summer fires a constant menace to their safety, fires sometimes deliberately lit to provide lush, tender grass in place of the trees, shrubs and flowers which were the crowning glory of the alps.

The observant walkers and naturalists noted with some misgiving the radical changes in vegetational cover that were taking place. The open park-like forests of Alpine Ash were deteriorating to scrubby wildernesses; lovely groves of Snow Gum, that hardy and amazing eucalypt of the mountain summits, were fast disappearing; the delightful sphagnum beds (or "moss beds" as they are popularly known) containing the meandering streams of the alpine plains were slowly but surely losing their character. Sorrel, flat weed, picris and many other alien plants were spreading and, in doing so, suppressing the lovely indigenes. Perhaps worst of all, erosion was becoming all too obvious in the bare patches which were appearing with greater frequency in all the places accessible to cattle.

Time has added to the number of Victorians who have become conservation conscious and it is now generally recognized that water and timber, more than any other things, are the two natural assets most in need of conservation.

Lowland Victoria was, and still is, short of water. Upon an adequate supply of this depends the future prosperity and development of our state. Our mountains are the one source of what can be a permanent supply of water from melting winter snows. To the thoughtful who observed the progressive deterioration of the high mountain catchments it seemed tragic that Victorians should have tolerated it with such equanimity.

In 1917 the Government undertook a preliminary survey of the Bogong High Plains with the object of assessing its water conservation potential and exploring its possibilities as a source of hydro-electric power. However, the development of the Yallourn brown coal deposits as a source of power caused further thoughts on it to be deferred but in the later years, between the two world wars, investigations were resumed. When it became apparent that Victoria would need to utilize every re-

source it could command if it were to fulfil the predictions of post-war development, the Bogong High Plains became once more a centre of political interest, this time with the emphasis on conservation.

The alps did not escape the state-wide fires of the summer of 1939, and Judge Stretton, in his report of the Royal Commission enquiring into the disaster, made it perfectly clear that the future well-being of the state depended on the conservation of the land and its vegetational cover. His report led to an awareness in political circles that the present methods of land management in the high mountain catchments (if the term "management" was indeed applicable) were not satisfactory.

The revived plans for hydro-electric undertakings emphasized the need for strict control of land use in the whole of the alpine catchment area. As the State Electricity Commission's interest lay mainly in the Bogong High Plains, a planned investigation was undertaken with the assistance of the Botany Department of the University of Melbourne and the State Rivers and Water Supply Commission. The study, not yet complete, has supplied irrefutable evidence of what naturalists of an earlier generation had vigorously claimed, that cattle grazing and fire on the high mountains were two of the major factors preventing recovery. The evidence which emerged from the investigation is so clear that steps are now being taken to reduce the number of animals permitted in such regions.

It is doubtful whether complete recovery will ever take place but, at any rate, such steps as have been taken to correct the faults of the past, will almost certainly slow down the erosion processes. The condition of the experimental enclosures to be seen near Rocky Valley and Pretty Valley allow some hope that the ground cover may eventually be restored, although it is too much to expect that the composition of the plant communities will be identical with that which existed there originally.

Tourist Potential

Twenty or thirty years ago, a trip to the Bogong High Plains was almost a major venture, to be undertaken only by the physically active after much careful planning. The jumping-off places were Harrietville, Tawonga and Omeo from which stores would be taken by pack-horse over the few access trails then available. Cattlemen's huts were the depots where goods could be dumped and where mountain trampers could rest at the end of the day's journey.

Today the approach is by a well-graded highway, laid down for the use of the State Electricity Commission, from Mount Beauty through the delightful little township of Bogong, then up and up to the High Plains, some 5500 feet above sea level. Here and there along the route branch roads and tracks lead to various hydro-electric installations and centres of construction activity, but these are not all open to private traffic.

The control and management of many square miles of forested

mountain-side, valley and summit has been vested in the Commission, and no effort is spared to ensure that those who enter the area in no way interfere with its conservation measures. Water is its first concern, and it is aware that unless all the catchment area is preserved as such the efficiency of the whole hydro-electric scheme will be imperilled.

This region of the alps provides skiers with some of the finest ski runs in the world and, as a consequence, a model ski village is being developed at Falls Creek. This village, too, has come under the control of the S.E.C. so that, even in the depth of winter, a check can be kept on all who enter the region. It nestles on the mountain side above the road beyond a small stream which tumbles from the heights of Frying Pan Ridge into the Rocky Valley branch of the East Kiewa River. The present twenty lodges are dotted here and there amongst a forest of Snow Gums, Hickory Wattle, Leafy Bossiaea, Mountain Pepper, Royal Grevillea, Phebalium, Orites, Rice-flower and all those lesser shrubs and herbs which adorn the alpine mountain slopes.

Foremost among the buildings is "Bob" Hymans' chalet which can cater for those lacking *entrée* to a ski lodge. Each lodge is owned by a recognized ski club and, like the chalet, is built on Crown land on terms of permissive occupancy in accordance with the rigid specifications demanded by the Commission in the interests of proper sanitation and safety from fire. Since our visit the Commission has announced its intention to appoint a committee to which will be delegated the task of managing the future developments of the "village" in the joint interest of the Commission and the "villagers"—a scheme modelled on that which has operated for some years at the Mount Buller ski village.

The bare gashes in the vegetation on the slopes behind the lodges reveal the sites of the ski runs and ski tows and, near one of them is something our party viewed with considerable interest: the chair lift, a device designed not so much for the benefit of ageing skiers but to provide the youthful ones with the opportunity for a greater number of downward runs in a given time.

The chair lift is Hymans' pride and joy, and it was a happy gesture on his part to allow us all, on the afternoon of the last day of our stay on the mountains, the unusual experience of riding up and down on it. There can be nothing quite like a chair lift for getting a low-flying bird's-eye view of an alpine village nor for wreathing in smiles the faces of staid and generally sober field naturalists.

Among other novel appurtenances to life on the alps was his snow plane—a vehicle designed to skim on the surface of the snow-covered roads at times when they would be impassable to a wheeled vehicle. The plane is powered by an aero engine and travels along by propeller traction. It looks rather like a miniature seaplane bereft of its wings. If Mr. Hymans' plans for the development of this alpine

resort came to fruition, visitors of the future may be able to experience something even more memorable than a ride on the 400 feet vertical chair lift. At present he is exploring the possibility of installing a really giant lift across the valley, a vertical 1960 feet up on to the heights of Spion Kopje. A project of this kind is, of course, something beyond the resources of a private individual but, with tourism recognized as an industry of national significance, he hopes the newly established Tourist Development Authority may interest itself in the scheme.

Geology for the Learner

This could well have been entitled "Geology for Grandmothers", but it does supply some useful hints for anyone wishing to take up the subject as a hobby and to get to know a little more about Mother Earth. These comments are submitted by Mrs. E. M. Dance.

There may be many women like myself whose children have grown up and married. One's first thought when the grandchildren begin to arrive is to do all kinds of things to help. However, saner reflections lead one to understand that it is the prerogative of the young parents to battle through the sometimes stormy seas of parenthood alone and that junior will become more self-reliant if not fussed over by grandma.

At this stage of life one needs diversions and interests. Mine have been the study of geology, and I should like to pass on the idea to you. The necessities are a pair of stout shoes, a geology hammer, a dilly-bag and an inquisitive and acquisitive mind.

A reasonable amount of reading is required, and to start with there is the valuable and fascinating book, *The Physiography of Victoria*, by Professor E. Sherbon Hills. This deals primarily with the physical geography of Victoria, which of course embraces the geological aspect, and it refers to localities in all districts of the state.

The Penguin Book, *A Dictionary of Geology*, is helpful; and *Geology for Beginners*, by W. W. Watts, published by Macmillan & Co., is very useful and can be purchased second-hand at a reasonable price.

Do not be daunted by such things as the classification of minerals; that is not for the mere "rock hound". Read a chapter on, say, sedimentary rocks, and then, if you are within range, visit the Mines Department Museum or the National Museum and see what is meant by sandstone, limestone and conglomerate. Take a notebook and pencil, for it is easy to forget salient points. These visits should be short and frequent; it is easy to become discouraged by trying to take in too much at once.

If you are a Melbournian and are not already a member of the Field Naturalists Club of Victoria, it is a good idea to join, for that will entitle you to participate in the activities of the Geology Discussion Group which meets at the National Herbarium once a month. This group welcomes beginners and in its harmonious atmosphere you are encouraged to continue. Specimens may be taken along for identification, and back numbers of the *Naturalist* may be obtained or consulted on the subject of geology and for indication of areas worth investigating.

One cannot stress too much the value of field work; you learn twice as much when pottering about with a hammer as you do by reading at the fireside. The Mines Department has some helpful literature on localities, for instance, *The Mornington Peninsula*, by R. A. Keble. By all means collect specimens and study them with a good hand lens as soon as possible after reaching home. These should be labelled and their exact localities recorded; that is part of the fun.

Should you carry out these suggestions faithfully, time will never hang heavily on your hands.

Field Naturalists Club of Victoria

General Meeting—May 11, 1959

The lecture hall at the National Herbarium was comfortably filled on the occasion of the May general meeting of the club. The president's first duty was to inform members of the passing of Mr. L. W. Cooper, one of our honorary members, and Miss C. Parry. Those present stood in silence for a minute as a tribute to their memory.

The speaker for the evening was Mr. E. R. Rotheram and his subject was "Lizards". He very capably discussed the main groups of reptiles in the world, those of them that are represented in Victoria and the characteristics of many of the local species. This information was amply illustrated by an excellent series of much enlarged photographs and a set of projected colour slides. The meeting was most appreciative of the lecture, and a vote of thanks to the speaker was carried by acclamation.

Mr. H. Stewart congratulated the club council on the new format of the *Naturalist*.

Election of new members resulted in the following joining the ranks of the F.N.C.V.:

Mrs. M. Abbott-Smith, Mrs. B. I. Anderson, Miss J. O. Annear, Miss E. M. S. Calcutt, Mrs. E. Costermans, Miss Marsali Dykes, Mr. G. G. George, Mrs. T. Allen Ovenstone, Mrs. M. E. Pearcey, Mr. R. Sullivan and Mr. J. R. Werner as ordinary members, and Mr. G. W. Lormer and Mr. J. K. M. Elmore as country members.

The exhibits which were on display on the tables included a volcanic bomb and kernel from the Anakies (shown by Mr. McInnes), the Brittle Greenhood from the You Yangs which was thought to have died out (exhibited by Mrs. Wood), and a number of cultivated native species of flowers (by Mr. Garnet). Mr. Webb showed a picture of the Ghost Fungus, photographed by its own light.

Entomology and Marine Biology Group Meeting—May 4, 1959

Mr. Fairhall spoke on spiders, with particular reference to the Leaf-curling Spider. He exhibited several of these, together with their shelters, which had been collected in a few minutes in his garden. These prettily-marked spiders sometimes choose snail shells, acorn caps, tram tickets and even pieces of newspaper to place in their webs for shelter.

Miss Balaam exhibited specimens of the Ribbed Case Moth and Wanderer Butterfly, Mr. Coghill showed examples of the Passion-flower Leafhopper, and Mr. Fairhall brought also some very young case moths.

Microscopical Group—May 20, 1959

"Mainly about Microscopes" was the theme of a talk by Mr. Charles Middleton at the May meeting. Having handled many thousands of microscopes for repair and overhaul, Mr. Middleton is well qualified in this sphere. He showed several antique microscopes, two of which were made between 1786 and 1791 and are still usable.

Mr. D. McInnes will speak on "Tube-worms" at the group meeting on July 17. There are usually about a dozen microscopes on the bench, displaying various specimens of interest, and club members are welcome to attend. This entails no special procedure, simply a trip to the National Herbarium on the third Wednesday

evening of any month. We invite you to come along, as we are sure you will have an enjoyable and profitable time.

Botany Group Meeting—May 15, 1959

"Conservation along the Murray" was the subject for Mr. Lloyd Williams' talk to the Botany Group. The water storages in the Snowy Mountains area were illustrated, as well as locks on the river further down stream. In the high mountains, due to destruction of topsoil by large construction works and heavy traffic, the danger of large scale erosion is present and measures need to be taken immediately on completion of operations, to replant the damaged surface. Of particular interest were very fine views shown of the Kosciusko region and of the Geehi River and other streams which combine to form the headwaters of the Murray.

Members were asked to give some thought to the compilation of a list of exhibits for the spring show. As it will be necessary to collect and preserve some specimens, as well as to gather others at the time, members' suggestions are needed.

Geology Discussion Group—May 6, 1959

Twenty members and visitors attended the May meeting, with Mr. Davidson occupying the chair. The subject for discussion, "Rock Textures", was conducted by Mr. McInnes who described, with the use of a microprojector, rock sections under ordinary light. In defining rocks and dealing with their origin, the speaker referred to the interesting variable arrangement of the different minerals forming the texture of rock types. Granitoid, granulitic, pegmatitic, porphyritic and graphic textures may be seen in granite rocks, whilst in the groundmass, textures were vitrophyric, cryptocrystalline and hypocrystalline. Ophitic, orthophyric and pilotaxitic textures were shown in volcanic rocks, and of metamorphic rocks, crystalloblastic and schistose textures occur.

Exhibits were graphic granite from Mount Martha Raft, Victoria—thin section under microscope (Mr. Cobbett); felspar, cassiterite and tantalite from Pilbara mineral field, Western Australia (Mr. Bairnstow); basalt, with primary and secondary minerals, from 22 feet below sea level at Spotswood sewerage works (Mr. Blackburn); sand samples from New South Wales (Mr. Tinckam); quartz-dolerite-gneiss, amethyst crystals, cassiterite and gemstones from Woolshed Valley, Beechworth, Victoria (Mr. Davidson); graphic granite from Central Australia, orbicular granite from New Zealand and Andalusite schist from Clackline, Western Australia (Mr. Baker); and calcium fluoride from Chillagoe, Queensland, uranium oxide from Bourketown, Queensland, torbernite in granite and pitchblende from Radium Hill, South Australia, and an artificial sample of pure silica (Mr. Ingume).

Other Clubs

The end of the club's year always sees a spate of annual reports from affiliated organizations, containing much of interest to our members.

Creswick F.N.C.—This club, which has been in existence for four years, reports that it is in a flourishing condition and its monthly meetings well attended. It has a new president, Mr. J. A. G. Geddes, and the secretary is Mr. H. Barclay. Like most similar organizations, it is running out of speakers, and any of our members who are able to visit Creswick and give a talk would be most welcome.

Sunraysia F.N.C.—This was formed some years ago but has only recently decided to affiliate with us, and the formalities are not yet completed. Among other activities it maintains a small wildflower reserve which is rented from the Lands Department. The secretary is Mary J. Chandler, Box 282, Red Cliffs.

Hawthorn Junior F.N.C.—The principal news from this club is that Mrs. Freame has resigned as secretary after 15 years of loyal and efficient service. Her place has been taken by another of our members, Mr. P. Fisch. Mr. H. P. Dickins is president. The Hawthorn Juniors are fortunate in the support (which includes a clubroom free of charge) of the Hawthorn City Council and its Chief Librarian, Mrs. Carbines.

Bendigo F.N.C.—This active club, from which we hear at frequent intervals, sends greetings. Mr. H. Henkel is president and Mr. A. C. Ebdon, secretary.

Maryborough F.N.C.—This club makes a practice of changing its office-bearers regularly. Miss M. Peck is the new president and Mrs. M. Forge, secretary. The report shows that it maintains a small unfenced plot of ground in Paddy's Ranges and has been instrumental in having a reserve created to protect the native wells recently described in the *Victorian Naturalist*. The reserve is only half an acre, but that is better than nothing. The council of the F.N.C.V hopes to be able to rely on the Maryborough Club for much of the detailed work of managing the Cosstick wildflower reserve.

Lorne League of Bush Lovers.—This body, through its active secretary, Mr. S. M. Callaghan, reports that it is working steadily for the establishment of a national park in the County of Polwarth and, meanwhile, is giving its attention to the improvement and connection of tracks throughout the Otways. It enjoys the most amiable relations with the Winchelsea Shire Council, especially the three councillors for the Coast Riding. Miss O. Armytage is President.

George Neville Hyam

Among people of a wide variety of interests, the memory of George Hyam will long remain fresh and cherished, among naturalists especially so, for with our club he enjoyed a long association and played an active part in fostering public interest in its objects and its work. A survey of the history of his connexion with the F.N.C.V. will serve to portray the man as his fellow-members knew him and show just how much he influenced the club's policy for its future progress. He was elected to membership on November 14, 1927.

George Hyam's hobby was "seeking out little-known beauty spots". His intense love of nature and an innate understanding of animals had taken him far afield both here and in New Zealand. So he soon began to concern himself in the affairs of the club, by leading excursions to places of interest, first in the metropolitan area and later further afield.

From 1931 to 1935 he was one of the club's vice-presidents and, during 1935-36 held office as president. At that time the club established a very active sub-committee to deal with problems concerned with national parks, national monuments and nature protection in general. This comprised Messrs. S. R. Mitchell, J. A. Kershaw and George Hyam, and it organized public meetings, inter-club conferences and a deputation to the Government. But for the intervention of the second world war their campaign would have led almost certainly to the introduction of worthwhile legislation.

George Hyam's presidential address, reported in the *Naturalist* of July 1936 (Vol. 53, pp. 47-51), expressed very clearly his ideas on the club's future and, for many years, as a member of its managing committee he did much to influence it both in its thinking and its actions. His two papers in the journal on national monuments (Vol. 53: 81 and Vol. 54: 99) are worth re-reading today when national monuments have become the object of parliamentary legislation.

After serving on the committee from 1936 to 1940 he took office as assistant secretary and acted in this capacity for two years and then was again on the committee for the ensuing seven years. He concluded his long term of active participation in club affairs by once more assuming the office of vice-president from 1949 to 1951.

For this long service he was elected an honorary member of the club in August 1951. During this period of nearly two decades the club has progressed despite the world war and its aftermath. Although his official duties in the Victorian Department of Agriculture were onerous, the club came to rely upon him in many ways. Apart from the conservation work of the

'thirties he represented the F.N.C.V. in many matters involving horticulture. Wattle Park, Maranoa Gardens, wildflower exhibitions and nature shows all made calls upon him. In 1946 he was chairman of the re-established national parks and national monuments standing committee, he assisted in the preliminary work of bringing about incorporation of the club, represented it at meetings of the Australian natural history medallion general committee and, from time to time, served as a member of the medallion award committee. He was one of the five members of the F.N.C.V. who, in 1950, submitted evidence to the parliamentary state development committee during its enquiry into our national parks and, in 1951, he accepted membership of the re-constituted committee of management of Lakes (Sperm Whale Head) National Park. For many years he was the club's delegate to the "Save the Forests" Campaign and his sound knowledge of the state's native trees and shrubs and their horticultural potentialities was freely available to the organizers of that campaign.

He was a prolific writer on horticultural topics and, through his regular column in the *Journal of Agriculture* and his weekly broadcasts from the A.B.C., succeeded in planting in the minds of readers and listeners the idea that our native plants were something more than botanical curiosities. In other fields, he was a member of the Anthropological Society and a vice-president of the Victorian Aboriginal Group.

After his retirement in 1953 from the position of Supervisor of Horticulture in the Department of Agriculture he settled down to a somewhat quieter though none the less busy life. In the later years we saw him at club meetings only occasionally. His sudden death on August 28, 1958, at the age of 72, was mourned by the club, and his wife, who survives him, is assured that George Hyam is a name that will be remembered in the Field Naturalists Club of Victoria.

J. ROS GARNET

F.N.C.V. DIARY OF COMING EVENTS

ANNUAL GENERAL MEETING

Monday, June 8, 1959—At the National Herbarium, The Domain, South Yarra, commencing at 7.45 p.m. sharp.

1. Minutes, Correspondence, Announcements and Reports.
2. Report of Council.
3. Report of Treasurer.
4. Report of Auditors.
5. Election of Office-bearers and Members of Council.
6. Appointment of Auditors.
7. Election of Members.

Ordinary Members:

Mrs. James Craig, 20 Merton Street, Ivanhoe, N.21 (E. H. Coghill/N. A. Wakefield).
Mr. A. Ingeme, 27 Olive Grove, Pascoe Vale (A. A. Baker/M. Allender).
Mrs. Zillah Lee, 197 Edwards Street, Reservoir, N.19 (N. A. Wakefield/M. Butchart).
Mr. John Hunn Scott, 28 Dillon Grove, Glen Iris, S.E.6 (A. G. Hooke/E. H. Coghill).
Mr. W. A. Stubbs, 19 Lennox Crescent, Williamstown (A. G. Hooke/M. Butchart).
Mr. Kemal Vitalis, 7 Wealgreen Court, Burwood, E.13 (N. A. Wakefield/M. Butchart).

Country Members:

Mr. E. V. Barton, 10 Sharpe Street, Bairnsdale (W. Hunter/N. A. Wakefield).
Mr. Allen F. Blaxter, 26 Byamee Street, Dapto, New South Wales (E. H. Coghill/A. G. Hooke).
Mr. H. R. Hobson, Rosebery, Victoria (A. G. Hooke/E. H. Coghill).
Mr. C. K. Ingram, 19 Keppel Street, Bathurst, N.S.W. (N. A. Wakefield/E. H. Coghill).
Mr. Kenneth Mervyn Nash, State Fish Hatchery, Snobs Creek (E. M. Watson/E. H. Coghill).
Mr. Ivan A. Robertson, S.S. 4067, Murrindal, via Buchan (N. A. Wakefield/W. P. Seed).

Joint Ordinary Member:

Mrs. D. E. McInnes, 129 Waverley Road, Malvern (D. E. McInnes/E. H. Coghill).

Junior Member:

Kenneth G. McInnes, 129 Waverley Road, Malvern (D. E. McInnes/E. H. Coghill).

8. Nominations for Membership.
9. Presidential Address: BOGONG HIGH PLAINS" (illustrated) by J. Ros Garnet.
10. General Business.
11. Nature Notes and Exhibits.
12. Conversazione.

An Extraordinary General Meeting will be held before the Annual General Meeting on June 8, at 7.40 p.m., to consider an application for affiliation from the Sunraysia Field Naturalists Club.

F.N.C.V. EXCURSIONS

Sunday, June 21—Sherbrooke Forest. Subject: Lyrebirds. Leader: Mr. K. C. Halafoff. Take 8.50 a.m. train to Ferntree Gully, then Ferny Creek bus to Sherbrooke Junction. Bring one meal and a snack.

Saturday, July 4—Geology excursion. Subject: Building Stones of the City. Leader: Mr. Hemmy. Details at Geology Group meeting.

GROUP MEETINGS

(8 p.m. at National Herbarium, unless otherwise stated)

Friday, June 12—Botany Group. Subject: "Conifers", by Miss White.
Wednesday, June 17—Microscopical Group.
Wednesday, July 1—Geology Group: "Geology of New South Wales", by Mr. Tinckam.
Monday, July 6—Entomology and Marine Biology Group. Meet in Mr. Strong's rooms in Parliament House. Enter by private entrance at south end of House.

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Australian Native Dog or Dingo, Zoological Gardens, Melbourne. Photographed by Edward R. Rotherham F.R.P.S., A.R.S.A.

Vol. 76, No. 3 July 9, 1959

F.N.C.V.

The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

The Southern Blue-tongue, *Tiliqua nigrolutea*, is found in Tasmania and the three south-eastern mainland states of Australia. It is one of the several members of this genus of large skink lizards. This picture appeared first in the *Victorian Naturalist* of May, 1931 (Vol. 48, pp. 9–10), accompanying an article by David Fleay. After he had obtained the parent lizard from the Snowy River area, it gave birth to its family of three. Mr. Fleay wrote that "the young lizards, being thrown on their own resources at birth, are extremely pugnacious, and, though measuring only three inches in length, snap and hiss vigorously at all comers".

Editorial:

Wildlife Management and Common Sense

In the daily press and other periodicals there regularly appear reports, articles and letters touching on facets of nature conservation and wildlife management. Koala, kangaroo, possum and lyrebird each receive their share of such attention, the poison "1080" crops up periodically, and now we have the exotic gamebird question and game reserves.

In analysing these bursts of publicity one usually notes a general similarity of pattern. This may be illustrated by a resumé of the latest controversy.

The Victorian Field and Game Association held a meeting on May 10 last at which a suggestion was made that mallards and pheasants should be established as wild game birds in Victoria. Next day the *Age* reported:

> Pheasants and mallards are to be raised by members of the association for release in Victoria by members of the Victorian Fisheries and Game Department.

This mis-statement was offset by a note in the *Age* on May 15:

> In a statement on this proposal yesterday, the director of Fisheries and Game (Mr. A. Dunbavin Butcher) said that until such time as the present game bird potential has been determined and the department knows the result of a survey now being made and expanded the department is not prepared to undertake the very costly experiment of introducing additional game birds.

Nevertheless, on May 16, the *Age* published this:

> A proposal by the Fisheries and Game Department to let loose mallards and pheasants in Victoria—seems just foolishness, said Mr. J. Garnet, president of the Field Naturalists Club yesterday . . ."

We do not know how accurately Mr. Garnet's actual comments were reported in the press, but the misapprehension was not to rest for, on June 6, again in the *Age*, there appeared an article, "No Room Inside Our Ark" by Alan Bell, criticizing Mr. Garnet and recording this comment:

> The department's suggestions are vetoed because two new birds would take up—in Australia's three million square miles—too much room . . ."

That this strife of words was "full of sound and fury, signifying nothing", is apparent when we turn up the Fisheries and Game Department *Newsletter* of April 1959. The "Director's Column", headed "Introduction of Exotics", dealt with "an oft raised request that the department should introduce game birds" and it set out "a reply to these requests".

Those seeking enlightenment in this matter are recommended to obtain the *Newsletter* and to study the six points explained by the director. One of these contains the sentence:

> Also the question of possible conflict with native fauna, agriculture and forests would have to be investigated.

All government departments concerned with the conservation and utilization of natural resources have their trained scientists—full-time specialists—who are more than familiar with the

numerous facets of the problems that often worry the man in the street. As well, the departments have their public relations personnel and liaison officers whose task is education in matters of conservation and the publicizing of departmental activities. The Fisheries and Game Department is no exception, and if one is not familiar with its operations, it is not for lack of available information.

On May 3, the Acting Premier of Victoria made a radio statement concerning game development and consideration being given to the setting up of *State Game Reserves*. Following this, the usual crop of misapprehensions grew up in the minds of many who heard or saw reports of the information. There was even talk of unlimited shooting of any and all fauna in such places!

Actually, a full-scale and highly scientific investigation of game birds' numbers, breeding places and movements has been progressing for many years. Based on the findings, the department has drawn up a detailed plan not only for game reserves but also for collateral inviolate sanctuaries. Some of the latter are already established and many areas—including very extensive ones—are under consideration.

The reserves would be for wildlife only, not to be used for any other purpose the year round. Most of the proposed sites are at present deteriorating from the fauna point of view due to their use by lessees. During open seasons, there would be shooting of game birds, to bag limit only, and, of course, no destruction of protected fauna would be allowed.

As the areas concerned would be managed and improved as breeding places for game birds, many other species would benefit: egrets, herons, ibis, crakes, grebes, etc., and, in fact, no shooting even of unprotected species of birds and mammals would be allowed during close seasons. Obviously, nothing is to be lost but a great improvement in fauna conservation and re-establishment would result.

The final part of Mr. Rylah's statement included the points that "the Fisheries and Game Department . . . expects that the apparent decline in the species of game birds will be halted . . ." and "as the programme proceeds the status of all game bird species will be raised".

Perhaps the most useful thing that the Field Naturalists Club could do in connexion with these problems of nature conservation, would be to help keep the public informed—by lectures, newspaper articles and such—of what is being aimed at and achieved by those sections of our government departments whose objects are the same as ours. This would tend to offset much existing public apathy and opposition to departmental operations and to develop instead an enthusiastic and interested co-operation. With a solid backing of knowledgeable public opinion, the task of carrying out the many conservation projects would be facilitated in a great many ways.

This is an approach to these "controversial" problems that is worth serious consideration by naturalists.

On the Roof of Australia

By Paul Fisch

Mount Kosciusko with its satellite peaks of Ramshead, Townsend, Mueller, and Carruthers Peak, is nowadays quite easily accessible, although it is Australia's highest point—very rugged and in a remote area of New South Wales.

During the summer months a well-graded road enables one to drive from Jindabyne right up to the summit. About three years ago the Snowy Mountains Authority opened up a very scenic road, affording access to the area from Corryong and Khancoban to Geehi, Tom Groggin and Deadhorse Gap and thence down the Crackenback Valley to Jindabyne.

In January 1954 the writer visited the Kosciusko-Lake Cootapatamba area on a day visit from Cooma. In January 1958 we camped on the Crackenback River just below Deadhorse Gap, and in January 1959 again visited the summit and also walked from Charlotte Pass to the glacial lakes of Headley Tarn and Blue Lake. Each trip to the area proved most interesting from the point of view of natural history and scenery.

The Geology

Geologists inform us that these eastern highlands of Australia were formed by the uplifting of a comparatively low and maturely worn landscape. This uplift, which occurred in the Pliocene era, attained its maximum elevation in the Kosciusko area and therefore is termed the "Kosciusko Uplift". As the term "Alpine Mountains" applies to folded mountains where lateral forces warped and folded landmasses upwards as in the European Alps, Himalayas and Andes, this term cannot be applied to the Australian highlands. Mount Kosciusko is composed of a dense granite which is very resistant to erosion, and this has preserved its elevation, while other parts of the highland composed of softer materials have been worn down more rapidly.

One of the most interesting features of this mountain area is the clear evidence of recent glaciation: smooth trough-shaped valleys, typical cols on ridges, moraine-dammed lakes (Cootapatamba, Headley Tarn) and lakes occupying cirques such as Blue Lake. It is believed that during the last great ice-age, warmer intervals occurred during which the evidence of work of the preceding ice sheets was obliterated. So it was mainly the work of the last "big freeze", ending about 15,000–10,000 years ago which is mostly in evidence, although that ice-sheet was probably the least extensive.

Looking North from Kosciusko

The Flora

A visit to the Kosciusko highlands offers opportunities to study and observe our most fascinating flora. As one gains altitude the change in the forests is noticeable. On the well watered slopes of this tableland, up to 4000 feet altitude, we find the home of our largest eucalypts—Mountain Ash (*E. regans*), Alpine Ash (*E. delegatensis*) and Candlebark Gum (*E. rubida*). Above that we enter the domain of the Snow Gum (*E. pauciflora*) which peters out as dwarf, gnarled trees at approximately 6100 feet altitude. From there on the herbaceous plants of the alpine-meadows take over. To illustrate the adaptability of trees, the Mountain Plum-pine (*Podocarpus alpina*), which in some East Gippsland scrubs grows to some fifty feet and on Echo Flat near Lake Mountain is several feet high, in the Kosciusko area at 6000 feet is a prostrate shrub growing *Espalier* fashion over granite boulders. Similarly, along the Crackenback River just below Deadhorse Gap, a low shrub sprawling over rocks revealed its identity by its numerous red "cherries" as *Exocarpus* (wild cherry). *Exocarpus* of the lowlands is a small tree, and when one compares it with the mountain dwarf the effects of altitude, snow cover and harsh weather conditions are very evident.

Cootapatamba

Just beneath the granite summit of Kosciusko (7316 feet) lies the small lake with this picturesque aboriginal name, lit-

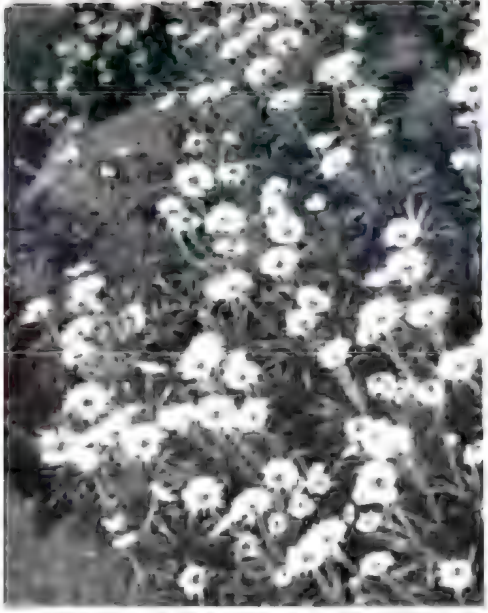
erally "place where the eagles drink". During the last ice-age, when glaciers occupied the depressions of Kosciusko, the valley floor at this point was over deepened and morainic material dammed up the small lake. At an altitude of 6740 feet, this is fed by the melt-water of snowdrifts which last well into the summer. On January 23, 1954, we noticed quite a large snowdrift on the right-hand side of the lake. From a distance it gave the appearance of a small glacier. At the time it was melting fast, leaving around its edges a black turf, continuously soaked by melt-water. At these altitudes snowfalls may occur any month of the year, and by May permanent snow cover is usually there again.

Soil that is free of snow for only a few months one would naturally expect to be rather barren of plant life. But far from it! Here we have a typical example of the Schneetaelchen-flora. On the very edge of the melting snow the white stars of the Mountain Marsh-marigold (*Caltha intraloba*) unfolded. Many Anemone Buttercups (*Ranunculus anemoneus*) were straightening themselves from the prostrate position to unfold their white flowers within a day or two, though stems and leaves were still a pale yellow. *Aciphylla glacialis* is also able to produce its strongly scented umbelliferous flowers as soon as the snow cover is gone. Associated with this plant community were extensive mats of moss and two fern species: Mother Shield-fern, *Polysichum proliferum* and Alpine Water-fern, *Blechnum penna-marina*.

On the upper end of the drift the snow was melting faster on the ground than above it, thus producing an over-hanging lip.

Silver Daisy, *Celmisia longifolia*, above Lake Cootapatamba — —→

Anemone Buttercup, ←— — *Ranunculus anemoneus*, near Lake Cootapatamba



It was here that we noticed a colony of flowering *Caltha* up to three feet under the snow-lip in snow-reflected sunlight. These observations show that the plants of the Schneetaelchen (="snow-patch" or "snow-bed") possess the ability to develop under snow cover with a minimum of light and to produce flowers and seeds within a few weeks after the snow cover has melted. Directly after the flowering of *Caltha*, dense patches of dark green leaves are produced, which manufacture the necessary plant foods to ripen seeds and to form buds for the following season. According to Professor C. Schröter in his *Alpen Flora* the term "Schneetaelchen-flora" was coined by Oswald Heer in 1836 in his *Plant Geographical Description of the Sernftal* (Switzerland). This occurs in depressions on mountain slopes where the snow remains for a long time and the soil is continuously saturated with melt-water. The melting snow leaves a dark soil, rich in humus, top-dressed with mineral dust and organic debris that has accumulated on the snow.

J. Braun-Blanquet, in *Pflanzensoziologie*, classifies the snow-bed associations of the European Alps into three sub-associations:

Arabidion coeruleae—on alkaline snow-bed soils, a definite basophil association.

Salicion herbaceae—on continuously wet humus-soils, an acidophilous association (pH 6.5–4.6).

Androsacion alpinae—on moderately moist and lime-deficient soils, also an acidophilous association (pH 6.4–4.7).

Our snow-patch community on Lake Cootapatamba would represent the counterpart of the sub-association *Salicion herbaceae*. The writer has observed snow-patches on Mount Hotham and Loch in the Victorian highlands, but there is extensive summer grazing in both localities resulting in much destruction by trampling of cattle which congregate there for feeding and watering. Lake Cootapatamba on the

other hand is situated in a national reserve.

Stone Axes

Unexpected finds were made of aboriginal stone artefacts at Deadhorse Gap and at No. 1 Creek along the Crackenback River, showing that the original inhabitants of this land used to visit the highlands in summer. The purpose no doubt was the hunt for game that would be attracted by the lush mountain meadows in midsummer when the lowlands were parched. Also, the occurrence of the Bogong Moth in large numbers among the crags was a source of food for aborigines.

Some interesting information about the visits of aborigines to the highlands is given on page 207 of *Aborigines of Victoria*, by R. Brough Smythe. This is quoted in an article entitled "Aborigines on Mt. Buffalo", by S. R. Mitchell, in the *Victorian Naturalist* of March 1940 (Vol. 56, p. 185).

The artefacts found in the Kosciusko area are shown in the accompanying illustration, with descriptions of them beneath.

Artefacts from Kosciusko Area

(*Right*). Ground-edge axehead, Deadhorse Gap: A waterworn pebble of micacious sandstone; 2½ lb. weight, 7½ in. long, 4½ in. wide.

(*Left*). Chipped hand-chopper, Deadhorse Gap: Of altered sandstone (low-grade metamorphic), a dual purpose implement, with a definite grinding groove; 1 lb. 14 oz. weight, 7 in. long, 3¼ in. wide.

(*Centre*). Hand-chopper, No. 1 Creek: Fashioned from a waterworn pebble of altered shale by skilful chipping of one side of edge; 14 oz. weight, 4 in. long, 3 in. wide.

SHERBROOKE SURVEY

[This statement has been submitted for publication following a request for information on the matter of banding lyrebird chicks in Sherbrooke Forest.]

The Lyrebird has been studied for many years by many people. Much is known of its life history; much still remains to be learnt. It has been known that the lyrebird population of Sherbrooke has been dwindling over many years in spite of the young birds which are bred there each season. Identification of individual birds is essential for solving some of the problems (particularly that of the movements of the birds), and banding is the only satisfactory method.

A complete knowledge of the life history is the only proper basis for conservation.

The Sherbrooke Survey Group was formed under the auspices of the Bird Observers Club in 1958. The aims of the group, the programme and rules under which the group would work, were written out in full and submitted to the director of the Fisheries and Game Department at a preliminary meeting with the group leaders. All aspects of the programme (including public relations) were considered before full permission to undertake the work was given to the group by the director (Mr. A. Dunbavin Butcher).

Similarly, approval was obtained from the Sherbrooke Committee of Management and the Forests Commission.

Six senior members of the group (all experienced workers, holding banding licences from the Fisheries and Game Department and the C.S.I.R.O.) have special written permission to band lyrebirds, and all working members of the group are registered with the Fisheries and Game Department.

It is not intended to band chicks at all nests in Sherbrooke.

Banding will be done, either in Sherbrooke or elsewhere, by the six banders working in pairs, and only at nests approved by the group. The chicks are handled once only, just before leaving the nest, and neither parent nor chick suffers any harm.

Members are rostered and on duty (not necessarily in Sherbrooke "proper") for observation of the birds each weekend. Full records of the work are kept and reports will be published from time to time as circumstances warrant. Dr. L. H. Smith is author of publications.

INA WATSON, *Convener*
RALPH KENYON, *Secretary*

BENDIGO FIELD NATURALISTS CLUB

Members of the F.N.C.V. who visit Bendigo are invited to participate in the activities of the Bendigo Club.

Syllabus of Meetings and Excursions—July to December, 1959.

Meetings—Start at 7.15 p.m. at Bendigo Technical College.

- July 8—Coloured Slides (Members).
- August 12—Botany Talk on Weeds (J. Kellam).
- September 9—Annual Meeting.
- October 14—Trip to Kangaroo Island (J. Ipsen).
- November 11—Specimen Night (Members).
- December 9—Shy Ground Wren (R. Eddy).

Excursions—Start from Gold Jubilee Statue (half-day at 2 p.m., full-day at 10 a.m.).

- July 19 (full-day)—Lyall Glen: General (J. Ipsen).
- August 30 (full-day)—Sedgwick: Birds (R. Eddy).
- September 27 (full-day)—Tarnagulla: General (A. Ebdon).
- October 18 (full-day)—Inglewood: Botany (R. Eddy).
- November 1 (full-day)—Wychitella: Botany (W. Perry).
- November 15 (half-day)—Spring Gully: Birds (R. Eddy).
- November 29 (full-day)—Metcalfe: General (F. Robbins).
- December 13 (full-day)—Egerton: General (J. Kellam).

A. C. EBDON, Hon. Sec., 45 Lucan Street, Bendigo.

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

A Pollen Tree in Winter

Mr. Tarlton Rayment keeps a watchful eye on the activities of bees. He writes:

Winter is here and I listen to the murmuring music of the trees. A few blooms linger still among the chrysanthemums and the garden tea-trees are beginning to clothe their branches blood-red. Lemon and cumquat bear a few flowers to attract the honey-bee, and the ageratum still graces the modest borders of heliotrope.

Late in the season, the midday sun, with its reviviscent warmth, will waken the wattles to gold from their slumbers, but it is as yet too early for the harvest of pollen. Bees rise later in the winter and retire to their hives before the touch of frosty fingers.

It is early June, the frost has melted from the long spears of grass and the sun calls the bees to labour. The ash trees have shed their leaves, and black beads of buds are strung along the twigs. Listen! There is murmur of a new music, a melody of industry.

A veil of tiny reddish-claret blossoms drapes the trees and the bees rejoice; the pale creamy pollen will soon mould the Lilliputian puddings for the combs. Under the microscope, the grains—the flour, the living male cells—resemble subspherical sago, but the bees pack it into a pudding of pale buff.

The ash is peculiar, for the minute flowers arrive long before the buds burst to clothe the tree with leaves. The ash seed, the samara, has a dry membranous wing, and clusters of these "keys" will hang throughout the winter months to unlock at length the stream of new life.

Echidna and its Young

The Australian Spiny Anteater or Echidna is widespread on the mainland, and there is a Tasmanian species, too, and another in New Guinea. These, together with the Platypus, comprise the group of mammals known as *monotremes*, which show the remarkable combination of the young being hatched from eggs and then suckled—that is, fed on milk—by the mother!

Peter Hodge, of W Tree, sends this story of an echidna family:

"Early in December a few years ago, Ben (my brother) came across a large, rotten log in the bank of the creek in our paddock. A mound of soil had been scratched out of an opening under the log, and there were signs that some of it had been freshly disturbed. Thinking that a rabbit or some other kind of animal must be living there, he smashed the log up, it being too heavy and rotten to roll over, and found at the end of a tunnel about four feet long a large, smooth, padded cavity containing a full-grown echidna and a young one.

"The baby echidna was about three inches long with smooth, black fur or hair, and we could feel where the quills were starting to grow underneath. These must have been slightly less than a quarter of an inch long.

"Ben brought the echidnas home, and after having their photo taken, they were put in an old, burnt-out stump, not far from the house, for observation. They both stayed for two days, and after that the mother went off, leaving the baby in the stump. We thought that perhaps she had deserted her baby, but it stayed there, fat and healthy, for about three weeks, so she probably came and fed it each night."

Echidnas develop a kind of pouch—actually two thick folds in the skin of the abdomen—to carry the egg and later the young. We have often wondered if the youngster was accommodated thus until its quills became too long for the mother's comfort, but the above observations indicate that these do not grow appreciably until the young one is too big to be carried about in any case.

← — — Echidna and Young

Wattle-birds and the Heat Wave

Mr. A. E. Brooks, of Cheltenham, sends us these observations:

Very late in the nesting season a pair of Little Wattle-birds began to display an unusual interest in a Red Flowering Gum which grows on our front lawn. There was much fluttering to and fro among the branches, accompanied by numerous not very musical noises. Then within a day or two they brought the first pieces of material for nest-building.

The efforts at building might be described as about the same standard as their attempts to make musical sounds. When the nest took on some semblance of a finished article, the bird we believed to be the female tried fitting her breast into it and turned around to test it for size. Believe it or not, the poorly-built nest was regarded as complete and the female took up her position. Whether one or two eggs were laid we did not discover, but in due course the beak of a young bird was seen occasionally above the rim of the nest.

Then the temperature soared above the century mark towards the middle of January, and the mother had to decide how best to care for the fledgling. First she tried sitting firmly on top as if to suffocate it. The youngster suffered this for some time, but it was eventually seen sitting on a branch near the nest, indicating that the mother might have decided to force it to leave the nest.

Later in the day the fledgling fluttered to the ground, but by nightfall was called by the parents to a safe place under a tree. It was still unable to fly properly and we were somewhat concerned when about three days later it was nowhere to be found.

However, we are pleased to record that about a week later the two adult birds and the youngster, now a tolerably good flier, paid a visit to our garden. Indeed, the three birds are frequently to be seen plundering the honey from our flowers; and the flimsy nest has withstood the elements, up to date, anyway.

By Jean Galbraith

Blackwood — *Acacia melanoxylon*

Golden Wattle to light the dry hills —Blackwood for the sheltered valleys and kinder soils! Blackwood is a king amongst the wattles, a forest tree of the higher rainfall areas, where its dark green phyllodes are a foil for creamy white or primrose bloom in clusters of large heads.

It belongs to the group of wattles which has several long veins in each phyllode, and there is no other that one could mistake for it. Perhaps its closest relative is the recently-described *A. frigescens*, but this is much more shrubby, with greyish foliage and bright yellow flowers.

Blackwood has sober green phyllodes, two to four or even six inches long and up to an inch wide, rather stiff, blunt-ended and narrowed to the base. It is a large and stately tree, beginning to flower after the Silver and the Golden Wattles are in bloom.

Perhaps that is why Frank Williamson spoke of Blackwoods that ". . . robed by tardy spring, in starlike beauty shone". Starlike indeed with their delicate pale bloom, but erect and holding their bloom erect, with sturdy trunks and furrowed grey bark.

There is an atmosphere of strength and permanence about them that does not belong to the earlier-flowering species with their lovely evanescent gold. In summer they ripen clusters of half-curled, light-brown pods and, despite their name (a literal translation of *melanoxylon*), the beautifully-patterned, close-grained wood is brown. Perhaps that is why the tree is often misnamed "Lightwood", although that name belongs to the summer-flowering, sickle-leafed *Acacia implexa*.

I know of few trees as shapely as a well-grown Blackwood, and groups are often left for shade on Gippsland farms, where clover will grow in a thick sward right up to the trunks. Solitary trees are not always long-lived, but several together may outlast generations of men and still increase in vigour and beauty.

Blackwood is seen at its best in the rain-forests, such as in gullies of the Otways and the Dandenong Ranges. In south-eastern New South Wales and far-eastern Victoria, it is dominant in sub-tropical "jungle" pockets and the limbs are often festooned with lianas. Blackwood extends too to Tasmania and South Australia.

Shapely Blackwoods provide shade and shelter on farmlands at Cann River in Gippsland.
Photo: N. A. Wakefield

Nature Study for Schools

BY NORMAN WAKEFIELD

ORGANIZATION OF REFERENCE COLLECTIONS (*continued*)

Although the animal kingdom is classified into about twenty main groups (*phlya*), the insect species, comprising but one class of the "joint-legged animals" (phylum, *arthropoda*), are actually more numerous than all the other animal species put together. Moreover, insects are practically universally distributed and many kinds occur in great numbers. For these reasons this group commands considerable attention in school nature study. As a result, and because insects in general present a substantial problem in the matter of common names, a reference collection of these is practically essential.

Towards the end of Chapter XVII of Leach's *Australian Nature Studies*, there is a section on "Breeding, Collecting and Preserving Insects", in which some useful general instructions are given. Similar details may be found in McKenwn's *Australian Insects*. Some modifications of the procedures suggested in these books are desirable when it comes to the building up of a collection at school.

For killing insects and other small animals, do *not* use potassium cyanide as suggested—it is too deadly a poison to have in a school. Obtain a small bottle of ether—ethyl ether is preferable, but acetic ether will do—and, as this is very volatile, it must be kept very tightly corked or lidded. The bottle should not be opened near an exposed flame, for the vapour is highly inflammable and, being heavier than air, will flow along a surface such as a table top.

A suitable killing bottle is a broad-mouthed jar fitted with either a cork or rubber stopper or a washered screw top. To the under suface of the stopper or lid, a small wad of cotton wool is fastened by means of a piece of wire threaded through small holes or by a tack. Liquid adhesives should not be used as ether is solvent for many such. The killing bottle should be reasonably small so as to allow a high concentration of vapour to build up.

The specimen is introduced into the bottle, a small quantity of ether is dropped or poured onto the cotton wool and the lid or stopper placed in position. The amount of ether needed depends on the size of the subject, but the latter should not come in contact with liquid or it may be spoiled. By this method the specimen is painlessly anaesthetized and it should then be left for a considerable time until one is sure it is dead, otherwise it may revive after being taken out.

Specimens may be preserved for any required length of time in an alcohol solution, and this can be done with insects and such if it is not convenient to mount them as soon as they have been killed. The ideal medium is

a 70% ethyl alcohol (and 30% water) solution, for this keeps the specimens pliable. Methylated spirits, which is almost wholly methyl alcohol, causes hardening of legs and other parts so that these cannot be arranged in position when a specimen is finally mounted, so, if this must be used, a small quantity of glycerine should be mixed with it.

The main collection is finally housed in boxes. These should be quite shallow, as specimens are "lost" in deep containers, and it is preferable that the top be transparent—of glass or a plastic such as celluloid. To the floor of each box should be fastened a layer of something like cork, fibre board or thick strawboard, into which pins may be stuck, and over this a sheet of white paper is pasted.

For school purposes, most specimens may be put into boxes immediately after killing, being fastened there with household pins. However, many will choose to obtain the more appropriate fine entomological pins for the purpose. The method of pinning is illustrated in *Australian Nature Studies* (see reference above). A pair of forceps is used for handling fine pins, the latter being grasped *below* the insect when being forced into the floor of the box.

It is most desirable to have each specimen in a collection as life-like as possible, so care should be taken for instance to place the legs in natural positions. To do this, fine forceps, a darning needle or some such pointed instrument may serve, and it is remarkable what a difference this small attention can make to the final appearance.

Moths, butterflies and similar insects require an intermediate step—drying with the wings held in position by strips of paper—before being finally mounted in the boxes. This is illustrated adequately in *Australian Nature Studies*.

Many large moths have in the abdomen much fatty material which is likely to exude and eventually spoil the specimen. If one feels inclined, the abdomen may be slit open with a razor blade and its contents removed and replaced by a rolled wad of cotton wool.

Some insects, and most spiders, have large soft abdomens which would shrivel up if an attempt were made to treat them by the method outlined above. These need to be permanently preserved in alcohol solution in small glass tubes or jars.

If one wishes to preserve a large spider for display purposes, it may be tied to a rectangle of glass or rigid plastic by means of a fine cotton, then immersed in alcohol solution in a transparent screw-top jar. The cotton should stretch reasonably tightly across the specimen between the abdomen and cephalothorax and thence right round the supporting rectangle. An even more satisfactory result is obtained by drilling two small holes in a rectangle of suitable plastic and tying the spider by means of a cotton passing through these.

With these general hints as a basis, teacher and pupils should be able to decide how best to preserve specimens of various other

animal groups when such are considered to be desirable additions to school reference collections. The seashore yields much of interest: soft-bodied animals go into alcohol, some crustaceans (tiny crabs, shrimps, etc.) are pinned in boxes, sea-urchins and large crabs are kept in individual boxes, and so forth. A score or so of match-box trays may be packed together, with or without permanent fastening, over the bottom of a shallow box, as containers for samples of as many species of small sea shells.

One does not normally kill and keep vertebrate animals in reference collections, but if a specimen, such as a snake, has been killed and it is desired to keep it as a novelty, it is placed in a jar of alcohol solution. To ensure that deterioration will not occur, it is advisable to first make a small incision in the abdominal wall to allow fluid to penetrate round the organs.

Most native species of mammals are protected by law, and it is illegal not only to kill them but also to have them in one's possession either dead or alive. However, children sometimes bring to school small mammals that have been found dead or have been killed accidently, such as during clearing operations. These should be placed in alcohol, with the abdominal wall pierced, for several days, then packed, still moist, in a plastic bag and that placed in a tin and sent to some appropriate authority. By such action, knowledge of distribution of species may be augmented and in some cases valuable discoveries are brought to light. For further details in this connexion, see "Collecting Hints", the last chapter of Troughton's *Furred Animals of Australia*.

As with all reference collections, it is essential that the relevant data be recorded, either with the specimens or in a substantial notebook. These comprise name of species or group, place and date of collecting, name of collector, and any general notes about the example.

Finally, it must be emphasized that the compiling of collections must not be looked upon as an end in itself. As Leach said, "Haphazard collecting is harmful and cannot be recommended". Only judiciously selected material should be preserved, and this not as a basis for study but as a reference set. Effective nature study is concerned not with the classification or physical characteristics of specimens in bottles or pinned in boxes, but with observation of the activities of living things in their natural environment.

Next Month: Sources of Information.

THE BOGONG HIGH PLAINS

This continues the story of the 10-day excursion by members of the F.N.C.V. to the Bogong High Plains.

By J. Ros Garnet

EXCURSION DIARY

The main party left Melbourne early on December 26, travelling via the Hume Highway to Wodonga, along the Kiewa valley to Tawonga and, from there, high into the mountains of north-eastern Victoria, reaching Falls Creek about six in the evening. There they were greeted by the leader who, with his wife and son, had arrived a few hours earlier.

After some ten hours of travel over the plains of the north-east in the heat of summer, what delight it was to reach the haven of the mountain chalet in the coolness of the closing day. There were no tents to erect, no meals to prepare, no camp chores to fret the weary; the party had merely to lounge about waiting for the dinner bell to call all together again.

Standing on the balcony, one gazed at Spion Kopje, with its large N-shaped snow-drift, due north of the ski village. To the south-east, but out of sight, was Rocky Valley, and to the westward, Pretty Valley—all places to be explored. Behind us was the Frying Pan, a fair, grassy plain, to be found by climbing the mountain hard by.

On the eastern end of the Spion Kopje range, across the deep valley, was Roper's Lookout, a basalt plug, treeless and almost bare of shrubs, perched on the side of the mountain top.

Saturday, December 27, 1958

We chose to call this "an easy day", one devoted to a leisurely trip by bus onto the plains and and into Pretty Valley. It was designed to give the party an idea of the general topography and a taste of the clean alpine air away from the turmoil of dusty highways.

From the ski village the road winds up the mountainside, first through snow gums and hickory wattle and, at higher altitudes, through masses of Leafy Bossiaea and Alpine Orites, both of which were in full bloom. Above Rocky Valley, we seemed to be on top of the world. Around us were the Bogong High Plains, almost treeless, undulating grassland and moor, stretching east, south and west and contained by deep valleys. Beyond rose the giants of the Victorian scene: Buffalo, Feathertop, Fainter, Niggerhead, Hotham, Cope and other eminences which have drawn generations of hikers away from the urgency of city life.

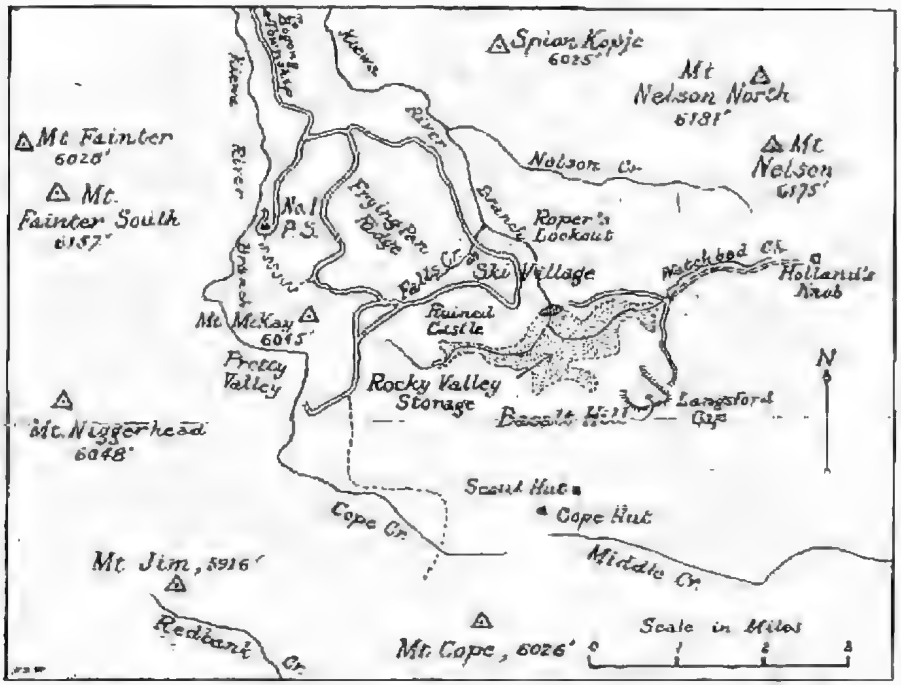
Nearby, on the western edge of the plain, was Mount McKay. We saw, too, the massive basalt residuals of the Ruined Castle and Basalt Hill, and the network of roads, serving the great Kiewa hydro-electric scheme, like ribbons along the slopes.

Below to the east, was Rocky Valley, peaceful during the brief holiday lull but showing horrible

scars of engineering activities. A few more years will heal the scars and the summer-time visitors will see a lovely lake filling the valley with 23,000 acre-feet of water. On the higher ground, the characteristic alpine wildflowers will remain. Each will add its quota to the wealth of fragrance and blossom.

The party could see around them a text-book illustration of chapters on plant associations and communities. On the exposed, wind-swept slopes were tangled low shrubs such as *Phebalium phylicifolium*, *Pleurandropsis trymalioides* and *Kunzea muelleri* which merged into colonies of *Hovea longifolia* or *Grevillea australis*. Where the depth of soil was inadequate for such shrubs one could see alpine tussock grass and hosts of herbaceous plants such as *Brachycome nivalis*, *Gnaphalium collinum* and *Ewartia nubigena* spreading between the rocks and fissures. Where the snow lingers longest were plants which prefer extra moisture: *Claytonia*, *Ranunculus*, *Cotula*, *Veronica*, *Celmisia* and so on.

In the valley we halted briefly to wander beside the streams which meander across it from the east before it turns south into the narrower confines of Pretty Valley. In this idyllic spot tiny Galaxias sped from sheltered pool to sheltered pool, tadpoles innumerable browsed in the



Locality Plan—Bogong High Plains

warmth of the sunlit water, and dragon flies and stone flies joined the murmuring throng of other winged creatures. Naturalists rambled about, gleaning entomological trivialia, or noting the profusion of plants which grow only in alpine meadows, among them *Caltha introloba*, *Ranunculus millanii*, *Prasophyllum alpinum*, *Stackhousia pulvinaris*, *Epacris petrophila* and *Carex buxbaumii*.

Among the more interesting objects added to David Woodruff's collection was a recently-deceased White-lipped Snake, which was examined with some attention before we boarded the bus and returned to Falls Creek and lunch.

Then we set out to some snowdrifts to the south of Rocky Valley and, in passing, inspected one of the fenced experimental conservation plots about which comment is made elsewhere. Here the Snow Aciphyll was seen in flower.

A few sturdy folk essayed the stiff climb to the Scout Hut while the main party headed for the snow where some time was spent in light-hearted frolics. A row of three of these persistent drifts occurs on the southern precipitous slopes of Basalt Hill, between Rocky Valley and Middle Creek. A longer stay might have been rewarding to the botanists, for in the vicinity have been found such plant rarities as *Chlorophytum alpinum*[21], *Lycopodium selago*, *Parantennaria uniceps* and *Pimelea biflora*. The Alpine Caladenia, an orchid which favours altitudes above 4000 feet, was there in bloom and, unexpectedly, plenty of Creamy Stackhousia, whose range from sea level to 6000 feet betokens considerable adaptability.

Snow sports and scrub bashing made most of us feel the need of a rest, but after it we made our way over to Basalt Hill to examine some almost perfect examples of basalt columns. The day's march was concluded by a ramble across the windswept flats of the treeless mountain top, from which we had an uninterrupted view for miles in all directions. Fitzgerald's "Shannonvale" lay to the south-east, a landmark familiar to those who tramp the track to the high plains from Omeo and beyond.

Cope Hut and Redbank Creek (one of the headwaters of the Bundarrah River) excited the fancy of a small party of keen men. On the banks of this creek were reported to be certain lignite deposits well worth closer inspection. It was resolved that this trip should be made at all costs.

While many were examining the ground flora of the Basalt Hill grasslands and studying rock specimens, Dan McInnes and Eyre Swarbreck were down in the valley, one hammering assiduously at rock faces, the other seizing spiders or capturing in colour scenes of unusual constructional works and the equipment used for them.

Back at Hyman's chalet, the dust of the day washed away, dinner-time could not come soon enough. At its conclusion the leader announced the programme for the morrow, and members dispersed to sort and pore over

Photo: Mrs. K. Parkin

Snow-drifts on Southern Slope of Basalt Hill

specimens or to enjoy the rest due after their first day in the rarer atmosphere of the high mountains.

Sunday, December 28, 1958

Through the good offices of Mr. H. H. C. Williams, construction engineer of the S.E.C.'s Kiewa project, our party, guided by the amiable patrol officer, inspected the No. 1 power station in course of construction. An unusual experience was the descent by cage, 180 feet below the surface of the western slope of Mount McKay, to the landing above the vast underground vault where six power generators will be installed. The water from Rocky Valley storage dam, after passing through the turbines, will flow into the Pretty Valley branch of the East Kiewa River and then through the two power stations in the valley far below.

Later we journeyed by road to the entrance and were taken by electric trolley through the tunnel to the vault. As a finale, we heard three mighty detonations from blasting within the vault which we had just vacated.

We made our way by circuitous roads to the mountainside far above, to enjoy our picnic lunch beside the huge surface pipeline through which will flow the Rocky Valley water after it passes through the three-mile tunnel in its descent of 1700 feet to the No. 1 power station.

After lunch we moved up onto the high plains where the afternoon was spent among the natural "ruins" of the Ruined Castle between Mount McKay and Rocky Valley. Hexagonal and pentagonal columns of basalt of all dimensions were to be seen in an exposure resulting partly from quarrying and partly from natural causes. There, too, were tuffs and other evidence of the Tertiary lava flows which have resisted weathering to a far greater extent than the widespread granodiorites.

Monday, December 29, 1958

John Garnet and David Woodruff, two younger members, made an independent resolve to track down whatever marsupial fauna might inhabit the countryside between Mount Cope and Rocky Valley. They departed before sunrise and returned in time for breakfast. Although no marsupials were observed they did see a fox and enjoyed the sight of a sunrise in the alps, a phenomenon which, for sufficient reason, eluded most of us.

This was a day when all were free to wander wheresoe'er they listed. Some set off in search of interesting geological material and others spent the time bird-observing, special attention being given to a nearby Spotted Pardalote's burrow situated conveniently at eye level on the bank of the road. Most of us, however, each with a tremendous lunch in his (or her) knapsack, climbed up the mountainside above the village and followed its aqueduct for a mile or so before plunging into a thick tangled scrub of snow gums from which we eventually emerged into the more easily-negotiable terrain which led us over the crest of the mountain onto the Frying Pan.

(Continued next month)

Field Naturalists Club of Victoria

Annual General Meeting—June 8, 1959

The lecture hall at the National Herbarium was comfortably filled, and Mr. J. R. Garnet presided at the opening of the club's annual general meeting. Members stood for one minute in silence as a mark of respect for Miss Helen Bowie who passed away recently.

The minutes of the last annual meeting were read and confirmed.

ANNOUNCEMENTS—The Bird Observers Club will hold a screening of films on Australian birds at the National Museum on July 10 at 8.15 p.m. in aid of the Crosbie Morrison Memorial Appeal.

The Australian Natural History Medallion for 1958 will be presented to Mr. C. J. Gabriel by Mr. C. W. Brazenor at the club's general meeting on July 14.

Dr. M. M. Chattaway, Mr. R. T. M. Pescott and Mr. A. J. Swaby will be the club's delegates at the A.N.Z.A.A.S conference in Perth next August.

REPORTS—The secretary read the annual report of council, and this was adopted by the meeting. The treasurer reported that the financial statements would be published in the *Naturalist* for review and discussion at the July general meeting. Both these items are elsewhere in this issue. On behalf of the auditors, Mr. W. J. Evans stated that the books had been examined and found correct.

ELECTION OF OFFICE-BEARERS—The following positions were filled:

President . . . . Mr. D. E. McInnes
Vice-presidents . . . . Dr. W. Gerce
Mr. E. S. Hanks
Secretary . . . . Mr. E. H. Coghill
Asst. Secretary (acting)
Miss L. M. White
Treasurer . . . . Mr. A. G. Hooke
Asst. Treasurer . Miss M. Butchart
Editor . . . . Mr. N. A. Wakefield
Asst. Editor . . . . Mr. W. F. Seed
Librarian . . . . Miss M. Argo
Asst. Librarian . . Mr. J. H. Quirk
Excursion Secretary
Miss M. Allender
Auditors . . . . Mr. R. Davidson
Mr. W. J. Evans
Council—Mr. A. J. Fairhall, Miss M. J. Lester, Miss F. Phillips, Miss K. Thomas, Mr. W. L. Williams.

Mr. Garnet welcomed Mr. McInnes as president and vacated the chair in his favour. Mr. McInnes in turn praised Mr. Garnet's work as president of the club, and this was emphasized by a vote of appreciation which was moved by Mr. Hooke.

PRESIDENTIAL ADDRESS—Mr. Garnet gave a most interesting illustrated talk on the club's summer excursion to the Bogong High Plains. He outlined the physical features, the unique flora, the question of cattle grazing and the development by the S.E.C.

