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of the

FIELD NATURALISTS' CLUB OF VICTORIA

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MAY, 1943, TO APRIL, 1944

Hon. Editor: A. H. CHISHOLM, F.R.Z.S.

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

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The Victorian Naturalist

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PROCEEDINGS

The ordinary meeting of the Club was held at the Royal Society's Hall on Monday, April 12, 1943. The President (Mr. P. Crosbie Morrison) presided and about 80 members and friends attended.

WELCOME TO VISITORS

The President welcomed to the meeting Lieut. Lee Burcham, of the U.S. Marines and a forestry graduate from the University of California. Other visitors included Miss Leumann from S.A., Mr. Rieschisk from Doncaster, Mr. W. Burrows, several members in uniform and Mr. Ludowici, a member from Sydney. Mr. Ludowici brought greetings from the N.S.W. Naturalists' Club.

SUBJECT FOR THE EVENING

This took the form of a symposium on the subject of "Soil Conservation" and was dealt with under the following heads:

(a) General Introduction.—Mr. Morrison, in his remarks under this heading, pointed out what erosion has done in the more ancient countries, as China and India, and drew a parallel between them and Australia.

(b) Botanical side of erosion.—Mr. P. F. Morris pointed out that it was removal of vegetational cover that caused erosion, and said that in many cases it was pioneering and advancing civilization that had started it all. Forests were cut or burned down for crop lands, often in the most unsuitable areas; stock was introduced and greed caused over-stocking and subsequent eating out of the flora. Besides these factors, rabbits played a large part in land despoiling, due to their habit of eating roots.

(c) Erosion Results.—Mr. F. S. Colliver spoke on some outstanding geographical features due to erosion, mentioning and showing illustrations of moving sand dunes in Egypt, desert country in Peru, great chasms in the loess formations of China, bad lands in parts of America, effect of wind on the slime dumps of the Rand, etc. He pointed out that similar features could and would eventuate in Australia. Wind influence was mentioned as the most insidious and therefore most dangerous form of erosion.

(d) Small-Scale Remedial Measures.—Mr. Ivo Hammett, taking his own garden as an example, spoke of the dangers of wind

erosion, and described how he had overcome the effects by a capping of gravel. He also remarked that since the gravel was spread most of the native plants had produced an abundance of seedlings. A series of slides showing native plants under cultivation, in the Mallee and at Ivanhoe, and sections showing how the beds were built up, illustrated Mr. Hammett's remarks.

(e) Large-Scale Remedial Measures.—Mr. P. Bibby showed illustrations of contour ploughing and terracing for hill slopes, planting of willow and other trees for river banks, various means of diverting river flow from erosion areas, brush laying and subsequent planting for wind-swept areas, and the various means for reclamation of eroded gullies.

In the remarks that followed, Mr. A. D. Hardy and Lieut. Lee Burcham spoke on their experiences in conservation matters overseas, and Messrs. Ludowici, Gates, Hyam and Jenkins contributed to the discussion.

REPORTS OF EXCURSIONS

Reports of Excursions were given as follows: Botanical Gardens, Mr. H. C. E. Stewart; Studley Park, Mr. P. Bibby.

ELECTION OF MEMBERS

The following were duly elected as ordinary members of the Club: Mrs. E. E. Lord, and Mr. R. Whitworth; as Country Member, Miss Ruth Bennier; as Associate Member, Miss Colleen Clugg.

GENERAL BUSINESS

Plant Names Sub-Committee.—A recommendation from the Committee was as follows: "That the Plant Names Sub-Committee be re-constituted with the following personnel: Messrs. P. F. Morris, J. H. Willis, P. Bibby, E. E. Pescott, Noel Lothian and Dr. C. S. Sutton, and that three be a quorum for meetings."

This recommendation was adopted.

THE FITZGERALD "SYMPOSIUM"

Since contributors began to express their views (in the January number of this journal), neither Mrs. Messmer, Mrs. Miller, nor Mr. Rupp has made any reference to the great Australian orchidologist's own handwriting. Several of his letters to Baron von Mueller are preserved at the Melbourne Herbarium, and in these he unquestionably signs his name with a capital "G." Echoing Mr. Rupp's sentiment, if an educated man cannot write his own name correctly, then who can? Mrs. Messmer's precedent in restoring the capital "G" is entirely justified and there should be no two ways about any future citation of "FitzGerald" in botanical literature.

JAMES H. WILLIS.

THE STORY OF MY HONEY-BEES

By EDITH COLEMAN, Blackburn, Vic.

For several reasons it seemed no more than poetic justice that a swarm of bees should settle in this garden. As the daughter of my father I could not fail to be interested in them, for there had always been a hive, sometimes two, in his garden. Moreover for years I had been filling the garden with English herbs and cottage flowers which for centuries have been regarded as "bee-flowers."

The bees came in late October, 1941, to a garden full of blossom. When discovered, the fabric of their waxen city had already taken shape. It was about as large as a child's football, somewhat flattened—three collateral leaves of pure white comb with several others started. It hung from the top of an apple-tree, and as it widened and lengthened it suggested a waxen cave-shawl, or a shawl such as a sculptor might chisel.

The bees were not molested for it seemed a golden chance to note their behaviour when free to follow natural instincts, to work without restraint or supervision. Here was living proof that the honey-bee (*Apis mellifica*) after centuries of exploitation, is not yet fully domesticated, and in this reversion we were privileged to read something of its ancestral ways.

The swarm had come to rest like the Assyrian bees of Isaiah. They had settled as the large primitive bee (*Apis dorsata*) settles to-day in Eastern lands where forests literally flow with honey, as it flowed in those far-back days for the men of Israel, when Jonathan reached up his rod "and dipped it into an honey-comb."

There were many cold days in December, 1941, and January, 1942, with much rain, and boisterous winds that littered the garden with broken boughs. The bees in their naked nest crowded between the leaves of comb, wings extended outward and downward, so that water ran off the tips. One could see the inner bees move out, as if to give the outer ones a chance of some warmth. It seemed that they must perish in their unprotected state. Later, on Mr. Hammett's suggestion, they were covered with a waterproof ground-sheet, and soon it was evident that all was well with them. The combs increased; their amber colour and honey scent bore witness to good work among the flowers.

The apple-trees were humming with bees and every flowering plant was a tavern to scores of unresting Deborahs, "victims of a tyrannical instinct for labour," inheritors of a long pedigree of toil. Ceaselessly they foraged, and laboured on the combs, to die outworn at six weeks or less. As Bridges laments: "Forty days; six unsabbath'd weeks of fever'd toil wasteth and wearieth out their little frames."

The nest was fully open to the East and West. It seemed

strange that bees which, under domestication, had loved to work in almost total darkness, should carry on in full sunlight.

At no time did I see any fanning; but this is not surprising, for, as Professor Romanes points out, fanning is not an inborn tendency, but is evoked by discomforts imposed upon the bees by the bee-keeper. Fanning almost ceased when Huber housed his bees in a large hive 5 ft. high.

The smell of the honey was delicious. To take it from a naked hive, however, required more courage than I possess—but I did study ways and means!

ROBBING THE BEES

It seemed one had only to so alarm the bees with a puff of smoke and, in their eagerness to save their stores, they would fill themselves too full of honey to curve the body to sting. That process sounds easy, but try it on an un-walled host free to rush to the attack from four directions! An old way was to suffocate the bees in a sulphur pit. Hardy, who had made a study of the manners and customs of rural "Wessex," describes this cruel method of robbing the bees. When Fanny (*Under the Greenwood Tree*) protests against the cruelty of it, her father says: "If you suffocate them they only die once. If you fumigate them in the new way they come to life and die of starvation, so the pangs of death be twice upon them."

Loudon, in his mammoth compendium of facts for gardeners and husbandmen, states that La Grenée "has the merit" of having shown that there is neither profit nor humanity in saving bees after honey-taking. Mercifully bees are no longer allowed to starve after honey-taking.

In his *Malay Archipelago*, published 74 years ago, A. R. Wallace describes the large natural nests built by *Apis dorsata* on branches 70 or 80 feet from the ground. These nests, 3 or 4 together, were built on the underside of a horizontal branch and were often 4 ft. in diameter. He tells how the natives robbed the nests at night with the aid only of torches. Enraged bees chased the sparks instead of the robbers; but the men did not go unscathed, nor did Wallace.

Professor Romanes quotes a significant statement (*Nature*, Vol. xvii. p. 373) that European bees when transported to Australia retain their industrious habits only for the first 2 or 3 years. After that they gradually cease to collect honey until they become quite idle, and the same fact is observable with bees transported to California. It is obviated by abstracting the honey as it is collected. There is a similar statement by Dr. Erasmus Darwin that bees transported to the Barbadoes, where there is no winter, cease to lay up honey. So it appeared that I must take the honey or entertain idle bees! Perhaps they would revert to nomadic habits and follow the flowering of Eucalypts.

I had always been interested in the work of bees in pollination, but this was a new experience full of promise to a novice, full of surprises, too! As might be expected, the bees presented many problems.

THE SWARMING

As the combs increased emerging young filled them to overflowing, taxing all the energies of the comb-builders, it seemed. Swarming appeared to be imminent. It became advisable to take some steps to persuade my swarms to settle in other parts of the garden. I looked up authorities on "casting," including the quaint classics of ancient bee literature which for some years I had been "collecting" as small boys collect match-box tops, with nothing definite in view, but for pure delight in them. I learned that, within certain limits, one was allowed to follow one's bees even to a neighbour's land, as one drummed with key on pan! Must I really drum them? What would the neighbours think?

"Bees," says Burton, discussing the response to music of man and the lower animals (*Anatomy of Melancholy*, the only book that had power to keep Dr. Johnson awake all night), "bees when they hear any tingling sound, will tarry behind." On the other hand, Lawson, the Isaac Walton of gardening and bee-husbandry, insists that "ringing in the time of casting is pure fancie."

Modern writers have suggested that drumming, or ringing, drowns the shrill piping of the queen, and so prevents the swarm from following her too far. This might necessitate some steps to secure another queen. It seemed imperative that I must drum my swarms. I gathered from Blackmore (*Springhaven*) that when a man is touting for his neighbour's bees the pan must be struck softly at first to tone with the murmuring mob. I need not have anticipated. The bees knew better than I what they would do. This "sipping-garden" apparently suited them and they meant to stay.

Twice the community appeared to break up a little, but in a week or so emerging young again filled the combs.

At night could be heard an elfin buzz as typical of bees as the perfume about the nest. Maeterlinck and others have stated that bees renounce sleep; but do they? Taking a torch I several times surprised my bees perfectly motionless, due perhaps to the new, or rather old, conditions under which they were living.

WINTER BEHAVIOUR

During the winter the bees were covered with more sacks. On very cold days they appeared not to move: then, when the weather was kinder, they indulged in short flights near the combs. It was presently obvious that these were cleansing flights, serving two wonderful purposes. Excrement is never, except in very rare

instances due to illness, voided on to the combs. After centuries of necessary suppression in unseasonable weather, evacuation is now stimulated only in flight.

It was noted that the bees returned to a fresh fold of the comb where cells had not been tapped, doubtless having exhausted the honey in those over which they had previously been clustered. Even in sunny Australia Winter is a sad time for bees that are not protected, and many perished daily, leaving just enough to feed the larvae that were to augment the community in the Spring.

On very cold days the bees clung together in strings: not the living ladders which are sometimes formed, on which they ascend or descend to reach inaccessible parts of a hive; but almost lifeless strings from which they dropped and disappeared. It was then that one understood the poetic references of ancient authors to "garlands of bees." Later I was able to accept Southey's more fantastic imagery—"a bow strung with bees."

Not until now had I been apprehensive of stings. While the hive was populous and prosperous I might safely stand within a foot of the combs, although the bees always seemed "edgy" during windy or thundery conditions.

On June 5th, 1941 (a windy day) I took my first photo. of the impoverished hive, for which, unfortunately, it was necessary to hammer stakes into the sloping ground to support my camera. Very soon, then, I was stung on a hand. Half an hour later another sting was left behind an ear, and next day one caught the hand that snapped off a tiny twig which impeded my view—three brave lives lost in guarding that wonderful city. I have never grudged them those stings. In each instance I saw the bee speed straight as a dart—a bee-torpedo—to my flesh. I felt that I had discovered a better explanation of the term "bee-line" than the accepted one of homing-flight. Quinby disagrees with those who say that a warning is always given before attack, and I am inclined to agree with him. After this the bees seemed to blame me for any untoward happenings—unseasonable elements or wind-tossed sacks. It must be confessed that there was some change in my own attitude and for a few days "all the world went softly" about their domain. I had discovered that bees are captious folk, "quick to turn against the lubber's touch."

TAMING VICIOUS BEES

It looked as if the bees would rule the garden. Could I tame them? Pettigrew (1875) tells how to tame and domesticate vicious bees by getting them used to the human form. He placed a Scotch bogle (scarecrow) in front of a hive which he dared not approach. Although they at first attacked it his bees soon grew quiet. But then my bees might grow fond of their bogle and blame me when

it was removed! I read of other methods, but thought it safer not to test them; and so perhaps I missed the chance of going down to posterity as a woman bee-tamer.

According to Professor Romanes (1883) who sifted records from many sources, bees do recognize people. He quotes Bingley's statement that they even lend themselves to tuition, and that Wildman could cause a swarm to settle on his face without stinging him. He could marshal them into companies and battalions waiting for his order to march! He even trained them not to sting admiring onlookers!

H. A. Page, in his life of Thoreau, tells of a clergyman named Cotton, son of a governor of the Bank of England, who took bees to Australia and to the islands of the Pacific. To the wonder of all in the ship the bees would come when he called them and covered him as he lay. After fondling them he would gather them together, as one would gather a mass of loose worsted, into a ball, take them close to the hive and give the signal for them to retire.

Remarkable as it seems, there must be some truth in these stories if we may trust another clergyman, White of Selborne. Writing in 1788 he tells of a boy whom he knew who would fill his shirt with bees. He would rap on a hive, as birds are said to do, and take the bees as they emerged, to remove their stings and suck the honey. Kipling's bee-boy who could pick up swarms in his naked hands was probably based on White's bee-sucker.

Mary Mitford, too, must have had "a way" with bees. "You're one of they as the bees love" said the bee-master who looked after Dr. Mitford's bees, "and that's a lucky thing to be." This man could foretell changes in the weather from the behaviour of his bees. Certainly the temper of the bees may be gauged from the state of the weather.

They are said to attack those who go to them in anger, or in a state of nervous excitement. One thing stands out in the literature of the bee—they love quiet. In primitive times a personality was ascribed to them. They must never be angered or grieved or ill would befall those responsible. They must be treated with affection and respect. Old bee-masters demonstrated this by taking off their hats to the hive.

Even to-day bees are said to be as much influenced by the bearing of the bee-keeper as by the weather:

> *"Now don't you wait where bees are*
> *When the lightnings play;*
> *Nor don't you hate where bees are,*
> *Or else they'll pine away."*

Kipling, who took great interest in bees, knew this. When Tom Shoesmith (*Puck of Pook's Hill*) tells the children how the frightened fairies of England crowded into the marshes during

the turmoils of the Reformation, he adds: "Goodwill among flesh and blood is meat and drink to fairies and ill-will is poison." "Same as bees," said the bee-boy. "Bees won't stay by a house where there's hating."

Not so fantastic as it sounds, perhaps. Harmony among humans as well as their animals was once regarded as essential to success on the land. A man who ill-treated his wife would influence both animals and bees. Again, not so fantastic as it sounds perhaps, for bitterness and bickering affect humans physically as well as mentally and, doubtless, react on any animals under their control. This theory of health and harmony in the farmer's family as well as among the farm animals is one of the planks on which Dr. Rudolf Steiner based his system of agriculture which is practised in many parts of the world to-day.

(To be continued.)

LONGEVITY OF LEGUMINOUS SEEDS

For just over a year a considerable area of the King's Domain, north from the Shrine of Remembrance (Melbourne) has been dissected by a complicated slit-trench system of air-raid shelters, and as these are now being filled in it is opportune to say something about the plant-life which had so quickly colonised the freshly-turned mounds of yellow clay sub-soil.

A wholesale invasion of grasses from the surrounding areas of undisturbed lawn was the most prominent feature, Indian Couch, Creeping Bent, Pigeon and Rye Grasses being the principal competitors.

But most interesting of all was the appearance of healthy plants (some now a foot high) of the four native legumes, *Acacia mollissima*, *A. pycnantha*, *A. longifolia*, and *Kennedya prostrata*; it is highly unlikely that the heavy seed of these was deposited by wind and, as it is ten years since the Shrine approaches were levelled off and planted with lawn grass mixture, the leguminous seeds have apparently remained deep in the ground and viable for at least a decade, probably much longer. The longevity of wattle seed is well attested. Mr. P. F. Morris recalls a fine crop of *Acacia mollissima* which followed the demolition of a house nearly 90 years old in Park Street, South Yarra. JAMES H. WILLIS.

DEATH OF MR. THOMAS R. A. ROBINSON

Members of the F.N.C. will join in paying tribute to the memory of Thomas Alfred Robinson, who died at "Chorizema," Dutson (Vic.) on April 23. He would have been 91 years of age on May 1. Born at Collingwood in (as his age indicates) the days when that now-populous area was a paradise of wild flowers, Mr. Robinson (a Melbourne Grammar School boy) became a teacher in the Education Department and, afterwards a farmer. Throughout his life he retained the keen interest in native plants acquired in youth and at "Chorizema" he had remarkable success as a grower and propagator. There are, perhaps, 500 species of native plants growing freely on the property.

Mr. Robinson had long been a member of the F.N.C. and continued to the end his interest in the Club's activities. He leaves one son and four daughters, to whom the sympathy of all Victorian naturalists is tendered.

THE ENGLISH SPARROW IN AUSTRALIA

By (the late) WALTER S. CAMPBELL, Sydney*

It is not possible, I think, to determine how or when the sparrow was introduced into Australia. He must have been brought out intentionally; not like rats and mice which are voluntary intruders.

Some sixty years ago sparrows abounded in parts of the colony —now State—of Victoria, more particularly about the City of Melbourne and suburbs, where I saw a sparrow for the first time in my life. These little migrants were quite at home in the city streets, enjoying to the full the streams of water which at that time were kept constantly flowing in the wide stone gutters at the street sides, to carry to the river Yarra a considerable proportion of the city sewage matter. Doubtless the sparrows found in the perennial streams abundant varied morsels of choice food on which to regale themselves with ease. There, chattering, hopping about, quarrelling, and with a general tone of impudence, were hundreds and hundreds which greatly interested me, for I had never seen anything like it before in bird life in Australia.

At the time to which I refer there were no sparrows about Sydney or suburbs, nor I think about any towns or settlements in N.S.W.; but before very long they appeared, became quite at home at once, and increased rapidly. This invasion was regretted by many persons interested in our native birds, because it was considered that the ubiquitous and prolific sparrow would oust or thin out many of the beautiful, smaller, indigenous species beloved by Australians.

So greatly have sparrows increased that some are to be met with in all the inhabited extra-tropical parts of Australia, if not within the tropics also. In the great wheat-growing districts they have become destructive pests, consuming considerable quantities of grain, and spoiling a great deal; particularly amongst varieties of wheat the grain of which "shakes out" easily, thus causing considerable losses to wheat-growers.

At railway stations to which wheat is conveyed in bags for transmission to markets, large open sheds have been erected for the storage of this wheat. These are covered with galvanized corrugated iron supposed by strangers to Australia to be tin. In these sheds the wheat is stacked and frequently remains there for some time. The sides and ends of the sheds being open, sparrows in hundreds, if not in thousands, have free access to the wheat-bags at which they peck and peck until large holes are made through which wheat pours to the ground. Many times I have seen considerable losses caused in that manner by sparrows.

*Mr. Campbell, sometime Director of Agriculture in N.S.W., who died a few years ago at the age of past-90 years, gave me these notes in Sydney about 1930. He had intended to revise them later, but the opportunity did not occur.—Editor.

During his remarkable and successful experiments in the making of high quality wheats for Australian conditions, my friend the late William Farrer was considerably impeded and annoyed by the attacks of sparrows on valuable varieties of growing hybrids, some of which have turned out to be worth hundreds of thousands, if not millions, of pounds sterling to the various wheat-growing States of Australia. Poison was of little or no avail, and resort was necessary to powder and shot, but even then it was difficult to keep the little pests away. They are becoming remarkably cunning and ever on the watch to destroy the treasures so tediously created by Mr. Farrer.

About the city of Sydney and suburbs at the present time sparrows abound in thousands. They seem to be ever breeding: if one nest is destroyed they set to and build another. Whether they are more prolific here than in England—as seems probable—I am not aware.

The habits of this bird seem to be just the same as they are in England, notwithstanding the change to a more genial climate, where throughout the year plentiful supplies of some kinds of grain, as well as of insect, foods are abundant and easily available. No doubt some kinds of grain are preferred to others such as wheat to various grass-seeds. They are remarkably fond of sunflower-seeds, and also of seedlings of annuals—strange to say only those planted out, self-sown seedlings being seldom attacked. I am obliged to protect my seedlings of poppies I may plant in the garden, or sparrows will speedily make short work of them, whereas hundreds of plants close by, self-sown, remain untouched.

The birds know the time to a minute—four o'clock in the afternoon—when I feed my poultry with wheat. There are dozens of them sitting on the fence or amongst the trees, on the look-out to obtain their share. (I may, perhaps, interpolate here that a number of gold-fish which thrive remarkably well in a waterhole in my garden, are just as well aware of the time of feeding as the sparrows; they are waiting for me with opening jaws, and some will let me rub their backs).

One day I heard in my yard a great noise amongst some sparrows. I looked in and witnessed a curious sight. On a patch of a few square yards of grass (which I put down for my dogs to roll on and where they may enjoy meat bones) was a rather large rib-bone and about six feet away was a young sparrow with its father standing close by. Pecking away at the bone was the mother, who, as soon as she had detached a small piece of meat, hopped up with it to the youngster, who, after calling out as loud as it could, opened its beak wide and into its throat the mother popped in the meat. She kept up this performance for several minutes, hopping from bone to offspring and from offspring to

bone all the time. I have puzzled myself to know why it was the father and child did not stand close to the bone!

Sparrows are exceedingly useful as scavangers about cities and towns clearing away odds and ends of bread, meat and other rubbish from yards and streets. I frequently see them carrying away from garden plants, caterpillars of various kinds. They also attack green aphis on rose bushes and insect scales on trees and shrubs. During the times when white-ants swarm and those furnished with wings fly about, sparrows invariably attack and make use of them for food. Moths and butterflies of various species are used frequently. Occasionally, at long intervals, we are visited by thousands of butterflies, flying from a south-westerly direction to the north. They remain about the suburbs for a few days, resting amongst the native shrubs and flying about here and there. During that period the sparrows are remarkably active in pursuit of this new game, which when caught is made use of as food. I have watched a sparrow chasing one of these whitish-grey butterflies for more than a quarter of an hour. The speed kept up was remarkable. In such hunts the sparrow was sometimes successful in catching the butterfly, but at other times the butterfly escaped; probably the sparrow was exhausted.

But the most remarkable subjects of attack by sparrows, during spring and summer, are species or varieties of cicadas which abound and keep up a continuous chorus of shrill music during the period they remain with us. It seems remarkable to me that sparrows should select such large and tough creatures for their food.

The male sparrows in my yard frequently have severe fights amongst themselves, pecking and clawing at each other and rolling over and over in the dustiest place they can select. I doubt whether any are killed in these encounters; occasionally I find a dead one on the ground, but those may die from old age. The aged ones become very feeble and unable to obtain a sufficiency of food. One poor old creature used to come to me, when I was cracking up biscuits for my gold-fish, appealing for a crumb or two. It was quite pathetic to see his ineffectual efforts to hop to the top of the box on which I cracked up the biscuit.

GOATS AND GUM LEAVES

Has anyone heard of the leaves of the sugar-gum being injurious to goats? A country reader says that a few leaves were given to each of four goats tied in a yard and having access to nothing else injurious. In less than two hours after one died in great agony, another was almost dead, but recovered, and the other two were not affected. These last two had eaten the long narrow leaves of the gum, while the goats poisoned had taken the round leaves. On examination the one that died showed no trace of irritation of the stomach, but the lungs and heart were almost black and full of congealed blood.

ON SOME PLANT REMAINS FROM MANSFIELD, VICTORIA

By F. S. Colliver, Melbourne

The impressions herewith figured and described, and apparently of a different type from any previously recorded from Mansfield, were collected during a short visit made with Mr. F. H. Salau to the district at Easter, 1942. They were not found in situ, but were taken from a pile of large stones at the side of the road to the Broken River just past the Barwite Road turn-off. At this spot the road is cut through a small hillside and doubtless these rocks came from road repairs that appear to have been made fairly recently.

On the low side of the road a section across the beds enabled prospecting to be done, and although no similar specimens were found, small pieces carrying the enamelled scales, etc., similar to those obtained at Fish Hill overlooking the homestead, were collected. Time and position did not permit a thorough investigation into the contents of the rocks exposed.

The specimen figured is without doubt of vegetable origin and the general habit first seemed to indicate one of the marine algae generally referred to as *Bythotrephis* or *Chondrites*.

Unfortunately the preservation of the specimen is not good and all important details are not showing; thus determination must be doubtful. Of these two genera, *Bythotrephis* is found in Ordovician and Silurian deposits, and *Chondrites* ranges from Palaezoic to Mesozoic at least, and thus the age does not admit much toward the determination of the specimens.

The beds from which these rocks were taken are certainly of the same age as the red sandstones of Fish Hill, and indeed appear to be portion of the same series

These beds, on their fossil content, mainly fish and Lepidodendron, have been referred to as of Lower Carboniferous age, and the genera of the fish, together with the association of land plant remains, seems to suggest at least estuarine conditions when the deposits were laid down. From this it is thus quite possible for marine algae to be found in association with these other fossils.

However, looking further into fossil plant forms for comparisons, the genus *Sphenopteris* in some of its forms (e.g., *S. affinis*, L. et H.) seems to approach closely to the specimen under discussion. This genus, according to Seward, is "one of those extremely useful provisional generic terms where we have no satisfactory proof of precise botanical affinity," and as such may be used to designate the specimen until some better preserved material is obtained.

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(a) General Introduction.—Mr. Morrison, in his remarks under this heading, pointed out what erosion has done in the more ancient countries, as China and India, and drew a parallel between them and Australia.

(b) Botanical side of erosion.—Mr. P. F. Morris pointed out that it was removal of vegetational cover that caused erosion, and said that in many cases it was pioneering and advancing civilization that had started it all. Forests were cut or burned down for crop lands, often in the most unsuitable areas; stock was introduced and greed caused over-stocking and subsequent eating out of the flora. Besides these factors, rabbits played a large part in land despoiling, due to their habit of eating roots.

(c) Erosion Results.—Mr. F. S. Colliver spoke on some outstanding geographical features due to erosion, mentioning and showing illustrations of moving sand dunes in Egypt, desert country in Peru, great chasms in the loess formations of China, bad lands in parts of America, effect of wind on the slime dumps of the Rand, etc. He pointed out that similar features could and would eventuate in Australia. Wind influence was mentioned as the most insidious and therefore most dangerous form of erosion.

(d) Small-Scale Remedial Measures.—Mr. Ivo Hammett, taking his own garden as an example, spoke of the dangers of wind

erosion, and described how he had overcome the effects by a capping of gravel. He also remarked that since the gravel was spread most of the native plants had produced an abundance of seedlings. A series of slides showing native plants under cultivation, in the Mallee and at Ivanhoe, and sections showing how the beds were built up, illustrated Mr. Hammett's remarks.

(c) Large-Scale Remedial Measures.—Mr. P. Bibby showed illustrations of contour ploughing and terracing for hill slopes, planting of willow and other trees for river banks, various means of diverting river flow from erosion areas, brush laying and subsequent planting for wind-swept areas, and the various means for reclamation of eroded gullies.

In the remarks that followed, Mr. A. D. Hardy and Lieut. Lee Burcham spoke on their experiences in conservation matters overseas, and Messrs. Ludowici, Gates, Hyam and Jenkins contributed to the discussion.

REPORTS OF EXCURSIONS

Reports of Excursions were given as follows: Botanical Gardens, Mr. H. C. E. Stewart; Studley Park, Mr. P. Bibby.

ELECTION OF MEMBERS

The following were duly elected as ordinary members of the Club: Mrs. E. E. Lord, and Mr. R. Whitworth; as Country Member, Miss Ruth Bennier; as Associate Member, Miss Colleen Clugg.

GENERAL BUSINESS

Plant Names Sub-Committee.—A recommendation from the Committee was as follows: "That the Plant Names Sub-Committee be re-constituted with the following personnel: Messrs. P. F. Morris, J. H. Willis, P. Bibby, E. E. Pescott, Noel Lothian and Dr. C. S. Sutton, and that three be a quorum for meetings."

This recommendation was adopted.

THE FITZGERALD "SYMPOSIUM"

Since contributors began to express their views (in the January number of this journal), neither Mrs. Messmer, Mrs. Miller, nor Mr. Rupp has made any reference to the great Australian orchidologist's own handwriting. Several of his letters to Baron von Mueller are preserved at the Melbourne Herbarium, and in these he unquestionably signs his name with a capital "G." Echoing Mr. Rupp's sentiment, if an educated man cannot write his own name correctly, then who can? Mrs. Messmer's precedent in restoring the capital "G" is entirely justified and there should be no two ways about any future citation of "FitzGerald" in botanical literature.

JAMES H. WILLIS.

THE STORY OF MY HONEY-BEES

By EDITH COLEMAN, Blackburn, Vic.

For several reasons it seemed no more than poetic justice that a swarm of bees should settle in this garden. As the daughter of my father I could not fail to be interested in them, for there had always been a hive, sometimes two, in his garden. Moreover for years I had been filling the garden with English herbs and cottage flowers which for centuries have been regarded as "bee-flowers."

The bees came in late October, 1941, to a garden full of blossom. When discovered, the fabric of their waxen city had already taken shape. It was about as large as a child's football, somewhat flattened—three collateral leaves of pure white comb with several others started. It hung from the top of an apple-tree, and as it widened and lengthened it suggested a waxen cave-shawl, or a shawl such as a sculptor might chisel.

The bees were not molested for it seemed a golden chance to note their behaviour when free to follow natural instincts, to work without restraint or supervision. Here was living proof that the honey-bee (*Apis mellifica*) after centuries of exploitation, is not yet fully domesticated, and in this reversion we were privileged to read something of its ancestral ways.

The swarm had come to rest like the Assyrian bees of Isaiah. They had settled as the large primitive bee (*Apis dorsata*) settles to-day in Eastern lands where forests literally flow with honey, as it flowed in those far-back days for the men of Israel, when Jonathan reached up his rod "and dipped it into an honey-comb."

There were many cold days in December, 1941, and January, 1942, with much rain, and boisterous winds that littered the garden with broken boughs. The bees in their naked nest crowded between the leaves of comb, wings extended outward and downward, so that water ran off the tips. One could see the inner bees move out, as if to give the outer ones a chance of some warmth. It seemed that they must perish in their unprotected state. Later, on Mr. Hammett's suggestion, they were covered with a waterproof ground-sheet, and soon it was evident that all was well with them. The combs increased; their amber colour and honey scent bore witness to good work among the flowers.

The apple-trees were humming with bees and every flowering plant was a tavern to scores of unresting Deborahs, "victims of a tyrannical instinct for labour," inheritors of a long pedigree of toil. Ceaselessly they foraged, and laboured on the combs, to die outworn at six weeks or less. As Bridges laments: "Forty days; six unsabbath'd weeks of fever'd toil wasteth and weareth out their little frames."

The nest was fully open to the East and West. It seemed

strange that bees which, under domestication, had loved to work in almost total darkness, should carry on in full sunlight.

At no time did I see any fanning; but this is not surprising, for, as Professor Romanes points out, fanning is not an inborn tendency, but is evoked by discomforts imposed upon the bees by the bee-keeper. Fanning almost ceased when Huber housed his bees in a large hive 5 ft. high.

The smell of the honey was delicious. To take it from a naked hive, however, required more courage than I possess—but I did study ways and means!

ROBBING THE BEES

It seemed one had only to so alarm the bees with a puff of smoke and, in their eagerness to save their stores, they would fill themselves too full of honey to curve the body to sting. That process sounds easy, but try it on an un-walled host free to rush to the attack from four directions! An old way was to suffocate the bees in a sulphur pit. Hardy, who had made a study of the manners and customs of rural "Wessex," describes this cruel method of robbing the bees. When Fanny (*Under the Greenwood Tree*) protests against the cruelty of it, her father says: "If you suffocate them they only die once. If you fumigate them in the new way they come to life and die of starvation, so the pangs of death be twice upon them."

Loudon, in his mammoth compendium of facts for gardeners and husbandmen, states that La Grenée "has the merit" of having shown that there is neither profit nor humanity in saving bees after honey-taking. Mercifully bees are no longer allowed to starve after honey-taking.

In his *Malay Archipelago*, published 74 years ago, A. R. Wallace describes the large natural nests built by *Apis dorsata* on branches 70 or 80 feet from the ground. These nests, 3 or 4 together, were built on the underside of a horizontal branch and were often 4 ft. in diameter. He tells how the natives robbed the nests at night with the aid only of torches. Enraged bees chased the sparks instead of the robbers; but the men did not go unscathed, nor did Wallace.

Professor Romanes quotes a significant statement (*Nature*, Vol. xvii. p. 373) that European bees when transported to Australia retain their industrious habits only for the first 2 or 3 years. After that they gradually cease to collect honey until they become quite idle, and the same fact is observable with bees transported to California. It is obviated by abstracting the honey as it is collected. There is a similar statement by Dr Erasmus Darwin that bees transported to the Barbadoes, where there is no winter, cease to lay up honey. So it appeared that I must take the honey or entertain idle bees! Perhaps they would revert to nomadic habits and follow the flowering of Eucalypts.

I had always been interested in the work of bees in pollination, but this was a new experience full of promise to a novice, full of surprises, too! As might be expected, the bees presented many problems.

THE SWARMING

As the combs increased emerging young filled them to overflowing, taxing all the energies of the comb-builders, it seemed. Swarming appeared to be imminent. It became advisable to take some steps to persuade my swarms to settle in other parts of the garden. I looked up authorities on "casting," including the quaint classics of ancient bee literature which for some years I had been "collecting" as small boys collect match-box tops, with nothing definite in view, but for pure delight in them. I learned that, within certain limits, one was allowed to follow one's bees even to a neighbour's land, as one drummed with key on pan! Must I really drum them? What would the neighbours think?

"Bees," says Burton, discussing the response to music of man and the lower animals (*Anatomy of Melancholy*, the only book that had power to keep Dr. Johnson awake all night), "bees when they hear any tingling sound, will tarry behind." On the other hand, Lawson, the Isaac Walton of gardening and bee-husbandry, insists that "ringing in the time of casting is pure fancie."

Modern writers have suggested that drumming, or ringing, drowns the shrill piping of the queen, and so prevents the swarm from following her too far. This might necessitate some steps to secure another queen. It seemed imperative that I must drum my swarms. I gathered from Blackmore (*Springhaven*) that when a man is touting for his neighbour's bees the pan must be struck softly at first to tone with the murmuring mob. I need not have anticipated. The bees knew better than I what they would do. This "sipping-garden" apparently suited them and they meant to stay.

Twice the community appeared to break up a little, but in a week or so emerging young again filled the combs.

At night could be heard an elfin buzz as typical of bees as the perfume about the nest. Maeterlinck and others have stated that bees renounce sleep; but do they? Taking a torch I several times surprised my bees perfectly motionless, due perhaps to the new, or rather old, conditions under which they were living.

WINTER BEHAVIOUR

During the winter the bees were covered with more sacks. On very cold days they appeared not to move: then, when the weather was kinder, they indulged in short flights near the combs. It was presently obvious that these were cleansing flights, serving two wonderful purposes. Excrement is never, except in very rare

instances due to illness, voided on to the combs. After centuries of necessary suppression in unseasonable weather, evacuation is now stimulated only in flight.

It was noted that the bees returned to a fresh fold of the comb where cells had not been tapped, doubtless having exhausted the honey in those over which they had previously been clustered. Even in sunny Australia Winter is a sad time for bees that are not protected, and many perished daily, leaving just enough to feed the larvae that were to augment the community in the Spring.

On very cold days the bees clung together in strings: not the living ladders which are sometimes formed, on which they ascend or descend to reach inaccessible parts of a hive; but almost lifeless strings from which they dropped and disappeared. It was then that one understood the poetic references of ancient authors to "garlands of bees." Later I was able to accept Southey's more fantastic imagery—"a bow strung with bees."

Not until now had I been apprehensive of stings. While the hive was populous and prosperous I might safely stand within a foot of the combs, although the bees always seemed "edgy" during windy or thundery conditions.