ELECTION OF MEMBERS—Mrs. Eulalie Bennett became an honorary member, having joined the club in 1918. New members elected were Mrs. James Craig, Mr. A. Ingeme, Mr. W. A. Stubbs, Mrs. Zillah Lee, Mr. K. Vitalis, Mr. J. H. Scott (ordinary members); Mrs. D. E. McInnes (joint ordinary member); Mr. K. M. Nash, Mr. E. V. Barton, Mr. A. F. Baxter, Mr. C. K. Ingram, Mr. H. R. Hobson, Mr. L. A. Robertson (country members) and Kenneth G. McInnes (junior member).

EXHIBITS—Mr. C. Gabriel showed a range of Victorian cowrie shells, from juvenile to adult. Mr. H. Stewart exhibited Blue Olive-berry (*Elaeocarpus cyaneus*), Juniper Wattle and Mosquito Orchid from Sperm Whale Head, the first being a new record for the Lakes National Park. Mr. E. Coghill introduced small land snails and shells occupied by spiders, collected at Point Henry. Mr. D. McInnes showed a nautilus shell, the animal and eggs, found in the sea at Brighton. Mr. R. Burbury had a fruiting specimen of Waxberry (*Gaultheria hispida*) from Mount Buffalo; and Mr. A. Swaby exhibited garden-grown native shrubs.

Mr. McInnes reported that a change of sea water had induced mussels in his aquarium to release dense clouds of ova and sperm, readily identifiable under a microscope with high power.

Entomology and Marine Biology Group Meeting—June 1, 1959

Miss Macfie gave an interesting talk on octopuses, dealing with their varying size, colour and, in some cases, phosphorescence. She dealt, too, with characteristics of squids and cuttlefish.

Many species of shells were exhibited, all having been collected by Miss White during the club excursion to Point Henry; they were identified by Miss Macfie. Miss White showed also specimens of a marine flowering plant, a cunjevoi and some sand-hoppers.

Mr. McInnes provided a high-light with the exhibition of a large nautilus "shell" or egg-case, the egg masses, young which had hatched and the parent animal. The last was alive when the specimen was found at Middle Brighton. It was interesting to see, under the microscope, colour changes taking place in the bodies of the young ones.

Microscopical Group—June 17, 1959

The meeting was devoted to talks on "Tube-worms", led by Mr. R. McInnes. Several microscopes displayed different species of living marine worms. Mrs. Freame had a comprehensive collection of preserved specimens in bottles, and also projected several lantern slides of the creatures. Her comments on the subject were very interesting and informative, and were deserving of a larger audience.

Dr. Susan Duigan, of the Botany Department, University of Melbourne, will be the guest speaker at the meeting on July 15, her subject being "The Structure of Pollen Grains and Their Possible Value to Geology".

Dr. Duigan has been engaged in research into pollen of brown coal and, more recently, peats and living spores. She has studied at Cambridge University, working with Dr. Godwin exclusively on Quaternary pollen studies.

Geology Discussion Group—June 6, 1959

The monthly meeting was attended by seventeen members, with Mr. Davidson in the chair. Miss Carolan gave a report on the excursion to the Anakies on Sunday, May 10 (to be published next issue).

The subject for the evening was "The Geology of Victoria", discussed by Mr. Paul Fisch, and illustrated with two movie films he had prepared. This is the first of a series of discussions on the geology of Australia. After introducing the geological time scale and the palaeobotanical relationships of the rock types, the speaker out-lined the physiographic divisions and described topographic features with the help of cross-sectional diagrams. Victorian rocks of service to man, the coal deposits, glacial periods and volcanic eruptions were described next, and, finally, the occurrence of gold in Palaeozoic rocks, and the advent of the aborigines.

Exhibits were volcanic bombs from the Anakie excursion (Mr. Davidson); aragonite in lava from Spotswood, zeolites from Flinders (Mr. Blackburn); a collection of rocks of Port Phillip Bay (Mr. Baker); Glacial rocks from Springhurst, and from Moyhu, near Wangaratta, showing polishing and similarity to Beechworth agate (Mr. Watts); Silurian rock with calcite (from a depth of 100 feet); vesicular basalt, and gypsum forming on an *Arca trapezia* shell, from the excavations for the King Street Bridge, South Melbourne side (Mr. A. B. Scott); specimen of amethyst from Mexico (Mr. Bairnstow).

Botany Group Meeting—June 12, 1959

The subject of conifers has for some time interested members of the group and they have looked forward to hearing a lecture on the subject. Miss L. M. White addressed the group on this topic at the last meeting at the Herbarium. She exhibited a large number of specimens of cones to illustrate the subject and, by the comments made and the questions asked, there is no doubt of the interest of members. Those present were most grateful for a particularly good lecture and, to further pursue the subject, an excursion has been arranged to the Footscray Gardens, where a variety of the species grows. Miss White will be the leader.

The spring nature show was discussed and progress is reported.

For the July meeting an interesting members' night has been arranged and a welcome is extended to all club members to attend.

F.N.C.V. Excursion to Point Henry

On Sunday, May 31, a bus-load of members journeyed to Point Henry, about six miles from Geelong. This headland is at the entrance to Corio Bay and the signal station there controls all shipping to and from the Port of Geelong.

As the party ate lunch near the beach, numerous sea birds, including cormorants, silver gulls and Pacific gulls, were seen. Two pelicans glided across the water close inshore, while a group of about nine rested on the sand-bar, their size emphasized by the many smaller species. Millions of minute shells formed much of the beach, and larger ones were collected by some members.

In the early days, cattle were driven across Corio Bay, and it may be recalled how the shallow entrance prevented Geelong being made the capital of Victoria.

A visit to the Eastern Park nursery before lunch was instructive and the extensive collection of Australian plants aroused great interest. The variegated Sugar Gum attracted attention, while Cats' Paws (*Anigozanthus humilis*) and Green Kangaroo paws (*A. viridis*) were in bloom.

On the way to Point Henry, salt-pans and stacks of newly-harvested salt were adjacent to the road. Sea-water from Corio Bay is circulated to the pans and evaporated until a thick layer of crystals forms at the bottom. At this stage the mother liquid becomes dark red due to the rapid development of microscopic shrimp-like crustaceans. After harvesting, the stacks of salt are covered with metal foil and thatch-grass from Lake Connewarre. Later, the salt is conveyed to the works to be purified by washing and packed ready for sale.

On the way from Melbourne to Geelong the features included the lava plain with the granite peaks of the You Yangs projecting above it. A brief halt was made at the monument to Matthew Flinders, and there was reference to his journey when he climbed Flinders Peak and to that of Hume and Hovell when they travelled from Lake George to Port Phillip Bay.

On the return journey the Geelong Botanic Gardens were visited, and a halt was made for tea at the Eastern Beach.

A. E. BROOKS

[The reference to "shrimps" which can live and multiply so rapidly in concentrated brine is exceptionally interesting. Obviously there are other organisms present, which also live in defiance of the apparently lethal environment and on which the crustaceans feed, whether directly or not. Perhaps the Microscopical Group will be able to tell us the whole of this interesting story.—Editor.]

SEVENTY-NINTH ANNUAL REPORT, 1958–59

This year saw the fruition of two important schemes, both foreshadowed in last year's report, and the initiation of two more.

The suggestion that the club should buy the unsold stocks of Miss Galbraith's book *Wildflowers of Victoria* was finally carried through. The arrangement agreed upon with Miss Galbraith is that she should have a royalty of 10% on sales and that the remainder, after deducting the club's initial outlay, should be directed one-third to the Native Plants Preservation Society, and the remainder to this club.

Obviously, this represents a substantial donation on Miss Galbraith's part, and many members felt we should press her to take control of these stocks for her own benefit. However, the majority both of council and of the last annual meeting, thought that we should accept her offer in the spirit in which it was made, and the final arrangement was as already stated. It may be added that the amount of the club's outlay has been recouped and the first payments of royalty to Miss Galbraith and of its share to the Native Plants Preservation Society, have been made.

The other project is the gift by Mrs. Nowlan of a block of land, a little over 12 acres, near Maryborough, to be preserved as a wildlife sanctuary in memory of her parents, the late Mr. and Mrs. W. Cosstick. The transfer of this land to the club has been signed and lodged for registration, and it is hoped to hold a club excursion there in the spring and to ask Mrs. Nowlan to attend and formally hand over the title to the club.

The two new projects are both of great importance.

With the May issue, the *Naturalist* was enlarged and its appearance altered. This has cost money and will cost more, but is is hoped that more readers and more members will be attracted, and that the club will reap great benefit from the change, in increased interest, and will not lose financially. In this connection, council feels that far too much is left to our energetic editor, Mr. Wakefield, and it hopes that something will come of recent appeals for members to assist, both with editorial material and with sales arrangements.

The other new project may also develop into something important, but it is still very nebulous. The National Museum authorities are conducting an appeal for a memorial to the late Mr. Crosbie Morrison, and hope to raise enough to establish a memorial hall to house scientific societies such as ours. If this appeal is successful to the extent proposed, it will, we hope, give this club a home of its own after so many years. We must step warily, but council is watching the position closely and will, of course, consult members before committing the club to any specific course.

Affiliated Bodies: During the year the Portland F.N.C. and the newly-formed Hamilton F.N.C. affiliated with this club, bringing the total of societies affiliated with us to eighteen. Sunraysia F.N.C. has made a similar application, but this will be dealt with in the coming year.

Membership on April 30 was 321 metropolitan, 146 extra-metropolitan, 18 junior, and 24 honorary and life members, a total of 509. This time last year the total was 491. Also there are a number of non-member subscribers to the *Naturalist*. During the year Miss Joan Galbraith was admitted to honorary membership for her outstanding services to the study of botany and to this club, and Miss R. Chisholm and Mr. P. F. Morris for long service. As is to be expected in a club as large as ours, we suffered several losses through death, including Sir Frederick Mann, a former Chief Justice of Victoria, Messrs. Charles Barrett, G. N. Hyam and A. D. Hardy, former presidents of the club, and Mr. J. K. Moir.

The club participated in the nature show held as part of the Moombe Festival last March, and much interest was aroused by living exhibits, snakes and lizards, spiders and marine life. Preparations are going forward briskly for the club's own nature show in October.

Arrangements have been made to have announcements of this club's meetings inserted monthly in the *Age*.

The club has consistently advocated the protection of native fauna and flora. It joined in the successful protest against the resumption of sealing on Macquarie Island, and the unsuccessful protest against the export of koalas, and has joined the recently formed Fauna Protection Council. It has watched with interest efforts to extend national parks, and congratulated the Government on its adoption of the pink heath as the floral emblem of Victoria.

As he announced at the last annual meeting, our immediate past-president, Mr. Swaby, has had leave of absence from the council during the whole of last year. Our senior vice-president, Dr. Gerce, has also been on leave since March on a trip to Europe. He will return in a few months and has been renominated for his position. During most of the year, the club has been without an assistant secretary. Recently Miss L. M. White was elected to the position. Miss White insists that her acceptance of the office is only temporary, so we must still look for an assistant secretary, though the need is not at present so urgent.

The question of finance is always with us. Thanks to the supporting membership introduced last year, we have felt more free to spend money this year, and have made some small but useful additions to library equipment. With the reorganization of the *Naturalist* it was felt that junior members should make a larger subscription towards an attractive periodical, and junior membership, with the *Naturalist*, has been increased to 25/-.

Club publications continue to sell steadily, but no major publication, other than the reorganization of the *Naturalist*, has been undertaken. Perhaps it is time to publish something else.

Council and the club must thank those who have lectured to us through-

out the year, also those who have provided and operated projectors.

Excursions: During the year excursions, numbering two or three a month, have been well attended. Many places were visited and various aspects of natural history studied, one excursion to Campbelltown was led by the Ballarat and Creswick F.N.C. members who showed a fine stand of waxflower, this patch being the only known occurrence of this species in the district. The feature of the year was the excursion to Falls Creek for ten days during the Christmas–New Year holidays. This excursion was led by the president and attended by 40 members. Visits were paid to the power stations and works in the Kiewa scheme and to the Hume Reservoir as well as to the Bogong High Plains.

Geology Discussion Group: A satisfactory year has been experienced by the Geology Group, attendances at both meetings and excursions having almost doubled, and it is felt that this is partly due to the monthly report appearing in the *Naturalist* but mainly to the sharing of geological knowledge by the members taking part. A healthy competitive thirst for this knowledge still exists despite the varied subjects presented throughout the year.

Microscopical Group: In June, Mr. H. B. Englis (our only "outside" speaker for the year) of the Forest Products Division of the C.S.I.R.O. lectured on the use of the microscope in forestry research. The talk was well attended and amply illustrated by means of both camera and microscope slides.

In August, one of our own members, Mr. W. Evans lectured on the subject of photomicrography on 35 mm. film. This was surely one of the most interesting talks for the year and its most outstanding feature was a highly successful practical demonstration in which Mr Evans employed his excellent home-made equipment. The resourcefulness shown by the speaker in improvising apparatus has been an inspiration to all members.

The meeting in November was one of the more unusual ones, the subject being circulation of protoplasm, blood, etc. Microscopes all exhibited some form of natural circulation, such as cyclosis in plant cells and desmids, circulation of blood in small pond forms and Brownian movement.

The highlight of the evening was Mr. Middleton's projection of a tadpole's tail onto a screen by means of his micro-projector. The blood corpuscles of the animal could be seen circulating within its veins.

Botany: The Botany Group has had a successful year. Though it is not large, members are keen and some most informative lectures have been given at the meetings. Mr. Swaby gave a series of "Beginners' Talks" which were very helpful. Mr. Williams spoke on "Growth of a River", Miss Lester "The Plant Kingdom", Mr. Court "Is Australia's Flora Unique?", Mr. Hanks "Field Identification of Eucalypts", Mr. Garnet "Acacias", Mr. Swaby and Mr. Wilson "Structure of a Tree" (illustrated with slides lent by Burnley School of Horticulture), Miss Carberry "Victorian Wildflowers", and Mr. Tinckam and Mr. Nicholls showed nature films.

During October the group held a week-end camp-out at the Grampians which was attended by thirteen members.

Entomology and Marine Biology: Thanks to the courtesy of Mr. J. W. H. Strong, this group meets monthly in Mr. Strong's rooms in Parliament House. It has also held several excursions. Principal interest has been the study and identification of specimens produced at each meeting and short talks of which may be mentioned those by Mr. Lukey on seaweed, and by Mr. Fairhall on leaf-curling spiders. As will be seen, the group does not limit itself exactly to the subjects covered by its title.

In conclusion we must thank the Herbarium authorities and especially the director, Mr. Pescott, for allowing us without charge to continue to occupy two rooms permanently, and to use the main hall regularly, and for other courtesies. The conferring of the title "Royal" on the Botanic Gardens gives us all the greatest pleasure, and we offer congratulations on this well-merited recognition.

On behalf of the council,

E. H. COGHILL

Hon. Secretary

FIELD NATURALISTS CLUB OF VICTORIA: FINANCIAL STATEMENTS, 1958–59

GENERAL ACCOUNT

STATEMENT OF RECEIPTS AND PAYMENTS FOR 12 MONTHS ENDED APRIL 30, 1959

(Figures adjusted to the nearest £1.)

Receipts		
Subscriptions received—		
Arrears	£23	
Current	894	
Life Members	7	
Supporting Members	47	
		£971
Sales of *Victorian Naturalist*		20
Advertisements in *Victorian Naturalist*		67
Interest received—		
Library Fund	2	
Bank Account	16	
		18
Commission on sale of Books		4
Sale of Club Badges		5
Total Receipts for the year		£1,085

Payments		
Victorian Naturalist		
Printing		£701
Illustrating		110
Despatching		85
		896
Working Expenses—		
Postage and Telephone	£35	
Printing and Stationery	47	
Duplicating	2	
General Expenses	26	
Library Expenses	21	
Subscriptions, Donations, and Affiliation fees	11	
Natural History Medallion Expenses	4	
		146
Total Payments for the year		1,042
Surplus for the year		43
		£1,085

Capital Expenditure—The above Statement does not include £47 spent during the year on additions to the Club's Furniture and Library.

BALANCE SHEET AS AT APRIL 30, 1959

(Figures adjusted to the nearest £1.)

Liabilities		
Subscriptions paid in advance		£119
Special Funds		
Building Fund	£1,535	
Publications Fund	1,030	
Library Fund	50	
Club Improvement Fund	190	
Excursion Account	136	
		2,941
Surplus of Assets over Liabilities		1,575
		£4,635

Assets		
Bank Current Account and Cash		
E.S. & A. Bank—		
General Account		£372
Petty Cash Advances		17
		389
Current Assets		
Sundry Debtors	£28	
Arrears of Subscriptions estimated to realize	10	
Badges on Hand at cost	32	
		70
Library, Furniture and Equipment		1,561
Investment of Funds		
Building Fund		
C'Wlth Bonds at cost	950	
Inscribed Stock at cost—		
S.E.C. £500 3¼% 1965	420	
M.M.B.W. £100 3½% 1963	90	
E.S. & A. Bank, No. 2 A/c	75	
		1,535
Publications Fund		
Stocks valued at cost—		
Wildflowers of Victoria	104	
Victorian Ferns	454	
Victorian Toadstools	193	
Other Publications	21	
E.S. & A. Bank, No. 3 A/c	168	
Amounts owing by Booksellers	90	
		1,030
Library Fund		
Commonwealth Bonds at cost		50
		£4,635

BUILDING FUND

Amount of Fund at 30/4/58	£1,477
Interest on Investments	56
" " Bank Account	2
Amount of Fund at 30/4/59	£1,535

PUBLICATIONS FUND

Amount of Fund at 30/4/58		£770
Surplus for year from—		
Wildflowers of Victoria—From Sales	£111	
Stock on Hand	104	215
Victorian Ferns		5
Victorian Toadstools		7
Other Publications		7
Sales of back numbers of *Naturalist*		15
Amount of Fund at 30/4/59		£1,030

WILDFLOWER BOOK ACCOUNT

Sale of 659 copies realized		£365
Deduct cost of books to the Club in June, 1958, 1846 copies @ 1/9 each		162
		203
Royalty at rate of 10% thereon		20
		183
Deduct expenses—Advertising	£7	
Despatching costs	10	17
		£166
This amount has been divided between—		
Native Plants Preservation Society ⅓rd		£55
Field Naturalists Club of Victoria ⅔rds		111
		£166

FERN BOOK ACCOUNT

Stock at 30/4/58, 2,651 copies @ 3/9	£497	Sales, 228 copies	£63
Expenses	2	Stock at 30/4/59, 2,423 copies @ 3/9	454
Surplus for year	18		
	£517		£517

TOADSTOOL BOOK ACCOUNT

Stock at 30/4/58, 1309 copies @ 4/-	£262	Sales, 346 copies	£76
Expenses	2	Stock at 30/4/59 963 copies @ 4/-	193
Surplus for year	5		
	£269		£269

A. G. HOOKE, *Hon. Treasurer*

Audited and found correct: W. P. J. EVANS, R. DAVIDSON } *Hon. Auditors*

ANNUAL ACCOUNTS, 1958–59

GENERAL ACCOUNT: The receipts for the year amounting to £1085, and the payments to £1042, a revenue surplus of £43 remained for the year, compared with a surplus of £9 for the previous year. In this account the cost of publishing the *Naturalist* and paying the club's own working costs is shown against the income from subscriptions and other sources applicable. In addition to the revenue items referred to payments amounting to £47 were made for capitalized items, mainly equipment for the library, bringing the combined results to a deficit of £4 for the year. The only sources of money for capital expenditure are surpluses on the general account and contributions made to the Club Improvements Fund. Out of this latter Fund your council intends buying a projector and having a considerable amount of binding done for the library during the present year.

SPECIAL FUNDS The *Building Fund* increased during the year by £58, this being the amount of interest earned, and it now stands at £1535. The *Publications Fund* increased by £260, mainly due to the surplus from the sale of the various publications; this fund now stands at £1030, consisting of stocks of publications £772 and cash £258.

WILDFLOWER BOOK: The club's outlay in acquiring the unsold stock of these books in June 1958, was recovered in a little over six months, owing to satisfactory sales, which were helped by a little advertising (at a cost of £7) just prior to the Christmas trade.

FERN BOOK: The following facts are of interest regarding the fern book, which was published just three years ago:

Cost of 5,000 copies, paid for during the period April to October 1956	£949
Proceeds of sale of 2,577 copies in 3 years	809
Outlay not yet recouped is therefore	£140

But it should be noted that the sales of £809 have yielded a surplus over the cost of the books thus sold of £316, which is retained in club funds.

TOADSTOOL BOOK: Reviewing the progress of this book along the same lines shows the following facts, since publication about two years ago:

Cost of 2,510 copies was	£502
Sale of 1,547 copies has brought in	390
Leaving an outlay not yet recouped of	£112

The surplus to date on the above sales is £79, which is retained in the fund.

It is very satisfactory to see these three publications making such good progress, realizing they are by far the biggest ventures of their kind undertaken by the club. Of the original combined outlay on all three of them the net amount not yet recouped is only £141.

The finance committee is continuing to meet about four times in the year, and is performing a valuable service to the club.

On behalf of the council

A. G. HOOKE, *Hon. Treasurer*

Did You Know?

THE FORESTS COMMISSION

is responsible for the implementation of the following objectives within the area of

14 MILLION ACRES of STATE FOREST

- **TO ORGANIZE SCIENTIFIC MANAGEMENT**
  with a view to attainment of sustained yield and permanent stabilized timber industry.
- **TO PRODUCE ADEQUATE ROADING**
  necessary for management, timber extraction and fire protection.
- **TO DEVELOP SILVICULTURAL TECHNIQUES**
  to secure natural regeneration and to improve the production potential.
- **TO INTENSIFY FIRE PROTECTION**
  to ensure maximum safeguards against the worst possible forseeable conditions.
- **TO ESTABLISH CONIFEROUS PLANTATIONS**
  sufficient to supply anticipated internal softwood timber requirements of industry.
- **TO OPERATE FOREST NURSERIES**
  for propagation of stock for farm tree planting, shelterbelt development and school plantations.
- **TO CONDUCT RESEARCH**
  such as is necessary to achieve the foregoing objectives.

We Appreciate Your Continuing Interest. . . .

Thank You!

The Victorian Naturalist

Vol. 76 (4) August, 1959

Published by the

Field Naturalists Club of Victoria

In which is incorporated the Microscopical Society of Victoria

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2/6

Koala (Phascolarctus cinereus) in natural surroundings. By E. R. Rotherham, F.R.P.S., A.P.S.A.
Exposure details: Rolleiflex camera, electronic flash, Kodak Super-XX film, f/22.

Vol. 76, No. 4 August 6, 1959

F.N.C.V.

The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

This is the Brown Flycatcher (*Microeca fascinans*), which most people know as "Jacky Winter". The photograph was taken by Mr. K. A. Hindwood of Sydney and it is remarkable because the bird is completely screening its tiny nest with the breast-feathers. It seems that this is a habit of the species of *Microeca*, for when the picture appeared first in the *Victorian Naturalist* of July 1940, it was accompanied by a photograph of the Lemon-breasted Flycatcher (*M. flavigaster*) doing exactly the same thing.

Did You Know?

THE FORESTS COMMISSION

will have these facilities and major equipment in readiness for detection and suppression of forest fires during the coming summer season—

- **132** . . . . . **FOREST FIRE LOOKOUTS**
- **320** . . . . . **RADIOS—**

Central Station	1
Base Stations	38
Automatic Repeater Stations	4
Mobile Radiophones	70
Portable Radiophones	190

- **400** . . . . . **POWER PUMPERS**
- **70** . . . . . **TANKERS**
- **2,413 miles** . . **FIRELINES, PATROL TRACKS**
- **900 miles** . . **TELEPHONE LINES**
- **11,300 miles** . . **FOREST ROADS**
- **1,730** . . . . . **WATER TANKS AND DAMS**

The Division of Forest Protection expects conditions of high fire danger in State Forests this summer.

We will rely on Your co-operation. . . .

Thank you!

Editorial:

The Victorian Naturalist

Three months ago we made a major break away from an old-established tradition, by publishing a *Victorian Naturalist* which bore very little resemblance to the journal as it had appeared for the past seventy-five years. It was to be expected that such a change would not meet with universal approval, and from a few of the members of long standing there have been expressions of regret that the old *Naturalist* seems to have disappeared.

On the other hand, there have been so many indications of wholehearted approval that it is quite evident that the change is welcomed by the general body of the F.N.C.V. Moreover, the new *Naturalist* has been selling steadily in the dozen bookshops to which we have introduced it as an experiment. But what is most significant is the development of an unprecedented spate of applications for membership of the club and of new subscriptions to the magazine.

Mr. Fred. C. W. Barton, of Eagle Point, has written as follows:

> I feel moved to offer my congratulations to all concerned in the presentation of a journal designed to meet the needs of a wider section of the community and especially to stimulate an interest among the young people. My own boys showed an immediate interest in the publication, whereas in its previous form they found little that they could intelligently absorb. When we realize that the future of the F.N.V.C. and kindred societies must eventually become the responsibility of the youth of today, it is essential that an interest in natural history must be encouraged at quite an early age.

A pupil of the Lang Lang primary school has made this rewarding little comment:

> We have just received a copy of the *Victorian Naturalist* and are very pleased that it has been made more interesting for us.

Among other letters is a lengthy one from Ellen Lyndon of Leongatha. We quote the beginning and the end of it:

> I would like to congratulate you on the handsome little publication that the *Naturalist* has suddenly turned into. I think that through "Along the By-ways" we country members will get to know each other better. . . . Please don't starve us of all those serious but very instructive articles on botany, geology and aboriginal lore.

This last request of Mrs. Lyndon's brings us to an interesting consideration. In an editorial in May we said, "We shall also have a scientific section"; but the fact of the matter is that, except for an article on aboriginal artefacts three months ago, no scientific material has come to the editor's hands for a considerable time.

For many years there has been apparent the trend for scientific workers to publish their papers in newer, more technical journals. The old *Naturalist* actually died a natural death, and the new one has been brought into being so that the club will still have a monthly publication in which to continue "to stimulate interest in natural history".

Discovering Emperor Penguins

By Susan E. Ingham

(Antarctic Division, Department of External Affairs)

The first thing one learns about the Emperor Penguin is that it is apparently mad, for this majestic bird, four feet high and weighing up to 90 pounds, breeds on ice in the cold and windy dark of the antarctic winter. In fact, its breeding habits are highly adapted to the hostile environment: the egg and chick develop only slowly, so the egg is laid in May, the chick hatches in July and fledges in midsummer, becoming independent at the most favourable time of year. To protect themselves against blizzards, the Emperors huddle together in enormous clumps, carrying their eggs or chicks on their feet; and for this they need a level surface, which is usually found only on the sea-ice itself.

In 1903 only one breeding colony (rookery) was known, and another suspected, in 1912 there were two certain and two possibles, and in 1953 four certain and two possibles. But now, in 1959, we know seventeen, with three more possibles! This is due to three things: the number of research stations set up in Antarctica for the International Geophysical Year, spring and autumn travel along the coast, and the large-scale use of aircraft. It is illustrated by the discovery of six rookeries within 400 miles of the main Australian base, Mawson.

Mawson lies on the coast of MacRobertson Land, about 3500 miles south-west of Melbourne. The neighbouring coasts were visited by Australians, Norwegians and Americans in summer seasons during the 'thirties, but at this time of year the Emperors were scattered and their rookeries were not suspected. In February 1954 Mawson was founded, and the first new rookery was discovered in the following October. Two men, Robert Dovers and Georges Schwartz, were making a dog-sledge trip westward along the sea-ice, inside the protective fringe of islands. After travelling for fifteen miles they began to see occasional Emperors at cracks and holes in the ice. Nearly fifty miles from Mawson they rounded a group of islands and saw a steady stream of them, moving in single file to and from a small glacier. They turned and followed the penguins' line of march to the rookery. About 2200 downy chicks and many adults were gathered in a small valley, protected from the prevailing winds by the Taylor Glacier to the west and by steep rocky ridges to the east and south. The site receives all possible sunlight but even when a brisk wind is blowing a hundred yards away, the air in the rookery is still. The situation is almost unique among known Emperor rookeries in that the birds remain on land throughout the breeding season, only going on the ice when they leave the rookery to feed. Dovers's observations also suggest that the sea

remains open throughout winter and spring within fifty miles of the rookery, though it is more usual for unbroken ice to stretch a hundred miles or more from the coast. As a result, the Emperors of this rookery have a shorter journey in search of food.

About forty miles further west, Dovers and Schwartz saw unusually large numbers of Emperors which made them suspect that another colony might be hidden among a certain group of islands, but they had no time to spare for a search. It was not until the beginning of May 1956 that this rookery, a small one of about a thousand breeding pairs, was found. During one of the first flights ever made from Mawson, Dr. Don. Dowie, who was acting as observer, was the first to see the birds grouped on a corridor of ice between the large Fold Island to the north, several small islands to the south, and a tongue of glacier ice from Fold Island to the west. This site is not protected from the offshore winds, which are channelled along the corridor with great force, and the height of Fold Island cuts out sunlight: the harsh conditions may account for the small size of the rookery. The breeding birds move about a good deal, from sea-ice to glacier-ice and to the land-ice of Fold Island.

During 1957 the flying programme was extended, leading to the discovery of three rookeries in two months. The first, largest and most unusual is only about thirty miles east of Mawson, but its existence had never been suspected. Early in August, Flight-Lieutenant Douglas Johnston, R.A.A.F., and physicist Jim Goodspeed, returning from a flight along the coast, turned off to invesigate the possibility of landing at the Douglas Islands, about ten miles off shore. On the way they flew over a labyrinth

Emperor Penguin,
Taylor Rookery, Antarctica

of large icebergs grounded in shallow water. Among the bergs they noticed first a large brown stain on the sea-ice, then a great number of Emperors in an open space, hidden from all but aerial discovery by the height and number of the bergs. Next day the rookery (named Auster rookery after the aircraft) was photographed from the air, and a fortnight later visited by Dr. Richard Willing, Mawson's medical officer and spare-time biologist. It was also visited twice in 1958. Combining all the information, we estimate the breeding population at between eight and nine thousand pairs. The birds move over a space of about thirty acres, but do not cover more than a third of it at a time.

The rookery is clearly flourishing, and its site is, in fact, not as precarious as it appears. The huge icebergs are stuck fast in shallow water, and remain so for years; they are almost as stable as islands and protect the sea-ice between them in the same way. In the rookery area the ice is hummocky and uneven, showing that it does not always melt or break up in summer, but remains in place from year to year. A good food supply is also assured, as there is open sea for much of the year a few miles east of the berg area.

The other two rookeries discovered in 1957 have been seen only from the air. One is about 380 miles from Mawson and fifty from the second Australian sta-

Emperor Penguin Rookeries in Antarctica
Cartwheel: Rookeries discovered before 1954
Cross: Rookeries discovered since 1954

Auster Rookery—Emperor Penguins, Antarctica *Photo: R. Willing*

tion, Davis: it was discovered in late August by Flight-Lieutenant Peter Clemence, R.A.A.F., during a flight from Davis. This rookery (it has been named the Amanda Bay rookery after Clemence's baby daughter) is situated on sea-ice in a narrow bay beside a glacier tongue, which probably provides the necessary protection against the ice breaking up. Again, there is probably open water throughout the year at an easy distance from the rookery. From aerial photographs the population was estimated at between one and two thousand birds.

A month later Clemence made a long flight westward from Mawson to Enderby Land. Towards the end of the flight he found a fairly large rookery in the middle of a group of small islands off a small promontory known as Kloa Pt. This rookery has not been photographed or visited and the site has not been properly described, but its population was estimated roughly at five thousand.

Nearly a year later, in August 1958, the sixth rookery was discovered, near Cape Darnley between Mawson and Davis. The usual air route between the two stations runs inland, but on this occasion the plane, flying high, was blown northwards off course. The pilot, Flight-Lieutenant Bill Wilson, R.A.A.F., came down through cloud to get his bearings from the coastline, and found himself near Cape Darnley. Just east of the cape he noticed a line of penguins travelling on the sea-ice, and then a large circular mass of them directly under the aircraft. The position of the rookery was confirmed a fortnight later and a rough estimate made of five thousand birds. Like

Portion of Taylor Rookery—Emperor Penguins, Antarctica *Photo: J. Becherraise*

the Auster rookery, this one is among large grounded icebergs, between two and five miles from the coast, but the bergs are not as closely crowded. When it was discovered, there was open water less than twenty miles away, very convenient for Emperors feeding young chicks.

The concentration of rookeries along this six hundred miles of coastline can only be matched, at present, in the Weddell Sea, where there are five known colonies in about five hundred miles. The other known rookeries are scattered, hundreds or thousands of miles apart, but we believe that more may be hidden in suitable sites, even on well-known stretches of coast. This was demonstrated dramatically last November, when a rookery of over 50,000 pairs, by far the largest known, was discovered in the Ross Sea, one of the best-known areas of Antarctica. The nearest island, Coulman Island, was discovered and named by Ross over a hundred years ago; in the last sixty years many ships must have passed near, and in the last three years many aircraft must have flown near, but the rookery remained unknown and apparently unsuspected until a low-flying helicopter travelled directly over it.

We can, I think, safely conclude that, in spite of all the hazards the Emperor Penguin has to face, it is well adapted to life in the Antarctic, and shows no signs of going under.

Aerial Acrobats

As an addendum to his article on "The Gannets of Cat Island", in the Victorian Naturalist, *April 1959, Mr. A. H. Chisholm, of Sydney, sends this note:*

Among the many interesting facets of Donald Macdonald's article on the Cat Island gannetry, in the Melbourne *Argus* during December 1908, is a discussion of the birds' fishing technique. He disagrees with the theory that the gannet spears a fish when it dives from a height. It would, he suggests, break its neck if it did so, and he therefore argues that the bird makes its lengthy and rapid dive from the air only to gain impetus to carry it into deep water, there to catch its fish as cormorants and penguins do.

During many years, much discussion has occurred in Britain and Europe regarding the fishing methods of gannets, but even now the question as to how deeply they dive, as well as related questions, remains undetermined.

For my own part, when writing in the *Argus* over a quarter-century ago (May 1933), under the title "Aerial Acrobats", I mentioned that gannets seen fishing near Melbourne at that time often twisted and changed course during their rapid dives, an action that appeared to be prompted by the movements of fishes swimming fairly close to the surface. And, subsequently (July 4, 1933), I wrote in the same newspaper regarding the remarkable maze of bone-tissue in the gannet's skull, which appeared to serve the bird as a safeguard on its striking the water. This shock-absorbing equipment had been shown to me, at the University of Melbourne, by Professor F. Wood Jones. He, at that time, was working on the anatomy of seabirds, and he had as "assistants" a big batch of beetles and mealworms, which thoroughly cleansed every one of his beach-battered specimens. It was those insects that revealed the complicated bone-tissue in the skulls of gannets.

On the whole, it would appear that the gannet flies well above the sea in order to sight fish, and then dives to obtain its prey, not by spearing, but in more or less orthodox fashion, which explains, no doubt, why its formidable beak is equipped with serrated edges that suggest barbed wire.

F.N.C.V. GEOLOGY GROUP EXCURSION—MAY 10, 1959

Members travelled by private cars to Exford, where widespread gravels overlie the basalts about 100 feet above the present Werribee River Valley. In a section along Toolern Creek the party examined pillow lavas with sand layers between the flows, and near the spillway of Exford Dam several lava flows were seen in section, together with ropy lava and what appeared to be an eruptive vent. They continued on to a hill north of the Anakies, with numerous coarse-grained granitic tors hollowed by directional weathering. Then, from Anakie No. 1 (1310 feet above sea level), which the party climbed, there was an uninterrupted view of the other Anakie mounts, the You Yangs, Rowsley Scarp along the Brisbane Ranges, and the wide expanse of volcanic plains to Port Phillip Bay. On the west side of the mount, many well-shaped volcanic bombs were collected. The party went on to Durdidwarrah, stopping at a road cutting in Ordovician sandstones and spotted slates with minor folding; then across the Tertiary red sands of the Brisbane Ranges to the Parwan valley, where streams have cut through the lava surface to the unstable sands and clays beneath. Numerous land-slips were noted. Finally, in a clay pit, beds of kaolin and granitic sands were seen to be dipping steeply to the east about the line of Rowsley Scarp, which suggests that the scarp here may be formed by a monocline rather than a fault.

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

Leaf-curling Spiders

"Early in March, Mr. W. Oliver and I made some observations on leaf-curling spiders at Kew where we live", writes Mr. A. R. Tinckam. "One had a pear-leaf shelter with two openings, from the lower of which its legs protruded. Another was seen to pick up one of the several gum-leaves on the ground, but, finding it too hard to curl, it built a wall of web across the concave under-surface, also with two doorways, for its den. It is difficult to understand why the latter spider did not choose a more flexible leaf as there were plenty about.

"The leaf shelter is supported in a broad web, and when a fly becomes entangled, the spider dashes out, binds it with silk, then *backs* partly into its shelter and proceeds to dine. When an insect is caught on the opposite face of the web, the spider cuts out an opening and drags it through, and it repairs the break during the following night.

"Often, before approaching its prey, the spider strums the web, apparently to estimate the size and nature of its catch. A small stick placed in the web induces the strumming, and if this does not fall the spider removes it during the night.

"The upper opening of the leaf shelter allows the spider to escape if it is interfered with. It backs out. And at night it comes right out of the leaf onto the web. Should the shelter fall or blow away during darkness, the spider will, in a matter of minutes, fabricate a new one on the ground and haul it up into its web by means of a spun thread."

Unusual Birds at Rosebery

The year 1958 was one of great interest to bird observers, for many species — particularly honeyeaters — turned up unexpectedly in districts far from their normal range. From Mr. H. R. Hobson, of Rosebery, whose farm is about fifteen miles east of Lake Albacutya in north-western Victoria, come these notes on birds which he had not seen previously in the area:

In autumn [1958] there appeared the Yellow-winged Honeyeater and the Black Honeyeater, busy in the blossoming mallee-trees. Then in early spring I heard a loud, unusual call from a line of trees and, getting my binoculars, identified the Grey-crowned Babbler. The smaller White-browed Babbler is stationary here, but the bigger bird stayed about for only two days.

In October, while pumping water from a supply channel, I was surprised to find, calmly wandering quite close, a Banded Landrail, one of the most prettily-marked water birds that it has been my good fortune to see. it would allow me to approach within six feet. I once noticed him give a patch of grass a careful look and then a wide margin, and on investigating I found a half-grown stumpy-tail lizard lurking there. The landrail was about when I was working the next day, but I did not see it again.

Shortly after this, I noticed flying overhead a bird with a long beak. Noting where it landed, I was able to identify it as the Australian Snipe. It was rather wary and would not allow close approach.

This last visitor is the species often called "Jack Snipe", and the most recently adopted name for it is Japanese Snipe, for it breeds in Japan during the northern summer and visits us in Australia during our warmer seasons.

Spangled Drongo in Victoria

Two months ago, in opening the series "Along the By-ways", we told the story of one of the few Victorian records of the bird known as the Spangled Drongo (*Chibia bracteata*). Now, from Mr. Fred C. W. Barton of "Bonnie Banks", Eagle Point, comes the following note:

Description of a bird observed at "Banksia", Sperm Whale Head, on April 14, 1958—"About the size of a Magpie-lark, but with a longer tail which was forked. Colour of plumage, mainly black, glossed with green on the back; the beak slightly curved, quite stout and black in colour."

The bird was very tame and I was able to get a good look at it for quite a little while. The forked tail and the curved black beak ruled out the possibility of it being a Blackbird. Could it have been a Spangled Drongo?

The answer is "Yes, there seems no doubt about it"; and the record is most interesting from several points of view. First, the species very rarely visits this southern state; in May 1948, Mr. K. A. Hindwood of Sydney published a list in the *Victorian Naturalist* (Vol. 65, pages 4-5) of all known Victorian records, and there were only six. Secondly, the only two *proved* records, (ones based on actual specimens) were from the Gippsland Lakes, one collected by J. Leadbeater on May 21, 1885 and the other (a head only) was mentioned in *The Argus* on June 18, 1926. Sperm Whale Head, now known as the Lakes National Park, is of course in the same district.

Thirdly, this last record from the Gippsland Lakes ties in with a report by Mr. W. Hunter of a Spangled Drongo at Mallacoota about late April or early May last year. This one, too, was observed quite closely and identified beyond reasonable doubt.

The fourth point involves quite a coincidence, for, 33 years ago, Mr. Barton made a youthful error (which he later corrected) in mis-identifying a newcomer to the area—the English Blackbird—and publishing it as the Spangled Drongo at Sperm Whale Head! That old piece of history makes the present observation even more satisfying.

By Jean Galbraith

Myrtle Wattle — *Acacia myrtifolia*

Myrtle Wattle is the gay child of a hundred roads and railway sides, a denizen of both valley and hill. So far we have met only tree wattles. *Acacia myrtifolia* is a shrub, usually two or three feet high, but sometimes twice as tall.

It has ovate, single-veined leaves under three inches long, always rather lop-sided. They are usually much shorter, and as a rule less than an inch wide at the widest part, easily recognized because the edges are thickened, as if a strong vein outlined the whole leaf. Sometimes the stems, and even the marginal veins, are reddish, and always the foliage is firm. The shape reminds one of those ellipses of very early school-days—too pointed at the ends, and never the same width on each side of the axis.

At its best Myrtle Wattle is a lovely small shrub, smothered in clusters of sunshine-yellow balls; but it is a Cinderella plant, cinder-maid and princess both, for instead of the happy flower of good soils it can be a meagre, sprawling undershrub with thin phyllodes and skimped heads of only two creamy flowers, like minute paint brushes, base to base. This cinder-maid form grows in poor, dry soils and on dry hill-tops. Sometimes it achieves heads of four flowers instead of two.

The pods of Myrtle Wattle, like the leaves, have thickened margins. They are narrow, curved, and usually a little longer than the foliage. When immature they hang like a green fringe from the twigs, and when mature they are particoloured, the dark brown body of the pod showing here and there between the wavy, light brown, thickened margins. Sometimes the tips are slightly hooked.

The species is widespread in lowland areas and the foothills, and it apparently extends over most of Australia.

Myrtle Wattle, near Orbost

Photo: N. A. Wakefield

Nature Study for Schools

By Norman Wakefield

SOURCES OF INFORMATION

Effective nature study is based not on formal lessons but on observation by children. So a study of the natural phenomena or of the objects themselves provides the key to information. For instance, one learns about the Wanderer Butterfly by watching the various stages of its development—either in the garden or in a suitable cage in the schoolroom or at home—not by hearing about it or by reading a book.

In general, primary school pupils need go no further than their personal observations and the discussions and activities that arise from them. In some cases, however, questions will come up which are not answered by observation. Especially in the work of senior grades there will often be the inclination to know more about some of the objects encountered. In particular, there is the ever-present problem of identification of specimens: the quest for names by which to refer to objects that are observed and discussed.

In the June and July issues of the *Naturalist* we discussed the function of reference collections in this regard. Now we shall consider some of the main sources of information.

Reference Books

The most readily available reference books are those in the school library, and Appendix II in the 1956 nature study course deals with reference books suitable for primary schools. These are classified into four categories, with a few lines of information about each book.

Nine books are available to Victorian state primary schools on free issue from the Education Department. Of these, *Australian Nature Studies* (J. A. Leach) is by far the most important; it is actually a miniature encyclopaedia on the subject. Many teachers obtain their own private copy of "Leach", and consistent reference to it will usually obviate the time-consuming process of seeking information further afield.

The ninth edition of *An Australian Bird Book* was published recently and is much more useful than the edition referred to in the appendix.

The other three categories deal with books worth retaining or buying for the nature study section of the school library. To these one may add *Australian Sea Shells* (J. Child), which was published recently. It gives a good, brief summary of the molluscs, and deals with our common sea shells and related orders. It is moderately priced at 7/6.

Another book worthy of consideration is *Victorian Mammals* (C. W. Brazenor). It has the local advantage of dealing primarily with the species of this state, and the section illustrating dentition and skull details is an

advantage when such specimens come to hand.

To be reviewed shortly in the *Naturalist* is *Australian Native Plants for Home Gardens* (A. E. Brooks). The information therein should be invaluable to the teacher who wishes to make a serious attempt to establish native species in the school garden.

Most teachers are aware that Angus & Robertson recently published the *Australian Encyclopaedia*. Its editor-in-chief, Mr. Alex. H. Chisholm, is a very well-informed naturalist, and he was for eight years editor of the *Victorian Naturalist*. Much general information on nature is available in the encyclopaedia.

Newspapers and Magazines

School pupils should scan the newspapers for paragraphs and pictorial material dealing with Australian nature topics. In particular, the *Age* and *Weekly Times* have regular nature sections, and from time to time the *Australian Women's Weekly* features some of our fauna and flora in colour. Magazines such as *Your Garden* and *Walkabout* often include appropriate material. And we now have *Victorian Resources*, which is to be issued quarterly by the Natural Resources Conservation League.

The magazines may be kept for permanent reference, and the compilation of a well-arranged and indexed scrap-book of news clippings should be of great value.

This phase of nature study work is a departure from the idea of local observation, but through it children may, in their own time, obtain concepts of many things outside their immediate environment—for example, the very important nation-wide problems of conservation.

Folios of news clippings should be large and of the loose-leaf type, with tagged sections: mammals, birds, insects, wildflowers, national parks, and so on. This kind of project may be done either by groups or by individuals. A properly indexed school or grade folio of this kind can serve the same purpose as a reference collection, and species represented in one need not be included in the other.

Local Information

In most localities there are people who have specialized knowledge in branches of natural history and who are very willing to help with general information and identification of specimens. There may be officers of such governmental bodies as the Lands Department, Fisheries and Game Department, or Forests Commission. Bee-keepers know the eucalypts which yield nectar and the various plants that produce useful pollen.

Otherwise, there are throughout the country many people who have developed interests in the natural phenomena around them purely as a pastime. These should be sought out and use made of their knowledge.

In many cities and larger towns of Victoria, there are naturalists' clubs similar to the F.N.C.V. Teachers in appropriate areas could well take an interest in the activities of these groups, even if it were for no other reason than to acquire more nature knowledge and thus to become more efficient teachers of nature

study. From time to time reports of the activities of these clubs and their current office-bearers are published in the *Victorian Naturalist*. Some of these appeared in June and July, and others are included in the present issue.

Information Bureaux

On page 4 of the course in nature study, details are given of facilities available at Melbourne Teachers' College. A similar information service is conducted by the *Victorian Naturalist* (see "Along the Byways").

Various government institutions, such as the National Museum and the National Herbarium, will identify specimens and answer queries, but data from these sources is often rather more technical than what is needed by primary schools. Use should therefore be made of the Teachers' College information bureau, as it is familiar with the needs of schools, and government officials can thus be relieved of the task of dealing with comparatively trivial questions.

In connexion with materials discussed on pages 67 and 68 of the July issue, two corrections are necessary. Specimens left in the vapour of acetic ether will remain pliable for considerable periods. Acetic ether is, therefore, better for killing insects than ethyl ether. Methylated spirit is not "almost wholly" methyl alcohol—it is mainly ethyl alcohol with a small proportion of methyl alcohol and some other substances added. Its disadvantage as a preservative is that it has a hardening effect when undiluted, and if mixed with water it becomes cloudy and will form a deposit on specimens.

THE BOGONG HIGH PLAINS

This continues the story of the excursion last summer by members of the F.N.C.V. to the Bogong High Plains

By J. ROS GARNET

The Frying Pan is bounded on all but the south side by steep declivities and from it one may gaze over magnificent panoramas. Falls Creek has its origin there as a small morass decked with alpine plants. After our meal in the shade of a patch of old snow gums, we took the less precipitous southern slope towards Mount McKay. Although McKay is 6045 feet above sea level and is exceeded in height by only eight or nine Victorian mountains, well-made roads converge upon it, and from the highest (which is at about 5500 feet) the ascent is easily accomplished. On the north and west sides, however, the mountain falls away abruptly into the valleys more than 1000 feet below.

On the top, we were on almost equal terms with Mounts Niggerhead, Fainter, Hotham, Loch, Feathertop, Spion Kopje, Cope, Nelson and Jim. Even Bogong, 460 feet higher, seemed less dominating. The Buffalo peeped out hazily through a gap to the west, while on a perfect day one would see, to the north-east, the Cobberas, the Pilot and perhaps even Kosciusko.

It was pleasant to laze awhile on the mountain, a gentle breeze tempering the warmth of the brilliant sunshine, watching beautiful swallowtail butterflies among the flowering shrubs, perhaps gazing over the edge at the drift where pipits pattered about feeding on the seemingly bare snow surface, watching brilliantly-iridescent chrysomelids feeding on the herbage or small blue moths flitting among the tufts of snow grass. Almost reluctantly we descended, one by one, to the road, and made our way back towards Rocky Valley.

Not far from the Ruined Castle a morass occupies some acres of the flat plain. From it tiny runnels converge into a stream which tumbles down the steep mountainside. It is one of the sources of McKay Creek, along which we noted big colonies of the Bogong Daisy. Just above where it has been channelled into a small tunnel beneath the road there was a colony of this interesting plant. A few flowers were expanded in anticipation of the fine display they would make a week or so later. Picture the colony, perching on the steep slope, the long, thick, intertwining roots in the scant wet soil or sprawled on rocks washed by the cascading streamlet. For companions they had alpine heaths, sundews, rope rush, phebalium, even orchids, and other lovers of perennially moist places.

Towards five o'clock, near the Castle, our bus met the party of leg-weary excursionists who had set off eight hours earlier for a quiet ramble. An excellent dinner soon restored most of our depleted reserves of vigour, for

preparations were made for a sally up to Rocky Valley after sunset to see construction work on the wall of the dam. Work went on at night under powerful electric lamps, giving the scene below the appearance of a particularly robust fairyland. From our vantage point far above, it was fascinating to watch the scurrying euclids, bulldozers, rollers and other heavy machines, all reduced by distance and the enveloping darkness to toy size, busily adding their contribution to the 600-yard stone and earth wall which will rise 100 feet above the valley. Soon instead of grassy plain, alpine bog and acres of wildflowers, an expanse of limpid water will nestle among the rocky slopes, 5330 feet above sea level. It will be Victoria's highest lake and, though man-made, will surely enhance the charm and beauty of an already wonderfully scenic place.

Tuesday, December 30, 1958

This day was set aside for a trip to the Hume Weir some seventy miles to the north so, with characteristic promptness, we set off after breakfast. A few of us elected, instead, to explore the summit and southern valleys of Mount Spion Kopje.

For the main party it was a purely sight-seeing trip in which we had an opportunity of seeing the Mount Beauty township and the changing countryside along the valleys of the Kiewa and Mitta Mitta Rivers. Through the thoughtfulness of Mr. Hymans we lunched at a cafe at Bonegilla and, in no time, were surveying the dry spillway of the great wall which holds back the waters of the Murray and Mitta Mitta Rivers.

Nearby we met a road-block set up by the Victorian Department of Agriculture to prevent entry of reinforcements of the Queensland Fruit Fly. We passed into New South Wales and were almost immediately confronted with another problem pest—*Echium plantagineum*, known variously as Patterson's Curse, Salvation Jane, or Vipers' Bugloss. Grazing lands are pecu-

liarly rich in alien vegetation and in the north-east pest plants and noxious weeds seem to reach their greatest development. St. John's Wort, on the forested slopes, is possibly the most conspicuous of them, but in the valleys and beside the streams we observed dense patches of Vervein (*Verbena bonariensis*) and Knotweed (*Polygonum persicaria*).

The keen eyes of bird observers brought many additions to the growing list of birds seen in our travels and a number of the water birds named in Appendix 2 were noted in the vicinity of the Hume Reservoir and the Mitta and Kiewa valleys.

From the spillway we travelled along the margin of the dam to the Bethanga Bridge across the Mitta Arm of the great inland lake, thence south to Old Tallangatta to gaze somewhat sadly on its submerged relics. Fences, trees and house-tops break the unruffled surface of the water, surely bringing nostalgic memories to their former owners, living at New Tallangatta, five miles away.

New Tallangatta is a neat and orderly settlement of brashly new buildings and wide streets, planned as only a newly-created town can be. It is hard to imagine it ever maturing to the tranquility and charm of the old town which once graced the end of the Mitta Valley.

We sped on and, after a brief stop at Tawonga South, retraced our course up to the chalet. By singular good fortune and to their unbounded delight, the Spion Kopje party emerged from almost impenetrable scrub onto the road just as our bus was passing and thus the sightseers and the bushrangers returned together.

In terms which may or may not arouse the envy of the rest of the party, Dan McInnes has put on record an account of this trip to Spion Kopje:

The first leg of the journey to the summit of this impressive mountain was almost unalloyed pleasure. Our genial host, for the day shorn of the worries of studying the welfare of his forty guests, brought out his jeep and took us far on our way beyond Mount Nelson to a point from which it woud be a mere hop, step and a jump of four miles across a 300-foot saddle to our goal.

Spion Kopje is at the western end of the 2000-foot valley through which flows the Rocky Valley branch of the East Kiewa River. It and its great snowdrift on the southern face were our familiar landmark, when on the chalet side of the valley. We passed through Rocky Valley and followed the Watchbed Creek road to Holland's Knob and, from there, bounced along a jeep track, past a small rounded hill about 200 yards away, a hill which was Mount Nelson, 6175 feet above sea level, past another little hill, Mount Nelson North, six feet higher than its companion, and then on to within almost a mile of what was alleged to be the summit of Spion Kopje range.

One of the sights of the morning ride was half a dozen emus racing away from the jeep. We knew emus were on the High Plains because feathers had been found during our ramble on Basalt Hill. Encouraged by the sight of them Bob drove us further than he might otherwise have done, but, after passing a huge quartz outcrop, the track became too boggy even for a jeep, so we said farewell to the driver and marched briskly off to Roper's Hut where, as is the custom, we signed the visitors' book and passed on our way. On reaching a high point of the range it was discovered that, if we kept to the 5600-foot contour, the summit would be something like six miles further on. We were not so near our destination after all, but

Photo: Eyre Swarbreck

Earthworks and Machinery in Rocky Valley

on the high ridge above the wart-like volcanic plug called Roper's Lookout.

Two of us investigated the practicability of short-cutting across an intervening valley and were rewarded by the sight of a pretty waterfall, but somewhat subdued by a slight mishap to one of us whose foot was trapped through stepping on a loose rock. After he was released by his companion it was realized just how serious could be such a simple happening to a lone hiker. Deciding that the short cut would be preferred by all, the valley was duly crossed and the summit approached from the north, where the slope is gentle, clear of trees and carpeted with acre upon acre of daisies—Silver Daisies, Alpine Daisies, Snow Daisies, Violet Fleabane and many more. There we were, at last, on Spion Kopje, looking down on Rocky Valley and its works, and on the ski village just across the valley, but our snowdrift was out of sight, hidden by overhanging rock ledges and steep cliffs.

After lunch in these delightful surroundings we felt ready for the journey home, a walk which was not expected to be at all arduous. Our instructions for the descent were clear and simple. One hundred feet south, below the summit, would be seen the wide clearing made through the timber for the ski run which ends at a meadow near the river far below. "Just follow the ski run. You can't miss it!"

Well, we did miss it. Heavy timber and precipices caused us to abandon an alternative direct approach to the river. Instead, we veered towards an eastern gully and spent the next few hours swinging from sapling to sapling, crashing through undergrowth, clambering over tangles of fallen logs and skirting cascading creeks, until we came at last to that lovely meadow at the foot of the ski run. The skiers come down in two and a half minutes. It took us two and a half hours, but we were at last safe and fairly sound at the ski hut near the junction of Nelson and Rocky Valley Creeks, nearly 2000 feet below the summit.

Should anybody, passing that way at some future time happen upon a collection of excellent maps of the

area, may he be advised that they are the property of members of the Field Naturalists Club, and left there by a mere oversight. (A geological hammer, if found somewhere in the vicinity of Redbank Creek, might also be regarded as an F.N.C.V. relic.)

It was during our memorable descent into the valley that the curious greenhood orchid referred to elsewhere was located.

We were still a long way from home, with one more river to cross, but, after some nimble rock-hopping or just plain wading, only 500 vertical feet remained between us and the road. A little reconnoitring led to something slightly resembling a track, and this we slowly negotiated to reach the road and that heaven-sent bus at 6.45 p.m.

(To be continued)

CHARLES LESLIE BARRETT, F.R.Z.S., C.M.Z.S.

By F. S. Colliver

C.L.B., as he was known to earlier club members, was elected to membership of the F.N.C.V. on September 11, 1899, and apparently took his first active part in a club meeting on August 12, 1901, when he exhibited ethnological specimens from Derby, Western Australia. From 1904 to 1906 he acted as assistant secretary and assistant librarian; he was a committee member during 1921-23, editor 1925-40, vice-president 1929-30, president 1930-31, and again vice-president 1940-41.

The first paper given to the club was a joint effort with E. B. Nicholls entitled "Bird Notes from Olinda Vale", read before the meeting on January 16, 1905. At the Mornington camp-out over Christmas and New Year 1906-07, where the Director of Education and fifty teachers were invited to share the instruction, C.L.B., then listed as secretary to the Bird Observers Club, gave a lecture on "Wild Life at Home", and in the written record of the camp reference is made to "Mr. Barrett" as "an observer of wild life and not a mere anatomist". At the F.N.C.V. Conversazione No. 16 held on September 22-3, 1908, C.L.B. gave a lecture on "Bird Life", which the Vice-Regal party attended, and in July 1909, his lecture, "A Naturalist in Bass Strait", gave to F.N.C.V. members some idea of what was seen and done on the Ornithologists Union excursion during November 1908.

C.L.B. commenced serious writing, it would appear, as one of three friends who called themselves "The Woodlanders". They were Charles Barrett, Brooke Nicholls and C. P. Kinane. Donald Macdonald wrote a series of nature articles in the *New Idea* (Melbourne) extending from November 1903, to at least February 1905, and then gave way to "The Woodlanders", who published a series of well-illustrated articles, "Our Bush Hut on Olinda", from October 1905, to February 1906, and it is almost certain that Charles Barrett did the writing.

In November 1907, his first book, *From Range to Sea*, was published by the Wayside Press, Fitzroy, and this was dedicated to "D.M." (Donald MacDonald). It seems likely that some of the earlier articles formed part of the basis of this volume. The reader is referred to the 1950 edition of Morris Miller's *Australian Literature* for a list of Charles Barrett's writings to that date.

Enlisting in the Field Ambulance in 1916, he served in Egypt and Palestine until 1919 with the Australian Camel Field Ambulance, and also edited the *Kia-Ora Cooee* and the *Kia-Ora Cooee News*. He found time to visit the valley of the Nile and steep himself in the wonders of early Egypt, an interest that remained with him to the end.

C.L.B. was a member of the literary staff of the Melbourne *Herald* for thirty-three years, and during this time also edited the boys' paper *Pals* for the few years that it lasted. Worthy of a long life this weekly did not really catch on, and mounting costs brought it to an end. He was co-editor of the *Emu* for seven years and editor of the *Victorian Naturalist* for twelve years. The latter effort, in terms of a monthly issue including

many special numbers, is certainly an outstanding item among his contributions to the F.N.C.V.

As the *Herald* nature writer he edited the series of twelve "Sun Nature Books" which sold 666,000 copies. Among the titles were *Gems of the Bush*, *Australian Birds and Blossoms* and *The Australian Animal Book*, and a complete set of these lovely little volumes would be a worthwhile addition to any natural history or Australiana library. Besides these he also edited the "Sun Travel Books", on Central Australia and the inland, and a delightful little volume called *Piccaninnies*—all have high sales.

C.L.B. was, without doubt, the most prolific nature writer in Australia and many of his books are well known, but it is doubtful if even he knew just how many articles, nature notes and paragraphs he had written. Certainly they run into many hundreds, and one remembers for example that long daily series of small diagrams and explanatory notes on aspects of Australian natural history that appeared in the Melbourne *Sun*.

On walkabout, generally with Mrs. Barrett, he visited most parts of Australia and Tasmania. He also visited many of the islands of Torres and Bass Straits, as well as Bali, and was the first white man to set foot on some of these places. A keen collector for others, he brought back many new species in many fields, and the specific name *barretti* may be found attached to all sorts of natural history items. Many rare volumes and some unique items came his way, and he brought together an outstanding New Guinea library that now, through the generosity of his son, Major D. Barrett, will go to the nation as a memorial library.

Awarded the Australian Natural History Medallion for 1953, C.L.B. was feted by his friends, who felt that some little recognition had been made of his vast amount of work for Australian natural history.

Charles Leslie Barrett died in February of this year at the age of seventy-nine.

The writer is grateful to Mrs. D. Campbell, his daughter, to Major D. Barrett, and to Mr. A. H. Chisholm, a contemporary and fellow club member, for many of the facts referred to above.

News and Notes

NATURE SHOW POSTPONED

It has been announced that a floral festival is to be held in Melbourne in early October. As this would clash with the proposed F.N.C.V. nature show, the show committee has decided that the latter should not be held this year.

Persons who have offered to help with exhibits are to be contacted soon. They are asked to continue with their preparations. It is hoped to obtain the Lower Melbourne Town Hall for the club show, and it may be staged next year.

OBITUARY—

ANTHONY MUSGRAVE

Anthony Musgrave was born at Cooktown, North Queensland, on July 9, 1895, and joined the Australian Museum, Sydney, as a cadet on February 7, 1910. He was appointed Assistant Entomologist on June 1, 1920, and later Chief Entomologist. The latter position became "Curator of Entomology", and he held this post until his death on June 4, 1959. Between the years 1911 and 1930 he had contributed twenty-seven papers, most of which appeared in the *Australian Museum Magazine* and *Records of the Australian Museum*. His greatest work, *Bibliography of Australian Entomology*, with biographical notes on authors and collectors, appeared in 1932. This work has been of inestimable value to workers in entomology all over the world. Since 1932, in addition to continuing this important work, Mr. Musgrave had written numerous other entomological papers. It is to be hoped that the continuation of his *Bibliography* will be published in due course. Mr. Musgrave's particular interests were in Hemiptera and Arachnida, and the dipterous family Nycteribiidae. He was an excellent photographer, and collected extensively in Queensland, New South Wales, Lord Howe Island, Victoria, South Australia, and Tasmania. His passing is profoundly regretted by all who were privileged to know him.

—A. N. BURNS

Field Naturalists Club of Victoria

General Meeting—July 13, 1959

About 150 members and friends attended the general meeting in the National Herbarium. Mr. J. H. Willis was welcomed back from his trip abroad. The President announced that three members, Mr. S. C. Richardson, Mr. L. Black and Mr. R. Driver, had died recently. Mr. H. Stewart spoke in appreciation of the work of Mr. Richardson as a foundation member of the Anthropological Society of Victoria, and recalled that Mr. Black collected the aboriginal burial trees now in the National Museum, Melbourne. Members stood for a minute in silence.

The treasurer presented the annual balance sheet. It was approved and adopted on the motion of Mr. A. G. Hooke, seconded by Mr. E. S. Hanks. Mr. J. R. Garnet expressed the club's deep appreciation of the generous and valuable help that Mr. Hooke is giving to the club as treasurer. He was warmly supported.

Mr. C. Brazenor, the Director of the National Museum, who presented the 1958 Natural History Medallion to Mr. C. J. Gabriel, spoke of the long association of Mr. Gabriel with the Field Naturalists Club, as a boy since 1892, and as an adult member since 1902. He outlined some of the valuable original contributions Mr. Gabriel had made to the study of molluscs in discovering new species, publishing many papers and revising catalogues of Victorian molluscs. Mr. Gabriel's generous sharing of his knowledge and of his specimens was gratefully recognized. Mr. Gabriel expressed his thanks for the honour given to him, and acknowledged the help he had received in his early work from Mr. J. H. Gatcliff.

The President presented honorary membership certificates to Mrs. Eulalie Bennett and Mr. P. F. Morris, both for forty years' membership. In responding, Mrs. Bennett expressed appreciation of Mr. Gabriel's inspiration and help. Mr. Morris, who had been president in 1943, recalled early club associations with Sir Baldwin Spencer.

Mr. K. C. Halafoff illustrated a talk on lyrebirds with enchanting moving colour films showing them dancing, displaying, bathing, nest building and feeding chicks. He showed nests in a variety of positions, one being sixty feet up in a mountain ash. Mr. P. Bruce broadcast a work of Igor Stravinsky and then some excellent recordings of lyrebirds' songs. Mr. Halafoff showed how they were similar to the Stravinsky work in introducing different melodies while repeating themes in sequence.

Mr. H. Stewart exhibited *Eragrostis australasica* (cane grass) from Glenrowan; *Acacia aspera* (rough), and *Melichrus urceolatus* (urn heath) from Reef Hill, Benalla; *Acacia flexifolia*, and white Geraldton Waxflower. Mrs. Swaby exhibited a fibre ball, and Miss Lester a fine flower of *Banksia collina*.

The following new members were elected: Miss M. Buesst, Miss M. May, Mr. C. Baker, Mr. W. Baxter, Dr. L. M. M. Beadwell, Mr. M. F. Clayton, Mr. J. F. Curlis, Mr. C. Macrae, Mr. R. W. Parnell, Mr. L. E. Price, Mr. E. Wingfield (ordinary members); Mr. and Mrs. G. T. Thompson, Mrs. I. E. Fairhall (joint ordinary members); Miss M. Harvey, Miss A. McRae, Miss N. Robinson, Mr. B. J. Johns (country members); Mr. and Mrs. C. O. Kroker (joint country members).

Microscopical Group—July 15, 1959

At this meeting Dr. Susan Duigan, from the Botany Department of the University of Melbourne, addressed the group on "The Structure of Pollen Grains, and Their Possible Value to Geology".

The speaker dealt first with the preparation of fossil pollens for microscopical examination. Pollens are usually deposited in strata with a high organic content, for example, brown coal, peat or shales, and their fossils must be extricated from the surrounding matrix by chemical processes. The processing leaves the highly-resistant fossils intact. They are concentrated by centrifuging, then stained, and mounted in glycerine jelly.

The shape, structure and other features of pollen grains were illustrated by lantern slides, several of them showing very high magnification. Some of the fossil pollens thus illustrated were as much as sixty million years old.

Qualitative examination of fossil pollens and comparison of these with

pollens of living plants, are useful in tracing the evolution of our modern plants and determining their relationships.

Pollen analysis, both quantitative and qualitative, not only tells us which genera of plants were present during the geological periods to which it applies, but also, from consideration of the relative amounts of each kind of pollen, enables an estimate to be made of the abundance of each genus. From this and other evidence climatic conditions existing millions of years ago can be deduced.

Palynology (the study of pollen grains) has recently been used for such diverse purposes as solving crimes and determining the diet of bats.

Various pollens of both recent and fossil plants were displayed under microscopes.

At the next meeting, on August 19, Mr. P. Genery will discuss "The History of Spontaneous Generation". This talk will deal with the theories put forward to account for the presence of infusoria in water, and other things inexplicable to the early microscopists. This promises to be a novel and instructive evening, and a large attendance is expected.

Even if you are not a member of the F.N.C.V., you are welcome to attend our informal group meetings on the third Wednesday of every month. These start at 8 p.m. at the National Herbarium. There is always adequate time afterwards for conversation and the examination of specimens.

Geology Discussion Group—July 1, 1959

With fourteen members present, the July meeting was held in the National Herbarium with Mr. Davidson as chairman. Mr. Tinckam presented "The Geology of New South Wales"; this was the second in the series, "The Geology of Australia".

Mr. Tinckam outlined the major structural formations of the state, and the physiographic divisions comprising the Northern Highlands, Central Tableland, Southern Highlands and the Western Plains. The present river systems were compared with ancient streams. He discussed the wearing down of the highlands to peneplains and the occurrence of artesian basins which cover a large area of western New South Wales. With folding of the Palaeozoic rocks, mineralizing solutions invaded rocks at Broken Hill and the New England district. Extensive coal measures were laid down, interbedded with marine beds and overlain by the Hawkesbury Sandstones and the Wianmatta Shales in the Mesozoic Era. Later, many parts of the state were covered by the Tertiary Volcanics. Mr. Tinckam showed films of the Hawkesbury Sandstone and the Wianmatta Shales of the Blue Mountains district.

In "Beginner's Corner", Mr. McInnes sought information on a specimen found at Walhalla. The specimen showed unusual tubular crystals of pyrite in quartz.

Exhibits by members: minerals from New South Wales; hornblende and anorthoclase in tuffs from Mt. Anakie; calcite crystals from the Older Basalt of Cape Schanck (Mr. Cobbett); specimen showing base of basalt and sub-basaltic sands; wood stems from the sands (from 25 feet below sea level, Brooklyn sewer works) (Mr. Blackburn); common opal; perlite from southern Queensland; coloured sands from Noosa River, Queensland (Mr. Hemmy); basalt from volcanic neck; Ordovician sediments with granite veins, from Toorabue, Victoria (Miss Carolan); collection of rocks, minerals and fossils from New South Wales (Mr. Baker).

Other Clubs

Reports have come in recently from several country naturalists' clubs.

Wimmera F.N.C.—The Wimmera club has thirty-one members. Mr. A. Hicks is president and Mr. G. Preston, of Klata, secretary.

Hamilton F.N.C.—This new club recently held its annual meeting. Mr. D. W. Goode was elected president, and Mr. L. K. M. Elmore, of Hamilton, secretary-treasurer.

Creswick F.N.C.—The Creswick club is campaigning against traffic in native birds, despite legal difficulties. It has appealed to the F.N.C.V. for aid, and Council has referred the matter to the newly-formed Fauna Protection Society.

Portland F.N.C.—This active club is still flourishing. The president is Mr. C. Beauglehole, and Mr. B. D. Carthew is the secretary.

F.N.C.V. DIARY OF COMING EVENTS

GENERAL MEETINGS

Monday, August 10, 1959—At the National Herbarium, The Domain South Yarra, commencing at 7.45 p.m. sharp.

1. Minutes, Reports and Announcements.
2. Lecturettes by Study Groups.
3. Nature Notes and Remarks on Exhibits.
4. Conversazione.
5. Correspondence.
6. Election of Members:

Ordinary Members:

Mr. C. E. Isaac, 230 North Road, Huntingdale (N. A. Wakefield/A. G. Hooke)
Dr. Charles R. Green, 9 Studley Avenue, Kew, E.4 (A. G. Hooke/N. A. Wakefield).
Mr. Fritz R. Lublin, 1 Wilson Grove, Camberwell, E.8 (K. C. Halaloff/E. H. Coghill).
Mr. W. M. Spry, "Bundanoon", The Basin, Victoria (A. G. Hooke/N. A. Wakefield).
Miss Doris J. Just, Staff, Gresswell Sanitorium, Mont Park (N. A. Wakefield/A. G. Hooke).
Miss Marjorie Hopkins, 25b Mont Albert Road, Surrey Hills (N. A. Wakefield/A. G. Hooke).
(Mrs.) Phyllis E. Kitchen, 91 Berkeley Street, Hawthorn, E.2 (A. G. Hooke/E. H. Coghill).
Mr. W. G. Cook, 9 Stanland Avenue, Malvern (A. B. Court/M. Allender).

Country Members:

Mr. T. J. Howlett, "The Wattles", Chetwynd, Victoria (C. Austin/N. A. Wakefield).
Mr. J. Mellens, Wurdi Boluc, Victoria (N. A. Wakefield/A. G. Hooke).
Mr. Ronald P. Falla, "Rosecrath", Litchfield, Victoria (A. G. Hooke/M. Butchart).
Mr. J. McQueen, Girgarre, Victoria (E. H. Coghill/A. G. Hooke).
Mr. R. G. Thoday, North Road, Langwarrin (E. H. Coghill/A. G. Hooke).
Mr. Alexander C. Neave, Private Bag, Laver's Hill (E. H. Coghill/N. A. Wakefield).

Junior Member:

Miss Lesley Elizabeth Falla, Box 14, Litchfield (E. H. Coghill/N. A. Wakefield).

7. Nominations for Membership.
8. General Business.

Monday, September 14—"Soil Conservation", by G. T. Thompson.

F.N.C.V. EXCURSIONS

Sunday, August 16—Somerville to Mount Eliza. Leader: Mr. R. Hemmy. Take the 8.53 a.m. train to Frankston or meet at Frankston station at 9.55 a.m. Bring one meal and a snack.

Saturday, August 29—Botany Group excursion to Boronia. Take the 11.20 a.m. Ferntree Gully train to Boronia station. Bring one meal.

Sunday, September 6—The Geology Group will hold a Mystery Excursion. Leader: Mr. Watts. Details at group meeting.

Sunday, September 13—Maryborough and the Costick Reserve. Coach leaves Batman Avenue at 9 a.m. sharp. Fare 25/-. Bookings with excursion secretary. Bring two meals. *Please note altered date.*

GROUP MEETINGS

(8 p.m. at the National Herbarium unless otherwise stated)

Friday, August 14—Botany Group. Subject: "Orchids", by Mr. L. McCully.

Wednesday, August 19—Microscopical Group.

Wednesday, September 2—Geology Group. Subject: "Geology of South Australia–Central Australia", by Mr. Cobbett.

Monday, September 7—Marine Biology and Entomology Group. The meeting will be held in Mr. Strong's room in Parliament House at 8 p.m. Enter through private entrance at south end of House.

PRELIMINARY NOTICE

December 26 to January 3—Apollo Bay. The party will travel by parlour-coach which will be used for day trips. Fare £6. Hotel accommodation is available at £14/14/- per week. Odd days £2/5/6 for coach party. Members travelling by private cars may need to book their own accommodation.

The Victorian Naturalist

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The edible Parasol Mushroom, **Lepiota gracilenta.** Photographed at Kallista, Victoria, by Robert D. Lee

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F.N.C.V.

September 10, 1959

The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

Sixty years ago, native cats were very abundant in south-eastern Australia. They were notorious for their raids on poultry and would tackle and kill fowls much larger than themselves. In about 1902, an epidemic swept off almost the entire native cat population, and now they survive in very few places in Victoria.

The cover picture was taken by Mr. Ray T. Littlejohns at Alvie, near Lake Corangamite, in western Victoria. It appeared in the *Victorian Naturalist* in May 1938, accompanying an article entitled "The Bush by Night".

Native cats are marsupials and are thus akin to kangaroos, bandicoots and such. They are not closely related to domestic cats which belong to a different sub-class of animals—the so-called higher mammals.

The Native Water Wells of Beaumaris and Black Rock

By A. Massola
Curator of Anthropology, National Museum of Victoria

Running fresh water is scarce on the eastern shores of Port Phillip, most streams being more or less brackish. This presented a problem to the early settlers and retarded colonization. Shortage of water was one of the reasons given for the eventual relinquishment of Collins's abortive settlement at Sorrento in 1803.

To the aboriginal inhabitants, however, this was no problem. Water, clear and cool, could be obtained from a number of springs and wells. Some of the swamps would also provide a drink, and food, after a day's walkabout. That wells were relatively plentiful, though only small quantities of water could be obtained from each, can be gathered from the report of the ill-fated Gellibrand. When he arrived in Victoria, in 1836, he disembarked at Western Port and journeyed overland to the infant settlement on the Yarra. He started from Sandy Point, made his way to Arthurs Seat, and followed the coastline, past Ricketts Point, to Melbourne. He relates how, although he had no native guides, and did not know the country, each day the party were fortunate in finding "native water wells" which enabled them to quench their thirst. The last of these wells he reports as being near the beach at about seven miles from the mouth of the Yarra.

The aborigines who owned this part of the country were members of the Bunurong tribe, and, in the early 1830's, numbered about 300. To the present occupiers of their hunting grounds they are but shadowy actors in an interesting period of the history of this country, and if it were not for an occasional skeleton turned up by cultivation or erosion, and the presence of their fast-disappearing middens, they would be entirely forgotten. There are, however, the "wells" and springs, which will probably long continue to flow. It is interesting to see these become monuments to this departed race.

Whence came the numerous springs on the northern part of the Peninsula? They were the natural drains of the Carrum and Dandenong swamps, and of the innumerable depressions present between the regular series of long sand-ridges from Brighton to Mordialloc. The drainage lines of all this surface water had a north-westerly trend, and the springs along the sea-shore are the mouths of this system. As the configuration of the land changed through reclamation, sealing of swamps, construction of drains and canals, and erosion of the foreshore, many of the springs in the Beaumaris-Black Rock area ceased to flow. One of the few remaining ones is even now disappearing under an avalanche of household refuse and rubbish. In the immediate past, however, more were known, and it is as well to record them.

Beginning from Ricketts Point and coming towards Melbourne, the first well was about half-way up the cliff between the Beaumaris Yacht Club and the boat-sheds to the immediate north-west. It is a hole in the earth, about four feet in diameter. At present it is filled with rubbish to within two feet of the top, but according to Mr. Wally Goodbody, a local fisherman now 78 years old, the hole is five feet deep, and used to contain about three feet of water. It appears that this was really a "soak", which means that it could not overflow, as the mouth, or spring, must have been elsewhere. Mr. W. L. Murrell, of the Beaumaris *Newsletter*, claims that in this area the sea has encroached fifty feet in the last forty years. It is, therefore, possible that the spring is now under the sea. This soak must have been enlarged to suit the white man's need, as native wells always have a small aperture.

The second well is a hole about eleven inches in diameter, and about three feet deep. It is, therefore, much nearer to the aborigines' requirements. It has been dug in the reddish sandstone, about sixty yards along the beach towards Melbourne from the Beaumaris Yacht Club. Wally Goodbody claims that when he was a boy of about ten years the well was in operation and local people used the water. Later it fell into disuse and was eventually completely covered with sand. About forty years ago he cleaned it out, since when he has become its unofficial guardian. His job has been very difficult lately, as this part of the beach is now very popular and is frequented by thousands of people. This well is known to the old residents, and was often visited by naturalists, such as A. H. Chisholm, R. H. Croll, Charles Barrett, A. S. Kenyon, D. Donaldson and C. Daley. Crosbie Morrison led several Field Naturalists Club excursions to the spot.

Originally the well must have been a pot-hole which filled with fresh water seeping into it from the sides. The natives would be quick to take advantage of this, and in due time it would be deepened to its present dimensions. Mr. Daley and Mr. Croll measured the inflow of fresh water, and found it to be four gallons in an hour. Lately Councillor J. Berg, of the Black Rock City Council, bailed out the hole once a day for several days, and found that it refilled to the 18-inch level each 24 hours, which is an intake of 6½ gallons for that period. However, 18 inches is the maximum level of this well, so it is possible that it would still fill up at the rate of four gallons an hour until that level was reached, when the inflow would cease.

Number 3 was a well about 100 yards on the Melbourne side of the last. According to Wally Goodbody it was used, if not made, by an old fisherman, the late Peter Toy, who was in the habit of mooring his boat nearby. It was a shallow hole, more like a basin, about one and a half feet square. Unfortunately its exact whereabouts are lost, and it is either under water or covered by sand.

Number 4 is another soak, a few yards from the foot of the Municipal Tip, between McGregor and Surf Avenues. Al-

Mr. Wally Goodbody at No. 2 Well *Photo: L. Cuffley*

ready it is partly covered with litter from the tip, and it is only a matter of time before it will disappear altogether. According to Wally Goodbody it is known as the "Maori" well, because, in the old days, several Maoris were camped there. His own version of the story is as follows:

There were about twenty of them—men, women and children. The men wore trousers cut short below the knees, and the women skirts almost down to the ankles. Above the waist the men and women seldom wore anything. The bush was very thick, mostly honeysuckle and tea-trees. They got their water from a wooden cask sunk in the sand. The Maoris spoke little English, and earned their living by collecting shellfish, which they sold locally. They had flat-bottomed boats made of planks, about 16 ft. long, about 5 ft. beam, and rounded to about 2½ ft. at the end. The boats were kept at Quiet Corner. There were a lot of fierce dogs at the Maori camp. The Maoris left when I was about fifteen, about 1896. I do not know where they came from or where they went to.

Mr. Goodbody's reminiscences are very interesting. To start with he gives a clue of how, after white settlement, the native wells would be enlarged by sinking barrels, so that the quantity of stored water would be increased, although, of course, the intake would be the same. Secondly, he refers to the Maoris. Anyone who delves into the early history of the Peninsula comes upon vague references to the Maoris. However, no one can give any precise information about them. They have been supposed to have formed camps all along the fore-

shore, to have been fishermen, and to have worked in the lime kilns. The date is anywhere between 1840 and 1900. They have been said to be shipwrecked sailors, and in support of this theory there is at least one reference to Maori crews manning the sealing ships which sometimes came from New Zealand to hunt seals in Bass Strait. But one would hardly expect them to have women and children on board. The only reasonable explanation of their presence in the Peninsula, remembering that the Maoris are not an emigrating people, is the one advanced by Mr. G. Byrne, in his paper "Early days of the Mornington Peninsula", published in the *Victorian Historical Journal*, Vol. 14. He states:

> It is perhaps worth mentioning a little Maori settlement which was formed at Rosebud somewhere in the 1860's. A troupe of Maori entertainers had been brought to Australia but, probably because the venture did not prove a financial success, the company were disbanded. Somehow the Maoris found their way to Rosebud where the men became fishermen, and one or two of them were drowned in the Bay and their bodies buried at Rosebud. After a year or so, money was sent to the others by their kinsfolk in New Zealand to enable them to return home.

Nevertheless, this does not account for Maoris and their families in Beaumaris as late as 1896. It is possible that because of the original presence of these people in the Peninsula it became habitual amongst an earlier generation of local inhabitants to call any people of darker skin, such as gypsies, half-castes and some others, "Maoris". The aboriginal natives had, of course, disappeared by this time.

Gypsies did in fact settle in the district, their headquarters being at Queen's Square, between Moor Street in the west, Swan Street in the east, Bridge Street in the north, and Banfield Street to the south. In those days (the early 1870's) Queen's Square was known as Gypsy Village, and Picnic Point as Gypsy Point. It is said that they gave their names to a number of streets in this locality, such as Banfield, Carew, and Moor. It is strange that while people talk about the "Maoris", the presence of the gypsies has been forgotten—hence this supposition.

Number 5 was another soak, now lost, in the vicinity of the "Maori" well. Mr. Wood, a local resident, of Dalgetty Road, remembers using water from it as late as 1901, and Mr. Goodbody recollects that earlier than that it had a wooden lid with "Please replace this cover" painted on it.

Number 6 is 500 yards towards Melbourne from the "Maori" well, at a point called Quiet Corner. At present, this well is about 2½ feet in diameter and about three feet deep, but the top has been destroyed by the sea, so it may have been much deeper as well as narrower. It is excavated in a sandstone mass, now at high-tide level, about eighteen yards south of the wooden groyne, a little north of the line of the two beacons indicating one end of the measured sea-mile. The sandstone mass itself is about three feet higher than the surrounding rocks.

Number 7 is a group of springs at the foot of the ramp opposite the hull of the *Cerberus*, at Black Rock, in Half Moon Bay.

The *Cerberus* is such a dis-

tinctive landmark that it deserves some mention. In 1866 Sir George Verdon, the State Treasurer, secured a grant of £100,000 from the British Government towards the construction of an ironclad. The *Cerberus* was built, an armour-plated turret ship of 2,107 tons, with twin screws, armed with four 10-inch muzzle-loading 18-ton guns, and manned by 123 officers and men. It was designed especially for harbour work, and behaved very badly even in moderate seas. To bring the ship from England it was fitted with a false wooden bow and stern to give it greater stability. Even so, it was nearly lost in the Bay of Biscay. The voyage out took six months.

The *Cerberus* soon became the pride and joy of Port Phillip and the flagship of the Victorian Navy. Its distinction was enhanced by its having been fitted with electric light as early as 1879, while the streets of Melbourne were not similarly treated until 1892. As the years rolled by, and better ships were built, the *Cerberus* lost its popularity, and in 1911 was put out of commission. With the outbreak of World War I, however, it was called back to the colours and used as a floating magazine, anchored off Williamstown. With the cessation of hostilities it became a depot ship and remained so until 1926. Then it was stripped of its fittings, towed to Black Rock, filled with cement and sunk, to serve as a breakwater.

Aborigines must have used the springs which issue from the rocks on the cliff opposite where the *Cerberus* now lies. Later, early residents and week-enders deepened some of the wells, squared them off, and made veritable little basins of them. Wally Goodbody calls these "Long Bob's Wells", and claims that an individual who answered to that name had built a hut on the cliffs above and each day came down for fresh water. He may even have been the builder of these basins.

Later, with an increase in population and picnickers, who would come to the spot by horse-tram which ran from 1888 to 1914, an enterprising individual started to sell "hot water", while others would sell winkles and other shellfish in threepenny bags, complete with a large extracting pin. Soon the picnickers found Long Bob's Wells, boiled their own billies and stopped buying water. Tradition says that the water sellers retaliated by destroying the basins. Naturally, they could not stop the water issuing from the rocks, but the necessary depth for immersing the billies was gone, and once more they could sell their water.

At the present time there are three of these basins left, although in each case the retaining rock wall has been breached and consequently they do not hold water. The first of these basins is 4 ft. 6 in. by 18 in. and had an average depth of 15 in. The second is 21 by 18 in. and averaged 12 in. deep; while the third is kidney-shaped, about 3 ft. long, 15 in. wide and had a depth of 8 in.

Old-timers remember a spring on top of the cliff at Half Moon Bay. In later years it became blocked and was a constant source of trouble, often breaking out in the centre of Beach Road.

Eventually a storm drain was constructed, and the spring diverted elsewhere.

This completes the enumeration of the wells in this particular series. There are a few points I wish to make clear. These natural supplies of water were found by the aborigines, and, in some cases, were adapted to their needs by the excavation of a hole with a small aperture which they could easily cover with a flat stone to prevent foreign matter contaminating the water. The district has been settled for so long that one cannot expect the wells to have remained as the natives knew them. The one near the Beaumaris Yacht Club (No. 2 in the list) is the nearest to its original condition, although even it must have been enlarged by white men.

Early colonists, fishermen and cattlemen were certainly responsible for enlarging others by sinking barrels and cutting basins in the rock in an endeavour to increase the water supply.

It is well to remember that Beaumaris not only supplied early Melbourne with fish, but was part of a cattle run known as the O'Shannessy Estate, which extended from Mordialloc to Point Ormond. Other early cattle stations in the district were McMillan's at Little Brighton, Martin's "Moorabin" at the sea end of North Road, and Ben-ben-jin at Beaumaris.

I wish to thank a number of local residents, especially Messrs. W. L. Murrell and Wally Goodbody, for the time they put at my disposal and for much interesting information freely given, and the Mayor and Councillors of the City of Sandringham for pointing out that, although well known, the wells had never been recorded.

Addendum to "Musical Analysis of the Lyrebird's Song"

Recently an opportunity presented itself to examine the frequency range of the lyrebird's song by means of an oscilloscope, using Peter Bruce's record of that song (Columbia 45 r.p.m.). The lowest fundamental tone proved to be 400 c.p.s. (fifth octave) and the highest fundamental observed was 12,000 c.p.s. Thus the total range of the lyrebird's voice amounts to nearly five octaves, exceeding anything known among other birds. It is worth mentioning that the Columbia record does not contain any of the lyrebird's "percussion" items, whose fundamental frequencies may be even higher.

Most of the sinusoids observed on the oscilloscope contained the harmonics up to 14,000 c.p.s., though sometimes a regularly-shaped pure sinusoid, indicating a single frequency, appeared on the screen. Therefore, the opinion that the birds use only single frequencies seems to be open to serious doubt.

It should be mentioned that the record used in the test has been played many times before, so that the very high frequencies over 14,000 c.p.s. might have been partly or fully eradicated, and therefore the actual upper limit of the frequency of harmonics may be considerably higher.

This oscilloscope test has been made possible by the courtesy of Mr. George Kudis, to whom sincere thanks are due for his willingness to collaborate in this important research.

As Mr. Peter Bruce is at present making, with the author's assistance, some new tape recordings of the lyrebird's song, and has already succeeded in obtaining two full-scale songs containing some percussion items ("cymbals" and "clicks"), it is intended to examine the structure of these recordings and their frequency range as soon as the technical arrangements for further tests are completed. Until this is accomplished the above figures may be regarded as giving a rather conservative but close estimate of the range of the lyrebird's astonishing vocal abilities.

—K. C. Halafoff

Mallee and Dwarf Eucalypts

By Patricia M. Carolan

It is not generally realized that the low-rainfall "Mallee" type of country is only one of the habitats of of the mallee form of eucalypts. In Victoria, Bull Mallee, *E. behriana*, grows around Pyrete and Djerriwarrh Creeks near Bacchus Marsh on poor Ordovician soil. Numerous mallees occur on the Hawkesbury Sandstone around Sydney and on the barren plateau tops of the Blue Mountains where the annual rainfall would be over 50 inches. One of these, *E. stricta*, is planted in the Melbourne Botanic Gardens.

More interesting, however, is the adoption of the mallee type of growth by eucalypts which are normally fair-sized trees. A good place to see this is on the flattish top (about 1500 feet) of the range west of the Lerderderg Gorge about six miles north of Bacchus Marsh. All the trees are dwarf—*E. elaeophora*, *E. dives*, *E. macrorrhyncha* and particularly the Red Ironbark, *E. sideroxylon*, which is a whipstick mallee in full flower and only 3-4 feet high. The annual rainfall there would be over 30 inches, but there is scarcely any soil on the Ordovician sandstone. Bush fires may have contributed to the present type of vegetation.

Along the coast too, difficult living conditions produce dwarf and sometimes mallee eucalypts. On Wilson's Promontory a blue gum (*E. globulus*) three feet high, with big single fruits, grows within 20 yards of the sand of Squeaky Beach. Stringybarks and peppermints (*E. obliqua*, *E. baxteri*, *E. radiata*, etc.) are mature at ten feet. At Marlo facing the ocean, Mahogany Gum (*E. botryoides*) grows as a dwarf tree.

Many species become dwarf on high or exposed mountains. Other changes such as bigger fruits and thicker leaves are often characteristic. These variations have been responsible for some unnecessary splitting into new species, for example, *E. niphophila* is merely the high altitude form of *E. pauciflora*. Variations must be expected in a tree which grows from sea level (even near mangroves) to 6000 feet. Many other examples of changes due to different environments can be found.

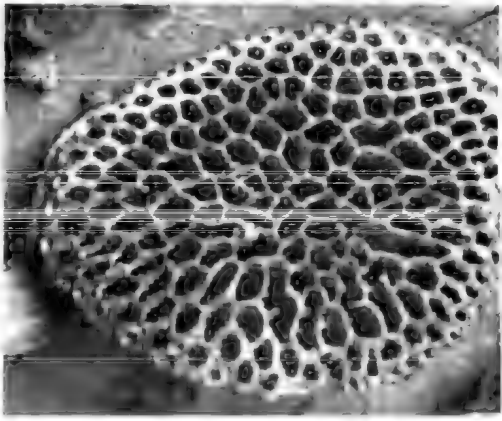
And Here are Some More

(Footnote by the Editor)

Near Mount Skene and on the 4000 feet range between the Buchan and Snowy Rivers grows the Alpine Mallee (*E. kybeanensis*), and on the rocky slopes above Suggan Buggan and Little River near Wulgulmerang in Gippsland one finds *Eucalyptus glaucescens*. Both these are typical mallees in their habits of growth.

On the coastal heathlands at Mallacoota the Bloodwood (*E. gummifera*) forms mallee thickets, and flowers, too, only four or five feet high; and at Marlo, as well as the Mahogany, the Manna Gum (*E. viminalis*) is mature at several feet and one of the stringybarks (either the brown or the white) may be seen in bloom when only two feet high!

What is it?



Perhaps you already know what this is. If not, can you make any suggestions? There is one clue: the illustration is about natural size. Turn to page 140 for the answer.

By Jean Gailbraith

Varnish Wattle — *Acacia verniciflua*

I grew up with Varnish Wattle, for it was the commonest shrub in the district. Its local name was "willow-scrub", no doubt because of its habit of growth.

Some of my affection for Varnish Wattle may spring from early memories of games amongst it, but I am sure it comes more from the distinctive beauty of the wattle—beauty of form, of fragrance, and of colour. Other wattles have these, and have them abundantly, but no two are alike, and Varnish Wattle has a distinctive charm of its own.

It is a shapely, rounded bush or small tree with slender, spreading branchlets. You could call it a tree with "good bones" — upspringing, widely branched brown stems, spreading rather than hanging—a good foundation for the branchlets.

The phyllodes are unlike any others: flat, very thin, usually sickle-shaped, narrowed towards each end, varying from one-quarter to three-quarters of an inch wide in different localities, about three inches long, and with two very conspicuous main veins.

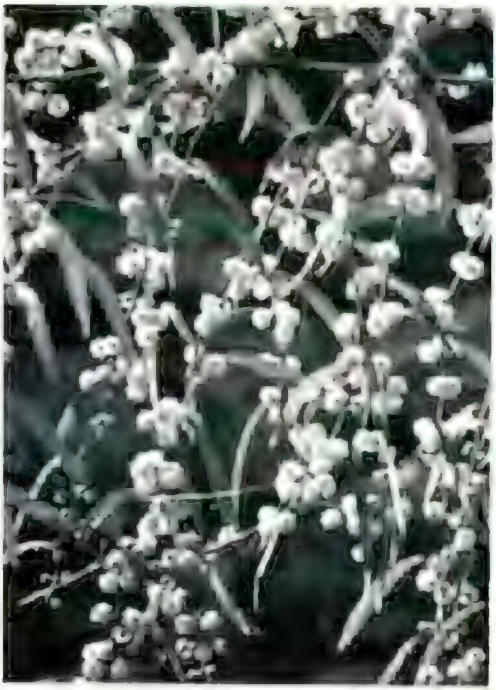
The foliage is bright green or yellowish — sometimes so yellow that a flowerless tree appears to be in full bloom. It has a pleasantly aromatic fragrance and resinous surfaces which feel like drying varnish, and give the tree its name. The young shoots are very sticky, and even mature leaves stick together when pressed. They grow on alternate sides of the stem, spreading and wide apart. This wide spacing adds to the grace of the arching twigs.

The phyllodes of *Acacia montana*, a northern species, are also resinous and two-veined, but they are much shorter and are blunt instead of pointed.

The big flower-heads grow singly, or two or three together, each on a half-inch stalk springing from the leaf-base. As far as I know, Varnish Wattle has larger flower-heads than any other Victorian species, not excluding Golden Wattle. From August to October, according to the district, each branchlet is an exquisitely graceful wreath of pale yellow and bright green, every leaf and flower-head standing out in separate, uncrowded beauty. Each globe of blossom is a tiny sun with long "rays" of threadlike stamens standing out straight from the centre, each separately visible and tipped with a pollen sac.

Primrose is the usual shade, but some plants have flowers of bright lemon-yellow, or shades between the two. In the granite country of north-eastern Victoria, where this species is called Dog Wattle, the blooms are a deep, bright yellow among very broad phyllodes.

Varnish Wattle grows in thickets that extend for long distances in forest country, and it is found in all parts of



Varnish Wattle, near Bruthen
Photo: N. A. Wakefield

Victoria except the north-west. It climbs the lower slopes and ridges, but rarely far up the hills.

Acacia verniciflua is most luxuriant in shallow gullies where the individual bushes become small trees. These are never very tall, but spread widely from stout trunks which divide into many tough brown stems. They cast a shade where few flowers grow, but a deep blanket of golden-green moss carpets the earth and clothes the fallen branches. This in turn is strewn with yellow and orange phyllodes which drop from time to time.

The lowland gully trees are greener than those in exposed places, but there is no difference in the flowers.

The National Park of South Australia

By THELMA OVENSTONE

Some years ago the Field Naturalist Section of the Royal Society of South Australia was instrumental in obtaining a tract of country near Adelaide for the preservation of flora and fauna.

The reserve consists of about 2000 acres of the Mount Lofty Ranges, about fourteen miles south-east of Adelaide. It comprises two parts: the undulating western slopes, and the deeply-dissected eastern highlands.

The park is of grey slates and quartzites, much younger than most of the surroundings, and it is close to the classical glacial beds of the Stuart Gorge. There is evidence that one of the north-south faults of the Lofty Ranges separates the western slopes from the eastern highlands.

The foothills flora extends from about 800 to 1000 feet above sea level, while that of the ranges covers from 1000 to 1500 feet. Eucalypts are distributed over the whole reserve as the dominant tree, but on the western slopes Blue Gum (*Eucalyptus leucoxylon*),* Red Gum (*E. camaldulensis*), Peppermint (*E. obovata*) and Manna Gum (*E. viminalis*) predominate. On the remaining two-thirds (the eastern highlands) Blue Gum and Manna Gum occur with White Stringybark (*E. obliqua*)* and Pink Gum (*E. fasciculata*).

Among the Red Gums on the western flats there are many shrubs, mainly Christmas Bush (*Bursaria spinosa*),* Golden Wattle (*Acacia pycnantha*), and the Native Cherry (*Exocarpus cupressiformis*).

Away from the creek, in the flats, peppermints become more numerous and Vanilla Lily (*Dichopogon strictus*), Cranberry (*Astroloma humifusum*), *Bossiaea prostrata*, Milkmaids (*Burchardia umbellata*), and Sheep's Burr (*Acaena ovina*) occur frequently.

As the land rises to the eastern highlands, the Red Gums are immediately replaced by a short, round-leaf wattle (*Acacia obliqua*), with occasional Blue Gums.

Workand Creek, one of two in the north-east section of the eastern highlands, rises in the corner of the park at about 1500 feet, where Stringybarks dominate the Blue and Pink Gums. Not far from the creek source the first waterfall is found. At about 1000 feet, where Stringybarks give way to Manna Gums, there is another. At this point the Blackwood (*Acacia melanoxylon*) grows on the richer, deeper soils of the gullies. Below the fall the Drooping She-oak (*Casuarina stricta*) occurs in some abundance. On the ridges Stringybark, Pink Gum and Golden Wattle are the main trees, while the principal shrubs are *Leptospermum myrsinoides*, *Pultenaea daphnoides*, Ground Heath and *Olearia ramulosa*.

On the slopes there are Pink Gums, Stringybarks, Blue Gums, *Banksia marginata*, *Hibbertia sericea*, Prickly Heath (*Lissanthe strigosa*), and Native Cherry.

Manna Gum is the main tree of the gullies, with Kangaroo Grass, Cranberry, Guinea Flower and Yellow Button-daisy (*Calocephalus utreus*) beneath.

In the reserve it is well demonstrated that altitude and slope markedly affect distribution of species.

* These are examples of the lack of conformity in vernacular names. In Victoria, *Eucalyptus leucoxylon* is known as Yellow Gum and *E. obliqua* as Messmate, while the names Blue Gum and White Stringybark are applied to other species. *Bursaria spinosa* is Tasmania's Christmas Bush, while in Victoria that name is applied to *Prostanthera lasianthos*.—Editor.

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

Disappearing Snails

From Mr. K. C. Rogers of "Rockbank", Black Mountain, in East Gippsland, come the following comments and queries:

Some years ago Miss Hope McPherson, conchologist at the National Museum of Victoria, was collecting native snails in our locality, and there seemed to be no scarcity of 'shell-backs' of various species, large and small. These were to be found both in dry places and in swamps or shallow water.

Since we often ride over our mountain runs mustering cattle, I developed the habit of collecting snails from time to time, particularly from the subalpine country, and sending them to the museum, where they wanted as many specimens as possible for identification.

After a lapse of a year or so I was informed they would like some more. Going on a tour of our mountain tops and valleys last January, I thought to make a collection from the various localities we rode over. The weather was hot and dry. To my surprise, though I turned over dozens of logs and stones, I didn't see a snail. It was perhaps more surprising that I could find none even among weeds or mud in shallow water, for I had formerly found them to be most abundant in such places.

Do snails burrow deeper into the ground in search of moisture in dry times? And what about those in water —do they, too, go down seeking cooler conditions?

Perhaps the exceptional heat in January was responsible for the disappearance. It would be interesting to know if and when they returned to their usual haunts. Has any reader any comment to make on the problem?

Lyrebirds in the Bogongs

"I would like to record the presence of Lyrebirds in the McKay Creek area at Bogong," writes Mr. Don. Dangerfield of Benalla. "I hear these birds each morning. They give the Whipbird call, Grey Thrush, Pied Currawong, and percussion noises evidently copied from the workmen up there hammering on steel. I have been informed that one makes a noise like the explosion of half plugs of gelignite.

There is another colony of these birds approximately a mile down-stream. They live in the scrub opposite the portal tunnel."

Mistletoe-bird in the Garden

Mr. Arthur F. Sheldon of Lilydale asks if we can suggest the identity of a bird that visited his garden on July 12 last. Here are his observations:

Attracted by a rather faint call, not much more than a squeak, I saw a small bird, mostly grey in colour, in a *Cestrum* often frequented by Eastern Spinebills. Its outstanding marking was a patch of pinkish-orange feathers on the under side only, occupying the area behind its legs right back to its vent. It was a rather dumpy little bird, boat-shaped when viewed from above and from the rear, and I would estimate barely four inches in length. Its breast was greyish, almost white, with a darker mark low down in the middle. Plate XVI, No. 20, in the 1931 edition of Cayley, shows the head and wing markings very well, but I did not see any red on its tail, which was not nearly as long as in that illustration.

It then flew rapidly along a *Muehlenbeckia* hedge, but quickly reversed and at intervals of about three feet it hovered at the tips of trailing stems of the creeper. It had to work harder than a spinebill to achieve this feat and each time it uttered a single little squeak. After doing this a few times, it settled in the creeper and began eating the fruits with apparent relish, chewing them and discarding what were apparently the seeds. After several minutes, it disappeared. I have not seen a bird like it before.

Later, I tasted the fruit and found it juicy, not exactly insipid, with a little hard pip inside.

The unobtrusive little visitor was undoubtedly a female Mistletoe-bird. The male is more often noticed, his red breast and blackish back attracting attention.

They visit orchards and gardens in the country and deposit the sticky seeds of mistletoes on the branches of a great variety of shrubs and trees. Evidence of these and the appearance of small plants of the parasites often tell us that the birds have been about even though we have missed seeing them.

Germinating Mistletoes
on Apple and Wattle Twigs

This picture originally accompanied an article entitled "Menace of the Mistletoe", by Edith Coleman, in the *Victorian Naturalist* of June 1949

Note: The feature "Nature Study for Schools" is to be resumed next month.

THE BOGONG HIGH PLAINS

This continues the story of the excursion last summer by members of the F.N.C.V. to the Bogong High Plains

By J. Ros Garnet

Wednesday, December 31, 1958

The day dawned grey, betokening mountain mists or even rain, so our plans for exploring Mount Nelson were deferred and it was decided to have a look down the road. At the upper turntable a copperhead snake, caught in the act of devouring a skink lizard, was added to David Woodruff's collection, together with a number of lizard eggs found nearby.

A short walk up a hill-side track brought us among stands of the beautiful Ovens Everlasting (*Helichrysum stirlingii*) in full bloom. The murmur of the forest was enriched by the calls of many birds, Golden Whistler, Grey Thrush, Lyrebird, Fantail Cuckoo and Crimson Rosella among them.

Later we stopped to look for the Dargo Gum (*Eucalyptus perrineana*), but instead several Mountain White Gums (*E. dalrympliana*) were inspected closely before we moved down to examine the type specimen of the Bogong Gum (*E. chapmaniana*[22]) named in honour of the late Brigadier Wilfred Chapman, a high official of the S.E.C. and, for some years, a member of the F.N.C.V. Enough manna was gathered from the tree to provide most of us with a taste of this curious sugary exudate. This is one eucalypt about which there can be no doubt as to identity, for the Commission has installed in front of it a plaque bearing the name and something of its history. Another specimen flourishes on the upper bank of the road almost directly opposite.

With lunch-time almost upon us, we drew into a convenient side road leading down to Rocky Valley Creek among a mixed forest of Blue Peppermint, Common Peppermint, Long-leaf Box and an under-shrubbery of Starhair, Elderberry Panax and Fragrant Bush-pea. After the meal most went down to a delightful spot on the creek. Among Myrtle Tea-tree, Mountain Correa, wattle and eucalypt, the water tumbled over huge mid-stream granite boulders, down to rocky pools abounding with aquatic life and decorated with almost perfectly rounded stones.

Messrs. Coghill and Hooke were convinced that they saw a marsupial mouse during the walk back from the cascades and there was no doubt about the identity of the wallaby which most saw from the bus as we were returning later in the day, nor of the two Gang Gangs—male and female—feeding on the trees within a few yards of the forty or so admiring excursionists.

At Bogong township we enjoyed a short stay in the charming surroundings despite oppressive heat and humidity. Thunderstorms rumbled high up on Bogong, Spion Kopje and Nelson,

but brought only an occasional large drop of rain, not enough to lay the dust which had spread a whitish mantle over the bus and its contents, including passengers. Ice-cream and cold cider from the café helped to wash away some, but after an hour's drive to the chalet the mantle was back. Never did travellers so relish the convenience of hot and cold showers as we did that evening.

After dinner, Mr. McInnes produced his microscope and members spent an hour or so examining his pond-life collections. There were, too, some minute red mites rather decoratively infesting both a caterpillar and a large grasshopper. The occasion was also turned to advantage by the botanists interested in minute structural features of some of their plant specimens. That evening, the excursion leader gave a short talk on alpine plant communities and the potentialities of the Bogong High Plains as a focal point of a great alpine national park.

Thursday, January 1, 1959

This was the day for an excursion to Mount Nelson and, by 10.30, with the prospect of bril-

FitzGerald's Hut
[illegible]
High Plains

liant sunshine, we had abandoned the bus on the other side of Langford Gap and set off briskly along the gently sloping approach to the summits of the two-peaked mountain. For the most part the well-defined track — almost a road — traverses a treeless plain which falls away steeply only on the north and north-east sides of the mountain. By lunch-time the party was scattered about as far as the eye could see. Some were surveying the scene from the trig. station, 6181 feet above sea level. Smoke away to the east towards Mount Wills betokened a distant bushfire which, as we later learned, it indeed was.

Many of the party, having mastered Mount Nelson and its slightly higher northern peak of quartz-veined granodiorite, descended to Roper's hut, where their names were duly entered in the visitors' book. This hut is one of many cattlemen's huts scattered along the alpine cattle trails. Usually they are built in valleys close to permanent water and sheltered from the icy winds and blizzards which descend upon the plains and mountains in all seasons of the year. Most of them are picturesque and have given shelter to all manner of travellers. With quick transport now possible with Jeep or Landrover, cattlemen have less need of huts, so, within a few years, they are likely to vanish unless some responsible authority can undertake their care and maintenance.

Except for pipits there were few birds on the heights, but lower, among the Snow Gums, ravens were plentiful and several Flame Robins were noted. The plants were mostly those already noted in other parts of the High Plains. An interesting exception was *Exocarpus nana*, the Alpine Ballart, a plant little more than four or five inches high found in a moist spot among dwarf heaths and mat plants and recognized only by a solitary fruit which persisted among the branchlets.

As the afternoon advanced the scattered party gradually reassembled, and by five o'clock the last of them (the leader) boarded the bus. It had been manoeuvred a couple of miles further up the track, and at the end of a long day's ramble this saving was much appreciated.

Two of the McInnes-Swarbreck-Woodruff team had already studied the Nelson area on their Spion Kopje trip on the previous Monday, so they spent the day on an independent excursion among the stones and rocky places elsewhere. With customary skill they managed to be in the vicinity of the bus as it sped towards the chalet, and thus they arrived back with the rest.

After dinner there was a kind of colloquium during which Eyre Swarbreck treated us to a delightful dissertation on the spider fauna of the region. He used, as apt illustration, wolf spiders which had been coaxed from their burrows during the day. Spiders, it seems, arouse interest second only to that evinced for reptiles—a subject ably dealt with on a subsequent evening by David Woodruff.

Friday, January 2, 1959

By arrangement with Mr. Fagan of the S.E.C. the morning was spent inspecting installations. First we travelled down to

Photo: Eyre Swarbreck

Pretty Valley—looking south-west towards Mount Jim

Kunzea and Orites are in the foreground, and Pretty Valley Creek in the middle distance

Junction Dam, a small reservoir fed by the Pretty Valley and Rocky Valley Creeks, and there were shown the No. 3 power station where electricity is generated as needed by releasing water through the turbines. We moved on to No. 4 station in the valley of the West Kiewa River and were taken in groups by lift 450 feet underground to see the four giant turbines. One was operating at the time of our visit.

By that time we had a clear picture of that great hydro-electric undertaking. We had seen the sources of the water and the collecting systems of water races high on the mountains, and the main storage dam nearing completion. There were the tunnels and vaults of the first power station, under construction in the bowels of a high mountain. Then came the succession of power stations, one below the other, connected to use the water from the High Plains during its descent of 4000 feet to the regulating pond at Mount Beauty. Thence, as the East Kiewa River, it flows into the main Kiewa Valley to make its placid way to the Murray.

The inspections occupied more of the morning than we had anticipated, for we returned to the chalet for lunch at about two o'clock. Too little time was left afterwards for our intended second trip to Pretty Valley. Instead we studied specimens, rested or rambled according to individual inclination. Despite the solace

of tea-urn and biscuit-tin during the afternoon, all were awaiting dinner with unabated interest.

As one room had developed into a vivarium for reptiles and spiders and a mineralogical museum, the occupants were pressed to share with the rest the interest afforded by such gleanings. Mr. McInnes responded and much of the evening was spent in surveying the mineralogy of the High Plains. What little was neglected in his entertaining discourse was amply covered during the session of question and answer which followed. As the discussion led into the field of gems and ornamental stones, attention was drawn to a well-illustrated little book on the subject, which Miss Lester offered to obtain for any who wished to learn more.

Following Mr. McInnes's references to rock decomposition, the subject was raised of nutrient qualities of High Plains soils. Miss Alison Hooke was persuaded to deal with this topic in a short talk which, except for tea and biscuits, brought another pleasant evening to a close.

Saturday, January 3, 1959

The day dawned fine and clear, ideal for the enjoyment of a longer ramble in Pretty Valley. We broke our journey there to examine some ancient Snow Gums of giant girth. Some members who had not climbed Mount McKay made that summit their target for the morning, and the indefatigable McInnes and his two young companions, John Garnet and David Woodruff, sped south in search of certain lignite deposits on Redbank Creek. The remainder left the bus on its way down to the valley and explored the steep hill-side where *Boronia algida* grew. There, near the site of the erstwhile Pretty Valley construction camp, examples of crossed dykes could be seen on the rock faces. Finally we reached the sphagnum bogs and rivulets in the basin of the valley, observing objects of interest which had escaped notice during the brief visit eight days before.

Alpine Orites (*O. lancifolia*)
This species is a feature of the High Plains flora

Photo: H. T. Reeves

We did not overstay our time there for that was the day for rides on Hymans's chair lift. So, after dinner and a little packing against the hour of departure next day, we went over to that fascinating contraption. We were sorry that the three lignite hunters missed the experience, but they arrived back too late from their excursion.

Our last evening on the mountains was drawing to a close. The Spion Kopje snow-drift had almost melted away. The sun had set with promise of another gloriously fine day for the morrow and the last of our packing was almost finished. As a finale we were treated to a talk by David Woodruff, who produced his collection of reptiles and discussed them and their kind in a very informative way. The discourse gradually merged into the "question and answer" stage, and after the inevitable but none-the-less entertaining succession of snake yarns, the gathering began to disperse. The last of the talks had been given, arrangements were completed for the departure next day and a regretful farewell was said by the leader and his family who were to leave early in the morning.

If the success of this F.N.C.V. "camp-out" can be judged by the enjoyment experienced by every one of the forty members of the party then this excursion to the Bogong High Plains may be numbered among the most successful. We saw enough to realize what a vast field awaited study and exploration by those who like to browse through the pages of Nature's book. It may be many years before another such trip to the High Plains is undertaken, but it is hoped that these notes will encourage other of our members and their friends to journey there. Bob Hyams's chalet can see to one's comfort, and, if the season is right and the weather kind, the quiet rambles among the high mountains of Victoria should be an experience to remember with delight.

(Next month: Appendix 1)

Alpine Bottlebrush (*Callistemon sieberi*)
The cream flower-spikes are a feature of our mountain shrubberies
Photo: H. T. Reeves

CORREA TIME

By A. E. Brooks

A visit to Wilson's Promontory during Easter served as a reminder that correa time was approaching. The heathlands of Yanakie and on the promontory itself were even then covered by a gay mantle of the Common Heath, *Epacris impressa*. Although the plants were low-growing, due to severe winds which at times tear across the hillsides, the colours were spectacular. There were brilliant red flowers, others of a delightful pink, some were white and still others were various shades of red and pink.

On the same heathlands were numerous plants of Common Correa, *C. reflexa*. Many had a few flowers and some were liberally covered with pendant red bells. The flowers varied, particularly in width, and many had the very broad bells beloved of correa growers.

Common Correa is variable both in foliage and flowers. The leaves vary in their roughness as well as shape, and on some plants they are unusually long and narrow. The flowers may be greenish-yellow, red tipped with green or yellow, completely red, or of a dusky-pink shade. The writer has no less than ten different varieties of Common Correa in his garden.

One of the most outstanding has very broad bells, rich red in colour with green tips. It is said to be from near Lakes Entrance in Gippsland.

Some of the varieties with narrow bells are among the easiest to propagate and to grow. One of these always has its first flowers in January and the last in October, with the peak of flowering in the middle of winter. During this long period thousands of flowers are produced.

Any plant which flowers during winter deserves serious consideration by gardeners, and one with a season as long as that of Common Correa should not be overlooked. Propagation is not difficult enough to explain why so few correas are grown. Why not try these delightful plants in your garden?

Hairy Correa (*C. aemula*), a native of the Victorian Grampians
By courtesy *The Educational Magazine*

Shortage of the "Victorian Naturalist"

At the present rate of increase in membership of the F.N.C.V. and of new subscribers to the *Victorian Naturalist*, stocks of the first four issues of the magazine in its new form will be exhausted before the end of the present club year. We expect you to keep your copies permanently and perhaps to have complete volumes bound. However, if you intend to dispose of your *Naturalists*, please consider handing them back to the club, to help offset the impending shortage. This request applies only to the issues for May, June, July and August, 1959.

Field Naturalists Club of Victoria

General Meeting—August 10, 1959

There was a large gathering at the general meeting to hear a number of subjects presented by the various groups within the club.

Mr. A. A. Baker (Geology Group) gave an illustrated talk on "captive stones"—a form of erosion where a rock, fallen from a sea cliff face, becomes imprisoned on the rock platform and, with wave action, wears itself a cavity. Most of his slides showed examples from the coast near Cape Patterson.

Miss M. J. Lester (Botany Group) illustrated her talk on Banksias with slides showing all Victorian species and habitats ranging from the Little Desert to East Gippsland.

Representing both the Marine Biology and Entomology and the Microscopical Groups, Mr. D. E. McInnes, the club president, showed two specimens of Paper Nautilus taken at Brighton and Black Rock this year, together with their shells and eggs, and coloured slides of the animals.

This exhibit promoted very much discussion. In particular, Mr. C. J. Gabriel referred to the distantly related Fairy Nautilus, and appealed to members to take complete notes of any occurrence of this species in Victoria, and to let him know.

Mr. J. Hyett stated that he has actually seen a mosquito trapped in a nodding greenhood, and was able to assert that it had turned itself around inside the flower and was emerging head first when caught. It is hoped that Mr. Hyett will supply full details of this for publication.

Exhibits included sea cucumbers and marine worms washed up at Rosebud during recent storms (Mr. Allan), Spindle Shells (Mr. C. J. Gabriel), shrubs from the Mallee and from the south-west of Western Australia (Mrs. E. Coghill), a Banksia (Mrs. Wood), and casemoths (Mrs. K. Parkin).

The secretary appealed for help in organizing gifts of garden-grown wild flowers to shows in Adelaide, Perth and Morwell.

Members were reminded of the excursion to Maryborough on September 13, and a preliminary announcement was made of a series of functions on October 17 and 18 to which country members are being invited.

The following new members were elected: Miss M. Hopkins, Miss D. J. Just, Mrs. P. Kitchen, Mr. W. G. Cook, Dr. C. R. Green, Mr. C. E. Isaac, Mr. F. R. Lublin, Mr. W. M. Spry (ordinary members); Mr. R. P. Falla, Mr. T. J. Howlett, Mr. J. McQueen, Mr. J. Mellens, Mr. A. S. Neave, Mr. R. G. Thoday (country members); Miss L. E. Falla (junior member).

Botany Group—July 17, 1959

At this meeting talks were given by a number of members. Miss M. Lester showed transparencies of fungi seen on a recent group outing to Begley's Bridge. Her other slides were of species of *Banksia*. Mrs. Ovenstone spoke on the National Park of South Australia (reported on page 129). Mr. Tinckam showed specimens from trees of western New South Wales.

A group camp-out at Brittannia Creek was tentatively arranged for November 14 and 15.

F.N.C.V. Library

Members are reminded that books borrowed during June, or earlier, are now due for renewal. Books may be borrowed for a maximum of six months, but must be renewed every two months in case other borrowers are waiting. The following books were borrowed at least six months ago and are due for return:

Showalter: *Wonders of the Insect World*

Curran: *Insects of the Pacific World.*

Wayside and Woodland Trees.

Laseron: *The Face of Australia.*

Chisholm: *Bird Wonders of Australia.*

Ward and Whipple: *Freshwater Biology.*

Garden Islands.

Pritchard: *History of the Infusoria.*

The co-operation of members will save the club much time, trouble and

expense in sending out reminders. Where reminders are ignored, action will be taken for recovery or replacement of books. Several recent issues of periodicals are also overdue. Members are reminded that current periodicals may be borrowed for *one month* only. The librarian may be contacted between 9 a.m. and 5 p.m., Monday to Friday, at FB 1825, extension 7.

News and Notes

Native Plant Display

The Beaumaris Tree Preservation Society will hold its annual display of native plants at the Jack and Jill Kindergarten, just south of Balcombe Road, between Reserve Road and Hayden's Road, Beaumaris, on Saturday, October 3, 2 p.m. to 9 p.m., and Sunday, October 4, 1.30 p.m. to 5 p.m. All flowers in the show are from cultivated plants and are correctly named. Many are available from local nurserymen.

Exhibition at Portland

The Portland F.N.C. has arranged an interesting programme for its annual Wild Flower and Natural History Exhibition, which will be open from 2 p.m. on Thursday, October 15, to 5 p.m. on Sunday, October 18, with evening sessions on the first three days. Proceeds will be used in fencing reserves. All field naturalists and their friends are cordially invited to attend.

Natural History Survey

Mr. Allan M. Fox, Hon. Organizing Secretary of the Caloola Club of New South Wales, has written to say that his club is organizing a natural history survey of Nadgee Faunal Reserve, to be held during the midsummer vacation. The Illawarra Field Naturalists are willing to join the survey and other kindred bodies are invited to do so. It is felt that the survey may be useful in understanding the adjacent areas in Victoria. Entry to the reserve will be made by boat from Mallacoota, enabling painless transport of three weeks' food and equipment. It is proposed to leave Mallacoota on December 27 and return about January 12. Mr. Fox's address is 90 Yathong Road, Caringbah, New South Wales.

Combined Week-end

The F.N.C.V. invites country members and other Victorian naturalists clubs to take part in a combined week-end on October 17 and 18. The programme will be:

Saturday afternoon, October 17 — Short excursions around Melbourne on special subjects such as geology, botany, marine biology and birds.

Saturday evening — Talk by Mr. J. H. Willis, entitled "The Challenge of a Changing Scene".

Sunday, October 18—Full day excursion to Kinglake, leaving Batman Avenue at 9 a.m., and led by Mr. J. R. Garnet.

Will those who wish to take part please inform the excursion secretary as soon as possible, giving details of the type of excursion preferred on Saturday and whether transport is required. *Will all country clubs please accept this as a personal invitation?*

MARIE ALLENDER
Excursion Secretary
19 Hawthorn Avenue
Caulfield, S.E.7.

What is it?

(Make sure you have looked at page 127 before reading this.)

If you haven't guessed, the photograph is of a fungus. It is named *Hexagona gunnii* (from the Greek *hexagonos*, having six angles, and in honour of Ronald Campbell Gunn, an early Tasmanian botanist). There is no common name for this species, but it could well be called "Honeycomb Fungus". It grows on dead eucalypts or on sticks lying on the ground. The length rarely exceeds two inches, and from above it is not very conspicuous. The picture is of the under surface, and it illustrates the character of the family Polyporaceae. This is the scientific name of the polypore family—fungi with many holes—but in most of the other species the pores are tiny and very numerous.

—Submitted by R. D. Lee

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Australian Native Dog or Dingo, Zoological Gardens, Melbourne. Photographed by Edward R. Rotherham, F.R.P.S., A.P.S.A.

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The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

This is *Trochocarpa clarkei*, a dwarf heath which is not known from anywhere but the highlands of Victoria. The edible berries are bluish-purple, giving the plant its popular name "Lilac Berries", though it is also referred to as Wheel Heath. These specimens came from one of the heads of the Yarra River, almost on the Great Dividing Range. The photograph is by H. T. Reeves, and the reproduction shows the plants about natural size. This picture first appeared in the *Victorian Naturalist* in February 1945, accompanying an article called "Tooronga Sub-alpine Flora" by J. H. Willis.

Forest Reserves for Recreation

(Contributed by Public Relations Section, Forests Commission)

In May 1958, Mr. A. O. Lawrence, Chairman of the Forests Commission of Victoria, announced that Victoria's first "forest park" had been formed by the consolidation of the Sherbrooke and Monbulk forest areas. Forest parks are new to Australia, but the term is commonly used in Great Britain and New Zealand to distinguish recreational areas and sanctuaries from commercial forests. Sherbrooke Forest Park is typical of these reserves, which are managed by a committee appointed by the Commission and developed for the preservation of native fauna and flora and for the education and pleasure of the public.

Sherbrooke is only one of the many areas of Victorian bushland reserved by the Commission. These reservations include "scenic reserves": blocks of forest that usually have a road frontage and extend some distance from the road. These areas will be developed with walking tracks, picnic places, fireplaces and sanitation. Among these are the You Yangs Scenic Reserve, the 950-acre area well known to naturalists as a haunt of native birds of many species; the Grey River, Mait's Rest, and Calder River Scenic Reserves in the Otway Ranges in south-western Victoria; the Victoria Mill Reserve, where eighty-one acres of

[illegible]

messmate and manna gum have been preserved, and the Fern Tree Water Falls Reserve, both in the Mount Cole State Forest; the Toorloo Arm Scenic Reserve in the Lakes Entrance district; and another area that needs no introduction to Victorian naturalists—Hattah Lakes, a sanctuary and breeding ground for waterfowl of many species, forming part of the 44,000-acre State Forest in the north-west.

The snow sports enthusiasts have not been forgotten in the reservation of forest areas for recreation. At Mt. Buller, 170 miles from Melbourne, an area of 2079 acres has been set aside as the first of Victoria's "alpine resorts". Controlled by a committee of management, Mt. Buller Alpine Resort is open for the development of ski-ing grounds and alpine villages. Among the many projects completed in the Buller area is the Helmut Kofler Hutte. Built by the Forests Commission and opened by the chairman in June 1959, it will serve as a canteen-shelter and as a rescue base for lost skiers.

In addition to the larger reservations, many "roadside reserves" similar to the one at Myers Creek, Healesville, will be selected for reservation, providing picnic places where travellers may stop and boil the billy. Adding to the area reserved for the use of the public, there are also "special purpose reserves" such as golf links, camp sites, picnic places and school endowments, all extending the Commission's principle of forest areas preserved for the education and pleasure of the people of Victoria.

Observations on the Paper Nautilus

By D. E. McINNES

On May 31, I was opposite North Road at Brighton, getting sea water for my marine aquarium and mussels to feed pet sea anemones. Investigating a disturbance in the shallow water nearby, I was surprised and delighted to find a Paper Nautilus. The creature, one of the group to which the octopus also belongs, was inside its shell, presenting an array of suckered tentacles and with the siphon projecting a little.

Apparently it had been stranded among the rocks by the receding tide and was making desperate efforts to escape. It was the spouting of jets of water from the siphon that had attracted my attention. I lifted the nautilus into a large plastic basin of water and carried it back.

The beautiful shell—really an egg case—measured seven and a half inches across and the animal was quietly pulsing water out from the siphon. A few tentacle tips were waving about and what seemed to be a flat sheet of suckers was holding the nautilus to the basin. At home the animal began squirting water harder through its siphon, causing it to bump the end of the basin. This seemed to cause it to "panic", as it squirted harder, the water coming right out of the basin. Then came the ink which these creatures pump out to help them elude their enemies.

Having a spare aquarium ready for freshwater fish, I poured the salt water from the jars into the tank. While being transferred from the murky fluid to the tank, the animal fell out of the shell. This revealed a mass of eggs much finer than sago and enough to fill a small jam-jar. In the marine aquarium the egg case floated with the narrow, darker part above water and the eggs retained within it.

The nautilus was put into the second tank, and immediately the water was discoloured with ink, and the animal had changed from its original dark-brown to a dull-grey.

It had eight tentacles, the longest ten inches in length, just like an octopus, except that two were flattened at the end with quite a number of suckers on each flattened part. These are the two special arms that secrete

Egg case of Paper Nautilus, with the animal in it

and form the egg case. The creature had two prominent eyes and a bag-like body about the size of an orange.

I put the egg case in with the nautilus wondering whether it might return to it, but at no time did it seem to be interested in anything, even when touched.

My son noticed that the eggs in the shell seemed to be moving, so, dipping some out with a pipette, I placed them in a flat glass dish under a microscope. What a sight! Some had hatched and the minute individuals, similar to the parent, were using their water jets to propel themselves.

In the tank they look like the common "water fleas" (*Daphnia*) seen in pond water. A few kicks upward, then a rest and a slow sinking down, then more spurts upward, and so on.

Under the microscope, with a magnification of about 100, one saw first the two bright eyes, quite large in proportion to the body. In some of the eggs the two red eyes were most striking and formed a fifth of the embryo.

An opaque part can be seen near the body, like a black "ace of hearts", then the tiny tentacles waving about; and one can see the tiny creature "breathing" water out through the siphon. But the most interesting are the colour cells of the baby nautilus.

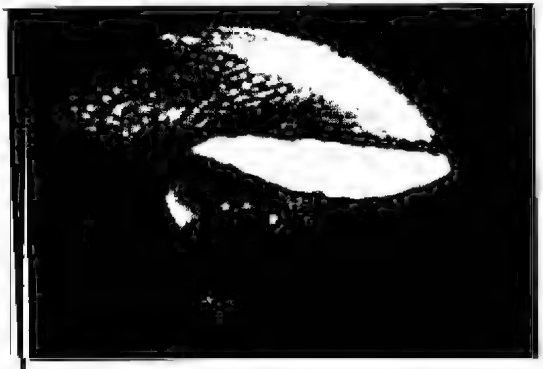
You see tiny red dots that change to larger orange dots and then to larger spots of greenish shade. These constantly change, quickly and with no apparent order, as though not yet under control.

Further observation showed just how these spots changed colour. If you take a piece of thin rubber sheet and stretch it, it will become a lighter shade, and if stretched further, it becomes semi-transparent. This is what happens to the colour cells. The small red cell is stretched out and becomes orange. It is possible to see where the muscle threads are attached around the colour cell, which is pulled out to little points at each thread. Even the muscle threads can be seen if the adjustment of the microscope is right. Stretched to their utmost the cells are greenish yellow.

The mass of eggs was in all stages from "new laid" to fully hatched, the new ones white with two red eyes, and later stages orange but without movement.

As there seemed small chance of the nautilus surviving, I placed the egg case in the other marine tank, and soon dozens of little ones could be seen swimming about. Next morning, there was no sign of life in the nautilus, and her last resting-place is in ten per cent formalin.

The young ones also disappeared in the tank, probably



The egg case is almost completely covered by the membrane which secretes it

due to the prawns that were already there. Fortunately, quite a number remained alive in the small basin on my desk and so were exhibited at the following meeting of the Marine Biology Group of the F.N.C.V.

All efforts to hatch out more young ones have been unsuccessful. The eggs are being attacked by fungus, and to avoid losing them all most of the older ones have been preserved in formalin.

On Queen's Birthday, between Ricketts Point and Quiet Corner, Black Rock, another nautilus shell was found with the live animal in it.

Remembering the inky mess with the first catch, I annoyed the creature until it ejected its fluid and, placing it in clean sea water in a basin, drove to the residence of Mr. E. S. Hanks with a request that some photographs be taken.

The nautilus created an inky mess again, but to everybody's surprise the beautiful white shell was completely covered by a blotchy purple skin. When touched it gradually receded under the shell. It was a membrane attached to the special arms which secrete and form the shell. Until this membrane is seen covering the whole shell, it is difficult to imagine how a tentacle could possibly form the beautiful egg case.

Hoping that this time I would be more fortunate in keeping the exhibit alive in the aquarium, I rushed it home, but the animal was dead the same evening. The eggs are in the tank and although none has hatched at the time of writing, there are many just ready to break out and swim about.

Note: Paper Nautilus is the popular name for *Argonauta nodosa*, which is in the order Octopoda (eight arms) of the subclass Dibranchiata (two gills), class Cephalopoda, phylum Mollusca.

The generic name *Nautilus* belongs to the Pearly Nautilus, which is not the sailor that its name suggests but lives at moderate depths in some tropical waters, pulling itself around on the bottom or swimming just above it. It lives in a chambered shell, has numerous retractile, adhesive arms without suckers, and has no ink sac. The shell is formed by a mantle. *Nautilus* is in the subclass Tetrabranchiata (four gills), of which it is the only living member, the group being notable mainly for the fossil ammonites, and for this example of confused naming.