On June 5th, 1941 (a windy day) I took my first photo. of the impoverished hive, for which, unfortunately, it was necessary to hammer stakes into the sloping ground to support my camera. Very soon, then, I was stung on a hand. Half an hour later another sting was left behind an ear, and next day one caught the hand that snapped off a tiny twig which impeded my view—three brave lives lost in guarding that wonderful city. I have never grudged them those stings. In each instance I saw the bee speed straight as a dart—a bee-torpedo—to my flesh. I felt that I had discovered a better explanation of the term "bee-line" than the accepted one of homing-flight. Quinby disagrees with those who say that a warning is always given before attack, and I am inclined to agree with him. After this the bees seemed to blame me for any untoward happenings—unseasonable elements or wind-tossed sacks. It must be confessed that there was some change in my own attitude and for a few days "all the world went softly" about their domain. I had discovered that bees are captious folk, "quick to turn against the lubber's touch."

TAMING VICIOUS BEES

It looked as if the bees would rule the garden. Could I tame them? Pettigrew (1875) tells how to tame and domesticate vicious bees by getting them used to the human form. He placed a Scotch bogle (scarecrow) in front of a hive which he dared not approach. Although they at first attacked it his bees soon grew quiet. But then my bees might grow fond of their bogle and blame me when

it was removed! I read of other methods, but thought it safer not to test them; and so perhaps I missed the chance of going down to posterity as a woman bee-tamer.

According to Professor Romanes (1883) who sifted records from many sources, bees do recognize people. He quotes Bingley's statement that they even lend themselves to tuition, and that Wildman could cause a swarm to settle on his face without stinging him. He could marshal them into companies and battalions waiting for his order to march! He even trained them not to sting admiring onlookers!

H. A. Page, in his life of Thoreau, tells of a clergyman named Cotton, son of a governor of the Bank of England, who took bees to Australia and to the islands of the Pacific. To the wonder of all in the ship the bees would come when he called them and covered him as he lay. After fondling them he would gather them together, as one would gather a mass of loose worsted, into a ball, take them close to the hive and give the signal for them to retire.

Remarkable as it seems, there must be some truth in these stories if we may trust another clergyman, White of Selborne. Writing in 1788 he tells of a boy whom he knew who would fill his shirt with bees. He would rap on a hive, as birds are said to do, and take the bees as they emerged, to remove their stings and suck the honey. Kipling's bee-boy who could pick up swarms in his naked hands was probably based on White's bee-sucker.

Mary Mitford, too, must have had "a way" with bees. "You're one of they as the bees love" said the bee-master who looked after Dr. Mitford's bees, "and that's a lucky thing to be." This man could foretell changes in the weather from the behaviour of his bees. Certainly the temper of the bees may be gauged from the state of the weather.

They are said to attack those who go to them in anger, or in a state of nervous excitement. One thing stands out in the literature of the bee—they love quiet. In primitive times a personality was ascribed to them. They must never be angered or grieved or ill would befall those responsible. They must be treated with affection and respect. Old bee-masters demonstrated this by taking off their hats to the hive.

Even to-day bees are said to be as much influenced by the bearing of the bee-keeper as by the weather:

> *"Now don't you wait where bees are*
> *When the lightnings play;*
> *—Nor don't you hate where bees are,*
> *Or else they'll pine away."*

Kipling, who took great interest in bees, knew this. When Tom Shoesmith (*Puck of Pook's Hill*) tells the children how the frightened fairies of England crowded into the marshes during

the turmoils of the Reformation, he adds: "Goodwill among flesh and blood is meat and drink to fairies and ill-will is poison." "Same as bees," said the bee-boy. "Bees won't stay by a house where there's hating."

Not so fantastic as it sounds, perhaps. Harmony among humans as well as their animals was once regarded as essential to success on the land. A man who ill-treated his wife would influence both animals and bees. Again, not so fantastic as it sounds perhaps, for bitterness and bickering affect humans physically as well as mentally and, doubtless, react on any animals under their control. This theory of health and harmony in the farmer's family as well as among the farm animals is one of the planks on which Dr. Rudolf Steiner based his system of agriculture which is practised in many parts of the world to-day.

(To be continued.)

LONGEVITY OF LEGUMINOUS SEEDS

For just over a year a considerable area of the King's Domain, north from the Shrine of Remembrance (Melbourne) has been dissected by a complicated slit-trench system of air-raid shelters, and as these are now being filled in it is opportune to say something about the plant-life which had so quickly colonised the freshly-turned mounds of yellow clay sub-soil.

A wholesale invasion of grasses from the surrounding areas of undisturbed lawn was the most prominent feature, Indian Couch, Creeping Bent, Pigeon and Rye Grasses being the principal competitors.

But most interesting of all was the appearance of healthy plants (some now a foot high) of the four native legumes, *Acacia mollissima*, *A. pycnantha*, *A. longifolia*, and *Kennedya prostrata*; it is highly unlikely that the heavy seed of these was deposited by wind and, as it is ten years since the Shrine approaches were levelled off and planted with lawn grass mixture, the leguminous seeds have apparently remained deep in the ground and viable for at least a decade, probably much longer. The longevity of wattle seed is well attested. Mr. P. F. Morris recalls a fine crop of *Acacia mollissima* which followed the demolition of a house nearly 90 years old in Park Street, South Yarra. JAMES H. WILLIS.

DEATH OF MR. THOMAS R. A. ROBINSON

Members of the F.N.C. will join in paying tribute to the memory of Thomas Alfred Robinson, who died at "Chorizema," Dutson (Vic.) on April 23. He would have been 91 years of age on May 1. Born at Collingwood in (as his age indicates) the days when that now-populous area was a paradise of wild flowers, Mr. Robinson (a Melbourne Grammar School boy) became a teacher in the Education Department and afterwards a farmer. Throughout his life he retained the keen interest in native plants acquired in youth and at "Chorizema" he had remarkable success as a grower and propagator. There are, perhaps, 500 species of native plants growing freely on the property.

Mr. Robinson had long been a member of the F.N.C. and continued to the end his interest in the Club's activities. He leaves one son and four daughters, to whom the sympathy of all Victorian naturalists is tendered.

THE ENGLISH SPARROW IN AUSTRALIA

By (the late) WALTER S. CAMPBELL, Sydney*

It is not possible, I think, to determine how or when the sparrow was introduced into Australia. He must have been brought out intentionally; not like rats and mice which are voluntary intruders.

Some sixty years ago sparrows abounded in parts of the colony —now State—of Victoria, more particularly about the City of Melbourne and suburbs, where I saw a sparrow for the first time in my life. These little migrants were quite at home in the city streets, enjoying to the full the streams of water which at that time were kept constantly flowing in the wide stone gutters at the street sides, to carry to the river Yarra a considerable proportion of the city sewage matter. Doubtless the sparrows found in the perennial streams abundant varied morsels of choice food on which to regale themselves with ease. There, chattering, hopping about, quarrelling, and with a general tone of impudence, were hundreds and hundreds which greatly interested me, for I had never seen anything like it before in bird life in Australia.

At the time to which I refer there were no sparrows about Sydney or suburbs, nor I think about any towns or settlements in N.S.W.; but before very long they appeared, became quite at home at once, and increased rapidly. This invasion was regretted by many persons interested in our native birds, because it was considered that the ubiquitous and prolific sparrow would oust or thin out many of the beautiful, smaller, indigenous species beloved by Australians.

So greatly have sparrows increased that some are to be met with in all the inhabited extra-tropical parts of Australia, if not within the tropics also. In the great wheat-growing districts they have become destructive pests, consuming considerable quantities of grain, and spoiling a great deal; particularly amongst varieties of wheat the grain of which "shakes out" easily, thus causing considerable losses to wheat-growers.

At railway stations to which wheat is conveyed in bags for transmission to markets, large open sheds have been erected for the storage of this wheat. These are covered with galvanized corrugated iron supposed by strangers to Australia to be tin. In these sheds the wheat is stacked and frequently remains there for some time. The sides and ends of the sheds being open, sparrows in hundreds, if not in thousands, have free access to the wheat-bags at which they peck and peck until large holes are made through which wheat pours to the ground. Many times I have seen considerable losses caused in that manner by sparrows.

*Mr. Campbell, sometime Director of Agriculture in N.S.W., who died a few years ago at the age of past-90 years, gave me these notes in Sydney about 1930. He had intended to revise them later, but the opportunity did not occur.—Editor.

During his remarkable and successful experiments in the making of high quality wheats for Australian conditions, my friend the late William Farrer was considerably impeded and annoyed by the attacks of sparrows on valuable varieties of growing hybrids, some of which have turned out to be worth hundreds of thousands, if not millions, of pounds sterling to the various wheat-growing States of Australia. Poison was of little or no avail, and resort was necessary to powder and shot, but even then it was difficult to keep the little pests away. They are becoming remarkably cunning and ever on the watch to destroy the treasures so tediously created by Mr. Farrer.

About the city of Sydney and suburbs at the present time sparrows abound in thousands. They seem to be ever breeding: if one nest is destroyed they set to and build another. Whether they are more prolific here than in England—as seems probable—I am not aware.

The habits of this bird seem to be just the same as they are in England, notwithstanding the change to a more genial climate, where throughout the year plentiful supplies of some kinds of grain, as well as of insect, foods are abundant and easily available. No doubt some kinds of grain are preferred to others such as wheat to various grass-seeds. They are remarkably fond of sunflower-seeds, and also of seedlings of annuals—strange to say only those planted out, self-sown seedlings being seldom attacked. I am obliged to protect my seedlings of poppies I may plant in the garden, or sparrows will speedily make short work of them, whereas hundreds of plants close by, self-sown, remain untouched.

The birds know the time to a minute—four o'clock in the afternoon—when I feed my poultry with wheat. There are dozens of them sitting on the fence or amongst the trees, on the look-out to obtain their share. (I may, perhaps, interpolate here that a number of gold-fish which thrive remarkably well in a waterhole in my garden, are just as well aware of the time of feeding as the sparrows; they are waiting for me with opening jaws, and some will let me rub their backs).

One day I heard in my yard a great noise amongst some sparrows. I looked in and witnessed a curious sight. On a patch of a few square yards of grass (which I put down for my dogs to roll on and where they may enjoy meat bones) was a rather large rib-bone and about six feet away was a young sparrow with its father standing close by. Pecking away at the bone was the mother, who, as soon as she had detached a small piece of meat, hopped up with it to the youngster, who, after calling out as loud as it could, opened its beak wide and into its throat the mother popped in the meat. She kept up this performance for several minutes, hopping from bone to offspring and from offspring to

bone all the time. I have puzzled myself to know why it was the father and child did not stand close to the bone!

Sparrows are exceedingly useful as scavangers about cities and towns clearing away odds and ends of bread, meat and other rubbish from yards and streets. I frequently see them carrying away from garden plants, caterpillars of various kinds. They also attack green aphis on rose bushes and insect scales on trees and shrubs. During the times when white-ants swarm and those furnished with wings fly about, sparrows invariably attack and make use of them for food. Moths and butterflies of various species are used frequently. Occasionally, at long intervals, we are visited by thousands of butterflies, flying from a south-westerly direction to the north. They remain about the suburbs for a few days, resting amongst the native shrubs and flying about here and there. During that period the sparrows are remarkably active in pursuit of this new game, which when caught is made use of as food. I have watched a sparrow chasing one of these whitish-grey butterflies for more than a quarter of an hour. The speed kept up was remarkable. In such hunts the sparrow was sometimes successful in catching the butterfly, but at other times the butterfly escaped; probably the sparrow was exhausted.

But the most remarkable subjects of attack by sparrows, during spring and summer, are species or varieties of cicadas which abound and keep up a continuous chorus of shrill music during the period they remain with us. It seems remarkable to me that sparrows should select such large and tough creatures for their food.

The male sparrows in my yard frequently have severe fights amongst themselves, pecking and clawing at each other and rolling over and over in the dustiest place they can select. I doubt whether any are killed in these encounters; occasionally I find a dead one on the ground, but those may die from old age. The aged ones become very feeble and unable to obtain a sufficiency of food. One poor old creature used to come to me, when I was cracking up biscuits for my gold-fish, appealing for a crumb or two. It was quite pathetic to see his ineffectual efforts to hop to the top of the box on which I cracked up the biscuit.

GOATS AND GUM LEAVES

Has anyone heard of the leaves of the sugar-gum being injurious to goats? A country reader says that a few leaves were given to each of four goats tied in a yard and having access to nothing else injurious. In less than two hours after one died in great agony, another was almost dead, but recovered, and the other two were not affected. These last two had eaten the long narrow leaves of the gum, while the goats poisoned had taken the round leaves. On examination the one that died showed no trace of irritation of the stomach, but the lungs and heart were almost black and full of congealed blood.

ON SOME PLANT REMAINS FROM MANSFIELD, VICTORIA

By F. S. Colliver, Melbourne

The impressions herewith figured and described, and apparently of a different type from any previously recorded from Mansfield, were collected during a short visit made with Mr. F. H. Salau to the district at Easter, 1942. They were not found in situ, but were taken from a pile of large stones at the side of the road to the Broken River just past the Barwite Road turn-off. At this spot the road is cut through a small hillside and doubtless these rocks came from road repairs that appear to have been made fairly recently.

On the low side of the road a section across the beds enabled prospecting to be done, and although no similar specimens were found, small pieces carrying the enamelled scales, etc., similar to those obtained at Fish Hill overlooking the homestead, were collected. Time and position did not permit a thorough investigation into the contents of the rocks exposed.

The specimen figured is without doubt of vegetable origin and the general habit first seemed to indicate one of the marine algae generally referred to as *Bythotrephis* or *Chondrites*.

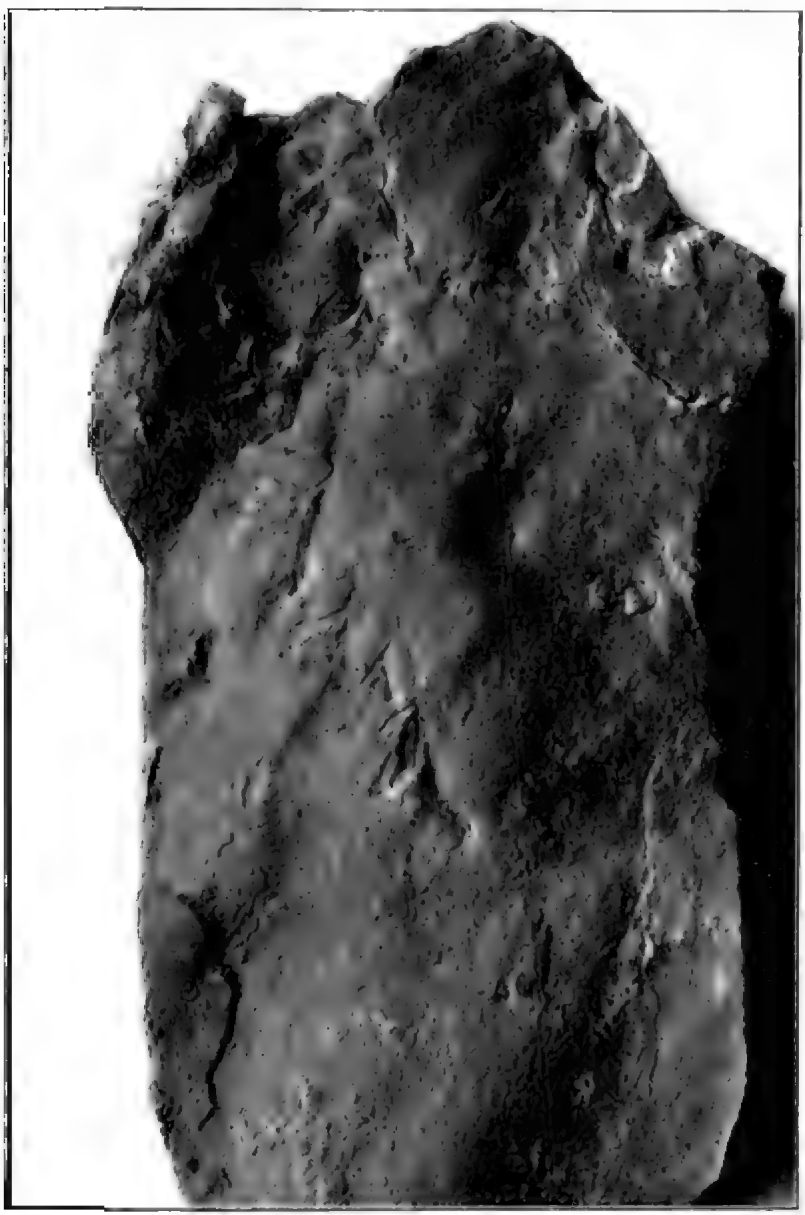
Unfortunately the preservation of the specimen is not good and all important details are not showing; thus determination must be doubtful. Of these two genera, *Bythotrephis* is found in Ordovician and Silurian deposits, and *Chondrites* ranges from Palaezoic to Mesozoic at least, and thus the age does not admit much toward the determination of the specimens.

The beds from which these rocks were taken are certainly of the same age as the red sandstones of Fish Hill, and indeed appear to be portion of the same series

These beds, on their fossil content, mainly fish and Lepidodendron, have been referred to as of Lower Carboniferous age, and the genera of the fish, together with the association of land plant remains, seems to suggest at least estuarine conditions when the deposits were laid down. From this it is thus quite possible for marine algae to be found in association with these other fossils.

However, looking further into fossil plant forms for comparisons, the genus *Sphenopteris* in some of its forms (e.g., *S. affinis*, L. et H.) seems to approach closely to the specimen under discussion. This genus, according to Seward, is "one of those extremely useful provisional generic terms where we have no satisfactory proof of precise botanical affinity," and as such may be used to designate the specimen until some better preserved material is obtained.

PLATE I



Sphenopteris sp., from Mansfield.

Photo.: H. T. Reeves

Thus I suggest the specimen be known as *Sphenopteris* sp.

This genus is common in the Carboniferous, and forms closely allied to the figured specimen occur in England and Europe.

As a further indication of the estuarine and tidal conditions during the laying down of these sediments may be mentioned the small Brittle-Star described as cf. *Aganaster gregarius* (Meek and Worthen) (*Proc. R.S. Vic.*, Vol. 47, Pt. I. p. 207), which was found at Maindample Park, Mansfield.

The photograph here reproduced was taken by Mr. H. T. Reeves, using a very low angle and mercury vapor as the illuminat. The detail of the photo. actually appears better than that shown on the specimen.

To Mr. F. Chapman, A.L.S., etc., for reading over the above and suggesting better terminology, and to the staff of the National Herbarium for facilities in checking references and examining specimens of algae, the writer extends his cordial thanks.

FURTHER NOTES ON PHALANGERS

By B. E. Carthew, Portland

In a recent issue of the *Victorian Naturalist* there appeared a photograph of a Phalanger being held by its owner, Josie Aldridge of Heywood. This week (April) Josie and her sister Sylvia came along to see me and had a surprise to unfold. The fact is, "Jermyn" has had another set of twins. They were but a few days old and, after vigorously partaking of a drink from their mother, they tucked themselves away in her pouch with astonishing speed.

Here are some of Josie's notes on her pets:

"We have given them practically everything to eat and the only refusals are frogs, earthworms, and slugs. They love almost any kind of moth, but do not take to the white cabbage moth. They were very fond of the black grubs which were so plentiful about Christmas time. Of fruits, perhaps the tomato takes first preference, especially the seeds. It is really marvellous how they can detect by smell the things they like; they come out very quickly for, say, a tomato, whereas if the offering is not their favourite food they won't hurry in the slightest. The white grubs, so plentiful in our forest, are first favourite of any of their foods. They drink plenty of cold water. They also had a helping of Christmas pudding, but did not get 3d.! 'Jermyn' is a cunning little scamp and if flies are plentiful she will not worry to move off my shoulder, for she knows full well that we will catch them for her. The first lot of twins are now very beautiful and the fur really lovely, but they have become a little wild, no doubt on account of my being away on a holiday. Up to this they were very tame.

"Here is the list of things they have 'sampled': cherry-plums, greengage plums, blackberries, mulberries, cooked meat, raw meat, cooked or raw fish, apples, grapes, carrots, cakes, jam, honey, milk, beetles, black grubs, white ground grubs, flies, moths, and white wood-grubs.

"'Jermyn' will be five years old next month and although the babies are lovely she still takes pride of place as our favourite."

THE YARRA BEND PUBLIC PARK

By P. N. BIRBY AND J. H. WILLIS, National Herbarium, Melbourne

The 20 members and friends who assembled at Johnston Street Bridge on Saturday, 10th April, were favoured with ideal excursion weather. Mr. F. S. Colliver, in giving a preliminary explanation of the geological history of Studley Park region, led our party up the left bank of the river to Dight's Falls. Excellent cliff-face profiles of the Silurian sedimentary bedrock (upon which Melbourne largely stands) were briefly examined and the intricate folding, faulting, displacement and pinching of strata, the effects of hillside creep and other interesting features were noted.

Botanical observations occupied the remainder of a pleasant afternoon. In accordance with the Club's project to make botanical surveys of the forested country still remaining within greater Melbourne district (a laudable policy, now that transport to more distant hunting-grounds is so restricted), Yarra Bend was chosen as the first reserve to have a series of quarterly visits.

The name Studley Park ceased to have official status in 1935 when the Lands Department incorporated that area so designated in a larger reserve of 587 acres (excluding over 54½ acres occupied by the Yarra Boulevard), which now embraces the country around Fairfield Hospital—between Merri Creek on the west and Kew Mental Asylum to the east. For convenience in compiling botanical statistics, the whole Yarra Bend Public Park is best divided into three distinct sections, viz., "Studley Park" as previously understood, "North East" section between Kew Asylum and the river, and "Central" section between the Yarra, Heidelberg Road, and Merri Creek—this last and largest division is the least interesting floristically, since it covers newer basalt grassland north of the Yarra which has been manifestly altered through grazing and consequent replacement of the original vegetation by alien weeds.

No more than three traverses were undertaken in the couple of hours of daylight available; these embodied the slopes and river frontages from Johnston Street Bridge to Dight's Falls, from the Falls past the Grimes memorial to steep cliffs near the Ferry stage, from the Boulevard above the Ferry past the Reservoir and along the river escarpment again to Gipps Street footbridge.

Notwithstanding this unusually dry autumn season which had withered the leaves on many shrubs (notably *Myoporum viscosum* and *Cassinia aculeata*, growing on exposed stony ground), no fewer than 140 higher plants (88 natives and 52 established aliens) were listed during the afternoon, and of the 140 more than a quarter were observed in flower.

Since F. M. Reader began a Census of Studley Park vegetation in 1885 only two of our Club excursions (in 1910 and 1919) have been concerned with botany and the published results of both were very meagre. Of Reader's species catalogued in 1885, 36 have not been re-discovered and at least some of these must be presumed extinct in the area, e.g., the "Meadow Mouse-wort" (*Botrychium australe*) which Mr. C. French senior collected here in 1858, and possibly *Hibbertia stricta*, but in compensation we have been able to add 67 plants, apparently recorded for the first time, thus bringing the all-time total for Studley Park Section to 122 indigenous and 77 introduced species. This does not include half a dozen spasmodic aliens which were noted but can hardly yet be regarded as naturalized ("Tree-of-Heaven," "Pepper-tree," "Common Ivy," "Japanese Honeysuckle," etc.), nor does it touch the lower cryptogams (mosses, lichens, fungi, algae, etc.). The figures are impressive enough for a reserve within three miles of Melbourne G.P.O., but it is hoped to augment the list during spring, when small seasonal plants appear and the other two sections of the new Public Park are botanized as well, and to publish at the end of the year a comprehensive check-list of the whole flora.

Ecologically Studley Park is complicated and one hesitates to define its natural plant communities as a distinct association: *Eucalyptus leucoxylon*, *E. melliodora*, and *E. viminalis* appear as the dominant trees (with *E. rostrata* dominating the riparian element and ascending hill slopes for short distances), while *Acacia pycnantha*, *A. implexa*, *A. acinacea*, *Dodonaea viscosa*, *Myoporum viscosum*, *M. insulare* and *Goodenia ovata*, singly or in various mixtures, form a shrub stratum on and around cliff faces. Perhaps the closest affinity is with Dr. R. T. Patton's concept of the "Red Box—Red Stringybark" association found higher up the Yarra at Warrandyte but the component species there are so different: no member of *Chenopodiaceae* nor of *Ficoidaceae* is mentioned in the composition but at Studley Park: *Atriplex semibaccatum*, *Rhagodia nutans*, *R. hastata*, *Enchylaena tomentosa* and *Mesembrianthemum aequilaterale* are conspicuous. Again, the R.B.-R.S.B. association claims at least 33 different orchids, whereas no species of this family has been so far reported from Yarra Bend.

A similar alliance of *Myoporum viscosum* with *Chenopodiaceae* has been observed on the stony walls of Morang, Anakie, Werribee, and Lerderderg gorges, but no attempt has been made in Victoria to classify the vegetation of cliff faces. This cliff element along the lower Yarra grades into a type of savannah woodland at Studley Park and the latter formerly passed over into almost a heathland community where the hard Silurian beds are capped with Tertiary sands and gravels toward Kew—such heathland element has suffered considerable destruction since F. M. Reader's day and is by now almost unrecognisable. The North East Section exhibits an analogous succession from river cliffs to Tertiary sands near the old Outer Circle railway.

It was regrettable to note the many small shrubs (chiefly "Hop Goodenia") eaten almost to ground level, presumably by rabbits; other recent damage to the Park had been caused by small bush-fires in the vicinities of Dight's Falls and Gipps St. Bridge, and it will be interesting here to see how winter rains affect the natural regeneration of plant cover—Fennel weed was much in prominence near the Falls and seems to flourish with successive burnings along the river bank. "Improvements" to the Boulevard include extensive planting of exotic shrubs and earth binding creepers, and it is only to be anticipated that some of these will eventually escape into and mingle with the undisturbed native vegetation.

In conjunction with botanical recordings it is expected that patrons of zoology will give some attention to the animal life of the region. Quite a noteworthy find on this first outing was that of a dead native cat (*Dasyurus viverrinus*), a creature rare near Melbourne; Mr. David Fleay had a family of dasyures under observation at Studley Park, while Mr. C. L. Barrett reported them as not uncommon there in 1925 (*Vic. Nat.*, vol. 42, p. 180, see also *Vic. Nat.*, vol. 49, p. 63). The present specimen was a full-grown male and we trust that he has left a mate and progeny somewhere in the reserve!

CARRYING THE BABY

A country naturalist, who not long since watched a wood duck bringing down a brood of ten from the nest in a high tree-spout, was lucky enough to be so close to them that he could make no mistake about it. In every instance the mother, using her beak, caught the duckling by the down on its back and flew with it to the foot of the tree. Each duckling as it was placed on the ground crouched flat and motionless in the grass until the whole brood had been brought in quick succession. Then, on a signal note from the duck, which, bearing perhaps for the first time, they appeared to fully understand, they trailed away with her to the nearest water.

ROYAL BOTANIC GARDENS, KEW, IN WAR TIME

The following notes, based on information contained in the latest number of the journal of the Kew Guild (1941) show how Kew, despite setbacks, is carrying on.

Early in the war it was decided that Kew Gardens should remain open to the public because of the recreational facilities it offered. Since that time, although the face of Kew has changed, this object has been maintained. By August, 1940, nearly all the male students had gone into the Services, and in their place women gardeners were employed. Despite evacuations from London, attendances in 1941 reached 825,000, some 2,000 more than in 1940.

Over five acres of the Gardens are now under vegetables. The main crop being potatoes, of which two acres were planted. Other crops grown were kohl rabi, carrot, leeks, beet, swedes, haricot beans, onions, squashes and marrows. So successful was the carrot crop that many of the best roots were kept for seed, probably the first time that such an activity has taken place at Kew. In addition to the acreage in the Gardens itself, there are further allotments behind the Herbarium and also on Kew Green.

Considering its size Kew has had remarkably few bombs, but during the "Blitz" it received its full share. Eighteen high explosive bombs fell in many different localities, damaging amongst other things the Queen's Cottage, Palm House, Rhododendron Dell and the Pinetum. Others caused damage to lawns, trees and garden-beds. Oil bombs fell near the "Mafus Mound," causing damage to some fine specimens of the Deodar Cedar. Another falling near the Temperate House blew out over 7,000 panes of glass. Many plants were damaged by flying glass and as winter came on the plants were exposed to frost and cold winds. Due to replacements of plants and glass, the damage now is hardly noticeable. The Palm House also suffered severely, but less glass was broken. As this house contains only tropical species these had to be immediately accommodated elsewhere. Bomb blast affected trees, not only by checking their normal growth, but by forcing many dormant buds into growth. Both trunks and main stems have been affected in this manner.

A fragment of an oil bomb was found embedded in the trunk of the Deodars on the Broad Walk, about 120 yards from the explosion. So firmly was it embedded that it could not be removed without causing serious damage to the tree, and so it "remains as a memento of the time in which we live." North Gallery and one of the Museums were damaged by blast from bombs falling near by. Fortunately the priceless North collection of paintings had been removed.

Because of the Centenary held during 1941, Kew received a great deal of attention. A national broadcast was given and a beautiful colour film (of which a pre-view has already been given in Melbourne) was made.

The Herbarium also has suffered, although no material damage has as yet been sustained. Just after the outbreak of war and because of their scientific value, over two-thirds of the specimens (approx. 3½ million sheets) and over 20 tons of books were evacuated with part of the Herbarium staff. This party split up into two sections, one settling at Oxford and the other in the Midlands.

Work in these sections has continued, although there is a marked lack of overseas correspondence but this is made up by the numerous inquiries for information concerning the local floras. Compilation of the supplements to the *Index Kewensis* and *Index Londonensis* are being continued.

Exhibits in the museums have been reorganized and now represents topical interests, including wild plants for bird and poultry seeds, medicinal and drug plants which can be collected in the field, etc.—Nov. Lorimer.

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PROCEEDINGS

The ordinary meeting of the Club was held at the Royal Society's Hall on Monday, May 10, 1943. The President (Mr. P. Crosbie Morrison) presided, and about 80 members and friends attended.

The President welcomed several visitors to the meeting, and also expressed pleasure at seeing Mrs. V. H. Miller back after illness.

PLANT NAMES SUB-COMMITTEE

Mr. J. H. Willis reported that the previous sub-committee not having been officially disbanded, the appointment of a new sub-committee at the last general meeting now meant that two committees existed, and to simplify the matter he proposed to move the following addition to the motion passed at the last general meeting:—"That the Plant Names Sub-Committee be reconstituted to function as a permanent standing sub-committee of the Club with a minimum personnel of five; that three members shall always constitute a quorum; and that the inaugural personnel be Dr. C. S. Sutton, Dr. R. T. Patton, Messrs. P. F. Morris, J. H. Willis, P. Bibby, J. W. Audas, T. S. Hart, E. E. Pescott and N. Lothian."

Mr. P. F. Morris seconded this motion, which was carried.

SUBJECT FOR THE EVENING

This was an illustrated lecture entitled "The Royal Botanic Gardens, Kew," given by Mr. Noel Lothian. The lecturer, using a good series of illustrations, traced the development of the gardens and showed some of the outstanding features of the present time. The effect of the war on the gardens and the part played in training students for administrative positions were emphasized.

Several questions were asked, after which the President expressed the thanks of the Club to the lecturer and pointed out that Mr. Lothian was a graduate of the Gardens, who returned to Australia about two years ago.

PERSONAL

Letters from Mrs. Blanche E. Miller, Messrs. J. Searle, J. A. Ross, J. Wilcox, and Geo. Lyell expressing thanks for Hon. Membership Certificates recently received.

The following were elected as Ordinary Members of the Club: Messrs. J. E. Marshall, N. Stuart, and John Calaby.

NOMINATIONS FOR OFFICE-BEARERS

The following nominations were received for 1943-44:—

President, Mr. P. F. Morris; Vice-Presidents, Mr. H. C. E. Stewart, Mr. Ivo Hammett, Mr. J. H. Willis; Hon. Editor, Mr. A. H Chisholm, F.R.Z.S.; Hon. Secretary, Mr. F. S. Colliver; Hon. Assistant Secretary, Mr. Noel Lothian; Hon. Treasurer, Mr. E. E. Lord; Hon. Librarian, Dr. C. S. Sutton; Hon. Assistant Librarian, Mr. P. Bibby; Committee, Messrs. A. S. Chalk, H. P. Dickins, H. T. Reeves, G. N. Hyam, J. H. Willis, A. Grassick.

Mr. A. S. Chalk and Mr. A. G. Hooke were re-elected as auditors.

FORESTRY PROBLEMS

Mr. A. A. Baker moved:—"That this Club bring before the Government the injury done to the country by de-forestation and soil erosion which may be caused by a policy of settling ex-soldiers of this war on the land, as was done after the last war, notably in South Gippsland, the Mallee and Beech Forest, where in many instances the land was vacated after clearing and is now overrun with bracken and rabbits, thus preventing the regeneration of the natural forest."

It was agreed to refer the matter to the Committee for further consideration.

NATURE NOTES

Mr. Ivo Hammett reported seeing a Wattle-bird clearing scale off Acacia trees.

Mr. V. H. Miller stated that a lack of bird nests in the trees of St. Kilda was noticeable this year.

Mr. P. Crosbie Morrison reported that a large green vegetable bug had crossed the Dividing Range this year, and that it had been proved by stomach examination that Mud-larks ate large numbers of these pests.

Members are reminded that Annual Subscriptions are now due. Prompt attention to this obligation would spare the Hon. Treasurer much work.

THE STORY OF MY HONEY-BEES

By EDITH COLEMAN, Blackburn, Vic.

(Continued from May issue)

It was an old belief, most common in mediaeval days, but dating from Greek and Roman writings of the 1st century, possibly earlier, and persisting to the end of the 19th in rural Europe, that bees must be told of the death of their owner, otherwise they would "pine and dwine away." Camerarius writes: "Who would believe, if experience did not make it credible, that most commonly all the bees die in their hives if the master or mistress of the house chance to die, except they be presently removed to another place? And yet I know that this hath happened to folk in no way stained with superstition." (*Historical Meditations*, Molle's translation.)

"Telling the bees" was practised in England less than 50 years ago. In *Precious Bane*, Mary Webb, who knew so well the traditions of Shropshire, makes use of this old custom. (As soon as his father had died, Gideon Sarn said in an every day voice "I'll go and tell the bees, mother, or we met lose 'em," and he told every skep.)

BEE ISHMAELS

When I was a child my father sometimes took certain "bees" from the flowers, enclosing them in his hand. He tempted me to emulate him by pointing out the ones I might safely handle, but always my courage failed at the critical moment. I have assumed that these were drones although I do not remember my father's telling me so. Edwards (1908) states that "no one has ever seen a drone among the insects that haunt the flowers, or ever seen him basking on a sunlit wall or tree-trunk, like almost every other winged atom. Once gone from the hive, he seems to keep incessantly on the wing until hunger prompts him home again." Yet Maeterlinck (1901) writes of drones "caressing their idleness in the midst of the flowers," and again, "making for the nearest flowers where they sleep until the afternoon freshness awakens them."

According to Quinby (1884) drones may be taken in the fingers with impunity, but he does not say whether from flowers or the combs. From Mr. Tarlton Rayment I learned that drones rarely visit flowers, and when they do alight it is accidental.

Virgil sang of his drones "sitting, without sharing in the labour, at another's food"; and another old writer has summed him up: "He flieth abroad, aloft, and about; and that with no small noise as though he would do some great act; but it is only for his own pleasure, to get him a stomach; and then returns he to his cheer;" and I fear this is the picture that most of us have formed of the lazy drone.

In November, 1942, when golden Aeoniums were in flower, I partly solved the problem. For three weeks the huge inflorescences were haunted by bees which must have found them easy foraging. Now and again a larger, brighter "bee" alighted which suggested—the wish no doubt being father to the thought—my father's "drones." But these were too swift for me to capture, even in a lidded box. They were golden and gleaming, without the hairy, velvety look of the hive bee. Like Michelet I thought them too radiant in their illuminated wings for toilers of the hive. When at last I did capture several I found that they were without the married wings of hymenoptera, quite obviously flies.

Later I was able to see them depositing eggs on the walls of a barrel which contained liquid manure, and to watch the rat-tailed maggots that emerged from them propelling themselves as swiftly about the unpleasant fluid as their beautiful parents had navigated the air. Some were sent to Mr. Rayment who confirmed my assumption that they were drone-flies (*Eristalis tenax*) and described them as flower-lovers. . . He added: "The transparent structures you mention between abdomen and thorax are actually the vestigial second pair of wings."

I still cannot associate these swift radiant creatures with the "bees" my father captured so unhurriedly, but memory is sometimes treacherous.

SPRING-SUMMER BEHAVIOUR

With the passing of winter it was evident that sufficient bees had survived to tend the developing larvae. When the weather was fine one saw many young bees leave the combs for short flights close by, returning almost at once to take up their duties in the nest. They were much too crowded for a novice to follow their doings.

According to Rosch bees are educated through a succession of duties, each bee being able to perform all the work of the hive when her period for that work arrives. He has divided the life of the worker-bee into three periods. For two days the newly-hatched bee prepares cells for more eggs, and assists with the fanning. Then, until 6 days old, she feeds the older larvae. For 9 days she may then feed the younger larvae. The second period, of about 10 days, is devoted to receiving and storing nectar and pollen brought in by foraging bees; comb-building and, at the end of the period, guarding the entrance. Only during the third period, of from 20 to 30 days, does she herself go afield to forage for nectar, pollen, propolis and water, and this brings her short life to a close. The sequence of duties may vary; special circumstances may demand some change in their order.