Review

"THE BIRDS OF SYDNEY"

This welcome addition to our regional bird books appears under the authorship of two of Australia's leading ornithologists—K. A. Hindwood and A. R. McGill. It is published by the Royal Zoological Society of New South Wales, and the price is 12/6.

The survey covers the County of Cumberland, an area of about 1650 square miles. Bounded as it is by sixty miles of coastline and several rivers, and including such diverse terrain as swamp and rain-forest, this area is naturally rich in bird life. In all, 377 out of Australia's 700 species have been authentically recorded as inhabiting or visiting the area, and many have nested there.

The 128 pages of text comprise field identification marks as well as notes on such points of interest as numbers, distribution and migration. In addition there are twenty-eight half-tone reproductions of very beautiful photographs, and for those desiring further information, the relevant numbers of plates in *What Bird is That?* are indicated.

Fifteen species of introduced birds found in the county are also described, so that complete coverage is given.

The authors are to be congratulated on a book that is at the same time comprehensive and concise.

—I. P. HANKS

Straight Wattle — *Acacia stricta*

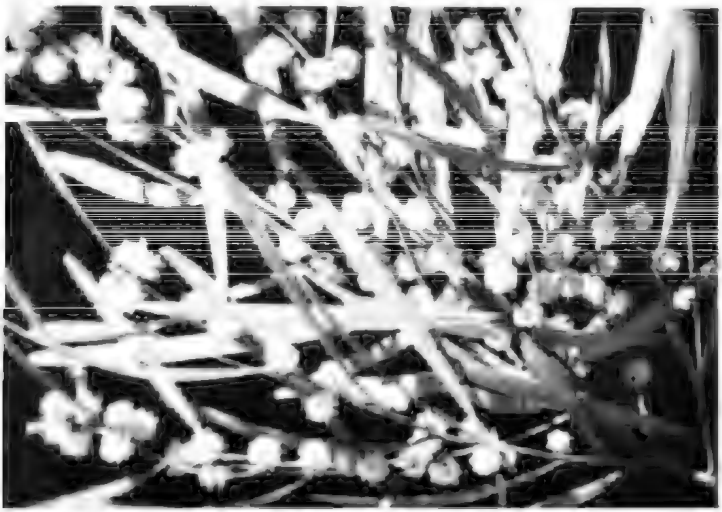
Straight Wattle seems naturally to follow Varnish Wattle, for they very often grow together. Both are shrubs with relatively pale yellow heads of bloom at the bases of flat phyllodes two or three inches long. Yet how different they are.

Straight Wattle holds itself stiff with branches erect, whereas those of Varnish Wattle curve outward. The leaves of the former are straight instead of curved, upward-pointing instead of spreading, dull green and thick instead of bright green and thin, blunt instead of pointed, and with one main vein. The flower-heads of Varnish Wattle are large and light as thistle-down on their stalklets; those of Straight Wattle are small and dense, nearly stalkless, pressed close to the stems, like yellow beads threaded in clusters of two or three on alternate sides.

Sometimes, when Straight Wattle grows in unbroken thickets in good moist soil, the foliage becomes a little looser and the flowers are larger and brighter and more abundant. Nevertheless there is no mistaking the species. It still has blunt smooth leaves with one main vein, stems and leaves upward-pointing, and characteristic short-stalked flower-heads close along the stems.

There is one form of Straight Wattle though which has a special charm. On first acquaintance I did not know what it was. The bushes grew on an exposed windy headland, whipped by spray. They were dense and wide-spreading as coastal shrubs are, and they were pale silvery-green. I have not seen them in flower, but the beauty of their foliage made them shrubs to remember. Only after half an hour's elimination of one species after another did I realize that they were Straight Wattle in seaside dress. The colour is due to a protective clothing of flat silvery scales.

When the fruit of Straight Wattle develops, the tree is suddenly graceful, with the beauty of a live oak hung with moss. The very narrow straight pods, about four inches long, hang in thousands over the tree, a light fringe of green or brown. The pods are only an eighth of an inch wide, with narrow-oval raised places marking the position of seeds.



Straight Wattle from near Cann River

Photo: N. A. Wakefield

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

Lyrebirds at Mallacoota

Mr. Frank Buckland is a resident of Mallacoota, the most eastern township in Victoria. His home, on a property which he calls "Sunny Corner", commands a superb outlook over the main lake, with the Howe Ranges and Gabo Island in the distance.

In previous years, he farmed a small property situated on Harrisons Creek, the north-eastern reach of Mallacoota Inlet. From there, cream was transported eight miles by boat to the township and thence a hundred miles by road to the Orbost butter factory.

In such a secluded spot there was ample opportunity for nature observation, and we have prevailed upon Mr. Buckland to place some of his experiences on record. Here are some notes concerning the behaviour of lyrebirds:

The late Crosbie Morrison was very interested in a remark the writer once made to him, about a male lyrebird flying across Harrisons Creek. This bird, a very fine male specimen, frequently crossed the creek in order to feed in a small patch of very dense wattle scrub. Where he crossed, the water was almost a chain wide and, with his long tail streaming behind, he made a very fine sight.

Mr. Morrison said it was the only case in his knowledge of a lyrebird flying across a stream of this nature. The usual thing was to cross over on a fallen tree, or, if none were available, simply to remain on the side where the bird happened to be.

In the same creek I observed a female lyebird taking a swim—not only once but on several occasions, and always in the same spot. The procedure was to walk down a fallen tea-tree log, the end of which was submerged in the water, step in, and swim rapidly in a circle about twelve feet in diameter back to the point where she had entered the water. She would climb back onto the log and commence a toilet, by running her beak through her feathers and vigorously shaking them. When this was completed to her satisfaction, she would enter the water

again, have another swim over the same distance, then come out onto the log once more. But the second time, after ruffling her feathers a few times, she would run rapidly back into the thick scrub bordering the creek at this point.

Association of Rare Wattles

"Within a ten-mile radius of my home at Black Mountain," Mr. K. C. Rogers writes, "it is interesting to note the distribution of some wattles. There is probably no species more attractive than the Snowy River Wattle (*Acacia hunteriana*), which grows in profusion along the Snowy for many miles.

"It is a rather tall, spreading shrub of open growth, with short, narrow 'leaves'—graceful at any time, but when in flower the slender branches become masses of misty gold.

"Though it seemed to be strictly confined to the Snowy Valley, it has since been noticed on a hill-top overlooking the Buchan River about fifteen miles to the west at an altitude of some 3000 feet.

"Now, *Acacia hunteriana* has been found, at much the same altitude, on a spur near Splitters Creek, a few miles west of Black Mountain.

"Growing with it is a patch of Boxleaf Acacia (*A. buxifolia*), not known elsewhere in Gippsland, as well as the Ovens Wattle (*A. provissima*), which is quite uncommon here. With these three grows the small Ploughshare Acacia (*A. vomeriformis*) which is widespread.

"Can botanists suggest why species rare in a district are often found together in a restricted area, particularly when that spot seems to have no unusual features of soil or climate?"

Bird Notes from Tyers

From Miss Jean Galbraith of Tyers, via Traralgon, come these observations:

I am writing with a friendly Yellow Robin feeding on the table beside me. It always comes in for a last meal at dusk—flying into the lighted room between half-past five and six o'clock. It was six tonight.

Has anyone had Satin Bower-birds visiting the garden when there were no pittosporum fruits ripe? Their visits here are always when the fruit is ripe. There was an abundant crop here last year and the birds stayed until late October. This year there were few berries and they finished them and left at the beginning of August.

The fruits of Sweet Pittosporum are not the only item of the Satin Bower-bird's diet, though it is certainly partial to them. Some years ago, Mr. Stephen Berrigan wrote that a bower-bird had taken up residence at his home in East Malvern.[9] His letter contained this comment:

His staple food is pittosporum berries. The pittosporums are in full fruit and I suppose this is the big attraction.

In about 1947, the Satin Bower-birds descended upon Cann River township in force, to feast on the dark blue berries of Virginia Creeper, and in East Gippsland they are notorious too for their raids on ripe fruit in household orchards.

Identification of Specimens

From Mr. F. J. C. Rogers, Moorooldbark State School:

1. Cluster Pomaderris, *Pomaderris oraria* (Balnarring). This is a lover of limestones and shelly soils. In some books it is erroneously referred to as *Pomaderris racemosa*.
2. Lance Beard-heath, *Leucopogon lanceolatus* (East Gippsland).
3. Leper Wattle, *Acacia leprosa*.
4. Black Wattle, *Acacia mollissima*.
5. Prickly Moses, *Acacia verticillata*.
6. Early Black Wattle, *Acacia decurrens*. This is not a native of Victoria; it has been introduced from New South Wales.

[9] See "Bower-bird Visits Melbourne", *Victorian Naturalist*, December 1956 (Vol. 73, pp. 116-24).

Nature Study for Schools

By Norman Wakefield

EXCURSIONS

The effectiveness of nature study as a primary school subject depends on outdoor observation by the pupils. A lively interest in fauna, flora and country-side must be maintained, and sometimes the foundation of this interest needs to be laid.

Continuous observational contact with the immediate environment, in any locality, must result in the development of an appreciation of the simple truths that are the *basic ideas* indicated in the 1956 nature study course.*

Most observations by children will take place outside school hours — during week-ends and holidays, and on the way to and from school. This may be supplemented by attention to the environs of the school itself, during recess periods, either without the teacher or with his casual participation.

There is really no clear-cut line of demarcation between this kind of observational activity and what we may call nature study excursions. The latter are conducted in a more or less formal way but the material encountered is of the same kind.

In rural areas there is an obvious abundance of nature subjects to be investigated — infinitely more than teacher and pupils can become familiar with. In towns and cities, where the natural country-side no longer exists, the material available for nature study is not so obvious. Nevertheless, even in the vicinity of the innermost city school, there is more to be drawn upon than can be adequately dealt with in the limited time available for the subject in the school time-table.

On page four of the nature study course, some concise instructions are given for conducting excursions. It is made clear that the "excursion" is not necessarily an expedition to some distant place. Emphasis is on outdoor periods in places close at hand, and it is stated that "longer trips are better confined to pupils in upper grades".

It is said, too, that careful preparation is necessary for the success of excursions. Whether this is true or not depends on the circumstances—on the attitude of the pupils and perhaps on the size of the group taking part. Certainly, excursions with a specific aim, such as bird observation on Bird Day, are useful. But experience has shown that another principle of the new approach to nature study can apply also to the excursion—"informality of approach . . . should be the key-note".

The writer has very pleasant memories of rambles in the bushland surroundings of several of the small rural schools in East Gippsland, with no planned pro-

* Course of Study for Primary Schools. Nature-Study. 1956. Education Department, Victoria.

gramme whatsoever. The most interesting things that the children found were the centres of attention, and the teacher rarely knew what the next focal point would be. There is no doubt that this procedure created a more lasting impression on many youthful minds than any organized nature work did, and many of those scholars of ten or twenty years ago still retain, as adults, a keen interest in their natural surroundings.

Occasionally, there *was* a major excursion. Advantage was taken of the regulation which permitted the school committee to allow a holiday for a local festivity on one day each year. On several occasions this took the form of a combined parents' and children's picnic to the seaside. The sea was fifty and seventy miles respectively from two of the schools concerned, but the effort in time and money was more than worth-while, for several of the pupils had never seen the ocean. The rollers coming in on the Ninety Mile Beach must have been awe-inspiring in the circumstances, and, of course, there were the shore birds to observe and a wealth of sea shells and flotsam and jetsam to be examined.

The reproduction at the head

Teachers' College students at the Royal Potato Garden

of the feature "Along the Byways" is of a photograph taken on a school picnic. The group is of pupils of the Cann River State School investigating the granites at Genoa Falls during a bus trip to Mallacoota about twelve years ago.

The idea of an annual school picnic to the seaside, to a national park or to a similarly suitable place for nature study, is passed on to teachers and school committees for their earnest consideration.

At large schools it is often impracticable to arrange a series of excursions even to places close at hand. The size of some grades makes it virtually impossible to organize effective outdoor nature study. When the problems of school accommodation and adequate staffing have been resolved, nature study as well as other subjects will benefit. In the meantime, the task of providing for ample nature observation will stand as a challenge to the initiative of many teachers.

Though the surroundings of the suburban school may not be as prolific in nature material as those of the rural school, the Melbourne area has unique facilities for several excellent major excursions. For the teachers who can take their grades away from the classroom and school occasionally, here are some suggestions:

Royal Botanic Gardens

Most of the material in these gardens is exotic and therefore outside the scope of primary school nature study. However, there are two outstanding features that may be used to excellent advantage.

There is the "Australian Border", a long narrow strip in which native trees, shrubs and herbs are grown. It is on the Domain Road side of the gardens, extending from the entrance nearest the Shrine (Gate F) to the Eucalypt Lawn.

Each plant has a label indicating its name, family and distribution, so there is no problem of identification. Furthermore, during any season of the year, at least some nectar-producing species are in bloom, and honeyeaters may be seen feeding among them.

As far as school nature study is concerned, however, the bird-life on the lake is the great attraction. Black Swans, Black Duck, White-eyed Duck (or "Hardhead"), Coots, and Dusky Moorhens will flock to be fed on scraps of bread. A pair of Cape Barren Geese wanders on the lawns. Generally there are cormorants and gulls there, and occasionally grebes and kingfishers may be seen.

Amongst the shrubbery and trees, or on the lawns, there are usually Grey Fantails, Willie Wagtails and families of Blue Wrens, as well as several species of introduced birds.

Maranoa Gardens

Many years ago, the Camberwell City Council acquired a property in Balwyn in which native plants had been established, and they have since developed it into a really outstanding garden of Australian species. To reach Maranoa Gardens, take the Mont Albert tram along Whitehorse Road to stop 54 or 55, then walk along Kireep Road or through Beckett Park to the gardens.

Early October is an ideal time for a visit, for then most of the trees and shrubs are in bloom. These include many wattles, eucalypts, banksias, mint-bushes, waratahs and a host of grevilleas. An outstanding feature is the garden bed where boronias and thryptomene are massed.

Only a few of the plants have been provided with labels, but in this case names are of secondary importance. The lesson Maranoa Gardens teaches is that not only are a vast number of native Australian shrubs strikingly beautiful but also they respond very well to formal cultivation.

In the neighbouring Beckett Park, many Australian wildflowers survive. They include Early Nancy, Milkmaids and other lily species as well as a few kinds of orchids.

Bayside Beaches

From the Sandringham rail terminus, the passenger buses that run along Beach Road provide means of reaching a number of interesting bayside beaches. That at Ricketts Point is one of the most suitable for an excursion.

Although the rock pools are not rich in marine life, there are univalves, bivalves and limpets of several kinds, and the remains of crabs, chitons and many seaweeds are to be found where the high tides have washed them up. Along the foreshore are several typically coastal plants—banksia, tea-tree, wattle and a shrubby saltbush.

Flocks of Silver Gulls come to be fed, and one can distinguish the old birds from the somewhat mottled young ones. There are usually groups of Crested Terns

Primary school children at Ricketts Point

and a few cormorants, and these may be observed fishing. The larger Pacific Gulls are not plentiful but both the pied adults and the brown juveniles should be there.

At Ricketts Point last February, a party from Melbourne Teachers' College was entertained by a Pacific Gull that spent most of the day flying up and dropping a large mussel onto the rocks in repeated attempts to break it open. We hope that success eventually rewarded its persistence!

Any one of these three excursions can add considerably to the nature knowledge of those who participate. But there is something more valuable to be gained from them. If season and weather are right, a visit to the Botanic Gardens lake, the lawns and groves of Maranoa, or the sands and rocks of the bayside, will demonstrate that nature observation, even in the suburbs, can be a very pleasant experience indeed.

Next month: Zoological Gardens, National Museum and Sir Colin MacKenzie Sanctuary.

Do readers know of other suitable places for school nature study excursions? If so, write and send details for inclusion in this feature.

Australians in the Garden

There is no reason to doubt that this country of ours produces some of the most interesting and most beautiful indigenous plants in the world. What their true potential is as garden specimens no one yet knows. If the common roadside briar has, over centuries, given rise to the pride of today's rosarian, what are the possibilities locked up in *Leschenaultia* and *Callistemon* and *Chorizema*? This is mere speculation in which the visionary is free to indulge if he will; but for the realist who will have nothing to do with speculation—the realist gardener, that is—there are obvious even today enormous possibilities in our native plants. Some of them, mint-bushes and wax-flowers, for instance, have already become favoured garden subjects; others await recognition; and it is precisely at this point that Mr. A. E. Brooks's *Australian Native Plants for Home Gardens* makes its best contribution. Published within the last few weeks by Lothian, the book not only lists and describes species that are worthy of horticultural attention and suitable for transfer from bush to garden, but also gives much valuable advice on such matters as choice of situation, cultivation, pruning, manuring, mulching, labelling, taking cuttings, and so on. It is to be emphasized that the advice is no airy-fairy stuff; it is the result of Mr. Brooks's own experiment and experience; the result of sweat and, perhaps, tears.

What does the would-be cultivator need to know of a plant that the author hasn't told him? Very little. Botanical name, common name, height and habit, original habitat, meaning of the specific name, description of inflorescence and foliage, time of flowering, soil and situation most favoured—they are all there. In addition, of the hundreds of species described, some seventy are illustrated by very attractive half-tone plates.

The arrangement of the book is interesting. The plants appear in the alphabetical order dictated by the generic names, and in among them are such sections as those on cultivation, pruning, and manuring, each in its proper alphabetical position. The table of contents at the beginning of the book thus becomes also an index, which makes for very easy reference. For additional convenience, however, an index of common names is appended. Naturalists and gardeners, both here and abroad, should find the work not only interesting, but valuable.

Australian Native Plants for Home Gardens, by A. E. Brooks (Lothian). 149 pages. Australian price 45s.

—W. L. WILLIAMS

"The Orchids. A Scientific Survey"*

(Book Review, by J. H. Willis)

With the possible exception of true grasses—numbering some 4000 known species, many of the highest economic importance—no family of plants can claim such a spate of technical and popular literature as the *Orchidaceæ*. Yet the ever-expanding interest of horticulturists and scientists in orchids, over the past two decades, calls for some handy condensation of the widely dispersed, often inaccessible writings on the group as a whole. So very large, complex and cosmopolitan is this intriguing plant family, estimated as comprising about 20,000 species, that a single authority could never hope to cover even the broader aspects of classification, habit, anatomy, variability, pollination, breeding, symbiosis, physiology and pathology.

The attractive symposium recently edited by Associate Professor Carl Withner of Brooklyn College, New York, is extremely welcome and will surely earn the gratitude (as well as many subscriptions) of orchidophiles all over the world—notwithstanding its price of $14 (about £A5/17/-). Sixteen authors have contributed the fourteen chapters, all but one being from North America or the West Indies—an understandable editorial expediency, although this compendium might have gained much from a more equitable admixture of non-American talent. Professor Hans Burgeff is the sole European writer (from Würzburg University, Germany), and he supplies thirty-five fascinating pages on "*Mycorrhiza of Orchids*". Almost a third of the book (188 pages) is devoted to the realms of cytology and genetics. A detailed story of *Vanilla*, the only "orchid of commerce", takes us through another thirty-two pages of delightful, informative reading from the joint pen of three experts at the Agriculture Experiment Station, Puerto Rico. The chapter "*Aspects of Variation*" includes sixty-one plates of line drawings that depict patterns of variability within the floral organs for various genera and species; here there is a sprinkling of such familiar Australian groups as *Caladenia*, *Dendrobium* and *Thelymitra*.

"*Classification of Orchids*" (Chapter 2) and a "*Key to the Orchids*" (Appendix 1) have been very capably handled by Charles Schweinfurth (Harvard University, Mass.), successor to the great Oakes Ames, whose vast Orchid Herbarium of 85,000 sheets is now in his charge. Schweinfurth's note (p. 37) concerning our two subterranean orchids of the subtribe *Rhizanthellinæ*—"the exact explanation of the development and life history of these small plants is still a mystery of science"—shows that, despite a relative poverty of *Orchidaceæ*, Australia does possess items of more than ordinary interest. From his *Key* to the higher categories (pp. 515-17) we learn that, of twenty-six subtribes in the world-wide tribe *Polychondreæ*, ten are wholly or predominantly Australian and embrace our largest genera—*Pterostylis*, *Prasophyllum*, *Caladenia* and *Thelymitra*. The "*Enumeration of Important Orchid Monographs and Floras*" (pp. 37-43) follows a geographical arrangement for convenience, and must necessarily be selective; but one is aware of several unfortunate omissions—e.g. that of V. S. Summerhayes's excellent *Wild Orchids of Britain* from the European literature and Rica Erickson's *Orchids of the West* from among the Australian references, both having appeared in 1951.

Schweinfurth's gracious tribute (p. 37), "In Mrs. Edith Coleman science is especially indebted for classic investigations into the realm of pollination", will cause a glow of pride in those fellow naturalists who were privileged to know the late Mrs. Coleman and to enjoy her many stimulating papers—from 1922 until 1951—in the *Victorian Naturalist*.

* *The Orchids. A Scientific Survey.* Edited by Carl L. Withner (*Chronica Botanica New Series of Plant Science Books* No. 321. Published in New York by Ronald Press Co., May 1959. 9 in. x 6 in. 543 pages. 61 plates, 88 text figs. Price $14.

THE BOGONG HIGH PLAINS

This is the first appendix to the report of the excursion by members of the Field Naturalists Club to the Bogong High Plains last summer. It has been compiled by J. Ros Garrett.

GEOLOGY

Members of the F.N.C.V. party were provided with a brief summary of the geology of the High Plains, compiled by F. Beavis, of the Melbourne University Geology Department. With Mr. Beavis's consent full use of his compilation has been made in the notes assembled here.

Between 1885 and 1903 James Stirling, Government Geologist during that time, published a number of papers dealing with the Australian Alps. In one paper he pointed out that in the north-eastern highlands we have "an unrivalled field wherein to study the mutual relations of the sedimentary, metamorphic and igneous rocks". He considered the Australian Alps to be older than the European, African and Himalayan. The folds which characterize the European Tertiary formation were absent from our alps. While submarine deposition was building up what were to become the European Alps, our Silurian and Devonian systems were being uplifted and sculptured by long-continued sub-aerial denudation to form what is now seen as a succession of high mountains and deep valleys. Stirling failed to find evidence of any Mesozoic formation in the Australian Alps.

From what was once a vast tableland throughout the area much of the softer sedimentary rock was excavated and what remained has been converted by the plutonic disturbances of Upper Ordovician or Devonian times to crystalline schists abundantly ramified with intrusions of granodiorite, quartz diorites and basic dikes. The gneisses characteristic of the Kiewa region have resulted from the granitization of the schists. Further upheavals occurred in the Miocene. The volcanic activity of Tertiary times contributed to the physiography of the Bogong High Plains to an extent that is now apparent in the thick sheets of basalt which have survived the denudation of the softer adjoining ranges.

In the approach to the High Plains along the Kiewa Valley one is impressed by the abrupt termination of the valley at Mount Beauty and by the sudden rise of more than 5000 feet to Mount Bogong. As Mr. Beavis points out, the head of the broad valley is marked by the Tawonga Fault —a low angle thrust of quite recent origin. A hint of its relative age is that the alluvial rocks of the valley have been involved in the faulting. The area south-east of the Tawonga Fault has been uplifted and deeply dissected, but the High Plains remain as a remnant of the undissected old peneplain. The rocks throughout the area have been intensively sheared and faulted and the streams, for the most part, have developed along the shear zones.

Physiographically, too, the area is of great interest because it is a part of the watershed of two river systems, the streams feeding the Murray and those flowing south to Bass Strait. Stirling, in his examination of these systems and their points of origin, was led to the belief that they furnished strong evidence of glaciation.

Geologists of our time are not certain that definite signs of glaciation do occur in this area. The transportation of rocks and the scoring of their surfaces have been reported from time to time, but these may have been due to other agencies. In the words of Beavis, "No glaciation has been proved on the Bogong High Plains and the youngest rocks are alluvia which occupy the remnant valley floors".

Stirling remarks that there is a complete hiatus in the geological record of the Australian Alps between the Devonian and the Miocene. The oldest members of the Tertiary series "are certain beds of auriferous gravels, clay, sands, fine gravels, ferruginous or siliceous conglomerates and *lignites containing leaves of Miocene age*. The leaves are found in a yellow-

ish-brown laminar clay. . . . These Miocene river gravels are overlain by sheets of basalt, as on the Dargo and Bogong High Plains. The present river valleys have been eroded along the margins of the lava flows, and in some places across them, to a depth of, in some places, over one thousand feet. . . . Fine escarpments showing columnar basalts are seen along the edge of several of these plateaux. The lava appears to have welled up through fissures, as no localities have yet been found where volcanic vents occur".

Stirling seems not to have recognized in Roper's Lookout the plug of an old volcanic vent.

This short outline of the geology of the area provided the background for our field studies. The inexpert majority was fascinated by the variety of minerals displayed by the several collectors or visible in sections in the field. One specimen of particular interest was a supposed piece of a core from the Rocky Valley boring operations, a massive cylinder of granodiorite about three feet in diameter and more than four feet long, standing by the roadside near the visitors' lookout point above the valley. A thin band, representing a quartz intrusion, was conspicuous on its surface.

In Pretty Valley, near the site of the former construction camp, rock faces exposed by recent blasting showed a splendid confusion of metamorphic rocks. Dikes penetrated the matrix in all directions, even crossing one another to demonstrate the time lapse between the creation and the filling of more than one series of fissures. One could see an orthogneiss, formed from granodiorite intrusions, a conversion which suggests the operation of considerable stress. There, too, the laminated nature of the micaceous schists was obvious. Here and there, in almost friable rock, large pieces of mica could be obtained. Twin crystals of black tourmaline were noted in some of the more massive quartz veins. This occurrence clearly indicated extremely slow cooling of the original melt and, by inference, the great depth of the intrusion at the time of its formation.

In his field notes, Mr. McInnes draws attention to the huge size of some of these dikes of light-coloured rock, presumed to be sillimanite quartz intruding into granodiorite which exhibits the light and dark banding of gneissic rock. He believes this is orthogneiss derived from igneous rock. In places, there occur dark basic rock intrusions intermingled with large areas of schistose rock probably identifiable as paragneiss of sedimentary origin.

He adds that near Langsford Gap a road cutting and quarry provide an excellent example of weathering of granodiorite. Close, square and straight jointing is to be seen. Where the joints are wider the edges of the remaining solid rock are rounded. The consequences of weathering can be seen in the flaking off of thin layers in the process of exfoliation. The flakes, in their turn, crumble to grain-sized particles leaving occasional rounded boulders of granodiorite bedded on light brown gravelly soil—the near-end product of its decomposition. These rounded boulders are a conspicuous feature of Rocky Valley. The process of weathering, so well demonstrated, indicates that these rocks are mere vestiges of a larger mass which was formed on the spot, and that they have not rolled into their present position from the slopes above or been transported there by such agencies as glaciers.

Beyond Langsford Gap, along the route of the projected race-line, a small two-foot wide pegmatite dike had been exposed by blasting. Embedded in it were large crystals of black tourmaline and white mica or muscovite. A similar type of tourmaline rock was noted along the track to Mount Nelson near Watchbed Creek. Its pegmatite source was not discovered.

Basalt Hill is being quarried for rock filling for the Rocky Valley dam retaining wall and hence some excellent exposures were to be seen. Columnar jointing was well displayed. Two small masses of these hexagonal columns have been left isolated on the surface and one of them provided photographers with an admirable subject for their cameras. At Mount Jim, a basalt eminence reaching 5916 feet above sea level but only a hundred or so feet above the surrounding plain, the jointing is much more massive although very irregular, a feature which confers upon it a singularly rugged aspect. Beyond it is Redbank Creek, along the course of which are known to occur lignite deposits of the kind mentioned by Stirling.

Fossil Hunting for Beginners

By E. M. DAVIES

For the Melburnian who wishes to take tentative steps in the study of palaeontology, I suggest a visit to Balcombe Bay. Both the locality and its fossils are easily accessible. The place is about a mile and a half on the south side of Mornington, just before one reaches the Dava Hotel, on the beach road. A sign on the right-hand side of the road says "Fossil Beach Picnic Reserve", and you follow a well-defined track through the tea-tree.

On reaching the beach, turn and walk back a few hundred yards towards the Mornington township. As you walk you will see the fossiliferous blue clay showing between the boulders, but wait until you round a small headland and you will find a good clear area just below the cliff-face. It is wise to go at low tide. A *Tide Tables* booklet is available, for 5/-, from the Public Works Department, Treasury Place, Melbourne. It is invaluable for those with beachcombing inclinations.

On examining the blue clay, you should see some partly exposed shells or at least some fragments, and that is where you get out your geological hammer. If you break up the shell marl with your hands you will find plenty of fragmentary coral and echinoid spines, and minute sponge spicules will soon make their presence felt.

Amongst the gastropods (univalves) are *Cypraea* (cowry), *Conus* (cone), *Voluta* (volute), *Murex* (a spiny shell) and *Cerithium* (creeper). Amongst the pelecypods (bivalves) is *Nucula gricei* (nut shell) whose shining nacreous lining testifies to the excellent preservative properties of the clay. Another small shell, important because it is a characteristic fossil of that zone, is *Limopsis morningtonensis*. The "tusk shell", *Dentalium* (of which there are many species, both fossil and living), belongs to the Scaphopoda, a class which has affinities with both the Gastropoda and the Pelecypoda. You should have an enjoyable few hours amongst the Mollusca, very likely taking home more blue clay on your shoes than in your haversack.

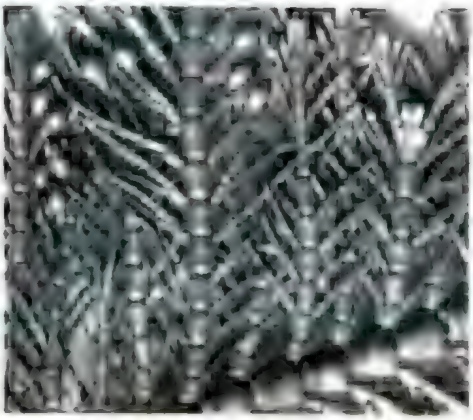
However, whether your collection satisfies you in both quality and quantity is not the main issue. The beginner should never forget that palaeontology means much more than just digging up fossils; it is the science that deals with the life of past geological periods.

It is necessary to try to understand where the Balcombian stage fits into the time scale. It belongs to the Miocene period of the Tertiary era (whether Lower or Middle Miocene is debatable). The lower fossiliferous ironstone of Royal Park is of the same age, but it contains different species of molluscs as they lived in somewhat shallower water.

The Tertiary marine formations are a discontinuous coastal fringe which extends from Lakes Entrance, Gippsland, to the North West Cape, Western Australia (approximately 5000 miles). In the Murray Valley Basin and the Nullarbor Plain it is found inland for some considerable distance. A famous fossil Tertiary locality is Table Cape, on the north coast of Tasmania.

A good book to read concerning life in past epochs is *Ancient Australia* by Charles F. Laseron, published by Angus & Robertson, Melbourne.

What is it?



A clue is that the picture is much larger than natural size. Turn to page 169 for the answer.

Field Naturalists Club of Victoria

General Meeting—September 13, 1959

Mr. D. E. McInnes presided over a large gathering at the general meeting.

The Secretary reported that two members, Mr. Byron Young, formerly of the Microscopical Society, and Mr. H. Bittner, had recently died, and members stood for a minute in tribute to their memory. He reported also that Mr. Hugh C. E. Stewart was seriously ill in Bairnsdale Hospital. Miss Young said Mr. Stewart was making a good recovery but still could not answer letters, and would not be home for a month or so.

It was announced that the Show Committee has booked the Lower Melbourne Town Hall for Monday, Tuesday and Wednesday, September 5, 6 and 7, 1960. The news was most enthusiastically received, and all resolved to make this a worth-while effort.

Members were asked to bring their cars for the proposed excursion on October 17.

President's Day will be a trip to Snobs Creek and Eildon on Cup Day, November 3.

Mrs. Daisy Wood will hold an exhibition of flower paintings at the Tasmanian Tourist Bureau from October 15 to 31.

The Victorian National Parks Association is holding its annual excursion to the Werribee Gorge on November 7. Those who would like to go are advised to contact the V.N.P.A. secretary, Mr. Garnet, or some other member of their council.

Mr. Gabriel, on behalf of the club, sent a gift of shells to a school in U.S.A. and has received a very warm letter of thanks.

The speaker of the evening was Mr. G. T. Thompson, Chairman of the Soil Conservation Authority and a member of the National Parks Authority. He showed coloured slides of each of Victoria's national parks, discussed their scientific importance as samples of what the country should look like in its natural state, and pointed out some difficulties of soil conservation, such as bridle tracks and cattle damage on Mount Buffalo, and sand movement at Wilson's Promontory, Mallacoota and in the Mallee. He also showed projected national parks at the Howe Ranges and Kulkyne.

Mr. Thompson said that he would not regard his work as completed until Victorian streams ran crystal clear all the year round, and high winds did not raise dust in the Mallee.

In the discussion which followed, the speaker mentioned the great need for Australian supplies of softwoods, and said that in his opinion pines were not as suitable as eucalypts for catchment areas. He said that he hoped soon to see scientific experiments conducted to test this point.

Messrs. McInnes and Coghill showed a piece of dead *Acacia* wood which had been neatly cut through by an insect, and a similar piece of green wood with the culprit, the larva of one of the longicorn beetles, still operating. Mr. Gabriel showed rare adherent shells from Twofold Bay and Mr. Garnet showed land shells identified by Mr. Gabriel as an introduced pest. Mrs. Hellison exhibited galls on eucalypts, and Mrs. D. Woods a number of orchids from Anglesea.

The President drew attention to some of the club's flower paintings by Miss Amy Fuller. Mr. Woollard offered to make stands to facilitate their display.

An account was given of the excursion to Maryborough and the Cosstick Reserve on September 13. A report of this will be published soon.

New members elected were Mr. A. L. Ede and Mrs. B. McIntyre (ordinary); Mr. David S. Boyle and Mr. J. J. Polinesa (country); Margaret Powell and Robert Turner (junior).

Club Excursion

Beautiful winter sunshine added to the enjoyment of the excursion on August 16—a cross-country ramble from Somerville to Mount Eliza. Arriving on the early train to Frankston, the party took the bus to Somerville and then walked along Eramosa Road. The way led through open pastoral country, but by the roadside both Hedge Wattle and Prickly Moses were in bloom.

About three miles from Somerville the party turned right into an unused road passing through a clump of Snow Gum. This attractive white gum is

identical) with that of the high snow plains, and the scene resembled that along Falls Creek or the Feathertop track. In this isolated strip there was a variety of botanical species and a profusion of bird life.

After reaching the main Moorooduc Road and turning to the left, the party found a side road leading into the quarries. After a short steep climb the top of the hill was found to be covered with greenhood orchids. From the summit there was a fine view inwards Western Port Bay.

A walk of a mile and a half along a bush road led to Mount Eliza, from which there is a bus service to the railhead at Frankston.

Geology Discussion Group—

August 5, 1959

Sixteen members and friends attended the August meeting. The chairman, Mr. F. Davidson, spoke on "The Geology of Queensland"—the third in a series of talks on the geology of Australia.

Mr. Davidson, using the new geological map of Queensland, described the physiographic divisions of the state and the extent of the Great Dividing Range, with its steep escarpment facing east and its gentle slopes to the plains on the west. A rich mineral belt, together with plutonic rocks, occurs along the whole of this range.

Rocks from the Palaeozoic era include pre-Cambrian metamorphic rocks and doubtful fossils. Quartzite, and sandstones with trilobites, pteropods and echinoderms, are among the rocks of volcanic, marine, freshwater and glacial origin from the Cambrian. There are thick coal deposits laid down in the Carboniferous and Permian, during which periods extensive folding took place.

The Mesozoic was a time of increased vulcanicity, and of swamps and lakes. The igneous rocks and coal deposits were later overlain by marine deposits which now appear as desert sandstones—with fossil dinosaurs, fish-lizards and ammonites—and form the aquifers of the artesian basins. Opal is mined from Mesozoic sandstones.

In the Tertiary freshwater deposits, containing fossil woods, fish and insects, were laid down. There were periods of uplift, peneplanation and volcanic activity.

During the Pleistocene, eustatic fall and rise of sea level led to erosion and drowning of coastal valleys. The Great Barrier Reef was formed, and mineral sands deposited which now outcrop along the coastline.

Exhibits by members: pitchblende from Mary Kathleen; Cambrian shales from Mt. Isa; calcite from Cape Schank; ore body from Magnet Mine, Tasmania (Mr. Cobbett); building stone samples to illustrate the excursion; a collection of rocks, minerals and fossils from Queensland (Mr. Baker); "clot" of lava and wood from base of basalt in sewer shaft, Spotswood (Mr. Blackburn); garnet, amethyst and topaz from Reedy Creek, Victoria (Mr. Ingeme); rocks, fossils and gem sands from Queensland; agates and jasper from Beechworth (Mr. Davidson).

Geology Group Excursion:

Building Stones of Melbourne

Eleven members spent the afternoon of Saturday, July 4, examining the stones used in buildings in parts of Collins, Queen and Bourke Streets. The primary interest was geological, but the architectural and aesthetic features could not be ignored.

Basalt, mostly from Footscray and Malmsbury, is the foundation material of many of our city buildings. Its homogeneous nature does not encourage study as it stands *in situ*, but where it is the only stone of an edifice, as in the Goldsbrough Mort building at the corner of Bourke and William Streets, or at 97 Queen Street, it repays examination as the material of a noble structure.

Superstructures of sandstone and limestone, being too high for examination from the street, have a rather similar appearance. Most commonly used are Hawkesbury Sandstone from New South Wales, Grampians or Stawell freestone, and limestone from Omaru, New Zealand.

Probably the most interesting stones are the granites used for bases, columns and facings. The grey Harcourt granite can be easily recognized both polished and unpolished, being frequently studded with xenoliths. Other granites recognized were:

From Cape Woolamai — salmon-pink. Colonial Mutual Life Building, 314 Collins Street.

From Drumana — a fine-grained green stone. Bank of New South Wales, 368 Collins Street.

From Galm Island—a fine-grained pink, grey and black stone. Rialto and Olderfleet Buildings, 497 and 475 Collins Street, and at ground-level doorway of the Victoria, 141 Queen Street.

From Murray Bridge—a light red, fairly coarse granite. Trustees Executors Building, 401 Collins Street, and Ajax House, 105 Queen Street.

From Orbost — a greenish-grey stone: Commonwealth Bank, 367 Collins Street.

From Warby Ranges, Wangaratta — a fine-grained pink altered granite. Collins House, 360 Collins Street.

From Trawool—a porphyry as an ornamental band. City Mutual Life Building, 459 Collins Street.

There is granite from Scotland in the columns of the Equity Trustees Building, 472 Bourke Street, and at 317 Collins Street; Balmoral Red from Finland in 108 Queen Street and as small ornamental columns in the National Trustees Building at the corner of Queen and Collins Streets. Here also were blue pearl "granite" columns from Norway.

A very common facing is the fine-grained volcanic trachyte from Bowral, New South Wales, to be seen in the columns of the Commonwealth Bank, 367 Collins Street, and at 358 Collins Street.

Within buildings can be seen (but only through windows on Saturday afternoons) shawl-like markings in the marble of the Trustees Executors Building at 401 Collins Street, red marble walls in the entrance to the Victoria Club, 141 Queen Street, and travertine, a redeposited limestone, used as a facing.

The small area covered indicates the wealth of geological information and interest available in the city. Enjoyment of the trip was enhanced by the use of the Mines Department booklet, *Victorian Building Stones*, published in 1937 and rapidly becoming out of date.

Microscopical Group—August 19, 1959

At this meeting, "The History of Spontaneous Generation" was dealt with by Mr. P. Genery. The speaker began by saying that to learn the origins of life has always been one of man's desires, and that, until comparatively recent times, there have been theories of spontaneous generation. Mr. Genery discussed the rise and fall of the different theories, beginning with those of the ancient Babylonians, Greeks and Romans, passing through medieval times to the age of Darwin and Pasteur, and from then to the present day. The acceptance of such theories was universal, for in India it was thought that beetles were spontaneously generated from dung, and the Egyptians believed that crocodiles, frogs and toads arose spontaneously from the silt deposited by the annual flooding of the Nile.

The speaker showed these ideas to be the outcome of faulty or careless observation. It was their simplicity and convenience, however, that inhibited further investigation. The teachings of Aristotle on this and other subjects held undisputed sway for nearly 2000 years, until the fifteenth and sixteenth centuries, when the bold investigations of Copernicus, Galileo and Bruno launched the first attempts at organized experiment and an era of accurate observation.

Theories of the origin of life, still of a "spontaneous" nature, though modified or weakened by the findings of Schultz, Gay-Lussac, Schwann, and especially Spallanzani, continued to flourish until the mid-nineteenth century, when the works of Charles Darwin and Louis Pasteur became known. Under the bombardment of Pasteur's findings, the fallacies in earlier experiments were revealed, and the popularity of these theories gradually waned until they are today regarded as curious and amusing myths.

The speaker concluded with an explanation of how to prepare chemical growths which simulate living organisms in being able to grow and to divide.

A New Field Naturalists Club

We are pleased to learn that a new club has been formed in Horsham. It has about thirty-five members who propose to meet on the fourth Thursday of each month and to hold regular outings. Honorary Secretary is S. Robertson, c/o 33 Pynsent Street, Horsham.

F.N.C.V. DIARY OF COMING EVENTS

GENERAL MEETINGS

Monday, October 12, 1959—At the National Herbarium, The Domain, South Yarra, commencing at 7.45 p.m. sharp.

1. Minutes, Reports and Announcements.
2. "Some Fisheries of Port Phillip Bay", by D. D. Lynch.
3. Nature Notes and Remarks on Exhibits.
4. Conversazione.
5. Correspondence.
6. Election of Members:

Ordinary Members:
Miss M. McLaren, 25 Tennyson Street, East Malvern (D. E. McInnes/A. G. Hooke)
Mr. John R. Vial, 22 Fosberry Avenue, Caulfield (A. G. Hooke/M. Butchart).
Mr. Sydney T. Frost, 44 Fellows Street, Kew, E.4 (E. H. Coghill/A. G. Hooke).
Mr. R. St. C. Pitt, 52 Dublin Road, Ringwood East (D. McInnes/E. H. Coghill).

Joint Honorary Member:
Mrs. J. R. Vial, 22 Fosberry Avenue, Caulfield (A. G. Hooke/M. Butchart).

Country Members:
Mr. Edward M. Walker, "Illouts", Old Monbulk Road, Kallista (E. H. Coghill/N. A. Wakefield).
Mr. Lindsay C. Yandell, 10 Park Street, Seymour (N. A. Wakefield/W. F. Seed).

Joint Country Member:
Mrs. Suzanne Walker, "Illouts", Old Monbulk Road, Kallista (E. H. Coghill/N. A. Wakefield).

Junior Member:
Miss Jennie Beavis, Egerton Street, Point Lonsdale (J. H. Anderson/E. H. Coghill).

7. Nominations for Membership.
8. General Business.

Monday, November 9—"African Wild Life", by R. Muthers.

F.N.C.V. EXCURSIONS

October 17-18—Combined week-end. The F.N.C.V. invites country members and other Victorian naturalists' clubs to take part. Please regard this notice as a personal invitation. If you will need transport for the excursions please let the excursion secretary know as soon as possible. The programme is:

Saturday afternoon—This is a private-car excursion and those who can take others in their cars are asked to tell the excursion secretary by the October general meeting. Meet at 1.15 o'clock at the corner of Alexandra Avenue and St. Kilda Road and proceed to Frankston to meet the Frankston F.N.C. There will be leaders for various subjects and members will join groups according to their interests.

Saturday evening—Meet at the National Herbarium at 8 o'clock Mr. J. H. Willis will talk on "The Challenge of a Changing Scene", and this will be followed by a social evening. Please bring a plate of supper and a cup.

Sunday—A full-day excursion to Kinglake led by Mr. J. Ros Garnet. There will be a parlour-coach as well as private cars. The coach fare will be 15/- for local members; country club members may travel free. Bookings with excursion secretary. Bring two meals. The party will leave Batman Avenue at 9 a.m.

Tuesday, November 3—President's picnic to Snobs Creek. Parlour-coach will leave Batman Avenue at 8.30 a.m. (*note the time*). Fare 24/-. Bookings with excursion secretary. Bring two meals.

Sunday, November 8—Geology Group excursion. Details at group meeting.

GROUP MEETINGS

(8 p.m. at the National Herbarium unless otherwise stated)

Wednesday, October 21—Microscopical Group. Subject: "The Slipper Animalcule, *Paramecium*", by Mr. W. Evans.

Monday, November 2—Marine Biology and Entomology Group. This group will meet in Mr. Strong's room at Parliament House at 8 p.m. Enter through private entrance at south end of House.

Wednesday, November 4—Geology Group. Subject: "Geology of Tasmania", by Mr. R. Hemmy.

There will be no Botany Group meeting in October.

PRELIMINARY NOTICE

December 26 to January 3—Apollo Bay. Travel by parlour-coach, which will remain for day trips. Fare £6: a deposit of £2 should be paid to the excursion secretary by October general meeting. Hotel accommodation is available for the coach party at £14/14/- per week, odd days at £2/5/6. Members travelling by private car may need to book their own accommodation.

What is it?

(Make sure you have looked at page 164 before reading this)

This should have been easy. You can see it growing on the rocks just below low-tide mark practically anywhere along the coastline of southern Australia, Tasmania or New Zealand. It is the seaweed, *Corallina cuvieri*, and it is unusual among seaweeds in having lime incorporated in its structure, which makes it hard and brittle. The colour is a dusky mauve-pink, but specimens washed up on the beach are soon bleached white. The generic name *Corallina* explains itself and the specific name is in honour of a French botanist, Cuvier.

—Submitted by R. D. Lee

Field Naturalists Club of Victoria

Established 1880

OBJECTS: To stimulate interest in natural history and to preserve and protect Australian fauna and flora.

Patron: His Excellency General SIR DALLAS BROOKS, K.C.B., K.C.M.G., K.C.V.O., D.S.O., K.ST.J.

Key Office-Bearers, 1959-60

President:
MR. D. E. MCINNES
129 Waverley Road, Malvern (UL 2427)

Vice-Presidents: DR. W. GEROE, MR. E. S. HANKS

Immediate Past President: MR. J. ROS GARNET

Hon. Secretary: MR. E. H. COGHILL, 15 Baker Avenue, North Kew (WL 4413).

Hon. Treasurer: MR. A. G. HOOKE, 400 Collins Street, Melbourne, C.1 (MY 1919; after hours, WF 5080).

Hon. Editor: MR. N. A. WAKEFIELD, P.O. Box 21, Noble Park (746 8440).

Hon. Librarian: MISS M. ARGO, 25 Spray Street, Elwood (FB 1825, ext. 7).

Hon. Excursion Secretary: MISS M. ALLENDER, 19 Hawthorn Avenue, Caulfield, S.E.7.

Hon. Sales Officer: MR. E. R. ALLAN, c/o National Herbarium, The Domain, South Yarra, S.E.1.

Group Secretaries

Botany: MISS M. ALLENDER, 19 Hawthorn Avenue, Caulfield, S.E.7.

Geology: MR. A. A. BAKER, 53 Carlisle Street, Preston (FJ 0484, ask for Geology Department; after hours, JJ 2569).

Microscopical: MR. J. WALSH, 4 Smith Street, North Coburg.

Entomology and Marine Biology: MR. J. W. H. STRONG, Legislative Council, Parliament House, Melbourne, C.2.

MEMBERSHIP

Membership of the F.N.C.V. is open to any person interested in natural history. The *Victorian Naturalist* is distributed free to all members, the club's reference and lending library is available, and other activities are indicated in reports set out in the several preceding pages of this magazine.

Annual Rates are:

Ordinary Membership	40/-
Country Membership (over 20 miles from G.P.O., Melbourne)	30/-
Junior Membership (under 18 years)	25/-
Subscription to the *Victorian Naturalist* (non-members) ..	30/- (post free)

NOTE: The currency of the present club year and of Volume 76 of the *Victorian Naturalist* is from May 1959 to April 1960.

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2/6

Koala (Phascolarctus cinereus) in natural surroundings. By E. R. Rotherham, F.R.P.S., A.P.S.A.
Exposure details: Rolleiflex camera, electronic flash, Kodak Super-XX film, f/22.

Vol. 76, No. 7

F.N.C.V.

November 5, 1959

The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

The Lowan or Mallee-fowl is one of Australia's "wonder birds". It does not brood its eggs as almost all birds do, but instead it buries them in a huge mound of sand and vegetable matter which it scratches together for the purpose. The heat of the sun and of the decomposing material provides the necessary warmth for incubation. From time to time the parent birds test the heat of the mound and if it is not the desired temperature, they open up the structure a little or else add more material to it. When the young hatch they burrow out of the mound and are immediately able to fend for themselves.

The Mallee-fowl was originally plentiful across inland southern Australia, from the Gascoyne River in Western Australia to the Victorian Mallee. It is now quite scarce and, in endeavors to preserve it, reserves have been established; there are Wyperfeld National Park and the Kiata Lowan Sanctuary, both in north-western Victoria.

The photograph reproduced on the cover is of one of these birds at its nesting mound. It was taken by the late Fred Lewis and appeared in the *Victorian Naturalist* in April 1953.

Did You Know?

THE FORESTS COMMISSION

expects that the relatively dry winter during 1959 will contribute to conditions of extreme fire danger during the coming summer months.

Forests Belong to us All

They must be protected from damage and fire

Please

- BREAK THAT MATCH!
- STUB THAT CIGARETTE!

Remember

IN THE FOREST MATCHES ARE A MENACE

We rely on Your co-operation

Thank You!

FORESTS COMMISSION, VICTORIA

The Great Gall Mystery

By Robert D. Lee

Galls are strange growths that one finds on various parts of trees and shrubs. They are caused by various insects—some flies (Diptera), some wasps (Hymenoptera) and some of a group called coccids (in the Hemiptera). It is known which insect causes a particular gall, and they have been scientifically named; but the mystery appears when we consider the effect on the particular part of the plant to which the insect gives its attention.

When certain insects lay their eggs in parts of a plant and others probe for the sap, these actions set up an irritation which causes the plant to make abnormal growths. Why is the outcome confined to the activities of the gall-making insects? This group includes certain flies and wasps, yet closely allied to these are species which do not cause galls.

One species of fly, *Cecidomyia*, lays its eggs in the buds of the Coast Tea-tree, *Leptospermum laevigatum*, and the tree produces a growth, nothing like the true flowers, but sufficiently flower-like to mislead the uninitiated. Open one of these and, under a hand lens, the tiny jelly-like eggs can be seen. Later, in different specimens, one may find several sandy-coloured larvae. These would develop into minute two-winged flies which emerge from the gall to carry on their fell work.

The Golden Bush-pea, *Pultenaea gunnii*, is the host of another gall insect of unknown name. The gall appears as a ball covered with bract-like leaves. Several which were opened each had a central chamber containing, in some cases, a tiny honey-coloured individual, the under side showing the shape of the legs to come and the upper side where the wings were forming; eyes could be seen as brown spots on the head. Other specimens had advanced a stage further, having turned black. With some of the galls, the top leaves had been eaten away and the flies had

Galls of *Cecidomyia* on Coast Tea-tree

gone. There were tiny black flies around the plant, possibly the adult insects.

Some years ago, along the railway line from Lilydale to Mount Evelyn, the country was ablaze with bush-peas, but the following year the insects evidently had the upper hand, for there was an abundance of galls on the plants but very few flowers.

The Yellow Wattle-gall Wasp, *Trichilogaster*, lays its eggs in a wattle bud and the tree obligingly grows a gall for the offspring. Sometimes one sees trees literally covered with these light brown galls. Cut one through and it will be found that the fleshy tissue is like that of a green apple, a succulent food supply for the larvae when they hatch out.

The coccids of the genera *Ascelis* and *Opisthoscelis* do not infest buds but turn their attention to leaves and branchlets. Another difference is that it is the nymphs, probing into the plant tissues, that cause the galls, not the depositing of eggs by the insects. Members of each of these genera may be found in great numbers on eucalypts, and the galls vary from the size of a match-head to that of a marble. Not all specimens are identifiable, so there is apparently still much work to be done in this field. However, a common one we do know is the Apple Gall, formed on gum-leaves by a species of *Opisthoscelis*.

And now for the deepest part of the mystery: Why does a differently shaped gall form for each type of coccid, ranging from a tiny round ball of an *Ascelis* to the fantastic shapes belonging to the genus *Apiomorpha*? Again, why such a difference between the male and female gall of this latter group? The females are finely-haired, top-like creatures that spend their adult lives in galls shaped according to the species. The males are two-winged insects which emerge from tiny cylindrical galls growing singly or in tight clusters on or near the females' structures. The mating is performed through a small aperture at the top of the female's home, and through this opening the young larvae eventually emerge to see about having homes built for themselves.

The male galls of different species of *Apiomorpha* are more or less similar in shape, but of the females there is an extreme variety. *Apiomorpha conica* is aptly named the Acorn Gall, and it is about one and a half inches long. *A. pileata* is much the same size but is not so regular in shape. Much more unusual is *A. munita*, which consists of a hard, woody,

Acorn Gall, of female *Apiomorpha conica*, split to show the insect

four-sided base with thin projections arising from each angle. Usually there is a tangled mass of these growing together, some covered with tight clusters of attendant male galls. Pride of place goes to *A. duplex* with its two flattened appendages arising from the body. One specimen measured five inches from base to tip of the projections, but this was a baby compared with those recorded as having appendages of up to nine inches and the insect itself one and a half inches long.

Cylindrococcus spiniferus is an insect that caused confusion and maybe embarrassment in the botanical world years ago. As you are doubtless aware, the she-oaks (*Casuarina*) have male and female flowers on separate trees, but it would appear that someone found male trees with what appeared to be fruiting cones! We now know these were the galls of our little friend, *Cylindrococcus spiniferus*. Who could condemn the mistake? The structures are sufficiently cone-like to be mistaken for fruits.

In Britain, one mystery that was solved was the life history of the gall-wasp, *Biorrhiza terminalis*, which causes the Oak Apple Gall. The tiny *wingless* ant-like female lays its eggs in the terminal bud of an oak shoot, which leads to the gall formation. The eggs hatch, the larvae pupate and the insects emerge through tiny holes in the galls. At this stage they are all *winged*, although the female's wings are not very effective. When she is ready to lay her eggs, she goes to ground and deposits them on the small roots where dark galls are formed. From these, *wingless* females emerge to climb the tree and start the double life cycle again. At first the two kinds of female were taken to be different species.

Australia has its share of gall-making insects, and much is to be learned about them. What we do know is that the plant provides not only home and protection during the most vulnerable period of the insect's life but a goodly supply of plant tissue for it to feed upon.

Male Galls of *Apiomorpha* on gum twig

History of the Coast Tribe

By A. Massola

In the September issue of this journal,* the water-wells of the Bunurong were discussed. This article gives a brief sketch of a phase of the history of the tribe. It will be remembered that they were among the first of the Victorian aboriginal groups to be contacted by Europeans: at Sorrento in 1803, at Corinella, Western Port, in 1826, and at Melbourne in 1835. Together with the Woeworong, or Yarra tribe, with whom they were allied, they formed what early writers called "the two Melbourne tribes".

The territory occupied by the Bunurong extended along the coast from the Werribee River on the east, to Cape Liptrap on the west, an area taking in Williamstown (Koort-Boork-Boork†), St. Kilda (euro-yoroke) the eastern environs of Port Phillip (Nerm) and all of Western Port (Warn-mer-in). Inland it reached to the Dandenong Ranges (Cor-han-warabul), Mirboo, Warragul, Neerim and the Upper Latrobe River. However, they were essentially a coastal people and much preferred the seashore. This is known by the almost continuous line of middens on the cliffs and sand dunes of Port Phillip, Bass Strait, and Western Port.

* *Vict. Nat.* 76: 121-6.

† This means "place of she-oaks" where the natives obtained the timber they preferred for implements. Mirboo meant "kidney", a place where they were likely to obtain kidney-fat from their enemies, as this was close to the Bunurong-Kurnai border. "Warragul" was a term applied by the Bunurong to the Kurnai, meaning "ferocious" and "savage". Euro-yoroke meant "sandstone"—for grinding axes; Werribee was "backbone" or "spine"; and Neerim meant "elevated".

"Midden", or "kitchen midden", is a term borrowed from the Danish. It was originally applied to the accumulations of shell and other food remains left by Mezolithic man in that country. Victorian coastal middens are easily recognized. All the shells and animal bones comprising them are in a fragmentary condition and often exhibit signs of having been burnt. The sand and any stone present, especially the large stones used as hearths, also frequently show these burn marks. Some of the middens are quite extensive, and the accumulation may be two or three feet deep.

Years ago it was possible to form a representative collection of the stone and bone artefacts used by the Bunurong by carefully searching these middens. Mr. S. R. Mitchell has given a list of the stone implements in *Stone Age Craftsmen*. To these must be added bone points, possibly used for extracting shellfish, for "barbing" fish spears and for fish gorges. Also of bone were the awls used by the native women in making their cloaks. The possum skins of which the cloaks were made would be pierced with these implements then laced together with sinews. Fine examples of bone awls have been collected at Point Ormond and at the foot of Olivers Hill at Frankston. These artefacts, both in stone and bone, are now very scarce on the Bunurong middens, so there is often no reward for the fossicker. Further, the

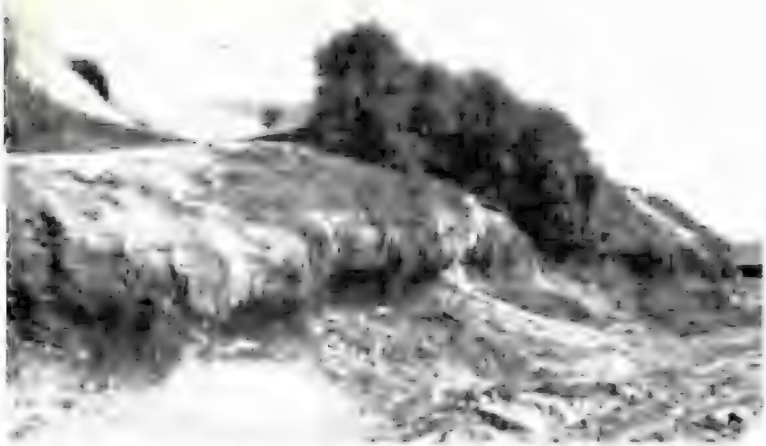
middens are fast disappearing through erosion of the foreshore and because of building projects. Soon there will be none within easy reach of Melbourne.

Middens were plentiful and larger on open, sandy places, and fewer and smaller in the clay areas or where there was a dense covering of tea-trees. There were none at all along the mangrove belts of Western Port. This had nothing to do with water supply, as the clay soil of that region tends to hold the rain, and to form swamps. The reason is rather that sand was easier on a naked body and, by camping in the open country, enemies could be discerned a long way off.

The Bunurong certainly had enemies, the tribes living to the east, the dreaded Braiakolung and the fierce Brataoulung, the most westerly sections of the Kurnai tribes, who collectively inhabited the Gippsland forests as far as the New South Wales border. They would come unannounced and raid the Bunurong camps at daybreak, kill every man and carry off the younger women.

One of these inroads had taken place just before white settlement of the Peninsula. One report, published in *Letters from Victorian Pioneers* states that "Previous to the country which lies on the Western side of the Bay of Western Port (between what was at one time Manton's and Allan's run) being occupied by squatters in the year 1835, the Gippsland blacks attacked some five and twenty of the Western Port tribe in the grey of the morning and cut off every one of them. Their tombs consist of many cairns plainly visible to this day."

Another report, supplied by W. Thomas, Assistant-Protector of Aborigines, to the Legislative Council's Select Committee on Aborigines in 1858-9, states that "in McMillan's Estate, at Little Brighton, was a large gum-tree, having carved on the trunk for a yard or two high, a host of blacks lying prostrate as dead.



Near this spot, in 1833-4, the Gippsland blacks at midnight stole upon the Western Port, or Coast, tribe, and made sad havoc, killing sixty or seventy of them. The spot was named Worrowen, or 'Place of Sorrow'. The tree mentioned, I am sorry to say, was shattered by lightning many years ago."

McMillan's Estate is interesting historically. In 1841, a Mr. Henry Dendy, by virtue of a payment of £5120 to the Crown, acquired the right to 5120 acres of Crown land wherever he cared to choose it. Dendy made his selection as near as possible to the infant city of Melbourne and planned a town which he first called Waterville, and, later, Brighton. The boundaries of his special survey were North Road, South Road, Boundary Road (to the east) and the shores of the Bay. Incidentally, Dendy obtained water by sinking a well on what is now the intersection of St. Andrews and Well Streets. In 1842 he parcelled off for sale a number of allotments. Mr. John McMillan was the purchaser of one, of 42½ acres, for which he paid Dendy £300. After clearing the land of timber and scrub he sowed wheat and was able to reap from 30 to 40 bushels to the acre. Part of his original house still stands, having been incorporated in the house called Clonaig in North Road.

Thomas's report of the carved tree is of great interest, as it is the only reference to a tree thus used in Victoria. However, memorial trees were common in western New South Wales. The exact position of the tree is not known, but "Little Brighton" was east of Nepean Highway and its centre was about the corner of Mill and Union Streets.

It is possible that the two attacks were made upon the Bunurong by two separate groups of Kurnai, as it was usual for a raiding party to return home as soon as an enemy camp was destroyed.

The Bunurong had their revenge in 1838, when a war party headed by Jack Weatherly, a "civilized" native, armed with firearms obtained from the settlers, marched into Gippsland. On the fifth day they came upon an encampment of the Kurnai. They killed all of them, seven men and an unspecified number of children and aged people. No mention is made of the fate of the women. The bodies of the slain were cut up, the kidney fat removed, and portions of the legs and thighs brought back to those of the tribe who were not present. This was hailed as a great victory by the Bunurong, as the Kurnai were much dreaded. The latter numbered well over a thousand, while the Bunurong by this time were less than two hundred.

The cutting up of dead bodies was the common practice, and portions were eaten as a further insult to the enemy. The Bunurong generally ate the hands and feet and drank the blood of their enemies, while the Kurnai contented themselves with the soft skin from under the arm-pits and the inner sides of the thighs. This they stretched between two sticks, grilled, and ate with much gusto, muttering abuse to the body which supplied the meal.

In October 1840, a party of nearly a hundred of the Kurnai set out to revenge the attack by the Bunurong. The latter, who

Jimmy Dunbar and his Lubra Nancy, from a picture published in 1877

by now were gathered in the Narre Narre Warran Protectorate, had been expecting a raid the whole spring. But it never came, for upon reaching the head of Western Port the Kurnai found a white settler's hut. This was Yalloak, the station of Dr. Robert Jamieson. The premises were pillaged by the Kurnai but no lives were lost, the proprietor and other persons being confined to their huts. Apparently satisfied with the loot, the attackers retired. This was the last attempt at an organized raid between the two tribes.

Some of the articles stolen from Yalloak reappeared later. For instance, a newspaper was found by the celebrated traveller Count Strzelecki during his journey of exploration in Gippsland. A large edition of the Bible was said to have found its way from Yalloak to a white woman who was held prisoner by the blacks near the Lakes country. Some leaves from this Bible were said to have been picked up by one of the relief expeditions at one of her supposed haunts.

After this time the Bunurong gradually disappeared. By 1866 no aborigines were to be seen in the Peninsula, although a few derelicts camped on the Mordialloc Creek* until the 'seventies.

The last of the Bunurong was Jimmy Dunbar. He was a well-built and sagacious individual, and at one time a proud member of the native police. He possessed a very retentive memory, was an excellent mimic and an expert with the boomerang. Jimmy's last lubra died in his mia-mia at Mordialloc six days previous to his own death. When Jimmy was removed to the Alfred Hospital his pack of twelve or fourteen dogs followed and camped outside. Eventually, as Jimmy failed to reappear, they set off to visit his usual haunts. Jimmy was in the habit of offering large areas of Mordialloc, of which he regarded himself as the sole owner, in exchange for a little tobacco or rum. With his passing, in April 1877, an interesting chapter of the history of the Peninsula closed.

* Moody-yallock: running fresh water.

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

The Sad Story of Bluey

Last month we introduced to you Mr. Frank Buckland of "Sunny Corner", Mallacoota. Here is another of his unusual bird observations:

At the time of writing a male Blue Wren is dividing his time between attacking his reflection in any one of three windows on one side of the house and in the plated headlamp of an old car parked under a tree close by. Due to his activities the windows always need cleaning. This is exactly the way another male Blue Wren started behaving, and he came to an untimely end, much to our regret.

In this case the bird found its way into a bedroom when the window was left open at the bottom during warm weather. Once inside, he found the large mirrors over the dressing-table. There were three separate mirrors, the outside ones hinged and set at such an angle that Bluey could see himself to perfection in all three at once. Thinking himself surrounded by enemies, he attacked each in turn, until he became quite exhausted.

During one of his excursions into this room, he accidentally knocked the lid from a round container of face powder. Possibly the lid was not properly in place and slipped off when he jumped on it during one of his wild attacks on a mirror. He got some of the powder on himself and apparently liked the scent of it, because from then on he could not be kept out of the house. When all the bedroom windows were closed, he would come in through the open door of any other room, and wait for an opportunity to gain entrance to the bedroom. The cover of the powder container was very shallow, and needed only a slight touch to remove it. We never saw him take the lid off, but he got it off on several occasions and finished up by taking a complete dust bath. By dusting himself in the approved manner, which meant sending powder all over the top of the dressing-table, then again attacking his reflection while his feathers were still full of powder, he certainly made a mess.

The bedroom could not be kept closed all day during the warm weather, and he seemed to be constantly on the watch, ready to slip in at every opportunity. He would come in so close to the floor that he appeared to be running rather than flying. He would take cover under any furniture and the lower it was to the floor the better he liked it. Once under the big settee in

the lounge he was as hard to dislodge as a mouse, because each time it was moved he would follow, keeping out of sight all the time.

As the powder bath became a daily occurrence, something had to be done about it. A similar container was secured, filled with talc powder, and placed outside with a small mirror. But he was not in the least interested, so it was decided to capture him at the first opportunity and transport him across the lake, in the hope that he would stay there. While trying to capture him without injury, a golf club was accidentally dislodged, and this fell on him, where he had taken refuge behind a wardrobe. This proved fatal.

We are now carefully watching the newcomer to see if he too will develop into the same kind of feathered ball of mischief.

Birds at Lakes National Park

Mr. Hugh Stewart has written a letter containing some observations made in the vicinity of the Gippsland Lakes. The following extract deals with birds noted while on a launch trip with Mr. Fred Barton of Eagle Point:

We landed for a brief period at Point Wilson, at the north-eastern tip of the Sperm Whale Head National Park.

Two Spurwing Plovers showed alarm at our arrival and the cause was disclosed by discovery of their nest, with two eggs, on the sandy beach, as we stepped off the jetty. Then we observed, a little distance away, on a sandy spit, a company of shore-birds, all with heads facing an ESE. breeze. The largest was identified by its red bill as a Caspian Tern. Then there were five Crested Terns and two Silver Gulls, all keeping still.

The highlight of the group (for me) was an Australian Snipe, which very considerately changed its body position to permit us to observe its characteristics through field-glasses. As Dr. Leach remarks, this bird journeys to Japan to breed, so is not a completely Australian species.

To add movement to the still bird-life, two Red-capped Dotterels flitted through and around the stationary shore-birds. In a eucalypt nearby we noticed Magpie Larks nesting. On the same side of this tree still stood the two mud nests of previous nestings, presumably of the same pair of birds.

To note all these birds in just a few minutes was indeed an ideal introduction to an Australian national park.

A Dyed Grasshopper

Miss Joan Ridsdale, of Camberwell Girls' High School, sent a small red grasshopper and a battery of questions regarding it.

It was a second-stage nymph of *Caedicia valida*, one of the common species of "long-horn" grasshoppers. The adults are usually referred to as katydids; they are green and have large wings. Katydids are not pests.

The interesting thing about this particular nymph was its *red* colour, and, when the matter was put to Mr. A. N. Burns of the National Museum, he suggested that it had been feeding on something pink, possibly young rose shoots.

Silver Gull Query

Mr. Alan J. Reid, whose address is "Children's School Camp, Somers, Victoria", is seeking information about our common sea-gull. He writes:

I would be most interested to hear from members who have known of breeding colonies of Silver Gulls in Victoria over the past five years, and also any definite observations on feeding and regurgitation of food or pellets by this species.

This Concerns You

We think "Along the Byways" has been an interesting feature over the past six months, but contributions are required *immediately* if it is to continue next month.

By Jean Galbraith

Spike Wattle — *Acacia oxycedrus*

There are many soils in Australia and apparently every one has its wattles. Spike Wattle belongs especially to sandy heathlands and mild climates.

It is usually a stiffly erect bush of six feet or so, though in exposed places it is dwarfed. The leaves are stiff, like curved flat daggers, about an inch or a little more long, stalkless, alternate, and ending in a hard sharp point. They are as a rule a dull or yellowish green, streaked with several distinct parallel veins.

The wattles mentioned so far in this series all have round heads of blossom—balls, or "bobbles", as they are often called. However, one group of wattles has flowers in long fluffy chenille-like spikes. These are not *catkins* but are more commonly described by that word than by the stiff but correct term, *spikes*. The soft bright yellow "catkins" of Spike Wattle are usually longer than the stiff leaves and often conceal them when the bush is in full bloom in October. Several spikes of bloom usually spring from each leaf axil.

Spike Wattle may have one or several erect stems and many short outward-curving branches, so that the bush is normally more tall than spreading and it is usually clothed with bloom right from ground level. "How lovely", you say when you see it in October, but during the rest of the year the bush is an inconspicuous tangle of short branches and sharp leaves, in which the long and slender brown seed-pods look like pieces of dead foliage.

No Victorian wattle could possibly be mistaken for this beauty of the heathlands. The two that superficially most resemble it are Rock Wattle (*A. rupicola*), of very limited distribution, and a variety of Prickly Moses (*A. verticillata* var. *ruscifolia*), which is found only on Wilson's Promontory. But the former has single-veined phyllodes, and flowers are in balls (though occasionally slightly oval), and the latter has smaller phyllodes in irregular whorls (circles round the stem).

The phyllodes of Spike Wattle grow alternately along the stems.

In East Gippsland, *Acacia oxycedrus* sometimes hybridizes with *A. longifolia*, the Sallow Wattle, producing a handsome shrub intermediate between the two in its foliage. Such plants have been found near the Gippsland Lakes and in the Mallacoota district.

Spike Wattle is widespread in the Victorian lowlands, and it occurs, too, in New South Wales, South Australia and Tasmania.

Spike Wattle from Gippsland

Photo: N. A. Wakefield

THE BOGONG HIGH PLAINS

This is the second appendix to the report of the excursion by members of the Field Naturalists Club to the Bogong High Plains last summer. It has been compiled by J. Ros Garnet.

BOTANY

The aesthetic appeal of a region is largely dependent upon its vegetation. A place may be full of geological interest but without attractiveness to the sightseer, if bare earth and rock alone greets the eye. There is no such monotony in the Victorian Alps. The highest peaks carry a rich vesture of plant-life which merits the admiration of those who visit such places.

In the Bogong area the F.N.C.V. party found a flora just as varied and distinctive as that of lowland places but more enticing in its appeal because it has suffered less at the hands of man and it is at the height of its floral glory when, below, its counterpart has been withered by the heat of summer.

The Plains, at elevations of up to 6000 feet above sea level, constitute the highest plateau in Victoria. The crests and troughs of the undulating expanse are almost treeless, although in a few sheltered places ancient Snow Gums bravely spread their gnarled and twisted trunks and branches. On its last journey to Pretty Valley the party took the opportunity to examine a group of them. One, not much more than twenty feet high, possessed a trunk with a girth of 18 ft. 7 in. If a subsidiary trunk growing out at ground level is included, this measurement can be recorded as 19 ft. 7 in. It was diligently photographed while we speculated upon its age; two or three hundred years was the modest estimate!

Mr. McInnes noted another fine specimen near Mount Jim. It measured more than 13 ft. about 4 ft. above ground level and it had a solid, round trunk to that height after which it commenced to spread. Here and there in alpine places fine old Snow Gums occasionally possess a symmetry quite uncharacteristic of those which are subject to snow and blizzard. Near Bullock's Lookout, in the ranges north-west of Mount Stirling, is a stand of several very ancient trees, all about 30 ft. high and with girths nearly 20 ft.

The High Plains still show evidence of the great 1939 fires in the ghostly pallid trunks of Snow Gums burned beyond recovery. Signs of their regeneration are slight. No doubt, young seedlings have arisen but only to vanish into the maws of the once ubiquitous Hereford. Now that fewer cattle are permitted on the plains for summer grazing, the trees may have a chance to become re-established in places where they can thrive. Several young plants were, in fact, noted during our wanderings on the Frying Pan Ridge.

Where *Eucalyptus niphophila* cannot live, hardy shrubs manage to thrive, and they are very colourful, too, in their flowering season. The melting of the snow is the signal for them to burst into bloom after their months of darkness under the cold blanket. From November to March, according to the species, they are at their best. The dwarf Mountain Beauty (*Hovea longifolia*), an early one, still showed its rich purple flowers while we were there. In places, whole mountain slopes were brightened by the scented lemon-yellow bottle-brushes of *Orites lancifolia* and, mingled with it or in separate colonies, were masses of Leafy Bossiaea (*B. foliosa*). Both are shrubs up to three or four feet high.

Scattered on the slopes was Mountain Pepper (*Drimys lanceolata*) just coming into bloom, and the Royal Grevillea (*G. victoriae*) displayed splashes of crimson among the sombre green of its foliage. It was only near Pretty Valley that we saw Alpine Boronia (*B. algida*), gay with its starry pink-backed, white-fronted flowers. Abundant in many places were Mountain Phebalium (*P. phylicifolium*), Leathery Star-bush (*Pleurandropsis trymalioides*) and several handsome Daisy-bushes (*Olearia*). An old acquaintance of the highlands, *Olearia gunniana*,

was there in several guises. It now rejoices in a name given it so long ago as to be unknown to the modern botanist, but he will have to accustom himself to it: *Olearia phlogopappa* no less! Its handsome dwarf variety, which we have been used to calling *O. subrepanda*, and also the beautiful little velvet-leaved *Olearia frostii* were just coming into bloom towards the end of our stay. Both grow near the Chalet and on the basalt slopes near the Ruined Castle.

A visitor to the High Plains later in January would see something which we missed—the Bogong Daisy (*Celmisia sericophylla*) in full bloom. When we were there a few early flowers were out but we could picture the myriads of large, white, daisy flowers, their long stalks above the dense dark green leaves, which would cover rock and turf along the cascading streams falling away from the sphagnum bogs to the valleys below. The plant grows in colonies so densely packed that one may identify it from far away by the contrast in colour between the surroundings and the masses of leaves.

Its congener, the Silver Daisy (*C. longifolia*), is one of the features of the mountains. On the High Plains it flourishes in myriads

"Continuous as the stars that shine
And twinkle on the Milky Way,
They stretch'd in never-ending line."

The Alps are the home of daisies and their kin—the family Compositae. *Brachycome, Cotula, Olearia, Erigeron, Lagenophora, Abrotanella Craspedia, Podolepis, Leptorrhynchus, Helichrysum, Helipterum, Ewartia, Erechtites, Senecio* and *Microseris* were all represented there. In our wanderings, many of the strictly alpine species were seen in flower, among them *Cotula filicula, Erigeron pappochroma, Senecio pectinatus, Gnaphalium alpigenum, Ewartia nubigena, Helichrysum stirlingii* and *Brachycome nivalis.*

Here are the alpine plants of other families which were noted, beside those mentioned already:

Lycopodium fastigiatum, Podocarpus alpina, Hierochloe redolans, Agrostis muelleri, Danthonia robusta, Agropyrum velutinum (a rare grass seen only at Pretty Valley), *Calamagrostis frigida, Carex buxbaumii, Herpolirion novae-zealandiae, Astelia alpina, Exocarpus nana* (between Rocky Valley and Mount Nelson), *Scleranthus singuliflorus, Ranunculus gunnianus, Ranunculus muelleri, Ranunculus millanii, Caltha intraloba, Drosera arcturi, Geranium sessiliflorum, Phebalium podocarpoides, Phebalium ozothamnoides, Stackhousia pulvinaris, Pimelia alpina, Eucalyptus chapmanii, Kunzea muelleri, Callistemon sieberi, Baeckea gunniana, Leptospermum myrtifolium, Trachymene humilis, Schizeilema fragoseum, Diplaspis hy-*

drocotylea, *Oreomyrrhis pulvinifica*, *Aciphylla glacialis*, *Leucopogon hookeri*, *Leucopogon maccrei*, *Epacris petrophila*, *Richea continentis*, *Prostanthera cuneata*, *Veronica nivea*, *Plantago tasmanica* and *Pratia gelida*.

Other alpines known to occur in the region but not seen by us included the interesting clubmoss, *Lycopodium selago*, the inconspicuous composite, *Parantennaria uniceps* and the Cushion Nertera—*Nertera granadensis*.

There was considerable interest in our search for the Dargo Gum (*Eucalyptus perrinciana*), a species closely resembling the common Snow Gum, and, in the end, Mrs. Webb-Ware, Miss White, Mr. Hooke and Mr. Hanks were satisfied that they had located and satisfactorily identified specimens between the Chalet and Rocky Valley.

The several epacrids aroused something more than mild discussion. *Epacris petrophila*, *E. breviflora*, *E. serpyllifolia*, *E. microphylla* and *E. hawbawiensis* were all "thrown into the ring". A similar earnest disputation about the identity of a greenhood orchid occurred when Mr. Haase, back from his New Year Day scramble on Spion Kopje, produced specimens secured in one of the deep valleys between that mountain and Rocky Valley Creek. What was the species—*Pterostylis alpina*, *falcata*, *nematoda* or *curta*? It had points of resemblance to all of them, especially to *alpina*. The writer resolved the problem to his own satisfaction eventually by referring it to *P. furcata*, a species rarely found on the mainland and, as was learned subsequently, reported many years ago from that same region.

The mat plants of the grassy plains and moist places were much admired. The Knawels, *Scleranthus singuliflorus* and *S. biflorus*, formed particularly compact mossy-looking patches in the spaces between rocks and even on low rock surfaces. The little Edelweiss, too, was a common sight on the basalt slopes and tops, often fairly covering several square feet of rocky ground with silver-grey foliage and brownish daisy flowers. In moist spots another mat, Alpine Stackhousia, flourished to perfection as a mass of green leaves surmounted by the upturned bells of small, almost stalkless, yellow flowers. Nearby, one might also find the Sky Lily, another lowly plant whose pale blue flowers lie open to the heavens. A single stem of any of these would scarcely merit a second glance, but in their mats, they add much to the charm of an already pleasing scene.

Sprawling between the tussocks of Alpine Poa were the deep rose-red floral globes of *Pimelia alpina*, one of the gems of the mountains. Its rival among the rice-flowers was the beautiful alpine form of *Pimelia ligustrina*, growing in wetter places: shapely bushes with creamy-white flower heads often two inches or more in diameter. This plant grows even better on Mount Stirling and Mount Buller.

The F.N.C.V. party was too late to see the several highland wattles in bloom and too early for *Wahlenbergia gloriosa*. We were too early for the golden blaze of the myriads of *Craspedia*, *Podolepis*, *Helichrysum* and *Microseris*, all of which flower later in January and in February. Of orchids, only the advance guard of *Thelymitra venusta* and *Prasophyllum frenchii* var. *tadgellianum* were seen in flower, although at lower levels *Diuris punctata* bloomed freely by the wayside while other species were past their prime.

Our census of plants of the Bogong High Plains comprised about one hundred and fifty species of phanerogams, but that number included only those in flower at the time of our visit or otherwise easily recognized. The species known to occur there have been listed in the *Victorian Naturalist*,[15] and, with due allowances for subsequent nomenclatural changes, that constitutes a useful reference to the flora of the area.

Our observations added nothing new to the official locality records for the Bogong High Plains, but an earnest team of field naturalists learned a good deal more about the highly interesting and fascinating botany of that region of Victoria.

NATURE STUDY FOR SCHOOLS

Circumstances have necessitated the temporary discontinuing of this feature. It is intended to resume it again shortly.

Field Naturalists Club of Victoria

General Meeting—October 12, 1959

Mr. D. McInnes presided at the large gathering of members and friends that filled the hall of the National Herbarium.

The President announced the death of two members, Messrs. D. Lewis and J. W. Audas, and a former member, Mr. A. P. Dunn. Mr. Hanks spoke of Mr. Lewis's active and loyal membership of the club and his readiness to help in all activities. Mr. Garnet said that Mr. Audas, who joined the club in 1906, led many excursions, wrote articles on flora of Victoria, especially of Wilson's Promontory and the Grampians, and published books on Victorian bushland and trees of Australia. Mr. Garnet also spoke of Mr. Dunn's work and mentioned that more recently he had been active in the Creswick Field Naturalists Club. The members stood for a minute in silence.

David Woodruff was welcomed back after his serious accident.

Mr. H. C. E. Stewart is now convalescing at Gippsland Lakes.

The President appealed to members for a typewriter, which is needed for the proper organization of the club library.

The Secretary announced that an extraordinary general meeting will be held five minutes before the December general meeting to consider the affiliation of Queen and Horsham Field Naturalists Clubs with the F.N.C.V.

Mr. D. D. Lynch, Senior Research Officer of the Fisheries and Game Department, gave an illustrated lecture on "Some Fisheries of Port Phillip Bay". He described the bait fishes, distinguished between the anchovy, with its lower jaw slung behind the level of the eye, and the larger pilchard, showing striations on the gill cover. He outlined their life histories, breeding habits and movements of the shoals when driven to the surface by larger fish from below.

They are of importance as food for larger fish, as live bait for tuna fishermen, and as pet food. They could be used for sardines and the larger ones with tomato sauce if it paid to catch and process them.

The mass mortality of fish at intervals is caused by toxins from dino flagellates, which are always present in the water in the proportion of about 1000 per quart. At this concentration they are harmless, but they can multiply to six million per quart, making the water brown, soupy and slimy—and poisonous to other organisms.

An ecological survey of Port Phillip is being carried out, and the speaker's coloured pictures of corals, holothurians, molluscs, sea urchins, sea stars and varieties of fish showed that there is a most interesting fauna.

It was resolved that Mrs. Jean Nowlan be elected an honorary member of the F.N.C.V. in recognition of her gift to the club of the Cosstick Reserve.

New members elected were Miss M. McLaren, Mr. S. T. Frost, Mr. R. St.C. Pitt (ordinary); Mr. and Mrs. J. R. Vial (joint); Mr. and Mrs. Walker, Mr. L. C. Yardell (country), and Miss Jenny Beavis (junior).

Members who do not wish to keep their copies of the *Victorian Naturalist* for May, June, July and August, 1959, were asked to return them to the club.

The President asked members to contact their local municipal libraries to ask them to become subscribers to the *Victorian Naturalist*.

Mr. Coghill showed a magnificent table of West Australian wildflowers sent to him by Mr. John Dewar of Perth. Other exhibits were a growing Streaked Rock Orchid, *Dendrobium striolatum*, and a number of garden-grown native plants (Mr. Garnet); specimens of wax-flower and waratah (Mr. Haase); a large wax-flower, *Eriostemon myoporoides*, and Wedding Bush, *Ricinocarpus pinifolius*, grown side by side in a garden (Mr. Fisch); shells of Pearly Nautilus from the New Hebrides and a very small Paper Nautilus shell (Miss Ralf); drawings of a wasp overpowering a spider (Mr. Tarlton Rayment); a collection of introduced land shells (Mr. Gabriel); a collection of shells, sponges and corals from the Great Barrier Reef (Mrs. Webb-Ware); microscope slides of insects from galls (Mr. McInnes); a collection of orchids from Anglesea, where a coal-mine is claiming their habitat (Mrs. D. Woods); a "cone" and leaves of a new West Australian banksia (Mrs. Faragher).

Botany Group Meeting

—September 18, 1959

The subject of the evening was a talk by Mr. Gabriel Francis entitled "The Origin and Development of Cereals".

The speaker traced the development of various grain crops such as wheat, barley and oats from the wild grasses which grew around a comparatively small area of Asia Minor. These grasses simply happened to develop a fairly satisfactory grain, and nothing had been done by man to improve them.

In the first place the seed was eaten as it was gathered, and it was not until later that man learned to cook it.

The talk was illustrated with drawings showing early implements used for cultivation and harvesting, and a series from primitive mill stones up to modern roller flour-milling machinery.

Members were intensely interested and Mr. Francis was asked to give another talk on the subject at a later meeting.

A surprise item was a showing of colour films of Queensland flowers, including many species of orchids. These films were shown by Mr. Powell, a visitor from Queensland.

Entomology and Marine Biology

—Excursion and Group Meeting

On Saturday, September 26, a most enjoyable and interesting afternoon was spent on the banks of the Yarra near Burke Road bridge.

Among arthropods found under the bark of trees were earwigs, carab beetles and red mites. In a neighbouring lagoon, refilled after a recent flood, members of the group collected (with the help of some boys who were there) flat-worms, slugs and an inch-long Redfin, as well as a number of microscopic pond dwellers.

At the group meeting on Monday, October 5, specimens from the excursion were exhibited under the microscope by Messrs. D. E. McInnes and E. H. Coghill. Miss Phillips exhibited scallop shells and a number of sponges, including cup and finger sponges. The latter are bright coral-red in the living state. The scallop shells had limpet shells attached, and the edges of these were found to conform to the fluting of the scallop shells—a result of the limpets' habit of returning always to the same spot on the same scallop after feeding expeditions. Mr. Curliss showed members two beautifully illustrated books, one on insects and the other on marine life. Another exhibit was a number of worm egg-capsules found in florists' moss.

Geology Discussion Group—

September 2, 1959

The monthly meeting was attended by twenty-two members and visitors.

The topic for the evening, "The Geology of South and Central Australia", was taken by Mr. Cobbett. This was a continuation of the series of talks on the geology of Australia.

With the aid of geological maps and carefully prepared sketches, Mr. Cobbett described the main physiographic features of the area, including the north-south Mount Lofty and Flinders Ranges and the east-west Musgrave and MacDonnell Ranges with their impressive gorges.

He outlined the geological history from pre-Cambrian to Recent, with special reference to fossil evidence, glaciation, the abrupt fault scarps of the highlands, and the formation of Spencer and St. Vincent Gulfs as the result of recent extensive faulting.

Mr. Cobbett explained the effect of recent minor uplift on the former drainage system, with the consequent formation of the Lake Eyre Basin. He referred also to the flora of Mesozoic times, now evidenced by the Leigh Creek coal measures, and to the climatic changes which caused the drying up of inland lakes and the extinction of herds of *Diprotodon*, whose remains are so plentifully preserved in the old muds of Lake Callabonna.

The extensive and varied mineral deposits of the region were described in detail.

Mr. Cobbett illustrated his talk with numerous lantern slides, those of Ayers Rock and Mount Olga, and of the opal fields at Andamooka, being particularly interesting.

Exhibits by members: extensive collection of mineral specimens (Mr. Cobbett); tourmaline crystals in fel-

spar from Wilson's Promontory (Mr. Visch); fossil wood from beneath basalt, unusual structure in basalt, and aragonite crystals — all from Brooklyn (Mr. Blackburn); polished specimens of fossil wood and various pebbles from Queensland (Mr. Davidson).

Microscopical Group—

September 16, 1959

The subject for the evening was "Micro Designs from Butterfly Wing-scales".

The task of forming micro-patterns with the powder-like scales from butterflies' wings is one calling for great skill and even more patience. Similar scales are found on moths, mosquitoes and silver-fish, but the vivid colouring of those of butterflies makes them the most suitable for patterns. The colour may be due to pigmentation or, with very thin scales which are themselves colourless, to a metallic iridescence due to diffraction of light. The orderly arrangement of these minute, feather-like scales makes the beautiful wing patterns of butterflies.

Scales are taken from a wing, placed on a microscope slide, and manipulated, with a fine hair mounted in a handle, into position on a thin film of gum, which may be wet or dry. If dry, the scales are placed in position one at a time, and the gum liquified by gentle breathing.

Members exchanged practical advice and discussed difficulties encountered during their experiments, and Mr. P. Genery exhibited several of his own carefully-made designs.

Later in the evening, Dr. R. M. Wishart gave a most instructive lecture on spiders. He dealt with their structure and habits, illustrating this with several of his beautifully mounted slides, screened by means of Mr. Middleton's micro-projector.

Of particular interest was the outline of spiders' mating procedure; the function of the pedipalps of the male, and his usual fate as "wedding breakfast".

At the meeting to be held on November 18, a visiting speaker, Dr. Ethel McLennan, will lecture on "Filamentous Algae". Members are requested to bring their microscopes and as much live material as possible

New Clubs to Affiliate with F.N.C.V.

Another natural history club has been formed, this time at Ouyen. The president is Mr. G. B. Eggleton, of Kulkyne, and the secretary Mr. R. Wise, Box 27, Ouyen. The new club has a membership of forty-four.

Both the Horsham Field Naturalists Club and the Ouyen District Naturalists Club have applied for affiliation with the F.N.C.V. The procedure is that such an application is heard at a special general meeting, after notice in the *Naturalist*. Accordingly, Council has called a special meeting to be held at 7.40 p.m. on December 14, 1959, immediately before the ordinary general meeting, to consider these applications.

F.N.C.V. Library

Overdue Loans

Reminder notices are now being sent regularly to members holding overdue loans. This is standard library practice, and recipients of such reminders are asked to co-operate by advising the librarian promptly if renewal of loans is desired. If, however, publications are recalled from loan, they should be returned to the library within two weeks of receipt of the notice, either at the following general or group meeting, or by registered book post.

Please do not return books to the shelves; they should be placed in the box provided for that purpose on the table under the library window, and the date of return should then be entered in the loan book. By following this simple procedure, you will assist considerably in the improvement of our library service to members of the club.

New Books, Pamphlets and Periodicals

A considerable number of new publications have been acquired recently for our library. The librarian hopes to be able to issue regular lists of these acquisitions in the very near future. In the meantime, if you require any particular publication or have suggestions for any which you consider we should acquire, the librarian would be glad to hear from you.

The edible Parasol Mushroom, **Lepiota gracilenta.** Photographed at Kallista, Victoria, by Robert D. Lee

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The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Articles:

Features:

Field Naturalists Club of Victoria:

Front Cover:

This is in the Wilson's Promontory National Park: Oberon Bay and Growlers Creek, with Mount Norgate in the background. The original photograph was taken by the late P. Crosbie Morrison, and it was used to illustrate the report entitled "National Parks Symposium" which appeared in the *Victorian Naturalist* in May 1953 (Vol. 70, pages 4 to 7).

Did You Know?

THE FORESTS COMMISSION

has now proclaimed the "Prohibited Period" during which fires can be lit only under written permit from a Forest Officer. This will continue until April 15, 1960.

DURING THIS PROHIBITED PERIOD

bush fire danger may necessitate the proclamation of an

ACUTE FIRE DANGER DAY

ON SUCH A DAY

LIGHTING OF FIRE

IN ANY FORM IN THE OPEN

IS

ABSOLUTELY PROHIBITED

Remember —

This ban applies without exception.
Therefore on an "A.F.D. DAY" you must not use

★ **ROADSIDE or CAMP FIREPLACE**
★ **SPIRIT or KEROSENE STOVE**
★ **PORTABLE BARBECUE**
★ **CAMP KETTLE**

We rely on Your co-operation

Thank You!

FORESTS COMMISSION, VICTORIA

The Challenge of a Changing Scene

By J. H. Willis

Dr. C. S. Sutton, a prominent member of the Victorian Field Naturalists Club and a great walker, wrote of the vanishing Sandringham flora as early as May 1911, and five years later he said:

> This flora was in such imminent danger of destruction that very soon it would not be so conveniently available for study.

At that time there were still delightful patches of heathland around Oakleigh, Caulfield and Ashburton, while hundreds of acres of similar country could have been purchased very cheaply at Black Rock, Beaumaris or Cheltenham.

Concerning the Keilor Plains flora, north and west of Melbourne, Sutton wrote (Dec. 1916):

> The flora of the basalt has suffered even more than that of the 'sands' from human interference . . . hardly any part now remains in the virgin state.

Yet, even then the glorious white *Diuris* orchid occurred in sheets along railway reserves at Williamstown, Braybrook, Tottenham, Sunshine and St. Albans. Now they have all gone beyond recall, and this fine flower is on the very brink of extinction.

Dr. Ronald Melville came out from Kew Herbarium in 1952 to spend a year botanizing in Australia, chiefly Victoria. His first journey was out west of Melbourne across the plains, and he was amazed to go five, ten, fifteen, twenty and more miles before catching a glimpse of our native flora. There were plenty of cardoon thistles, alien grasses, capeweed, box-thorn hedges, odd pine-trees, yes, but *where* was the true Australian vegetation? All but completely ousted by aggressive weeds!

Sutton deplored the steady disappearance of those two formations so near Melbourne — sand and basalt plants—and he stressed the need to record all that was left while there was yet an opportunity to do so. He certainly gave a splendid lead in his valuable lists of species forty to fifty years ago, prior to the vast increase in suburban building that we have seen in recent decades. Vestiges of both coastal heath and basaltic grassland lingered until World War II; but, since then, they have virtually vanished under the housing and industrial sprawl of Greater Melbourne.

On the occasion of the seventieth anniversary of the F.N.C.V. (July 1950), the then President, Mr. E. E. Lord, stated:

> From an unknown colony, 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 teeming population. . . . What does all this mean to natural history, and to the Field Naturalists' Club? Everything. It means that during the next 50 years we are going to see a population of perhaps 50 millions. We are going to see the putting to use of

* An address delivered at the country naturalists clubs' combined week-end meeting with the F.N.C.V. in Melbourne, Oct. 17, 1959.

every possible bit of our land. . . . If this Club is going to be a factor of any account in the preservation of the fauna and flora of the country . . . to reality.

In September 1959, the Victorian Premier (Mr. Bolte) said that Victoria was expanding at a tremendous rate, a rate faster than any other part of Australia, and in every direction Victoria had to make provision for the future. I wonder if he gave a thought to the future of our dwindling wild life — to the primitive bushland scenes that we older people have enjoyed, but the like of which our children will never see again. Wherever the natural plant cover is destroyed or impoverished, so, too, is much of the native animal life which depends upon it. Yes, it *is* a changing scene, indeed; and the preservation of our natural heritage an urgent challenge.

The causes of change inimical to Victoria's native plants and animals are inseparable from man's interference with nature and may be set out under the following seven principal categories:

1. *Agriculture*, which takes one of two forms—

(a) *Actual cultivation of the ground*, with immediate destruction of the flora and introduction of alien crop-plants† and their attendant weeds.

(b) *Development of pasture land*, involving the clearing of trees and scrub, browsing and trampling of native plants by stock, manuring of land (with deliberate introduction of exotic pasture plants such as paspalum grass and subterranean clover) and accidental introduction of more weeds (e.g. capeweed).

† Pine plantations might also be classed as "crops" of alien plants, replacing native flora.

With the discovery that trace elements can be applied to soils once thought hopeless for the support of any kind of agriculture, vast areas of scrub are now being transformed into productive farmland. An example is the A.M.P. project now under way in the Big Desert north of Nhill.

2. *Soil erosion*, resulting directly from bad cultivation practices on steep friable slopes, overstocking on sandy tracts with low rainfall, or trampling in various places.

3. *Naturalized animal pests*, such as the rabbit which causes enormous damage and prevents seedling regeneration (especially in arid country), the deer, and alien birds which compete with the useful natives for food and nesting places.

4. *Bushfires*, which not only annihilate whole populations of plants but destroy the soil-binding cover and alter the composition of forest and scrub. For instance, bracken and fireweeds spring into prominence on the mountains, and increase of such plants as the grass trees may completely oust other native ground flora.

5. *Housing and industrial expansion of all kinds*, including open-cut coal mining (Yallourn, Morwell, Bacchus Marsh and now Anglesea) and quarrying.

6. *Track formation of all kinds*—roads, railways, electric power-lines and so on.

7. *Sheer vandalism*, such as flower-picking, indiscriminate shooting, trapping, bird-nesting.

Enlightened education might do much to eliminate vandalism and to lessen the danger of bushfires. Myxomatosis and poisons have greatly reduced the rabbit problem, but these other forms of destruction still proceed at an accelerating pace: agriculture, building, track construction, and the extraction of mineral wealth from the soil. Even in some State Forests, clearing up of debris on the ground as a fire precaution is quite detrimental to the nesting sites and refuges needed by many native animals, including scrub-birds.

It is perhaps some comfort that the more colourful wildflowers tend to prefer rocky or poor sandy ground — country that is often classed as "waste land" and is unlikely to be exploited for any purpose. Many National Park areas are of this nature.

No one can halt industrial progress in a vigorous growing nation, nor would it be thinkable to do so; and apparently we must gear our thoughts to an atomic and space-travel age; but *has* anything been done here in Victoria toward meeting the inherent threats to our native fauna and flora.

We now have a Government-financed National Parks Authority, under which large areas in various parts of the State are protected from exploitation of any kind. We also have a small but extremely active Native Plants Preservation Society that, in less than eight years since its inception, has secured *55 wildflower sanctuaries* for surviving native flora in representative parts of Victoria. There are game reserves and other faunal sanctuaries from district to district.

But these moves are only a beginning. It behoves every naturalist to keep systematic records of the plant and animal life around him—local lists of species and forms, flowering and seeding habits, migration patterns, life histories of as many organisms as possible (and we know remarkably few as yet). How fascinating it can be to study the sequences in any plant species—budding, flowering, fruiting, germinating, methods of pollination, evidences of hybridism—or the courtship and nesting habits among birds and insects, food preferences, effects of climate and local weather, incidence of disease, resistances to it. Why, the sky is the limit to any naturalist keen enough to observe the passing scene around him; but he *must* have some method of recording what he sees. So often the most vital secrets die with the one who discovered but failed to note them down for the benefit of posterity.

In England it is now almost impossible for woodlands to regenerate naturally, because of the abundance of mice and voles which destroy any seedlings that may appear. The British Isles as a whole have lost many objects of great interest over the centuries — the beaver, elk, brown bear, lynx, wolf, wild hog and bustard, to mention a few. Scottish wild cats, golden eagles, and red squirrels are now rarely to be seen, while kites and ospreys are on the verge of extinction. During the first half of last century a great improvement in the efficacy of firearms brought about a wholesale massacre of mammals and birds, so that by 1900 many species had become restricted to the roughest, remotest highlands.

Some British plants, too, are presumed extinct, and several of the fifty orchid species are now numbered by individual plants, amongst them the Slipper, Monkey, Military and Late Spider Orchids. Mechanized farming since World War II has resulted in the cultivation of high chalk downs that had been pastureland for centuries, and many rare plants of the chalk have been decimated as the land was ploughed up. However, Britain appears to be more conservation-minded than Australia, and, despite the much denser population there, strenuous efforts are being made to protect and preserve the remaining wild life. The number of natural history and field societies throughout the United Kingdom is astounding: Yorkshire has about 100, Lancashire 80, London 130 (if one include the royal and learned societies), and even little Cornwall has 23 (including the Old Cornwall societies). It is doubtful whether Victoria could muster more than about 20, and other States are even worse off.

Again, Great Britain is explored and mapped in far greater detail than any part of Australia, while there is no dearth of local literature on the history and natural history — County floras, booklets on birds, insects, rocks and so on. The intensive botanical mapping scheme of the British Isles is centred at Cambridge Botanic Garden, and needs to be seen to be believed; only Holland seems to have anything approaching it. In effect, one may feed a series of punched cards into a machine, press a few

buttons and, in a matter of minutes, receive a map giving the known range of any species of flowering plant over the whole British Isles (with respect to every 100 square kilometres).

These achievements are a challenge to our local naturalists, for the amateur field man in Britain plays an important rôle in collecting data for the mapping scheme. Could we not also prepare and publish detailed check-lists of organisms in particular districts, shires or counties? In this connection Tarlton Rayment's *Bees of the Portland District* (published by the Portland Field Naturalists Club in 1953) is a most praiseworthy effort, embracing no less than 137 species. But what of the ants, spiders, molluscs, reptiles, lichens, mosses, grasses and other flowering plants of many districts? Are they not just as worthy of record?

And even weeds themselves, which are now more important than native plants in many places, are worthy objects of study. We have about 500 to 600 different kinds in Victoria, and much remains to be known about their habits—if only to discover means for eradicating the pests. Several competent botanists in the U.K. devote most of their energies to studying the alien plants that have obtained a foothold, but the British weed flora is not nearly so diverse or aggressive as that in Victoria. Ours is favoured by a much greater range of climate, from the heat and aridity of the Mallee sandhills to the persisting snow-fields of our alps.

Hattah Wildflower Sanctuary dates from 1952, and a view on both sides of its rabbit-proof fence shows how well the native Mallee flora will respond under protection from browsing animals.

By courtesy: C.S.I.R.O., Merbein

IMPRISONED ROCKS: A PROCESS OF ROCK ABRASION

By Alfred A. Baker

Rock falls along precipitous coastlines are of common occurrence and wave action usually removes the material almost as fast as it is deposited. However, along a section of the cliffy coastline of Cape Paterson in south-eastern Victoria, about half a mile west of the Eagle's Nest, rock falls are not removed by wave action, but, by a process of abrasion, form a mosaic by which the rocks are "imprisoned".

The coastline in this area is composed of felspathic sandstones and mudstones, which are part of extensive lake deposits of the Lower Jurassic period. The black coals of the Wonthaggi area belong to the same period. The area is subject to faulting, and earth movements cause the cliffs to crumble, providing material for these "imprisoned" rocks.

Normally, waves reduce large blocks to smaller size by battering, abrasion and the scouring action of the water itself, until finally, at sand-grain size, they are removed by tides and currents. Along this section of the Cape Paterson cliffs, the amount of rock fall is much greater than the waves can remove. Also, it occurs in a bay protected by a headland, and wave strength is thereby reduced considerably.

Strong waves travelling easterly along Bass Strait into Venus Bay, strike this headland

Pressure abraded rocks [illegible] by marine [illegible] and [illegible] more [illegible]

Abraded rocks cut into each other.

and rebound obliquely into the bay, where the weaker waves continue on to the fallen rock at the cliff base. Wave action being insufficient to batter and reduce these rocks to sand, they remain more or less in the original position of their fall and are only abraded by normal high-tide action or by storms.

Storm tides, with increased winds and violent waves, apparently only move the fallen rocks about in a rough levelling manner or turn them about in the pile itself. Normal high tides cause buoyancy of the rocks, producing slight up and down or sideways movements, allowing them to abrade each other and eventually to form a crude rock mosaic, the pieces being so "imprisoned" that it is impossible to remove one from among the others without breaking them.

fect this process can be seen by the previously gouged, rounded or pointed abrasions having become discoloured by marine algae, while the more recently abraded surfaces are quite clean in appearance. If for some reason, wave action ceased in this area, then the effect of wind and rain, with continued rock fall, would infill the spaces between the abraded rocks to form a solid mass. Evidence that this has taken place in the past can be seen in wave-worn boulders in the vicinity showing a mosaic pattern of sandstone and mudstone pebbles similar to that described here.

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

Habits of Silver Gulls

Miss Ina Watson, who is Information Officer of the Victorian Fisheries and Game Department, has supplied these notes, following Mr. A. J. Reid's queries last month about the Silver Gull:

The regurgitation of food pellets is the method of feeding the young birds. At first the food is held in the bill and the young peck the regurgitated material from there. At this stage it is mixed with a certain amount of the parent's saliva. As the chicks grow the food is regurgitated on to the ground by the parent and picked up by the chick. Begging, subsequent regurgitation of food and feeding is part of the ritual of courtship between breeding couples.

The Altona Survey Group of Melbourne has been studying the Silver Gull for a number of years and will be publishing a detailed life history within the next few months. In that will be described some seven or eight methods of taking food by the adult birds, whose diet is extremely varied. Seagulls are omnivorous.

There are a number of breeding colonies of Silver Gulls at the Salt Works at Altona, on islands and reefs off the coast, and on islands and even in hollows and on stumps of isolated trees in inland lakes.

Banding of thousands of young gulls has shown considerable movement in the species. Birds banded at Altona have been found at Broken Hill, at Cooks River north of Sydney, and in South Australia, Tasmania and the Bass Strait islands.

Thank you, Miss Watson. We hope that when they are published, the reports of the Altona Survey Group will be reviewed in the *Naturalist*.

In May 1958 some information about a nesting colony of Silver Gulls was published in this journal (*Vict. Nat.* 75: 13-15). It was seen at Mallacoota by members of the F.N.C.V. during the club excursion in December 1957.

The Moth's Diet

Miss Jenine Andrew has sent along a small brown moth which was caught eating tomato relish. She wrote:

> It had uncurled its tongue and was poking it up under the lid and drawing the relish down through it.

In moths and butterflies, the proboscis or "tongue" is a hollow tube through which the insects suck liquid. With it they reach down into the corolla tubes of flowers to obtain nectar, and they often drink water from wet surfaces with it, too. But, of course, these insects are not as voracious in the adult stage as when they are caterpillars. When not in use the proboscis is tightly curled up like a clock spring under the head.

The moth concerned has been identified as *Persectania ewingii*, of the family Noctuidae. Its proboscis is about half an inch long, which is quite short compared with those of some hawk moths in which it may be two inches or more long.

Birds at Play

The nature student must be prepared for surprises, and one does not need to go to remote places to find out something new. Here are some observations made by (Mrs.) I. P. Hanks of Black Rock, one of Melbourne's south-eastern bayside suburbs:

> The habit of the Pacific Gull of dropping a mussel from a height on to a rock, or other hard surface, in order to break it open, has often been noted and commented on. Not so well known is its habit of play.
>
> I have on several occasions watched a Pacific Gull rise in the air, carrying in its bill a long strand of seaweed, with or without a mussel attached, but instead of letting it reach the ground when dropped, the bird swooped below it, catching it and rising again with it in the bill. This was repeated a number of times before it finally dropped the seaweed. It may then start the performance all over again. Ricketts Point on a windy day is a good spot for such observations.
>
> It was on a windy day late in September that I made a more unusual observation in the same area. The bird, some distance out at sea, was dropping and retrieving in flight a small dark object in the manner of the Pacific Gull, swooping to catch it before it reached the water. Training the binoculars on it I was surprised to find that the bird was not a gull, but a Crested Tern (*Sterna bergii*). I have not heard of any similar observation on a tern.
>
> It seems remarkable that whereas with mammals it is generally the young that indulge in play, with birds this seems to be confined to adults.

The Cherry Ballart

In *Flora of Victoria*, our "native cherry" is said to be a root parasite. Here are some comments on it by Jean Galbraith:

> Two years ago Mr. W. Cane of Maffra found a patch of seedlings of *Exocarpus cupressiformis* with no other tree near them.
>
> He had already begun to doubt the fairly widely-held view that the species is parasitic, and thinking this a good opportunity to test it, he prised away rocks and followed the roots of a number of plants right to the end (sometimes as much as two feet deep), and was satisfied that in no case did they touch the root of any other species.
>
> The seedlings were so crowded that all could not have survived, but not wishing to destroy any he took the uprooted plants home and planted them in the glasshouse. All but one of them grew.
>
> He has since grown many plants from seed (and I believe others have done so, too) under conditions which made parasitism impossible.

White Sallow Wattle — *Acacia floribunda*

The blossoms of White Sallow Wattle are not really white but a very pale yellow colour. This is the least common of a group of three wattles with narrow phyllodes and flowers in "catkins". Although it grows wild in Victoria only along Gippsland streams, it is known to many as a street and windbreak tree.

Many who have seen the extensive roadside plantings of *Acacia floribunda* near Yallourn have decided to grow it. It has spreading limbs and branches drooping as gracefully as a willow, carrying dense foliage right to the ground. It is remarkably uniform in growth, shaped like half of a broad ellipse, fifteen or twenty feet high, in the places where it grows best.

The colour of the foliage varies with the season and the amount of exposure. In shaded places it is usually dark green, but in the open the foliage is yellowish-olive. The phyllodes are often tipped with yellowish-bronze, which gives the tree a distinctive hue.

The narrow phyllodes hang gracefully. They are three or four inches long, pointed and slightly sickle-shaped, smooth and thin, and very inconspicuously veined.

The strongly scented, primrose-yellow spikes are often two inches long and they clothe the tree thickly in September and October. The name *floribunda* means literally an abundance of blossom.

White Sallow Wattle is tolerant of a variety of climates and soils, so it is easy to grow. This is surprising, for the species is a native of rich soils on sheltered river-banks. It is restricted in distribution, being found only in south-eastern New South Wales and eastern Victoria. It does not occur anywhere west of the Glenmaggie area.

In cultivation it is an excellent shelter tree because its dense leafy branches sweep the ground, affording protection from wind where protection is most needed.

Being a tree, though small, it is easily distinguished from its two nearest relatives which are shrubs with blunter, thicker, strongly veined phyllodes.

Notes on the Dotted Heath-myrtle

By JEAN GALBRAITH

There are exciting discoveries to be made by plant-lovers even in these days when there is no unmapped land remaining in Victoria, and one is surprised now and then by "islands" of plants which have not been recorded. One such recent discovery has a dual aspect, affecting both the name and distribution of an uncommon shrub.

Research by two botanists of the National Herbarium staff—Messrs. Court and Willis, working independently—revealed that the same species has been living under two names. In Tasmania it was known as *Thryptomene micrantha* Hook. f., and on the mainland as *T. miquelliana* F. Muell. No one, apparently, compared the two in Australia or suspected that they were one and the same.

Soon after this confusion of names had been detected, a visit to the La Trobe Valley Water and Sewerage Board Farm (Dutson Downs) at Dutson, south-east of Sale, resulted in the discovery there of the plant in question. In the past it has been known from southern New South Wales and South Australia (as far west as Eyre Peninsula), but in Victoria only from Sperm Whale Head—a tongue of land jutting into the Gippsland Lakes, two or three miles across Lake King from Paynesville. Even there it was unnoticed until 1919.

No other Victorian record existed until we found the species growing abundantly on Dutson Downs, in August 1959. There it covered several acres with twiggy bushes densely covered with small white flowers. The general effect of the bloom is coral-like, and, instead of the dazzling white of a bush of *T. calycina* in bloom, *T. micrantha* appears rather "off-white" because the dark centres of the flowers are so much larger in proportion to the size of the petals than those of *T. calycina*. The size and habit of the two bushes are much the same, but no one would ever mistake the Gippsland *T. micrantha* for the Grampians *T. calycina*.

It is, however, worth looking at the supposed difference between the Tasmanian *T. micrantha* and the mainland *T. miquelliana*. Bentham, in *Flora Australiensis* Vol. 3, p. 58 (1866), says:

T. miquelliana—Flowers 1½ to 2 lines long.

T. micrantha—Flowers very slender, ¼ lines long.

"Very slender" would describe the flowers of what we have been calling *T. miquelliana* equally well; and ¼ of a line (i.e. 1/48 of an inch, or ½ mm.) is a very slight distinction on which to base a species. In any case neither Court nor Willis found even this small difference to be constant. Mr. Willis has made these comments in a letter to the writer:

"When Baron von Mueller published *T. miquelliana* in 1858 he was apparently ignorant of the fact that J. D. Hooker had described *T. micrantha* only five years previously, for Mueller does not mention the former species as having any affinities, although he compares his new plant with both *T. mitchelliana** (Grampians) and *T. ericoides* (South Australia), which differ significantly.

"When H. B. Williamson described *T. miquelliana* as new for Victoria [see *Vict. Nat.* 36: 111 (Dec. 1919)] on the basis of specimens collected by T. S. Hart, three miles from Paynesville, he had apparently not checked the material against perfectly similar *T. micrantha* from eastern Tasmania which was in the adjoining folder at the National Herbarium.

"Since the identity of *T. miquelliana* with *T. micrantha* has been established, and *T. micrantha* was published first, the latter automatically becomes the name of all specimens previously known as *T. miquelliana*, whether collected in South Australia, New South Wales or at Sperm Whale Head in Victoria. *T. micrantha* is thus recorded for three mainland States, the east and west coasts of Tasmania and some Bass Strait islands. The southern records, in addition to Sperm Whale Head, are Freycinet Peninsula (Dr. Curtis's *Student's Flora of Tasmania*, 1956), "North-east coast from

* A synonym for *T. calycina*.

Shouten Island, Bass Straits, Macquarie Harbour" (Rodway's *Flora of Tasmania*, 1903) and Flinders Island (*teste* Rev. H. B. Atkinson). Rodway queried the Macquarie Harbour record, but there is material in the National Herbarium from that locality."

Its recent discovery at Dutson Downs fits into this coastal pattern, for it occurs in sand (with an undergrowth of *Astroloma pinifolium*, as at Sperm Whale Head) only a few miles inland and perhaps twenty miles west of its occurrence at Sperm Whale Head. On learning of its rarity the Latrobe Valley Water and Sewerage Board decided to fence a couple of acres of their farm at Dutson Downs as a sanctuary for the Thryptomene, and because of their vision we need not fear that Victoria will lose this part of her flora from its latest recorded habitat; an "island" of a few acres on the 10,000-acre farm.

In thanking Mr. Willis for information about the work done at the National Herbarium on this species, I should like also to express my gratitude to his colleague, Mr. Court, for permission to quote their findings, which have resolved the *T. micrantha*-*T. miqueliana* confusion and underlined once more the need for wide comparison of specimens before "new" records are published.

The Gippsland Mallee

By A. G. Hooke

The article in the September *Naturalist* on "Mallee and Dwarf Eucalypts" recalled the discovering of the Gippsland Mallee, *Eucalyptus kitsoniana*, during the last few years in two quite unexpected localities.

At Mount Oberon, on Wilson's Promontory, it was found growing in fair quantity among the huge masses of rock on the very summit, 1850 feet above sea level, and also a mile away on the southern slope of Big Oberon Saddle—a mallee form of eucalypt flourishing in an environment as far removed as one can imagine from the conditions typical of the Mallee country. Exposure to the severity of mountain top and Southern Ocean climatic conditions restrict the height usually to five or six feet, instead of the normal ten to twelve feet in the usual habitat—a limited area in South Gippsland twenty to thirty miles away inland, mainly about Meeniyan and Stony Creek.

The second locality lies a hundred miles across the ocean, west of Wilson's Promontory. This was a much more notable find, as *E. kitsoniana* was discovered growing in a very restricted area, one of two square miles in extent, of flat sandy country, lying at the foot of the Otway Ranges, close to the coast a few miles eastward from Cape Otway. The area appeared to be completely covered with an impenetrable growth of tea-tree (*Leptospermum*) with a uniform height of about seven feet, making it difficult to see the surroundings. However, by climbing into the lower branches of a sturdy old specimen of *kitsoniana* which happened to be growing close to the track, I was able to see a number of others which also grow a few feet higher than the prevailing tangle. There appear to be no other kinds of eucalypt in the immediate vicinity, which lies outside the edge of the main Otway Forest.

At the time, we were following the old road from Apollo Bay to Cape Otway Lighthouse, a road unused for the past thirty years, since the construction of the Ocean Road, and in parts difficult to follow because it is so overgrown. Two questions arise. First, one wonders how a little pocket of *E. kitsoniana* comes to be growing so far away from the usual habitat and separated from it mainly by the ocean. The most likely answer appears to be related to the events that caused the drowning of Bass Strait, and it indicates a habitat in earlier times extending for perhaps 120 miles from west to east. The second point of interest is the evidence thus provided of the age of the species, which had apparently assumed its present form and perhaps its present characteristics when Bass Strait was dry land. Comparison of specimens from both localities might yield useful information.

THE BOGONG HIGH PLAINS

This is the final appendix to the report of the F.N.C.V. excursion last summer. It has been compiled by J. Ros Garnet

POND LIFE AND MOSS BEDS

It might be thought that the little crystal-clear streams which meander through the High Plains and the quiet pools near them would teem with small aquatic life. These waters, margined by dense beds of sphagnum and other vegetation in various stages of development and decay and their submerged gardens of water milfoil, seem to be an admirable breeding place and shelter for an abundance of microscopical life.

Mountain trout, or "minnows" (*Galaxias corn*) were plentiful enough to indicate an abundant food supply, but investigation failed to reveal much in the way of likely sources of sustenance apart from tadpoles and frog spawn.

During the visits to Pretty Valley, the problem was given special attention by Mr. McInnes. Many sweeps with his net and rinsing of the spagnum brought to light only a few ostrocods. The expected rotifers, cladocira and copipods were not found, nor were any interesting protozoans. Even pieces of milfoil, when examined under the microscope, showed no sign of life. After two hours fruitless dipping in both still and running water, interest in the pond life of the Bogong High Plains simply faded out.

In contrast to the Pretty Valley sphagnum ponds and streams, nearly all the roadside pools, aqueducts and quarry holes were teeming with tadpoles. Where pools were drying through seepage or evaporation, this population was so congested that the local birds could not cope with it.

These negative observations are of interest, and Mr. McInnes's surmise that the pools and streams would yield a rich harvest as the season advanced is probably a correct one.

At the beginning of the spring thaw, melt water, too cold to stimulate growth and multiplication, is likely to be inadequately furnished with nutrients. In running water, those that leached in would be diluted too much to support a population of swimming organisms. With the advance of summer warmth, nutrients from decaying vegetable matter and minerals from rock decomposition would pass, in increasing amounts, into the water, reaching a concentration at which pond life could flourish.

In still pools, the accumulation of food materials would be much faster, so one might expect to find them populated before the streams. Also, life cycles would be completed much faster because evaporation would bring about concentration of the soluble nutrients. A stage might eventually be reached when the concentration of minerals or the day temperatures of pools becomes too high for the comfort of the free-swimming denizens and they would pass into their resting stages.

Moss beds are almost world-wide, ranging practically from sea level to the margins of perpetual snows. In Victoria one is as likely to meet them in tea-tree thickets at Rosebud by Port Phillip as in the alps. They can be taken as the progenitors of peat, a useful fuel that still warms many a European hearth.

Sphagnum bogs have a common mode of origin. The moss spreads into depressions with an impeded water outflow, always in very acid conditions and often in granite country. These conditions favour sphagnum but inhibit most other plants, so the moss thrives with a minimum of competition. Layer upon layer is formed, the lower strata becoming peat when high acidity prevents its breakdown by micro-organisms. The peat is almost impervious, so the water table rises and provides for higher layers of the sphagnum which thus may grow upwards and outwards.

Peat also has the capacity to absorb minerals, thus depleting the already meagre supply available to other vegetation (and fauna). Extension of the bog will cease only when surface evaporation balances the sum of rainfall and capillary rise of subsurface water.

In our alpine moss beds, the vegetation is remarkably uniform: epacrids, a few rushes and sedges, Alpine Sundew, Veined Sun-orchid and a very few other herbs and low shrubs. The bogs cannot support a population of trees or tall shrubs. Vascular plants that do grow in this environment root deep in the peat where the mineral content is high or else just below the surface of the mees where there are slight concentrations of nutrients due to surface deposition.

The moss beds provide a fascinating field for the study of a particular phase of ecology, and they shed some light on the problem which confronted our party—why the waters associated with them were so poorly endowed with aquatic animal life.

AMPHIBIANS AND REPTILES

Mr. D. Woodruff has presented the following notes on specimens collected during the excursion.

Hyla ewingii alpina. The common frog of the alps, found both above and below the tree line in running or still water. Multitudes of tadpoles were seen in all stages of development.

Amphibolurus muricatus. One female was taken near Bogong township. When discovered, this lizard was apparently covering with soil its clutch of six eggs. The eggs, rather off-white in colour and measuring 12 x 7 mm., were concealed by an inch of soil.

Sphenomorphus quoyii. A little skink lizard, common throughout the area.

Denisonia superba. Six specimens of the Copperhead Snake were seen, all less than four feet in length and conspicuously darker than the lowland form, a characteristic which frequently leads people to mistake it for a Tiger Snake.

Denisonia coronoides. A little White-lipped Snake was produced at Pretty Valley in a damaged condition.

BIRDS

Miss M. Butchart has supplied the following bird list, compiled from the records of several bird observers.

(a) *Birds seen on the Bogong High Plains and in the Falls Creek area:*

Flame Robin, White-browed Scrubwren, Striated Pardalote—all four nesting; Pipit, very abundant; Raven, abundant; Little and Red Wattlebirds; Crescent, Yellow-faced and White-eared Honeyeaters; Eastern Spinebill; Fantail and Bronze Cuckoos; Grey Thrush; Grey Fantail; Willie-wagtail; Yellow Robin; Golden and Olive Whistlers; Eastern Whipbird; Brown Thornbill; Blue Wren; Silver-eye; Magpie-lark; Bronzewing; Tawny Frogmouth; Gang-gang Cockatoo, Crimson Rosella, Grey and Pied Currawongs; Nankeen Kestrel; Emu; Goldfinch; Skylark and Starling.

(b) *Birds noted below 4000 ft. elevation, between the High Plains area and the Murray River:*

Whistling Eagle, Black-faced Cuckoo-shrike, White-throated Treecreeper, Rainbow-bird, Welcome Swallow, Fairy Martin, Rufous Whistler, Black-backed and White-backed Magpies; Kookaburra, Lyrebird, Yellow-tailed Black Cockatoo, Black Swan, White and Straw-necked Ibises, Pelican, White-faced Heron, Silver Gull, Coot, Black and Musk Ducks and Spur-winged Plover.

INSECTS

A number of interesting specimens were collected for and by Mr. E. H. Coghill and these were subsequently presented to the National Museum of Victoria, where the Keeper of Insects, Mr. Alex. N. Burns, made the following identifications.

HEMIPTERA

CICADIDAE

Diemeniana curvaliana Kirkaldy (Golden-scaled Cicada)

Melampsalta denisoni Dist. (Small Black Cicada)

LEPIDOPTERA

PAPILIONIDAE (Swallowtails)

Papilio macleayanus Leach

SPHINGIDAE (Hawk Moths)

Hippotion scrofa Boisd.

NOCTUIDAE

Agrotis infusa Boisd. (Bogong Moth)

COLEOPTERA

ELATERIDAE (Click Beetles)

Credipomonus ?montanus Carter

SCARABAEIDAE

Diphucephala elegans Walk.
Heteronyx laeviceps Blkb. (Dumbledoors)
Phyllotocus sp. (Cockchafer)

CHRYSOMELIDAE (Leaf-eating Beetles)

Paropsis angusta Blkb.
Paropsis atomaria Marsh
Paropsis laesa Germ.
Edusa chrysura Germ.
Haltica sp. (Flea beetle)

CERAMBYCIDAE (Wasp-like beetles)

Hesthesis cingulatus Kirby

CURCULIONIDAE (Weevils)

Aoplocnemis suturalis Pasc.

CLERIDAE

Eleale simplex Newm.

MELYRIDAE

Telephorus pulchellus Macl.

ORTHOPTERA

ACRIDIIDAE

Monistria sp. (Spotted Mountain Grasshopper). This and several other insects were infested with red mites, identified as *Leptus keyi*.

BLATTIDAE (Cockroaches)

Platyzosteria sp. Apparently undescribed; collected at 6000 ft. on Mount Nelson; female with egg sac attached.

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Abnormally Coloured Cicadas

By C. E. Chadwick

Systematic Entomologist, Department of Agriculture, Sydney

The note by Mr. A. N. Burns in the *Victorian Naturalist* of April 1959 (Vol. 75, pages 201-2) on the occurrence of blue specimens of the cicada *Cyclochila australasiae* Don. recalls that abnormally coloured specimens were collected in the Sydney suburb of Bexley in 1957 and 1958. Here are the relevant details.

Two specimens were taken in 1957 by a schoolboy named Stephen Way. He writes: "Early in the morning of Tuesday, November 26, I found the first one on the side fence on a passion fruit vine, beneath our apple tree. On Thursday morning, November 28, I found the second one on the same fence within four feet."

One specimen, a female, was subsequently given to the Department of Agriculture. Another female is in the possession of Mr. J. R. Kinghorn. The two specimens mentioned by Mr. Burns were also females. In 1958 another specimen, this time a male, was collected at Bexley in late October or early November, and given to Mr. Kinghorn.

The specimen in the collection of the Department of Agriculture is obviously broader than normal, and shortly after being collected it was described by various people as cerulean blue, turquoise blue, bluish green or greenish blue. The colour extended into the veins of the wings. It has been kept in darkness since it was received. In view of the note by Mr. Burns and the various opinions expressed about the colour by different people, it was considered desirable to compare its present colour with those in Ridgway's *Colour Standards and Nomenclature* to obtain an objective estimate. There is a certain amount of variation in the colour of the thorax but the general colour would be between French Green and Ackermann's Green. A flange projecting from the prothorax is nearly transparent but has patches of green showing through. The eyes, except for their edges, are practically black, the edges being somewhat greyish. The ocelli are clear vitreous, surrounded in each case by black circles. The forelegs are lighter in colour than the body, except for the tibiae which are brownish. The only tarsus remaining is that of the right foreleg, which is brown; the tarsal claw is black. The middle and hind legs are lighter green than the body and the tibiae are reddish. The veins of the wings are much the same colour as the thorax but towards the apex there is a tendency to brown. The dorsal surface of the abdomen is slightly darker green than that of the thorax. The general surface is somewhat glossy.

Mr. Kinghorn's specimen, collected in 1957, is very much the same colour as the Department of Agriculture specimen, but the head and thorax lack the glossy appearance of the rest of the body. He considers that the specimen is definitely more green now than when it was collected.

The male specimen collected in 1958 is pretty well the same colour as the specimen in the Department of Agriculture, but it is less glossy.

THE COSSTICK RESERVE, MARYBOROUGH

On September 13, 1959, the club held an excursion to Maryborough, primarily to inspect the Cosstick Reserve and to accept it from the donor, Mrs. Jean Nowlan.

The main party, including Mrs. Nowlan and her two young daughters, travelled by bus through Gisborne, past the burnt-out ruins of the Log Cabin Café, through Woodend and Castlemaine to Maryborough. During part of this section of the journey Messrs. Dodds and Coghill sat together in the front of the bus, commenting over the public address system on features of interest.

"Maryborough," Mark Twain is alleged to have said, "is a railway station with a town round it", and the station is certainly an imposing edifice. There we met a large party from the Maryborough Field Naturalists Club, led by Mr. Rogan on behalf of the president of that body (who could not attend) and the secretary, Mrs. Forge. There was also a contingent of the Cosstick family, including Mrs. Nowlan's two sisters, Mesdames McDougall and Withell. Here, too, we met a number of Melbourne members who had come by private car.

From the station we visited Phillips Park, a reserve in the town, notable for a magnificent Lemon-scented Gum, *Eucalyptus citriodora*. Thence we were led to the native wells in the forest, recently described in the *Naturalist* (Vol. 73, p. 48) which proved very interesting. Here, as was to be expected, the botanists escaped from control, and soon the whole area was swarming with naturalists examining the native flora, much of it just coming into bloom despite the dry season. However, they were mustered again in course of time, and we left for the Cosstick Reserve, where a party of the Maryborough people had lit fires and made tea in preparation for our arrival, so lunch was then taken.

The reserve is a block of a little over twelve acres, roughly rectangular in shape, of typical goldfields country on the left of the road from Maryborough to Avoca, about two miles from Maryborough. It was the property of Mrs. Nowlan's late mother, Mrs. Louisa Cosstick, and is named, in honour of Mrs. Nowlan's parents, the "Walter (Jim) and Louisa Cosstick Wildflower Reserve". A sign bearing that name, with the addition "Field Naturalists Club of Victoria, Trustees", is erected on the land and is clearly visible from the road. The land has been scratched for gold and cleared of timber long ago, there being an open shaft on the land and another about thirty feet deep just outside the boundary. However, it has not been disturbed for many years, and local flora, including trees, has made almost a complete recovery, there being no exotic vegetation on the land at present.

At a quarter to three it was time for the official handing-over ceremony. In the presence of about a hundred spectators, Mr. Rogan on behalf of the Maryborough Club welcomed us all and called on Mrs. Nowlan, who presented the title deeds to the land to our President, Mr. McInnes. Appropriate speeches were also made by the President of the local municipality, the Shire of Tullaroop (Councillor Dennis), who stated that his Council had exempted the land from rates, by the Mayor of Maryborough (Councillor Hedges) and by the Secretary of the F.N.C.V. (Mr. Coghill), and the gathering broke up to inspect the block.

At four we left for home, returning via Ballarat, where a picnic meal was taken in the Gardens.

The weather was most propitious. The few showers on the way occurred when we were safely in the bus, and as soon as we started for home, the rain started to come down steadily, and we were able to picture the thirsty soil we had just left, greedily absorbing the moisture.

It has been decided to make a list of the vegetation on the reserve. A preliminary census of the plants on the area shows a total of over fifty native species. The trees are Buloke, Grey Box and Yellow Gum, there are four species of wattles and several other shrubs as well as a great variety of small plants including seven kinds of orchids. Eventually we should be able to publish a fairly full list of the flora of the Cosstick Reserve.

Field Naturalists Club of Victoria

General Meeting—November 9, 1959

At the meeting, of about 150 members and friends, the President (Mr. D. McInnes) welcomed Mr. H. C. E. Stewart back after his illness.

Mr. McInnes introduced the idea of wearing name cards at club functions so that members may know one another.

Members were asked for ideas for the F.N.C.V. show in the Lower Melbourne Town Hall on September 5, 6 and 7. One suggestion was that artists be invited to show paintings of wild flowers.

There was an invitation for members to visit Mr. H. Best, an old member of ninety-six, at the Cheltenham Home for the Aged.

Miss Allender announced that there were still vacancies for the Christmas holiday at Apollo Bay.