I could, of course, read little of this on my crowded combs, but

it was pleasant to reflect that my three valiant attackers were no more than ten days old.

The hive was photographed on October 7th, 1942. At the beginning of December the "federation" had so increased that no comb was visible. At night when the bees were all home they must have been several inches deep, so that we became apprehensive that the points of anchorage might give way under the great weight of bees and honey. When Mr. A. G. Campbell saw them he suggested that there might be danger from enraged bees should the nest fall. The weather was very warm. One could discern nothing to denote softening of the wax, which occurs even in ordinary hives under high temperatures, and affects the temper of the bees.

However, as they had passed safely through the previous summer, and were fairly well shaded with apple and gum trees, nothing was done, although the bees were closely watched with a view to warning our neighbours should the nest fall.

DISASTER

Every evening I said "They will swarm to-morrow." On the eve of January 26th, 1943, after a very hot day, it seemed certain that something must happen. With such an incredible number of bees on the combs and more bees emerging daily, the comb-area must surely be trebled if they were to carry on. At 2 p.m. next day (a hot north wind) I found the nest on the ground while hosts of bees were flying under and above the roof as if they knew not where to take their loads. Some would fly to the fallen nest and then off as if to forage again, or perhaps scout for a new site.

The strangest thing was that the bees did not appear to blame me, although I stood by for long periods. As they lay motionless on a fallen sack, they resembled the skin of an animal. Instead of falling on its apex the nest lay flat on one side. It must, I think, have slid very gradually and gently, so that many bees on the under side had not been crushed. These had crawled on to the upper surface where they formed part of a dense blanket of bees, apparently protecting the larvæ from the great heat.

At 5 p.m. when, normally, on such a hot day the bees would still be active in the garden or on the combs, they were perfectly still. At 8 p.m. the under surface of the roof and the 8 or 10 inches of comb still attached to it were covered with bees, and on the sack below they were deeper than ever.

Next day (January 28th) at 7 a.m. there was still little movement and no bees were seen among the usually bee-haunted flowers in a bed of bergamot close by. No ill-temper was shown although I visited them many times during the morning, always a little

apprehensive, and keeping at a reasonably safe distance; but distance, of course, is nothing to a wrathful bee.

I was at the nest at 2 p.m. Fifteen minutes later the bees had completely vanished—and I had missed one of the most moving spectacles in nature. It seemed remarkable that they should desert combs in which there was still so much honey, and hundreds of larvae in all stages of development. For several days the comb was visited by many bees, whether the lawful owners or robbers I had no means of discovering.

Wishing to examine the comb I accepted Kirby's assurance that bees may be safely immersed in water for 9 hours, and will revive with warmth. I had seen many revive when accidentally washed into the bird pools. So taking a hose I made it rain gently—on the just and the unjust alike. I was able to examine the illusive drones as well as a living queen, and larvae in many stages. After cutting off about 3 lbs. in order to test honey from my own herbs, the nest was given up to marauders. It weighed (12/2/43) with dead bees, larvae and the little honey that was left, 10½ lbs.

The part of the comb still attached to the roof revealed the beauty of waxen architecture. The leaves had been strengthened and conjoined by means of small flying buttresses. Had it been possible to roof the nest more securely the combs would probably have increased until too close to the ground; but from the ingenuity of the bees and the skill they bring to bear on an unanticipated problem, it is certain that they would have met the danger by building in safer directions before this stage was reached.

It is known that bees fly long distances in search of pasture. These bees gave convincing proof that they are glad to forage near home if the right nectar be available. Water is necessary to them at all stages, in rearing broods and in liquefying honey in very cold weather, and they came right to the house for it, visiting bird-pools and the dogs' drinking bowls. I have counted 9 bees sipping from a tiny rock pool.

We had hoped that they might return to the remaining comb, for bees do exhibit attachment to a favoured situation. In this district for four successive years a large nest occupied the roof of a shop, entering by a small perforated ventilator in the wall. Kipling's bees of Little Lindens, probably based on fact, had lived under the tiles of the old farmhouse ever since it was built. There is a record of 150 years for bees in an Oxford home.

The garden had lost a living charm. The bees had brushed into it the finishing touches. They had conjured up pictures of those old "sipping gardens" of England, of my own county, Surrey; of Mary Webb's Shropshire; of Hardy's "Wessex;" of Kipling's Sussex, and Hudson's Wiltshire where cottages were "wrapped in flowers as in a garment," and rounded off with bee-skeps. Lastly,

PLATE II

the bees enabled me to settle, to my own satisfaction at least, several doubtful points on the pollination of certain flowers; but this must be another story.

It seems surprising that more flower-lovers do not employ the bee. In olden days every flowery garden had its bees, until bee-farming on a large scale made it easier to buy honey than to hire the bee. Certainly Eucalypt honey is delicious, perhaps second only to the thyme-honey of flowery Hymettus, or the heather-honey of Scotland; but is there any finer honey than that gleaned from English cottage flowers?

It is a fascinating subject on which one is tempted to dwell. Lawson's words come to mind: "I will not account her any of my good housewifes that wanteth either bees or skilfulness about them."

(Concluded)

ORCHIDS OF THE PORTLAND DISTRICT

By CLIFF. BEAUGLEHOLE, Gorae West, via Portland

The following list of orchids is made available chiefly by the efforts of Mrs. K. Mellblom, of Portland, Mr. Murray Holmes, of Gorae, and myself, plus the great help we have received from Mr. W. H. Nicholls, of Melbourne.

I am mentioning mainly seven localities, viz.—Gorae and Gorae West (forest country), Cashmore, Heathmere (wet heath country), South Portland, Bridgewater and Mount Richmond (drier areas, sandy nature, also limestone ridges—all three adjoining sea coast). The Portland district is by no means a large area, but is noted for the varied nature of its soils, and this is the main reason why I have divided it into different sections.

This list excludes all doubtful finds; that is, no orchid is included unless determined by our authority, Mr. Nicholls. In some cases of the rarer orchids I am including the date on which we first discovered them. Orchids that have been found throughout are indicated by the word "All," otherwise the locality or localities, in initials, will be stated. The total of valid species is 81.

The key is: *, Orchids peculiar to Portland; nos., approximate number of different plants seen; v.r., under 25 plants; r., appearing in dozens (under favourable conditions); c., appearing in hundreds (under favourable conditions); v.c., appearing in thousands (under favourable conditions).

DIPODIUM punctatum	Hyacinth Orchid	..	All; c.
GASTRODIA sesamoides	Potato Orchid	..	All; c.

PRASOPHYLLUM			
australe	Austral Leek-orchid	..	G., G.W., H., C., B.; c.
Beaugleholei	Peat Leek-orchid	1942	Gorae West; 24.
despectans	Tiny Leek-orchid	1933	G., G.W., S.P.; r.
diversiflorum	Variable Leek-orchid	1941	Gorae West; 100.
elatum	Tall Leek-orchid	..	All; c.
flavum	Yellow Leek-orchid	1931	G., r.; S.P., H., v.r.
Frenchii	Graceful Leek-orchid	1934	Gorae West; 3.
fusco-viride	Dusky Green Leek-orchid	1942	Bridgewater; v.r.
gracile	Elegant Leek-orchid	1934	Gorae West; 140.
Hartii	Maroon Leek-orchid	1942	Gorae West; 100.
nigricans	Dark Leek-orchid	..	Gorae; v.r.
odoratum	Sweet Leek-orchid	..	All; c.
var. *album*	White Leek-orchid	1942	Gorae West; v.r.
parviflorum	Small-flowered Leek-orchid	1933	Gorae West; v.r.
CALOCHILUS			
campestris	Copper Beards	1941	Cashmore; 1.
paludosus	Red Beards	1934	S.P., B.; r.
Robertsonii	Brown Beards	..	All except B.; r.
saprophyticus	Leafless Beard-orchid	1941	G.W., 250; C., B., v.r.
THELYMITRA			
antennifera	Rabbit-Ears Orchid	..	All; v.c.
aristata	Scented Sun-orchid	..	G., H., S.P.; r.
rubra	Pink Sun-orchid	..	G., S.P., G.W.; r.
fusco-lutea	Blotched Sun-Orchid	1932	G., C., G.W.; r.
flexuosa	Twisted Sun-orchid	..	All; c.
grandiflora	Great Sun-orchid	..	All; c.
ixioides	Dotted Sun-orchid	..	All; c.
var. *Merranae*	Purple Sun-orchid	1932	S.P., G.W.; 1 ea.
var. *subdifformis*	Green Sun-orchid	1934	South Portland; r.
media	Tall Sun-orchid	1932	South Portland; 1.
pauciflora	Slender Sun-orchid	..	All; v.c.
var. *Holmesii*	Blue Star Sun-orchid	1932	Gorae; r.
MICROTIS			
atrata	Yellow Onion-orchid	..	Gorae; v.r.
oblonga	Scented Onion-orchid	..	G., G.W., B.; v.c.
orbicularis	Swamp Onion-orchid	1935	Gorae West; c.
parviflora	Small-tongued Onion-orchid	..	All; v.c.
unifolia	Common Onion-orchid	..	All; v.c.
CORYBAS			
diemenicus	Purple Helmet-orchid	..	G., S.P., G.W., B., M.R.; v.c.
dilatatus	Stately Helmet-orchid	..	All; v.c.
unguiculatus	Small Helmet-orchid	1932	G., S.P., G.W., M.R.; v.c.
ACIANTHUS			
caudatus	Mayfly Orchid	1933	Mt. Clay, M.R.; c.
exsertus	Mosquito Orchid	..	All; v.c.
reniformis	Gnat Orchid	..	All; v.c.
LYPERANTHUS			
nigricans	Red Beaks	..	All except G.; c.
BURNETTIA			
cuneata	Lizard Orchid	1930	G.W., C., c; S.P., 1.
ERIOCHILUS			
cucullatus	Parsons' Bands	..	All; c.
LEPTOCERAS			
fimbriatum	Fringed Hare-orchid	1934	S.P., North Portland; c.

CALADENIA			
angustata	Musky Caladenia	..	G., S.P., G.W., C., H.; r.
carnea	Pink Fingers	..	All; v.c.
var. *pygmaea*	Pygmy Caladenia	..	All; c.
cardiochila	Fleshy-lipped Spider-orchid	1934	C., M.R.; v.r.
congesta	Black-tongued Caladenia	..	G., H., C., G.W.; c.
clavigera	Clubbed Spider-orchid	..	All; r.
deformis	Blue Fairies	..	All; v.c.
dilatata	Fringed Spider-orchid	..	All; c.
filamentosa	Tailed Spider-orchid	1934	S.P., B.; v.r.
**hastata*	Mellblooms' Spider-orchid	1930	S.P., B., C., G.W.; v.c.
latifolia	Pink Fairies	..	S.P., B., C., M.R.; v.c.
Menziesii	Hare Orchid	..	All; v.c.
pallida	Golden-hued Spider-orchid	1941	Gorae West; 200.
Patersonii	Common Spider-orchid	..	All; v.c.
var. *arenaria*	Tooth-lipped Spider-orchid	1942	S.P., G.W., C., B.; r.
*var. *suaveolens*	Scented Spider-orchid	1930	All; v.c.
reticulata	Veined Spider-orchid	..	G., S.P., G.W., C., B.; c.
*var. *valida*	Portland's Spider-orchid	1930	S.P., B.; v.c.
Patersonii × *dilatata*	Hybrid Spider-orchid	1930	S.P., G.W., G., C., r.
CHILOGLOTTIS			
reflexa	Autumn Bird-orchid	1932	G., G.W.; v.c.
GLOSSODIA			
major	Large Waxlip Orchid	..	All; v.c.
DIURIS			
longifolia	Wallflower Diuris	..	All; v.c.
palustris	Swamp Diuris	..	B., G.W.; c.
pedunculata	Snake Diuris	..	G., H., S.P., G.W.; r.
sulphurea	Tiger Diuris	1934	Heathmere; v.r.
ORTHOCERAS			
strictum	Horned Orchid	..	All except G.; r.
CRYPTOSTYLIS			
subulata	Large-tongue Orchid	..	All; c.
SPIRANTHES			
sinensis	Lady's Tresses	..	G., S.P., G.W.; c.
PTEROSTYLIS			
acuminata	Pointed Greenhood	..	H., Narrawong; v.r.
alata	Striated Greenhood	..	All; c.
barbata	Bearded Greenhood	..	All; c.
cucullata	Leafy Greenhood	..	H., C., B.; r.
curta	Blunt Greenhood	..	Mt. Richmond; r.
cyanocephala	Swan Greenhood	1933	Bridgewater; c.
falcata	Sickle	..	All; v.c.
foliata	Slender Greenhood	1931	All; r.
longifolia	Tall Greenhood	..	All; c.
nana	Dwarf Greenhood	..	All; c.
nutans	Nodding Greenhood	..	All; v.c.
parviflora	Tiny Greenhood	..	All; c.
pedunculata	Maroon Hood	..	All; c.
vittata	Banded Greenhood	..	All except C.; r.

FIELD NATURALISTS' CLUB OF VICTORIA

STATEMENT OF RECEIPTS AND EXPENDITURE FOR 12 MONTHS ENDED 30th APRIL, 1943.

RECEIPTS

Subscriptions—						
Arrears	£59	2	6			
Current	202	14	6			
In Advance	24	10	4			
				£286	7	4
Cash Sales of—						
Victorian Naturalist	6	8	3			
Publications	4	16	11			
Badges	2	13	2			
Crockery	5	5	0			
				19	3	4
Advertisements in *Victorian Naturalist*				4	4	0
Interest Received—						
"Best Fund," Fixed Deposit £50 @ 2½%	£1	2	6			
Fixed Deposits	1	2	6			
Commonwealth Loans	20	5	0			
				22	10	0
				£332	4	8
Balance at Banks on 30th April, 1942—						
State Savings Bank credit	£260	7	9			
Less E.S.&A. Bank Overdraft	29	0	6			
				231	7	3
				£563	11	11

EXPENDITURE

Victorian Naturalist—						
Printing	£173	5	0			
Illustrating	42	18	9			
Despatching	7	11	7			
				£223	15	4
Reprints				4	19	0
Postage and Freight				9	10	6
General Printing and Stationery				6	17	2
Library				9	11	6
Rent and Caretaking				17	10	0
Affiliation Fees				1	11	6
General Expenses				8	11	7
				£282	6	7
Invested in Commonwealth Loan				200	0	0
				£482	6	7
Balance at Banks on 30th April, 1943—						
E.S.&A. Bank	£23	8	10			
State Savings Bank	57	16	6			
				81	5	4
				£563	11	11

FIELD NATURALISTS' CLUB OF VICTORIA

BALANCE SHEET ON 30th APRIL, 1943.

LIABILITIES				ASSETS				
Late Dudley Best Fund		£50	0	0	Arrears of Subscriptions—£69/16/- Estimated to realize		£40	0	0
Subscriptions paid in advance		24	10	4	State Savings Bank—				
Special Trust Account (in Savings Bank)		12	15	3	General Account	£57 16 6			
	£87	5	7		Special Trust Account	12 15 3			
							70	11	9
Balance, being surplus of Assets over Liabilities	1,540	15	0	E.S. & A. Bank—					
					General Account		23	8	10
					Investments—				
					E.S. & A. Bank Fixed Deposits—				
					"Best Fund"	£50 0 0			
					General	50 0 0			
					Commonwealth Bonds — Face value	650 0 0			
					(Market value at this date £691)				
							750	0	0
					Library, Furniture and Epidiascope— At Insurance Value		680	0	0
					Stock on hand of Books and Badges— At Valuation—				
					Fern Book	£40 0 0			
					Fungus Book	20 0 0			
					Club Badges	4 0 0			
							64	0	0
	£1,628	0	7				£1,628	0	7

Audited and found correct on 14th May, 1943.

A. S. CHALK, A. G. HOOKE, } Hon. Auditors.

E. E. LORD, Hon. Treasurer.

A NEW SPECIES OF *CALOCHILUS* (ORCHIDACEAE)

(*C. gracillimus*, sp. nov.)

By the Rev. H. M. R. Rupp, Northbridge, N.S.W.

Planta gracilis, 20-35 cm. alta, folio angusto canaliculato. Caulis bracteas 2. Flores 2-8, aliquanto parvi. Sepalum dorsale late lanceolatum, cucullatum, circiter 1 cm. longum; sepala lateralia lanceolata, vix 1 cm. longa. Petala multo breviora, fere rhomboidalia, fusca cum lineis rubro-purpureis. Labellum gracillimum et longissimum, pilis longis rubro-purpureis dense fimbriatum; lamina ad basem omnino papillosa, ad apicem filamentosa, pilosa. Columna brevis, ad basem cum glandibus separatis parvis duobus; anthera nutans. Ovarium magnum, conspicue costatum.

A slender plant from 20 to 35 cm. high, with a narrow channelled leaf sometimes hardly reaching the inflorescence, and two sheathing stem-bracts. Flowers 2-8, rather small. Dorsal sepal broadly lanceolate, cucullate, about 1 cm. long. Lateral sepals rather narrowly lanceolate, scarcely 1 cm. long. Petals very much shorter, almost rhomboid, after expansion soon turning inwards in front of the column, brownish with deep reddish-purple striae. Labellum very slender and very long, densely fimbriate with long reddish-purple hairs; lamina at the base wholly papillose, the papillae gradually lengthening till they blend with the hairs; apical portion not a bare ribbon, but the lamina gradually becoming finely filiform, and beset with hairs almost to the tip. Column short, with two small very dark unconnected glands at the base. Each gland has a very short vein entering it from above and from below, and about midway between the glands is a dark-coloured swelling. Anther much bent forward, often emarginate. Lower margin of stigma conspicuous, dark; upper margin obscure. Ovary large, conspicuously ribbed.

Blackwall Mountain, Woy Woy, Christmas Day, 1933, H. M. R. Rupp. Mount Irvine, Blue Mountains, January, 1934, Mrs. C. A. Messmer; January, 1943, Misses J. P. and G. J. Scrivener.

As will be gathered from the above data, the new species has been actually known for over ten years; but from various causes its description has been delayed. Morphologically the flower is most nearly related to Bentham's *C. Robertsonii*, but it could not be included in that species. Its outstanding characteristics, distinguishing it from all other species yet discovered, are: (1) Flowering season—midsummer. (2) Extreme slenderness and great length of the labellum. (3) Anterior portion of labellum not contracting into a bare ribbon, but gradually becoming filiform, and clothed with hairs practically to the tip.

The specific name is in particular allusion to the labellum, but is almost equally applicable to the whole flower. The isolated dark swelling between the basal glands of the column is interesting, and may possibly represent a third gland; but it is ill-defined.

DEATH OF MR. A. S. KENYON

Australia lost a notable and highly useful citizen when Mr. A. S. Kenyon died, after a lengthy illness, at his home at Heidelberg, Melbourne, on May 14, 1943.

Alfred Stephen Kenyon was born on December 7, 1867, at Homebush, near Maryborough (Vic.), where his father, Alfred Henderson Kenyon, had for some time a general store. Afterwards (in 1869) the father established chain stores at Beaufort, Ararat, Stawell and Horsham. In 1875 he went in for farming at Bulgana for several years, until the exceptional drought which culminated in 1881, and the educational needs of his family directed him to Melbourne, where he started in business as bookseller, stationer, etc., at Bridge Road, Richmond.

A. S. Kenyon attended St. Stephen's Grammar School, Richmond, and after matriculating commenced the course for civil engineering at the Melbourne University; but, accepting the opportunity of obtaining practical experience, in 1887 he entered the Public Works Department under Messrs. Cheechi and Catani. Next year he transferred as draftsman to the Victorian Water Supply Department, and in 1898 was Assistant Engineer and in 1901 Engineer-in-Charge of Town Supplies and New Proposals. In 1906 Dr Cherry, Director of Agriculture, induced him to join his Department as Engineer of Agriculture, in which active capacity he was employed in the important task of developing the Central Mallee district, with its difficult problems of water supply and reclamation, clearing and cultivation by traction power. In addition, lectures were given in all the agricultural districts, and informative articles published in the Journal of Agriculture.

At the re-organization of the Department in 1911, Mr. Kenyon was appointed as senior engineer to the State Rivers and Water Commission, for which his varied experience was invaluable. In 1932 followed appointment as Acting Commissioner, and shortly after as Commissioner.

Retirement from the Public Service (in 1935) directed his abundant energy elsewhere. Having for some years been honorary Numismatist at the Public Library, he was appointed to take charge of the collection permanently and later to be Keeper of Antiquities. The present excellent condition of these departments shows his thorough knowledge of the subjects, painstaking ability, and capacity for organization. His series of lectures on both subjects were appreciated for their lucidity and wealth of information.

In the subject of Ethnology Mr. Kenyon was an undoubted expert, having through his outdoor work over so extensive an area in forest, plain, and desert, met and studied the aborigines and the remains of the Stone Age in Australia closely and intelligently, and with an intuition that was remarkable. In the comparison and relation of stone artefacts from all parts of the world, and in all ages to the present, his arrangement is most illuminating. In this subject also he gave many striking lectures and wrote informative articles.

His knowledge of the physiography, geography and natural features of Victoria was comprehensive, especially so in regard to the Mallee and the Murray River and its affluents, his keen observation being shown in his knowledge of the geology, flora and fauna of the country, on which he could always give first-hand information as a field naturalist.

As a member of the Historical Society of Victoria for more than 30 years, he devoted much time to the study and compilation of the history of Victoria, more particularly of the pastoral period from 1834 to 1860, of which he made a comprehensive survey. With Mr. R. V. Billis he published *Pastures New* (1930) and *Pastoral Pioneers of Port Phillip* (1932), whilst

The Story of the Mallee (1914-15) vividly and completely presents that remarkable area. In these works is a reliable and enduring record of the pastoral pioneers. For some years Mr. Kenyon, alternatively with Mr. C. Daley, gave monthly lectures on Australian history at the Melbourne Public Library.

Mr. Kenyon also published short histories or annals of places, such as *The Story of Melbourne, The Story of Australia, Heidelberg, the City of Streams*, also of Swan Hill, Kowree, etc. He also, as one of the Historical Sub-committee for the Centenary Celebrations, collaborated with Messrs. A. W. Greig, C. R. Long and C. Daley in writing *Victoria, the First Century*, the official history in 1934. Mr. Kenyon was on the Committee of the Historical Society for many years, and occupied for two years each the positions respectively of President, Hon. Secretary, and Editor.

Besides the works above mentioned he contributed many articles, historical, scientific, engineering and general, to the Press and magazines, and lectured to societies and clubs on various subjects.

Mr. Kenyon was a member of many societies and clubs of cultural character, in all of which he gave some official service and help. Of these may be mentioned the Field Naturalists' Club of Victoria, the Anthropological Society, the Institute of Engineers (Aust.), of each of which he was ex-President. Other societies in which he took part were the Australian and New Zealand Association for the Advancement of Science, the Society of Genealogists, the Royal Society of Victoria, the Australasian Institute of Mining and Metallurgy, with many kindred societies in the other States and in America—a widespread connection.

Mr. Kenyon in 1895 married Miss Alexandrina Leontine Délépine, who died in 1905. Their daughter, Justine (Mrs. O. C. Tyrer), the devoted help-mate of her father, survives the double loss.

In Mr. Kenyon's notable career in the Public Service of Victoria, as well as in his honorary association with useful societies and institutions, his work, official or otherwise, was invariably characterized by full knowledge, mature judgment, purpose, method, precision, and efficiency, ensuring its success. Versatile and resourceful, he was dismayed by no difficulty. Gifted with a very retentive memory, tinged with a keen sense of humour, from a wisely garnered store of varied knowledge, almost encyclopedic in character, Mr. Kenyon always derived pleasure in supplying with facility and readiness useful and accurate information to enquirers over a wide range of thought. A clear and logical thinker, his considered opinions on matters of moment always carried great weight.

Genial and open-hearted in nature, easily approachable and responsive, a good raconteur, with a broad, tolerant, and understanding outlook on men and manners, Mr. Kenyon retained a wide circle of friends who appreciated his distinct and attractive personality, valued his acquaintance, and now sincerely mourn his loss to the community.

The funeral took place on May 15, to the Heidelberg Cemetery, where a service was conducted by the Rev. C. Harland (Presbyterian) in the presence of a large number of mourners. Representatives of the F.N.C. included the President, Vice-Presidents, Secretary, Editor, and other members.

C. Daley.

Members of the F.N.C. will sympathize warmly with Mr. and Mrs. W. H. Nicholls, whose daughter Doris (Mrs. Paulet) died on May 19, after an illness of several months, at the age of 21 years. Mrs Paulet (whose husband is in the A.I.F.) had been married less than one year.

POISONING BY EUCALYPTS

Considerable attention is now being directed to the presence of hydrocyanic acid (HCN) in poisonous amounts in various plants. Many species of both wild and cultivated plants in Australia are capable in certain circumstances of developing hydrocyanic acid, also called prussic acid, which is highly poisonous.

The quantity of poison that can be formed in plants may vary considerably with the stage of growth, climatic conditions, and soil. In general, mature plants contain a much smaller percentage of potential acid than do young plants. James F. Couch, an American chemist, has shown that sorghums grown in the warmer Southern States of America have not poisoned live stock so much as those grown farther north. The reason for the difference, he states, is probably climatic; but little is known about the exact causes of the formation of the poisonous acid in this case.

Eucalyptus cladocalyx, F.v.M. (Sugar Gum) has often been the cause of many deaths in all classes of stock, especially when the trees are lopped for windbreaks. Both juvenile and mature leaves have been found to be toxic. As in most cyanogenetic plants, the young leaves contain the highest percentage of HCN. The Poison Plants Committee of N.S.W. gives the results of extensive experimental and practical work on the subject. Finnemore, Reichard and Large have isolated a glucoside which they identified as a prunasin previously found in other plants. Fresh suckers yielded 0·59% HCN.

Eucalyptus viminalis, Lab. (Manna Gum), has been suspected by me as the cause of deaths in Koalas, especially after fire and other periods of quick growth when HCN is likely to develop. Finnemore, Reichard and Large tested leaves collected from Braidwood, N.S.W., and got a negative reaction. Other samples of adult and juvenile leaves from two different localities gave positive reaction and yielded 0·09% HCN.

In my opinion the chief causes and periods of development of HCN are: (1) after fire, (2) after drought followed by rain, (3) after a very cold snap, (4) worked-out soil, (5) soils deficient in lime, (6) plants that have been injured.

The timber of *Eucalyptus hemiphloia* (Grey Box) and *E. maculata* (Spotted Gum) are suspected of causing skin irritation in bushworkers and sawmillers.

P. F. MORRIS, National Herbarium.

The note in last month's issue enquiring whether the foliage of the Sugar Gum is injurious to goats reminds me that this gum, *Eucalyptus cladocalyx*, is definitely classed as a poison tree—young and old foliage alike carrying HCN. Fatalities are more common among stock during drought.

The earliest record goes back to 1908. In 1929 at Alleena, in New South Wales, a horse and a cow were poisoned. In Deniliquin in 1935 sheep and cattle were killed after eating the lopped foliage. In 1936 a flock of sheep suffered severely at Narrandera and 80 of the animals died.

Records of the Poison Plants Committee of New South Wales show poisoning of sheep, cattle and horses, but goats are not mentioned. From May to July seems to be the danger period.

Other Eucalypts are known at times to contain poison in the foliage. For instance, the aborigines would throw branches of the Coolabah (*Eucalyptus microtheca*) into water in order to poison fish.

E. E. PESCOTT.

THE LATE T. A. ROBINSON

A note in the *Vic. Nat.* of last month relates to the passing of that great lover of our native flora, Thomas Alfred Robinson, in his 91st year. I remember meeting him by appointment, on the top of One Tree Hill, Balwyn, about four years ago, to show him something of our native garden (Maranoa) adjoining Beckett Park. I was astonished to find him keeping his promise in a blinding sheet of rain. He must then have reached the age of 87. His knowledge of the secrets of native plant propagation was most impressive. Nothing seemed beyond his skill in the making of two or more plants grow where only one grew before. When he retired from school-teaching he purchased an inferior plot of land (according to his friends) at Dutson, near Sale. Having faith and "green fingers," he succeeded even beyond his own expectations. He rightly named his property "Chorizema," for he evidently made it sing for joy.

For my own part I have to cry *peccavi*, for when some years ago in company of the Director of the Geological Survey (Mr. Baragwanath) I visited the limestone quarry at Dutson, I referred to the owner as Mr. Robertson, and so the spot passed down to posterity in my geological report as "Robertson's quarry." At the time my eyes were filled with the tiny shells called forams, with which the quarry abounds, and I failed to visit the owner's wonderful garden, to my everlasting regret. Some years later, however, I had the chance of offering my apologies for the error to this grand old gardener.

F. CHAPMAN.

APHIDS WANTED

A note from Mr. Hubert Jarvis, the Queensland entomologist, tells an interesting story based on a paragraph in the *Vic. Nat.* by Mr. W. Hunter on the pine *Podocarpus alpina*. As a special aphid occurs on a species of Podocarpus in Brisbane, Mr. Jarvis asked Mr. Hunter to send aphids from *P. alpina*, and these when received were found to include a winged aphid of an entirely new species. Probably this is the first purely Australian aphid yet discovered, all the others (more than 60 species) having been introduced. Now Mr. Jarvis suggests that possibly members of the F.N.C. would be good enough to send him more aphids from any species of Podocarpus, and more particularly *P. alpina*. This merely means plucking a leaf or twig carrying the aphids, enclosing it in a tin, and posting the package to Mr. Jarvis at the Department of Agriculture, Brisbane.—A.H.C.

HAVE YOU ANY QUESTIONS?

Arrangements have been made to constitute something in the nature of a Natural History "Brains Trust" at the July meeting. That is to say, questions are invited—preferably to be handed in at the June meeting—and these will be discussed by members of the panel. The subjects and speakers are: Insects, Miss Janet Raff; Shells, Mr. C. J. Gabriel; Rocks, Mr. A. C. Frostick; Fossils, Mr. F. S. Colliver.

MOSQUITO BITES

A correspondent in N.S.W. says that mosquito bites affect him painfully, being irritable for days, and he found that a piece of washing-soda, about the size of a hazel nut, dissolved in an eggcupful of water, made a very good lotion. The poison of most insects is, no doubt, an acid similar to the formic acid of ant bites, so any alkali neutralizes it.

The Victorian Naturalist

Vol. LX.—No. 3 July 7, 1943 No. 715

PROCEEDINGS

The Annual Meeting of the Club was held on Monday, June 14, 1943. The President (Mr. P. Crosbie Morrison, M.Sc.) presided and about 80 members and friends attended.

BEREAVEMENTS

The President announced the recent death of Mr. A. S. Kenyon, an ex-president and a member of many years' standing, and also that Mr. W. H. Nicholls had recently lost a daughter. Members stood in silence as a mark of respect.

GENERAL BUSINESS

The President announced that a Rural Reconstruction Commission had been formed and is meeting in Melbourne, and that the committee would watch the evidence given before it.

Mr. F. Lewis, Chief Inspector of Fisheries and Game, wrote stating that a proclamation would shortly be issued giving full protection to the Grey Butcher-bird.

REPORTS OF EXCURSIONS

Excursions were reported on as follows:—Ferntree Gully National Park, Mr. J. H. Willis; Royal Park Cutting, Mr. F. S. Colliver; National Herbarium, Mr. P. F. Morris; Botanic Gardens, Mr. H. C. E. Stewart.

ELECTION OF MEMBERS

The following were elected as Ordinary Members of the Club: Mr. and Mrs. E. R. Stewart, Messrs. J. Ferguson, C. F. Hulett, E. W. Rieschieck; and as Country Member, Mr. M. M. Furze.

ANNUAL MEETING

The Annual Report was received and adopted.

The Balance Sheet was explained by Mr. A. G. Hooke, who paid a tribute to the Hon. Treasurer (Mr. E. E. Lord) for the

work he had done during his first year in office. Mr. Hooke moved and Mr. Chalk seconded the adoption of the Balance Sheet, and the motion was carried. The President returned thanks to the auditors for their work.

The retiring President installed Mr. P. F. Morris as President, and mentioned that it was just 25 years since Mr. Morris joined the Club.

Other officers were elected as follows: Vice-Presidents, Mr. H. C. E. Stewart and Mr. Ivo Hammett; Hon. Editor, Mr. A. H. Chisholm; Hon. Secretary, Mr. F. S. Colliver; Hon. Assistant Secretary, Mr. Noel Lothian; Hon. Treasurer, Mr. E. E. Lord; Hon. Librarian, Mr. P. Bibby; Committee, Messrs. A. S. Chalk, G. N. Hyam, H. P. Dickins, J. H. Willis, H. T. Reeves.

NATURE NOTES

Question by Member

Question: The innermost claw of the Cassowary, unusually long and straight, is said to have been used by certain aborigines in one of their implements. Does anyone know in what implement the claw was placed and if its use was limited to tribes in those regions in which the Cassowary is found? *Discussion*: Mr. Chisholm stated that the claw was quite possibly used as an implement by the natives, and mentioned that proof of the strength in the claw and foot of the bird was a record of a Cassowary kicking a boy and severing the jugular vein. Mr. Colliver suggested that the claw could be a highly specialized tool, and added that in certain districts the churingas were carved with a tool consisting of a possum's skull with one incisor left in.

Mr. V. H. Miller, correcting a published note, stated that St. Kilda Road should have been given, instead of St. Kilda, in the reference to the lack of birds' nests.

RETIRING OFFICERS

The President expressed the thanks of the Club to the retiring committee, and paid tribute to Dr. C. S. Sutton, who felt unable to carry on as Librarian, after 19 years in that office. In thanking the retiring President, Mr. Morris stated that Mr. Morrison had set a high standard to follow.

PRESIDENTIAL ADDRESS

Mr. Morrison spoke on the subject "The All-Round Man." The address was thought-provoking, and a fitting finale to the programme of lectures given during the year. A natural colour film of the gleanings of an all-round man illustrated Mr. Morrison's remarks.

SIXTY-THIRD ANNUAL REPORT.

The Committee of the F.N.C. has pleasure in submitting the 63rd Annual Report.

Membership is as follows: Honorary Members, 16; Ordinary Members, 230; Country Members, 79; Associate Members, 14; total members, 339. This represents a decrease of two on the figures of the last year.

Many of our members are with the services and the following we know to be in uniform: K. Ash, E. V. Barton, T. H. Brunn, C. A. Burley, W. R. Cover, G. I. Dundas, J. Firth, D. C. Geddies, D. E. Greenwood, Keith A. Hateley, M. F. Leask, N. Lothian, R. G. Matthews, F. N. Morley, C. C. Ralph, B. M. Sloggett, N. A. Wakefield, J. Waterhouse. Possibly there are others, and we would be glad to have their names.

We record with sorrow the death of the following members: Miss E. L. Kearland (1926-1943), Mr. A. S. Kenyon, M.I.E. (Aust.) (1927-1943), Mr. Chas. Fletcher (1935-1943). Mr. Fletcher lost his life with the Air Force somewhere in Australia. An old friend and past member, Mr. T. Robinson, of Dutson, near Sale, passed away recently at the age of almost 92.

All things considered, the attendances at the Club meetings are well sustained and interest has been maintained with a worthy series of lectures during the year. Exhibits have fallen off somewhat, but this can be ascribed to the time of our members being taken up with various home defence activities and long hours in work.

The Air Force has taken over both the lecture room and library room as class rooms and a certain amount of inconvenience to members has resulted; but as this is the only upset we have had so far, we can be thankful that we still have the use of the rooms.

The Excursion List had to be curtailed somewhat this year, and alterations and cancellations were necessary; nevertheless a good programme was arranged and many of the excursions were well attended.

Vol. 59 of the *Victorian Naturalist* has been completed, and again the war-time paper restrictions have operated. However, a good series of scientific and popular papers has been published and our journal's place in scientific literature has been maintained. Additional overseas and local institutions have been added to our exchange list, and many have been the calls for back numbers. In this matter it is of interest to note that a series of articles by Mr. G. N. Hyam on "Vegetable Foods of the Australian Aborigine" have been sought by the Navy and the Commando headquarters.

War conditions have prevented matters pertaining to protection

of flora and fauna from receiving full attention, but in many matters recommendations and reports have been passed on to the proper authorities.

We are still in association with the Department of Information and expect so to continue for the duration. Business relating to the Australian Natural History Medallion is still in the hands of the Club, and we record with great pleasure that the last recipient was Mr. David Fleay, B.A., Dip.Ed., of the Sir Colin MacKenzie Sanctuary, Healesville. The presentation of the medallion took place at a function arranged by the Bird Observers' Club and the Leach Memorial Club.

No Wild Flower Show was held this year, due to lack of halls and manpower, but we look forward to the time when this part of the Club's activities can be re-instituted.

This year the Plant Names Sub-Committee has been re-instituted and many problems of plant nomenclature are now receiving attention.

The Junior Branch of the Club at Hawthorn is in process of formation. To illustrate the working of the Club a display was staged at the Hawthorn Library rooms and this created considerable interest in the district.

During the year honorary membership certificates were printed and sent to the members so designated. The simple yet dignified certificate received general approval.

At the last annual meeting Mr. Geo. Coghill retired from active membership after some 48 years of service in various offices, and Messrs. J. and W. H. Ingram retired from the offices of Hon. Treasurer and Hon. Assistant Librarian, positions they had held for many years. At the last committee meeting Dr. C. S. Sutton tendered his resignation as Hon. Librarian, a position he has occupied for nineteen years. To these grand old members we extend the thanks of the Club for fine service.

During the year we have welcomed to our meetings visiting naturalists and members of the American Forces stationed here. From time to time, too, we have been pleased to see some of our country members.

To Mr. McCrae Howett we give our best thanks for the continued use of his rooms as a committee meeting place. A comprehensive expression of thanks is extended to all who have given of their time and energies toward the advancement of the Club and its ideals.

Mr. Charles Daley writes that on p. 30, line 27, in the *Vic. Nat.* for June "1905" should be replaced by "1940."

THE ALL-ROUND MAN

Portion of Presidential Address to the F.N.C., June, 1943.

By P. CROSBIE MORRISON, M.Sc.

People in the old days made jokes about the all-round man. I recall one of them. "Dr. So-and-So . . . Oh, he's a good all-round man. The doctors say he's a good golfer and the golfers say he's a good doctor!" It is only more recently that the specialist has come in for his share of the bantering, as the man who knows more and more about less and less until he knows everything about nothing; while, of course, the all-round man is one who knows less and less about more and more, until he knows nothing about everything.

There is, indeed, much to be said for the all-round man. After all, he is the one who sees most of the game. To take an analogy from some of the homely trades, a new house to the plumber provides examples of something new, or something to be criticised, in the arrangement of the sewerage and the water supply. The bricklayer's eye is alert for the courses that are not quite true, or delights in a perfect job. The eye of the carpenter and of the plasterer cannot fail to be held by the work that pertains to his own speciality. The architect may criticise the general planning. But it is the man who is looking for a home—the all-round man, the man with an unjaundiced eye and an unbiased mind—who sees the house as a home, to be lived in and loved. True, he may have to call in all the specialists, one after another, to advise him on special points that might escape his inexpert eye, but the full enjoyment of the house is his, and his alone.

We may apply the analogy fairly completely to our work as naturalists. We cannot do without our specialists, and I would be the last to disparage one of them; but in their own specialities they have their reward, and it is the all-round man who has the fullest, most complete enjoyment of nature as a cultural environment.

But to-day the matter goes deeper, far deeper, than that. We have all been living very close to our work. So much is being learned day by day that one human mind cannot compass it all. It is only comparatively recently that a choice few of the world's great scientific minds have taken time to deliberately stand off and view the whole edifice, and what they have seen has made them marvel.

We have become accustomed to regard evolution in terms of "natural selection"—in other words, "the survival of the fittest." Every living thing, plant or animal, is born with slight differences (or, in some cases, marked differences) from its parents and its

fellows, while retaining a strong family resemblance. If these differences are favourable to its mode of living, says Darwin, they are perpetuated. The most efficient animal has first choice of a mate, and first pick of the food, while the least efficient goes under, and may never perpetuate its kind. So evolution goes on toward a grand climax yet to be seen.

There have been difficulties, though not insuperable difficulties, in applying this theory to our known experiences in the field. No one has felt quite happy about them, though all have hoped to clear up the last little discrepancies.

But the arrangement of our 90-odd elements is no less logical and orderly, yet they are not endowed with life; they are not subject to the processes of natural selection, or of survival or eclipse. Professor Lawrence Henderson, of Harvard University, pointed this out some twelve or more years ago. As a biological chemist—and a self-declared materialist, therefore unbiased by religion—he remarked how uniquely the elements carbon, hydrogen and oxygen were suited to the creation and maintenance of life in animals and plants—three elements out of nearly 100, with properties incapable of being provided by other elements on other planets. Henderson remarked further how the unique suitability of carbon dioxide as a starting-point in the building up of plant tissues depended upon the action of chlorophyll and upon the alternation of light and darkness, and that, of course, brings the astronomical sciences into the picture—the strangely purposive arrangement of the Solar System.

Now, recently, our own Professor Wood Jones—we like to call him "ours" because of the stimulus he gave to the scientific community during his professorship in Melbourne—has carried the matter a step further still. In brief, he says if we can only stand far enough off to see Nature as a whole, in the light of all that modern science and specialization has taught us of its component parts, we cannot fail to be impressed with the design and purpose behind it all. It is not a religious view; on the contrary, it is a strictly scientific view, which provides immediately a clearer sight through difficulties which have puzzled scientists since Darwin's day, and chemists since the announcement by Mendeljeef last century of the periodic classification of the chemical elements.

But though it has been reached in distinction to the views of religious writers and thinkers, it brings our science of to-day almost within reach of the fundamental ideas behind practically all religions, whether Christian or Mahommedan, Taoist or Buddhist.

Wood Jones comes down to this in his Purser Lecture delivered at Trinity College, Dublin, in December, 1941, published under the title of "Design and Purpose." The conflict between religion and science, of which we have heard so much, especially in the

biological sciences where the name of Darwin is used, becomes now, according to Wood Jones, an attempt "to reconcile the findings of an imperfectly understood science with dicta of an imperfectly understood religion."

This is the problem that assails the modern youth, who finds religion being reduced to an absurdity in times of war when (again to quote Wood Jones) "every belligerent country held days of prayer in which they dictated to the Almighty the justness of their cause, and demanded His support in order to supplement the lethal effects of their weapons of destruction."

He quotes the Bishop of Bradford (Dr. A. W. F. Blunt) telling a Youth Rally that "God was not just a referee watching and controlling the game from aloof, but rather was He the centre-forward of the home team, helping to shape its course." "It would," Wood Jones adds, "be difficult to frame a conception of deity more stultifying to the aspirations of youth in its search for some grander realization of the ordering of things."

And that is why I say that the present and the future are with the all-round man. The specialist is needed more than ever he was, but the study of nature to-day, guided by such great thinkers as those I have quoted this evening, holds the greatest rewards of happiness and hope in store for the man who can see nature not most minutely, but most widely.

EXCURSION TO FERNTREE GULLY NATIONAL PARK

The party of Club members who entrained for a fungus and lichen foray on Saturday afternoon, May 15th, was increased to nearly 70 by the presence of first-year trainees from the Teachers' Training College and representatives of the Workers' Educational Association. Such a large number of excursionists prevented the digression from main tracks to follow the quest after smaller cryptogams; but, in spite of prevailing grey skies, much mud, and the impossibility of keeping everyone to a team within earshot, we believe that the outing was generally appreciated. The long dry autumn was reflected in a paucity of fungi, usually so abundant at this season, and out of the total of 230 species collected hereabouts during past excursions no more than 44 were observed on this occasion. A curious stalked puffball, *Mitremyces fusca*, and velvety brown rosettes of *Stereum elegans* were, however, listed for the first time. Among lichens, the most attractive species observed were the pink terrestrial *Baeomyces fungoides* and *Sticta fossulata*, a wood-inhabiting species with flattened fronds of emerald green.

It was with great satisfaction that we noted four Lyre-birds, busily scratching beside the track and quite imperturbed by human company; none exhibited the plumage of an adult male, and it is presumed they were either females or young birds.—J.H.W. and P.N.S.B.

TRACHYMENE AND *PLATYSACE*

(With particular reference to members of the former Genus)

By JAMES H. WILLIS, National Herbarium, Melbourne

Rudge[1] established the genus *Trachymene* in 1811, selecting *T. incisa* as his type from specimens collected around Port Jackson by Robert Brown, 1802-05. De Candolle[2] (1828) substituted his own generic name of *Didiscus* for the same group as Rudge's plant, in the mistaken belief that the latter was referable to Labillardière's *Azorella*, whereas Turczaninow (1849) and later Mueller used the genus *Dimetopia* for several new congeners of *T. incisa*, Rudge.

Although Bentham recognized the just claims of *Trachymene* and correctly applied it in his treatment of the Australian *Umbelliferae* for "Flora Australiensis" (1866), Vol. 3, followed by Bailey[3] and Rodway,[4] other recent botanists have favoured the later Candollean name of *Didiscus*, e.g., Mueller[5] in his later works, Domin,[6] Maiden and Betche,[7] Black,[8] Gardner,[9] and Ewart.[10]

Within the last decade C. Norman, F.L.S.,[11] has again opened up the involved question of correct nomenclature for this group, finely sifting the interpretations of previous authors and emphasizing the undeniable priority claim of *Trachymene* as described and figured by Rudge. P. Buwalda[12] and B. L. Burtt[13] have since come forward to endorse Norman's opinion and to make the necessary new combinations for all species described under Didiscus since Bentham's day. This is very briefly the history of genuine Trachymenes.

Meanwhile the name "Trachymene" had been wrongly applied in Australia to another group of Umbelliferae generically distinct from Rudge's type. Norman[11] shows clearly that the oldest valid epithet for this second group is *PLATYSACE* (syn. *Siebera*, Reichenbach), based on the West Australian *P. cirrhosa* of Bunge, 1845. He consequently combines the 22 appropriate species under this correctly restored genus; three species only are present in Victoria, so in lieu of "Trachymene" these now become *Platysace heterophylla* (Benth) C. Norman, *P. ericoides* (Sieb. ex D.C.) C. Norman, and *P. lanceolata* (Labill.) Druce, *Trachymene Billardieri*, F.v.M., being a synonym of the last-named.

As properly understood, *Trachymene* now consists of 40 species, ranging over the whole Australian continent (two-thirds of the total species), New Guinea, and the more easterly spice islands, with one representative as far north as Borneo and another in New Caledonia, New Hebrides and Fiji, the twelve occurring in New Guinea and/or Celebes mountain stations are of comparatively recent discovery, and without doubt still other undescribed entities await the more intensive exploration of that region. Following is a complete list of species as combined by Bentham, Buwalda, and Burtt, with the ones that affect Victoria designated by the symbol †.

AUSTRALIA

†*pilosa*, Sm. (syn. *pusilla*.).
†*leptopetala* (F.v.M.) Benth.
juncea, S. Moore.
ornata (Endl.) Druce (syn. *eriocarpa*.).
Cunninghamii, F.v.M.
glachocarpa (F.v.M.) Burtt.
††*anisocarpa* (Turcz.) Burtt, (syns. *Benthamii*, *australis*, in part).
glandulosa (F.v.M.) Benth.
†*cærulea* (Hooker) Graham.
composita (Domin) Burtt (= *anisocarpa*, q.v.).
macrophylla (Domin) Burtt (syn. *australis*, in part).
villosa (F.v.M.) Benth.
glaucifolia (F.v.M.) Benth.
†*bialata* (Domin) Burtt.
oleracea (Domin) Burtt

incisa, Rudge TYPE
procumbens (F.v.M.) Benth.
microcephala (Domin) Burtt.
tenuifolia (Domin) Burtt.
pimpinellifolia (Domin) Burtt.
†*humilis* (Hook.f.) Benth.
scapigera (Domin) Burtt.
Gillenae (Tate ex Domin) Burtt.
didiscoides (F.v.M.) Burtt (syn. *hemicarpa*).
setosa (O. Schwarz) Burtt.
Dusenii (Domin) Burtt.
geraniifolia, F. M. Bailey.

POLYNESIA

Cussonii (Montrouzier) Burtt. (syns. *Homei*, *austro-caledonica*).

NEW GUINEA-CELEBES

saniculifolia, Stapf.
novo-guineënsis Domin (Buwalda).
keysbrensis (Gibbs) Buwalda.
rigida, Buwalda.
acrotricha, Buwalda.
erodioides, Buwalda.
celebica, Hemsley.
Sarasinorum (Wolff) Buwalda.
aceriifolia, Norman.
arfakensis (Gibbs) Buwalda.
adenodes, Buwalda.
papillosa, Buwalda.

*Bentham bestowed the new name "*australis*" on the Trachymene already described by Turczaninow (1849) as "Dimetopia anisocarpa" and gave as its distribution Queensland, New South Wales, Victoria, Tasmania and West Australia. In 1908 came Domin[6], who added to the confusion by splitting Bentham's *australis* into three species, each with a *new* epithet, viz.—*Didiscus Benthamii*, from West Australia, *D. macrophyllus* and *D. compositus*, from the eastern States: *Benthamii* is keyed out (in Latin) as having "simple umbels, not disposed in inflorescences like compound umbels," whereas *compositus* is stated to have "umbels disposed in inflorescences which are like very compound umbels."

After examining considerable material from West Australia and comparing it with coastal Victorian and Tasmanian samples, I cannot agree with Domin's separation; in both eastern and western collections the inflorescence varies markedly—sometimes umbels are quite simple, sometimes slightly branched, and at other times highly compound; the fruits and foliage appear indistinguishable. Mr. C. A. Gardner, Government Botanist of Western Australia, lends support to my contention that *Benthamii* and *compositus* are one and the same species, but the correct name for our common "Wild Parsnip" must henceforth be *Trachymene anisocarpa* (Turcz.) Burtt.

I have gathered (1937, 1940) *Trachymene bialata* (Domin) Burtt. on Mallee sandhills amongst Porcupine Grass at Red Cliffs (a new record for Victoria) and also in similar country just over the Murray (near Burtundy, N.S.W.). This species is recognized by the *double*, very narrow, serrated wing edging the ripe mericarps, otherwise there is a close affinity with *T. glaucifolia* (F.v.M.) Benth. Since the latter is represented in Melbourne National Herbarium from nearby Wentworth, doubt arises as to the specific merit of *T. bialata*; it may be merely a form with aberrant fruits, and field research over a wide area is necessary to prove the constancy (in association with other characters) of the mericarp wings.

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A NEW SPECIES OF *HYPOLEPIS*

By N. A. WAKEFIELD, Genoa, Victoria

HYPOLEPIS MUELLERI sp. nov. Rhizomate late repente; frondibus asperulis, tripinnatis; rachibus et stipitibus albidis vel aureis, sublanuginibus, fulgentibus, ferentibus setas parvas sparsas albidas rigidas; pinnulis peltatis vel adnatis, lobatis, ferentibi setas albas utrinque; lobis multi-venulosis, plerumque integris, saepe soros plures ferentibus; soris permultis, parvis, saepe non marginalibus, plerumque sine spuriis indusiis.

The type description is taken from a Victorian specimen (Mount Drummer, East Gippsland, in a shaded hillside brush; 6/7/1941; N.A.W.) In the Melbourne National Herbarium there are specimens from "Rockingham Bay"—F. Mueller (Queensland); "Waratah, near Newcastle—W. Woolls," "Botany Bay—Gulliver," "Mount Dromedary—Reader" (New South Wales); "Forests of Dandenongs—Feb. 1875"- F. Mueller, "Near Moe—1884—D. Spencer," "South Gippsland—1893—A. F. Stirling," "Genoa River—Reader," "Near Arthur's Seat—20/1/1942—O. Singleton" and "Shady wet banks of Latrobe River—May 1853" -F. Mueller (Victoria). Mueller labelled the last-mentioned specimen as *Polypodium Kippistianum*, but this name was never published; so it has been deemed suitable that the plant should have its specific epithet derived from the name of the great botanist who, at least once, considered it to be a distinct specific form.

The present genus *Hypolepis* was universally adopted only after Hooker's *Species Filicum* (1852), in which many species were transferred to it from the old genus *Cheilanthes*. These were the true *Hypolepis* species, with conspicuous scale-like indusia, or well developed spurious indusia consisting of reflexed and slightly altered lobes of the margins of the pinnules. Other species, with the sori not so conspicuously protected, remained for the time in the genus *Polypodium* together with some ex-indusiate species now placed in the genus *Dryopteris*. The species concerned, which have no indusia, can be placed generically by reference to their vestiture, which in the case of *Hypolepis* is a pubescence of jointed hairs or setae, whereas species of *Dryopteris* bear flat scales or paleae. Christensen's *Dryopteris punctata* (the present *Hypolepis punctata*) included numerous forms from many countries. Of these, there are three in Victoria which have proved to be specifically distinct—one is almost typical *H. punctata*, the second is *H. rugosula*, and the last is the newly described *H. Muelleri*.

Throughout their ranges, each species shows considerable variation in size of frond, degree of serration of pinnules and lobes, development of the spurious indusia and in vestiture. However, the three Victorian species can always be distinguished by the combination of most of the characteristics given here for each.

Hypolepis punctata (Thunb.) Mett. Kuhn, Fil. Afr. 120 (1868); *Polypodium* Thunberg. Fl. Jap. 337 (1784). Rhizome very robust widely creeping; stipes and rachises thick, sticky-pubescent, fronds 2 to 9 ft. high, deltoid, 3- to 4-pinnate, green when fresh, brown when dry, dull, weak, viscid on both sides; ultimate lobes almost entire but distinctly serrulate, many-veined; sori marginal and generally subtended by small pointed spurious indusia. Abundant in Victoria, New South Wales and Queensland, and extending to the Himalayas and Japan. In the eastern brushes, in humid shaded conditions, the species is best developed and very pubescent; but in more open southern parts (Dandenongs, etc.) it is smaller and loses much of its pubescence.

Hypolepis Muelleri, sp. nov. Rhizome extensively creeping, branched; fronds deltoid, 1 to 2½ ft. high, tripinnate, slightly harsh and stiff; stipes and rachises whitish or golden, rather smooth but often slightly tuberculate,

shining, bearing a few scattered stiff whitish hairs; pinnules stalked to adnate, lobed, bearing tiny white setae on both sides; lobes many-veined, entire or almost so, often soriferous on both sides of the costule; sori numerous, small, often away from the margin and generally absolutely unprotected. In eastern districts of Queensland, New South Wales and Victoria; generally in rather dry shaded brushes, but often in open swampy places where plants are sometimes in dense clumps and with fronds stiffer, rusty-coloured and much reduced in size of frond and sori.

Hypolepis rugosula (Lab.) J.Sm., Bot. Mag. 72 Comp. 8 (1846), as "rugulosa" (from *Polypodium*, Pt. N. Holl. II 92 Tab. 241, 1806). Rhizome thin and shortly creeping; stipes and rachises reddish, tuberculate and sparsely reddish-hairy; fronds small, rather narrow-triangular, 2- to 3-pinnate, 1 to 2 ft. high, dull, light-green, weak, pubescent but not sticky; ultimate pinnules with a few one-veined lobes; spurious indusia well developed. Plentiful in Tasmania, Victoria and eastern New South Wales, but also in South Australia (Mount Lofty Ranges); generally in very wet soil. Small plants in drier brushes are very pubescent, but in Tasmania and the Dandenongs the common form is rather attenuated, stronger and almost glabrous.

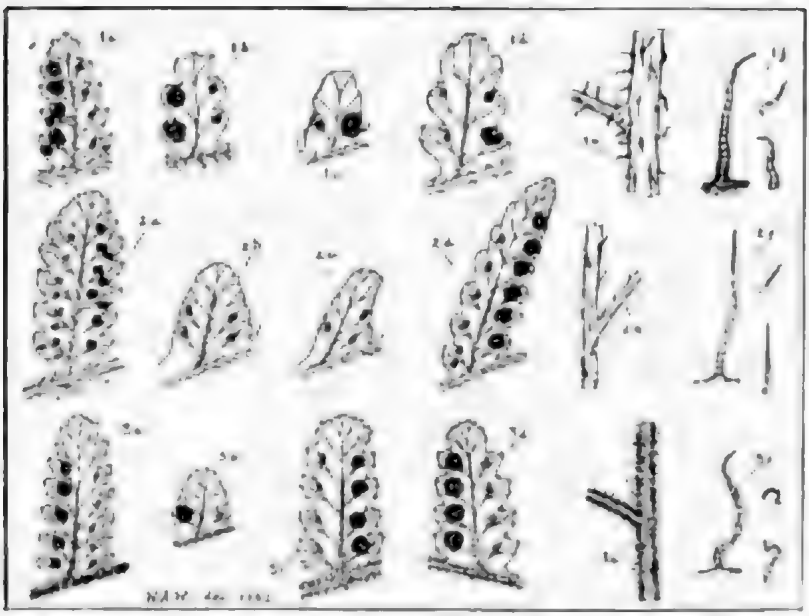


Figure 1.—*H. rugosula*. a, b, c and d: Variously shaped pinnules showing the constant features (× 2). e: rachises showing setae, etc. (× 2). f: Setae (much enlarged).

Figure 2.—*H. Muelleri*, a, b, c and d: Various pinnules showing the almost entire, many-veined lobes, etc. (× 2). e: rachises showing stiff setae (× 2). f: Setae (much enlarged).

Figure 3.—*H. punctata*. a, b, c, and d: Pinnules, note serration (× 2). e: rachises with dense pubescence (× 2). f: Setae (much enlarged).

(Sporangia removed in some cases to show venation, position of sori, etc.)

AN ABORIGINAL CEREMONIAL GROUND

By LINDSAY BLACK, Leeton, N.S.W.

On 25th April, 1943, Mr. Forster, Inspector for the Milparinka Pastures Protection Board, stationed at Tibooburra, took the writer to a large aboriginal ceremonial ground on Tuerikia Station. This property is owned by Mrs. Davies, and once formed part of Connulpie Downs Station, at that time a very large property joining the Queensland border north-east of Tibooburra.

This ceremonial ground is situated about one mile north-west of Tester's Tank, close to the Bulloo River floodwaters, and about eight miles south-east of the Adelaide gate on the Queensland border fence. The Adelaide gate is really an historical place, being one of the recognized official places of entry for stock between N.S.W. and Queensland.

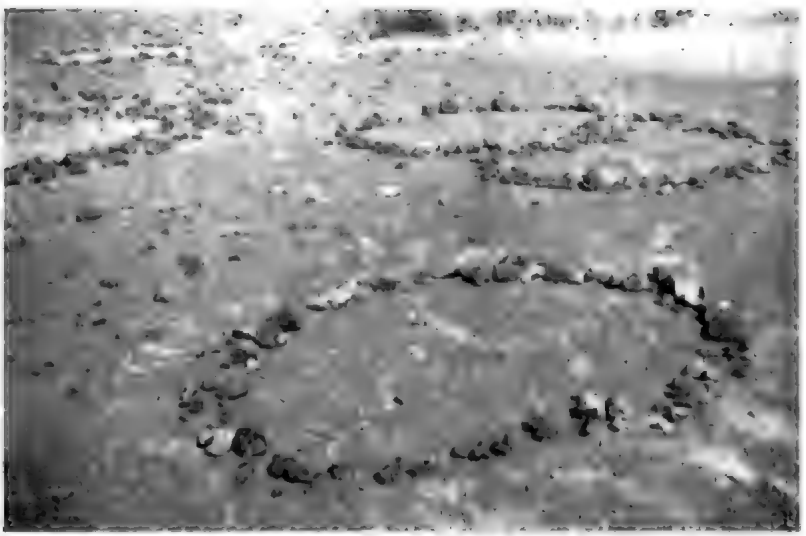
This very extensive ceremonial ground consists of a series of stone arrangements situated on flat ground between two low hills which are covered with small stones, commonly known as gibbers. From the top of the hill on the eastern side, which at no place would be more than 100 ft. high, one can look over the flat grey flooded country of the Bulloo River. It is, however, only after very heavy Queensland rains that the floodwaters come through and spread over this flat country, and at this point it is about 30 miles wide. The ceremonial ground extends for about 40 chains and contains ten separate stone arrangements. About 70 yards distant on the south side of some of the formations is a small round lake, 100 yards in diameter, which would hold 6 feet of water. When full this lake would provide water for those camping here for a considerable time, and it probably affords one of the reason for the position of this ceremonial ground, as sites of this kind are always close to a good watering place. The Bulloo floodwater country being so close would also mean a good food supply, as there would be plenty of game.

One hundred yards west of the northern portions of the formations are a number of old fire-places, and around these and the small lake we found a number of grinders, hammers, and flaked implements.

Arrangement No. 6 appeared to be the main centre; it is most extensive and was made from stones up to 12 inches in diameter. Arrangement No. 7 is also very extensive, and there are many of the small heaps of stones always found at these areas. Amongst some of the formations we found well-finished flaked implements, some made from flint and others from quartzite. This is the first time I have found so many white quartzite implements, as generally material of a more suitable nature was used.

PLATE III

Stone Arrangement No. 6. Circle at left base is partly covered by sand.



Central portion of the Circles, looking from south to north.

Photos. by Lindsay Black.

Some of the sections had their circles, yards, races and arrangements made from small stones not more than about 5 inches in diameter, but others had stones up to 12 inches in diameter. The surrounding hills must have been picked over for these large stones, as on the slopes around this area the stones are generally only 3 to 6 inches in diameter.

It is hard to say how far these stone arrangements extended, as some have been partially covered with blown sand. Many of the larger stones are practically buried in the silt washed down from the hills, which accounts for the formations being so well preserved. Some stone arrangements are found in South Australia, and have been described by Mountfort and others.

The only part of New South Wales in which these large stone ceremonial grounds are found is west of the Warrego River and north of a line drawn west from Bourke. The writer inspected another large stone arrangement of the same type as the above on Duulop Station, near Louth, and E. B. Dow has described others in *Mankind* (Vol. 2, No. 5).

GOONOO FOREST—FLORAL WONDERLAND

By GEO. W. ALTHOFER, Dripstone, N.S.W.

The Goonoo forest area, which is situated between Dubbo and Mendooran, central western N.S.W., is a treasure-ground for nature-lovers. A bewildering variety of wild flowers—mostly of shrubby type—paints the land with beauty during the spring and early summer. The gently undulating country is mostly sandy, with here and there low ridges of ironstone and sandstone-conglomerate, and is covered with a fairly thick growth of Ironbark (*Euc. sideroxylon*) interspersed with patches of a tall Mallee (*Euc. viridis*) and of *Casuarina* and *Acacia* species.

My brother Peter and I spent an all-too-short day there in early September of last year, and many were the rarities we noted. It may be mentioned in passing that each ridge usually had one species in abundance, and in many cases that species would be confined to its particular ridge.

The *Acacia* group was well represented, though we were too late for the flowering of many species. The first one noted was *A. doratoxylon*, here 25 to 30 ft. high and loaded down with golden fingers of fragrant bloom. Then came a small tree, past the flowering stage; it is of upright habit and 12 to 15 ft. in height. Sydney Herbarium places this as a form of *A. acinacea*, but when it is possible to obtain a flowering specimen I feel confident it will prove to be something quite different. Not flowering, but very lovely with its smooth stems and very narrow

phyllodia, was *A. subulata.* This plant, very rare here, has previously been recorded only from the Upper Hunter valley on the eastern fall of the Dividing Range. Another extremely rare Acacia seen was *A. Havilandii,* a lovely low-spreading bush very much like *A. calamifolia.* One of the feather-leaved types, *A. cardiophylla,* was noted, and though usually a tall shrub, it was almost prostrate here. The gem of all the low-growing kinds, however, is *A Brownii,* an inland adaptation of *A. juniperina,* forming shapely little bushes 2 to 4 ft. high, with pungent dark-green phyllodia and extra large, deep golden flower balls. *A. lineata,* a low bush; *A. conferta* (Golden Top), in dense thickets; *A. flexifolia*; *A. triptera,* with its recurved "wait-a-while" phyllodia; and *A. undulifolia,* not unlike a dwarf *A. podalyriaefolia,* were all more or less common.

Grevilleas were represented by *G. floribunda* (everywhere abundant), with its strange, goblin-like flowers, and *G. obtusiflora,* a rather straggling shrub with green and red flowers. The Blue Pincushion, *Brunonia australis,* carpeted the ground in many places with colour. As far as the eye could see were undershrubs in profusion, amongst those observed being *Calytrix tetragona* (up to 6 ft., and always attractive with its wealth of starry pink or white blossoms), *Hibbertia stricta, Dampiera lanceolata* in huge clumps of violet-blue, *Baeckea densiflora, Westringia rigida* (the most profuse flowering member of the genus I have yet seen), *Leptospermum trivalvum, Melaleuca glomerata, M. uncinata, M. pubescens, Myoporum deserti, Dodonæa peduncularis* (an extremely dwarf form), *Pultenæa microphylla* and *Daviesia acicularis.* The rare *Mirbelia Jeanæ,* recorded previously only from Penrose (near Goulburn) and the Nepean River, was located also.

In a number of places that lovely plant *Philotheca australis* was prolific. Individual plants showed flowers much deeper in colour than the average, and they ranged from nearly pure white, through pinks to lilac, purple and blue.

Phebalium stenophylla, covering hundreds of acres, was a very striking plant. Many ridges were a sea of yellow where this species with its masses of star-shaped flowers grew in rank profusion. The Boronias were hereabouts represented by *B. rosmarinifolia,* a straggling undershrub, though 30 miles away, on the other side of Dubbo, we found *B. ledifolia* var. *glabra,* surely the most striking of all Boronias; its drawback is the strong "foxy" odour given off by the leaves when touched. Shapely bushes 5 ft. through and about the same in height were seen, literally covered with deep rose-red blooms. We estimated that the larger plants carried up to twelve thousand open blooms.

A lovely *Prostanthera* was *P. empetrifolia,* plentiful and gay

with violet flowers. On one ridge we came across a strange *Prostanthera* in fair quantity. Small shrubs of no more than 3 ft. had flowers of a pale bluish-green, looking for all the world like resting moths with folded wings. This species is like *P. Leichhardtii*, but differs slightly in the formation of the leaves. It may possibly be distinct, since *P. Leichhardtii* is a very rare plant and has previously been recorded once only in N.S.W.—from Cobar—and from another locality in Queensland.*

Many other species were seen and the end of the day came all too soon. A thorough exploration of this huge area would doubtless yield many more wonderful plants and some rarities.

*The description tallies with *Prostanthera chlorantha* (Green Mint-bush) which is not uncommon in parts of the South Australian and Victorian Mallee, notably Mildura district.—Editor.

EXCURSION TO NATIONAL HERBARIUM

Mr. P. F Morris reported that the visit to the National Herbarium on June 5 was well attended, a party of about forty members and friends availing themselves of the opportunity of seeing the collection and library. The Director and Government Botanist (Mr. A. W. Jessep) gave a lecture on the drying of botanical specimens and the methods of keeping and working the collections. Visitors interested themselves in the rubber plants and rubber substitutes, quinine and Australian barks which are now being used in malaria and fevers. The interesting exhibits were mostly of an economic nature and reminded members that there is a future for Australian plants in commerce.

Specimens collected by Banks and Solander during Captain Cook's voyage in 1770 and Petiver's Indian and American plants of 1696 astonished members by their excellent state of preservation.

The Herbarium was established by Baron Ferdinand von Mueller in 1857 and ranks amongst the larger herbaria of the world.

THE ENGLISH SPARROW IN AUSTRALIA

Referring to the notes of the late W. S. Campbell as published in the *Vic. Nat.* for May, the writer stated that he saw his first sparrow at Melbourne about 1870, when they were present in "hundreds and hundreds." He remarked that he did not think it possible to determine how or when the sparrow was introduced into Australia.

The sparrow was definitely introduced into Victoria in the early 'fifties, by the Zoological and Acclimatisation Society of Victoria, when 60 birds were released at the Royal Park and five at Ballarat. It is generally considered that an error was made in introducing the English house sparrow and not the field sparrow.

About the year 1856 two boys found a sparrows' nest in a street tree at Warrnambool, and they were fined £5 for destroying the eggs! Many of us would like to collect a similar sum for each of the sparrow nests and eggs we have destroyed.—E. E. PESCOTT.

SUPPLEMENT TO INDEX, VIC. NATURALIST, VOL. LIX

The following alterations and additions are necessary in the Botanical Section:

	PAGE
For *"Cyathea acerosa"* read *Cyathodes acerosa.*	
For *"Cyathea mariscus"* read *Cyathea marcescens*	
Add *Discaria australis* Distribution of—J. H. Willis ..	68
Add Domestic Botany—J. H. Willis	212
Add Manna. Value of—A. H. E. Mattingley	36
For *"Orymoanthes"* read *"Drymoanthus."*	
Add Plants of the Bayside—H. C. E. Stewart	144
Add Plants of the Marshes—J. H. Willis	144
Add *Podolepis acuminata* var. *robusta* comb. nov. Alpine Podolepis—J. H. Willis	120
Add *Pomaderris velutina*—J. H. Willis	67
After *"Prasophyllum"* insert in brackets, thus (Section *Genoplesium*).	
Add *Prasophyllum diversiflorum* and *P. Beaugleholei* spp. nov. (illtd.) —W. H. Nicholls	8, 9
Add *Rhamnaceæ*. Notes on Victorian, Pt. 2—J. H. Willis	67

EXHIBITS AT JUNE MEETING

Mrs. M. E. Freame—A series of marine biological specimens, including sundry polyzoa, *Hydractinia, Sertularia, Gorgonia, Isis, Pennatula*, etc.

Mrs. C. French—Garden-grown native plants, including *Correa reflexa* var. *rubra, Olearia* (*Aster*) *ramulosa, Leptospermum scoparium Wolkeri, L. scoparium Sanderai, L. scoparium Keatleyi, Eucalyptus torquata.*

Mr. H. P. Dickins—Water-colour of the Australian water-lily.

Mr. J. H. Willis—Living specimens of the three King William pines of Tasmania (*Athrotaxis selaginoides, A. cupressoides, A. laxifolia*), together with samples of the timber showing the exceedingly close annual rings.

Mr. R. G. Painter—Garden-grown native flowers, including *Correa Lawrenciana, C. reflexa, C. reflexa* var. *rubra, C. reflexa* var. *pulchella, Grevillea rosmarinifolia, G. oleoides, G. oleoides* var. *dimorpha.*

Mr. Ivo Hammett—Garden-grown native flowers, including *Correa pulchella, Cassia artemesoides, Baeckea crassifolia, Dampiera lanceolata, Pimelea linifolia, Grevillea stenomera, Banksia collina, Correa reflexa* var. *rubra.*

Mr. F. S. Colliver—Small series of tertiary fossils from Royal Park Cutting.

Miss Janet W. Raff—Samples of autumn-swarming flies (*Scatopse* sp.), found clustering in large masses on *Acacia verticillata* and other native plants; collected by Mr. T. S. Hart at Croydon, Vic.

BOTANICAL COLLECTIONS AS PRESENTS TO SEND HOME

Parties desirous of transmitting to their friends collections of the flowers of this district, but more especially those collected during his late excursion to Adelaide via the Murray River, and return from there by Lake Alexandrina, and the coast line, among which will be found many both new and interesting. The undersigned will be happy to supply cases at prices to suit the convenience of purchasers. The collections are botanically arranged and named, and the parcels of seed accompanied with a corresponding specimen of the plant in blossom. Apply to the undersigned personally, at the house lately occupied by Messrs. W. Hull and Sons, Flinders Lane, Melbourne, or to Mr. Daniel Harrison, Stationer, Geelong.

DANIEL BUNCE.

Flinders Lane, Sept. 15, 1850.

[The above advertisement is extracted from the Melbourne *Argus* of September 18, 1850.]

The Victorian Naturalist

Vol. LX.—No. 4 August 5, 1943 No. 716

PROCEEDINGS

The ordinary meeting of the Club was held at the Club Rooms, Royal Society's Hall, on Monday, July 12, 1943. The President, Mr. P. F. Morris, presided and about 80 members and friends attended.

APOLOGIES

Apologies for non-attendance were received from Mr. E. E. Lord and Mr. J. H. Willis.

SUBJECT FOR THE EVENING

This took the form of a Natural History "Brains Trust," the panel of experts and their subjects being: Miss J. Raff, Insects; Mr. C. J. Gabriel, Shells; Mr. A. C. Frostick, General Geology and Rocks; Mr. F. S. Colliver, Fossils. The President invited Mr P. Crosbie Morrison to conduct the session.

Question 1. To Mr. A. C. Frostick: "Could gold be found along Domain Road, South Yarra?" *Answer*: This is debatable, as the western end is in the tertiary sands and the eastern end in the silurian sediments. The nearest locality where gold has been recorded is Dights Falls, Studley Park, an assay of the small quartz leaders in the locality giving a result of approximately 2 dwt. per ton. There is a possibility of finding gold in crush zones that are possibly hidden under the tertiary beds of the area. *Comments*: The President stated that small quantities of gold had been found in a shaft some 80 feet deep at the eastern end of Domain Road in the early days.

Question 2. To Mr. C. J. Gabriel: "Are there any poisonous Victorian shell fish? This question to be answered in two parts:

(a) Have we any shell fish which have a venomous bite or sting like the textile cone of the North Australian waters?

(b) Have we any shell fish that are normally poisonous to eat?

Answer: (a) As far as is known, no Victorian shell fish is capable of giving a bite or sting with injection of poison, but as certain cone shells of northern waters are known to be capable of so acting, it would be inadvisable to eat or even handle the Victorian members of this genus.

(b) Various shell fish are credited with the property of affecting the digestive organs, etc., but it can be stated that this is not due to any active poison principal. *Comments*: Mr. F. S. Colliver stated that at certain times in certain parts of America clams and oysters were a means of transmitting typhoid fever. Miss Raff stated that the idea that mussels collected off pier piles were unfit to eat probably arose at the time when drains were carried along the pier piles. The President stated that he had been stung on the lip when eating a limpet.