Mr. R. Mathers, speaking on "African Wild Life", told of his work and travels as a mining engineer connected with copper, gold, zinc, cadmium and asbestos mines in Northern and Southern Rhodesia, Tanganyika and Kenya.

He gave a vivid account of the vastness of the copper mines of Northern Rhodesia, where 12,000 Africans and 2,870 Europeans are employed in one mine. He showed the extent of their housing, welfare services, sports facilities, schools and health services.

Excellent pictures illustrated the luxuriant growth in a climate where seventy-five inches of rain fall from November to April and none from April to November. Masses of Bougainvillea, Poinsettia, Poinsiana, Coral Creeper, African Flame Trees, Hibiscus, Gladiolus and Pride of Barbados were shown in colour slides.

An appealing colour slide of a chameleon showed change of colour with change of background, and its comical concentration on two views at once, due to independent eye movements.

Pyrethrum fields, bananas, coffee plantations, wild strawberries, and sisal (*Agave*) plantations were shown.

The grandeur of the Victoria Falls and Kilimanjaro (19,324 ft.), and free-roaming giraffes, elephants, rhinoceroses, gazelles, buffaloes, zebras and hippopotami, as well as gloriously-garbed African girls and Masai warriors, tough and proud on a diet of blood and milk, were splendidly illustrated by colour slides.

The meeting passed a vote of thanks to Mr. Mathers.

Exhibits by members: Australian opal chippings from Tarcoola forming a picture (Miss E. Raff); *Callistemon* and fascinated *Thrypptomene* (Miss J. Raff); Rose Robin's nest (Miss Balaam); garden-grown *Callistemon*, *Prostanthera nivea*, *Veronica perfoliata*, *Melaleuca squamea*, *Kunzea ambigua*, *Eustrephus latifolius* (Mr. Garnet); *Leptospermum nitidum*, *Callistemon pallidus*, *Melaleuca wilsonii*, *Chiloglottis gunnii*, *Banksia collina*, *Grevillea alpina*, *Olearia* and *Eutaxia* (Mr. Fisch); *Diuris punctata*—grown seven years in a pot (Miss Elder); *Cheiranthera linearis* (Miss Woollard); minute *Diomus pumilio* beetle (Mr. Coghill); lizard with a new tail (Mr. McInnes); Roman tile from St. Albans, England (Mrs. Helleson).

Mr. Stewart showed whitish emu feathers from a Gippsland district and speculated on the possibility of albinism in the species.

Microscopical Group Meeting—October 21, 1959

At this meeting Mr. W. Evans presented "*Paramecium*—the Slipper Animalcule", using 35 mm. slides synchronized with a tape recording.

Paramecium is a protozoan with cilia and a definite shape—two characteristics of the class (Ciliophora) which contains the most highly organized members of the phylum. Paramecia are free-swimming animals, and among the aspects discussed were the "avoiding reaction", which enables them to find their way among obstacles, and their reactions to temperature and chemical (food) concentration gradients.

There are two methods of reproduction, sexual and asexual. These were described, together with their effects on the genetic make-up of the offspring.

Entomology and Marine Biology Group Meeting—November 2, 1959

Mr. Curless gave a very interesting talk which led to much discusion—on the axolotl. This animal is the larval form of a salamander, which achieves sexual maturity without undergoing the metamorphosis that normally occurs in the amphibia. If axolotls, which occur most extensively in Mexico, are fed experimentally on thyroid extract, they will metamorphose into the Tiger Salamander which is common throughout the United States. It has been suggested that climatic differences have enabled the elimination of the adult stage from the axolotl's life history—a process known as neoteny.

Axolotls cannot see very well. They are carnivorous and eat with a quick snapping action. These characteristics lead to the occasional loss of limbs if a number are kept together, but they have great powers of regeneration and such losses are soon made good.

They will eat tadpoles, small worms, mosquito larvae and finely-chopped meat, and are hardier than goldfish in being able to tolerate a greater range of temperature.

Exhibits: a huge brown grasshopper from Darwin (Mr. Parnell); Tiger Moth eggs on a leaf (Mrs. Fairhall); galls on an acacia (Mrs. Finches); a tick from the body of a dead platypus (Mr. Genery); an axolotl and several young ones (Mr. Curless).

Geology Discussion Group —October 7, 1959

The twenty-five members and visitors who attended the October meeting enjoyed the fifth talk in a series on the geology of Australia. This was "The Geology of Western Australia", presented by Mr. Blackburn.

The speaker introduced the subject by comparing the palaeogeography of Western Australia with that of Victoria. Western Australia comprises a plateau of ancient rocks which is fringed by large sedimentary basins. The main rocks are greenstones and whitestones of Pre-Cambrian age. These are altered tuffs, shales and schists of a much earlier period. Quartz hematite bars (jasper bars) occur as resistant ridges in the Murchison and Kalgoorlie areas, and at Marble Bar in the north-west. Lower Cambrian basalts are overlain by limestones of the same age in the Nullagine area. The Carnarvon Basin, of Permian sediments, is at present being explored for oil; in the Perth Basin, evidences of Permian glaciation and deposits of black coal occur. The Eucla Basin, of which the Nullarbor Plain is part, is composed of Cretaceous marine sediments which rest on Pre-Cambrian rocks and are covered by Miocene marine sediments. Extensive folding of the greenstones in the Kalgoorlie area brought about mineralization of gold and tellurides.

Topographically, Western Australia consists of a vast arid plateau, with hills, ridges and buttes. With a rainfall of less than ten inches, and in the absence of a well-defined drainage system, surface water collects into lakes, many of which develop a migrating habit. Much of the centre and north-east of the State still remains unexplored.

The lecture was illustrated with coloured slides of many of the features mentioned.

Exhibits by members: lepidolite, petalite, microcline, albite and beryl, from Londonderry, south of Kalgoorlie; columbite and tantalite, from Tantalite Hill; blue asbestos; copper ore from Marble Bar (Mr. Cobbett); a collection of rocks and fossils from various horizons in Western Australia (Mr. Baker); jasper from Marble Bar (Mr. Bairnstow); conglomerate of slate and coarse sands from the Mitta Mitta River, Victoria (Miss Carolan); and brachiopods from Tasmania (Mr. Davidson).

Combined Weekend— October 17-18, 1959

After a rendezvous and introductions at Alexandra Gardens, F.N.C.V. and country club members drove to Frankston, where they were met by members of the Frankston F.N.C. and led to the sand pits reserve.

The botany of the area was discussed briefly by Miss Jean Galbraith, the geology by Mr. A. Baker, and the birds and animals by Mr. J. C. Le Souef, President of the Frankston club. Mr. S. R. Mitchell told something of the history of aboriginal

tribes which had roamed the district, and Mr. E. S. Hanks suggested that the reserve might be named after the Bunerong tribe. A separate report on the natural history of this reserve is to be prepared by the Frankston F.N.C. for publication.

On the Saturday night country members were guests of the F.N.C.V. at the National Herbarium. Mr. J. H. Willis, of the National Herbarium staff, who has just returned after a year at the Royal Botanic Gardens, Kew, addressed the gathering on "The Challenge of a Changing Scene". The substance of this talk appears elsewhere in this issue.

Mr. Willis then showed many slides of botanical interest which were taken in England during his visit. The speaker's fluent commentary, the interesting information about the orchids of England, and the vast amount of detail available to enquirers about natural history subjects in different parts of England, gave those present a delightful night's entertainment. Even without the supper it would have been, as so many said, "a splendid night".

F.N.C.V. DIARY OF COMING EVENTS

GENERAL MEETINGS

Monday, December 14, 1959—At the National Herbarium, The Domain, South Yarra, commencing at 7.45 p.m. sharp.

1. Minutes, Reports and Announcements.
2. "Nature Rambles in Britain", by J. H. Willis.
3. Nature Notes and Remarks on Exhibits.
4. Conversazione.
5. Correspondence.
6. Election of Members:

Ordinary Members:
Miss Dorothy Lloyd Robinson, 20 John Street, Kew E.4 (J. O. Annear/E. H. Coghill).
Mr. H. Eric Wilkinson, 93 Carrington Road, Box Hill, E. 11 (A. A. Baker/A. M. Cobbett).
Mr. Philip Robinson, 8 Marchington Avenue, Mornington (J. C. Walsh/D. E. McInnes).

Country Members:
Mr. John Edwin Sheehan, Park Road, Warburton (M. Butchart/A. G. Hooke).
Mrs. Lois Sourry, 100 Mann Street, Gosford, New South Wales (E. H. Coghill/A. G. Hooke).
Miss Yolande Newton, "Woburn", Morris Road, Woodend (E. H. Coghill/A. G. Hooke).

Junior Member:
Miss Ann Bunting, 343 South Road, Brighton East (J. M. Watson/A. J. Swaby).

7. Nominations for Membership.
8. General Business.

Monday, January 11—"Further News of Queensland", by Mr. Stan Colliver.

F.N.C.V. EXCURSIONS

December 26 to January 3—Apollo Bay. The parlour-coach will leave Flinders Street, opposite the Gas and Fuel Corporation, at 9.30 a.m. Bring a picnic lunch. The full bus fare (£6 less deposit already paid) must be paid to the Excursion Secretary by the December general meeting. Other details in previous issues of the *Naturalist*.

GROUP MEETINGS

The Microscopical Group and the Botany Group will not meet in December.

The Geology Group and the Entomology and Marine Biology Group will not meet in January.

The Victorian Naturalist

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Australian Native Dog or Dingo, Zoological Gardens, Melbourne. Photographed by Edward R. Rothernam, F.R.P.S. A.R.P.S.A.

Vol. 76, No. 9 January 7, 1960

F.N.C.V.

The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

This photo of a Silver Gull nestling was taken by the late Charles Barrett. It accompanied an article he wrote in December 1933 (*Victorian Naturalist*, Vol. 50, pp. 176-181), on "The Gulls of Lake Corangamite", in which he described their island rookeries, their behaviour, and their value to the local farmers.

The mottled appearance of the nestlings is retained, particularly on the wings, in the juvenile plumage, which replaces the down seen here and precedes the adult plumage.

Native Figs in Victoria

By Norman Wakefield

Since the publication of A. J. Ewart's *Flora of Victoria* in 1930, many species have been added to the census of native plants of this state. Many were found in the border districts of East Gippsland, and most of these were previously known from south-eastern New South Wales.

Now there is another new record to report, and it is perhaps the most interesting of all: native fig-trees have been found in Victoria, in some of the pockets of jungle on the northern side of Mallacoota Inlet.

The story really began almost a century ago. Baron von Mueller —or Dr. Ferdinand Mueller as he was then—was the Government Botanist of Victoria. In September 1860, he went by boat to Twofold Bay and investigated the flora of the district.

In his next report to the Government, Mueller wrote enthusiastically of the "tropical plants in the most south-eastern portion of the colony". He meant Victoria, for the border had not been surveyed. In his list of species he included "Large Fig-trees (*Ficus aspera*)". Because of this observation, Twofold Bay was cited by Bentham, in *Flora Australiensis* in 1873, as "the most southern point reached by any *Ficus*".

Although the border was marked in about 1870, Mueller continued to treat all his Twofold Bay plants as Victorian. So the fig and many others were included in his *Key to the System of Victorian Plants* in 1885-8.

In May 1919, in "Notes on the Census of Victorian Plants" in the *Victorian Naturalist* (Vol. 36, pp. 11-19), H. B. Williamson pointed out that a number of the species in Mueller's *Key* had never been found in Victoria. Most of these, including the fig, were removed from our census and therefore did not appear in the *Flora of Victoria* in 1930.

In November 1955 in the *Victorian Naturalist* (Vol. 72, pp. 107-9), twenty-two new Victorian plant records were published, all from East Gippsland. These included *Trema aspera*, another species which Mueller had in his *Key* because he found it at Twofold Bay and which was removed from the census by Williamson. A flowering specimen of the *Trema* had been collected at Mallacoota in 1937 by Mr. V. H. Miller, but it was not identified until it was donated to the National Herbarium in 1954.

Originally, both *Trema* and *Ficus* were classified in the nettle family (Urticaceae) but now neither is. *Trema* is grouped with elms and hackberries in the

family Ulmaceae, and *Ficus* is in the Moraceae. Neither of the last two families is in *Flora of Victoria*, and now both must be added to our plant census.

As well as giving Miller's record, the report in November 1955 said that *Trema aspera* had been found "more recently in the Howe Ranges by the writer". This referred to a collection I made in December 1950 in an upper branch of Harrisons Creek, north-east of the main Mallacoota lake. The specimen was of foliage only, and it now proves to be, not the *Trema*, but the fig species. The two are very similar in leaf characters.

Credit for first identifying the local figs is due to Mr. W. Hunter of Mallacoota. Early in 1957 he found trees of the fig at Smellie's Creek, a small tributary of the top lake near Gipsy Point. Again, with only foliage to go by, the plants were passed as *Trema aspera*. In January 1959, Hunter and I collected "fruiting" specimens from Smellie's Creek, and a month later a letter was received from him with this comment:

> I am very keen to know what you think of "*Trema aspera*" at Smellie's Creek on the top lake, of which we gathered some "fruits". I couldn't make them out as anything else but receptacles of *Ficus scabra* (which is *Ficus aspera* in Bentham).

Specimens were then checked, Hunter's decision was confirmed, and the identification of the Harrisons Creek plant was corrected.

The names *Ficus aspera* and *Ficus scabra* have been applied to a group of species. The correct name of our species has been given by the Chief Botanist of the New South Wales National Herbarium. He wrote:

Trunks of Fig-trees and massive lianes (Water Vine), at Smellie's Creek, Mallacoota.

Native Figs at Mallacoota. Typical foliage is in upper part of picture.

This is *Ficus stephanocarpa* Warb. Its occurence in Victoria is interesting but not unexpected since it is one of the hardiest of the New South Wales species.

Ficus stephanocarpa is one of the sandpaper figs, a group with very harsh foliage. At Mallacoota it grows into a small tree with a trunk up to eight inches thick and leaves to five inches by two. The figs are up to one inch and a half long and an inch wide, and they grow on twigs singly in leaf axils as well as in clusters on trunks and limbs.

In the *Australian Encyclopaedia* there is an article on fig-trees by the late C. T. White, who was Government Botanist in Queensland. He wrote that there were about a thousand species of fig in the world, of which some sixty occur in Australia, but "no species of fig-trees grow spontaneously in either Victoria or Tasmania".

A species with smooth foliage, the Port Jackson Fig *(Ficus rubiginosa)*, grows on rock cliffs at Bellbird Creek, a few miles from Eden and Twofold Bay. Perhaps this too awaits discovery in granite gullies of the Howe Ranges in the far-eastern corner of Victoria.

[Even more interesting than the finding of fig-trees in Victoria is the story of the partnership between figs and the wasps that pollinate them. An account of this and of the two fig insects from Mallacoota is to be written shortly for the *Victorian Naturalist*.]

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

Bird Notes from Here and There

Miss Jean Galbraith is interested primarily in botany, but apparently she also takes notice of the birds she meets on her excursions. Here is a series of three observations; the third was made at Miss Galbraith's home, at Tyers in Gippsland.

* * *

I thought the delightful habit of sitting on the tip top of a bush to sing was confined, among honey-eaters, to the Tawny-crowned Honey-eater, which I have often admired as it perched with head up and whole body lightly poised while its song rang out over the coastal scrub of Wilson's Promontory.

At Portland recently I was interested to see singing honey-eaters behaving in exactly the same way, sitting on the very top of tea-tree bushes to sing. While we watched one it darted straight up, snapped what seemed to be a small moth, then resumed its perch and its song.

* * *

One of the pleasures of a trip to Tidal River in 1957 was watching the Black Swans "up tails all" as they fed on the green *Zostera* in the river shallows.

Apparently they could submerge for just twenty seconds. I had not a watch, but counted twenty or twenty-one slowly every time between the moment each head went under water and when it reappeared. The difference of one was probably due to variation in my counting speed.

I lost count of how often I timed them in the course of half an hour.

A familiar "Clink! Clink!"—last heard a few years ago—announced the return of Regent Honey-eaters to the blossoming ironbark (*Eucalyptus sideroxylon*). You can imagine the picture of slim black and gold birds among rose-pink flowers and blue-green leaves.

A vociferous pair of wattle-birds make threatening dashes at them now and again but the Regents merely slip on to another bough and go on feeding. Noisy Miners are taking their share of nectar and insects from the lower boughs, and Yellow-faced Honeyeaters come and go in search of theirs.

Changes in Bird-life

District bird lists are a feature of ornithological literature, but there is comparatively little record of changes that take place over the years in bird populations. Here are some notes on the latter aspect from Mr. Keith Rogers of Wulgulmerang in East Gippsland. The river referred to is the Little River, a western tributary of the Snowy River, about forty miles north of Buchan, and the observations apply to an area with an elevation of slightly less than 3,000 feet above sea level.

When we were living at the Black Mountain homestead as children, there was a colony of Noisy Miners in a large clump of Black Mallee eucalypts close to the house. Their nests, and those of Red Wattle-birds, quite numerous in the low trees, were easy for us to look into and to watch the youngsters grow. If it was raining or snowing, a break in the clouds was always heralded by the miners, even before we were aware of it.

For a number of years the miner was one of the commonest birds in the district. Then, possibly about the 'twenties and for no apparent reason, they disappeared, and I have not known of one in the area since.

Another bird well known in those days, though never plentiful, was the Stone-curlew, with its mournful call at night accompanying the noise of Spurwing Plovers down in the flats. However, it is probably twenty years since I have heard the curlow's distinctive call here.

Though along the river the Golden Whistler used to be fairly common, I have not noticed it there for a long time. However, of quite recent years, the Rufous Whistler has appeared in numbers throughout the district. At the present time their melodious song is almost continuous in the trees around the house and in the garden. They take little notice of people coming and going or of any unusual noises.

Strange Behaviour of a Thrush

The following story comes from Mr. Noel Learmonth, a member of the Portland F.N.C.:

Mrs. Walter Stanford, a lifelong nature-lover living at Tyrendarra in south-western Victoria, protects all birds that come into her garden. During one World Bird Day count I saw Scrub-wrens, Blue Wrens, Red-browed Finches, Brown Flycatchers, Silvereyes, Yellow Robins, Scarlet Robins, Spinebills, Yellow-winged, White-naped and White-eared Honeyeaters, Cuckoo-Shrikes and Grey Thrushes. Here is her story about a pair of these thrushes.

On a chimney ledge about six inches wide and five feet from the ground, between the chimney and the wall, Mrs. Stanford was in the habit of putting secateurs, a garden hand fork, and similar articles. Recently she left a small pocket knife there, and a few days later found it had disappeared. She dismissed the matter with the thought: "Perhaps I didn't leave it there". Then a pair of thrushes built their nest on the chimney ledge. Next time Mrs. Stanford went out for the day she left the door key as usual on the ledge. On her return home it had gone and she had to force a window to enter her house. Then she placed a large nail on the ledge and that, too, vanished. Thinking there might be some connection between the nesting birds and her lost articles, she put another key behind the chimney, bound with white cloth to make it conspicuous should the birds drop it in the garden. Sure enough the key went but was not to be found in the garden. Now thoroughly aroused, she put the shiny top of a jam tin on the ledge and watched proceedings. After several attempts one of the thrushes managed to get the tin top in its beak, then flew across a chain road and into a thick forest of gum saplings and wattles. Mrs. Stanford followed and found in one spot her knife, two keys and the tin lid—the nail was evidently lost in thick bracken.

Bower-Birds are apparently not unique in removing "unwanted" articles from the precincts of their domestic quarters.

Two New Painted Shelters at Glen Isla

Photo: C. Kroker

By A. Massola

This is a preliminary report of the recent discovery of two additional sites bearing aboriginal paintings in the Glen Isla region of the Victoria Range, Western Grampians.

The two sites are in the vicinity of the well known Red Rock of Glen Isla, which was the earliest reported Victorian example of aboriginal rock art, and they obviously belong to the same series of sacred places which, as well as Red Rock, includes the Lesser Red Rock and the Cave of Fishes.

One of these new shelters had been located during an earlier visit to the district by Messrs. W. Blucher and I. R. McCann, both members of the Stawell Field Naturalists Club. It is only about half a mile from the Red Rock in a straight line, but, because of the nature of the country, quite a long walk and a fair length of time are necessary to cover this short distance. The shelter itself is situated near the top of a spur, on the right hand side of the valley, on the lower end of a huge sandstone mass, about forty feet high and fifty yards long. It is an eroded niche twenty-two feet long, fourteen feet wide and fourteen feet high. The frontal opening faces slightly east of north and looks across the valley to the hill opposite, over the crest of which, almost in a direct line, is the Cave of Fishes. The Red Rock is visible in a north-north-westerly direction, about half a mile away.

A few bird tracks and one kangaroo track are painted in red ochre on the wall of the shelter. The bird (or "emu") tracks, of which there are seventeen, average four inches in length, while the kangaroo track is only two inches long. It is too early as yet to determine their meaning, but it is hoped to be able to do so when they are studied in relation to the other examples in this region.

On the surface of the floor of this shelter, which consists of sandstone rocks covered by a few inches of washed sandy loam, the party found a few quartz and flint chips but no worked implements. Quartz and flint are not local stones, so these must have been carried there by man.

The position of the second site was not known to any member of the present party, and looking for a specific shelter in the Grampians is like looking for the proverbial needle in the haystack. Eventually it was found to be about half a mile further down the valley than the previous one. It is not actually a shelter, but a huge boulder, eighty feet long and thirty-five feet high, with a very slight overhang on the side facing east of north. On the lower end of this rock face, just out of reach of a standing man, there is a representation of a human figure painted in red ochre. It is ten inches high and about one and a half inches wide. About twelve inches to the left and slightly below this figure, there is another painting, but at this point the surface of the rock has flaked, and the design is difficult to interpret. It appears to have been the imprint of a human hand.

The style of the figure and the shade of red used in its execution are identical with the two human figures holding hands painted on Red Rock. There is no doubt that both examples are the work of the same artist, and that they were executed at about the same time. At some future date it may be possible to determine the chronological order of the Red Rock paintings, and the figure on this new site will then take its rightful place in the sequence.

Members of the party were Mr. I. R. McCann of Stawell, Messrs. E. Puecker, E. Barber and C. Kroker of Horsham, and Messrs. N. A. Tudehope and A. Massola of Melbourne.

Photo: C. Kroker

Gold-dust Wattle — *Acacia acinacea*

Gold-dust Wattle is the gold-fields wattle, but no doubt its blossom, not the habitat, suggested the name.

It is a bright, pure yellow and shines golden on the barren hills. It does not form sheets of gold for miles as some wattles do, yet over alluvial areas and similar gravelly country it is quite abundant—here one or two, there a dozen or even a hundred bushes.

The "gold-fields" stretch across Victoria from Stawell to Chiltern. Of course they have many other wattles, but *Acacia acinacea* is probably the most widespread, and it is certainly the brightest. Its small leaves and long-stalked golden heads give it a characteristic elegance.

Gold-dust Wattle is a rather straggling bush, varying from a sprawling two or three feet to much taller. Its little olive-green phyllodes are pointed at the base but nearly square across the top, with the terminal point at one corner instead of in the middle.

There are other wattles with the same foliage characters. One of them, Ovens Wattle, *A. pravissima*, belongs to the gold-fields, too, but it is found only in the north-east of Victoria, and its leaves are decidedly broader, smooth and bluish-green instead of slightly rough and olive-green. Furthermore, its light yellow heads of blossom are in large terminal clusters instead of in ones and twos along the stems.

Gold-dust Wattle is at its brightest in October, and even old bushes with substantial root-stocks keep their light and straggling character. Straggling is an apt description but it does not imply anything unattractive. The elegant little shrubs, wreathed in bright gold, are rarely symmetrical, but are always light and graceful. Their irregularity adds to their beauty and seems to fit in with the equally-irregular and even more elegant growth of several species of beard-heath with which they are often associated.

The flower clusters of Gold-dust Wattle are as small as they are bright. They gleam on half-inch stalks, singly or a few together from the leaf angles. The pods, too, are graceful—slender and usually curled along the stems, among the leaves.

Gold-dust Wattle, *Acacia acinacea*.

Photo: R. D. Lee

NATURE PROTECTION

National Parks and National Monuments

By J. Ros Garnet

Through the medium of this section of the *Victorian Naturalist* it is hoped to bring to the notice of readers, from time to time, places in Victoria which are recognized, or at any rate, which should be recognized, as either national parks or national monuments.

A national park is a part of the countryside dedicated to the protection of nature, its scenery and wild life. The term "national monument" denotes an area too small to warrant being called a park, but which possesses within its confines something of particular scientific, historic or scenic value; a geological section or curiosity perhaps, a wildflower sanctuary, an ethnological relic, or even some site or object of historical significance.

In your district there may be something worthy of dedication as a national monument. If you think so, tell us about it. If it is the sort of thing that can be damaged or destroyed by human agencies, then it is the sort of thing that can be protected by human intervention. For many such potential national monuments time is running out, so use these columns to bring them to public notice.

The editor has suggested that the series should start with an article on Victoria's largest park—Wyperfeld. An excellent choice, for in Wyperfeld Victoria possesses something quite out of the common. It is a place about which a book will be written some day, but all the books in the world are no substitute for the delight one will experience in rambling in the park. Books, and articles like this one, can be only the bait to tempt you to journey there and to seek out the interesting things within is boundaries.

Wyperfeld National Park

Of the fourteen national parks now scheduled as permanent reserves under the National Park Act, Wyperfeld is the only one west of Melbourne, and

The Scrub Robin, one of the many birds to be seen at Wyperfeld.

Photo: H. Dickison

that it exists at all can be credited to the enthusiasm and wisdom of one man—the late Arthur Mattingley, a prominent naturalist and ornithologist. In the spring of 1907 he and two other bird men spent a naturalists' holiday in the Mallee and, in the course of their rambles from Hopetoun to Pine Plains, traversed what Mattingley regarded as a wonderful natural national park. (Their guide was Charles McLennan, a dingo trapper who became well known, first as a nature writer for the Melbourne *Argus*, and subsequently as the first ranger at Wilson's Promontory National Park.)

So impressed was Mattingley with the potentialities of the region as a nature conservation area that he decided, then and there, that a large part of it should be preserved for all time as a national park. Eventually his dream was realized. In 1909 the Lands Department caused 9,600 acres to be reserved temporarily, and after the termination of the First World War, upon the urging of Mattingley (then president of the National Parks Association of that time), the reservation was made permanent. This was effected in 1921, since which time there have been five additions to the area originally gazetted, until today it embraces approximately 216 square miles of semi-desert, sand-hill, mallee and Black Box-flat country midway between Rainbow and Underbool.

The park is best approached from Hopetoun or Rainbow, both of which towns are about twenty miles from its entrance. It is situated in the ancient Murray flood-plain and, in by-gone ages, represented that portion of the land, once an ocean gulf, which was later traversed by the Wimmera River as it flowed northward to join the great Murray River. Today, the Wimmera River finishes its wanderings in Lake Hindmarsh, occasionally overflowing further north into Lake Albacutya and, more rarely, spilling over from there into its old course through the park—a course now known as Outlet Creek. Not since 1918 has the river flowed right through the park to Pine Plains, which lie four or five miles beyond its north-western boundary. Doubtless it does still gravitate northward but underground instead of as a surface stream, for, along the Outlet Creek track and its chain of dry billabongs and lakes, one finds a rich vegetation of Black Box and River Red Gum as well as tea-trees and wattles.

The main track through the park from south to north-west follows in a general way, the usually dry creek bed, but only motorists with four-wheel-drive vehicles should venture much beyond the camping area some five or six miles in from the entrance to the park.

Wonga Hut is there, providing tank water, fire place and shelter for picnic parties. The meagre supply of rain water is supplemented by water from a nearby bore, brought to the surface by a windmill. The bore water is not altogether suitable for drinking.

The park, now under the control of the National Parks Authority, is managed by an honorary committee of men

who are field naturalists and specialists in nature conservation. With some money to spend (something the earlier committees of management never had), they are about to introduce some substantial improvements in the quality and quantity of the amenities available to visitors.

Mr. Rud Campbell has been appointed recently as the park's first ranger, and, in time, we may hope to have Wyperfeld attracting hosts of visitors each intent upon seeing for himself a little of that aspect of nature which Walt Disney, in his famous nature films, has depicted so entrancingly.

Just what is it that, even now, draws visitors to this national park? I think the reason is partly in the great contrast between the country within the park and the country outside it. The singular native flora of the region has been swept away from hundreds of square miles of the adjacent private holdings to provide the vast wheat fields of the Mallee. Within the park it survives in its natural state. Within the park survives, too, the fauna—species well adapted by the long process of evolution to just such an environment. As well as kangaroos and emus in plenty, there will be found in Wyperfeld many of Victoria's rarer species, especially of birds. One of the reasons for its dedication as a national park was to retain a permanent natural habitat for such birds as the Regent, Mulga and Red-backed Parrots, the Gilbert Whistler, Major Mitchell Cockatoo, Mallee Emu-wren, and the Lowan. The bird list is impressive, not so much for the variety to be found there as for the comparative rarity of some species. Reptiles are there in plenty, too—goannas, dragons, skinks, snakes—and, of course, entomological rarities and curiosities: a fauna mostly small in size but very important in the ecology of the region.

The flora of the park has received considerable attention from visiting botanists. More than 190 species of vascular plants have been listed. In few other places will one see such plants as Bell-fruit or Blue Boronia. Here they grow with their age-long associates, surviving in a harmony that can be disturbed only by man and his works.

Something about the park which appeals is the sense of vastness of the landscape. From the summit of any sandhill, clothed in wattles, mallee eucalypts and other shrubs and herbs, one may gaze for miles, not on a sea of sand, but on a vista of gently undulating heathland, mallee or timbered flat. Lush green meadows, dotted here and there, betoken dry lake-beds or claypans, of which there are many along the course of Outlet Creek and tucked away among the sandhills. Such flats are where you will see your emus and kangaroos browsing in the early morning and the late afternoon.

Blue Boronia *(Boronia caerulescens)* in the North-western Desert.

Photo: W. H. Nicholls

Pollination of the Nodding Greenhood

By JACK HYETT

Cross-pollination would seem to be of vital importance to the orchids for, of all families of flowering plants, the *Orchidaceae* is that which has the most varied, and perhaps the most ingenious, methods of ensuring cross-fertilization, using insects as the pollinating agents. Yet in some orchid genera cross-pollination, in fact pollination of any sort, seems to take place rarely. The plants appear to rely on vegetative methods, using tubers and underground runners to ensure propagation of their species.

This is particularly so in the genus *Pterostylis*, where the large patches of these plants which do still occur in our rather "shop-soiled" bushland are attributable almost entirely to this method. Despite the fact that FitzGerald and Cheeseman had both experimented with various small beetles and dipterous insects as early as 1873, finding that these agents could remove the pollinia from *Pterostylis longifolia* R. Br. and *Pterostylis trullifolia* Hook. f. (a New Zealand species), it was not till 1909 that Sargent (*Ann. Bot.* 1909) first described the actual pollination of a member of this genus, *P. vittata* Lindl. In July 1934 he summarized this article in the *Victorian Naturalist* (Vol. 51, pp. 82-4) with added notes on pollinators of a flower of the *Pterostylis reflexa* group and of *P. turfosa* Lindl. "Gnats" and a large brown dipteran were responsible, but unfortunately all of Sargent's pollinators were accidentally destroyed before they could be identified.

Also in March 1934 (*Vict. Nat.* Vol. 50, pp. 248-52) Mrs. Edith Coleman had described the pollination of *Pterostylis falcata* Rogers and *P. acuminata* R. Br., both by a female mosquito of the genus *Culex*.

In all members of *Pterostylis* it appears from the structure of the flower that pollination depends on the trapping of an insect by the closing of the labellum against the column, so that it is forced to make its escape through the tunnel of the column wings thus having to make contact with the two pollinia in the anther at its apex. These are glued to its body by a round sticky disc (the viscidium). A needle thrust into the apex of the column will also come away with the pollinia attached. On visiting another member of the same species that part of the insect bearing the pollinia comes in contact with the receptive stigma and cross-pollination is effected.

The whole of the pollinating mechanism is enclossd by a hood (galea) made up of the dorsal sepal with the two lateral sepals closely appressed to it. This prevents the sideways escape of the pollinator and ensures that its only exit is the tunnel between the column-wings. In one section of *Pterostylis* the lateral sepals, which are more or less joined together, hang away from the hood forming a lower lip or a possible alighting platform for the pollinator. An excellent example is *P. longifolia*. In this orchid the labellum (or third petal) normally lies along this lower lip and is extremely irritable, springing up to trap the pollinator in the column at the slightest touch.

The other group is that in which the sepaline lip remains close to the hood, the ends of the sepals often embracing it or almost completely enclosing it. Here Mrs. Coleman has shown [*Vict. Nat.* 45: 111-14 (August 1928)] that, in *Pterostylis grandiflora* R. Br. at least, the labellum is irritable at certain times and that a slight touch on almost any part of it causes it to spring up against the column.

In her description of the pollination of *P. acuminata* and *P. falcata* Mrs. Coleman did not clearly indicate the position which the pollinator assumed in escaping through the tunnel of the column-wings. When a mosquito-like insect was found, buzzing furiously in the hood of a flower of *Pterostylis nutans* R. Br. at East Ringwood, on Sunday, August 9, 1959, an attempt was made to ascertain this. Eventually the buzzing ceased, and the labellum of the flower was seen to move, not with the snap of *P. longifolia*, but more slowly.

After a moment the flower was

pinched in an endeavour to fix the position of the insect as it passed between the column wings. On dissection the insect was found to be right between the wings, attempting to emerge head first and with the ventral surface towards the column. Obviously, tipped into the space between the labellum and the column, head down, it had righted itself to make a way out of the trap. Miss Dorothy Coleman's drawing [*Vict. Nat.* 50: Pl. xli (March 1934)] would indicate, by the position of the pollinia, that the Culex mosquito had emerged with the dorsal surface towards the column in pollinating *P. falcata*.

Pterostylis nutans

A. Dorsal sepal
B. Lateral petal
C. Lateral sepals (coniconed).
D. Labellum.
E. Column.
F. Stigma.
G. Column-wings.
H. Pollinia.
I. Appendage
J. Labellum.

The pollinator from the East Ringwood *P. nutans* was submitted, on the advice of Mr. A. N. Burns, to Dr. N. V. Dobrotworsky of the Zoology School, University of Melbourne, who identified it as a fly of the family *Mycetophilidae* (Fungus-gnats, Shade-midges). To both of these gentlemen the writer owes gratitude for their courtesy and help. Unfortunately, the pollinator was so badly damaged by the pinching that its genus and species could not be determined.

The slow movement of the labellum aroused curiosity and a number of experiments have since been carried out to determine the method by which the labellum is caused to close and trap the insect. No sensitivity to touch has been found in any of these experiments. The only thing which would cause the labellum to tip, apart from turning the flower upside down, was slight pressure on the penicillate appendage which appeared to act as a counterweight to the labellum. It is presumably also the source of attraction to the insect.

In a number of flowers the labellum moved slowly back to its original position with the tip protruding through the sinus of the lower lip. The weight of an insect on the labellum-appendage, which lies at the bottom of the trap chamber, would presumably keep the labellum shut. However, in three specimens the labellum remained against the column and even when pushed back to the original position returned to the position against the column, not with a snap, but the movement was definite and faster than the original movement. Varied pressure on the appendage gave varying speeds in the original movement.

Much more observation and experiment has to be done before we can finally, if ever, close the chapter on the pollination of the members of the genus *Pterostylis*.

Field Naturalists Club of Victoria

General Meeting—December 14, 1959

As usual the President, Mr. McInnes, ensured that the business session preceding the main event of the evening took up as little time as possible.

The Ouyen District and the Horsham field naturalists' clubs were affiliated with the F.N.C.V.

Members were invited again to visit an old member, Mr. Best (aged 92), who is now at the Masonic Homes, Punt Road, South Yarra.

Young members of the club are asked to make contact with David Woodruff to form a junior group.

An anonymous member has subscribed most of the cost of a new typewriter for the library. Members expressed their appreciation of this generous gift to the club.

An appeal was made for the loan of colour slides of the Grampians, Mallee and Western District. These will be shown, with a tape-recorded commentary, at the Moomba Nature Show on March 5-11, 1960.

Mr. Swaby reported interesting sessions he had attended at the recent A.N.Z.A.A.S. conference in Perth.

Mr. J. H. Willis, of the National Herbarium, Melbourne, gave a talk entitled "Nature Rambles in Britain"—a country where hundreds of natural history societies keep the people aware of their natural surroundings.

The topics and places he discussed ranged from Kew, where "the most wonderful gardens in the world" have been created from 300 acres of waste land, to ancient British burial mounds; from rare orchids of the English chalk country to Australian eucalypts (*E. coccifera*) in the Scottish highlands; and, literally, from Land's End to John o' Groats. In spite of the lack of coherence this suggests, the talk was no mere "butterfly flit": the commentary Mr. Willis gave with his slides covered so many fascinating aspects of nature, and was presented so concisely and fluently, that it could almost be called a summary of British natural history, if such a thing were possible.

It was certainly a night to be remembered for a very long time by those members and their friends who packed the hall to a little beyond its intended capacity.

Mr. Willis's exhibits included current British books on a wide range of natural history topics; postcards of British birds and very rare wildflowers; interesting rocks and seaworn pebbles from various parts of Britain; Cornish serpentine and agate carved and polished to form attractive ornaments; marine shells from the Isles of Scilly; Orange lichen (*Xanthoria parietina*) from the Isle of Man; paper-knife made from Thomas Gray's famous yew tree in Stoke Poges churchyard.

Exhibits by other members included numerous botanical specimens; several species of spiders, egg cases, and young; fan shells; a bat; honey wasps—a winged male and wingless female; a minute beetle (*Dasytes*); various lepidopterous larvae, pupae and adults; *Cecidomyia* galls on *Leptospermum*; a Fijian war club.

Nature note: Mr. Jack Hyett, whose book, *A Bushman's Year*, was published recently, described how a skink (which lives in a vivarium in his classroom) stalks and catches blowflies. Its technique seems infallible and is far superior to that of a blue-tongue lizard with which it shares its quarters. Presumably the blue-tongue's normal prey is slower-moving than blowflies.

Geology Discussion Group—November 4, 1959

With an attendance of eighteen members and Mr. Davidson in the chair, the main business of the evening was the discussion on the "Geology of Tasmania" by Mr. Hemmy, this being the last of the series on the geology of Australia.

Mr. Hemmy referred first to the diverse scenery and climate of Tasmania, due to the severe topography, comprising the north-coast range, the steep rugged mountains of the west coast, the plateaux, with their systems of lakes, and the coastal lowlands.

A description of the geology fol-

lowed. The oldest rocks consist of Pre-Cambrian slates, quartzites, schists, dolomites and glacial deposits. In the Palaeozoic period, conglomerates, shales, sandstones, and the Gordon River limestones were deposited. The Mesozoic period is represented by the easterly extension of Gondwanaland. In the Cainozoic period, extensive volcanic intrusions of dolerite occurred and, later, glacial conditions extended across Tasmania and to Mount Kosciusko in New South Wales. The introduction of the aborigines, the extinct *Thylacoleo*, the living fossil *Anaspides*, and the forming of Bass Strait, were all referred to by Mr. Hemmy. Finally, he dealt with occurrences of gold, tin, copper, asbestos, bauxite and many other minerals, which indicated that Tasmania is one of the important mineral states of the Commonwealth.

Exhibits: Collection of minerals from Tasmanian localities (Mr. Cobbett); collection of rocks and fossils from Tasmania (Mr. Baker); copper minerals from Mt. Hope, N.S.W. (Mr. Tinckam); thin section of solvsbergite, from Brock's Monument, under the microscope (Mr. McInnes); series of minerals and plant fossils from various places in Victoria (Mr. Jeffrey).

Geology Group Excursion—October 11, 1959

The excursion started from the Lancefield Road, just north of the Bolinda railway station. A road to the east was followed, first into a cutting (790,828),* where very coarse vesicular basalt of the aa type had been deposited, interbedded with ashy material; a layer of ropy lava, with similar material, indicated a later flow, at the top two feet. Winding down the valley, the party crossed the small stream which joins Emu Creek, 2½ miles south. The bed of this creek was well covered with black volcanic soil and a young growth of artichoke thistles (*Cynara cardunculus*), an introduced plant which is conspicuous on the volcanic soils nearer Melbourne.

An easterly course was taken across a fairly level lava field, until to the north the party descended into the picturesque township of Darraweit Guim (930,865). There, in the valley of the Deep Creek, the work of river erosion is very evident; this creek, with its extensive catchment area to the north, has worked on the margin of the basalt and the older sedimentary rocks of Silurian-Ordovician age.

Continuing west, then northwards, the party examined a road cutting (928,876) on a hill of compact mudstone, typically Silurian in appearance but quite devoid of fossils. Conspicuous features were jointing with iron solutions and three places showing minor faulting.

Lunch was eaten where a tributary stream on the north side of Deep Creek intersects the road (895,871). This small stream performs a number of close meanders near the road, cutting into steeply dipping sandy mudstones, and in one place it exposes a twelve-foot section of basalt. At the top of the cliff is a layer of quartzite, then lava extends upwards and across to higher ground.

Adjacent to a northerly road, basalt was clearly visible in stream sections and as loose blocks in the fields. In the distance the volcanic cone (859,942) could be seen to the north of Springfield, rising about 250 ft. above the surrounding country. The road to the west descended sharply into another valley of Deep Creek which, coming from a northerly direction, has cut through lava flows to the underlying Cambrian slates and cherts. Crossing the creek and coming to the top of this valley, the party stopped at the head of a small stream (813,926) which enters Five Mile Creek and has exposed excellent lava columns of regular polygons affording easy work for the small stream flowing over the edge.

After the photographers had been satisfied, the party moved south for a closer look at Brock's Hill (819,884), a barren hill 1780 ft. above sea level, composed of Cambrian cherts. The final stage of the excursion was to Brock's Monument (922,934), a hill of solvsbergite 300 ft. above the surrounding terrain. Excellent long distance views were obtained from the top, and samples were obtained of the volcanic rock which consists of phenocrysts of felspar (anorthoclase) in a trachytic mass of felspar and aegirine.

* Numbers in brackets are grid references to the No. 328 Lancefield 1-inch Military Map.

F.N.C.V. DIARY OF COMING EVENTS

GENERAL MEETINGS

Monday, January 11, 1960—At the National Herbarium, The Domain, South Yarra, commencing at 7.45 p.m. sharp.

1. Minutes, Reports and Announcements.
2. "Further News from Queensland", by Mr. Stan Colliver.
3. Nature Notes and remarks on exhibits.
4. Conversazione.
5. Correspondence.
6. Nominations for Membership.
7. General Business.

Monday, February 8—"Nunniong Plateau", by N. A. Wakefield.

GROUP MEETINGS

(8 p.m. at National Herbarium unless otherwise stated)

Friday, January 15—Botany Group. Subject: "Victorian Wildflowers", by Mr. Reeves. Visitors welcome.

Wednesday, January 20—Microscopical Group.

Monday, February 1—Entomology and Marine Biology Group. The meeting will be held at Mr. Strong's rooms at Parliament House. Enter through private entrance at south end of the House.

Wednesday, February 3—Geology Group. Subject: "Holiday Geology", by members.

F.N.C.V. EXCURSIONS

Saturday, January 23—Marine biology excursion to Rickett's Point, Beaumaris. Leader, Mr. D. McInnes. Meet at kiosk at 2 p.m.

Monday, February 1 (Australia Day)—Mystery parlour-coach excursion. Meet at Batman Avenue at 9 a.m. Fare £1. Bring two meals.

BENDIGO F.N.C.— SYLLABUS TO JUNE 1960

EXCURSIONS

Start from Gold Jubilee Statue, the half-day ones at 2 p.m. and full-day ones at 10 a.m.

Saturday, February 6—Botany, North-eastern Whipstick, led by Mr. J. Kellam (half day).

Sunday, March 27—Geology, Heathcote area (with Maryborough F.N.C.), led by Mr. F. Robbins (full day).

Sunday, April 10—General, Lyal Glen, led by Mr. J. Ipsen (full day).

Sunday, May 15—Trees, Harcourt, led by Mr. R. Eddy (half day).

Sunday, June 12—General, Sedgwick area, led by Mr. R. Allen (half day).

Visitors from other clubs are invited to participate.

MEETINGS

At Bendigo Technical College on the second Wednesday in each month, starting at 7.15 p.m.

February 10—Holiday observations, by members.

March 9—Colour slides of birds and flora, by Messrs. R. Eddy and J. Kellam.

April 13—Botany, by Mr. Zimmer (Forests Commission).

May 11—Birds, by Mr. J. Ipsen.

June 8—Illustrated talk, by Mr. F. Robbins.

—A. C. EBDON, Hon. Secretary
46 Lucan Street, Bendigo

ERRATA

Vol. 76, page 124, second column: For Swan read Susan; correct the spelling of Bamfield (twice).

Vol. 76, page 202: After the fourth line insert "then there must be a rapid awakening".

Vol. 76, page 213, third paragraph: Correct the spelling of sphagnum, ostracods, cladocerans and copepods.

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The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

Those who were stimulated by last month's article on Wyperfeld National Park to find its whereabouts on a map, will have noticed to the west of it—depending on the sort of map used—a blank space, an advertising slogan, or a blank space with a single track running across it from Yanac to Murrayville.

Not very attractive country you'd think, and a boring and uncomfortable trip across miles of desert for anyone attempting that track. But a party of F.N.C.V. members found its "botanical features . . . varied and indeed beautiful", and recorded them in the *Victorian Naturalist* (February 1942).

One of the prizes of the trip was the finding of young seedlings of *Grevillea pterosperma*, of which we see a mature plant in full bloom. The photograph was taken by H. T. Reeves.

Painting by Berak

By A. Massola

Berak, last of the Woewurong (Yarra Yarra) tribe. The name is often misspelt "Barak."

Through the courtesy of the Director of the Ballarat Art Gallery it is possible to reproduce here one of the few surviving examples of the art of Berak.

Berak had the distinction of being the last of the Woewurong, or Yarra-Yarra tribe of aborigines. Conversely, he had the melancholy fate of witnessing the coming of Batman, the founding of Melbourne and the rapid demise of his entire tribe.

It is unfortunate that so little information is available about Berak's early life and that accounts of his later days are contradictory His father was Bebejern, head-man of the Kurnajeberring, a sub-section of the tribe, the territory of which extended from the Darebin Creek to the sources of the Plenty River. Berak was born between

1818 and 1822, his birthplace variously being given as the banks of Merri Creek, on Brushy Creek and near the present site of Yarra Glen. He was initiated into the Waang (crow) class, and brought up in the accepted native fashion. As a youth he was said to have witnessed the signing of the famous Batman Treaty, which is supposed to have occurred on the east bank of the Plenty River, to the north-west of Eltham, about three miles above its junction with the Yarra.

After the founding of Melbourne Berak attended the school attached to the Mission, established in 1837 by the Church of England under the charge of Rev. H. Langhorne, on the site of the present Royal Botanic Gardens. His teacher was Mr. John Thomas Smith, later several times Mayor of Melbourne. However, this phase of his life soon came to an end and he joined Captain Dana's native police. This interlude made a great impression in his life, and to the end of his days he remained a great admirer of the captain. About this period he married Lizzie, of the Gippsland tribe, according to the native fashion. By her he had three children, two of whom died in infancy, and the third, David, of consumption in 1881 at the age of seventeen. After quitting the native police. Berak lived at the Acheron River, but following the loss of his wife in 1864, went to Coranderrk, where he remained for the rest of his life. In February 1866 he married Annie, of the Goulburn Tribe, according to the Christian rites. However, she died in May 1881, and he married Sarah, of Ramahyuk (Gippsland).

By this time his cousin Wonga (Pigeon) had died, and Berak, as his next of kin, had become the headman of the remnants of his people. Wonga was the son of Jakki-jakki (the Jagga-Jagga of the Batman Deed) who was at the time of the signing principal headman of the Woewurong.

Berak had also inherited the ownership of the Mount William stone axe quarries (*willam mooring*, the home of the axes) through his maternal grandmother. This quarry was very valuable in pre-European days, as it supplied axe blades to all Victorian tribes, and its owner was then a very important person. However, the inheritance was of no use to Berak, as the natives had long since stopped using stone tools.

Berak was the main informant for the section dealing with the Central Victorian tribes in A. W. Howitt's *Native Tribes of South-East Australia*. As well as an authority on the lore of his own tribe, Berak was very well informed on the Goulburn people, the Jajowurong. He knew their language perfectly, even to the extent of habitually referring to Coranderrk as "Geringdah". This was the Goulburn tribe's name for the Victorian Christmas Bush, *Prostanthera lasianthos*. This word in the Yarra language was Korranderrak, now spelt Coranderrk.

Soon after the death of his third wife, Sarah, Berak's health began to fail. He resented the changes brought about by white

The painting by Berak which is discussed in this article.
Reproduced by courtesy of Ballarat Art Gallery.

men. His mind went back to the days when, as a youth, he had the bush for a home. He lived very much in the past. One night he fell asleep too close to the fire and severely scorched his hand. He refused medical treatment and insisted on using the "blood of the tree" for healing it. This meant the liquid resin of the Red Gum, which had been used for burns by his people for centuries. The shock from the burn proved fatal, and Berak died on August 15, 1903. He was then said to be eighty-five years old, although the manager of the aboriginal station there, Mr. J. Shaw, was reported on good authority to say that he was about seventy-five in 1898. This would make him eighty years of age at the time of his death.

Berak was buried amongst his people in the little native cemetery at Coranderrk. His grave, which bears the number 209 in the register, was marked by a wooden slab bearing his name and date of death. Years later the idea of a monument to his memory was mooted by the Healesville branch of the Australian Natives Association. The marble for it was donated by Mrs. Anne F. Bon, of Wappan, and was erected by public subscription at Healesville. It was unveiled by the then Chancellor of the University of Melbourne,

Sir John MacFarlane, on June 27, 1934.

The stone was inscribed thus:

To the Glory of God
and the memory of

BARAK

Last Chief of the Yarra-Yarra Tribe of Aborigines and his race Barak died at Coranderrk, 15th Aug., 1903, aged 85
A Sincere Christian
This stone is the gift of

ANNE FRASER BON

late of Wappan Estate, Bonnie Doon, to the Shire of Healesville and is erected by Public Subscription, 1934

The choice of the site for this monument, the main street in Healesville, was unfortunate, and local people objected to a gravestone in that position. After a short time vandals pushed it over, and it was then stored for several years in the local council yard. Eventually, the matter came to the notice of the Bread and Cheese Club, and this body was able to have it placed over Berak's grave at Coranderrk. The event was recorded on the stone, the inscription stating that it was

Re-erected here, over his grave, surrounded by 300 of his race, by the Bread and Cheese Club, 1955.

By this time the original wooden slab was so weather-worn that the inscription painted upon it had become illegible.

Berak was not a talented painter in the European sense, nor did he ever receive any tuition. His was that spontaneous art manifestation, so common to many of his people, naive and childlike, but expressive. No attempt was made at perspective or at comparative proportion of figures. Objects which he deemed important, such as boomerangs and beards and hair of subjects, were emphasized. Other details, such as fingers and toes, were merely indicated by strokes. Apparently, he had the urge to fill all vacant spaces of his canvas—a trait common to most primitive artists. Therefore, in this painting, he brought to his aid animals as well as a hunting scene, which appear to have no bearing on the corroboree he was depicting. But his characters are there, painted in native earth pigments on white man's paper, and they serve to remind us of occurrences in the daily life of the blacks.

A corroboree is represented, and the warriors, their faces painted for the occasion, are in the typical position of the dance. Their only covering is the fringe, which is seen falling in front of them. They are wielding boomerangs. It will be noted that one of the boomerangs has that peculiar swelling at one end, which is characteristic of the lil-lil, and generally associated with the Murray tribe. Possibly, Berak saw these weapons whilst he was a member of the native police, or perhaps some of the Goulburn blacks knew them. The lil-lil has certainly not been recorded from southern Victoria.

The ballet masters face the dancers and keep time with their boomerangs. The use of boomerangs as clapping sticks has not been reported for Victoria, although well known in northern Australia. Was this fact overlooked by early recorders?

The women are squatting,

beating the possum rugs stretched over their knees in order to add to the percussive noise. Children are sporting about and adding the clatter of their clapping sticks to the general rhythm. Two fires are blazing merrily: Berak's treatment of flame and smoke is interesting. Some animals are introduced between the dancers and the orchestra. Are they "fill-ins", or do they represent the reason for the corroboree: a ceremony for the success of the hunt? One man is seen lassoing an emu. Notice the rendition of the emu's feet—this same treatment is visible on cave paintings. It is not the American lasso but the native implement which is being used to capture these birds. A noose is fitted to the end of a long stick, fifteen feet or more in length. With the aid of this stick the noose is placed over the bird's head by the hidden hunter, then with a sudden jerk the noose is pulled tight. This, of course, secures the biped. This method of hunting was well known to the Victorian blacks but seldom reported by observers. Berak vividly brings it to our notice.

The whole painting is packed with action and vibrates with movement. However, there is one thing which at first would seem difficult to explain: all the figures, human and animal, as well as the fires, are clothed in what appear to be possum skins laced together. This treatment answers very well for the cloaks of the ballet leaders and the women, but it is rather disconcerting to see animals in the same dress. The same peculiarity appears in the few other paintings by Berak which are known to the writer. Did it have a meaning or was it just Berak's way of covering the body? Actually, it is another instance of the *horror vacui*, which is explained by Dr. L. Adam in *Primitive Art* as "an aversion to empty spaces and, implicitly, an aesthetic urge to fill these spaces with ornament". A similar treatment of figures, both human and animal, can be seen in any bark paintings from the Northern Territory, where dots or diagonal criss-cross lines are used.

The size of this painting of Berak's is thirty-one inches by twenty-two. Except for the paper, the materials used were native. The figures were first drawn with charcoal and then filled in with yellow ochre, charcoal being used for hair, beards and feathers. The colours appear to have been powdered, then mixed with an oily substance and applied with a frayed or chewed stick. The pigments were certainly not mixed with water, as they adhere very firmly to the paper.

The animals depicted are emu, lyrebird, wombat, tortoise and echidna. Lyrebird tail feathers are shown being used as head ornaments by some of the women.

A brass plate, screwed to the back of the frame, states that it was

> Presented to the Ballarat Art Gallery by Mrs. Anne Fraser Ben, late of Wappan Estate, Bonnie Doon, and is the work of Barak, late Chief of the Yarra Yarra Tribe of Aborigines, who died at Coranderrk, August 15, 1903. Aged 85 years.

FIG INSECTS

By Norman Wakefield

In the *Victorian Naturalist* last month, a report was published of the discovery of native fig-trees in Victoria. They grow in some of the jungle gullies to the north of Mallacoota Inlet, in the far east of the state. The other part of the story is to be told now: the observations which have been made of tiny insects that inhabit the figs and the remarkable partnership between fig insects and figs wherever the latter occur.

After the identification of the Victorian figs by Mr. W. Hunter of Mallacoota, a request was made to Mr. Frank Buckland, another local resident, for specimens of mature figs. When the parcel arrived in Melbourne and was opened, it contained not only figs but scores of tiny insects.

There seemed to be three kinds of insects: black winged flies about a tenth of an inch long, brown winged flies of about the same body-size but with very long egg-placers, and some minute wingless insects, as well.

Specimens were taken for identification to the National Museum of Victoria. By good fortune, an expert on the subject was visiting there. He is Mr. E. F. Riek of the Division of Entomology, C.S.I.R.O., Canberra. He tentatively labelled the black fly *Pleistodontes* and the brown one *Philotrypesis*, with the comment that the latter was probably parasitic on the former. The winged specimens were females and the tiny wingless ones were males of one or both species. These fig insects are chalcid wasps of the order Hymenoptera.

In *Australian Insects* by W. W. Froggatt, Plate XII illustrates the Moreton Bay Fig (*Ficus macrophylla*) and two species of fig insects. One is a *Pleistodontes* and the other an *Idarnes*; they are remarkably similar in general appearance to the species from the Mallacoota figs. The *Idarnes* has an egg-placer about twice as long as the rest of its body, and the wingless males of each species are illustrated. The reader may refer to Froggatt's plate and text for a general idea of fig insects, though the species are different from those at Mallacoota.

A trip was made to Smellie's Creek at Mallacoota in late May 1959, more specimens were collected and the photographs which appeared in the *Naturalist* last month were taken. Further samples were sent to Mr. Riek and he replied as follows:

> The fig insects have proved to be most interesting. The *Pleistodontes* is in reality an undescribed species of *Kradibiella*. Little is known of the host relationships of this genus. Though they have all been bred from figs, in North Queensland and at Gosford, there has been no clue as to the type of host fig. The *Kradibiella* is the pollenizer of the figs.
>
> The other species is *Philotrypesis silvensis* Grit. and it is parasitic on

the *Kradibiella*. This accounts for its presence in only some of the figs. At times, with heavy parasitism, it can be the dominant insect emerging from figs. *Philotrypesis* has a very distinctive apex to the abdomen in the female and differs quite markedly from *Idarnes* in this respect. I am unable to say whether this parasite is restricted in its host range to the species of *Kradibiella* as so little is known of the biology of our Australian fig insects.

There are other chalcid wasps which can be bred from figs either as parasites or as seed gall-makers or parasites of the gall-makers. I would be most interested to obtain fruits of any other native figs you may come across.

In *The Biology of Flowering Plants*, MacGregor Skene gives a full account of the partnership between fig and wasp. Here is an extract from his treatment of the subject:

Unisexual flowers are borne on the inside of a hollow inflorescence, a *syconium*, which opens to the outside by a constricted apical pore. The swollen and fleshy inflorescence is the "fruit" or edible fig; each "seed" is in reality a fruit, the product of a separate flower. Pollination is carried out by various small wasps.

The wild fig, *Ficus carica*, the "fico sylvatico" of the Italian peasant . . . bears three generations of flowers and fruits in the year. The first, the "profichi", are formed in February; the inflorescences contain numerous male flowers, just inside the mouth, and, lower down, innumerable "gall flowers". The gall flower has a short style, with an open canal, and a single rudimentary ovule incapable of forming a seed. Female wasps (*Blastophaga grossorum*) enter the syconium and deposit eggs in the ovules of the gall flowers, one in each. In the ovule the larva is hatched out, feeds, and undergoes metamorphosis. The male wasps gnaw their way out, approach gall flowers containing female wasps, pierce the ovarial wall, and fertilize the female within; they then die without leaving the syconium. By this time the fig is ripe, though still tough and bitter, and the male flowers are shedding their pollen. The female wasps leave their abodes and crawl out of the syconium, becoming liberally dusted with pollen on the way. They are lazy and fly but little, crawling about the tree in search of young inflorescences. These they find in the second generation, the "fichi", now developing about the end of May. These contain only normal female flowers with long styles. The wasp tries in vain to lay its eggs in the ovaries, at the same time pollinating the stigmas. The fichi ripen about the end of September, and are fleshy and edible. Meantime the third generation, the "mamme", is developing, and the gravid wasps ultimately find their way into the syconia and lay their eggs in the gall flowers which alone are present. In these the larvae pass the winter, escaping in spring to repeat the cycle. Fig and wasp are entirely dependent the one on the other.

The illustration on page 259 is of the halves of three of the "fruits" of *Ficus stephanocarpa*, collected at Mallacoota in May 1959. The female flowers are in the central and basal parts of the figs and are uppermost in the photograph. All the female flowers are gall flowers. Those in the left specimen contain pupae. In the central fig the galls are dark as they contain adult insects, and some of the latter are emerging from galls that have been cut. The right hand specimen shows empty galls, with holes through which insects have emerged, and a few winged females and wingless males of *Kradibiella* are crawling on the cut face. In each fig there are male flowers between the galled female ones and the opening.

It is evident that at least part of the story of the partnership between the wild fig, *Ficus carica*, and its pollinating agent, *Blastophaga*, applies also to our

Three "fruits" of the Sandpaper Fig (*Ficus stephanocarpa*) from Mallacoota. They have been cut longitudinally to show three stages of the chalcid wasp *Kradibiella*. See text for a full discussion of this picture.

Sandpaper Fig at Mallacoota and the *Kradibiella*. But it is not known how many generations there are in these local figs each year. Were the galled Mallacoota figs, collected at the end of May, the equivalent to the third generation—the "mamme"—of the wild fig in the Northern Hemisphere? If so, why did the adult insects emerge *before* winter? Did the picking of the figs cause them to mature sooner than they would have done had they remained undisturbed? This is an avenue of investigation which remains to be pursued.

Field naturalists who live or travel in areas where native fig-trees grow could help with the study of this remarkable partnership by sending specimens of figs, as well as foliage of the trees, to Mr. Riek in Canberra.

Formation of Junior Field Naturalists Group

For some time now, several of our younger members have felt that it would be a good idea to have their own group within the F.N.C.V., just as those with specialized interests in natural history have their groups.

The idea has been mentioned at several recent general meetings, and now David Woodruff has offered to take things a stage further by arranging for a meeting of all those interested. This will be held at 7.30 p.m. on Monday, February 4, just before the general meeting.

Please make every effort to be there if you are interested and feel young enough (no age limit has been set).

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

Blue Cicadas

In the *Victorian Naturalist* for April 1959, there was an article under this heading by Mr. A. N. Burns, who is Assistant Director and Curator of Insects at the National Museum of Victoria, Melbourne. This further contribution from Mr. Burns gives readers an opportunity to "keep the ball rolling" with their own observations:

Mr. Chadwick's interesting article in the December issue of the *Victorian Naturalist* brings under my notice two records of blue cicadas not hitherto known to me. It is very interesting to note that apparently all these blue colour varieties of *Cyclochila australasiae* Don. have come from suburban areas, and this seems to point to the possibility that this colour change might be due to the nymphs feeding on the root sap of some introduced shrub or tree. It would be interesting to find a blue specimen in the bush where the nymphs would have only natural roots to feed from.

The most striking colour variety of this cicada is the fairly common yellow and black one (*spreta* of Goding and Froggart); yellow specimens are not uncommon, also intergrades between the yellow and black and the yellow variety. The normal colour is green without any markings at all, and the few blue specimens that I have seen have been extremely uniform in colour.

Last year was the first time that blue specimens had come to this museum and two female specimens were received. Again this summer two reports of blue specimens have already been received. The finder of the first specimen described it over the telephone, but as we did not receive the specimen the sex is not known. About a week later another phone call came indicating the capture of a blue cicada. This specimen was brought in next day and proved also to be a female and identical in colour with the two specimens of last year. The writer would be greatly interested to hear from any reader who has

seen blue specimens of this cicada, and specially to know the sex and where taken—that is, in the suburbs or natural bushland.

Bristle-bird Autocrat

The taming of wild things is always of interest. Usually, the provision of food in a secluded spot brings native birds and other animals about, and they gradually lose most of their fear of humanity. In these circumstances, an insight is often gained into the personalities of some of the denizens of the wild.

Here are some notes on a little bush community, from Mr. J. W. Hope, of Portland:

It was amazing how quickly all the birds and bandicoots became friendly. I have a big dish for a bird-bath; sometimes it is quite full of different birds, but the Rufous Bristle-bird rules the lot. If the Bronze-wing Pigeons or Red Lory Parrots lie in the bird-bath too long, the Bristle-bird jumps on their backs, with a great show of wings and fan tail. The Bristle-bird has found also that if a bandicoot is sitting on something it wants to eat, it is a waste of time to peck its back, but a peck on the tip of the tail does the necessary.

Spider Venom and Insects

A few weeks ago Mr. W. F. Seed, of Templestowe, saw a black spider scurrying into the fold of a newspaper on his desk. He says:

The next day there was a sheet of web stretching out and downwards. It consisted of lines which radiated from the end of the fold (which had been modified with silk to form a small funnel) and were linked together by loose ribbons of combed silk zig-zagging irregularly between them. After a couple of apparently fruitless nights spent waiting for a meal, she added another, much larger, sheet of web, above the first but still sloping downwards. Between this and the original sheet the small funnel was extended slightly forward. No conspicuous additions were made after this.

The spider herself appeared fairly uniformly black, not more than half an inch long in the body, and was not very aggressive, even with her prey, which she several times fumbled and lost.

As far as can be determined from McKeown (*Australian Spiders*), and Dunn (*Victorian Naturalist*, April 1946), this was a specimen of *Ixeuticus robustus*, the Black House Spider.

Because of the structure and position of the web, most of her victims were trapped on the outside of it and had to be pulled through. If they struggled she stopped to give them an "injection" on the spot, but in any case they were taken back within or close to the funnel as quickly as possible.

The main reason for writing this note is that one of her victims was a blowfly, which she subjected to a prolonged cheliceral bite and made no attempt to take to her "dining room" until it was quite still—apparently dead. About two hours later (during which time, unfortunately, no observation was made) the body of the fly was at the entrance to the funnel and appeared to be only a shell. Below it, however, on the lower sheet of the web, perhaps two dozen small maggots were suspended—most of them wriggling vigorously.