Question 3. To Miss Raff: "Are bees colour blind, and if so, to what extent? Do they have favourite colours among the flowers they visit?" *Answer*: Bees are sensitive to colour, the range extending from between the red and orange to the ultra-violet, and apparently they cannot distinguish between red and black. Regarding the favourite colour of bees, experiments seemed to indicate blue as favourite. *Comments*: Mr. Sherwin stated he had read of bees responding to colour training.

Question 4. To Mr. F. S. Colliver: "Have fossil cycads been found in Tasmania?" *Answer*: Yes, at least four species belonging to the cycads properly are known—*Cycadites dowlingi*, from the Launceston tertiary beds, but thought to have been derived from beds of Mesozoic Age; *Cycadites microphylla*, described from the tertiary of Mr. Bischoff by Johnston; an undescribed species noted from the Mesozoic of Lords Hill by Walkom; and another specimen from the same locality referred to the genus "Podozamites."

Question 5. To Mr. C. J. Gabriel: "How is the shell secreted by the female paper Nautilus? Is the shell present in all adult female Nautili, or is it merely produced at and discarded after the breeding season? Do Nautili breed regularly?" *Answer*: The shell is secreted from glands in the inner side of the large expanded webbed extremities of the two dorsal arms, the so-called shell serving as an egg-cradle and as a temporary retreat for the female, and is discarded after the breeding season. The shell is present in all adult female Nautili, and once the female provides ova she dies. *Comments*: Mr. Colliver mentioned that fossil sepia bags were not uncommon at Lyme Regis, Dorsetshire, and that the British Museum possesses several sepia prints that used this fossil material as the colour medium. Miss Raff mentioned that carefully turning the shell with the animal in upside down, then waiting a few minutes, and a sudden jerk would dislodge the animal from the shell.

Question 6. To Miss Raff: "Why is the Emperor Gum Moth called the Australian silkworm? Has any use been made of the

silk of any Australian moth?" *Answer*: The genus of the Emperor Gum Moth is one of two that are well known as silk producers, but in this case, owing to the amount of gum in the cocoon, the silk is of little use. Further, as the caterpillars are wanderers in habit, they would be difficult to breed to compete with the commercial silkworm. *Comments*: Mr. A. H. Chisholm stated that he understood that woven silk samples from Emperor Gum Moth cocoons had been exhibited at the Crystal Palace, London.

The session then closed down, and will continue next month with the following subjects and leaders: Botany, Mr. J. H. Willis; Ornithology, Mr. A. H. Chisholm; and General Zoology, Mr. P. Crosbie Morrison.

REPORTS OF EXCURSIONS

Reports of excursions were given as follows: Zoological Gardens, Mr. P. Crosbie Morrison; Sherbrooke, Mr. A. H. Chisholm.

ELECTION OF MEMBERS

On a show of hands the following were duly elected as ordinary members of the Club: Mrs. D. W. Lyndon, Mrs. R. A. Lewis, Miss V. Wheeler, Dr. William Geroe, Mr. Peter Garner; and as Country Members, Sgt. M. F. Leske and Mr. Eric Muir.

GENERAL BUSINESS

Australian Natural History Medallion.—Mr. P. Crosbie Morrison reported on the committee's discussions on this matter, and stated that Major Wilson, recently of the Teachers' Training College, had been suggested as the Club's nomination.

NATURE NOTES

Mr. Ivo Hammet drew members' attention to examples of the Queensland Bean recently sent down by Dr. Flecker for distribution to members.

Mr. R. G. Painter reported on flocks of the White-plumed Honey-eater, and stated he had not seen them in such numbers previously. Mr. Chisholm, commenting, stated that such flocks were of common occurrence.

Mr. H. Jenkins asked if the drab birds seen with Blue Wrens were females or immature males. Mr. A. H. Chisholm stated they were probably immature males. Such birds lose their blue colour each winter for at least four years.

Mr. H. C. E. Stewart asked regarding the calls of the Lyrebirds. Were they all imitative, and did some at least belong to now extinct birds? Mr. A. H. Chisholm stated it was possible

that many of the calls were copied direct from their authors, but with respect to the birds of the Sherbrooke Forest he thought that they learnt the calls from one another, and thus all the birds of the district had similar calls. He further stated that some of the calls heard in Sherbrooke are not heard in New South Wales.

Mr. L. W. Cooper reported that recently thirteen Lyre-birds were seen along the track from Cement Creek to the top of Mt. Donna Buang.

EXHIBITS

Mr. Owen Singleton: A comprehensive series of the Fossil Australian Cowries. The exhibit included most of the described species, a series of the largest cowry known (*C. gigas*, McCoy) and the largest example of the three perfect specimens known of the flanged cowry (*C. gastroplax*).

Mr. C. French: Bead or Tassel Flower (*Garrya elliptica*) from California.

Mr. C. J. Gabriel: Marine shells "Cones" from Victoria, *Conus anemone*, Lam., *C. rutilus*, Menke, *C. segravei*, Gatliff; from various localities, *C. aulicus*, Linn, *C. geographus*, Linn, *C. lineatus*, Chem., *C. marmoreus*, Linn, *C. textile*, Linn, *C. tulipa*, Lam. Also *Argonauta nodosa*, Sol., from Victoria, and *Nautilus pompilius*, Linn, from North Australia.

Mr. R. G. Painter: Garden-grown native flowers, including *Epacris impressa*, *Banksia collina*, *Correa reflexa*, *Correa reflexa* var. *rubra*, *Grevillea Dallachyana*, *G. oleoides* var. *dimorpha*, *G. rosmarinifolia*, *Pimelia* sp. *Thryptomene calycina*, *Leptospermum scoparium* var. *grandiflorum roseum*.

Mr. P. Fisch: Winter-flowering Greenhoods, *Pterostylis nutans* and *P. concinna*.

Mr. P. Crosbie Morrison: "Vegetable caterpillars"—caterpillars of Ghost Moths (*Hepialidae*)—affected by the parasitic fungus *Cordyceps* sp. The spores are picked up in the soil by burrowing larvae, whose tissues are gradually absorbed and replaced by fungal tissue without altering the general contours of the victim. Finally the fungus sends up a fruiting body which projects above ground and spreads spores to infect the next generation of caterpillars. The fruiting bodies are specially prevalent just now in many parts of the Dandenongs, and recently I saw many thousands under pine trees at Kalorama, but there were only two pupa-cases on the ground to show that the owners had escaped the plague. To the Hepialid population, it must have been a greater scourge than the Great Plague was to Londoners of the 17th century.

A "NEW" BIRD FINDS OUR VALLEY

By JEAN GALBRAITH, Tyers (via Traralgon), Victoria

After many years of bird watching in one valley, the years still bring delights; but it is rarely now that we see a new bird, so the visit of a flock of White-backed Swallows last spring was memorable.

I knew (and know) very little about the species, beyond the notes in reference books. They do not come into any bird literature with which I am familiar, and we are wondering rather interestedly whether they are rare or merely unnoticed.

On the 29th of October last year I spent a day at the Tyers River, with a companion equally interested in birds. It was a mild day, with intermittent showers, and the riverside was alive with sounds and songs. But though all delighted us; none of the birds we saw was the least bit unusual. Our chief entertainers were White-browed Scrub-Wrens and Yellow-faced Honeyeaters.

When it was almost time to return home I heard a strange note, a single indescribable call which might have been made by a frog or a bird. At the same moment my companion saw the birds. She thrust the field glasses into my hands.

"Look quickly," she said. "They're swallows of some kind, but they're not ordinary swallows."

She saw them better than I did; but for so long as we dared stay we watched the small flock of swallow-like birds hawking up and down the river, apparently dipping in the water now and then as they skimmed over it.

They were swallow-winged, fork-tailed, dark, with conspicuous white backs. That, after long watching, was all we could say, for a dense tangle of blackberries kept us from drawing nearer, and the birds passed so swiftly that it was hardly possible to focus the glasses upon them. We could not name them, but when we reached home the reference books left us in no doubt.

The opposite (eastern) bank of the river was vertical and gravelly, the water shallow enough for wading; and we had learned that White-backed Swallows nested in tunnels in such banks, so I had high hopes of finding nests and watching the birds go in and out.

A week later I visited the eastern bank and hid under a bush, watching for the swallows. I saw dramas and comedies: a Fan-tailed Cuckoo two yards away seemed to be calling from half a dozen different places, while I watched his throat shiver at every trill; a Whipbird in the thicket opposite called intermittently; a flock of Beautiful Firetails retreated before a "charm" of Gold-

finches; and a pair of Yellow-faced Honeyeaters were disturbed by a confident *tertium quid*. Welcome Swallows skimmed the river up and down, but not one White-backed Swallow did I see, not one nesting tunnel did I find.

At last, with eyes blurred with watching the moving water and the birds, I turned homeward. The swallows must have been a flock out hunting, not a nesting colony as we had hoped. That seemed, for the time being, to be the end of the story.

It wasn't—quite. On November 10th I was cycling through open country, about four miles east of the Tyers River, when several White-backed Swallows skimmed over the road in front of me—flying so low and so close that I looked down on their white backs—disappearing toward a creek half a mile away.

There seems no doubt of the species, though I am disinclined to be positive when I have never seen a named specimen for comparison. We have not seen another one. Perhaps we never will. But that discovery last spring remains a pleasant memory and an encouragement still to expect unfamiliar visitors to our familiar valley.

SPIDERS ASSIST BOTANISTS

Normally I do not like spiders, although I admire their handiwork of web weaving. At the Whipstick near Kamarooka in mid-May, Mr. Perry and I set out to find an elusive botanical specimen whose name we wished to confirm. Mr. Perry was eager to show me Nephila of the golden web. I did not like the look of her, less still after running into her net or parlour. We found Nephila on the alert but not spiteful; one thing we noted was her cleanliness about her house, for all the refuse of disused or unwanted food was gathered into a long waste bag and fastened on top of the web, well out of the way—quickness of movement was so necessary for catching her prey.

There were other spiders with grass-like webs sometimes nearly a foot long, the interwoven pieces of grass looking like nests in the shrubs, and on one of the lower shrubby plants we made our find. The plant we had searched for as "*Dodonaea procumbens*," although sticky and extraordinarily like it in foliage and general appearance, had small "nests" in which were tangled the unmistakable achenes of a composite. Our "Dodonaea" had cast its flowers except the six involucral bracts, but affixed to the web-grass "nest" was the cast material which identified our plant as *Olearia decurrens*, rather uncommon about here, for although we had walked a mile in a circle we saw only a few plants.

Without the aid of the spider, its nest and the bristles of the achenes holding firm to nests within the bushes, we should not have had our reward.

Deletion of *Dodonaea procumbens* will be necessary and *Olearia decurrens* substituted in my note, *Victorian Naturalist*, Vol. LIV, No. 8, December, 1942.

A. J. TADGELL.

OUR PERPLEXING SUN-ORCHIDS

A New Variety; Two Reductions in Status; the Evolution of a *Thelymitra* Column; and other Notes.

By W. H. Nicholls, Melbourne.

I. *THELYMITRA TRUNCATA*, Rogers[1] and *THELYMITRA MERRANÆ*, Nicholls.[2]

According to my own investigations over a number of seasons (since the spring of 1930) these are but forms of the well-known *Thelymitra ixioides*, Swartz.[3]

Th. truncata was first found in South Australia (at Myponga) in October, 1917. Rogers reports it as very rare. *Th. Merranæ* was recorded from Airey's Inlet, in Victoria (October, 1927-28). In a large collection of *Thelymitra* specimens collected in the hill country encircling Mount Cobbler (5,340 ft.) in Victoria during January, 1936, and brought home for study, quite an array of columnar forms were in evidence. All of these specimens had been tentatively labelled — after a cursory examination — "*Th. ixioides*, Sw. *typical*."

The above hypothesis, formed after careful examination of numerous specimens from other Victorian habitats, was thereby fully supported.

A representative set of column-forms, drawn mainly from Cobbler material, is shown here (see Figures G. to R.-U.V.W.). These show the gradual evolution of the two forms referred to above. The perianth-segments (upper) of both are usually dotted in the typical *ixioide*-fashion. In the case of *Th. Merranæ* this form (which is rare) should be regarded as transitional, and not as a fixed form or variety. It is unquestionably an intermediate between *Th. ixioides*, Sw., and *Th. truncata*, Rogers. It is not confined to the one locality, thus is not, as mentioned by Ewart[4] a "local form." It is now recorded from a number of habitats far removed one from the other.

But with *Th. truncata* the case is different; this form is more widely distributed (in some districts an abundant plant), consistent in the size of the plant, length of leaf, likewise in the size of the flowers. *Th. truncata* is also consistently few-flowered, though, like many other *Thelymitras*, variable in the colour of the blooms.

Thelymitra ixioides, Sw., variety *truncata*, *comb. nov.* (*Th. truncata*, Rogers).[1]—I consider that *Th. truncata*, Rogers, should be stabilized as a variety. Though usually associated with *Th. ixioides*, the variety *truncata* is not (as is the case with the form *Merranæ*) restricted to these areas. Many colonies of *truncata*

may be seen in habitats remote from the haunts of typical *Th. ixioides*.

II. *THELYMITRA PAUCIFLORA*, R.Br.[5]

This is one of our polymorphic species. One is sure to contract headache if persistent in the close examination of a large batch of flowers culled from selected districts. No wonder botanists have bestowed other specific (now synonymous) titles to one or other of its variations!

One form, remarkable for the dilated apex to the column middle lobe, has been collected in three areas, viz., Hurst's Bridge, Portland, Wonthaggi. How our orchids vary! But this strange feature is an inconsistent one, apparent only in approximately 50 per cent. of the plants examined. (Figures X.Y.)

Thelymitra pauciflora, R.Br., variety *Holmesii*, *comb. nov.* (*Th. Holmesii*, Nicholls).[6]—This is a Portland form, bearing 1-9 rich violet flowers. Here the column mid-lobe is somewhat large, cuneate and prominently cleft, and the hair-tufts of the penicillate lobes are usually yellow, sometimes streaked with red.

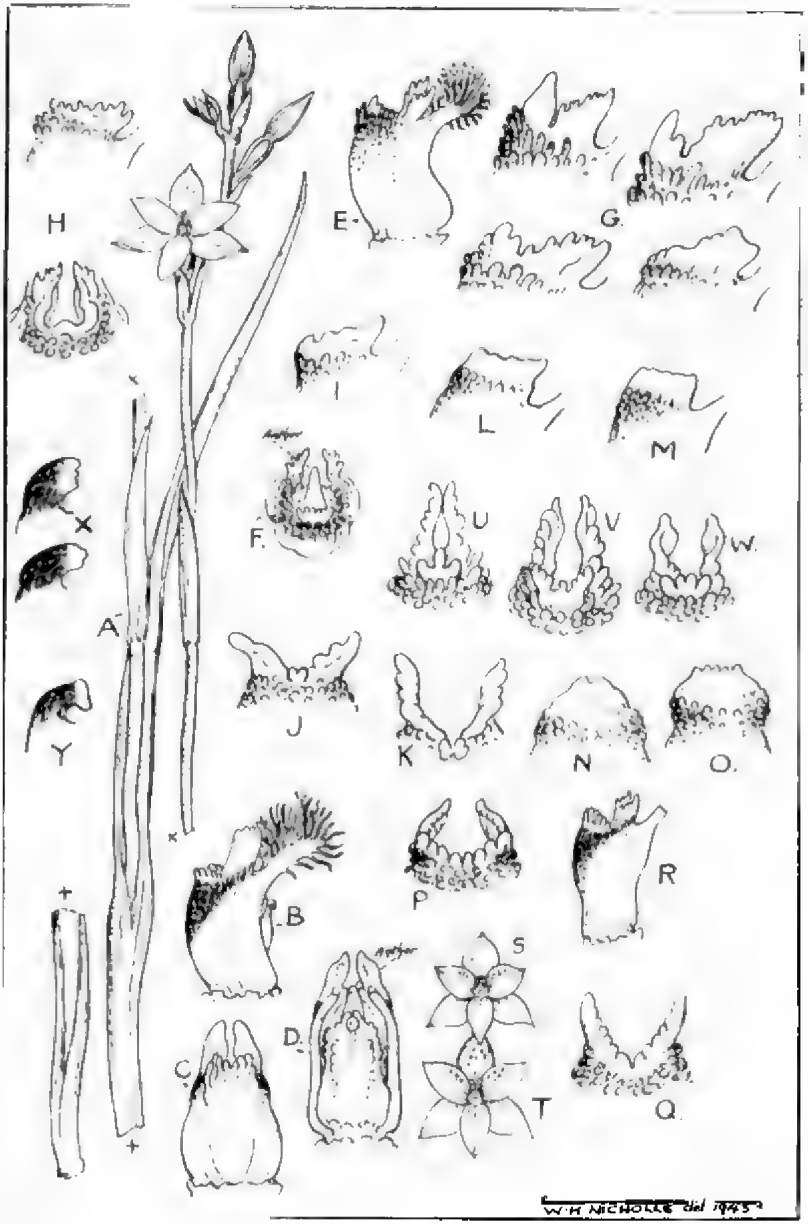
A solitary specimen—undoubtedly the above form—was forwarded to me by Mrs. F. Mellblom; it suggested a closer affinity with R. D. FitzGerald's West Australian *Th. mucida*[7] than hitherto suspected. In this particular instance the column mid-lobe was very small, the yellow and red hair-tufts in less definite *tufts*, the penicillate lobes short and stout. More material, however, is necessary for a conclusive diagnosis, for the specimen was not in a first-rate condition. Only a solitary specimen of *Th. mucida* has been collected—apparently at Wilson's Inlet, Albany, by FitzGerald.

Are these two orchids also transitory forms, in this instance of *Th. pauciflora*, R.Br.?

III. *THELYMITRA MEDIA*, R.Br.,[8] variety *carnea-lutea*, *var. nov.*

Planta gracilis conformans cum typo (*vide R. D. FitzGerald in "Australian Orchids"*); *omnino* (*floribus exceptis*), *pallide viridis. Flores pauci, 2-5, circa 1·5-2·5 cm. in diametro. Perianth-segmenta carnea supra infra lutea. Columna carnea, lobi intermedia magni; stigma prominens.*

A slender plant 23-40 cm. high. Leaf, stem and bracts a soft shade of glaucous green. Leaf linear, channelled, erect, 10-23 cm. long. Stem-bracts 1-2. Flowers 2-5, about 1·5-2·5 cm. in diameter. Perianth-segments pale flesh-pink, reverse surface of sepals yellow. Column pink, intermediate lobes very prominent.



Thelymitra. For Key, see page 58.

Stigma prominent. The soft glaucous shade of green which pervades almost the whole plant, combined with the dainty bi-coloured flowers (pale pink and yellow) form a neat combination of colour tones not previously recorded in the genus *Thelymitra*.

The habitat of this newly-found variety is "swampy land at Tynong North," in Victoria. (October-November, 1941; collector, Mr. J. Leppitt.) Mr. Leppitt is a member of the club and an enthusiastic collector and student of our orchidaceous plants. He reports this variety as numerous.

Th. media, in Victoria, is more commonly a robust, large-flowered plant. Occasionally it rivals *Th. grandiflora*, FitzG., the "Great Sun-orchid," in height, robustness, and beauty. The larger forms, in my experience, are often more abundant than the small slender forms, though these oftimes are plentiful also, and well distributed throughout *media's* range (in Victoria).

The finest examples of *Th. media* I have examined were collected near Wandin (C. Barrett) and from Yarra Junction (J. W. Audas). From these two localities the specimens possess, often, remarkably thick, leathery, somewhat rugose leaves, the plants attaining a height of well over 90 cm.

REFERENCES

1. *Trans.Roy.Soc.S.Austr.* xli, 343 (1917)—referred to by A. J. Ewart in *Fl.Vic.* (1930) as a variety of *Th. pauciflora*, R.Br.
2. *Vic.Nat.*, xlvi (nov., 1929), 139.
3. *Kong.Svensk.Acad.Handl.*, 228 (1800).
4. *Fl.Vic.* (A. J. Ewart), 329 (1930).
5. *Prodr.*, 314 (1810).
6. *Vic.Nat.*, xlix (1933), 263.
7. *Gard.Chron.*, xvii (1822), 433; fig. in *Aust.Orch.* ii (FitzG.).
8. *Prodr.*, 314 (1810).
9. *Orch.Zel.*, ii, 156.

KEY TO PLATE

THELYMITRA, Forst.

Fig. A.—*Th. media*, R.Br., var. *carnea-lutea, var. nov.*; B.—Column from side; C.—Column from rear; D.—Column from front. E.—*Th. ixioides*, Sw. Column from side; F.—Same from above; G.—Four variations of column mid-lobe from side; H.—Middle lobe of column from side (upper), and from above. Column mid-lobes, form *Merranæ*—I. (from side), J. (from rear), K. (from above). L., M.—Column mid-lobes of var. *truncata* from side; N., O.—Same as L., M. (but from rear; P., Q.—2 column mid-lobes from above. R.—*Th. ixioides*, Sw., var. *subdiffornis*, Nich.; (g) Column from side. S.—Flower *Th. ixioides*, var. *truncata*. T.—Flower *Th. ixioides*, form *Merranæ*. U., V., W.—*Th. ixioides*. Heads of columns from above; 3 variations of intermediate forms. X.—*Th. pauciflora*, R.Br. 2 column mid-lobes from side. Y.—*Th. pauciflora*, R.Br. Abnormal form of column mid-lobe.

(Note: In the majority of the figures the hair-tufts are not shown.)

GEOLOGY AND ETHNOLOGY OF THE KONGORONG HILLS, SOUTH AUSTRALIA

By S. R. Mitchell, Melbourne.

The coastal belt lying between the Glenelg River in Victoria and Kingston in South Australia is portion of an extensive plain that forms much of the south-eastern part of the State of South Australia. Its chief physiographic features are several volcanic craters, among them being Mt. Gambier and Mt. Schank, standing some five or six hundred feet above the plain, and a series of dune ranges that run parallel to each other and to the coast, particularly pronounced to the north of Millicent. They are seldom more than one hundred feet above the general level and are frequently indurated.

"The ranges are generally recognized," states R. L. Crocker, "as representing old coastal dunes or dune remnants connected with successive stages in the retreat of the sea in late Pleistocene or recent geological times." The Rev. J. E. Woods (1862) described the district as remarkably level and only slightly raised above sea level, much of it occupied by extensive swamps and morasses, with grassy plains and heath country, also immense sandy tracts supporting no grass, with belts of short and crooked stringy bark and some minor elevations. Ridges or low ranges of hills with limestone cropping out (indurated dunes) and ridges of sand, the former always well grassed and not thickly timbered.

The vegetation, he states, comprised *Casuarina, Bursaria, Banksia, Eucalyptus* and *Acacia,* and much *Pteris* (bracken). The sandy ridges were generally thickly timbered.

The abundance of surface water is accounted for by the flatness of the low-lying parts and the absence of watercourses. Much of this water could only find its way underground by slow infiltration through the soft rock beneath. Lake Bonney and the Dismal Swamp are two of these large swamps, the former extending some 30 miles to the north-west, with an outlet to the sea at Carpenters Rocks.

The observations of Woods are interesting and indicate very favourable conditions for a former aboriginal population. This is borne out by the profusion of the stone relics found on their old camping places, usually situated on the crests and flanks of dune ridges, from which the sandy capping has been removed by wind action (and locally known as "drifts"). These sites were then dry, sheltered spots, with abundant water and food supplies in the vicinity. Settlement has since greatly changed the appearance of the country, which is now carrying prosperous farming communities.

Much of this coastal belt is underlain by a white limestone of Miocene Age, consisting mainly of fragmental material derived from bryozoa, corals, foraminifera and other marine organisms. It is used locally as a building stone, and being comparatively soft, can be sawn into blocks, which on exposure harden into durable constructional material.

The ridges of consolidated dune sand are highly calcareous and are now quite hard. The sandy cappings result from the leaching out of the calcium carbonate, leaving the quartz grains as loose sand. Freshly exposed surfaces of these ridges show a remarkable series of pillars and pinnacles that vary in height from 6 inches to 2 feet or more and from 4 inches to 15 inches in diameter. These pillars are very characteristic of the older and harder limestones. In this case sand has protected the limestone from the denuding agencies without retarding the solvent effect of the rain water which has carried away the limestone between the pillars.

Associated with the tertiary limestone is a somewhat poor quality flint in masses of irregular shape, tabular sheets two or three inches in thickness, and nodules, usually occurring immediately above more or less impervious beds, and on different horizons. This flint is black, or of various shades of grey, buff, or brown. It breaks with a well-marked conchoidal fracture, but the fresh surfaces are usually dull, unlike the better quality flint of the Old World.

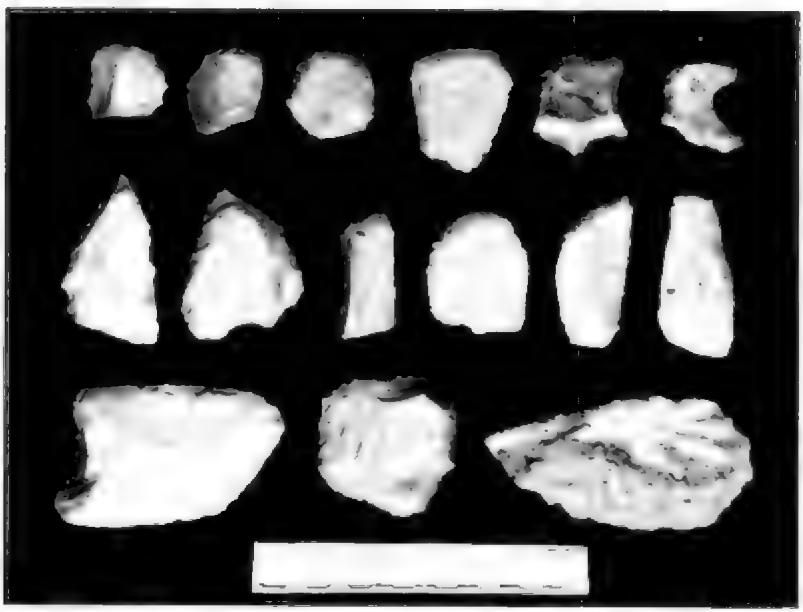
The presence of remnants of marine organisms indicates its origin as a molecular replacement of portions of the limestone by solutions, whereby the calcium carbonate has been dissolved, simultaneously with the precipitation of silica in a crypto-crystalline state. It is known that some sponges, foraminifera and diatoms are composed largely of silica which is readily soluble in alkaline water. Whether this chemical reaction took place during the formation of the limestone, where it would be subjected to pressure and possibly a rise in temperature, or subsequent to its elevation, is an interesting speculation.

The denudation of the limestone has freed some of the flint which now lies on the surface wherever it is not masked by later deposits. Wide marine platforms that are exposed at low tide and the large quantities of flint in the coastal shingles piled up by wave action indicate the seaward extension of this formation. Some old shingles also extend inland, providing further evidence of a comparatively recent change of sea level. Both the surface flint and that from the shingles show much surface alteration in the form of a brownish-grey or white crust or cortex.

A visit to the Kongorong Hills, south-west of Mt. Gambier, was

PLATE IV

Blown surface of an aboriginal camping site on a Kongorong hilltop, showing limestone pillars.



Typical flint artifacts from the Kongorong area.

Photos.: S. R. Mitchell.

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made for the purpose of investigating some of the camping places and artifacts of the aboriginals. Seven sites were examined and a large number of implements collected. Their abundance in this district may be accounted for by the large quantities of flint available, and the ease with which suitable flakes could be produced. The outstanding characteristics of the artifacts is the absence of any conventionalized types. No attempt had been made to produce any particular form of flake, the principal objective being a flat, or slightly concave, or even a convex surface on which a cutting, scraping or sawing edge could be formed by percussion or pressure flaking. The shape, thickness or size of the flake or piece of flint selected was immaterial, some well-worked or used implements being made from very rough or even cavernous flint, others from thick, massive pieces giving rise to high-keeled or horse-hoof types.

Of 240 specimens examined, 55% retained more or less of the original brownish crust similar to that on the flint lying about in the vicinity and were the first flakes struck from the core. Apparently little or no flint was obtained from the coastal shingles, which invariably has a white cortex. All of these camps are at least five miles inland. The small amount of debris, small flakes and chips, and the few hammerstones and cores present would indicate that only usable flakes were taken to the camps.

Almost every conceivable shape of implement is to be found. Some show little use: others have working edge on much of the margin. Implements approximately circular, semi-circular or oval are common; others have the effective edge on one or both sides, one end, or on the sides and end; some have concave notches (7·8%) suitable for scraping round objects and some have projecting points, together with a large proportion of crude asymmetrical types. It would appear that in most cases the final shape largely depended on the original shape of the flake or lump, and the amount of re-edging given it during use.

One interesting find consisted of 15 pieces lying within a radius of 2 feet, five of these having been struck from one banded type of flint and six from another. Eight were flakes only, showing no signs of usage and are obviously blanks, the largest measuring 5·2 × 3·2 inches. The others show more or less use as scrapers.

Another set consisted of 11 artifacts, found within a radius of 4 feet, seven having one or more well-defined concave or hollow notches for scraping round objects. From their proximity to each other and the similarity in material, it can be assumed in each case that the one artisan made and used them for a similar purpose.

The majority of the artifacts found in this locality show more or less alteration in the form of a friable crust which may extend

nearly or quite into the centre. They are usually buff in colour through staining by iron oxide, and have a pronounced glossy surface. Chemical analysis proves this crust to be largely silica. Long exposure to weather and water containing solvents has caused the removal of varying amounts of silica, which may be as much as 40% of the original crust. This chemical change has been accelerated by the slightly porous nature of the flint, and is probably much more rapid than is generally considered.

Only two of the larger implements of flint flaked on two sides were found, and one badly-weathered ground-edged axe of basalt. The former type is very common on some of the coastal dunes in Victoria, together with a *coup de poing* type and it is possible that many of those described as choppers should be classed as blanks or cores, the purpose of the flaking being to ascertain whether the internal flint was suitable, and reserved for future use.

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OWEN STANLEY IN AUSTRALIA

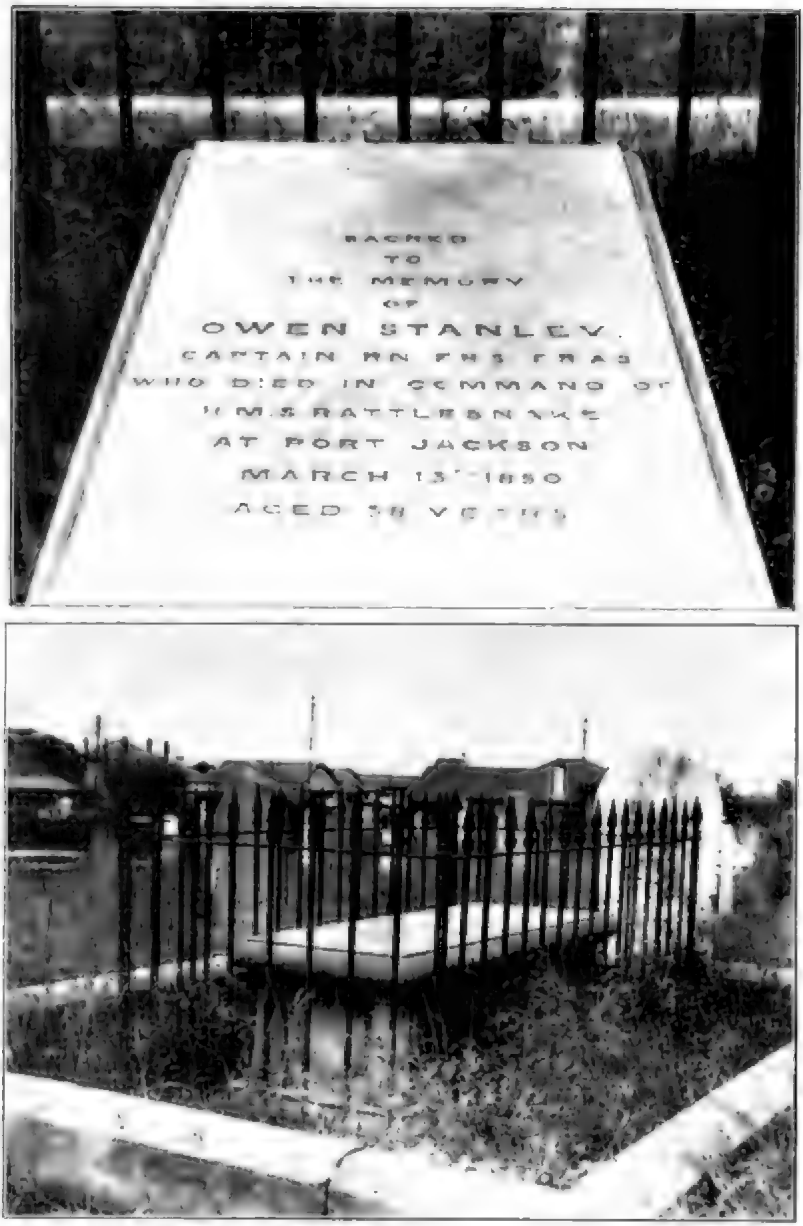
By A. H. Chisholm

The most important mountains in the Pacific War at present are the towering heights of the Owen Stanley Range, our main defence line in Papua. Yet few people know anything of the man after whom they were named—a distinguished figure in the Australia of his day, whose grave is in this country.

Owen Stanley was a bright youngster in England in the early part of last century. Eldest son of the Right Rev. Edward Stanley, Bishop of Norwich, and Catherine, daughter of the Rev. Oswald Leycester, he might easily have become a country parson. But the sea was in the boy's blood and at the age of 13 he entered a naval college. At 18 he was a midshipman voyaging to South America, and at 19 he was with Captain P. P. King (afterwards famous in Australia) surveying the Straits of Magellan. What better beginning than that could any sea-minded lad have desired?

During the early 1830's Stanley served on a number of ships, mainly in the Mediterranean, and notably with a man who afterwards became Lieutenant-Governor of Tasmania and a famous Arctic explorer, namely, Sir John Franklin. Stanley, too, had a taste of the Arctic; he was there in 1836-7 as lieutenant in charge of astronomical and magnetical observations aboard H.M.S. *Terror*. That experience was to have a curious repercussion in Australia years later.

PLATE V



Grave of Owen Stanley on St. Thomas's Cemetery, North Sydney

Photo: K. A. Hindwood

Australia first knew Owen Stanley in 1838, when, as commander of H.M.S. *Britomart* (and aged only 27) he assisted to establish at Port Essington, north-east of Darwin, the settlement of Victoria, which afterwards became known as the capital of North Australia. That visit was the beginning of a long association of Stanley with this country. In various vessels, particularly H.M.S. *Rattlesnake*, he did a considerable amount of valuable work in surveying the waters of North Australia and New Guinea.

During his northern wanderings Stanley frequently returned to the little settlement on Port Essington. He was there, for example, in August, 1839—just 103 years ago—and showed his resource by organizing and stage-managing the first performance of the drama in North Australia, with hardy marines in the female parts. The name of the play is not recorded, but the performance was based upon a book that had "already performed a voyage to the North Pole" (presumably with Stanley), and the scenery was painted by Stanley himself with what a chronicler of the day termed "earths of the country."

The versatile young officer had, in fact, distinct ability as an artist. Between intervals of marine surveying he painted many scenic pictures, and a considerable number of these are now in the Mitchell Library, Sydney. Showing as they do aspects of early Australia, they are a record of historical features.

Meanwhile, too, Captain Stanley became well-known as an astronomer and general scientist, and he rendered most valuable service to John Gould and John Gilbert in their work on the birds of Australia. Stanley and Gilbert met at Sydney in 1840, when the captain offered to take the bird-man to New Zealand on the *Britomart*.

This, then, was the accomplished Englishman in whose honour the great bastion of Papua (and later also a mountain in North Queensland) received the name of Owen Stanley.

In December of 1849 the officers of the *Rattlesnake* examined the Owen Stanley Range. They found the highest peak, Mount Owen Stanley, to be 13,205 feet.

Tragedy developed a few months later. The *Rattlesnake* returned to Sydney and there, on March 13, 1850, Owen Stanley died on board his vessel. He was only 38 years of age, but he was worn out by the effects of tropical fevers and by the heavy work and responsibility he had shouldered as a track-blazer in northern waters. Also, he had been stricken by the news of the death of his father and his brother.

Captain Stanley was buried by the Rev. W. B. Clarke, in the presence of 400 sailors and a large number of civilians, at old St. Thomas's Cemetery, North Sydney. His grave has long been neglected. It should be a public possession.

THE SWARMING OF THE SWALLOWS

For many years a reed-fringed lake at Blackburn has afforded an exceptional chance to watch the autumn flocking of swallows. For some weeks before their northern flight they gather at the lake in late afternoon, hawk over the water for about 20 minutes, and enter the reed-beds at sundown.

To witness their first morning flight, one must reach the lake before dawn. In typical autumn weather one can just discern the trees, all motionless, darkly mirrored in still, brown water. Although we know that the swallows are among them, not a reed stirs until dawn, when the whole flock streams out and up, to where the sky is just growing light. They are out of sight for five minutes or so, when they become visible again, then descend a little, before flying off in a south-westerly direction—returning to the reeds just before sundown. It seems very wonderful that entering the reeds and their greeting to the sun are so accurately timed, although not more so than other deeds in their chequered lives.

For ten years a small band has roosted, from early in March, on six insulated wires under the verandah of a Blackburn shop. They are still there (35), and will probably remain through the winter. It has been interesting to note how accurately they are spaced, like vertical lines in a piece of brickwork, one line facing east and one west, so that no droppings fall on the lower birds. Dr. O'Shaughnessy told me to-day (June 15) of a band of 175 which have roosted under a Lilydale verandah for three years, probably longer. The Olinda Creek is near, and there is, as one so often notes, an area of low-lying, treeless, sedgy land which offers unimpeded hawking space.

During the first two weeks in December, 1942, a flock of about 50 swallows visited my garden. They flew in and out of the tops of some silverleaf stringybark trees which grow in the fowlyard. It was beautiful to watch their aerial manoeuvres as they probably disturbed good insect-food in flying through pendent branches. We were puzzled to know why, for two weeks, the fowls would suddenly run from the sunny end of their enclosure to the shady end, which they had never favoured except in extremely hot weather. They would remain there for hours as if greatly alarmed. Egg-laying dropped off sadly. We could not trace the cause until I stood quietly in the yard and noticed the beautiful pattern of swift-darting shadows the swallows were weaving on the ground. Evidently these shadows suggested hawks. The swallows left us on December 15.

Recently I came upon the following note on swallows and poultry in Michelet's *The Bird*, published in 1856: "They have less cause than any others to dread the beasts of prey, from their lightness of wing; and they are the first to warn poultry-coops of their appearance. Hen and pigeon cower and seek an asylum as soon as they hear the swallows' signal notes." Is it the shadow or the signal note that frightens the fowls?

EDITH COLEMAN.

A SPIDER'S TRICK

G. H. Easton, of Toorak, says that, while in the garden a few evenings since, he noticed a large black spider lowering itself from a high branch by a single thread. After dropping thus some distance it cast off a second thread to a side branch, and then remained suspended and perfectly still. When a small moth came flitting near, the spider either cut or cast away the side stay and swung over just in time to intercept and catch the moth, which it ate. This was repeated and never failed to catch the moth or fly.—(The *Argus*, Melbourne.)

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PROCEEDINGS

The monthly meeting of the Club was held at the Royal Society's Hall on August 9, 1943. The President (Mr. P. F. Morris) presided and about 90 members and friends attended.

It was announced that Mr. A. F. Fullard, a member of over 40 years' standing, had passed away, and members stood in silence as a mark of respect.

"BRAINS TRUST," No. 2

The subject for the evening was "The Brains Trust," Part 2, with leaders and subjects as follows: General Zoology, Mr. P. Crosbie Morrison; Ornithology, Mr. A. H. Chisholm; Botany, Mr. P. F. Morris.

Question 1. To Mr. Morrison: "What is *Anaspides tasmaniensis*? Is it an insect, an animal or a crustacean, and why all the fuss about it anyway?" *Answer*: A freshwater crustacean of unique character, and the only living form of permo-carboniferous fossil types. Habitat: The mountain pools of Mt. Wellington, Tasmania, with a decided preference for the ice-water pools. *Comment*: Mr. F. S. Colliver stated that a fossil of the same genus is recorded from the Triassic deposits of Brookvale, N.S.W.

Question 2. To Mr. Chisholm: "How many kinds of Bower-birds are there in New Guinea, and are they in general the same as those of Australia?" *Answer*: New Guinea is now known to have nine species of Bower-birds, as against eight in Australia. Only one species is shared by the two countries. Some of the New Guinea species, such as the Gardener Bower-bird (*Amblyornis*) build very distinctive bowers, but the habits of some others are not yet known. *Comment*: Mr. P. F. Morris stated that a Satin Bower-bird had on one occasion built a bower in the Botanical Gardens and had decorated it with paper streamers discarded after a Boat Race day. There were also fragments of blue glass and a number of aluminium milk-bottle tops.

Question 3. To Mr. Morris: "I have read that the group of Euphorbias has members ranging from plants 2 inches high to trees 40 feet high. Is this correct, and if so, why are all these plants lumped together?" *Answer*: The statement is entirely correct, and I would go one better and say that the range in size

is from *E. cuneifolia* of France to *E. Winkleri* of Africa; the first being a delicate little herb of about 1 inch high and the other a huge cactus-like growth of 90 feet. The reasons for the lumping together of such apparently diverse plants is that their respective fruits and flowers are very closely related in structure. *Comment*: Miss J. W. Raff asked if the *Poinsettia* was a *Euphorbia*. Answer: Yes. Mr. Fisch asked if the family were represented in Australia. Answer: Yes, by many species.

Question 4. To Mr. Chisholm: "Could we have a list of birds that are named after human occupations, together with notes on why they bear such names?" *Answer*: Such a list would include the Miner (Soldier-bird), Scissors-Grinder, Tailor-Bird, Policeman-bird (Jabiru), Auctioneer-bird (Logrunner), Carpenter-bird (Nightjar), Butcher-bird, etc. (Reasons behind the names were also given.)

Question 5. To Mr. Morrison: "Why are the Australian animals regarded as being primitive?" *Answer*: Because in the case of the Monotremes there is the reptilian character of laying eggs, and in the case of the Marsupials the production of very immature young that are suckled in a pouch for some months before they are able to fend for themselves.

Question 6. To Mr. Morrison: "Have kangaroos ever given birth to more than one young at a time?" *Answer*: No record of this, but if it ever did happen only one could live, as there is only one functional teat within the pouch.

Question 7. To Mr. Chisholm: "How many kinds of Australian birds are known to nest in association with each other, and is it for mutual protection?" *Answer*: The following can be listed: Wagtails and Mudlarks, Manucodes and Black Butcher-birds, Mopokes and Grey Butcher-birds, Yellow-tailed Tits and Magpies. In some cases (as of the Manucode seeking the Butcher-bird's company) it is for protection; in other cases the reason is doubtful.

GENERAL BUSINESS

Mr. P. F. Morris reported on the excursions to the National Museum for the subjects Anthropology, Conchology and Ornithology.

The following were duly elected as Ordinary Members of the Club: Mr. and Mrs. J. Pinches, Miss J. R. Cummin, Messrs. L. P. Richardson, F. J. Sullivan, R. Mew, J. E. Jewell; and as Country Member, Mr. R. S. Bellinger.

ON THE SWARMING OF *SCATOPSE SP.* (DIPTERA)

By JANET W. RAFF, Melbourne

The purpose of this paper is to record the occurrence of swarms of blackish midges (*Scatopse sp.*) found clustering on trees and shrubs at Croydon, Victoria, in the autumn of 1942 and 1943 on almost coincident dates.

On 24th April, 1942, Mr. T. S. Hart observed at Croydon swarms that had settled on branches of *Acacia verticillata* in a grassy paddock. He did not know how long they had been there. He forwarded specimens to me, together with some field notes, from which I have copied the following: "Thin branches were bending down under their weight, and about 10 feet in total length of several twigs was occupied, clusters of flies frequently falling off."

I have to thank Mr. Hart for drawing my attention to these swarms—a really remarkable sight as I saw them a few days later. The tips of the branches were still bearing clumps of flies, giving the appearance of small blackish mops.

It may be of interest to quote Mr. Hart's description of the situation of the swarming: "a grassy paddock lightly timbered in parts with various Eucalypts, and some *Casuarina* and *Exocarpus*; remaining shrubs mainly *Bursaria* and *Acacia verticillata*. One *Acacia verticillata* heavily loaded with insects, another more moderately, others in the same patch apparently free from these insects." The paddock is moderately grazed by a few dairy cattle.

Swarms were noted also at another spot in the vicinity, namely, "on the edge of open grassland and near cultivation (oats, maize and potatoes). The flies had settled on branches of a Peppermint (*Eucalyptus australiana*), and also on tea-tree (*Leptospermum scoparium*)." The swarms were still to be seen some ten days later, though, owing to heavy rains, they had apparently been broken up to some extent and had reassembled in smaller masses.

This year swarming has again occurred at approximately the same time, Mr. Hart informing me in a letter dated 21st April, 1943, that he had seen clusters a few days previously in the same two places as the 1942 swarms, on *Acacia verticillata*, on some rushes nearby, and on other plants.

The family *Scatopsidae* is a small group of minute blackish flies, included by some workers in the family *Bibionidae*. Although they are classed along with midges, their bodies are more thick-set than the better-known of the midges. Their larvae are said to live in damp soil, feeding and breeding in great numbers in decaying organic matter.

(The Croydon swarms had probably developed in manure and general decaying matter in or near the paddock cited.

Further instances of this autumn swarming of midges in Victoria are suggested by the following:

(a) A report of warms seen in Croydon in 1940, similar to those of 1942 and 1943.

(b) A large mass of *Scatopse sp.* (about a cupful) was forwarded to the University on 31st March, 1928, from Montrose, where swarming was seen; the specimens were taken by Mrs. Donald Thomson from a large cluster on "Tree Lucerne."

(c) In a report of a Field Naturalists' Club excursion to the Bass Valley during Easter, 1911 (about April 16th), Mr. E. Brooke Nicholls[1] notes that "an interesting feature . . . . was the finding of an 'ivy' bush, in flower, swarming in parts with small flying insects (midges). So thick were these that at a short distance parts of the green ivy appeared blue-black in colour. A leaf two or three square inches in area accommodated hundreds of the insects. When disturbed by throwing a stick into the bush, they fell off in a cloud as thick as smoke." (The blue-black colour of the midges suggests *Scatopse.*)

Numerous references to fly swarms are to be found in literature, and although those dealing with the Scatopsid-like midges refer mostly to spring (not autumn) swarming, it may be of interest to quote some of these cases.

Foster[2] records swarms of *Scatopse atrata* occurring in the spring of 1932 in Georgia, U.S.A. These lasted for several days, the insects issuing in countless numbers from between corner boards of a dwelling house, and were pairing during flight. This species is one commonly found in Georgia, on the inside of windows, especially in basements.

In the spring of 1901 swarms of *Bibio fraternus* on pastures at Lake Forest, Illinois, U.S.A., were described by Needham.[3] Countless numbers were flying in sheltered places in the woods, or climbing on blue grass panicles, or resting in pairs on leaves.

Professor Herbert Osborn[4] wrote that in the spring of 1891 the white-winged Bibio (*Bibio albipennis*) was present in phenomenal numbers in Iowa, U.S.A., and was attracting attention far and wide.

Barnes[5] refers to an autumn swarm reported by Douglas as an "all female swarm of *Dilophus vulgaris* (*spinatus* Wlk.), a Bibionid, on the schooner *Topsy* on 2nd September, 1880, about a cable's length from the Norfolk coast. He reported that they were thrown overboard by the shovelful."

The phenomenon of swarming is indeed a remarkable one, and in the case of our local autumn swarms, one wonders whether the flies will be capable of hibernating over the winter in sheltered places, to emerge for egg-laying in the spring. In this regard it is of interest to note that Skuse,[6] referring to the species

Scatopse fenestralis in New South Wales, says that it is very abundant in September and October, and that "in the spring months it is scarcely possible to find a window without one or two specimens." He had frequently seen hundreds swarming on the inside of shop windows in Sydney.

I am indebted to Mr. T. G. Campbell, of the Division of Economic Entomology, Council for Scientific and Industrial Research, Canberra, for examining the Croydon specimens. He notes that though they resemble *Scatopse fenestralis* Skuse, they differ on some characteristics.

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4. Osborn, H., *Insect Life*, vol. 3, 1891, p. 479.
5. Barnes, H. F., *Entomologists' Monthly Magazine* (London), vol. 69, 1933, p. 230.
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EXHIBITS AT AUGUST MEETING

Mrs. J. J. Freame: A small series of bird skins.

Mr. H. P. Dickins: Yellow form of *Banksia collina* from Cembrook.

Mr Ivo C. Hammet: Garden-grown native plants, including *Grevillea lavandulaceae, G. linearis, G. alpina, G. oleoides Sholtzia oligandra, Eriostemon gracilis, E. obovalis, Diploloena grandiflora, Howea lanceolata, Templetonia retusa, Micromyrtus ciliatus.*

Mr T. S. Hart: *Eucalyptus yangoora* (Melbourne form of *E. eugenioides*), the white stringy-bark; part (as labelled) from a tree identified by Blackely; loc., Croydon, Vic. *E. macrorhyncha* (Red Stringy-bark) old and young fruits; loc., Croydon. *Muehlenbeckia Cunninghamii* (Tangled Lignum) grown from a piece rooted in water; collected at Kororoit Creek, Sunshine.

Mr. O. P. Singleton (on behalf of the Geological Museum, Melbourne University): *Geoteuthis bollensis*, a cephalopod from the Lower Jurassic of Metzingen, Wurtemburg, Germany, showing the ink-bag in position.

Mr. F. S. Colliver and Mr. O. P. Singleton: A series of Australian Tertiary Cephalopods, including new species from the Eocene of Pebble Point, near Princetown, Victoria. A series of *Aturia australis*, two specimens of which show colour banding, a rare feature in fossils; Nautilus species from the Eocene and other Victorian Tertiary deposits; and two specimens of the rare Cuttle-fish, *Notosepia cliftonensis*.

NATURAL HISTORY MEDALLION

Major H. W. Wilson, for many years lecturer in nature study at the Teachers' Training College, Melbourne, a founder of the Gould League of Bird Lovers, and a former chemical adviser on gas to the A.I.F., has been awarded the Australian Natural History Medallion for 1942. The presentation will be made at a meeting of the Field Naturalists' Club on September 13.

THE LITTLE MOUNTAINS

By E. M. Webb, Melbourne

I suppose psychologists would find it easy to diagnose a man with a passion for climbing hills. Anyway, I make no apology for the habit, although I have not been able to indulge it lately.

The snowclad mountain leaves me cold. It is too high and aloof, and when you get to the top all you can see usually is the tops of a lot of other hills. The little mountains are different. They are close and intimate and friendly. From their summits you can see life going on all round you—the little farms, the patches of crop, the courses of rivers, the bits of forest, and the winding roads. You are still in the world of man although not of it.

It is possible to feel friendly towards mountains, and the first friend I made was Mount Korong. He stands nobly near the roadside between Inglewood and Wedderburn—not very high (about 1,400 feet), but truly massive, dignified and old.

I have climbed him twice and passed him dozens of times. Even when I am past, I must turn for one more look. He is an old granitic tor, worn down by millions of years of buffeting by wind and rain. From his top you can see the remains of the friends of his youth, little stumps of granite hills like the worn-down teeth of an ancient animal. They, too, were mountains in the dim past.

There is something thrilling about the huge granite boulders that stand on the top and sides of old Korong. They are immense, imperturbable and time-defying. They inspire the thought that man is little and the universe great.

Once, in the early afternoon, I drove past old Korong. There had been a shower of rain, followed by bright sunshine. The rocks on the mountain were wet and they reflected back the sunshine from a thousand places. It was a beautiful and dazzling sight, like reflections from the windows of a great city built on the hill.

Major Mitchell, in his explorations of 1836, turned his theodolite on Mount Korong from Pyramid Hill and subsequently steered in that direction. When he reached the base he climbed it. (Mitchell, too, was fond of climbing hills.)

Pyramid Hill, in the Loddon Valley, is another fascinating old tor. Travelling up from Bridgewater to Kerang you see it rising out of the great plain like a veritable tomb of Cheops. It stands practically alone and if you are allergic to hills you cannot take your eyes from it. I took the first opportunity to inspect and climb it and have since scaled its pointed top a second time.

To my amateurish eye the granite looks very old and worn, and the geologists agree that it is very, very old. Mitchell stood on

the top of it like a Moses surveying the Promised Land and waxed lyrical on the beauty of the scene below.

The most beautiful mountain of all, when seen from the proper angle, is Mount Napier, about eight miles south of Hamilton. It is an old volcano with a deep crater and alternating steep and sloping sides. I had seen its top often, but it was not until I came on it from the south that I realized how truly lovely it was.

Coming up from Portland towards Hamilton, you strike east at Myamyn to pick up the Macarthur-Hamilton road. On the way Mount Napier presents itself, a perfect thing of misty blue, rising symmetrically out of the bluestone plain with gently sloping sides leading up to the concave top which indicates the crater.

As you draw nearer the blue changes to a vivid green, for the slopes are studded with trees. I made a detour to reach it and presently, after a fairly easy climb, was on the top. Indications of its last lava flow can be picked out along one of the creeks.

One morning early I packed a friend in the car and drove up to Castlemaine for breakfast. Afterwards we went on to Maldon and drove to the top of Mount Tarrangower. Old poppet legs provide a lookout up there and the sight is more than worth the effort. The rocks are metamorphic (hornfels) and much more resistant than the surrounding granite.

Then the car took us to Smeaton on the Ballarat plateau and presently we were climbing up the steep slopes of Mount Kooroocheang, a massive lava heap overlooking the ancient home of Captain John Hepburn, who settled in its shadow in the late thirties or early forties. There is a monument to Captain John at the top and a grand view of the fertile plateau.

Down below we could see Captain John's fine old bluestone house and near it his private cemetery, where his bones and those of some of his family are laid. On Kooroocheang I picked up a pretty sample of a volcanic bomb.

Just across the way from Kooroocheang, so to speak, is Mount Beckwith, a handsome hill from a distance but obviously not volcanic. Beckwith is just outside Clunes and I had been wanting to climb it for some time, but getting to the base by car was not easy. Finally we left the bus at a farmhouse and walked what seemed to be miles.

It was a steep climb and the day was hot. We scrambled up mostly on hands and knees and walked along the ridge to the top, where my companion took off his clothes and wrung the perspiration from them. Nudity was safe enough there, but I don't want to put ideas into anybody's head about starting a nudist club on old Beckwith!

The rocks are granitic, with pink felspar in them—at least those of the trigonometrical station were—and I brought away a sample. There must be an easier approach to Beckwith; I will find it some day.

Then on to Ballarat to drive to the top of volcanic Mount Buninyong, the highest above the sea of all these hills. The lookout there is necessary to get you above the treetops. After that—home in the dark.

I must not omit referring to what I call the smallest mountain in the world. Mount Wycheproof is the Mallee's one mountain, although it only stands about 300 feet above sea-level and is hard to see from anywhere. It also is granitic. On its top is a tall pole carrying an electric light, put there as a beacon to travellers by a kindly shire council. There are no problems in climbing Mount Wycheproof. You just stroll along and are there.

Mounts Noorat and Leura in the Western District are worth a look. The former has a road to the top. When I climbed Noorat a bull eyed me contemplatively as I crossed a paddock, so I climbed quickly.

I mustn't miss out the You Yangs. These, too, are noble old hills. On the top of Flinders Peak (originally called Station Peak) you stand alongside the ghost of that great little man Captain Matthew Flinders, who was up there in 1802 having a look round. He buried there a cylinder containing a record of his visit, but I never heard of anybody finding it. The You Yangs are granitic and are reminiscent of Mount Korong in shape.

Granite always confers nobility. A favourite exit of mine from Melbourne is over the Lancefield Pass to Toohorac (the old-timers wrote it Toobouric). The way lies high up over a vast granitic plateau that I have christened "The Grey Country." It is windswept, and even in spring has always a touch of greyish sadness conferred by great boulders and little rocks. To me it is exquisitely beautiful and I never tire of passing through it.

I nearly missed Mount Arapiles, that whale-like outlier of the Grampians, which lumbers out of the Wimmera plains and is a sight to make you gasp when you first see it. You can drive up to the top.

Outside the northern face of the Grampians are the remnants of what appears to me to be a very much older range. Chief of these old hills is Mount Dryden, which I have climbed, although that is no feat because it is worn down by the strife of many millions of years. Its rocks (diorite) are so tough that no stonecrusher will look at them. These old hills seem to me to be far more interesting than the Grampians themselves.

There are many more little mountains in western Victoria that I hope to climb some day when this pestilential war is over.

QUARRIES USED BY THE ABORIGINES OF THE PAROO RIVER, N.S.W.

By C. C. Towle, Eastwood, N.S.W.

During the month of May, 1933, I spent several days on Tillenbury Station, which is situated on the channel of the Paroo River, about 25 miles north of Wilcannia. I had already done considerable collecting of stone artifacts in the vicinity of Wilcannia, including Lake Woytchugga, and had also been about 35 miles north of Tillenbury in the vicinity of Lake Peery.

At Tillenbury the stone artifacts were generally similar to those found in the areas to the north and to the south. Some slight but significant variations in the flakework were due to certain local conditions, which will be mentioned in this paper. After traversing a great part of Tillenbury, especially that part near the channel of the Paroo, I noted that flakes, core-like implements, cores, and mill stones were lying everywhere in abundance. It was evident that the aborigines had had ready access to plentiful supplies of materials.

Quartzite Quarry for Flakes, etc.

For making flaked stone implements, quartzite was used by the aborigines in every part of north-western New South Wales. In texture it varied from fine-grained to coarse-grained. The fine-grained material, which was found in many areas, was sufficiently homogeneous to enable the aborigines to produce a proportion of finely chipped implements, including the more conventionalized types, such as the pirries, the crescents and the adzes (a hafted type). The coarse-grained materials were much more widespread. Of them, some of the coarser-grained and less homogeneous varieties were not generally suitable for the making of implements belonging to the conventionalized types, but they provided the aborigines with a plentiful supply of flakes for knives and scrapers of all kinds.

On nearly all of the camping grounds I found a mixture of the coarse-grained and the fine-grained materials. In the areas around Wilcannia the coarser-grained materials predominated. Near Lake Peery a much greater proportion of fine-grained material had been used by the aborigines. At Tillenbury the coarser-grained varieties were so predominant that after several days' search only a few implements made from fine-grained material were collected.

During my visit I examined the areas on both sides of the channel. At Tillenbury the channel of the Paroo, which is normally dry, is more than a mile in width. The low banks on

both sides are marked by lines of sandhills which continue to the horizon. At several places along the banks there are outcrops of quartzite. On the eastern side of the channel, not far from the southern boundary of Tillenbury, I located along the top of the bank a well-exposed outcrop which had been used extensively as a quarry by the aborigines. (Plate 1, No. 1.) Many thousands of flakes, roughly shaped cores, and shattered stone covered the surface of the ground for a considerable distance. In every direction I found flakes lying undisturbed in small clusters where cores had been broken up by the aborigines. The amount of flaking which had been done was far in excess of actual requirements.

At quarry sites in some other parts of Australia, according to Spencer and Gillen,[1] Roth,[2] and others, the aborigines produced large numbers of flakes from which they selected only those which suited their requirements or their tastes. The residue was left on the site for subsequent use if the need arose. Apparently the aborigines at Tillenbury also followed the same practice.

The flakes obtained by the aborigines from the material at the quarry were on the average large in size. In proportion to the number of flakes on the camping grounds in the vicinity, the number of implements showing marginal retouch was unusually small. Very few of them belonged to any of the conventionalized types. The material generally did not appear to be suitable for fine marginal retouch.

The aborigines required large quantities of stone for making flaked implements. Where local supplies were obtainable, as they were at Tillenbury, the aborigines made the widest use of them, even if the material was not so tractable as that obtainable elsewhere. Scraping and cutting implements of all kinds could be, and were, fashioned from a great variety of rock material. If in any locality suitable material was not found for such conventionalized types as the adzes, it was obtained from elsewhere, usually by barter. At Tillenbury, as I have stated, a few flakes of fine-grained material were found, but apparently for nearly every purpose the local material adequately met the requirements of the aborigines. The paucity of conventionalized types may not have been a matter of prime importance to the aborigines.

With such an abundance of flakes at hand, the aborigines at Tillenbury had small need to spend their time resharpening used flakes by marginal retouch. From the evidence which has been collected by investigators in contact with the aborigines, there cannot be any doubt that flakes with sharp edges unmodified by retouch were efficient implements in the hands of the aborigines. Mountford[3] and Tindale[4] have each given descriptions of the

Plate VI

No. 1. Site of quartzite quarry showing outcrop and stone-strewn surface.

No. 2. Site of sandstone quarry showing stone-strewn surface. The outcrop is behind the trees.

No. 3. Large roughly-shaped stone, in situ, in course of preparation as mill stone, 30 ins. × 17 ins. × 3 ins.

Photos.: C. C. Towle.

work done by the Central Australian aborigines with crudely prepared pieces of stone.

At Tillenbury there were also large numbers of core-like implements made from the same material as the flakes. Implements of this type have been found widespread in western New South Wales.

Quarry for Mill Stones

It was not until six years after the discovery of the quartzite quarry that the large number of mill stones which I had found in the vicinity of Tillenbury had been satisfactorily accounted for. In April, 1939, I was searching for specimens in the Pondie Ranges on the western side of Tillenbury, not far from its southern boundary. In that part there are many low ridges where a compact sandstone outcrops in relatively thin layers.

On one of these ridges I located a quarry which extended for a considerable distance along both sides of the ridge. (Plate 1, No. 2.) From it material for large mill stones and for upper grinding stones had been obtained by the aborigines.

The evidence at the site indicated that the aborigines had been able to break off from the mass slabs of standstone sufficiently large to be suitable, after preparation, for use as mill stones. Many large flat stones were lying on the sandy slopes in all stages of preparation. Many had already been shaped into the usual oval type of mill stone. (Plate 1, No. 3.) Parts of the surface of some of the stones had also been shaped by hammer dressing. In every direction small flat pieces of sandstone were strewn on the ground. Most of them, after slight preparation, would have been suitable for use as upper grinding stones.

Other Quarry Sites

In the course of my travels in far-western New South Wales I have seen two other places where the aborigines obtained material for implements—one near Lake Peery and the other between Wanaaring and Milparinka. I did not have an opportunity of examining either of them closely.

It should be mentioned that my nephew, Geoffrey A. Williams, participated with me in the finding of both quarries at Tillenbury and that he worked with me in the collection of specimens and data.

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3. Mountford, C. P., *Trans Roy.Soc.S.Aust.*, vol. 65 (2), (1941), pp. 312-16.
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A MODERN LINNAEUS: CHARLES DAVIES SHERBORN

By FREDK. CHAPMAN, Assoc.Linn.Soc.Lond.

The passing of my life-long friend, Dr. C. D. Sherborn, in London on June 22nd of last year, in his 81st year, came as a great shock to his many friends not only there but in all parts of the scientific world, for his reputation as the author of the *Index Animalium* alone has firmly established him as a great bibliographer on the names of animals, second to none since Linnaeus wrote his *Systema Naturae* of 1758.

Nearly two years after I had entered Professor Judd's geological laboratory at South Kensington, a small body of local naturalists at Fulham, with whom I was then associated, deputed me to advertise for new members. The result was a solitary letter from a Charles Sherborn, dated 4th September, 1883. This I still have. Unfortunately for our little club, but not for myself, Sherborn, a little later on, had other plans before him, owing to his reaction to being eternally a scrivenor to a Bond Street tailor. About ten months after my first meeting, on the advice of our mutual friend, Prof. T. Rupert Jones, Sherborn started on his continental wanderings. He had already saved about £100 and decided thereby to visit one or two continental centres of scientific learning, and to do some intensive study and also brush up his French and German.

The late Charles Davies Sherborn

After Sherborn's return, at Easter, 1885, mainly enthused by his studies at Strasbourg University, we joined in researches on our favourite subjects of Ostracoda and Foraminifera at his private room—over an undertaker's shop, which bore the Dickensian name of Bultitude, and which was opposite his father's residence in the King's Road, Chelsea (No. 540). Here Sherborn was compiling his fine work, the *Bibliography of the Foraminifera*. At that time we conjointly wrote for the Royal Microscopical Society's Journal, the "Foraminifera of the London Clay," which was thrown fortuitously, so to speak, into our lap. For, prior to Sherborn's return from the Continent, the drainage works at Piccadilly had been started, the waste clay being carted six miles away, to be thoughtfully dumped at the back of my father's house at Fulham. Laboratory experience at South Kensington had just taught me that interesting results might be obtained from the most refractory clays by drying and washing down, so that by Sherborn's return I was able to gladden his eyes by an unusually large display of minute and elegant shells as had never before been found in such numbers in the London clay.

It was during the preparation of the *Bibliography of the Foraminifera* in 1888 that Sherborn conceived the idea of a comprehensive Index to the genera and species of animals, fossil and recent, a work that had already been supplied for the plants. Already there was in existence the *Index Kewensis*, which we owe to the foresight of Charles Darwin, who, in 1881, made arrangements to meet its expenses out of his own private estate.

At the base of all scientific naming of animals and plants there lies the principle of the law of priority; and since present nomenclature under the

binominal system of Linnaeus; he gives with the names of animals that were described on and after January 1st, 1758, the date of the tenth edition of his *Systema Naturae*, it is also necessary to ascertain the *earliest valid name for those species*, as well as the exact date of publication.

The first volume of the Index by Sherborn brings the references to 1800; and in this there are 61,118 direct entries. There are eleven subsequent volumes, the last of which brings the names up to 1850. Altogether these volumes, including cross references and classifications, must contain well over one million entries. The first volume appeared in 1902 and the last in 1932, 43 years after the inception of the scheme in 1890.

Dr. Sherborn was even able to indulge his passion for collecting: stamps (restricted to South American States up to a certain date), antiquities, rare Mss., and old books. A recent post-card from him said, "Don't leave your Gesner (1565) in Australia." His memory had gone back nearly 60 years to the time when I picked up from a London bookseller, for a few shillings, one of the oldest and rarest books on natural history.

It was a great privilege to know and work with so genial a researcher, and the inspiration I gained from his friendship, both in London and Melbourne, is beyond my power to express. In my work at the National Museum here, I often had occasion to test his profound knowledge of palaeontology on the nomenclatural side, and I was never disappointed.

As a later confrère says: "Of many qualities that endeared him to all, his kindness, toleration, ready wit and equable temper, and above all his abundant generosity, stand out, and few who were admitted to friendship with 'The Squire' can have failed to benefit by the association."

"ANTING" WITH APPLE-PEEL

Some time ago, when the problem of birds' "anting" themselves was being discussed, a correspondent told of a cockatoo that rubbed apple-peel on itself, and the question was raised as to whether this would have a cleansing effect. Information on the point is given by Dr. Charles McLaren, a Presbyterian medical missionary, who has just published in Melbourne a booklet entitled *Eleven Weeks in a Japanese Prison Cell*. Dr. McLaren says that in the absence of any water for washing in his prison he took to rubbing himself with apple peelings, and he found that they were very cleansing and also "an excellent and very agreeable dentifrice." He suggests, therefore, that in addition to keeping the doctor away an apple may also enable one to dispense with the dentist and the wash-basin!—A.H.C.

POISON OF THE STONE-FISH

This interesting note has come from a Club member, Pilot-officer C. C. Ralph, Somewhere in New Guinea:

"One of the fellows in the camp here trod on a stone-fish a week or so back. At first there was little pain—so little that he was persuaded by his companions that he had merely scratched himself on the coral. But in a short time pain developed and the leg swelled up, and although he is a very tough individual he was screaming and half mad with agony. It was two hours before he could be got to a doctor and he was treated by placing the foot in water so hot that the skin ultimately peeled off. The acute pain lasted for six hours in spite of heavy injections of morphia and the leg was in some degree of pain for about 36 hours. Incidentally he was walking on a sandy bottom with just an odd piece of coral here and there."

"THE CARNIVOROUS PLANTS": A NOTABLE BOOK

The Club's Library has been enriched by a review copy of *The Carnivorous Plants*, by Dr. Francis Ernest Lloyd, Emeritus Professor of Botany, McGill University. This notable work forms volume nine of "A New Series of Plant Science Books," edited by Dr. Frans Verdoorn and published by the Chronica Botanica Company, Waltham, Mass., U.S.A. The author visited Australia in 1936, when he delivered a memorable lecture on the subject which he has made his own—the carnivorous or insectivorous plants. Learning was lightened by humour, while Dr. Lloyd's sketches, moving pictures and lantern slides were of the same quality as his vivid descriptions of the mechanism of *Utricularia* traps and other marvels in a Plant World province known to very few of our botanists.

It was my privilege to see much of Professor Lloyd during his stay in Victoria; and he readily acceded to a request that he should write for the Club's journal a paper on *Utricularia*, with special reference to Australia. (See *Victorian Naturalist*, Vol. LIII, No. 6.) Besides giving a general account of the Bladderworts, of which, in certain directions, Australia possesses a larger and more varied assortment than any other geographical region, Dr. Lloyd described four new species, one being named *Utricularia Dunstani*, in honour of Mrs. William Dunstan, wife of the General Manager of the Herald & Weekly Times Ltd. One may search through fifty volumes of the *Naturalist* without finding a more interesting and important botanical article than this by the author of the book now being reviewed.

The Carnivorous Plants is a finely-printed, well-illustrated volume (there are 36 plates on art paper), priced at $6, an expensive book in Australia owing to foreign exchange. It is essential to any serious student of Bladderworts, Droseras, *Cephalotus*, *Byblis*, and other "insect-eating" plants, including Fungi (*Cordyceps*, *Zoophagus*, etc.).

An historical review and summary of our present knowledge about carnivorous plants, of which there are some 450 or more species, representing 15 genera, is given by Dr. Lloyd in a work that is not only an outstanding contribution to scientific botanical literature, but also possesses great interest for the field naturalist.

Australia has a prominent place in *The Carnivorous Plants*. A whole chapter is devoted to the Western Australian Pitcher Plant (*Cephalotus follicularis*); another to *Byblis*, of which only two species are known: *B. gigantea*, of Western Australia, and *B. linifolia*, native to Arnhem Land in the Northern Territory. Our Sundews, of course, receive full attention, for the genus *Drosera*, with more than 90 species, reaches its greatest development in this country.

For more than a decade before he commenced work on his great book, Dr. Lloyd had been studying the carnivorous plants of the world. In 1929 he made an observation of importance in understanding the mechanism of the *Utricularia* trap, when examining a species related to *U. gibba*. This created a desire to study other species of the genus primarily to determine the validity of his conclusions; and the professor's feeling that research in this field appeared promising was strengthened by the discovery that the pertinent literature was singularly barren of the information most needed; that is to say, precise accounts of the structure of the entrance mechanisms of the traps. Herbarium material, meagre in the underground parts of terrestrial forms, was of slight value for his purpose; so Dr. Lloyd sought, from all parts of the world, adequately preserved specimens. Then he found it necessary to travel, in order to study carnivorous plants as they grew. His travels included a journey to Africa, and one to Africa and Australia. The visit to Albany was in the nature of a pilgrimage to the home of a world-famous insectivorous plant—*Cephalotus*.

Byblis gigantea was the other lure to the West: this insect-catcher with lovely flowers, called "rainbow plant" by children, grows freely in a swampy place not many miles to the south of Perth. The other known species of *Byblis* has been recorded only from North-eastern Arnhem Land, and the professor, in this case, must needs be content with dried material. Few specimens of *B. linifolia* have been collected since its discovery many years ago. When exploring, with the Rev. T. T. Webb, H. Shepherdson and three aborigines, an unknown river of the Aboriginal Reserve, Arnhem Land, I found *B. linifolia* growing abundantly around rocky pools. The specimens collected were sent to Professor Lloyd long afterwards, and reached him in poor condition. However, he was able clearly to see in them how the leaves in this species are outwardly circinate—"a somewhat surprising fact."

Swampy country round about Darwin, and farther afield, is rich in species of *Utricularia* with traps of various structure. Some of them are scarcely known outside Australia, and had but recently been described when Professor Lloyd came here to prosecute his studies. How the mechanism of the Bladderwort trap works was for many years a puzzle. The key to explanation was found when Dr. Lloyd discussed how the door was rendered watertight. The door is latched and waterproofed around. When the latch is disturbed by a very small aquatic animal, such as a water-flea (*Daphnia*), the sides of the trap can spring out (like the sides of a rubber ball) and pull in the door and a stream of water in which the animal is carried. Then the door closes, the walls pump out the water, and the trap is re-set within half an hour. Dr. Lloyd has made moving pictures of *Utricularia* traps catching water-fleas and other victims. This is a very notable achievement, for the largest traps measure only 5 mm. in length, the smallest 0·5 mm.

CHARLES BARRETT.

725,000 "PESTS" KILLED IN 11 YEARS

Under this heading the Brisbane *Courier-Mail* of May 20, 1943, has the following note:

"State Government, through the Lands Department, has paid £43,212 to local authorities as subsidy for combating animal and bird pests in the last 11 years. In that period more than 725,000 animal and bird pests have been destroyed. Announcing this yesterday, the Lands Minister (Mr. Walsh) said that the total included 237,554 marsupials, 209,257 dingoes, 142,606 pigs, 71,515 foxes, 43,550 eaglehawks, and 1,145 eaglehawk eggs, 17,043 crows, and 3,587 hares. Total cost of baits for the poisoning of dingoes, provided free, was £5,000, exclusive of free railage."

It should be added that "Eaglehawks" are the regal Wedge-tailed Eagles, which include among their activities the destruction of rabbits. Imagine the killing of 43,550 of these birds in 11 years in one State alone!—A.H.C.

Mr. R. M. Trudinger, who is due to address the September meeting of the F.N.C., has been for about three years teacher at the Presbyterian School for Aborigines at Ernabella, in the north-west of South Australia. Within a month of his arrival at Ernabella he was teaching the children in their own language, and since then he has devoted himself in a remarkable manner to the study of the language and the instruction of the children.