The fly had been bitten in the abdomen and died quickly, presumably because poison was injected. Even if its larvae were protected by their cuticle (which can obviously withstand the conditions inside a carcase in summer) from the direct effects of the poison, most of it would have been ingested when they were eating their way out. (The sides of the thorax were perforated by cleanly-cut holes—a condition which has been noted in other dead blowflies from which the unborn young had escaped.)

Practically nothing is to be found, in the textbooks consulted, about the nature and mode of action of spider venom, except in the case of humans. I wonder if any readers have made observations or know of any book which will throw further light on this matter.

By Jean Galbraith

Prickly Moses — *Acacia verticillata*

Prickly Moses is the "catkined" wattle most similar to Spike Wattle, *Acacia oxycedrus*. The latter, which was dealt with in this series in the *Naturalist* in November last, has flattened scimitar-like phyllodes.

Acacia verticillata is so named because it has more or less verticillate or whorled phyllodes, which means that the "leaves" grow in circles around the stems. This feature, and the fact that the foliage has one, or at the most two, main nerves, distinguishes the species from *A. oxycedrus*. Usually, the former is a much lighter, more graceful and spreading bush.

Prickly Moses grows in damp places, often in boggy ground, in open gullies or hollows or on the lower slopes of hills, but, in my experience at least, it does not grow in heavy shade, for it likes sunshine as well as moisture.

The common name is a corruption of "Prickly Mimosa", because all wattles are called mimosa in England. I have heard our graceful prickly shrub called "Prickly Mimosa". However, true mimosa is not a wattle although it belongs to the same family. Prickly Moses has, therefore, been adopted as the common name for our species—and a pleasantly folk-sounding name it is.

The stems are often long and arching. The whorled, needle-like phyllodes, about half an inch long, are ridged above and below by a strong central vein.

The slender stems are quadrangular and the circles of fine yellowish or dark-green leaves give them a fairy-like daintiness, enhanced in September and October by "catkins" varying in colour from primrose to bright lemon-yellow.

The flower-spikes hang softly from the arched stems and are commonly from half an inch to an inch long, but in some forms they are oval—just too long to be globular. In the variety *ruscifolia* they may be two inches long, almost hiding the foliage.

Any Victorian wattle with oval or cylindrical flower-clusters, quadrangular stems, and one- or two-veined verticillate leaves is sure to be Prickly Moses. Though graceful it is apt to have a rather blunt-topped, sometimes one-sided appearance, because the upper branches normally bend over instead of standing erect, and it may be anything from two feet high to over ten feet.

Prickly Moses is widely distributed in south-eastern Australia, ranging from New South Wales to South Australia and Tasmania. It is a favourite nesting bush for Yellow-tailed Thornbills, which no doubt feel safe amongst its crowded and prickly foliage.

Prickly Moses, *Acacia verticillata*.

National Parks and National Monuments

By J. Ros Garnet

Fern Tree Gully National Park

I suppose there is many a reader whose recollection can carry him back vividly to the years before the beginning of the First World War—in retrospect halcyon days, but only because we were young then and had no hint or care of what lay ahead of us.

In those horse-and-buggy days I spent many a pre-school and school holiday with relations at Fern Tree Gully—relations who were among the pioneers on Mount Corhanwarrabol, the big forest-clad hill that rises above the township. Lynnhurst was our home, Head's Store the shopping place, and the Gembrook train the magnet which drew us to the railway yard nearby. A scramble up through the forest to Gould's place high on the mountain-side was an occasional adventure. When the owner was in residence a flag fluttered from the mast-head. Another walk was over the hills in the other direction to more distant relations at Willow Vale. And then, of course, there were always the lovely forest and fern bowers of the national park, not much more than a mile away, whence emerged the Corhanwarrabol or Fern Tree Gully Creek, which, fern-decked, meandered through the township and behind the hotel towards Lower Fern Tree Gully.

In those days the name was apt. During the war years Fern Tree Gully was Melbourne's premier picnic ground. Each weekend and holiday there would be special trains drawn by those fascinating A2's arriving one after the other, pouring out their multitude of passengers—some bound for the further hills anywhere from Upwey to Gembrook, festively cooped in the converted cattle-trucks which supplied the deficiency of carriages on that historic narrow-gauge line. Others with hampers were content in the sylvan loveliness of the Fern Tree Gully National Park.

Everyone took home loads of heath, wattle, ferns and anything else they could lay their hands on. The homeward-bound carriages were filled with the choicest of wildflowers and ferns from the Dandenong Ranges and the adjacent foot-hills. A cynic suggested to me, not so long ago, that it was more than likely that half of the tree ferns now in Melbourne's suburban gardens came from Fern Tree Gully and its national park. Be that as it may, it is dreadfully apparent now, after half a century of popularity, that Fern Tree Gully, its national park and all other accessible parts of the Dandenong Ranges, bear little resemblance to the original environment. However, the park is very pleasant and still one of Melbourne's favourite picnic spots. It is little more than twenty miles from the city and reached quickly by electric train.

A refreshment kiosk is near the entrance and visitors can boil their billies, if they wish, in the open fireplaces provided for them. Luncheon shelters and rustic seats are in abundance, a playground, with swings and roundabout, is there for the very young, and a well-formed track for the older ones leads up the valley of the creek to the look-out high on the mountain top.

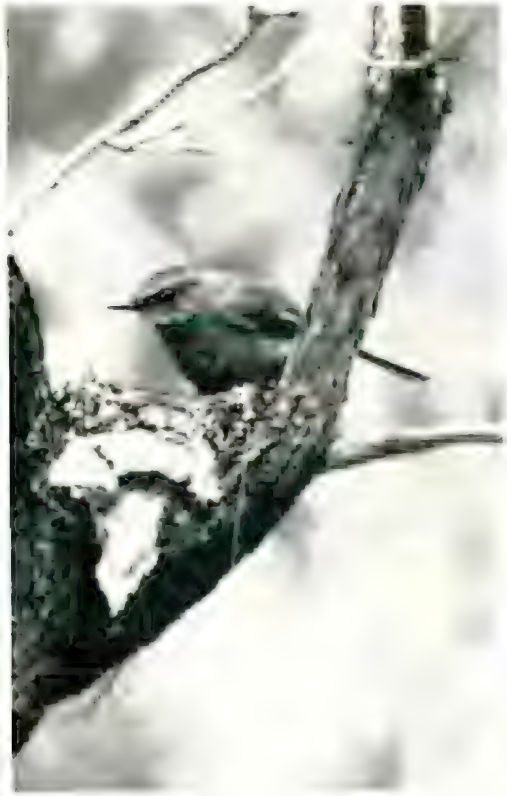
This national park was established as long ago as 1882, at a time when land-settlement schemes were engaging public attention. Most of the Dandenong Ranges was, in that period, thrown open for selection, but the influence of some of our forefathers was strong enough to save a sample, and almost one and a half square miles were reserved for public purposes as a national park. In recent times there has been an extension of its boundaries to include an area of about 400 acres of the mountain above.

As a contribution to wildlife protection and nature conservation this acquisition was a commendable action by the government, for it has meant the narrowing of the gap between the border of the Fern Tree Gully National Park and those of the Sherbrooke and Monbulk State Forests—

two areas which, although controlled by the Forests Commission, are administered almost as though they were national parks.

Fern Tree Gully National Park needs little in the way of development unless it be in the direction of further extending its boundaries as opportunity occurs. Its greatest needs are constant attention to the maintenance of tracks, the repair of damage which inevitably occurs when crowds are let loose in places of beauty, and the supervision of those who, even now, plunder the place of the ferns and wildflowers which have survived there.

One of our few Victorian epiphytic orchids (*Sarcochilus australis*) was known to grow there, in the moist gullies. Perhaps it still does, in more secluded places, but certainly it has gone from where it once hung on the Musk and Blanket-leaf beside the well-worn track.



Ground orchids used to be plentiful in the forest: Nodding Greenhoods, Maroon-hoods, Tiny Greenhoods, Blunt Greenhoods, Blunt-tongue Greenhoods, Tall Greenhoods, and, higher up, Mountain Greenhoods and Summer Greenhoods were all to be found there. As well, there were two species of Bird-orchid, Parson's Bands; Helmet-orchids (on the trunks of the Soft Treefern); Mosquito and Gnat Orchids; a few Sun-orchids, Wax-lips and *Diuris* species; Spider-orchids and other species of *Caladenia*. I expect they would be hard to find now, but the shrubs and trees have fared better, although they have suffered from bush fires—which now, we hope, are things of the past.

In the park grows the typical flora we associate with Stringybark, Manna Gum and Mountain Ash forests. Beside the ferny creek will be found Blackwood, Hazel Pomaderris, Blanket-leaf, Musk Daisy-bush, Banyalla, Christmas-bush, Prickly Currant-bush, Elderberry Panax, Wonga Vine, Twining Silk-pod and Clematis, while higher up one will see Golden Tip, Bush-peas, Acacias, Flat-peas, Dusty Miller and numbers of other beautiful shrubs and herbs.

The birds of the park, too, were (and still are) a delight to the visitor. Kookaburras, Whip-birds, Honey-eaters, Wrens, Robins, Parrots, Wagtails, Butcher-birds, Whistlers, Thrushes, Owls and Nightjars all inhabit the forest or wing their way through it to other feeding grounds and nesting places.

Its marsupials include Wallabies, Possums, Koalas, Gliders, Native Cats and Wombats—some rarer than others but few of them seen by daytime visitors. Their freedom is becoming more and more restricted as settlement surrounds the national park, but let us hope they will always have access to the vast areas of the ranges beyond the park through corridors of unspoiled and unfenced bush—corridors deliberately left for them by a well-planned policy for the future development of the Dandenong Ranges.

The Yellow Robin at its nest. This is one of the commonest birds in Sherbrooke State Forest.
Photo: A. H. Chisholm.

Two Notes on Fungi in Victoria

Mr. J. H. Willis, of the National Herbarium, who is the author of the F.N.C.V. handbook *Victorian Toadstools and Mushrooms*, has contributed these two notes on locally-occurring fungi.

Orchids and the Higher Fungi

On September 29 last I was assisting Professor Vernon Cheadle (Davis University, California) to dig up whole plants of several terrestrial orchids along Mt. William Creek near Pomonal in the neighbourhood of the Grampians, our legitimate objective being an investigation into the vascular anatomy of these protected subjects. *Diuris pedunculata* ("Golden Moths") was particularly common, and one of the six specimens that we unearthed had, apparently, *very* swollen tubers. As we tried to clean away the dirt from these two tubers, preparatory to pickling them, we dislodged the entire swelling from each one and were astonished to find that it consisted of a closely adherent fruiting body of some hypogeal fungus! Dr. G. H. Cunningham (Auckland, N.Z.) has confirmed the fungus as an immature condition of the strange, little-known *Mesophellia arenaria* Berk. which I had previously noted at Mt. Cole, Creswick, Dandenong Ranges and Gembrook. No information is available on the life history or nutrition of this puffball ally (Order *Gasteromycetales*), and one wonders whether its association with an orchid near Pomonal was purely accidental or not.

In the *Victorian Naturalist* for November 1899 (Vol. 16, p. 110) D. McAlpine described "a new parasitic agaric", *Hebeloma frenchii*, collected two months previously at Cheltenham. The mode of occurrence is intriguing —"on the stem of an orchid, *Pterostylis pedunculata* R.Br., just at the collar and beneath the basal leaves, where it formed a dense felt of mycelium, without apparently interfering with the proper flowering of the plant". After describing his new toadstool, McAlpine concluded: "This is the first instance known to me of a *Hebeloma* being parasitic. . . . The plant did not seem to suffer much from the parasite, although it formed a dense felt at its base and was firmly attached." Not a shred of evidence is brought forward to prove actual parasitism (penetration of the host's organs or tissues by fungal hyphae), so we must treat McAlpine's conclusions with some reserve; this orchid-fungus alliance may also have been quite fortuitous.

The Fly Agaric in Australia

Apparently M. C. Cooke was first to record the introduced and highly poisonous toadstool *Amanita muscaria* for Australia, his only locality being "Victoria—woods, especially fir and birch" [see *Handbook of Australian Fungi*, p. 3 (1892)]. D. McAlpine in *Systematic Arrangement of Australian Fungi*, p. 5 (1895) added South Australia to the range of this brilliant —fiery red to orange—spectacular species. Doubtless the initial record was from somewhere in or near the Dandenong Ranges, for fly agarics have been found over many years at Emerald (under chestnuts, birches and pines), Upper Beaconsfield (pines) and Olinda (pines). Occurrences at Gladysdale (under an oak) and Mt. Macedon (pines again) were noted in May 1947 and April 1945 respectively. The sixth locality record for Victoria is Beech Forest (near pines, June 1958)—provided by Mr. D. M. Hodges of Colac. Finally, Mr. Paul Fisch wrote an illustrated article on the occurrence of *Amanita muscaria* under pines at Doncaster East, in the *Victorian Naturalist* of January 1959 (Vol. 75, p. 138).

As to other States, Professor J. B. Cleland substantiated the only South Australian record by an account of material from Aldgate, "under oak and spruce" [*Trans. Roy. Soc. S.Aust.* 48: 237 (1924)], while the first and only Tasmanian occurrence would seem to be that reported in *Wild Life* 4: 222 (June 1942)—from under birches at Lalla near Launceston. Can anyone augment this list of localities?

Field Naturalists Club of Victoria

General Meeting—January 11, 1960

Mr. D. McInnes presided at a meeting of about ninety members and friends. He welcomed back Miss Forster.

Mr. S. Colliver gave an illustrated talk entitled "Further News from Queensland". He brought greetings from the Queensland Naturalists Club and told of excursions to the Glasshouse Mountains and surrounding country, to the Warwick district (a bird sanctuary), and to David Fleay's property. The expansion of the city has led to the disappearance of some farm and bush land, with its bird life, and of an aboriginal sacred site.

The President said that Mr. Colliver's continued interest in the F.N.C.V., and his visits, were warmly appreciated by his many old friends in the club.

David Woodruff spoke of the possibility of having a short junior meeting before each general meeting, and of having special junior excursions. Mr. McInnes reminded younger members to get in touch with David at club meetings. He also spoke of the possibility of more publicity being given to the Hawthorn Junior Naturalists.

The President appealed for members who arrive early at meetings to help set up tables, lights and the microphone. This would enable him to meet members more than he has been able to do.

Mr. Hooke reported briefly on the excursion to Apollo Bay. Details will be given at a future meeting.

Mr. Wakefield was congratulated (*in absentia*) on completing a science degree with honours in botany.

An appeal was made again for the loan of slides or motion pictures of plants, animals and the countryside in the Mallee, Grampians and the Western District as far as Portland. These are wanted for the club's Moomba show. If you can help, please notify Miss Watson (Fisheries and Game Department, 62 3611) or Mr. A. B. Court (National Herbarium, 63 7020).

A letter from Senator Henty thanked the F.N.C.V. for their appreciation of his efforts to stop export of native animals.

Photographic slides and prints were received from Mr. Hardy's relatives.

Mrs. Salau told of a visit to Mr. T. S. Hart, who is 92—the only member still living of those who joined the club before 1900.

Referring to a letter asking about preservation of the Organ Pipes formation at Sydenham, Mr. Garnet said the price asked for the land was more than the government would pay. Mr. Colliver said that the Mines Department would not grant a licence for quarrying this basalt.

Nature Notes and Exhibits: Gabo Island granite, a fasciated stem of *Goodenia barbata* from Genoa (Mr. Garnet); native plants from Mount Buffalo (Mr. Stewart); Skirted Tree Fern leaflets, *Eucalyptus kitsoniana* from Apollo Bay district (Mr. Hooke); seeds of *Podalyria sericea* (Miss Raff); "Lace-Coral", a polyzoan (Mr. McInnes); *Helichrysum bracteatum* (Mrs. Zirkler).

Mr. Hyett explained his exhibit of a spider mimicking an "apple" gall on a gum leaf. Miss Young pointed out Mr. Rayment's observations of wasps which paralyse mole crickets for their offspring.

Geology Discussion Group—December 2, 1959

The main business of the evening was "Exhibits by Members". Mr. Cobbett described an excellent collection of minerals, mainly from overseas localities. Mr. Nielsen discussed his collecting of sharks' teeth and fossil oysters (*Conchothyra*) from the Waimakariri River Gorge in the South Island of New Zealand. Mr. Jeffrey described collecting fossil Jurassic ferns (*Cladophlebis*) from Cape Paterson, Victoria, and a meteorite from Henbury, Central Australia. Mr. Watts exhibited varieties of silica minerals and quartz growths from Tallangallook, Victoria. Mrs. Salau exhibited silicified breccia, a quartz crystal group, and an aboriginal axe-head, all from Heathcote, Victoria.

Mr. Dodds described finding Tertiary grits overlying decomposed Older Basalt whilst digging in his garden at Essendon. Mr. Davidson displayed a large collection of polished agates and siliceous minerals collected from Beechworth, Victoria. Mr. McInnes showed a felspar porphyry from Stawell, near the Grampians, Victoria; this was seen under ordinary light through the microscope.

The remainder of the evening was devoted to the screening of coloured slides and a film. Mr. Nielsen showed the locality where the fossils were collected at the Waimakariri River Gorge, New Zealand. Mr. Angior had several pictures of the recent F.N.C.V. excursion to Maryborough, and Mr. Fisch showed a colour film of a trip to Lord Howe Island.

Excursion with Frankston F.N.C.—November 28, 1959

Some members of the Entomology Group joined the Frankston club on an excursion under the expert and enthusiastic leadership of Mr. Le Souef. A keen hunt for butterflies and their larvae and pupae along the railway reserve proved highly successful.

After noticing the tell-tale sign of the sides of the sword grass leaves being eaten down by the larvae of *Tisiphone abeona*, two of these beautiful brown butterflies—a male and a female—were found. Other sword grass leaves, bent over at right angles and stuck together to form a shelter, pointed to the larvae of the Skipper, *Cyclosphia heapernla chrysotricha*.

Xerotes leaves, cut cleanly and obliquely and stuck together, indicated the presence of *Trapezites symmomus* larvae and pupae. Leaves of the purple flag, *Patersonia*, cemented with silk to form a tent with a tough silken floor, harboured the pupa of *Mesodena halyzia*. Under the loose bark of a eucalypt infested with mistletoe, larvae of the beautiful metallic-blue *Ogyris* sheltered, attended by ants. The larvae feed on the mistletoe at night.

Encouraged by Mr. Le Souef, Mr. Coghill took all these larvae and pupae under his care, hoping to hatch them out to adult butterflies.

The keen eyes of Mr. McInnes and some very young enthusiasts, and the technique of Mr. Le Souef and Mr. Coghill, resulted in the capture of a host of other insects to be taken to the museum for identification, among them a big, beautiful green and gold jewel beetle, long-legged scorpion flies, and small beetles. The Grass Tree (*Xanthorrhoea minor*) was in full flower and visited by a multitude of insects of all sizes, including the minute *Dasytes* beetle.

Little fat frogs, lurking in the sword grass and grass trees, appeared to flourish on the wealth of insects. Small blue butterflies, pure white and bright orange moths, bees, and wasps were in abundance. Though the area is burnt off usually every second year, it is heartening to find such a rich fauna and flora persisting and regenerating.

It was late for many flowers, but *Dillwynia* was still out and the leafless *Sphaerolobium vimineum* had a few late flowers and showed numerous little globular pods. The large bright-green fruit clusters of the Wedding Bush (*Ricinocarpus pinifolius*) were plentiful and a few late flowers remained.

Blue and purple predominated among the flowers; in the large *Stypandra* flowers and the smaller *Dianella*; in species of *Dichopogon* (Chocolate Lily), *Arthropodium* (Vanilla Lily), and the lovely *Thysanotus tuberosus* (Fringe Lily); in the dainty Fairies' Aprons (*Utricularia dichotoma*) and the spikes of *Bredemeyera calymega*.

Only two kinds of orchid were found, a *Microtis* and a *Prasophyllum*, but seed capsules of sun orchids were seen.

F.N.C.V. members were very grateful to the Frankston club, and especially to its President, Mr. Le Souef, for such an enjoyable day.

General Meeting in March

Members should note two points about this meeting:

1. The meeting will be held on Tuesday, March 8, at the National Herbarium. This change was caused by Labor Day holiday.

2. Two motions relating to club finances will be put to the general meeting, as required by the F.N.C.V. constitution. Both of them have already been approved by the Finance Committee and Council.

Notices of these motions appear on page 269.

F.N.C.V. DIARY OF COMING EVENTS

GENERAL MEETINGS

Monday, February 8, 1960—At the National Herbarium, The Domain, South Yarra, commencing at 7.45 p.m. sharp.

1. Minutes, Reports and Announcements.
2. "Cicadas", by Mr. A. N. Burns.
3. Nature Notes and Remarks on Exhibits.
4. Conversazione.
5. Correspondence.
6. Election of Members:

Ordinary Members:

Miss Margaret Flora Bland, 16 Elmhurst Road, Caulfield, S.E.7 (E. Webb-Ware/I. J. Hooke)

Mrs. Agnes Hope North, 26 Tennyson Street, Sandringham, S.8 (K. Hough/E. H. Coghill).

Mr. Ronald William De Gruchy, 76 Whitby Street, West Brunswick (J. Ros Garnet/D. McInnes).

Mr. Kenneth Graham Simpson, 9 Radnor Street, Heidelberg, N.22 (A. A. Baker/A. Blackburn).

Mr. Alexander Stirling, 75 Park Road, Cheltenham, S.22 (W. C. Woollard/J. M. Woollard).

Mr. James Austin Baines, 45 Eastgate Street, Oakleigh (E. H. Coghill/L. M. White).

Mr. William H. King, Warrandyte Road, South Warrandyte (N. A. Wakefield/E. H. Coghill).

Mr. John Giles Featherstone, 12 Marne Street, South Yarra (A. C. Hooke/E. H. Coghill).

Mrs. May Stratham, 8 Gleeson Avenue, Burwood (E. H. Coghill/L. M. White).

Country Members:

Miss Edna Walling, "Good-A-Meavy", Moorooolbark (E. H. Coghill/D. McInnes).

Mr. Allan Turner, Box 324, Shepparton (D. Wood/E. H. Coghill).

Mr. Michael E. White, Forestry Office, Bellangry, N.S.W. (N. A. Wakefield/E. H. Coghill).

Junior Member:

Master James Frederick Mann, "Geronga", Gembrook (D. S. Craig/E. H. Coghill).

7. Nominations for Membership.
8. General Business.

Tuesday, March 8, 1960—"Nunniong Plateau", by N. A. Wakefield.

GROUP MEETINGS

(8 p.m. at National Herbarium unless otherwise stated)

Thursday, February 11—Botany Group.

Wednesday, February 17—Microscopical Group. Subject: "The Hydra", by J. Walsh. Members are requested to bring as much live material as possible and microscopes with which to display it.

Wednesday, March 2—Geology Group.

Monday, March 7—Entomology and Marine Biology Group. The meeting will be held at Mr. Strong's rooms at Parliament House. Enter through private entrance at south end of the House.

F.N.C.V. EXCURSIONS

Saturday, February 20—Healesville Sanctuary. The parlour-coach will leave Batman Avenue at 11.30 a.m. Fare 14/-. Bring two meals.

Sunday, March 6—Geology Group excursion. Details at group meeting.

PRELIMINARY NOTICE

August 14 to September 4—An excursion to Central Australia will be conducted by Mr. G. C. Kennewell and 15 seats have been reserved for the F.N.C.V. until 30th March. Members will need sleeping bags, tents and eating utensils. Fare £68 (deposit £20). Further details later.

Notice of motion to be put before the General Meeting on March 8: 1960:

"That the rental due to the National Herbarium for accommodation be paid out of the Building Fund income."

This resolution was recommended by Council on January 26, 1960. The procedure is in accordance with the following clauses of the constitution of the Building Fund as established in General Meeting on May 13, 1957:

Clause 2. The Building Fund shall be applied for the acquisition of accommodation and furniture for the use of the Club and for any emergency.

Clause 6. No moneys shall be expended out of the fund or loaned for Club purposes except with the authority of the Club given at a General Meeting after a clear month's notice has been given in the *Victorian Naturalist* of intention to authorize such expenditure.

Notice of Motion to amend the constitution of the Publications Fund as established in General Meeting on May 13, 1957, to be put before the General Meeting on March 8, 1960:

"That Clause 5 of the constitution of the Publications Fund be amended by deleting the words 'so much of the proceeds of sale of back numbers of the Victorian Naturalist *as exceeds £20 in any one year'."*

Clause 5 in its original form reads:

Into the Fund shall be paid the proceeds of sale of the Club's publications other than the *Victorian Naturalist*, so much of the proceeds of sale of back numbers of the *Victorian Naturalist* as exceeds £20 in any one year, the income from investment of the Fund, and any other sums which may be allotted to the Fund from time to time by the Club in General Meetings.

By unanimous vote, on January 26, 1960, Council recommended the above amendment. Council considers that, as the cost of production of the *Victorian Naturalist* is met out of general funds, all returns from sales of the magazine should be retained in the general account to help meet costs of publication of the magazine.

Field Naturalists Club of Victoria

Established 1880

OBJECTS: To stimulate interest in natural history and to preserve and protect Australian fauna and flora.

Patron: His Excellency General SIR DALLAS BROOKS, K.C.B., K.C.M.G., K.C.V.O., D.S.O., K.ST.J.

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MEMBERSHIP

Membership of the F.N.C.V. is open to any person interested in natural history. The *Victorian Naturalist* is distributed free to all members, the club's reference and lending library is available, and other activities are indicated in reports set out in the several preceding pages of this magazine.

Annual Rates are:

Ordinary Membership	40/-
Country Membership (over 20 miles from G.P.O., Melbourne)	30/-
Junior Membership (under 18 years)	25/-
Subscription to the *Victorian Naturalist* (non-members)	30/- (post free)

NOTE: The currency of the present club year and of Volume 76 of the *Victorian Naturalist* is from May 1959 to April 1960.

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The edible Parasol Mushroom, **Lepiota gracilenta.** Photographed at Kallista, Victoria, by Robert D. Lee

Vol. 76, No. 11 March 3, 1960

F.N.C.V.

The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

Bower-birds comprise one of the groups of Australia's "wonder birds". They build playgrounds which they decorate and paint, and they are master-mimics. The picture is of an immature male Satin Bower-bird which took up residence for three months, in 1956, in one of Melbourne's eastern suburbs. It built a playground under some shrubbery, and it "sang" regularly on a window-ledge, usually with some plaything in its beak. A full report of this unusual visitor appeared in the *Naturalist* in December 1956.

EXCURSION TO APOLLO BAY

During the Christmas-New Year period last summer, the Field Naturalists Club of Victoria conducted an excursion to the Otways area, with Apollo Bay as the centre. Here is a report of the activities, told by the leader of the outing.

By A. G. Hooke

Thirty-two members attended the excursion, travelling to Apollo Bay in a chartered coach, which remained to provide transport for daily trips. Apollo Bay is twenty miles on the Melbourne side of Cape Otway on a short and narrow coastal plain with a backdrop of mountains. The town area is closely surrounded by cleared spurs of the Otway Ranges, which further back are heavily forested and rise a few miles inland to 2000 feet. Apart from some beautiful beaches near the township the coastline is almost entirely rocky.

The rainfall is high and spread throughout the year, which in conjunction with an unusually rich podzolic soil gives rise to dense undergrowth and numerous fern gullies and keeps the entire district green throughout the summer. As the weather during our visit was perfect, the stage was set for an enjoyable excursion for a party of naturalists with a diversity of personal interests.

The general pattern of arrangements provided for the party to spend their time partly in the forest and partly on the coast, taking lunch out and using the coach to reach a different locality each day. Numerous opportunities were given to members on some trips to get out and walk ahead at their own pace while the coach remained behind for fifteen or twenty minutes. Thus it was possible for everyone to have fair opportunity of observing and collecting and in general to enjoy the surroundings in the various ways dear to the naturalist. Some of the results of their efforts are mentioned later in this report, so the early part is mainly a brief outline of localities visited.

The party left Melbourne on a warm morning, travelling through Geelong. About two miles before reaching Anglesea a diversion was made in order to visit the new brown coal mine a few miles inland from that township. A small open cut has been made by the removal of sixty to eighty feet of soil, and members saw how the coal was being won from the underlying deposit.

After lunch on the Step Beach at Airey's Inlet, far from the passing traffic, the party proceeded on through Lorne. Unfortunately, the spectacular coastal scene for the last twenty-five miles to Apollo Bay was hidden by rain, but this was beneficial in producing cooler and fresher conditions later.

The next day, Sunday, the party had two short outings. In the morning there was a pleasant walk along the road leading up the face of Marriner's Hill, from which there were splendid views of the coast and the township far below. The afternoon was

spent a few miles up the valley of the east branch of the Barham River. Some time was spent in Paradise Gully, a popular tourist resort and an excellent place for naturalists. The whole valley, which is narrow and steep-sided, with much natural growth in the lower part, is a great resort of birds.

Though very small, Paradise Gully yielded a great deal of interest: myrtle-beeches, tree-ferns, numerous smaller ferns, many birds and several nests. The most notable find here was two specimens of the Skirted Treefern, *Cyathea marcescens*. After driving a mile and a half further up the valley, the bus remained for twenty minutes while the party walked towards home.

That evening after tea a haunt of the Rufous Bristlebird, *Sphenura broudbenti*, was visited, a short distance along the Wild Dog Creek Road. Several of the birds were heard calling.

The objective of Monday's outing was Crayfish Bay, a tiny sandy bay behind a rocky reef, about two miles west of Cape Otway. As on several subsequent outings the route lay first for several miles along the Great Ocean Road, which, after leaving Apollo Bay, turns inland, passing then for twelve miles through a magnificent stretch of the Otway Forest. The way was down the branch road almost to the lighthouse, thence by a short track to the coast. After lunch on the beach the party dispersed to explore. The shore life enthusiasts returned well laden, the bird observers added to their lists, while some of the party enjoyed a swim in the bay.

Tuesday was devoted to a visit to the Aire Valley Plantation, by invitation of the Forests Commission. Mr. Ritchie, the District Officer, met our party at the road junction known as Cape Horn, and he led a tour of portion of the forest which is under his control. Members were taken into several parts of the plantation, which covers over 6000 acres in the upper portion of the Aire Valley towards Beech Forest. The itinerary included a visit to one of the Commission's dugouts, and lunch was eaten at a delightful spot beside the river, where boiling water was ready.

Throughout the day Mr. Ritchie was plied with many questions, and altogether a most interesting and enjoyable time was spent in the company of a well-informed, patient and courteous guide. The party is grateful to him for giving up a day of his holidays for its benefit. After leaving Mr. Ritchie near Beech Forest the coach returned by way of Turton's Pass and Skene's Creek Road.

Wednesday morning saw the party set out early for Port Campbell, seventy miles distant. Following the Great Ocean Road for the whole way, the route lay in turn through forest, past dairy farms with grazing paddocks on impossibly steep-looking slopes, across river flats, and finally above the perpendicular cliffs of the southern coast for the last few miles of the journey. The party lunched near the edge of the cliffs, London Bridge close at hand and a lazy surf breaking

Wave Erosion: Two of the Twelve Apostles near Port Campbell.
Photo: Eyre Swarbreck

on one of the rare beaches sixty feet below.

Arrangements allowed for a good deal of time out of the coach during the rest of the day. The Blow Hole was inspected, and most of the party went down the steps into Loch Ard Gorge, where several had a swim as the day was warm. On the homeward journey, while driving through the flats of the Lower Gellibrand River, observers identified a number of aquatic birds on a swamp close to the road. Otherwise the return journey was uneventful as far as Laver's Hill, where an evening meal had been arranged.

It was decided to return to Apollo Bay by a different route. The way lay for eleven miles to Beech Forest, along the crown of the Otway Ranges. There the party had several opportunities to get out and walk ahead of the coach, which was pleasant in the cool of the evening. With a clear atmosphere there were good views of Cape Otway and the distant ocean on one hand and a great expanse of lower timbered ranges on the other. Dusk was falling as the coach entered the pine plantations near Beech Forest, where it turned south for Cape Horn and the now familiar section of the Great Ocean Road through the forest to Apollo Bay.

On Thursday, the party drove slowly up the Wild Dog Creek Road, which winds up the valley for ten miles from sea level to 2000 feet. Several times members walked on ahead of the coach, and a number of photographs were secured and much

F.N.C.V. Party at Marriner's Lookout above Apollo Bay.

Photo: Eyre Swarbreck

of interest seen and studied. One point of interest was the scene of the landslide where, six years before, a large section of the steep hillside slid down into the valley, carrying a hundred yards of the road with it. A fresh section of road has been constructed, and a growth of grass together with the tramping of a grazing herd have almost obliterated the scars of the incident.

After lunch in a shady spot near the top of the range, the party drove to the fire tower on Mount Sabine, the highest point of the Otway Ranges. Several climbed the sixty-odd steps to the room at the top, and talked a while to the watchman, who explained the equipment used and pointed out distant places. From there the route lay down Sunnyside Road to the coast.

New Year's Day was spent in the depths of the Otway Forest. The coach drove for about two miles along one of the Forests Commission's newly made access tracks, the Elliott River Road, and the party walked a further two miles along a roughly bulldozed section over which the coach could not be taken. One club member, Mr. Keith Parkin, who had his car with him, kindly brought it out and drove the party's "baggage" both ways over that last two miles, so adding greatly to the day's pleasure.

Along this secluded track, which crossed two permanent streams, birds were plentiful and not shy. At lunch time the surrounding bush was full of bird calls, and the leader asked for a few minutes' silence while Mrs. Hough and Miss Joan Forster

identified those that were calling. After lunch a short walk brought the party to a locality where the taller timber ceases as the soil changes to sand and the predominating vegetation is tea-tree. Amongst the tea-tree the Gippsland Mallee, *Eucalyptus kitsoniana,* grows. In some places, encouraged by the surrounding vegetation, it reaches a height of thirty feet, which is probably the maximum attained by this species (see *Vict. Nat.*, vol. 76, page 212). Walking further on and exploring a side track which led into the old overgrown road to Cape Otway lighthouse, the members of the party went off for an hour or more and then slowly made their way back to the coach.

Saturday's destination was Blanket Bay, a few miles along the coast from Apollo Bay but accessible only by a drive of twenty-two miles through bushland. The route passes within two miles of Cape Otway, thence by a side track for four miles, crossing the Parker River and then traversing sandy scrub-covered country and heathland to the coast. After lunch on the beach the party roamed at will for an hour or more before commencing the return journey. Some who went back along the road heard and saw the Bristlebird and inspected another small area in which the Gippsland Mallee is found.

On Sunday, the party set out to return to Melbourne. Weather conditions showed the first fifty miles of coastal scenery to full advantage. The lunch break was taken at Airey's Inlet, this time on the grassy slopes on the cliffs at the foot of the lighthouse.

At Anglesea, a brief stop was made to inspect one of the roadside reserves of the Native Plants Preservation Society. Members removed about fifty young seedlings of *Pinus radiata*, which were due to seed blown across from a nearby plantation. Otherwise the reserve was in good condition.

It is fair comment to say that the party reached home feeling that the whole excursion had been enjoyable and worth while. A number would have liked a longer stay and more opportunities of pursuing their particular interests, so great is the appeal to the naturalist of the Apollo Bay district.

Next month: Reports on special aspects of the excursion.

What is it?

If you do not know, turn to page 289 for the answer.

Pink Boronia

By A. E. Brooks

Have you ever seen the acres of Pink Boronia (*Boronia muelleri*) in the forests of parts of Gippsland? If you have not, then you must wait until the end of next October, travel along the Princes Highway until you are about fifty-three miles from Melbourne, watch for a signpost marked Labertouche, and then travel in a northerly direction for a few miles. Do not be alarmed when the road appears to end at another which runs east and west: only a few yards to the left it will be found that the northerly direction is resumed.

Soon a small sign, erected by the Native Plants Preservation Society, will inform you that you are entering a State Forest and will implore you to "Protect Your Native Plants".

A little over five miles from the highway an extensive patch of Pink Boronia will be seen on both sides of the road. Unless you are in need of water this is a good spot for a picnic. A walk further along the forest road, or along a side road not far away, will confirm the extent of the boronia.

The flowers are mostly waxy white with a tinge of pink. As the flowers "fade" they become a much deeper pink, but apart from this there is considerable variation in colour between the flowers of different plants; they range from pure white to deep pink. The random occurrence of these colours shows that the differences are not due to soil.

There is also much variation in the size of the plants. Although the usual height is about four or five feet, some are only a few inches high (but with quite a large number of flowers), while others grow to as much as ten feet tall with trunks up to two inches in diameter. These "boronia trees" are found only in moist, sheltered gullies.

Although Pink Boronia is the main attraction, many other interesting plants will be found in flower at the same time. You may be fortunate enough, too, to see a Black-tailed Wallaby go hopping unhurriedly into the undergrowth; and in soft patches the tracks of other animals will keep you guessing unless you are much more expert bushman than I.

Incidentally, in the far east of Victoria, the Princes Highway itself passes through an extensive area of Pink Boronia, between Thurra River and Mount Drummer.

Pink Boronia

Photo:
H. T. Reeves

The Domestic Fig

Mr. E. H. Coghill, secretary of the F.N.C.V., puts forward a query about our garden figs. He writes:

On reading the interesting articles on our native fig and its attendant fig insects, in the last two numbers of the *Naturalist*, I wondered how much of what you had written applied to the ordinary domestic fig.

I am sure many other readers will share my interest in this further point. Can you enlighten us please?

I think I am right in supposing that the variety which requires "caprification" is not grown in Australia?

The answer to the first question is quite involved, and it could hardly be put more lucidly than MacGregor Skene has it, in *The Biology of Flowering Plants*. This is what he says:

The cultivated fig . . . is derived from the wild species. It exists in two races, the fig (*Ficus carica, domestica*) and the caprifig, or goat fig (*Ficus carica, caprificus*), which never produces edible figs. Each bears three generations of flowers. The wasps pass the winter in the mamme of the caprifig, and, escaping about March, enter the profichi of the caprifig and also the "fiori di fico" of the fig. In the former they lay their eggs in the gall flowers; the latter contain sterile female flowers only, in which eggs cannot be laid. The fiori di fico ripen in some varieties, and are edible, but usually they fall off. From the profichi the gravid females escape in June, becoming dusted with pollen as they make their way out. They then enter the "mammoni" of the caprifig and the "pedagnuoli" of the fig. In the former they find gall flowers in which they lay eggs, in the latter they pollinate the female flowers which alone are present. The pedagnuoli ripen into edible figs from August to December, and form the main crop of all varieties. From the mammoni a new generation of gravid female wasps escapes in September, and these, sparingly dusted with pollen from a few male flowers, pass to the mamme of the caprifig, in the gall flowers of which the larvae pass the winter. They also enter the "cimaruoli" of the fig, in which only female flowers are present, and pollinate these. The "cimaruoli" of some varieties produce a crop of edible figs in winter. The cultivated fig may bear two crops of figs, or very rarely three, in the course of a year. The wasp seems to go through three generations, though this is not certain.

"Caprification" is an established feature of fig cultivation in many places. The peasant grows caprifigs among his fig trees, or grafts shoots on the figs, or even hangs branches in the bearing trees. When the Smyrna fig was planted in California it was found necessary to introduce the caprifig, with the Blastophaga, before a crop could be obtained. In the north of Italy caprification is not practised; the varieties of fig grown there are parthenocarpic, and produce swollen fruit without fertilization. These do not keep well and cannot be dried; the dried figs of commerce always contain seed.

The caprifig bears gall flowers and male flowers; the fig bears only female flowers, which in one generation are sterile. We have a unique case in which a monoecious wild plant has been changed by selection into a dioecious cultivated form. The caprifig is essentially male, the fig female. Only in cultivation can this condition be maintained, for the seeds of the fig revert to the wild species; artificial propagation by cuttings and grafting is necessary to carry on the cultivated fig.

Parthenocarpic varieties of fig are grown commercially in Australia but the Smyrna fig is not, so caprification is not practised. However, caprifigs were introduced in the past and a few survive in some old suburban gardens in the Melbourne area.

—NORMAN WAKEFIELD

National Parks and National Monuments — 3

Lakes National Park

By J. Ros Garnet

It used to be called Sperm Whale Head which, perhaps, more aptly suggests its coastal location. It is a national park little known to the average Victorian, for the excellent reason that there is no easy access to it.

By arrangement, a visitor can be conveyed by launch across the few miles of Lake Victoria, from Paynesville to Sperm Whale Head. There is, however, a rough bush track into the park from the west; it connects with formed roads from Sale and Rosedale, but at present it can be negotiated comfortably only by using a Jeep or Land Rover. As settlement is extending towards the park's western boundary, the track—actually a surveyed road—will eventually be formed and thus provide an easy overland approach to the reserve.

Lakes National Park is in one of the loveliest parts of Victoria, among the famous Gippsland Lakes, a region renowned for its coastal and inland fishing, its abundance of aquatic bird life and its scenic panoramas. These features and the proximity of the Ninety Mile Beach to the lake system, have made Lakes Entrance and Paynesville into very popular tourist resorts.

The park is on a blunt peninsula, about six miles long and nearly a mile across at the widest part. It lies between Lake Victoria and Lake Reeve. Reeve itself is a narrow island-studded channel separated by dunes from the Ninety Mile Beach and the Southern Ocean.

The Head was reserved temporarily in 1927. For that we may thank both the late A. D. Hardy, who was a prominent member of the F.N.C.V., and the Barton family, pioneers of the district and field naturalists, too. It was Hardy who recognized the value of Sperm Whale Head as a conservation area. It is one of the two Victorian localities where *Thryptomene microphylla* is known to grow. It has Mahogany Gum (*Eucalyptus botryoides*) which does not extend much farther west in Victoria. Another eucalypt of somewhat limited distribution is Fuzzy Box (*E. baueriana*). These, with Manna Gum, Forest Red

Kangaroo Tracks, at Emu Swamp in Lakes National Park.

Photo: F. Lewis

Gum, Black Wattle, two species of banksia and Cherry Ballart, are the principal trees. Two of the eucalypts serve as food trees for the park's koala population.

With areas of open forest and heathland, Sperm Whale Head shelters a good deal of native wildlife including kangaroos, wallabies, emus and many less-known species. A recent extension of the park to the west has included another interesting community, the salt marsh, where a peculiarly specialized association of plants and animals thrives. Unfortunately there is no permanent fresh water which can be recommended for visitors and campers. However, there are waterholes that serve as drinking places for animals.

Now, under the control of the National Parks Authority, the Lakes National Park may soon have some of the amenities that such places might be expected to provide. A well-formed access road and a car park are required, as well as landing jetty, camping ground, shelter cabin, a kiosk perhaps, public conveniences and, above all, a good supply of fresh water.

The park now has a part-time ranger, Mr. Fred Barton, who for years has accepted the responsibilities of honorary ranger. To him Victorians owe much for his zealous guardianship of one of the state's proud possessions.

Lakes National Park has a curious history. About a century ago, when south-eastern Victoria was the victim of somewhat impractical land settlement schemes, Sperm Whale Head underwent considerable clearing, and the Mahogany Gum was almost wiped out. Black Wattle subsequently provided income for bark-strippers and, when shale oil began to interest speculators, test bores were sunk in the area. The tanning bark and shale oil operations furnished the first committee of management with a little revenue, and this was supplemented by fees for sheep grazing rights. By these devices the annual income varied from £8 to £20, so very little could be done to publicize the park or provide elementary facilities for visitors.

The original committee of management included leading naturalists: George Coghill (chairman), A. D. Hardy (secretary), Charles Barrett, T. S. Hart and J. A. Leach. The then Chief Inspector of Fisheries and Game, Fred Lewis, was a member, too. He had worked with A. D. Hardy for the dedication of the peninsula as a national park. Two interested local residents, E. Cox and A. J. Gilsenan, were also on the committee. In August 1929, the name was officially changed to Lakes (Sperm Whale Head) National Park. It was permanently reserved and, later, in November 1936, was declared a sanctuary for fauna under the Game Act.

Now, Victoria may expect some important and beneficial developments at Sperm Whale Head. Mr. Hugh Stewart, an esteemed member of the F.N.C.V., is the secretary of the present managing committee, a strong body interested in expediting improvements to the park.

If you are visiting south-eastern Gippsland next spring, make a point of visiting Lakes National Park. It will be worth the effort.

(*Next month:* The Kulkyne.)

News and Notes

V.N.P.A. Conference

On Saturday, March 19, at a location to be announced at the March general meeting of the club, the Victorian National Parks Association will hold a conference of members and representatives of corporate bodies. Sessions will be in the morning, from 10 to 12 o'clock; afternoon, from 2 to 4; and evening, from 7 to 9.30. Proposals for new national parks, and principles of control and management of parks are to be the subjects for discussion.

Wildflowers in Colour

On Tuesday, March 22, 1960, Dr. G. N. Christensen will show and comment on a selection of colour slides featuring well-known Victorian wildflowers and the places where they still grow. The lecture will be in School Hall at M.C.E.G.G.S., Anderson Street, South Yarra, commencing at 8 p.m. The admission charge, 2/6, will be in aid of the Native Plants Preservation Society of Victoria.

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

Nesting Times of Birds

Mrs. L. Lowe of Glen Iris writes about an experience with a young blackbird:

> Is it unusual for blackbirds to nest during January?
>
> On the hottest day of the recent heat-wave (I think January 15) I happened on a nest, exposed to the blazing western sun, with only one nestling in it—tiny beak wide open, and apparently in a bad way.
>
> I gave it water with an eye-dropper, which contented it. At intervals the treatment was repeated, but during the night it vanished.

Fatalities in bird families are the rule rather than the exception. It is interesting to consider that, if the balance of nature is maintained and the number of individuals of any species in an area maintains a certain average over the years, then during their whole lives each pair of breeding birds raises only two offspring to maturity, despite the large aggregate of eggs laid during the life of the female parent.

Summer breeding is apparently not unusual. From Leongatha, Mrs. Ellen Lyndon has written a letter which contains this comment:

> In spite of very dry conditions (for our part of Gippsland) both before and after Christmas, Willie-Wagtails and Blue Wrens are still nesting here, in early February.

Also on the same theme is a report from Mr. W. J. M. Davey of East Malvern. He tells of a female blackbird that became quite tame; it would stay to be fed when other birds flew off. It built three nests last season, in a very small area. The first and second broods, each of three, were successfully raised to the self-supporting stage, but the last was not. This third family came to grief during the heat-wave of mid-January, just as

the Glen Iris ones did. Mr. Davey commented, too, on the way the female blackbird used to fight and drive off the wattle-birds that came near the nests, an interesting point in view of the usual pugnacity of the latter.

Birds' Nests at Beechworth

Miss Jean Galbraith has written sending details of a remarkably large number of birds' nests in a small area. She gives this explanation:

The list was enclosed in a letter from my cousin who lives on the Old Sydney Road, Beechworth, where the nests were found last spring. She has since found quite a number more I believe, and her mother (on the same road) writes of shrike-tits and a Rufous Fantail bathing in her bird bath. It's a wonderful bush road and of the six families living along it, all but one are related and are interested in birds.

The nests were found along the road or within half a mile of it. Here is the score:

Mudlark, 2; Magpie, 2; Grey Fantail, 9; Blackbird, 5; Rufous Whistler, 5; Blue Wren, 3; Yellow Robin, 3; Scarlet Robin, 3; Red-capped Robin, 1; Spotted Pardalote, 4; Goldfinch, 6; Silver-eye, 2; Striated Thornbill, 2; Yellow-tailed Thornbill, 4; Grey Thrush, 2; Eastern Spinebill, 1; Yellow-faced Honeyeater, 2; White-browed Scrub-wren, 2; Mistletoe-bird, 1; Willie-Wagtail, 1; White-throated Warbler, 1; and two unidentified nests blown down. Total, 63.

It is gratifying to know that birds are so plentiful in the Beechworth area and also to learn that a number of local people are keenly interested in their doings. Did you notice that all the species mentioned are of the order of Perching Birds? Song Birds is an alternative name for the same order; and the Old Sydney Road near Beechworth must be a pleasant place for a stroll in spring, when many of these songsters are giving voice.

Bird Notes from W Tree

W Tree is a locality about sixteen miles north of Buchan in East Gippsland. It is a country setting with an abundance of bird life. One of the club's country members, Mr. Leo Hodge, has established a substantial garden of native flowers there and, as is usual in such cases, nectar-feeding birds know it well. Here are some notes and queries about local birds from Mrs. Hodge:

Early one morning last December, my attention was drawn to noises coming from the waratah bush outside the back door. A young Crescent Honeyeater, almost full-grown, was doing a little singing practice, and a Willie-Wagtail was answering from across the road. The little bird's song resembled the Willie-Wagtail's call closer than the notes of its own kind. The exchange of calls continued for at least five minutes.

On January 20, out of the morning bird chorus, the lovely ringing notes of the Grey Butcher-bird caught my ear. Immediately the magpies in complete unison drowned the melody with their own song. Three times the butcher-bird tried again to make himself heard, without success, and he apparently gave up and flew away. One magpie then gave a triumphant, deep-throated warble, a delightful runnel of notes which I have always associated with August dawns.

I wonder if anyone has studied bird calls and their apparent meanings. I have often kept up a whistling "conversation" with Crimson Rosellas, by repeating their calls back to them. The triple-note call—low-high-low—is answered for several minutes then changed to a two-note call. When this has been answered several times the birds give squawks of alarm and fly off. It seems that the first call is a

form of greeting and the second a demand for identification.

Miss Galbraith's note on honeyeaters preferring the topmost twig is most interesting. I have often noticed that when the Crescent Honeyeaters return to our garden after an absence, one will always fly to the top of the kurrajong tree and send forth a clear, ringing call, like a challenge.

From my kitchen window I can watch the honeyeaters on a tall upright of a pear-tree. This is a favourite perch on early spring mornings, for it catches the sun before the rest of the garden does. The Eastern Spinebill is usually first; it is chased away by a Yellow-faced which in turn gives way to a Crescent Honeyeater. The Yellow-winged and White-eared will also take a turn, all within the space of a few minutes. I often wonder if any species of birds are more playful than these. Until they settle down to the serious business of nesting, the garden is full of whirring wings, as the little feathered folk play "chase me Charlie" in and out of the shrubs.

Yes, bird calls and the significance of some of them have been studied. It seems that magpies often carol for the same reason that roosters crow, to broadcast their claims to certain territories in their localities and to challenge any intruders. It is very doubtful that honeyeaters chase members of different species about in the spirit of play. It is more likely that they aggressively hunt others from their territories or food supply. I have watched the birds feeding amongst the grevilleas in the Hodge garden at W Tree and have noticed that the Yellow-winged Honeyeater invariably chases the Spinebill; it is never the other way round. Perhaps some ornithologist could make appropriate comments.

Brown Snake's Meal

Mr. A. B. West, correspondent of the Sunraysia Field Naturalists Club, sends the accompanying photograph and explanation:

While on a joint expedition of the Sunraysia and Ouyen Field Naturalists Clubs in the Hattah area recently, one of the party killed a brown snake. It was observed that the snake had rather a large bulge in the stomach,

so it was decided to investigate. When opened, the snake was found to have swallowed a stumpy-tail lizard about eight inches long. The photograph was taken by Mr. J. Webster, president of the Sunraysia club.

Cup-moths and Gumtrees

A letter comes from Master Fred Becker of Genoa, in East Gippsland, accompanying a specimen of "grub" for identification. Fred gives these notes on the insect's doings:

I have seen them around here in ones and twos before but this year they seem to be here in large numbers. There are several different colours of them and, if touched, little spikes come out of their backs. Be careful how you handle this grub because it has a nasty sting.

One of my brothers sent one to the Correspondence School, but while travelling down it wove a cocoon and they could not inspect it. Could you tell me what kind it is?

The grubs in question have eaten all the leaves of some gum bushes and these have died. Other bushes have been partly eaten, and only some stems have withered.

The second specimen, too, had made a cocoon by the time it came to hand. However, it can be identified as a cup-moth. The larvae are almost as broad as they are long and have eight clusters of stinging spines on their backs. The spines are tucked in out of sight normally but when the insect is disturbed the tufts are brought into position like miniature pincushions.

What is it?

(See picture on page 281.)

This is part of a bivalve shell, the Scallop, which you may pick up on the beach. The valves are reddish and about four inches across; one is flat and the other convex.

Hedge Wattle — *Acacia armata*

Amongst our most distinctive shrub wattles is *Acacia armata*, the Hedge Wattle. It is usually a shrub of open places. As its name suggests, it is often used as a hedge, and its dense prickly habit makes it a very effective hedge plant indeed. Possibly because plants sometimes spread from hedges to open pastures, it is proclaimed a weed in some shires, but I do not know of any place where it is really troublesome.

It blooms in early spring, and no Victorian wattle has more deeply golden heads of bloom. These are large, globular and crowded, on stalks as long as or longer than the half-inch phyllodes which are thus often quite hidden by the heavy gold.

Hedge Wattle is usually a substantial bush, six to eight feet high and sometimes of similar breadth, becoming a mound of golden blossom in spring. However, in dry, rocky soils it develops a lighter, more slender and irregular habit.

Only when you touch the golden clusters do you realize that it is very well armed with spines. These are slender and straight, and they spring from the leaf-bases. The spines are actually stipules which, though inconspicuous, are stiff and very sharp, standing out at right angles to the stems. The slightly longer leaves are very short-stalked; they are olive-green and point upwards, often nearly parallel to the stems. The phyllodes are smooth or very slightly hairy, feather-veined, with one central nerve, ovate or oblong in shape, and the apex is rather to one side of the tip. They are noticeably wavy-edged and are often slightly twisted, too.

When the shrubs are not in bloom, the little dull-green leaves make them look sombre, even heavy. They haven't the lightness of Prickly Moses, and their intricate branching adds to the appearance of solidarity.

The slender, cylindrical pods hang from the leaf-bases but are not conspicuous. Only when the blossom comes, hiding the leaves, are the bushes gay. Few wattles have larger heads of flowers, and none is more richly golden.

In *Flora of Victoria*, A. J. Ewart says: "There is no evidence that the proclamation as a pest of this native plant has served any useful purpose." Certainly Hedge Wattle has both use and beauty, and only those who handle it incautiously are likely to dislike it.

The combination of globular flower-heads and ovate, feather-veined leaves with spiny stipules makes *Acacia armata* a species not to be mistaken for any other. It ranges from Western Australia to Queensland but does not occur in Tasmania.

Hedge Wattle, near Springvale

Photo: N. A. Wakefield

Nature Study for Schools

By Norman Wakefield

EXCURSIONS*

Here are three more suggestions for nature study excursions to places within reach of Melbourne and suburban schools:

Zoological Gardens

Zoological gardens were established originally for educational purposes. They were intended to be places where animals would be studied scientifically, and where people could learn the characteristics of native and overseas species of reptiles, birds and mammals. But, at the Melbourne zoo, inadequate grants for development and maintenance have necessitated the introduction of various money-making amusements and amenities: rides on the elephant, the merry-go-round and miniature train. As a result of these and the provision of swings, slides, etc., the zoo is a place of amusement, to which people flock with their children of a weekend and on public holidays, and the value of the zoological gardens as an educational institution has been obscured.

However, teachers should be aware that the zoo has much to offer. Excursions can be organized there to very great advantage, particularly because on school days the place is free from crowds of careless pleasure-seekers.

As far as limited finances allow, the zoological gardens are being improved as time goes on. Several years ago, the Australian section was very poor, but it is now well forth a visit of a few hours.

The basis of elementary school nature study is observation in the local environment. What is seen at the zoo provides a further step in experience; it brings children into contact with animals that they have heard or read about but not seen in the flesh.

It is a valuable experience for scholars to see a dozen species of parrots and several kinds of hawks. They can compare these with the rosella and kestrel which they have in suburban areas, and so they appreciate that there are birds similar to but distinct from those of their own district.

It is interesting indeed to see the barn owl—so well known from illustrated story-books—side by side with the hawk-owls, and to learn that one of the latter is responsible for the "mopoke" call that some children will have heard in the country at night.

At the zoo, pupils are able to compare our spiny anteater or echidna with the porcupine of other countries. Having seen both, they will apppreciate that, despite the common misnomer, our animal is *not* a porcupine.

These are a few of the lessons to be learned on an excursion to the Melbourne Zoological Gardens. The area is reached by train to the Royal Park station

* Continued from the October 1959 issue of the *Victorian Naturalist*.

or by the West Coburg tram from William Street. An alternative route is by a Coburg or Brunswick tram along Elizabeth Street, which involves several minutes' walk to the zoo from the nearest stop.

Until recently, school groups were admitted free. Now, however, a concession system operates. By arrangement with the office of the Gardens, individuals in groups are charged half-price: children under fourteen pay sixpence and those fourteen years of age or more pay 1/6.

Guide maps, at sixpence each, are available at either entrance to the zoo; they show the locations of the various cages and animal groups.

National Museum, Melbourne

The National Museum of Victoria is concerned with branches of natural history other than botany. It deals mainly with zoology, anthropology and geology.

For school nature study, the most useful exhibits are the dioramas. In these, birds and mammals are displayed in three-dimensional representations of their natural habitats.

Otherwise, most of the display cases contain series of specimens and relevant data, too detailed for assimilation by primary school pupils though valuable to older students. Nevertheless, though gaining little or no specific information from them, no child could fail to be impressed by a strikingly beautiful array of butterflies or a series of large, highly-polished sea shells.

On the other hand, a case containing mounted specimens of our several glider-possums is very instructive to primary scholars of middle and upper grades. So, too, is the display of some local—but unspectacular—molluscs, grouped naturally on pieces of rock.

Exhibits are changed from time to time, and teachers who intend to take school groups to the museum could very profitably make a visit beforehand to assess the potential of the place. This would enable them to plan their excursion very effectively. This is a general principal for the organization of any excursion, that the leader should be familiar with the items to be observed and studied.

Before the date of an excursion, the museum office should be contacted. The proposed time of the visit should be given as well as the number of children in the party. The museum authorities require that there is one teacher for every fifteen to twenty pupils and that the groups are conducted methodically and with normal discipline. It is assumed that the teachers will have a basic knowledge of natural history and will be able to explain exhibits and answer general questions.

Unfortunately, we in Victoria have no Education Department liaison officer attached to the National Museum. We lag behind other states in this respect, despite the fact that about 15,000 school children are taken, in organized groups, to the museum each year. In the circumstances it is impossible for the museum staff to provide personnel to instruct children during excur-

sions, but an officer can be made available to answer questions if necessary.

Pictorial material may be purchased at the museum. There is a set of six postcards with coloured paintings of common Victorian birds, for sixpence each (or 2 6 a set). Plain postcards depicting native animals are twopence each, or 1 6 for a set of twelve. A book, *Mammals of Victoria*, by C. W. Brazenor, the Director, is priced at 7 6.

Sir Colin MacKenzie Sanctuary

The sanctuary is at Badger Creek, three miles from Healesville, which town is some forty miles from Melbourne. It is fairly well publicized and documented, though pamphlets and booklets become obsolete or out-of-print from time to time. The Victorian Government Tourist Bureau in Melbourne, or the Director of the sanctuary itself, will supply up-to-date information upon application.

Many hundreds of visitors go to the sanctuary of a weekend, but conditions are comparatively quiet of a week-day when school excursions are normally organized. Trains go to Healesville, but there is no satisfactory public transport system for large groups from the town to the sanctuary, so it is usual to charter a parlour-coach for an excursion.

A kiosk at the sanctuary serves light meals, drinks, etc., and sells postcards and films. There are picnicking shelters, tables, seats and fireplaces in the area. However, a common procedure is for school groups to go to the Mooroondah Dam for a picnic lunch, then to visit the sanctuary in the afternoon.

Those organizing excursions should contact the Director of the sanctuary, Mr. W. R. Gasking, by letter or telephone

Brolgas at Sir Colin MacKenzie Sanctuary.

Photo: F. Lewis

(Healesville 7) to arrange for their parties. For school groups the admission is £1 per coach.

Guide booklets of about sixteen pages, including a map of the sanctuary area, are obtainable for a shilling each. There is also a stereotyped pamplet of several pages, prepared by the Tourist Bureau for issue to children on organized educational visits; this is out of print but should be available again shortly.

For school nature study the really valuable exhibits are the animals and birds in practically natural habitats. Kangaroos occupy a large paddock which visitors may enter; the animals are practically tame, and some females have young ones in their pouches. Scampering about amongst tussocks in a nearby enclosure are pademelons, a group that foxes have wiped out in Victoria.

Emus are free to wander about in the sanctuary, and one must beware or fruit and sandwiches may be whisked from the hands of diners by these birds.

The platypus exhibit is most popular. It is very well housed in a building donated by the Olympic Tyre and Rubber Company. Every day a platypus is out in the large, elevated display tank, from 2.30 to 4 p.m. This arrangement replaces the previous procedure of a 3.30 p.m. feeding time—and an accompanying congestion of viewers. From time to time a recording by the late Crosbie Morrison is broadcast over a public address system, giving information about the remarkable animal.

One of the most attractive features of the sanctuary at Healesville is its bush setting. Beside the creek there are tree-ferns and ground-ferns. The numerous native shrubs include the Christmas-bush, which is very spectacular when in flower towards the end of the year. And huge Manna Gums tower above the enclosures. Bush birds are as plentiful and appear to be as varied as those in captivity. Crimson Rosellas, Yellow Robins, Red-browed Finches, Bronze-wing Pigeons and numerous others are always there to be seen.

[This ends the series on organization of nature study in primary schools. In future, the feature will provide illustrations and notes on topics for observation.]

F.N.C.V. Junior Group

With David Woodruff as convenor, several of the younger members of the F.N.C.V. held a preliminary meeting at the National Herbarium on February 8, before the general meeting of the Club. The idea was to inaugurate a Junior Group in the F.N.C.V. It was decided to hold a similar meeting at 7.30 p.m. on March 8.

An excursion was arranged to Ricketts Point, Beaumaris, to coincide with the exceptionally low tide due on Sunday, February 21. Although no suburban trains ran that day, several juniors were there. With the club president, Mr. D. E. McInnes as leader, an interesting survey was made of marine life about the rocks exposed by the low tide.

The most interesting discovery was a handsome nudibranch; it was about four inches long and bright pink in colour. Under one rock there were several specimens of *Terebella*, a large marine worm with feeding tentacles at the head. One member photographed these and it is hoped that the slides may be shown at the next junior group meeting.

Senior members who could lead a junior excursion, particularly one with a botanical flavour, are asked to contact David Woodruff or Mr. McInnes.

Field Naturalists Club of Victoria

General Meeting—February 8, 1960

Mr. D. E. McInnes presided at the meeting which was attended by about 150 members and friends. Mr. Knox Thompson from Western Australia was welcomed.

Notices of motion were given of resolutions to be put before the general meeting on March 8. Details of these were published in the February *Naturalist*.

Mr. Garnet announced that a National Parks Association conference would be held on March 19. Details of this are given on page 285.

Because of the illness of Mr. Alex. Burns, Miss Ina Watson generously consented to give an illustrated talk on the vegetation and fauna of north-western Victoria, particularly the Lake Hattah area. Highlights of the lecture were the vivid depicting of Lowans nesting, the Crested Bell-bird's nest decorated with caterpillars, slides of young parrots, and a close facial view of a wolf spider.

The following new members were elected: Mrs. Agnes H. North, Mrs. May Stratham, Miss Margaret F. Bland, Mr. Ronald W. deGruchy, Mr. Kenneth G. Simpson, Mr. Alexander Stirling, Mr. James A. Barnes, Mr. William H. King and Mr. John G. Featherstone (ordinary members); Miss Edna Walling, Mr. Allan Turner and Mr. Michael G. White (country members); and Master James F. Mann (junior member).

Mr. deGruchy read a letter from the Fisheries and Game Department indicating that koalas had not been destroyed by fire in the Silverband area of the Grampians where they were liberated. Any destroyed must have migrated from there. Mr. deGruchy also reported vandalism at the Sydenham organ-pipe formation. He appealed to members to write separately to Mr. M. J. Fraser, Minister for State Development, asking for the protection of this geological formation.

Exhibits included plants from Mallacoota: Sandpaper Fig (*Ficus stephanocarpa*), Water-vine (*Cissus hypoglauca*), Blue Olive-berry (*Elaeocarpus reticulatus*), Wombat Berry (*Eustrephus latifolius*)—collected by Mrs. Taylor. Miss Neighbour exhibited a group of twelve egg-sacs of an Orchard Spider (*Calacnia excavata*).* Miss Lester displayed a fine sequence of photographs of a cicada emerging from its pupa-case; and Mr. Rayment showed paintings of purple bees (*Callomelitta picta*) on tea-tree flowers. Mr. Gabriel exhibited examples of Australia's largest and smallest land-shells.

Miss Watson provided a nature note, illustrated by a colour slide, of larvae of a slipper-beetle (*Paropsis*), which resemble saw-fly larvae; they eject a fluid which maddens ants attacking them, but the ants usually succeed in killing the larvae.

After further nature notes, the meeting was adjourned for the usual conversazione and perusal of exhibits.

Geology Discussion Group—

February 3, 1960

Sixteen members attended the first meeting for 1960 with Mr. Davidson in the chair in place of Mr. Jeffrey who was absent on holidays.

The subject for the evening was "Holiday Experiences by Members". Mr. Blackburn dealt with the Bellarine Peninsula and mentioned that the Miocene rocks at Curlewis were probably the most contorted in Australia. The Older Basalt and limestone deposits were discussed. A fossil cowrie from the limestone was exhibited and numerous other fossils from the same deposit are easily obtainable. The large number of phosphatic nodules on the surface in various places was noted and their origin explained. Aboriginal implements from the peninsula were shown and probable quarrying sites were given. Slides in colour illustrated the speaker's remarks.

Mr. Baker: Silicified wood from the Omeo area was exhibited and the various forms of weathering by oxidation of the wood explained.

* See "Three Months with an Orchard Spider", by J. H. Willis—*Vict. Nat.* 75: 84-5 (Sept. 1958).

Mr. McInnes: Pictures of geological points of interest on the club excursion to Apollo Bay. These included Airey's Inlet basalt, Jurassic platform beyond Apollo Bay, Port Campbell Miocene sedimentary deposits and various other views of Miocene cliff deposits.

Miss Carolan: Extensive collection of slides of holiday tour through the Western District, including volcanic craters and lakes near Colac and Camperdown, basalt headland at Portland, Bridgewater dune lakes, Tertiary limestone deposits showing cave formations, and oil drilling at Port Campbell. Some slides showing prominent dip-formations on Mount Howitt at Mansfield concluded the display.

Miss Forster: Pictures of Snowy hydro-electricity area including Tumut and Guthega Dams.

Mr. Davidson: Explanation of opal collected from Older Basalt at Yinnar and zircons from Sailors Creek at Daylesford.

Exhibits: Mr. Baker — silicified wood; Mr. Blackburn — limestones, basalts and various other rocks from Indented Head; Mr. Davidson—opal from Older Basalt at Yinnar; zircons from Sailors Creek, Daylesford; Miss Forster—marble both rough and polished from Wombeyan, New South Wales; this stone has been used in the Roman Catholic Cathedral at Goulburn.

Microscopical Group—November 18, 1959

A letter was received from the Royal Microscopical Society concerning a display of old microscopes, to be held in Melbourne in conjunction with the National Museum. Members were asked to assist in the setting up of stands and photographs. A request came from Mr. Tindale for freshwater sponges for the purpose of comparing their spicules with those found in diatom deposits.

The main event of the evening was a lecture by Dr. Ethel McLennan, and the subject was "Filamentous Algae". The speaker mentioned typical members of the main groups of algae and discussed the features which distinguish the groups. Certain of the larger and more important genera were dealt with, and such aspects as algal pigmentation, cellular pigment distribution, and pigment content as compared with that of land plants were concisely dealt with.

Algal reproduction was discussed at length, and structure of algae was amply illustrated by microscope mounts showing living specimens brought along by group members. At the conclusion of the address, Dr. McLennan was accorded a sincere vote of thanks for a most absorbing evening.

"Photomicrography in Colour" will be the topic for the March meeting, and club members who have experience or knowledge in this field or who are interested are invited to attend.

Botany Group—November 13, 1959

Mr. J. M. Wilson described some aspects of propagation and gave practical demonstrations of some of the methods.

Hard-coated seeds were distinguished from soft-coated, and the presowing treatment of the former was discussed. Six types of layering were dealt with, descriptions of apparatus were given, and treatment after severance was demonstrated.

Cuttings were dealt with next; four types were discussed, with appropriate demonstrations and exhibits.

Botany Group—January 15, 1960

Mr. J. M. Wilson completed the lecture on propagation which he had begun at the group meeting in November last.

Four common methods of grafting were described and demonstrated and a comparison made with budding; the advantages and disadvantages of each were outlined.

Types of plants which respond to propagation by division were described and the procedure demonstrated. At the conclusion of the lecture, a number of young plants was distributed to members.

Australian Natural History Medallion

The award for 1959 has just been announced. It goes to Mr. Keith A. Hindwood of Sydney, for work in the field of ornithology. Further details should appear shortly in the *Naturalist*.

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The edible Parasol Mushroom, **Lepiota gracilenta.** Photographed at Kallista, Victoria, by Robert D. Lee

Vol. 76, No. 12 April 7, 1960

F.N.C.V.

The Victorian Naturalist

Editor: NORMAN WAKEFIELD

CONTENTS

Front Cover:

The Tiger-cat (*Dasyurus maculatus*) is the largest species of carnivorous marsupial to be found on the Australian mainland. It lives in mountainous districts of eastern Victoria and about the Otways. The photograph which is reproduced on the cover is of a female Tiger-cat and one of her young ones at the Sir Colin MacKenzie Sanctuary, Healesville. It was taken by David Fleay and it appeared in the *Victorian Naturalist* in February 1940, illustrating an article entitled "Breeding of the Tiger-cat". See Volume 56, pages 159-163.

Editorial:

The Victorian Naturalist

A year ago, the *Victorian Naturalist* underwent a radical change. The mode of presentation which had served for over seventy-five years was abandoned, the magazine was enlarged by 40 per cent and the number of illustrations trebled. Moreover, in anticipation of a wider circulation, the number printed each month was increased by 40 per cent.

As a result of these moves, the *Naturalist* cost 70 per cent more to produce this year than it did last year. To offset extra costs, some additional advertising space was sold, sales were arranged with a few selected bookshops, and some advertising was done.

Compared with last year's figures, the number of regularly subscribing non-members has more than doubled and so, too, has the enrolment of new club members. This last augurs well for future club activities. There will be a small deficit in this year's balance sheet, but the F.N.C.V. council considers this a reasonable price to pay for the difficult initial step in developing a popular nature magazine.

So much for the past. What of the future?

Recently, printing costs rose sharply, so the *Naturalist* now faces a year of higher production costs. It is therefore necessary to devise means of further increasing club income, both to offset higher costs and to provide further improvements to the magazine. Here are some ways in which you may be able to help:

Supporting Membership—This system was introduced two years ago to obviate the necessity of considering an over-all raising of membership fees and subscription rates. Now, the purpose of supporting membership is rather to maintain the *Naturalist* and help improve it. Read the details on the re-enrolment leaflet in the middle of this issue, and give the matter your earnest consideration when filling it in. This invitation is extended also to non-members who subscribe to the magazine.

New Members and Subscribers—All readers are asked to try to obtain one or two new members or subscribers. Recommend the club and the magazine to your friends, and give them the appropriate form from the centre of this issue. Those who have obtained their *Naturalist* from a bookshop may send a year's subscription to the club and receive the twelve issues by mail, from May 1960 onwards. Direct sale by the club yields more revenue than is obtained through agents.

Both the F.N.C.V. and the *Naturalist* are maintained for you by a comparatively small number of honorary office-bearers. Neither is run for profit and all monetary returns go toward increasing these services. By helping the club and its magazine you help yourself.

Among Californian Trees and Flowers

By J. H. Willis

The great goldfields of California and Victoria were discovered and worked almost simultaneously, and some of the "forty-niners" crossed the Pacific to try their luck on our Victorian diggings. In latitude and general climate the two regions have much in common, so that many plants from one state will grow quite successfully in the other; a propinquity of outlook and interest has also encouraged us to borrow from the Californians—their flora included. Baron von Mueller speeded up this useful interchange by importing Monterey Pine, Monterey Cypress, Douglas Fir, etc., as early as 1857, and later by fostering the introduction of Australian eucalypts and saltbushes in California. If one looks around any large Victorian garden, listing the flowers and the countries of their origin, it is surprising to find how many have reached us from the Pacific states of North America, especially California: Californian poppy, Matilija poppy, western azalea, sticky monkey-flower, flowering currant, snowberry, leopard lily, various penstemons, salvias and lupins, species of *Godetia, Clarkia, Gaillardia* and so on.

I could scarcely believe my good fortune, when the opportunity came to see these beauties, and many others, *in their native hills* last June. Five crowded days were spent, by courtesy of the Californian Forest Service, in a traverse across the state by car:

from San Francisco north along the coast 150 miles to Fort Bragg (centre of a big Redwood and Douglas Fir logging industry), then inland over the Coast Range to Clear Lake and Sacramento, across the wide hot Central Valley to Sierra foothills at Angels Camp, up through Calaveras and Alpine Counties to high Ebbet Pass (8750 ft.) on the Sierra Nevada itself, down the dry eastern side of that vast mountain chain to Markleeville and the border of Nevada State, then back to Sacramento via Lake Tahoe (6000 ft.), Kyburz and Placerville.

What variety of scenery, forests and glorious flowers! But, before dwelling on some of these excitements, it may be helpful to give a brief note on the physiography of Central California—a state longer than and nearly twice as large as Victoria.

Rising from the sea to about 4000 ft., the fringing Coast Range intercepts moisture-laden westerly winds from the Pacific and enjoys more humid conditions than other parts of the country; fogs are not infrequent. This is the home of the great Redwood and Douglas Fir forests; but, within a few miles, one emerges on to the drier eastern slopes of the range and is confronted by an astounding change of scenery—xerophilous grey-brown scrubs of the Cha-

parral formation. Farther inland, and at still lower elevation, we enter the Central Valley of rolling plains and stifling summer heat—a land of corn, vineyards, citrus and olive groves, through which the leveed Sacramento River meanders lazily. Indeed, the whole landscape bears a remarkable resemblance to our fruit-producing Murray Valley. Beyond the plains, you encounter dry auriferous hills and the "Butte Country" of curious, detached, table-topped knolls.

Then the ascent of the mighty Sierra Nevada commences. Rainfall rises again with increasing altitude, and rushing rivers are fed by snow water. Here are great coniferous forests, until one climbs above the tree-line between 10,000 and 11,000 feet. Above this lies the true alpine zone, where snowdrifts are permanent among the granite crags and a few pinnacles attain 14,000 feet—highest land in the U.S.A. south of Canada. If the east and west sides of the little Coast Range provide a sharp contrast, those of the Sierra Nevada are even more startling: high forest on one side, a pronounced rain-shadow with scrub and near-desert conditions on the eastern fall into Nevada State.

My botanical wanderings began at San Francisco, where it was a matter for pride to see how much the present attractiveness of Golden Gate Park owes to Australian eucalypts, tea-trees and wattles which were used extensively to stabilize the loose sandy soil and to break the force of salt-laden ocean winds. Some of the remaining Coast Tea-trees are now veterans, as gnarled and broad as any along the Beaumaris foreshore. At Berkeley, across San Francisco Bay, there is a magnificent grove of hundred-foot Tasmanian Blue Gums (*Eucalyptus globulus*) close inside the main entrance to their University campus, and I was to see much of this adaptable species in other parts of California. Salt-marshes around the Bay looked exactly like those of Port Phillip, and the component species of glasswort, seablite, salt-grass, etc., if not identical, were closely related to our own. Even the weed flora was almost the same as one finds around any Victorian sea-port, a conformity that does not apply to the cooler Atlantic coast of New England states.

Coast Redwood (*Sequoia sempervirens*) is the tallest tree on earth, and many monarchs, some 1300 years of age, exceed a height of 300 ft. in the several famous groves; pride of place goes to the 364-foot "Founders Tree" in Humboldt Redwoods State Park, thirty-three miles south of Eureka. Beginning near San Luis Obispo, the Redwood becomes more impressive as one goes 500 miles north into Oregon State. It occurs right down on the coast, often in company with Bishop Pine (*Pinus muricata*), but attains maximum size on wet creek flats among the higher hills.

Words fail to convey the experience of strolling through Armstrong Redwood State Park near Russian River, where the "Colonel Armstrong" tree tops 308 feet (with diameter of 14½ ft.). Footfalls are silent on the

accumulated mould of centuries, and no cathedral nave could inspire a sense of greater solemnity or majesty than those tremendous living pillars of cinnamon-brown, fading into the sky through a canopy of deepest green; only an occasional shaft of sunlight can penetrate to the twilit forest floor. Ferns grow more abundantly along the Redwood gullies ("canyons" and "gulches") than in any other sector of the state, and, of understorey trees, few are more attractive than the Californian Laurel (*Umbellularia californica*), often called "bay" or "myrtle"; its shiny leaves are highly aromatic, with a sweet fragrance embodying all the mingled spices of Araby. Blueblossom (*Ceanothus thyrsiflorus*) bursts into dense shrubberies after burning and becomes virtually a forest weed—like *Acacia* and *Cassinia* species in our fire-blasted Victorian hills.

Just behind Fort Bragg, at the mouth of Noyo River (Mendocino County), is an extraordinary formation known as the "Pygmy Forest"—a strip of sandy terrain forty miles long by one to three miles wide. Hard pan comes close to the surface there, where normal forest trees are suddenly dwarfed into mere bushes, often gnarled and twisted like Japanese *bonsai*. The principal conifers affected thus are *Pinus contorta*, *P. muricata* and an endemic cypress, *Cupressus pygmaea*. Representatives of *Ericaceae* are conspicuous both in quantity and variety. Salal (*Gaultheria shallon*) being a dominant, broad-leaved and luxuriant scrambler. Pink-flowered *Rhododendron californicum*, up to eight feet high, was blooming lustily through the Pygmy Forest at the time of my summer visit, while several *Vaccinium* and *Arctostaphylos* species were coming into berry.

Drier eastern slopes of the Coast Range afford a wealth of attractive small trees, amongst which were Manzanita (*Arctostaphylos manzanita*) with lustrous brick-red stems, Christmas Berry or Toyon (*Photinia arbutifolia*), Western Red-bud (*Cercis occidentalis*) and Buckeye (*Aesculus californica*). The last, a little horse-chestnut, manifested itself as rounded, yellowish bushes among the prevailing blue-grey tones of oaks and Digger Pine (*Pinus sabiniana*), for Buck-eye was already beginning to lose its palmate leaves and it would remain bare during the whole of late summer, autumn and winter—a remarkably long period of dormancy for any deciduous plant. Along depressions, it were better to avoid contact with the so-called "Poison Oak" (*Rhus diversiloba*), a red-berried rambler that can have agonizing consequences for those allergic to it. Forest workmen often suffer cruelly by breathing in the tainted smoke, when a bushfire passes through Poison Oak thickets. I found the sombre slaty-blue landscape reminiscent of many an Australian scene. The spreading, "cabbagey" trees of White Oak (*Quercus lobata*) and Blue Oak (*Q. douglasii*) could easily have passed for box eucalypts, and the sparse grey Digger Pines for bull-oak or belah (*Casuarina* species). A halt was called beside

the shore of big Clear Lake to see the localized, vividly green Button Willow (*Cephalanthus occidentalis*—in the family *Rubiaceae*).

Then we moved up into the *Chaparral*, which finds its nearest Australian counterpart in Mallee scrublands. In this part of California the formation bears rather a uniform, monotonous appearance—hills dominated by grey-brownish, tough, twiggy entanglements of Chamise (*Adenostoma fasciculatum* in the *Rosaceae*); to attempt walking through it would be an ordeal. Here and there were occasional clumps of Oak, Manzanita, Buckeye or Digger Pine. Farther south, the Chaparral qualifies for a wildflower garden in spring—scarlet larkspur, gold of the leafless sun-rose, prickly gilia, blue-flowered species of *Phacelia*, flame-red "paintbrush", chaparral pea, chaparral lily, tulip-like species of *Calochortus* (collectively known as *mariposa*—Spanish for "butterfly") and countless other colourful gems. The hot Central Valley, profoundly altered by man's activities, is now of limited botanical interest, if we except a few rare endemic survivals like species of the strange little grass genus *Orcuttia*; but there seem to be innumerable weeds, and Australian Blown Grass (*Agrostis avenacea*) is widely naturalized also.

From Angels Camp, venue of the traditional frog-hopping contests, we began to ascend the Sierra foothills around Murphys. Roadside banks were gay with *Godetia*, *Oenothera*, Mountain Hemp (*Apocynum androsaemifolium* var. *pumilum*) and the dazzling purple, gentian-like Harvest Brodiaea (*B. coronaria*). At about 3500 ft. near Arnold, the first Incense Cedars (*Heyderia decurrens*) appeared among the Yellow Pine (*Pinus ponderosa*), to be joined at 4-5000 ft. by White Fir (*Abies concolor*) and an astonishing assortment of *Ceanothus* and *Ribes* species. Soon we reached the North Grove of Calaveras State Park for Big Trees (*Sequoia gigantea*) — totalling about 5000 acres—and gazed with awe upon the titans in that reserve. This is the type locality of the species, and the largest tree felled therein had a diameter of twenty-four feet, at about five feet above ground-level; its smoothed-off stump, still intact, has been used for a dance floor!

But our main objective was the newly acquired, larger South Grove of the Park near Beaver Creek, not yet open to the public. Here we slept overnight at a forestry camp, housing gangs of prison workers on the "honour system", and in early morning paid our homage to the Big Trees, while friendly blue jays flitted among the trunks and chipmunks scampered over fallen logs. The biggest standing tree has a maximum diameter of twenty-eight feet and is much hollowed at the base, so that one may walk in and out among its buttresses. This and all the other very old trees were found to be scarred by at least two fires in centuries before the coming of white men; they are reckoned to be 2000 years old or more.

There are many points of difference between the habits and

habitats of the Coast Redwood and Big Tree. For example, the former occupies vast stretches of forest and reproduces readily both from seed and sucker growth; the latter occurs only in isolated groves of limited extent, has no means of vegetative reproduction and rarely produces much viable seed—regeneration, therefore, is extremely slow. Ferns are scarce (or virtually absent) in the drier Big Tree country which, however, is not lacking in a variety of saprophytic growths. I was delighted to find flowering examples of the curious whitish Phantom Orchis (*Cephalanthera austinae*), the leafless orchids *Corallorhiza striata* and *C. maculata*. Three members of the small Indian-pipe family *Monotropaceae*—Snow Plant (*Sarcodes sanguinea*), Pine-drops (*Pterospora andromedea*) and Fringed Pine-sap (*Pleuricospora fimbriolata*)—were also admired, the first two being wholly crimson, the last creamy-white. The fleshy, leafless Snow Plant is particularly beautiful and has long since earned the sentimental regard of local people. When snow begins to melt from the higher mountains, the coral-red buds push up through the litter of pine needles on the forest floor, hence its attractive name.

Snow Plant (*Sarcodes sanguinea*), in pine woods near Lake Tahoe, at 6000 feet.

Mountain slopes around the Big Trees bristle with the tall spires of *Pinus ponderosa*, *P. jeffreyi*, *P. lambertiana* (Sugar Pine) and the ubiquitous *Heyderia decurrens*. These trees, particularly Sugar Pine, are sometimes killed by the ravages of a small bark boring beetle, when they are known colloquially as "bug trees". The pine trunks are frequently decorated throughout by coralloid masses of a canary-yellow lichen, *Evernia vulpina*, which gives the forest scene an elfish quality, especially under illumination by occasional sunbeams. In more open places there is often a complete

ground cover of bright green Mountain Misery (*Chamaebatia foliolosa*), from a distance looking like swards of grass or beds of moss; this white-flowered member of the *Rosaceae* has very dissected, ferny leaves that are clammy to the touch—indeed, the whole plant exudes an aromatic tarry substance which can gum up the legs of travelling stock, and this undesirable trait has inspired the sobriquet "mountain misery".

Down along the stream-banks are many delightful flowering shrubs, such as fragrant Western Azalea (*Rhododendron occidentale*), Thimble-berry (*Rubus parviflorus*), Ground Rose (*Rosa spithamea*) and Mountain Dogwood (*Cornus nuttallii*). A wealth of fascinating herbs is also present: Pink Dicentra (*D. formosa*), Red Columbine (*Aquilegia truncata*), the palmate and yellow-flowered Pine Violet (*Viola lobata*), Hartweg's Wild Ginger (*Asarum hartwegii*), giant rhubarb-like *Peltiphyllum peltatum*, yellow and lilac *Iris hartwegii*, modest white *Clintonia uniflora*, the two Solomon's Seals (*Smilacina amplexicaulis* and *S. liliacea*), Pacific Starflower (*Trientalis latifolia*), etc.

Our journey upwards through Alpine County to Ebbet Pass (8750 ft.), just at the summer snow-line, was exhilarating, the brilliance and variety of subalpine flowers a crescendo of excitement. Silver-boled *Pinus monticola*. *P. contorta* (Lodgepole Pine), *Abies magnifica* (Red Fir), *Tsuga mertensiana* (Mountain Hemlock) and *Juniperus occidentalis* appeared at about 8000 ft. Of these the juniper makes a last brave stand against the elements, and no trees could be more picturesque among their native crags—hobgoblins and dragons in wood, bleached almost white by driving sleet and storm-pruned into fantastic shapes; ancient indeed must be many of them which have diameters of one or two feet. Patches of meadow and bog are dotted with such little gems as the alpine shooting-star and tiny white violet (*Dodecatheon alpinum* and *Viola blanda*), with diminutive species of *Mimulus* and *Saxifraga*. Robust herbs seem out of place in this lilliputian scene; but there are at least two spectacular plants having very big, lush leaves several inches wide: the sunflower-like daisy, *Wyethia mollis*, and a false "skunk cabbage", *Veratrum californicum*, the inflorescence of which may be as tall as a man.

The most interesting areas to me were natural rock-gardens, with a quite bewildering array of rosette, mat-forming and cushion plants. Among them one could extol the charms of pale mauve to lilac Prickly Phlox (*Phlox diffusa*), a crucifer with round leaves, purple calyces and filiform pods (*Streptanthus tortuosus*), silvery prostrate *Lupinus breweri*, "Pussy Paws" (*Spraguea umbellata* — an annual, fleshy rosette in the *Portulacaceae*), the rubescent succulent *Sedum obtusatum*, creamy stars of *Brodiaea ixioides* and grey-pink ones of several small *Allium* species, white-and-gold zinnia-like *Eriophyllum lanatum* and *Eriogonum lobbii*—the last an aristocrat of the dock family, *Polygonaceae*. Two outstanding

penstemons were vivid blue, large-flowered *P. confertus* on gravelly screes and "Mountain Pride", *P. newberryi*, with rosy-magenta blooms in great profusion among granite rocks. Several small ferns and fern-allies lurked in subalpine crevices, notably *Pellaea bridgesii*, *Cheilanthes gracillima* (Lace Fern) and *Selaginella watsonii*.

One was kept in a constant spirit of expectancy, as wonder after wonder revealed itself; but what can be gained by a mere recitation of names? You need to tramp along the crests of the Sierra Nevada, to *feel* the mountain air and to feast your eyes on the living, incomparable loveliness of it all—as yet unsullied by man (if one excuses a few access roadways) and free from introduced pests, either weed or animal. The road from Ebbet winds down eastward into the upper valley of Carson River, through white-stemmed clumps of aspen (*Populus tremuloides*) at about 6000 feet, and very soon the whole panorama changes completely. We see a dry-walled valley of scrub and dwarf trees, including the quaint little One-needle Pine (*Pinus monophylla*) with small cones but relatively big, edible, nut-like seeds. At dusty Markleeville immediate attention is claimed by a magnificent large-flowered, white evening-primrose (*Oenothera trichocalyx*) and prickly poppy (*Argemone platyceras* var. *hispida*), with crinkly white petals as large as those of the cultivated Matilija Poppy (*Romneya coulteri*). Within a few more miles we are surrounded by sage-brush (greyish *Artemisia* species), bitter-brush (*Purshia tridentata*) and other harsh prickly xerophytes; and now, here is the Nevada border—arid plains and mesas lie beyond it. The west-east traverse of California is complete, and so is this sketchy account of my botanical impressions.

These columns are available each month for your nature notes and queries. Address your correspondence to the Editor, "Victorian Naturalist", P.O. Box 21, Noble Park, Victoria.

Notes on Eucalypts

Mrs. Ellen Lyndon writes, from Leongatha in South Gippsland:

On warm nights, during the latter half of January, I found myriads of small brown beetles swarming around trees of the Rose-flowered Yellow Gum, *Eucalyptus leucoxylon rosea*. They could be plainly heard buzzing and banging against the leaves. Several blossoming specimens of Gippsland Mallee, *E. kitsoniana*, were similarly affected, although a Common Peppermint nearby was not. By daylight, the edges of many of the leaves were seen to be scalloped, with the beetles still munching away at them. The Yellow Gum was not in bloom, but it had very small buds. The beetle plaque had disappeared by the end of the month.

Although Gippsland Mallee has finished flowering, it still bears numerous bud clusters on slender twigs. Many of these groups are partly enclosed by papery brown wrappings, burst asunder. Kept in check, this is a delightful small gum, a picture when in flower. Given garden conditions though, it tends to forget that it is a "mallee" and races upward in the fashion of its taller relatives.

It is fairly safe to say that the beetles would belong to the Chrysomelidae, the Leaf-eating Beetles, but there are about 2000 Australian species of this family. In it, Slipper Beetles (*Paropsis*) comprise the largest genus, and they usually feed on young eucalypt leaves. They are shaped like the common ladybird but are usually larger and brownish.

Regarding the growth of Gippsland Mallee, Mr. A. G. Hooke mentioned specimens thirty feet high in last month's *Naturalist* (page 281).

More Thrush Behaviour

Following a note from Portland which appeared in the *Naturalist* three months ago, Mrs. Vera Greaves of Lang Lang sends this little story:

I was interested in the story about the behaviour of a thrush in "Along the By-ways" in January. I recall a similar instance at my mother's home at Corinella some years ago. A pair of Grey Thrushes built their nest in a fern basket hung from the ceiling of a latticed veranda. This was very close to the bathroom door, opposite which was a large mirror and shelf. Every day the male thrush would "fight off" his image in the mirror, but before doing so he would clear the shelf by dropping articles from it into the bath. They were not pushed off accidentally, for tubes such as toothpaste, face cream and shaving cream, would be punctured in many places by his beak or his sharp claws. Hair brushes, combs and tooth brushes would all be removed from the shelf if they were not too heavy. This behaviour went on until the young were hatched; then I suppose there were more important chores to keep Mr. Thrush occupied.

Was it a Water-rat?

Mrs. L. Hodge of W Tree in East Gippsland has written the following query:

Could you tell me please if water-rats are likely to be found in local streams nowadays? One very hot afternoon in January, the boys were swimming in the Murrindal River a few hundred yards below where it is joined by Butchers Creek. I was walking across the flat to examine an unfamiliar shrub growing among flood debris when a creature scuttled up a low bank and disappeared in tall grass. It appeared to be dark grey on the back, with lighter grey chest, long snout and inconspicuous ears. It was at least twice the size of either the Swamp Rat or Allied Rat. I took it to be a bandicoot until Peter said he saw an animal answering to the same description plunge down the bank into the water near where he was swimming.

It is fairly safe to say that the animal *was* the Eastern Water-rat. The size and behaviour of the one seen leaves little doubt of it. And the species is known to occur in the district. About a year ago, Mr. Keith Rogers reported catching one at Little River, about twenty miles north of W Tree.

Identification of Specimens

Strella Harrison, Camberwell Girls' High School: A brown winged insect a quarter-inch long, with "three horn-like objects across the head like a tiara"; found on a zinnia leaf. It is a membracid or tree-hopper; but the head is hidden underneath, and it is the broad thorax that has the three horns. The larvae of membracids exude a sweet substance that is collected from them by ants.

Margaret Bell, Grade 4, Weerite: A large metallic green and black fly with a stout body three-quarters of an inch long and with a two-inch wing-span. This is a dexiid fly (*Rutilia regalis*) but it has no common name. The species lays eggs in the ground and the larvae attack cockchafer beetle grubs, so the fly is a beneficial insect.

Shocking!

Mrs. Lyndon provides a conclusion to this month's notes:

Nature notes should conclude with a snake story. Not having one ready I shall have to make do with one about a skink. Hardly an hour of the day passes here without an encounter with one of these lively creatures. They turn up in all sorts of unlikely places, both outside and inside the house. I picked up the electric toaster from a low shelf on one occasion, switched on the power, and out leaped a large lizard. To be truthful, both it and I leaped convulsively.

To All Contributors

Thanks to those who have shared their observations with others during the past twelve months. So far there have been over forty contributions in "Along the By-ways", and we look forward to an even wider variety in the future.

National Parks and National Monuments—4

The Kulkyne

By J. Ros Garnet

Red Gums in Kulkyne Forest
Photo: L. G. Chandler

Rather more than 300 miles north-west of Melbourne and forty miles south of Mildura, there is a magnificent area of country which must be dedicated as a national park some day.

Although at present it is a State Forest, controlled by the Forests Commission, this status is far outweighed by its potential value as a national park. The area is known as *The Kulkyne* to those familiar with it: members of nature clubs, people interested in natural sciences and those who delight in charming scenery. The place is known as well to some one-time Italian prisoners of war who were encamped there some years ago.

Its name derives from the old Kulkyne Station on the Murray, but the area has more to it than relics of a one-time homestead. A good road map will help you to locate it, lying in an approximate rectangle formed by the Calder Highway, Murray Valley Highway, the Murray River, and a line from Kulkyne to Nowingi. This embraces about 137,000 acres, one-third of which is highly interesting mallee, rich in wild flowers, birds (including lowans) and other fauna. The rest comprises some of our state's best "lake country"—the Hattah Lakes—set among gently undulating savannah and grass lands and bordered by fine old River Red Gums and Black Box.

The lakes, all fresh water, are connected by shallow channels and fed from two branches of Chalka Creek, which is really a meander of the Murray. The Chalka is a running stream only when the great river rises above the creek inlet upstream. After flowing through the lakes the water passes back into the Murray at another point farther north, downstream. In between times it is a chain of ponds, lagoons and lakes which be-

come progressively drier as the season or drought advances.

The larger lakes—Hattah, Mournpool, Konardin and Brockie—rarely become completely dry in normal seasons. They are the home and breeding places of countless water birds, including swans, ducks, coots, spoonbills, pelicans, cormorants, darters, egrets and herons. They are the watering places of emus, both Red and Mallee Kangaroos, and the haunt of tortoises, goannas and other lizards, snakes, possums, and an incredible variety of other native fauna. The area abounds with native and introduced fish, freshwater crayfish, mussels, snails and frogs.

Insect life thrives in myriads: gnats, midges, mayflies, caddis-flies, damselflies, mud-eyes, bees, ants, ant-lions and wasps are but a few of the groups. I cannot remember seeing so many ant-lion pits as on the Hattah sandhills and plains. During a camp-out on the shore of Lake Hattah last Easter we noticed that the murmur of the millions of insects at the water's edge was audible fully fifty feet away! A few opportunist mud-eyes, emerging from the water overnight, left their skins clinging to the tyres of the car parked by the sandy lake side. Every River Red Gum trunk had its share of such skins.

Among other wonders of the place are the spiders. Countless mallee nephilas stretch enormous cartwheel webs between the stems of porcupine-grass or branches of gum and bottle-brush. They are large, colourful, long-legged spiders whose huge egg sacs are emerald green first but become golden yellow as the eggs mature. The Mallee trap-door spider is there, too, hard to see except when one happens upon her sunning her egg sac at the entrance to the burrow and she is too slow to shut the concealing lid.

Out beyond Lake Brockie we were led to the playground of a Spotted Bower-bird. It was beneath a Murray Pine, and his *décor* of odds and ends of bones, glass, fruits and pebbles was fascinating to see.

Even as late as March a few wildflowers were blooming. Blue Rod, *Morjania floribunda*, grew densely around the waters like a field of wheat, and much of it was still in flower. Sometimes it almost disappears but will reappear in profusion after a flood. The famous Hattah Lily was abundant but long past its prime. On the flats, among the lignum, where kangaroos love to browse, the tall graceful Eumong (*Acacia stenophylla*) was in flower and Black Box (*Eucalyptus largiflorens*) was coming into bloom, sometimes with mixed pink and white flowers.

Out in the mallee, beside the track into the lake, stands a fine old Bell-fruit (the rare *Codonocarpus cotonifolius*). It was in flower, with masses of bloom like miniature spoked wheels. Desert Jasmine was in flower, too, a specimen like a small tree, perhaps twenty-five feet high, among a group of Cattle-bush (*Heterodendron oleifolium*). The latter looked very colourful with their shining black seeds almost enveloped in the succulent red arils. Of course, the time to see the Kulkyne's flowers is in spring, when acre upon acre of Ham-and-Eggs Daisy adorn the sand plains and slopes. A few stragglers bloomed at Easter time but they would be a memorable sight, indeed, in October or November, especially after some good winter rains.

Towards Lake Mournpool there are several eucalypts now labelled by the Sunraysia F.N.C. to distinguish them from nearby trees. They appear to be hybrid between River Red Gum and the Black Box, possessing features of each.

The plant life of the Kulkyne is something to delight the heart of a botanist and perhaps to worry him a little. This is partly because plants are often rugged and gnarled with age. Pittosporums grow as thirty-foot trees, Hakeas are fifteen or more feet high, and Porcupine Grass plants reach twenty feet in diameter. There are Quandong, Southern Liquorice, Desert Chinese Lantern and plants of that kind seldom seen by easterners. Unfortunately there is little regeneration of the rarities because rabbits and cattle feed upon the seedlings. When old plants go there may be none to take their places if grazing continues and rabbits are not controlled. This is a task which authority must do if one of the most charming places in Victoria is to remain unspoiled.

In natural wind-swept sandhills (if the erosion due to sheep grazing in

the distant past may be called "natural") there are aboriginal relics. Chipping flints as well as other artefacts and what seem to be fragments of weathered and altered human bones, indicate the sites of kitchen middens and burial grounds.

The attractiveness of the Kulkyne is primarily due to its system of tree-girt fresh-water lakes, about the only one in the Victorian Murray Valley which persists almost in its pristine condition. Nearly all other lakes have suffered changes in water-table level due to construction of irrigation systems. To the south-east, there is evidence of this along the Murray Valley Highway. On flats and round lakes and lagoons stand Red Gums killed by a permanent rise in the water-table. No such change has occurred in the Kulkyne. There the water rises and falls with the level of the Murray and the Red Gums thrive to perfection, benefiting from their periodical flooding and drying-out.

The Kulkyne is, indeed, a lovely place. It is too good to be exploited by grazing or timber harvesting. Fuel and fence posts can surely be culled from the multitude of river-bend forests beyond its boundaries. It is too good to be spoiled by market gardens on the bends, a project in the mind of one politician. Rather, it is a gem for reservation as part of our system of nature-protection and conservation. Then it will not be lost to the people of Victoria.

The Kulkyne area is not at all like Wyperfeld National Park and it can be said that, within its 200 square miles, there are features of such scenic value and scientific interest that it would be criminal were they allowed to vanish or deteriorate beyond redemption. That is what *will* happen if we are not careful.

Scene on
Lake
Little Hattah

Photo:
L. G. Chandler

EXCURSION TO APOLLO BAY

Over the Christmas-New Year period of last summer, the F.N.C.V. conducted an excursion to the Otways area. The party was based on Apollo Bay, and day excursions by parlour-coach took members as far afield as Port Campbell. A general excursion diary was published in the Naturalist *last month. Here now are several reports on specific phases of the natural history of the areas which were visited.*

MARINE BIOLOGY

By Frances Forster

On two occasions members were able to collect and observe living marine life that frequents the intertidal fringe of the coast near our headquarters.

In the rock pools of Crayfish Bay, there were heavy growths of brown algae, including *Sargassum*, *Hormosira*, *Padina*, and the yellow-brown tripe-like *Colpomenia*. Bunches of moving seaweed proved to be the seaweed crab (*Naxia tumida*); numerous uncamouflaged crabs scuttled away as rocks were overturned. On the undersurfaces were compact areas of bryozoa, two distinct types of sea-anemone—the dark red-brown sea waratah and the smaller species with longitudinally striped columns, white on a dark ground. Two nudibranchs about one to one-and-a-half inches in length were found among the seaweeds, one orange in colour and the other black. When removing a piece of coralline seaweed, several bristle-worms were disturbed, and many rocks were encrusted with the limy cases of the tube-worm *Galeolaria*. Chitons and multicoloured sea-stars were numerous on the undersides of rocks and rock ledges.

Several specimens of black elephant snail (*Scutus*) and mutton-fish (*Haliotis*) were taken and their movements watched with interest. Other living molluscs included Turban-shells, limpets, tritons and periwinkles of various types and colours.

One biscuit-star, with five short arms, patterned in dark brown and cream was found among seaweed as well as one specimen with longer arms and of a bright red colour. Marine isopods, deep green in colour and similar to garden slaters, were found near the high-tide line when rocks were overturned.

The rock shelf, about seven miles east of Apollo Bay, was of such a formation that the pools were well sheltered from direct ocean fury. The rock strata are parallel to the coast line and dipping toward the ocean, the broad level platform is made up of a series of ridges leaning towards the shore with hundreds of pools of all sizes between the ridges, an ideal set-up for the "rock pool comber". Most conspicuous as the tide receded were the conjevoi (*Pyura stolonifera*) an ascidian with a very tough outer coat and so encrusted with seaweeds as to resemble the rocks to which they were attached. When mollested they squirt out seawater. Another tunicate (?*Pyura*, the sea-tulip) of a deep purple colour, was rather less numerous, it hung by a single "stalk" from a bed of corallines and encrusting sponges. An interesting point is that the conjevoi are not found on the ocean coast west of Cape Otway.*

The undersides of rocky ledges that remain perpetually wet were almost entirely covered with encrusting sponges of various colours: light purple, salmon pink, yellowish green and russet browns. Slithering across the sponge-covered shelving side of a pool we saw the tentacles of an octopus; the body appeared for a few seconds then disappeared in a thick mass of *Sargassum*. Immediately rock crabs came scuttling to the surface of the weed; doubtless some were less fortunate. About an hour later Mr. McInnes pulled an octopus from a pool in this locality; it proved a most fascinating exhibit in the saloon that evening, measuring three feet in span. Mutton-fish were plentiful in these pools; so, too, were the 8-pointed sea-stars in a variety of shades ranging from blues and purples to orange and red.

* *Ref.*—Dakin, W. J., *Australian Sea-shores.*

Sea-cucumbers (*Holothurian*), clusters of three to eight, and varying in length from two to five inches, were found under boulders. They varied in colour from slate grey to almost white, the outer skin had sand-grains and broken shell fragments adhering to it, there were numerous branched tentacles at the mouth end, and as is characteristic of their species they threw out their internal organs when disturbed. In another pool a deep purple to black sea-urchin was found wedged between rocks. Two species of sea-anemones were very prolific in rock crevices, one with clean tentacles, the other with sand grains and broken shell particles attached about the tentacles. Another exciting specimen was *Retepora*, a piece of pale apricot-coloured "lace coral"—not a real coral but a polyzoan.

Numerous shells were gathered along the seashores at various times. These included limpets of various types, mutton fish shells, tritons, whelks, sea-snails, periwinkles, cone, turban shells, elephant snail shells, kelp shells, cowrie and olive.

Great interest was shown by field naturalists and other visitors to the Apollo Bay Hotel in the various specimens displayed in plastic bowls and under the microscope, and our grateful thanks go to our president for making these closer and more leisurely observations possible. One exhibit was the octopus posed on a hotel sheet set on the back lawn for the benefit of the photographers. The dull grey colour of the dead octopus was seen to be changing in waves to a patchy dark brown. A small piece of the membrane from between the tentacles was cut out with a pair of scissors and mounted under the microscope, and there the colour cells could be seen still contracting and expanding, more so when a shadow was made to pass across the membrane.

BIRDS

By Katherine Hough

As a large and varied area was covered in the course of our stay, a good bird-list was to be expected. Though none of the group could be considered experts and a number of birds was seen which could not be identified, over ninety species were listed over the period and members had some unforgettable "birding".

Most rewarding perhaps was the day at well-named Paradise. Birds were everywhere and a pair of brilliant Rufous Fantails and a Blue Wren put on a performance around a log on the creek bank. They were pirouetting over, along and under it, and flashing through the reeds while groups of people came and went on the opposite bank. At one time all three were reflected in the water. Grey Fantails were everywhere and scrub-wrens were eating crusts a few feet away. A Yellow Robin sat in its exquisite little nest balanced on a gently swaying tree-fern frond. White-naped Honeyeaters were round the picnic area and the only Mistletoe Bird of the trip was seen.

On an evening walk on Wild Dog Creek Road the lovely song of the Bristle-bird was coming from undergrowth a few feet up the bank but the singers refused to show themselves. The sight of some thirty people standing on a lonely road and staring up the hillside for about half an hour caused a stir in the camping area in the valley below. Curiosity led one young man to make a difficult climb up to us, the result being a likely new member. We never did see those particular birds, but some were seen at Blanket Bay and at Paradise.

Another very fruitful time was during the visit to the Elliott River area. A continuous chorus of calls came from the surrounding bush, but many of them were strange to us. Notable that day were the Satin Flycatcher, Pilot-bird, and a group of King Parrots. Round a bend in the track a Wedge-tailed Eagle was surprised on the ground and it made a hurried and lumbering take-off.

Near the breakwater at Apollo Bay and almost in the village itself, a Fairy Penguin had made a burrow under a coil of old rope behind a shed. A chick, nearly full-grown, could be seen in the evening scrambling amongst some nearby rubbish. We were told by a local who was guarding the nest carefully that this was the first time one had been known along this particular stretch of coast.

The commonest bird, apart from the

Goldfinch, was the Crescent Honeyeater. In the forests its calls accompanied us along all the tracks. The Grey Fantail would take second place. Waders were very scarce though we visited a number of likely places. Our most notable bird was the Bristle-bird, and our most uncommon the Heath Wren which delighted three members in the scrub at Blanket Bay.

TREES

By A. G. Hooke

The following species of *Eucalyptus* were observed during the excursion:

Brown Stringybark (*E. baxteri*)—In coastal belt of poor country, mostly stunted or straggling; inland from Blanket Bay.

Blue Gum (*E. bicostata*†)—Common along coast from Lorne to Apollo Bay, and in scattered localities inland well up into the ranges.

Broad-leaf Peppermint (*E. dives*)—Very little seen.

Mountain Grey Gum (*E. goniocalyx*)—Very widely spread through the higher areas of the district, generally one of the tallest trees.

Gippsland Mallee (*E. kitsoniana*)—Restricted to a small area of poor country between coast and foot of ranges, one to three miles inland and north-westerly from Blanket Bay.

Messmate (*E. obliqua*)—Widely distributed throughout; a local variety, known as Otways Messmate, has smooth bark but appears typical otherwise.

Swamp Gum (*E. ovata*)—Common along the coast, often in dry country, otherwise mainly in valleys and on moist flats; noted also high up on well-drained slopes near Wattle Hill.

White Mountain Ash (*E. regnans*)—In scattered localities, mainly well up in the ranges where it becomes one of the tallest trees to be seen.

Red Ironbark (*E. sideroxylon*)—In small areas at Airey's Inlet and on the Big Hill, in poor country near the coast.

Manna Gum (*E. viminalis*)—Not common, but a good deal found scattered about moist valleys and well up in the main forest; grows into a fine tall timber tree in the upper part of the Parker River valley.

River Red Gum (*E. camaldulensis*)—A few of these are growing near the Barham River close to Apollo Bay, on private property, probably planted there originally.

† Some of these Blue Gums are referable to *E. globulus*, but the two intergrade in the Otways area.—Editor.

GRASSES

By Alison Hooke

Twenty-five kinds of grasses were noted during the excursion, more than half of them being native species. They are listed according to habitat.

Coastal sand-dunes

Marram Grass (**Ammonphila arenaria*)

Hairy Spinifex (*S. hirsutus*)

These two are found on sand-dunes throughout southern Australia; they are valuable sand-binders as they have very extensive rhizomes.

Short-hair Plume-grass (*Dichelachne sciurea*)

Salt Grass (*Distichlis distichophylla*)—A lover of salt water, found just above high tide level at Blanket Bay.

Hare's-tail (**Lagurus ovatus*)—Less common on the little-frequented beaches than on those near Melbourne.

Yellow Spear-grass (*Stipa flavescens*)

Coast Spear-grass (*S. rerotifolia*)

Native Grasslands

Several areas were found where trees and shrubs had been cleared and the resulting grassland consisted of native species.

Common Wheat-grass (*Agropyron scabrum*)

Wallaby-grasses (*Danthonia pilosa* and *D. setacea*)

Weeping Grass (*Microlaena stipoides*)

Tussock Grass (*Poa caespitosa* form)

Kangaroo Grass (*Themeda australis*)

* Introduced species.

Forest

Under the trees and shrubs were Hedgehog Grass (*Echinopogon ovatus*) and Wire Grass (*Tetrarrhena juncea*). The latter often forms tangled masses, very difficult to push through; on the stems are barbs reinforced with silica, and scars from Wire Grass scratches have been known to last for almost a year.

Introduced Pastures

The rainfall is well distributed throughout the year, so perennial pasture species are sown. The best pasture grasses used are:

Cocksfoot Grass (**Dactylis glomerata*)
Perennial Rye-grass (**Lolium perenne*)
Crested Dog's-tail (**Cynosurus cristatus*)

Volunteer Grasses

This name is given to species that come into pastures and other places without being sown. These were seen in neglected pastures, vacant allotments and near the beach in inhabited areas.

Sweet Vernal-grass (**Anthoxanthum odoratum*)
Couch Grass (**Cynodon dactylon*)
Red Fescue (**Festuca rubra*)
Yorkshire Fog (**Holcus lanatus*)
Rat-tail Grass (**Sporobolus*)
An *Agrostis* species

PLANT LIFE

By L. M. White

The plant enthusiasts of the party took the opportunity to explore the vegetation of Airey's Inlet. Berries were much in evidence: tiny white ones on Coast Beard-heath (*Leucopogon parviflorus*), those of Boobialla (*Myoporum insulare*) rich purple, and blue-purple fruit on Spreading Flax-lily (*Dianella revoluta*). Cushion-bush (*Calocephalus brownii*) made decorative silver masses, with the creamy *C. lacteus* interspersed. A variety of shrub species, including Hop Goodenia (*G. ovata*) in flower as usual, clung to the cliffs, and the bright pink flowers of Blushing Bindweed (*Convolvulus erubescens*) made a pleasant patch of colour. Further inland, both Austral Grasstree and Small Grasstree (*Xanthorrhoea australis* and *X. minor*) showed their long spikes.

At Apollo Bay, improvements have eliminated most native plants, but the fleshy Sea Rocket (*Cakile maritima*) flowered on the sand in defiance of salt spray and civilization. A golden patch of Scented Groundsel (*Senecio odoratus*) drew attention to a genus which is prominent in the district where clearing has let light through to the ground. Species included Fireweed Groundsel (*S. linearifolius*) and the beautiful large-flowered Forest Groundsel (*S. velleioides*). Seaberry Saltbush (*Rhagodia baccata*) and New Zealand Spinach (*Tetragonia expansa*) frequently appeared to bind the cliff-faces against erosion. Unfortunately, the outlaw of the genus, Ragwort (*S. jacobea*), is showing its lovely heads too frequently in the hills.

On the track to Marriner's Lookout, the fragile Wild Flax (*Linum marginale*) and Austral Bluebell (*Wahlenbergia*) displayed their blue flowers despite dry habitats; and in damp spots Bird's-foot Trefoil (*Lotus corniculatus*) was a mass of gold.

Inland from Apollo Bay, where the annual rainfall is about seventy inches, the Otway forest is a dense and beautiful natural vegetation. At Paradise Gully the tree canopy included Myrtle Beech (*Nothofagus cunninghamii*) as well as eucalypts and wattles. A lower storey comprised Musk Daisy-bush (*Olearia argophylla*), Blanket-leaf (*Bedfordia salicina*) and Hazel Pomaderris (*P. aspera*). There were three kinds of treeferns: Soft Treefern (*Dicksonia antarctica*), Rough Treefern (*Cyathea australis*) and the rare Skirted Treefern (*C. marcescens*). Mosses, filmy-ferns, polypods, spleenworts, water-ferns, rasp-ferns, brakes and the exquisite Lacy Ground-fern (*Dennstaedtia davallioides*) were all abundant. On the edge of the track, the blue Austral Hound's-tongue (*Cynoglossum australe*) and a number of very tall Cinnamon Bells (*Gastrodia sesamoides*) and the White Elderberry (*Sambucus gaudichaudii*) were all flowering. The Green Bird-orchid (*Chiloglottis cornuta*) grew on treefern trunks.

At Mait's Rest, one ancient hollow

Myrtle Beech was buttressed with old and new natural supports. A Slender Treefern (*Cyathea cunninghamii*) was estimated at fifty-one feet high. The beautiful Weeping Spleenwort (*Asplenium flaccidum*) grew high up on a tree-trunk, festoons of beard-moss hung from the boughs, and the striking umbrella-moss displayed its spore-capsules.

In a clearing at Cape Horn, there were over sixty plants of a sun-orchid (*Thelymitra*); and nearby Trailing Pratia (*P. pedunculata*) made a dainty white mat.

Further north, Binns Road passes the Calder Scenic Reserve, with its towering White Mountain Ash (*Eucalyptus regnans*). Along the road, the numerous shrubs included Satin Box (*Phebalium squameum*) in all stages of growth and Mountain Pepper (*Drimys lanceolata*) with its attractive red stems and fruits.

Turton's Track brought more shrubbery, with Tree Lomatia (*L. fraseri*), Mountain Correa (*C. lawrenciana*) and Sandfly Zieria (*Z. smithii*) prominent. Along almost every road the fragrance of Tree Everlasting (*Helichrysum dendroideum*) was evident and the beautiful Christmas Bush (*Prostanthera lasianthos*) was in full flower.

Thousands of acres near Beech Forest have been planted with Monterey Pine (*Pinus radiata*), Corsican Pine (*P. laricio*), Oregan (*Pseudotsuga taxifolia*) and Sitka Spruce (*Picea sitchensis*).

In the area near Elliott River, where Gippsland Mallee grew, tea-tree (*Leptospermum juniperinum*) and Scented Paper-bark (*Melaleuca squarrosa*) grew very tall, and the fragrant Tree Broom-heath (*Monotoca elliptica*) was in flower. The party was surprised to find a bed of sphagum moss (*S. australe*), and near it were the Forked Sundew (*Drosera binata*), Leafless Milkwort (*Comesperma defoliatum*) and Pink Swamp-heath (*Sprengelia incana*). Wiry Bauera (*B. rubioides*) was in flower, and a specimen of Tall Leek-orchid (*Prasophyllum elatum*) three feet high claimed attention.

On the way to Blanket Bay, a patch of heathland was bright with the red of Common Heath (*Epacris impressa*). Trigger-plants, flat-peas, herbaceous lilies and many other small plants were flowering, too. Among the floral gems were Hyacinth Orchid (*Dipodium punctatum*), Running Postman (*Kennedya prostrata*) and Satin Everlasting (*Helichrysum leucopsidium*).

Beside the road to Port Campbell, one could see masses of coral-fern over six feet high, lovely fan-ferns and spikes of Digger Speedwell (*Veronica derwentia*).

In Loch Ard Gorge, the Dune Sow-thistle (*Sonchus megalocarpus*) made a fine picture with its large golden flower-heads, pastel-tinted Sea Celery (*Apium australe*) flourished, and Sea Box (*Alyxia buxifolia*) grew on the cliffs. Inside the caves were masses of liverworts and mosses, all facing the light and kept moist by comparatively fresh water dripping from above.

At London Bridge, as a contrast to the scenic grandeur, there was a flat carpet of minute bright flowers on the cliffs. These included the exquisite Small Daisy (*Brachycome parvula*), Creeping Brookweed (*Samolus repens*) and Swamp-weed (*Selliera radicans*). Coast Everlasting (*Helichrysum gunnii*) was the tallest plant there.

The lovely pink Austral Trefoil (*Lotus australis*) and a coastal form of Turpentine Bush (*Beyeria leschenaultii*) grew at Crayfish Bay.

F.N.C.V. Fauna Survey Group to be Formed

Recently, one of our club members, Mr. Graham George, convened a meeting at his home in Glen Iris, of people interested in field survey work in connexion with native mammals. Several of those present have been devoting considerable time to this, their interest being correlated with university studies in zoology.

Those present decided that it would be an advantage to form a group within the F.N.C.V. A preliminary meeting of the group will be held at the National Herbarium at 7.30 p.m. on Monday, April 11, prior to the club's general meeting. Members who are interested and able to participate in country survey work are invited to attend.

Spreading Wattle—*Acacia diffusa*

Spreading Wattle, though it grows in most parts of Victoria, is the special sunshine of the heathlands. Low-growing and with clear lemon-yellow blossom, companion of *Hardenbergia* and Pink-bells (*Tetratheca*), it is the wattle that comes to mind when I read of spring that comes "Golden bloom of wattle bringing, and the wildflower's purple bell".

Like Hedge Wattle, it is prickly and has flowers in globular heads, but its light bright colour is very unlike the deep gold of Hedge Wattle and it has stiff slender phyllodes ending in spines instead of soft flat ones with spiny stipules from the bases.

It is a small, light, often irregular bush of a few long stems and relatively few short branches. Often it sprawls, one or two feet high, amongst bracken and heathland flowers, sometimes with quite long branches on the ground. In other places it may be two or three feet high and not noticeably spreading. It is never dense, always loose and sparse, with rather widely spaced needle-like phyllodes and "bobbles" on half-inch stalks—two or three from the base of each phyllode.

The foliage is always slender and sharp, with a single central nerve strongly raised on both faces. This, with the nerve-like margins, makes the needles appear four-sided. The phyllodes are always longer than the flower-stalks, sometimes only three-quarters of an inch in length but usually an inch or more. In the most graceful forms they are two inches long.

Several other wattles have narrow spiny foliage and globular flower-heads, but all differ from Spreading Wattle in some conspicuous character. Two species (*Acacia aculeatissima* and *A. brownii*) have phyllodes shorter than the flower-heads, one (*A. ulicifolia*) has whitish flowers which come in winter; and Rock Wattle (*A. rupicola*), the one that most resembles *A. diffusa*, has small but distinct differences in foliage.

Rock Wattle is of limited distribution, growing in dry rocky soils in the Grampians and central Victoria. It has phyllodes always under an inch long (usually less than three-quarters of an inch), widest at the base and narrowing towards the spine-like tip like a very attenuated triangle. The phyllodes of Spreading Wattle are either narrowest at the base or equally narrow all the way to the terminal spine. Furthermore, Rock Wattle has much shorter flower-stalks than *A. diffusa*.

Spreading Wattle ranges from Tasmania to New South Wales.

Spreading Wattle near Orbost
Photo: N. A. Wakefield

Field Naturalists Club of Victoria

General Meeting—March 8, 1960

The president, Mr. D. E. Mehnes, occupied the chair, and about 150 members and friends attended. It was announced that a fauna study group is to be formed; and an appeal was made for leaders of junior group excursions.

The club treasurer, Mr. A. G. Hooke, moved and explained the two motions set out on page 269 of the February *Naturalist*. The secretary, Mr. E. H. Coghill, seconded the motions which were then passed without dissent.

The subject of the evening was "Nunniong Plateau", by Mr. Norman Wakefield. The area lies between the upper Buchan River and the heads of the Tambo River, and its elevation is between 4000 and 5000 feet. The key point is a remarkable gorge or chasm cut by the Reedy River, the valley of which lies in the middle of the plateau area. The talk was illustrated with colour slides of wide ranges, deep gorges, rare and beautiful plants and wild animals. Mr. Keith Rogers of Wulgulmerang had accompanied the speaker on two expeditions to Reedy River, and it was he who first penetrated the chasm. Mr. Rogers was present at the meeting, and he was accorded a warm welcome. A summary of the talk will be published shortly in the *Naturalist*.

The following new members were elected: Mr. O. Fauser and Mr. L. R. Murray (metropolitan), Mr. A. W. Bullock and Mr. R. C. Knight (country), and John Blake and Susan Taylor (junior).

Exhibits: Shells of land snails from Dandenongs and Otways (Mr. Gabriel); cup-moth and its cocoon, wingless female of painted acacia moth (Mr. Coghill); longicorn beetle from Gippsland mahogany gum, pupating *Xyleutes* moth (Miss White).

Microscopical Group—January 20, 1960

The meeting took the form of a conversazione, in which members discussed their exhibits. As is usual with this type of evening, a varied array of interesting topics was brought to light.

There was some discussion on the poor attendance at the display of old microscopes at the National Museum last December. This was thought due to lack of publicity, and regret was expressed that such an excellent show was seen by so few.

Microscopical Group—February 17, 1960

On this occasion, Mr. J. Walsh spoke on the hydra, a minute fresh-water coelenterate which obtained its name from its remarkable powers of regeneration. With its two differentiated layers of cells and a simple nerve net, it is a higher evolutionary form than the sponges. Besides these points, the speaker dealt with the hydra's reproductive, digestive and locomotor processes. This phase of the lecture was greatly assisted by Mr. W. Evans who projected his excellent slides on to a screen. The locating of hydras and collecting methods were touched upon, as well as fixing and staining for microscopical mounts. The talk was illustrated by microscope mounts of both fixed and live specimens, and some of the latter were screened later with Mr. E. Snell's micro-projector.

Geology Group—March 2, 1960

About seventy persons attended the meeting, which was of a special nature, as Mr. W. Hanks gave an illustrated lecture on his trip across the Andes. A special welcome was extended to thirty-three students of St. Margaret's, Berwick, who made the trip by bus to hear the lecture.

Mr. Hanks commenced his talk by giving a resumé of the geology of the Andes mountain chain, stressing particularly the volcanic regions. This was followed by an extensive and beautiful selection of colour photographs. Special emphasis was on the physiography of the mountains, with many examples of the rugged nature

of the terrain. A series of pictures covered many aspects of Indian life in the high valleys and plateaux.

The speaker comprehensively discussed the now extinct Inca civilization and gave an outline of its history, religion, agriculture and architecture. Slides of the Inca roads were followed with great interest; these served the extensive empire, traversing both mountain valleys and almost impassable ranges. The discussion and questions following the lecture were mainly upon this feature.

A vote of thanks to Mr. Hanks was carried with acclamation.

Exhibits: Andesite from volcanic regions of the Andes (Mr. Hanks); polished specimens of opal from Yinnar (Mr. Davidson); plant remains—*Caldcophlebes* and *Tumopteris*—from Jurassic mudstones at Cape Paterson (Mr. Jeffrey).

Botany Group—February 11, 1960

This meeting of the group was the first on the changed meeting night—the second Thursday of the month. It took the form of a members' night and proved most interesting.

Miss Lester spoke on the MYRTACEAE, exhibiting various specimens of the family; and she led a discussion on methods of identifying its members, including the eucalypts. Mr. M. Wilson followed with an explanation of one particular aspect of identification of the same family. He showed, by blackboard drawings, the position of the style in relation to the stamens and the ovaries and what is meant by the terms superior and inferior ovaries. Members are asked to bring specimens of this family to the next meeting.

Further discussion led to the decision to have further talks on plant families. Mrs. Webb-Ware agreed to open the subject of the PROTEACEAE and, at the next meeting, members should exhibit representatives of this family.

The practicability of making an ecological survey of a small piece of parkland close to Melbourne was discussed and it was decided that a botanical survey would be more within our scope. It was decided to proceed with the latter, and an initial visit to the area chosen will be made on Sunday, March 20.

Botany Group—March 10, 1960

The idea of a short talk on a plant family was continued. Mrs. Webb-Ware chose the Proteaceae, describing the distinguishing features, distribution and representative genera. The family takes its name from the South African genus *Protea*, and the many Australian genera include *Banksia* and *Grevillea*. Members exhibited specimens of Myrtaceae, which had been dealt with at the previous meeting, and they were asked to bring specimens of the Proteaceae to the next meeting. In April the Liliaceae will be dealt with.

The main topic of the evening was "Cultivar naming in accordance with international regulations", by Mr. M. Wilson. The speaker told of the confusion existing in the designation of new cultivated varieties of plants. The name "cultivar" had been coined to describe these. Mr. Wilson told how an international committee has been set up to correct the existing state of affairs. January 1, 1959, was chosen as the date when the regulations would come into force; and thereafter all new cultivars should be registered. Efforts were being made to establish the system in Australia, and it is hoped that machinery will be set up in Victoria for the same purpose. An opportunity exists to have correct nomenclature for our native plants instead of the confusion of a haphazard system.

Members made arrangements to commence the botanical survey of part of Cheltenham Park.

Nominations for Office-bearers and Council, 1960-61

Office-bearers and council members for 1960-61 will be elected at the annual general meeting of the club on June 8. Each nomination must be proposed and seconded by a financial member of the club, and in each case an indication should be given that the consent of the nominee has been obtained. Nominations must be made by the April general meeting, and they will be published in the May *Naturalist*.

F.N.C.V. DIARY OF COMING EVENTS

GENERAL MEETINGS

Monday, April 11, 1960—At the National Herbarium, The Domain, South Yarra, commencing at 8 p.m. sharp.

1. Minutes, Reports, Announcements.
2. Correspondence.
3. Lecture: "Conducting Tissue in Plants", by Professor Cheadle.
4. Election of Members:

Ordinary Members:

Mr. R. J. McLeod, 137 Booran Rd., Glen Huntly (E. H. Coghill/A. G. Hooke).
Mrs. Patricia Kaufmann, Flat 5, 1A Tiuna Gr., Elwood (E. H. Coghill/N. A. Wakefield).
Mr. P. Birrell, Moonee Valley Hotel, Brunswick St., Fitzroy (M. E. Argo/D. S. Woodruff).
Miss Antoinette A. LeGren, 21 Union St., Windsor (A. M. Hooke/A. G. Hooke).
Miss Joan E. Brockman, Flat 33, Greyfriars, 53 Balaclava Rd., East St. Kilda (C. M. S. Rush/M. Butchart).
Miss Nancy R. Bowman, "Homebush", 4 Homebush Cres., Hawthorn, E.3 (E. H. Coghill/D. E. McInnes).
Mr. Robert G. Taylor, 5 Noel St., East Brighton (N. A. Wakefield/R. H. J. McQueen).
Mr. Robert J. Kosky, 10 Mayrose Cres., Brighton, S.6 (N. A. Wakefield/R. H. J. McQueen).
Mr. N. L. Lazar, 5 Connelly St., Brunswick, N.18 (J. H. Quirk/A. G. Hooke).

Joint Ordinary Members:

Mrs. R. J. McLeod, 137 Booran Rd., Glen Huntly (E. H. Coghill/A. G. Hooke).
Miss Anne E. Lee, 15 The Crescent, Highett, S.21 (R. D. Lee/E. H. Coghill).

Country Members:

Mr. Roger B. Smith, School of Forestry, Creswick (E. R. Allan/E. H. Coghill).
Miss Estelle McCombe, "Strabane", Castarton (M. E. Argo/N. Hellison).
Mr. A. E. Campbell, "Tresid", Yaapeet (J. Landy/J. R. Garnet).

Junior Members:

Christopher Kaufmann, 1A Tiuna Gr., Elwood (E. H. Coghill/N. A. Wakefield).
Peter Holmes, P.O. Box 41, Albury, N.S.W. (A. G. Hooke/N. A. Wakefield).

5. Nominations for Membership.
6. Nominations for Office-Bearers and Council for 1960-61.
7. General Business.
8. Nature Notes and Exhibits.
9. Conversazione.

Monday, May 9, 1960—"Apollo Bay Excursion" by A. G. Hooke.

GROUP MEETINGS

(8 p.m. at National Herbarium unless otherwise stated)

Monday, April 12—Preliminary meeting of Fauna Survey Group, 7.30 p.m. at National Herbarium (see page 321).

Thursday, April 14—Botany Group.

Wednesday, April 13—Microscopical Group.

Monday, May 2—Entomology and Marine Biology Group. At Mr. Strong's rooms, Parliament House, at 8 p.m. Use private entrance, south end of House.

F.N.C.V. EXCURSIONS

Friday, April 22-Monday, April 25 (Anzac Day Weekend)—Marysville. Accommodation available at Kooringa Guest House; tariff, 5 guineas for the weekend; bookings to be made through the Excursion Secretary by the April meeting. Party to leave Melbourne by parlour-coach Friday evening, returning Monday; and it is hoped to have trips to Lake Mountain and Cumberland Valley. Transport back to Melbourne is available on Sunday if required. (Coach to leave Whight's Tourist Bureau, Flinders Street, at 6.30 p.m., Friday.)

Sunday, May 1—Botany Group will visit Cheltenham Park for a botanical survey. Meet at gate at 2.30 p.m.

Sunday, May 8—Geology Group Excursion. Details at group meeting.

PRELIMINARY NOTICES

Sunday, May 15—Werribee M.M.B.W. farm. Subject, birds and general. Leader, Mrs. Searle (wife of farm manager). Coach to leave Batman Avenue at 9 a.m. Fare, 12/-. Book with Excursion Secretary.

August 13-September 4—Central Australia. This is fully booked, but the Excursion Secretary will take names for waiting list in case of cancellations.

ERRATA

Pages 27 and 30—Correct spelling of author to "Rotherham".
Page 207, column 2, line 3—Add "That the tides do aff-".
Page 237—Correct acknowledgement of photo to "D. Dickison".