EXCURSION LIST FOR F.N.C.V. FROM SEPTEMBER, 1943, TO AUGUST, 1944

1943	Locality	Subject	Leader
Sept. 4	—Maranoa Gardens	Cultivated Native Plants	Mr. F. Chapman
„ 18	—East Oakleigh	Heathland Flora	Mr. F. Salau
„ 25	—Wattle Park	Birds (B.O.C.)	Mr. A. H. Chisholm
Oct. 9	—Melbourne Botanic Gardens	Medicinal Plants	Mrs. E. Coleman
* „ 17	—Lilydale-Mt. Evelyn-Lilydale	General	Mr. J. H. Willis
„ 23	—Eltham-Montmorency	Birds and Flora (B.O.C.)	Messrs. A. S. Chalk and P. F. Morris
Nov. 6	—Bayswater-Ringwood	Orchids	Mr. C. French
„ †	—Flemington Racecourse	General (B.O.C.)	Messrs. Hill, J. Jones, A. M. Steinfort
Dec. 11	—Melbourne Botanic Gardens	Cycads and Proteads	Mr. H. C. E. Stewart
„ 18	—Blackburn Lake	Birds (B.O.C.)	Mr. P. C. Morrison
1944			
Jan. 8	—Seaford	Entomology and General	Mr. C. French
„ †	—Altona	Marine Biology	Mr. and Mrs. J. J. Freame
Feb. 12	—Upper Ferntree Gully	Ferns	Mr. A. J. Swaby
„ *27	—Rickett's Point	General (B.O.C.)	Mr. P. C. Morrison
Mar. 11	—Beaumaris	General Geology	Mr. F. S. Colliver
„ 18	—River Yarra	Social Afternoon	Mr. H. P. Dickens
„ 25	—Queen's Park, Moonee Ponds	Wading and Aquatic Birds (B.O.C.)	Miss M. L. Wigan
Apr. 8	—Seaholm	Salt Marsh	Mr. J. H. Willis
„ 22	—Frankston	Birds and Flora, General (B.O.C.)	Messrs. E. S. Hanks, A. C. Frostick, P. Bibby
May 6	—Wild Life Sanctuary	Australian Fauna	Messrs. W. R. Maughan, A. S. Chalk
„ 20	—Mooroolbark	Autumn Foliage	Mr. R. G. Painter
*June 4	—Kalorama	Lyre Birds, Fungi, General	Mr. H. C. E. Stewart
„ 17	—Herbarium	Preservation of Botanical Material	Mr. A. W. Jessop
July 1	—Botanic Gardens	Arboreal Vegetation	Mr. H. C. E. Stewart
„ 22	—Museum	Feathers (B.O.C.)	Mr. G. Mack
Aug. 5	—Melbourne	Building Stones	Messrs. A. C. Frostick and F. S. Colliver
„ 19	—Black Rock	Winter Botany	Mr. T. S. Hart
„ 26	—Heidelberg	Birds' Nests and Wattles (B.O.C.)	Mr. and Mrs. E. S. Hanks

*Sunday—all-day excursion.
†Date to be arranged.

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PROCEEDINGS

The monthly meeting of the Club was held at the Royal Society's Hall on September 13, 1943. The President (Mr. P. F. Morris) presided and about 120 members and friends attended.

It was announced that Mrs. Frank Sides (*nee* Dorothy Sarovich) had lost her husband recently in New Guinea, and the Hon. Secretary was instructed to write a letter of sympathy to our fellow-member.

The President welcomed to the meeting delegates from kindred societies who were attending for the presentation of the Australian Natural History Medallion; and also the Rev. H. C. Matthew, Secretary, Presbyterian Board of Missions Committee, who was responsible for the lecturer being available for this meeting.

NATURAL HISTORY MEDALLION

The President introduced Major H. W. Wilson, O.B.E., M.C., etc., the recipient of the 1942 Award, and also Mr. J. A. Seitz, Director of Education, who was to make the presentation.

Mr. Seitz outlined the career of Major Wilson as a soldier, teacher and naturalist, and stated that as Director of Nature Study at the Teachers Training College he was so highly regarded that his term of office was extended—that after he had 34 years of service to his credit. Mr. Seitz further stated that the winning of the medallion was a tribute to the work Major Wilson had done in bringing Natural History before school children and the general public, as well as to the sound scientific work he had done.

Major Wilson, in reply, thanked the Medallion Committee for the honour accorded him, and Mr. Seitz for making the presentation. He gave an insight into his early years as a teacher and described the origin of Nature Study in the schools.

The present Nature Study Director at the Teachers Training College (Mr F. G. Elford) also spoke, stating how pleased members of the staff of the Teachers Training College were that such an honour should go to their former lecturer.

TEACHING ABORIGINES

A lecture entitled "Teaching Aborigines in the North-west of South Australia" was given by Mr. R. M. Trudinger, and as illustrations natural-colour motion pictures were shown. The lecturer, a missionary and teacher at Ernabella (Musgrave Ranges) told of the methods used and described how he had also been educated by the children whom he taught. He emphasized that the aborigines were not being civilized, but rather were being taught to live their own lives on an improved pattern. They were not taught to speak English, nor were they made to wear clothes, of which they had no need. A special feature of the lecture was the singing of corroboree songs by Mr. Trudinger and the exhibition of writing and drawings made by aboriginal boys and girls.

Mr. S. R. Mitchell, moving a vote of thanks, suggested that the Presbyterian Church was to be commended on the choice of such a versatile and capable teacher as Mr. Trudinger. He emphasized the need for broad-minded and sympathetic education of aborigines, the extermination of which always followed on the old method of contact with white people. Mr. Mitchell added that Mr. Trudinger had educated and impressed the audience by his account of a people who are our immediate responsibility.

Mr. R. H. Croll, seconding the vote of thanks, stated this seemed an exemplification of the most successful method of dealing with our dark-skinned brethren. Mr. Trudinger's work was admirable, and it merited support in a practical fashion.

The vote of thanks was carried by hearty applause.

GENERAL BUSINESS

Reports of excursions were given as follows: Frankston, Mr. J. H. Willis; Maranoa Gardens, Mr. C. French.

Prof. J. B. Cleland, of Adelaide University, was elected as a country member of the Club.

The President stated that the Junior Branch at Hawthorn had been successfully started, and announced the staging of a Natural History Exhibition early in October.

Miss Nance Fletcher conveyed greetings from the Western Australian Club, members of which would gladly contact kindred spirits from Victoria.

Mr. P. Crosbie Morrison (for Mr. Marc Cohn, Bendigo) gave some notes on two rare Bendigo wildflowers: the White Hovea (*H. heterophylla*), and the double form of the Fairy Wax-flower (*Eriostemon obovalis*).

Mr. Ivo Hammett remarked on *Grevillea lavandulacea* from the Grampians.

A CAMPING SPOT OF THE "EMU MEN"

By MAURICE F. LEASK, A.I.F

This paper describes aboriginal rock carvings which are found on an apparently unnamed creek on Upalinna sheep station, eleven miles east of Wilpena Pound, Flinders Ranges, South Australia.

The carvings are for the most part in a compact group on both banks of the creek. The examples of art present many characteristics typical of the Flinders Ranges series of carvings, thus being worthy of comparison. Moreover, a few of their features are almost unique and may form useful links in the chain story which explains the motive for the extensive carvings about the natives' frequented spots.

The site is at a dry hole in the creek-bed approximately three miles east of Upalinna head station. This is eight miles east-south-east of Wilpena Pound and Wilpena Homestead. Upalinna is owned by S. A., T. P. and J. F. Reynolds, and is not to be confused with Appealinna Hill, which is outside the holding in question. The new mail route from Hawker, 40 miles southward, to Blinman, 44 miles northward, passes close by Upalinna Homestead.

Early in January 1940 the author was accompanied by Mr. G. C. Netherway of Ballarat, Victoria, on a visit to Wilpena Homestead. The purpose was to obtain directions to the site of aboriginal carvings believed to exist on Wilpena property. These directions were followed until Upalinna Homestead was reached. As this had not been mentioned previously, fresh inquiries were made, and they led to the examination of the carvings dealt with herein. This site is definitely on Upalinna ground and must be distinct from the one that was originally intended to be visited.

From the homestead a bridle path was followed for the whole distance, about three miles, first in an easterly and then in a northerly direction. At two and a half miles the Gum Creek was crossed, and the track wound on to the old chimney which is the landmark on the next creek, known locally, for lack of a better name, as Pine and Gum Creek. A quarter of a mile downstream from the old chimney the carvings were located.

At Pine and Gum Creek the essential factor in the choice of the spot has been the occurrence of rockholes in the creek bed. One of these is formed against a low cliff on the left side of the stream. The other is below a waterfall five feet in height. It is worthy of note that a waterfall is not a common feature of the sites of native art, but this has no other significance, probably, than the conservation of water. Here, as in any typical case, three walls have been formed in the shape of a U, and all three have been utilized by the artists.

The figures depicted at this spot include footprints of the

turkey and the emu, the latter being the predominant type, though even it is not numerous when compared with some other localities. The figure most characteristic of this site is the U, with its embellishments, called the camp symbol. By far the greater number of the designs consist of circles, with their additions. Concentric circles are used very sparingly. There is a great deal of work after the "road map" or "locality plan" type; in one of these the circles are enclosed by a pear-shaped line; in another numerous circles, touching or joined by a line, follow in succession. In all of the composite designs it is difficult to determine where one ends and the next begins.

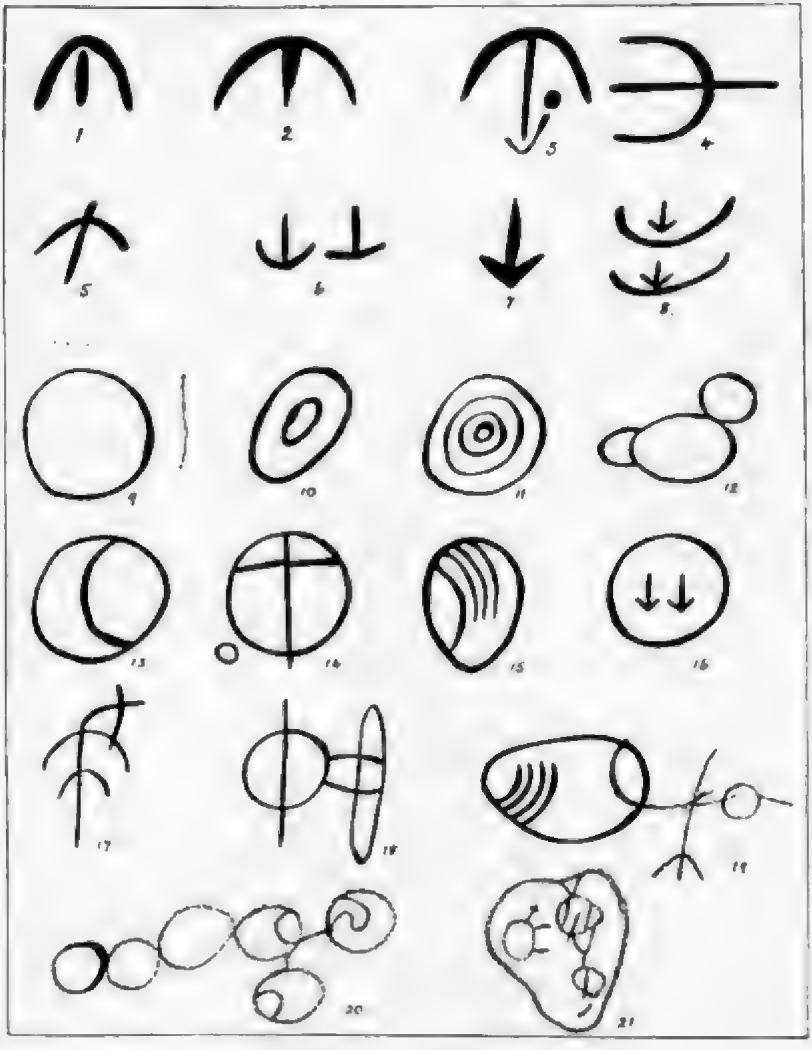
In approaching the classification of the designs found in the carvings we enter, to a large extent, the realm of theory. However, it is now widely recognized that aboriginal art was used chiefly to illustrate the ceremonial life of the natives. The whole of the figures seen at Upalinna may well fall within this category. As the present-day blacks draw incidents from their daily life, it is possible that some forms discussed here were carved for that purpose. The apparently meaningless shapes can be explained only by the totemic ancestor theory.

DESCRIPTION OF CARVINGS

One of the best and plainest of the carvings is the crescent with bar shown in the text figure herewith. It is situated below the waterfall on the vertical wall on the right bank. The bar is cylindro-conical in shape and does not touch the crescent. No. 2, close to No. 1, has a pointed bar which is joined to the crescent. The bar in No. 3, adjacent to No. 2, differs from the two former, it projects beyond the extremities of the crescent and has the addition of a "V" and dot. Closer to high water level is No. 4, in which the axis is at right angles to the axes of the previous three, and in which the bar extends right through the crescent.

On the creek-washed stones in a horizontal plane occur Nos. 5, 6 and 7. No. 5 has an extended bar, but in other respects resembles No. 6. The latter figure may represent an emu's tracks, although the two feet do not match, one having a rounded crescent and the other an almost straight bar. This straight bar is seen as a perfect English "T" enclosed by a circle on the vertical wall. Again on a horizontal surface occurs No. 7, a very large emu track of the stereotyped broad arrow shape and of symmetrical construction.

No. 8 is found on the left bank. The arrows are true symbolical emu tracks, one of which does not touch the crescent. The crescents themselves, in contrast with some former ones, are asymmetrical.



Among the circles No. 9 is quite plain, although the thin lines (shown as dotted lines) may be associated with it. These markings are found on the left bank near the upper rockhole. Below the fall, on the right bank, are the concentric circles, two in number, shown in No. 10. They are somewhat elliptical, while those in No. 11, four in number, are more perfect in shape. In No. 12, on creek-washed stones, one circle merely touches another, but the third is truncated.

The cut circles present several outstanding features. There is no true barred circle, No. 13 being an arced circle exactly similar to those seen in the Pekina Creek at Orroroo (S.A.). In No. 14 the short arm of the cross does not bisect the circle and is not in the same straight line at its intersection of the long arm, both these characteristics differing from those in an otherwise similar figure at Grassy Creek, near Carrieton, S.A. The combination of arcs in No. 15, only one of which is continuous from circumference to circumference, form a figure which has not been noticed at any other locality. Typical of the procedure at Yunta is the simple enclosing of obvious emu tracks in a circle: No. 16. However, it should be noted that among the Salt Creek series at Panaramittee there are kangaroo tracks within two concentric circles.

Placed close to Nos. 1, 2, 3, and 4 is [illegible] "liney" figure, No. 17, which could be a combination of the elements in the four first-mentioned. The work in No. 18, a complex design on the left vertical bank, is fairly open, showing the method of pitting. No. 19 consists of an "egg" in which the arcs are drawn in a different direction from those in No. 15, and to which another figure has been joined.

On the roughly horizontal, spacious surface towards the left flank of the stream, No. 20 forms part of a confused array of carvings. The darkest line at the left of the illustration is the part that appears to have been renewed. Renewal is possibly seen in a second figure where recent shallow work touches old deep work, and in a third where ancient grooves are covered with dark colouring while recent grooves leave the lighter coloured rock exposed.

A great deal of work follows the pattern of No. 21, with lines enclosing a group of carvings which probably have a group significance.

At Upalinna, then, is to be seen quite a prolific array of aboriginal carvings. Some of the figures (Nos. 1, 7, 9, 10, 11, and 16) are well known, stereotyped forms. Others (Nos. 13 and 14) occur in restricted localities. No. 15, notably, is an uncommon design, while many of the variations are not seen elsewhere.

The workmanship is characterized by some deep grooving and by some open pitting. There is strong evidence in favour of the belief that certain parts of the designs have been renewed.

Discussion

It is at once recognized that the crescent with bar is a good representation of the camp symbol, as described by C. P. Mount-

ford. That figured (No. 1) is more perfect than any seen elsewhere by the writer. The crescent is the camp and the bar the natives. But it was stated by the ethnologist at the South Australian Museum (Mr. N. B. Tindale) that this very symbol is used to illustrate the marks made by a native sitting on the ground. When we try to apply both theories to No. 2 we want to know why, in either case, the bar is pointed and why it joins the crescent. No 3 contains the dot well reconciled to the fire at the camp as figured by Mountford. The bar extending right through the crescent in No. 4, however, does not appear to be true of either a camp or a sitting imprint.

If the artist who carved No. 7, or an artist of equal ability, also carved Nos. 5 and 6, there must be some significance in the departure from the orthodox broad arrow of the emu symbol in No. 7. In fact, we are forced to waver in placing those intermediate forms in either the camp or the emu group.

The emu track combined with the camp in No. 8 appears to be the symbolic use of these in myth. Perhaps, in one, the emu is leaving the camp.

In the illustration of their daily life the aborigines drew hills, "some as circles, some as ovals." A waterhole was portrayed by concentric circles. The combination in No. 12 could be a group of hills.

The simple barred circle, not seen here, in other areas represents a head-dress, a totem pole or a wanigi; that is, it may have widely different meanings. It is possible that the dissected circles, Nos. 13, 14 and 15, have some obscure meaning also, and it would be unwise to elucidate further without definite comparisons.

Some of the remaining figures contain units already described. In No. 20 occur two circles similar to No. 13. The complicated result achieved in such as No. 20 is generally recognized to be the track of the wanderings of an ancestor.

In an examination of these figures we may be confronted with the problem of the different aspect given by a different artist to the same figure. This would account for the merging of the emu tracks into the camp symbol.

It is necessary to distinguish between the figures which are isolated, or units, and those which form a continuous mass of work. The logical course is to regard the designs as being somewhat similar to others placed adjacent to them. Thus the whole layout effects interpretation, although it does not too strictly determine significance.

When the whole scene is examined, the elements (for some of the units serve as elements) may be seen in their correct perspective. Although, in general, the idea of the aboriginal

artists practising should be discounted, it must be that these elements were used in some way for illustration or emphasis.

From these discussions we may assume:

(a) There is an artist discrepancy, or
(b) There is a distinction between the element as a unit and as part of a combination, or
(c) There is an increased range in the universality of symbols, or, if these are not valid,
(d) There is a significance in each of the details of variation.

Finally, at Upalinna there is a total absence, as far as was noticed, of carvings of kangaroo tracks. The predominant track is that of the emu. Hence we conclude that this was one of the camping spots of the Emu Men.

EXHIBITS AT SEPTEMBER MEETING

Mrs. C. French: Bouquet of native flowers (12 species), all garden-grown.

Mr. M. Cohn: Fairy Wax-flower (double form) and white form of the common Hovea from Bendigo.

Mr. A. H. Mattingley: Live red-back spider (*Latrodectus hasseltii*).

Mr. V. H. Miller: *Dendrobium falcorostrum* (Orange-blossom Orchid).

Mr. S. R Mitchell: Large ground-edge axe with hafting groove, shaped by hammer dressing; also ground-edge and grooved axes from Cape Otway. Flaked-edge axes with hafting notches; sandstone axe (edge produced by hammer dressing and grinding) from near Woori Yallock, Vic.

Messrs. Ivo Hammett and R. G. Painter: Garden-grown native flowers.

CAPTAIN OWEN STANLEY

An article published in the August issue of the *Vict. Nat.* dealt with the career of Captain Owen Stanley, of H.M.S. *Rattlesnake*, and drew attention to the need for preserving his grave, which is in St. Thomas's Cemetery, North Sydney. Apparently this article attracted the attention of the North Sydney Council, for it wrote for copies of the journal and later (August 27) Sydney newspapers reported that the Council had written the trustees of St. Thomas's Cemetery, drawing attention to the desirability of proper care being given national memorials. After the chairman of the trustees had replied as well as possible, the Council appointed a committee to confer with the trustees on the preservation of the cemetery's monuments of national interest.—A.H.C.

A Natural History Exhibition under the auspices of the F.N.C. was opened at the Hawthorn Library (near the Town Hall) on Monday last. It will continue until the 9th inst.

A NEW CRANE-FLY FROM VICTORIA
(Tipulidae, Diptera)

By CHARLES P. ALEXANDER, Amherst, Massachusetts, U.S.A.

During the past sixteen years I have received for study and naming many striking and beautiful crane-flies from my good friend, F. Erasmus Wilson. These were taken by him in South Australia, Victoria, Tasmania, New South Wales and Queensland, and included many scores of new and rare forms, the types and uniques of which are preserved in the Wilson Collection, undoubtedly the largest and most valuable series of these flies in Australia. Very recently I received a further shipment that included, among others, three specimens of a crane-fly that proved to be new to science and very distinct from all known allied forms. I consider it to be one of the most attractive species of these flies that I have ever seen.

Before describing this striking novelty I would like to issue an appeal to the younger members of the Field Naturalists' Club who are interested in insect collecting to save any specimens of these fragile, long-legged flies that they may find, particularly if they are favoured by opportunity to collect in out-of-the-way spots or in hitherto little-worked areas. It seems certain that further collecting on the Bogong High Plains will yield many additions to the Victoria list, since a considerable number of species have been taken in the mountains of southern New South Wales that have not yet been discovered in Victoria. If such specimens could be turned over to Mr. Wilson, they would be sent to me for study and would possibly add to our still incomplete knowledge of the Tipulidae of the State.

GYNOPLISTIA (PARALIMNOPHILA) WILSONIANA SP.NOV.

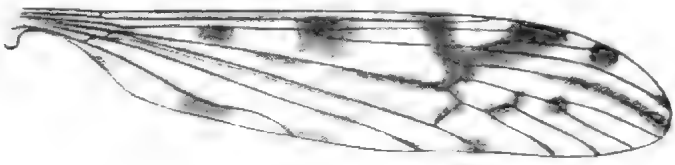
Size large (wing, male, 17 mm. or more); antennae with unbranched segments; colour of mesonotum grey, more yellowish on the praescutal interspaces; praescutum with four conspicuous dark brown stripes; pleura light grey with two conspicuous, dark brown, longitudinal stripes, the more dorsal ending at posterior portion of the mediotergite; halteres yellow; femora with a yellow subterminal ring; tibiae with a yellowish white subbasal annulus; tarsi brownish black; wings yellow, handsomely patterned with dark brown, including larger costal areas, the one in the region of the sigma V-shaped; male hypopygium with the gonapophyses appearing as slender pointed horns.

Male: Length about 18-20 mm.; wing 17-19 mm.; antenna about 3·4-3·6 mm.

Rostrum dark brown, sparsely pruinose, palpi black. Antennae with scape dark brown, pedicel slightly more reddish brown; basal flagellar segments uniformly light yellow, the outer ones more infuscated; flagellar segments simple, unbranched, elongate-oval to subcylindrical, with the lower face a trifle more bulging than the upper; verticils conspicuous, much

exceeding the segments in length. Head dark grey, the anterior vertex slightly more yellowish; anterior vertex elevated into a small conical point; setae of posterior vertex black, proclinate.

Pronotum dark grey, restrictedly infuscated medially. Mesonotal praescutum with the humeral region silvery grey pruinose, the interspaces more golden-yellow; disk with four conspicuous dark brown to blackish stripes, the intermediate pair separated only by a capillary ground vitta except at suture, where they are more widely separated; pseudosutural foveae large, circular in outline, reddish brown; scutum grey, the lobes conspicuously patterned with dark brown, the median region less conspicuously darkened; posterior sclerites of mesonotum grey, narrowly darkened medially to produce a vague stripe; posterior and lateral portions of mediotergite and dorsal margin of pleurotergite blackened, being a direct prolongation of the dorsal pleural stripe. Pleura light grey, with two conspicuous dark brown longitudinal stripes, the more dorsal one involving the ventral propleura, anepisternum and dorsal pteropleurite on to the postnotum, as described; the lower stripe is chiefly restricted to the ventral sternopleurite; dorsopleural region light yellow. Halteres yellow. Legs long and slender; coxae light grey pruinose, vaguely patterned with dusky, especially the fore pair; trochanters reddish brown, sparsely pruinose; femora black, with a conspicuous yellow ring more than its own length from the blackened apex; tibiae brownish black, with a slightly more yellowish white ring less than its own length beyond the base; remainder



of legs brownish black to black. Wings (Figure) clear yellow, heavily and conspicuously patterned with dark brown; prearcular and costal fields more saturated yellow; dark areas distributed as follows: Cell *C* except at base with its central portion blackened; a major area in radial field at near midway between arculus and origin of *Rs*; origin of *Rs*; a V-shaped area with the basal arm extending from Sc_2 caudad across the fork of *Rs* to *r-m*, the outer arm from the stigma caudad to *r-m*; other areas along posterior cord, outer end of cell *1st* M_2, tips of longitudinal veins, especially vein R_5 and a long continuous streak along outer half of vein R_1, widened outwardly; still further seams and clouds at fork of M_{1+2}; along most of veins *M* and *Cu*, except on their basal portions, these latter areas tending to be broken into individual spots; clouds at near midlength of cells *Cu* and *1st A*, about in transverse alignment with the origin of *Rs*; a conspicuous cloud near outer end of cell *2nd A*, opposite the narrowest part of the cell; veins yellow, scarcely evident in the more saturated ground areas, darker brown in the patterned fields. Venation: R_{2+3+4} longer than basal section of R_{2+3}; cell M_1 from 2·5 to 3 times its petiole; *m-cu* more than one-third its length beyond the fork of *M*; vein *2nd A* sinuous.

Abdomen with tergites reddish brown to dark brown, still darker on lateral and posterior portions; sternites brownish black, more reddish on central portion; hypopygium brownish black. Male hypopygium with the caudal border of tergite strongly emarginate or concave, forming two rounded dusky lateral lobes. Outer dististyle as in other members of the

subgenus. Inner dististyle with the basal lobe unusually large, rounded, conspicuously setiferous. Gonapophyses appearing as slender, gently curved horns that narrow to acute tips. Aedeagus a little longer than the gonapophyses.

Holotype, ♂, Mount Donna Buang, above Warburton, altitude 4,000 feet, January 21, 1943 (*F. E. Wilson*); in the Wilson Collection. *Paratopotypes*, 2 ♂♂, one preserved in the writer's collection, one returned to Wilson.

I take unusual pleasure in dedicating this beautiful fly in honour of Erasmus Wilson. To him, more than to any other individual, is due our great increase in knowledge of the Australian, and particularly the Victorian, Tipulidae. This is one of the most striking and distinct crane-flies known to me. It belongs to the group of the subgenus having the antennae simple, without branches of any sort. Among the approximately 35 species of *Paralimnophila* now known from Australia and Tasmania, the only species having similarly simple antennae are *Gynoplistia* (*Paralimnophila*) *indecora* Alexander and *G.* (*P.*) *woodhilli* Alexander (and possibly *G.* (*P.*) *incompta* Alexander, the latter still known only from the unique type that had lost the antennae). Elsewhere within the range of the subgenus, all of the known species have the antennae simple, these including two species in New Zealand, and rather numerous forms in southern Chile and south-eastern Brazil.

The present fly superficially resembles certain large and showy local members of the genera *Austrolimnophila* Alexander, *Epiphragma* Osten Sacken, and *Limnophila* Macquart, but is readily told by the diagnostic features indicated above. The Australian species of *Paralimnophila* Alexander with simple antennae, as listed above, are much smaller than the present fly and have entirely different patterns of the wings and legs.

Wilson's notes on the occurrence of this fly are of interest and I quote this part of his letter: "Spent a week-end on Mount Donna Buang in the Warburton district where I took *Eutanyderus wilsoni* Alexander some years ago. We went up to collect a series of two alpine butterflies that occur there. I got a very fine Tip new to me from a damp spot under *Nothofagus* trees. I took several specimens of *Austrolimnophila pristina* Alexander in association with this species. The altitude of 4,000 feet is much higher than Belgrave where I formerly took the latter."

OBITUARY

Members of the F.N.C.V. greatly regret the loss of Miss Ethel Bage, M.A., who died in August at her home in Melbourne. Her sister, Miss Freda Bage, the Brisbane naturalist and educationist, was present during her illness. Miss Ethel Bage joined the F.N.C.V. in 1921 and had always been a keen, if quiet, worker. Her father was one of the most accomplished naturalists in the early days of the Club.

SUGGESTIONS TO CONTRIBUTORS OF ARTICLES ON TAXONOMIC BOTANY

By Joyce W. Vickery, M.Sc., Sydney

Writers of articles on taxonomic botany in the *Victorian Naturalist* usually desire to present not only the technical part of their work but other information about the plant and its history of general interest. They do not desire to strip the technical details to the bare bones, as is done in many journals devoted exclusively to this science. On the other hand, they aim at sound work which will help and not confuse other workers in the same field. Confusion can be caused so inadvertently, however, that I have ventured to make a few suggestions, adherence to which should tend to make some taxonomic papers clearer.

Taxonomic botany is full of innumerable pitfalls for the unwary, so the first requirement for anyone aspiring to take up this science is a thorough study of the *International Rules of Botanical Nomenclature*, and much practice in their interpretation and application. Without such study no one should venture to publish anything involving the nomenclature of plants or further confusion is inevitable. This is a fact insufficiently realized by non-taxonomic workers in other branches of botanical science. It is not proposed to comment here on matters laid down in the international rules which can be consulted directly, except to refer to a few points which have not been given sufficient attention in this journal in the past.

Articles should set out very clearly, and with a suitable use of headings, the actual points they cover. For instance, the name of a new species, variety or combination, etc., should be used as a definite heading either above or at the commencement of the paragraph dealing with it, and the name should be followed by the symbols for the appropriate categories, e.g., new species, new variety, new combination, new name, new status, etc., as the case may be. The significance is then quickly appreciated by the reader. A new combination should never be hidden away in a paragraph of discussion. Let the discussion follow the clear statement, preferably in a paragraph separate from that giving the technical data. Do not be over-modest and seek to modify your work by merely "proposing" or "suggesting" new names. By publishing at all you are introducing these names into botanical literature, and no modesty can magnify your glory if your suggestion is a sound one, or lessen your guilt if it is not; it can merely serve to conceal your real work in useless verbiage.

In the case of new combinations, etc., the taxonomic history (or synonymy) of the species should then be set out, with the authors and preferably their place and date of publication also shown after each name. When a new combination is disguised in a paragraph of discussion it may be difficult to determine precisely on what the author has based it. There is also the chance that it may be entirely missed.

When a species is described which has previously been known under a varietal name, the author should make it absolutely clear whether he is basing his species on the variety (in which case the type specimen of the variety automatically becomes the type of the species) or whether he is describing the species from another specimen (which he should then designate the type) and is merely linking up the varietal name as a synonym. In much Australian literature this has not been made clear in the past, and much further unnecessary work has been stored up for the future.

When new species and varieties are described, the actual type specimen should be clearly quoted as such, only one specimen can be the holotype, even though several specimens may be cited. It is far better for the author

to select the type than for a later worker to be forced to do so. It is also very desirable to state in which herbarium the type specimen is located.

All new species and varieties must be accompanied by a Latin description, otherwise they will not now be accorded any standing.

In discussing variation in a species, the words "type form" should be avoided unless reference is being made to a form actually known to be identical with the type specimen. Often, however, those words have been used when "typical form," "normal form," "usual form" or "common form" would have been more appropriate.

Ambiguity should be avoided. For instance, "a new Victorian genus" suggests that a new genus is being described, but has been used in cases which meant a genus newly recorded for Victoria. Careful consideration of the meaning of the words and phrases used will enable future taxonomists to avoid misinterpretation of the author's intentions, and will certainly shorten their work.

The above suggestions, of course, are in no way exhaustive, but are merely a few points noted by the writer in the course of some work involving the abstracting of botanical literature.

IS "BLUEY" A POLYGAMIST?

According to a note in a recent issue of the *Vic. Nat.*, there seems to be a doubt whether the familiar Blue Wren is a polygamist. From a study of the species in the Fitzroy and Treasury Gardens some years ago, over a period of three years, I can say for certain that he is not guilty.

My uncle, the late Dr. Horne, and I made friends with two pairs of Blue Wrens and regularly every morning fed them, especially during the breeding season. The pair in the Treasury Gardens became so tame that when I called to them they came to me and fearlessly alighted on my hand and took food from me to their young. When the young left the nest they also became our friends and we were able to note that they stayed with their parents until the following season; then some of them, apparently the young females, disappeared, presumably having mated up. But the young males stayed with their parents and helped in the feeding of the young. At the end of the breeding season the adult young disappeared, leaving their parents with the later young family. This kind of thing took place each year.

We met one of the first family, a hen bird, in the Carlton Gardens one day. She recognized us and came to us for food, but as we had none with us she was disappointed. I kept up these observations for three years, when, owing to my uncle's illness, I was obliged to give up my friendship with these interesting little birds. Some years later, when I sought them out again, I found the male alone with his family (minus his wife) and later he gave up his allotment. They had nested each year in the same place.

The other pair were in the Fitzroy Gardens, and all this family showed white feathers somewhere in their plumage. This pair never became so fearless as the first one and had to be coaxed to come for titbits.

I hope that these notes will serve to remove any doubts in the minds of ornithologists about the matrimonial habits of the dainty Blue Wrens.

(Miss) HELEN BOWIE.

BIRDS AS EXPLORERS' "MESSENGERS"

When recently looking through the Melbourne *Herald* of 1858 I came upon several references to the exploratory journey of B. H Babbage, who was then about to work up the western side of Lake Torrens in an attempt to round its northern side and link up with Eyre's track. Although Babbage had been out previously (in 1856) testing Gregory's report regarding the supposed "desert" nature of the interior, on this occasion he made somewhat slow progress (largely due to dry conditions), with the result that the South Australian Government became dissatisfied and replaced him by Colonel P. G. Warburton, then Commissioner of Police.

At the beginning of the expedition, however, as is clear from the *Herald* reports, Babbage was in strong popular favour and was given considerable attention by the newspapers. One of the newspaper reports is especially interesting, in that it represents the explorer as putting forward the novel plan of attempting to catch wild birds and use them as messengers. That plan, we may be sure, came to nothing, but it makes engaging reading. Here is the *Herald* report of Babbage's remarks on the subject, dated 26th February 1858

"Among the different plans he had thought of for the contingencies which might arise was one which might afford a slight chance of enabling the public of South Australia to be informed of the whereabouts, and, he trusted, of the well-doing of the expedition. The plan he referred to was that, whenever they were not pressed by hunger, they should let loose any birds that they might chance to take uninjured, especially such as were known to frequent the settled districts, and to attach to their legs slips of parchment with inscriptions in indelible ink, setting forth the latitude and longitude, together with a few words respecting the condition of the party. Perhaps, out of every twelve or twenty such winged messengers, one might be shot, and thus, perhaps, after ranking him and his companions with the gallant but unfortunate Leichhardt, they might gather the news that, at a certain date, they were alive and in a certain locality.

"He wished this to be known as generally as possible, so that, if anyone chanced to see a bird with anything peculiar about it, he should by all means try and shoot it. He had made his intentions known in N.S.W. and Victoria through his correspondents there, for he was quite ignorant as to which way the birds migrated; and some of his little aerial balloons might change to drop down in the other colonies. It might happen, of course, that none of his messages would be received; but, in such cases, no shadow of a chance should be left untried."

A. H. CHISHOLM.

REQUEST FOR SEED OR SEEDLINGS

The Botanist, Technological Museum, Sydney, is desirous of obtaining fresh seed, or preferably young plants, of Australian myrtaceous shrubs for important cytological research, and wishes to contact any member of the Club who would be willing to assist him. The less common Victorian species of *Leptospermum*, *Melaleuca*, *Kunzea*, *Callistemon*, *Baeckea*, *Calytrix*, etc., are desired, but Western Australian members of the genera *Verticordia*, *Darwinia*, *Actinodium*, *Pileanthus*, *Chamaelaucium* (excepting *C. uncinatum*), *Lhotzkya*, *Calytrix*, *Thryptomene* and *Hypocalymma* would be particularly welcome in that order and the freight thereupon gladly refunded.

SWARMING OF "MIDGES"

In the *Vict. Nat.* of September, 1943, Miss Janet Raff wrote an interesting paper on the swarming of midges on shrubs at Croydon, Victoria. Apart from the phenomenon of swarming, it was pointed out that there was added interest in the fact that the occurrence was observed in autumn—evidently an infrequently observed habit.

The penultimate paragraph, with its remark concerning the possibility of these diptera "hibernating over the winter in sheltered places" caused me to recollect my having observed what must have been an event worthy of putting on record. On August 7th of this year (in mid-winter) I had occasion to visit the Bayside village of McCrae, and as I walked along in the unexpected warmth of that afternoon and in the company of my little daughter, our attention was caught by what looked like a new occurrence in nature. Several branchlets of a sturdy specimen of *Casuarina suberosa*, growing among its kind close to Point Nepean road and not 100 yards from the beach and the tea-tree scrub, hung heavy with what looked like catkins of black flowers. As the tree had finished flowering only a few weeks previously, it was, of course absurd to imagine that a new set of flowers (and black ones at that) had occurred, so I reached up and pulled the bough down to have a closer look.

When we had brushed the "flowers" from our faces and removed a few from our eyes, we were able to see that we had disturbed a portion of one of a number of swarms of tiny black diptera. No specimens were collected—consciously at any rate—nor was any minute observation made, so, for lack of an accurate classification, I label them "midges." From memory I would judge them to be no more than 2 or 3 mm. long, and each of the burdened branchlets held a swarm that would fill a teaspoon. The swarms extended from 6 to 12 inches along the wispy branchlets and the individuals comprising it appeared to distribute themselves evenly over that length.

The small cloud that expanded and contracted above our heads eventually settled on another branchlet and all was calm again in that community of midges. As we passed those trees next morning on our way to explore the beach the black "flowers" were still there. If the flies also swarmed on gums, wattles, honeysuckles, tea-trees or cherry ballarts, all of which were interminglied with the she-oaks, we did not notice them. But, of course, they may have been there, too.

J. ROS GARNET.

SMALL TRIGGER-PLANTS NEEDED FOR EXAMINATION

The Grass Trigger-plant (*Stylidium graminifolium*) with tall pinkish to violet spikes is a handsome wildflower, familiar to most Victorians—it is giant among its kind, but we have at least four other Stylidiums which in consequence of their diminutive size, usually escape observation and are still imperfectly understood. During the current spring season the help of interested readers would be much appreciated, in collecting fresh material (in flower, and in fruit if possible) of *S. calcaratum* and *S. perpusillum* and sending same to the address below: both are tiny annuals with rosulate leaves, flowering stems under 4 inches high, and a preference for damp, sandy soils; localities on record include Grampians, Portland district, Heathcote, Black Rock, Frankston and Langwarrin.

The Heathcote district form of *S. perpusillum* differs markedly from the very delicate plant inhabiting heathlands east of Port Phillip and may represent a distinct species.

T. S. HART (Croydon).

THE MARANOA GARDENS

The excursion to the Maranoa Gardens which took place on Saturday, September 4, was favoured with a delightful and sunny afternoon. It was a typical early spring day, too early, perhaps, for the Gardens to exhibit their best efforts in Wattle display; yet, of the 58 species included in the magnificent collection, there were at least 20 species in flower. Some of the outstanding kinds were the Gold-dust, Wyalong, Queen, Fringed, White Sallow, S. Australian Willow, Juniper, Buffalo, Hickory, Sallow, Mount Morgan, Alpine, Golden-rain, Downy, Golden or Gold-Fields, Rock, Golden Wreath, Coast, River and Varnish Wattles.

The Grevilleas were especially showy, whilst of other Proteaceous shrubs, the Gippsland Waratah (*Telopea oreades*), was bravely breaking into crimson flowers. Amongst other early spring-flowering shrubs we noted some finely-developed masses of the Grampians Heath-Myrtle (*Thryptomene calycina*), and the Small-leaved Heath-Myrtle (*Micromyrtus microphylla*), the latter making great promise for the weeks to come. In the course of a week or so the three species of Clematis (*C. aristata*, *C. glycinoides* and *C. microphylla*) will show a prodigious display of white or creamy star-like blossoms. The several plants of the Bendigo Wax-flowers (*Eriostemon*) were very attractive and worth while in small gardens, as well as the lovely *Chorizema* from the West.

Here and there strong plants of the False Sarsaparilla were crowded with their white and deep purple flowers, almost dazzling in their effect when allowed to ramble at will amongst a heap of gravelly stones.

FREDK. CHAPMAN.

INTRODUCTION OF SPARROWS

The following interesting paragraphs, clipped from the *London Illustrated News* of 84 years ago, have been forwarded by Mr. Arthur Hargreaves, of Ararat.

August 13, 1859.—It appears from the papers that in New Zealand the country, at particular seasons, is invaded by armies of caterpillars, which clear off the grain crops as completely as if mowed down by a scythe. With the view of counteracting this plague a novel importation has been made. It is thus noticed by the *Southern Cross*:—"Mr. Brodie has shipped three hundred sparrows on board the *Swordfish*, carefully selected from the best hedgerows in England. The food alone, he informs us, put on board for them cost £18. This sparrow question has been a long-standing joke in Auckland; but the necessity to farmers of small birds to keep down the grubs is admitted on all sides. There is no security in New Zealand against the invasion of myriads of caterpillars which devastate the crops. Mr. Brodie has already acclimatised the pheasant, which is abundant in the north. The descent from the pheasant to sparrows is somewhat of an anti-climax; but, should the latter multiply, the greatest benefit will have been conferred on the country."

September 24, 1859.—We learn that the 300 sparrows imported into New Zealand at the suggestion of Mr. Brodie have already done the farmers immense service by devouring the caterpillars, which have been till recently most destructive in that country. The arrival of the birds, in the first instance, was treated with universal derision.

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PROCEEDINGS

The monthly meeting of the Club was held at the Royal Society's Hall on October 11, 1943. The President (Mr. P. F. Morris) presided and about 70 members and friends attended.

"BRAINS TRUST"

Questions held over from previous sessions were answered.

Question 1. To Miss J. W. Raff: "What is *Heterodoxus spiniger*? Is it a fossil, a plant or a louse?" *Answer*: A biting louse, often found on dogs, but whose natural host is the wallaby. It has transferred from the natural host to a secondary host and ranges from 40 degrees North to 40 degrees South, climate playing a large part in its distribution. *Comments*: Mr. P. Crosbie Morrison asked whether the foot-grips differ on the sucking and biting lice. *Answer*: In this case Miss Raff was not able to answer with accuracy, but possibly differences did exist.

Question 2. To Mr. A. H. E. Mattingley (taking the place of Mr. A. H. Chisholm): "How does the Reef Heron know when to fly out to the islands off the mainland to feed at the turn of the tide, seeing that the tides differ from day to day?" *Answer*: Mr. Mattingley suggested that some radial rays at present unknown, but due to the tides, affected the birds in such a way that they knew when to leave the mainland and reach the islands at the proper time. Mr. Mattingley further suggested that the word "instinct," used to explain such happenings, should be dropped from use, as it rather prevented any explanation being given. *Comments*: Mr. E. S. Hanks doubted that such an explanation could be accepted, and in any case he questioned whether the birds did fly from the mainland as suggested by the question. Mr. H. P. Dickins asked if the birds were only affected by one tide, or did they realize that there were two tides each day. Mr. Mattingley thought that the birds would know of the two tides. Mr. F. S. Colliver suggested that until some definite proof could be had that such rays existed and affected the birds in any way at all, it would be better to call the reason for the flight "instinct" and be done with it. Mr. Scott gave, as a possibly better explanation, the theory that the birds were able to appreciate the slight changes that take place on the surface of the earth due to the added or subtracted weight of the water along the shore-line at the tidal changes.

Question 3. To Mr. C. J. Gabriel: "Do you believe that the most satisfactory classification of the mollusca has been arrived at, and if not where would you make alterations?" *Answer*: Classification of the mollusca has been made on such items as the radula, anatomical characters of the soft parts, and the shells themselves, to mention only three of many. The personal feelings of the worker concerned play a large part in such a matter as a classification, e.g., the fossil forms usually are found lacking characters to be seen in the living shell, and thus a classification based on soft parts would be useless in dealing with fossil forms. Mr. Gabriel also remarked that if it can be said the best classification had been arrived at, then we have stopped progress in this particular branch of study. *Comments*: Mr. Colliver suggested that the best classification would be one based on the shell itself, as by this both recent and fossil forms were comparable with each other. Mr. Morrison submitted that anatomical characters of the soft parts would possibly be the best grounds for classification, and even if the work of the palaeontologist were made more difficult, the main item of relationship between forms would have been determined. Mr. Gates remarked that the line of descent was certainly the most important matter to be considered, no matter what the classification was based upon.

Question 4. To Mr. J. H. Willis: "Name six different Victorian native plants which are poisonous to animals and give the toxic principles in each." *Answer*: Although stock-poisoning by certain indigenous plants is well attested, the most recent available work on the subject (*Poison Plants of N.S.W.*, 1942) indicates that very little is known about the actual poisonous principles involved. We may conveniently group our chief poison plants under three broad headings, viz., those containing cyanogenetic glucosides, thereby yielding prussic acid upon ingestion, those secreting alkaloids, and those that poison insidiously by cumulative effect. To the first category belong the great majority of toxic species and three of the worst offenders are: (1) Flat Spurge or Caustic Weed; (2) Austral Trefoil, and (3) Spotted Emu-bush or Native Fuchsia. These commonly give rise to trembling, shivering, frothing at the mouth and rapid mortality. The Emu-bush has a higher percentage of prussic acid than any other Australian plant. Astounding variability with local soil conditions, climatic changes and stage of growth obtains in most cyanogenetic vegetation, so that a plant of bad reputation in one district may be quite harmless elsewhere, or later in the season. Among alkaloid poison plants may be instanced the Yellow Rice-flower (the toxicity, due to daphnin or a related substance, causes severe gastroenteritis) and poisonous toadstools, of which the muscarine-yielding "fly agaric" is a good type. Intoxication, with strange hallucinations, is a

frequent effect, but over-doses end in a lingering, agonising death. The Purple Swainson Pea (a coastal trailer) well exemplifies cumulative poisoning; indeed, the whole genus *Swainsona*, when persistently browsed, causes animals to become "pea-struck"; they wander about in a dazed condition until too exhausted to stand. *Comments*: Mr. H. C. E. Stewart mentioned the apparent immunity of our native marsupials and many birds to plants which would kill the introduced domestic animals. Mr Ros Garnet drew attention to the avoidance of certain eucalypt leaves by koalas, presumably because of toxic properties, whether cyanogenetic or due to high phellandrene content.

Question 5. To Mr. A. C. Frostick: "What evidence is there that Tektites are of meteoric origin, and what is the weight of the largest?" *Answer*: Since there appears to be no accepted record of the observed fall of tektites, direct evidence of their extra-terrestrial origin is admittedly lacking. However, their almost unique composition, peculiarities of distribution, and the unusual form of some Australian examples, while strongly supporting the meteoric theory, at the same time rules out most of those remaining. Furthermore, the recent research of Mr. G Baker and Mr. H. C. Forster into the specific gravity relationships of the widespread Australian tektites (Australites), clearly demonstrates the existence of the chemical gradient long ago predicted by supporters of the meteoric theory. The unique form of Australite "buttons," so admirably explained as due to ablation resulting from atmospheric friction, also remains an enigma if the meteoric theory be refuted. Lastly, the one serious objection advanced against the acceptance of tektites as acid meteorites is the wide divergence of their composition from that of both the stony and metallic meteorites. In estimating the value of this objection, it should be remembered that eighteenth-century scientists believed the "fall of stones from the sky" to be a physical impossibility, so that at that time the true origin of even meteorites was as obscure as that of tektites to-day. In reply to the second part of the question. The largest Australite recorded weighs 218 grams, though Indo-Chinites may weigh several kilograms. *Comments*: Mr. J. H. Willis inquired about the age of Australites, and whether the aborigines made use of them. *Answer*: In the absence of any precise age determination the occurrence of Australites, both on the surface and in the Quaternary gold drifts, would indicate that they are geologically recent yet historically remote. The aborigines apparently did make use of them, but not to any extent.

Question 6. To Mr. Colliver: "Is there any fossil proof showing ancestry of the highly evolved Casuarina from ancient Gymnosperms. Failing geological evidence, on what is the implication

of the relationship by systematic botanists based. Or can the Brains Trust briefly outline the probable development (palaeontological) of the Australian Casuarina?" *Answer*: Engler and Prantl's *Pflanzenfamilien* (1889), the now widely-accepted standard for plant classification, gives: "The resemblance of *Casuarina* to *Equisetaceae* is purely superficial, and a derivation of *Casuarina* direct from the *Equisetaceae* cannot be considered seriously. Somewhat greater is the conformity with *Ephedra*, at least in the course of the vascular fibres: in floral structure, however, Casuarinas show themselves as undoubted angiosperms (plants with ovaries) and a comparison with the floral conditions of *Ephedra* will again not permit the thought to be entertained of any closer relationship: it may be mentioned at the same time that in the male flowers of *Ephedra* a synandrium replaces the single stamen found in Casuarinas." *Notes* to above translation by Mr. J. H. Willis: It is important to remember that present-day vegetative structure in many plants tells us very little of the true evolutionary affinities. Because *Equisetum*, *Ephedra* and *Casuarina* display a common reduction of leaves and a verticillate or whorled, "whip-cord" habit of growth, this means really no more than the development of succulence, for instance, among desert plants of such diverse and unrelated families as *Cactaceae*, *Euphorbiaceae*, *Compositae*, *Asclepiadaceae*, etc. Here the swollen, water-holding and photosynthetic stems are remarkably similar and, in the absence of leaves and flowers, one family might well be mistaken for another. Then again, *Casuarina* is usually reckoned a primitive type and relegated to the lowest rank of flowering plants, but is there a valid reason for this view? Mere simplification of the floral parts (absence of perianth, reduction in number and size of stamens, etc.) is no criterion for an ancient type; the grasses, willows, and other wind-pollinated plants were once called "primitive," but are now more often regarded as highly evolved. There is absolutely no fossil evidence to link up the "sheokes" with any other plant family, past or present, and to maintain that they are related to Gymnosperms seems to me quite unwarrantable.

Question 7. To Mr. Colliver: "Has any form of fossil ever been found in Igneous rock?" *Answer*: Yes, many casts, impressions and enclosed wood have been recorded from basalt deposits. To mention some of the more important ones: In 1892 portion of a Lycopod stem in basalt was recorded from Bo'ness Coal Field, Scotland, by Cadell. (*Trans.Edin.Geol.Soc.*, Vol. 6, Pt. 3); in 1900 a unique cast of a tree-trunk in basalt from Footscray was described by Walcott. (*Proc.R.S.Vic.*, Vol. VII; ns. pt. 2; p. 140); in 1907 Solorzano and Hobsen recorded numerous and distinct external impressions of female ears of maize, entire grains, and carbonised remains of the axis of the ear, preserved in scoria from Mexico. (*Geol.Mag.*, Vol. 4, No. 5); in 1914 Chapman recorded

the impression of the fruit of a *Casuarina* in a basalt block. (*Vic.Nat.*, Vol. 31, No. 6.)

Question 8. To Mr. Colliver: "Which of the rival views concerning the origin of the 'Devil's Corkscrews' (Daemohelix) do you favour?" *Answer*: The Daemohelixes, as now known, are giant spiral structures found in widely dispersed areas and deposits of various ages: e.g., they have been recorded from the Miocene of Nebraska, Pleistocene of America, Oligocene of Bavaria, and Jurassic of Queensland. Allied forms are known from the Wealdian of England. (Dinocochlea) and have been dredged from the North Sea. These last two, from their general appearance, could possibly be giant mollusca, but for the Queensland form, to which the question apparently refers, this view does not seem possible. Possible explanations are: (a) infilled potholes (impossible owing to these structures occurring both horizontally and vertically; (b) concretions (no methods known whereby a spiral structure can be formed); (c) infilled animal burrows (no spirally-formed burrow known); (d) infilled holes caused by decayed roots (no such roots known); (e) coprolites. Personally, whilst I agree that infilled burrows and root-holes could cause such structures, I favour the coprolitic origin; but one must admit that no proof has been found. That they are large for coprolites is also admitted, but the same deposits contain remains of two Dinosaurs of approximately 50 feet long, and these animals could have produced a coprolite of 7 feet, which is approximately the length of the Queensland spiral.

Question 9. To Mr. Colliver: "What is the Fossil Eucalyptus Record?" *Answer*: For Australia, 19 species named, and of these 18 are accepted by Maiden in his Critical Revision. Besides these, four living species are listed as sub-fossil, e.g., *E. obliqua, ex* Haddon, Malmsbury and Daylesford; *E. amygdalina, ex* Redruth, near Casterton; *E. melliodora, ex* Bruthen (fossil wood), and *E. piperita, ex* Mallacoota Inlet (fossil wood). A comprehensive survey of the above will be found in a paper on the "Fossil Eucalyptus Record," by Chapman. (*Vic Nat.*, Vol. 42, No. 9, p. 229.) Of extra-Australian described species, some 21 have been recorded from such diverse localities as Tirol, Moravia, Siberia, Poland, Portugal, and America. All of these are doubtful determinations. Cretaceous fruits, supposedly of Eucalyptus, from Siberia have been proved to be cone scales of a conifer, *Dammara borealis*.

This final question brought the "Brains Trust" to a close. Several members spoke congratulating those who had taken part in the series, on the amount of information they had given to the meetings, and suggested that a similar series should be arranged in the near future.

REPORTS OF EXCURSIONS

Reports of excursions were given as follows: East Oakleigh, Mr. P. F. Morris (for Mr. and Mrs. Salau); Wattle Park, Mr. E. S. Hanks (Mr. Chalk reported per Mr. Cooper that a visit to the park the following Saturday showed that most of the nests noted at our excursion had been destroyed by boys); Botanic Gardens, Mr. P. F. Morris.

ELECTION OF MEMBERS

The following were elected as Ordinary Members of the Club: Miss H. Parry, Messrs. A. Bates, John Swanston, W. N. Kewley; as Country Member: Mr. B. E. Carthew; as Associates: Miss Patricia Harris and Master A. N. Carter.

GENERAL BUSINESS

Mr. P. F. Morris reported on the Natural History exhibition held last week at the Hawthorn Free Library, and thanked all who had contributed in making the show so successful; he further stated that Mr. S. R. Mitchell and Mr. and Mrs. Freame deserved a special vote of thanks.

EXHIBITS

Mr. P. Fisch: Greenhoods (*Pterostylis curta, P. longifolia, P. nutans*), found along Koonung Creek at Doncaster. Also the Bird Orchid (*Chiloglottis Gunnii*), Wallflower Orchid (*Diuris longifolia*) and garden-grown *Prostanthera ovalifolia*.

Mr. J. H. Willis: Curious insect galls on "Sugarwood" (*Myoporum platycarpum*) from the Mallee; also lustrous ironstone pebbles from Sandringham beach.

Mr. J. Ross Garnet: Female hermit crab from a whelk shell. (The relatively few eggs attached to the body of the animal are but a small portion of the total number produced.) Specimen collected at McCrae, 19/9/43.

Mr. H. P. Dickins: Four studies of Australian flowers.

PLUCKY BUTCHER BIRD

"The butcher bird," says an experienced bushman, "is a tyrant, but I admire the pluck with which he fights for his own if the female is sitting, or there are young in the nest. He never whistles to his mate, as most other birds do when nesting, his tuneful whistle being heard later in the season. He will tackle a brown hawk or a crow in defence of his family, and drive them off.

"And though he destroys so many small birds, it is a curious fact that I have found the nest of the black and white robin and the black-eared miner on the same shrub with the butcher bird's nest, and only a few feet from it, yet all living harmoniously together. That is not an uncommon occurrence. Many birds which are antagonistic seem to fraternise or at any rate call a truce when nesting close together."

A NEW ABORIGINAL ART GALLERY

By LINDSAY BLACK, Leeton, N.S.W.

Some months ago Mr. A. R. Campbell, of Broken Hill, told me he knew of a cave containing engravings and paintings on Glenlyon Station, western N.S.W. As I knew this was a Gallery which had never been recorded, I arranged with him to guide a party to investigate.

The position described was in the Scope Range and not a great distance from Burke's Cave where there are engravings, paintings, and stencilled hands which have been described by Dow in *Mankind* (Vol. 2, No. 5, p. 117).

The chief cave of the Glenlyon painting.

The party visited the Gallery early in August (1943) and was well rewarded. At this Gallery there are a number of rock-shelters and one cave. The site is near the Gum or Sixty-Mile Creek and is about 60 miles N.E. from Broken Hill, close to the main road to Wilcannia.

There are many aboriginal Art Galleries in this district, which was the home of the Bullalli tribe, and they are all close to large water-courses. The aboriginals must have selected these places on account of the water supply, both for domestic use and because there would be plenty of game in the vicinity of the water.

The unusual items at this Gallery were illustrations of two ducks

and a large egg. One duck painting, measuring thirteen inches long and seven inches high, was painted white, but had to be chalked over in order to obtain a clear photograph. The other duck was engraved, but it was weathered and indistinct and a photograph could not be obtained. Close to these two birds was a large egg and 24 hands, all painted white. These hands were very clear, as they were well sheltered in the cave. On the wall of the cave there were also some stencilled hands. Stencilled hands are very common, as there are numbers at every Gallery where paintings are found, and sometimes they are in shelters or caves where

This Gallery has never previously been recorded.

SOLDIERS COLLECT BUTTERFLIES IN NEW GUINEA

The main trial of a soldier's life in New Guinea is his constantly waged war against monotony. Many have sought respite from this danger by taking an active interest in the study and collecting of local butterflies, which must surely rank among the most colourful in the world.

I am afraid this practice was originally looked upon by many as the first signs of the victory of monotony over the average brain. Those who were so weakened were termed "Troppo," and looked upon pityingly by the others.

But time passed, and the students of nature's collection increased to become gradually the show piece of the camp. Slowly but surely the interest in New Guinea's butterflies became more apparent among the ranks until to-day we find quite an army of collectors out each day searching jungle trails and beside jungle streams for new specimens.

Rank amateurs having little knowledge of the habits and the entomological names of the butterflies, they soon developed a language of their own. When, for instance, they refer to an RAAF, you know they mean a black and white variety with an Air Force circle on its wings. It is only caught at rest on a leaf. The "Tiger" has Richmond Football Club's colours—yellow and black. It is the most elusive of its kind, and has to be caught in flight. The Blues are ranked among the most colourful, being a broad V-shaped, fantailed variety, with a beautiful blue silky wing and are caught only by decoy.

Those types so far mentioned are the size of a man's palm when extended.

The collectors found that many of the species move unceasingly along the same jungle trail back and forth over a hundred yards or so. Blues remain high among the jungle foliage, but are attracted down by a decoy of their own kind placed in a leafy, sunny spot. Most brown varieties seem to move among the kunai grass, and are beautifully marked in brown and white.

The butterflies play a most important part in the life of New Guinea flora, as their main work is pollination, taking the place of our Australian bee. The study of their habits by observation has developed, as did the formation of a local nomenclature for them.

The students are as keen as the most seasoned collector, and one can but marvel now at the knowledge they have of the butterfly and its habits. Not only that, but, more important, it seems to have improved their general knowledge of the tropics and the jungle and shown to them in a more practical way all those rules and tactics on bushcraft and law we were taught from jungle training manuals.

So this developed interest has served a dual purpose, and from the appreciation of the butterfly has come a more intimate and general knowledge of the type of country we all must fight in, and, of paramount importance, has helped lift the local, steamy, veil of monotony.

—From *The Argus* (Melb.), 23/10/43.

Plate VII

This illustration of a wild duck is a painting: it was chalked over for the purpose of photography.

Various hands painted in the Glenlyon Cave.

Photos. by Lindsay Black.

FURTHER NOTES ON THE GREAT BROWN STICK-INSECT

By EDITH COLEMAN, Blackburn, Vic.

The first female Stick-insect which developed from eggs deposited by my captive had herself dropped 33 eggs on July 16, 1942 (*V.N.*, Aug., 1942). This insect was kept alone in order to count her eggs. She died on January 8, 1943, during a very hot spell. In less than seven months she dropped 452 eggs. She herself hatched from one of 594 eggs deposited by her mother in less than a year.

It will be remembered that five adult females of this hatching were isolated to decide the question of parthenogenesis (*V.N.*, Aug., 1942). Later, two more adult females were placed with them. A large cage gave ample room for movement, and for plenty of gum-tips. In this cage egg-deposit commenced on July 2, 1942, increasing until, at a conservative estimate, some 2,400 eggs had been dropped.

In the mixed cage, pairing, which was continuous for from 24 to 36 hours, commenced on October 4, 1942, lasting until March 5, 1943, and here egg-laying did not start until October 31, 1942. All these adult males had died by March 10, 1943. Most of them had lost a leg or two, even three. The last of the females in this cage died on August 28, 1943. Some of these, too, had lost a leg. Three of the seven isolated females are still alive, sound in wind and limb. Indeed, none of these was mutilated in any way.

Some of the eggs from each cage were removed to labelled boxes containing humus. The rest were left on the floors of the cages. All were sprinkled with water from time to time. Although some of the parents of these eggs hatched in four months from the time of deposit, there is at present no sign of hatching, yet the eggs are from 12 to 15 months old.

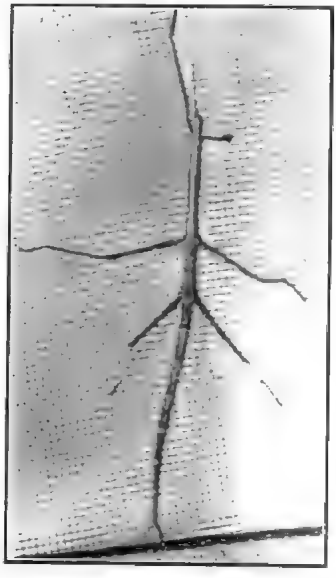
This long hibernation is not unusual. Professor G. D. Hall Carpenter (Oxford) has told me of such an instance. In October, 1941, he received a large (dead) South African Phasmid with her eggs, presumably deposited in 1940. The eggs were mounted on a card and put away. On September 18, 1942, he found that two eggs had hatched, but the larvae had not been able to free themselves from the membranes. The card of eggs was transferred to a damp chamber, and after four days a living larva emerged, but died, probably owing to the lack of its proper food-plant.

Second Hatching

To return to my own experiments. In the meantime, a second large family of Stick-insects emerged from the first 594 eggs. On May 24, 1942, one egg hatched eleven months after the last of the first hatching. Not until October 2, 1942, did another larva

emerge, the early, or tardy, comer of May 24 being then about three inches long.

Two more hatched on October 18 and two on October 24. One of these fell into a dish of warm milk set on the floor for a dog. It appeared to be quite dead when I lifted it out, although a moment before it had been struggling in the milk; but, although only a few hours old, the tiny creature was shamming. Still stiff, it was placed on a piece of clean linen, and in a few minutes was quite lively again. When lifted to the gum-twigs, it again "froze"—but it ran under a leaf of its own colour when I moved away.



Stick-insect showing a regenerating foreleg at the penultimate moult. At the final moult this leg will be normal, except that it may be slightly shorter than the opposed leg. Only half the head can be hidden in the hollow of the one foreleg.

Hatching continued until November 27, 1942, when I had a second family larger than the first. One wondered how many of the delicate creatures that emerged during the torrential rains of November 4 would have survived in natural conditions. At the present time (September 30) two females and one male of this second hatching have passed their final moult, but egg-laying has not started. Just before this takes place the insect rests with heavy abdomen reflexed backward, a position retained throughout the egg-laying period, except when moving to feed on fresh leaves.

It is interesting to note that hatching of the first lot of eggs, assumed to have commenced in November, 1941, lasted until February, 1942. In the second batch it began on October 14, 1942, and ended on November 27, 1942, a much shorter period for the older eggs.

Regeneration of Lost Limbs

Occasionally during ecdysis a limb is lost. In two instances I saw this happen, a bead of green fluid appearing on the newly emerged body at the point where a leg had been torn off. The insect appears to suffer no discomfort, although when a foreleg is lost half of its head, only, can be hidden in the hollow inner side of the remaining foreleg.

At the next moult a minute protuberance indicates a coming leg. With another moult it is a little longer and slightly thickened at

the tip. At the next moult the thickening has curled, like a little pig's tail, and at the penultimate moult the curl is twice revolute.

At this stage a slight wriggling movement is noticed in the curl, especially when the opposed leg is moved, but the regenerating leg is not yet used in walking or clinging. With the final moult the new leg is almost normal, although it is usually slightly shorter than the opposite leg.

Growth of the regenerated leg is apparent only after a moult. When a leg is lost after the final moult, regeneration does not take place.

The insect illustrated "A," one of the second batch, is 7½ inches from tip of the extended foreleg to end of the "tail"-appendages. Final moult should soon take place. She is still green. A striking feature of the second family has been the retaining of their green colour until the penultimate moult.

On November 3, 1942, I watched a tiny creature lose a middle leg during its first moult. On January 26, 1943, this insect was 5 inches long and had grown a "leg" ½ an inch in length. On January 30, 1942, it again moulted, the new leg measuring ½ an inch to the curl. The opposite (normal) leg was 2 inches long. On March 15, 1943, after final moult, the regenerated leg was 2⅞ inches long, the opposed one being 2 11-12ths inches.

During the winter little movement was seen in the cages, although food was eaten in June and July.

The insect illustrated ("A") was photographed twice: the second photograph, although taken 24 hours later, shows no change of position. An exposure of 3½ minutes was necessary, yet little, if any movement is shown, so rigid is the "freezing" attitude.

POISON OF THE PLATYPUS

The following note has been written in a Victorian paper by a resident of Devonport (Tas.):

A boy engaged in trapping rabbits on a farm in northern Tasmania one morning found a large platypus caught by one of its forefeet in a trap, and brought it, still attached to the trap, to our house. I impulsively took it by the neck, as one would a duck, and it immediately curled its body round and drove two sharp spurs into my left hand on either side. The agony was so intense that I fell to the ground, and the creature then slipped away. In a short time my hand was swollen to three times its normal size, and my arm was likewise affected. A foment, in which permanganate of potash was dissolved, having been tried without reducing the pain or swelling, I was taken to a doctor. He ordered my hand and arm to be kept in water (to which antiseptics were added) as near to boiling point as could be borne. I was in bed for nearly a fortnight, and my hand was lanced four times. The doctor declared that if I had not been in perfect health I would certainly have lost my arm and probably my life. As it was I suffered for many months from the effect of the poison in my system and from loss of power in my left hand, the finger-nails of which turned black, while those of my right hand became brown.

REVISION OF THE VICTORIAN GLEICHENIACEAE

By N. A. WAKEFIELD, Genoa, Victoria.

In the latest comprehensive Victorian Flora,[1] the family Gleicheniaceae is represented by the genus *Gleichenia* and four of its species. In 1938, however, Christensen[2] broke the family up into five genera, which arrangement Copeland[3] has adopted, though the latter revives an additional genus.

The first Australian species to be described was *G. circinnata* of Swartz; but in 1810 Robert Brown[4] discarded this name on the grounds that the species was insufficiently described, and he applied specific names to several plants, any one of which might have been Swartz's species. Subsequent writers[5] regarded Brown's *G. microphylla* as a synonym of *G. circinnata*, and *G. dicarpa* of Brown was listed as a valid species. But Christensen, who recently examined Swartz's original material, found that the reverse was the case, and that it is Brown's *G. dicarpa* which corresponds to Swartz's species; so, for our Victorian material, the name *G. microphylla* must replace our *G. circinnata*, and the latter name must be applied to our *G. dicarpa*, which becomes a synonym.

Our other Victorian species now belong to the genus *Stichcrus*. Robert Brown[4] described two of them as *Gleichenia tenera* and *G. flabellata*, but Bentham[6] and subsequent Australian botanists reduced the former to a variety of the latter, though Christensen[6] rightly regards both as distinct species. The third Victorian species of *Stichcrus* has, until the present, remained undescribed; for it has been wrongly identified as *G. laevigata*,[7] a species ranging from Malaya to New Guinea.

Our local species of Gleicheniaceae are distinguished by their tiered fronds which consist of opposite pairs of apparently dichotomous pinnae. This pattern of growth is called pseudo-dichotomous, and is brought about by the primary pinnae producing only one pair of opposite secondary pinnae, the apical part being represented by an undeveloped circinnate "bud." The secondary and the tiertiary pinnae and the apex of the frond behave in the same manner; though in *Gleichenia* many of these buds often develop into frond parts to produce a more complicated pattern.

The Victorian genera and species are as follow:

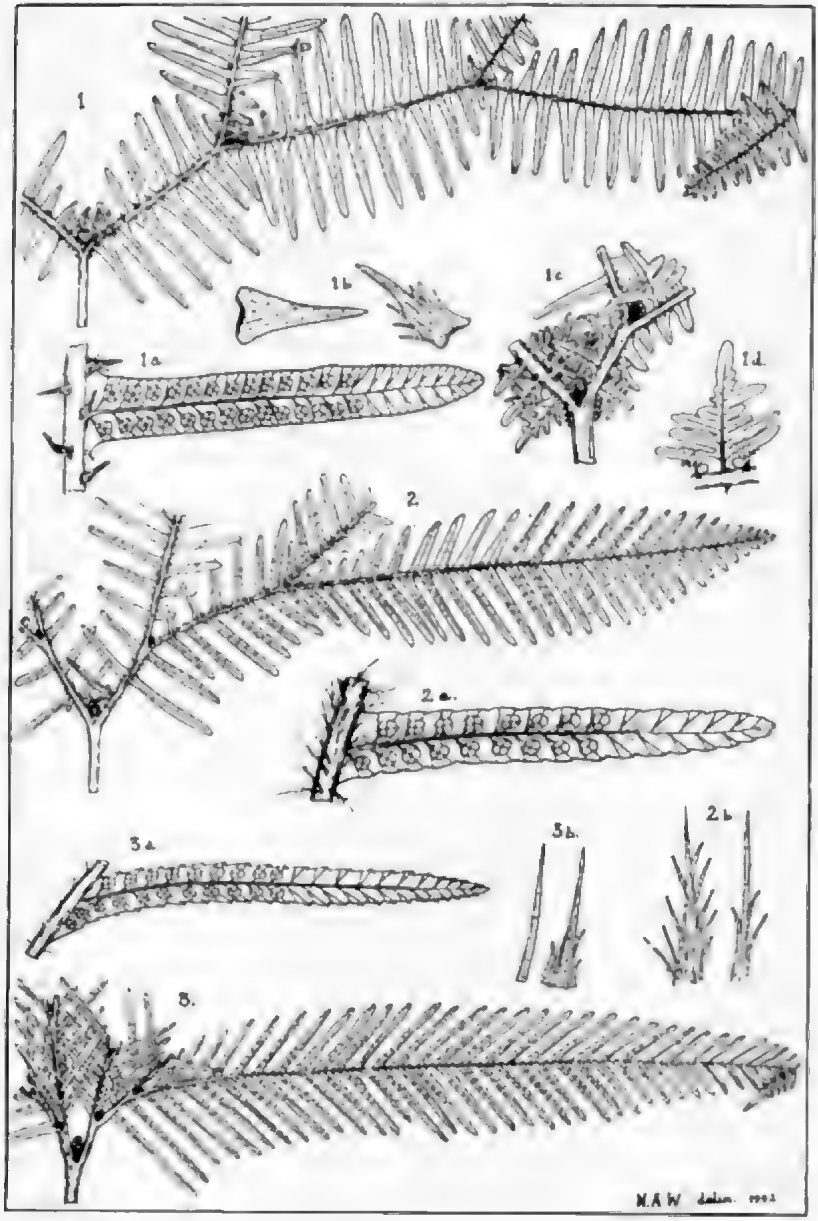
Pinnules deeply cut into rounded segments .. .. .. *Gleichenia*
  Segments flat .. .. *G. microphylla*
  Segments forming pouches .. .. *G. circinnata*
Pinnules entire or almost so .. .. *Stichcrus*
  Pinnules entire, widely spreading; rachises bearing broad scales .. .. *S. lobatus*
  Pinnules entire, acutely angled; rachises scaly-hirsute .. .. *S. tener*
  Pinnules denticulate, acutely angled; rachises glabrous or almost so .. .. *S. flabellatus*

"Genus *Gleichenia* Smith.—Fronds bipinnate or more compound; segments minute, round or ovate; *sori* usually composed of 3 or 4 sporangia. A small group of the oriental tropics and further south."[3]

G. circinnata Swartz. (Syn *G. dicarpa* R.Brown[4]). Stipes and rachises wiry, red-brown, scaly-villose; lobes of pinnules very concave beneath, their incurved margins forming pouches in which the sori are situated; sporangia 2. Distribution: N. Austr., Q'land., N.S.W., Vic., Tas., N. Zeal., N. Caledonia and N. Guinea.

G. microphylla R Brown.[4] (Syn. *G. circinnata*[5] of many writers but not of Swartz). Similar in most features to the preceding species, but the lobes of the pinnules larger and flat; sporangia 3-4. Distribution: Q'land., N.S.W., Vic., Tas., S Austr., N. Zeal. and N Caledonia.

"Genus *Stichcrus* Presl.—Rhizome and frond paleaceous or glabrescent; frond in typical development pinnate or bipinnate, its subsequent division



pseudo-dichotomous, the growth of the terminal bud being suppressed above each node; foliar segments borne on ultimate axes and usually on one to three preceding internodes, nodes without stipular appendages; veins once forked; sori of 1-6 (most commonly 4) sporangia. A large genus, throughout the Oriental and American tropics. Presl's diagnostic character, reticulate venation, is imaginary."[3]

STICHERUS LOBATUS sp.nov. Frondes altæ vel breves; pinnæ primariæ 2-4 oppositis paribus dichotomæ ramis divaricatis ferentibus basibus confusionem magnarum pinnularum lobalarum; rachises squamæ latæ acutæ desiduæ; pinnulæ integræ glabræ basibus latis concurrentibus; sporangia 3-5.

Synonyms: *Gleichenia flagellaris* of Bailey[7] and others, not of Bory, and Spreng.; *Gleichenia laevigata* of Domin,[8] Ewart[1] and others, not of Willd. and Hook.

Fronds of the typical plant are up to 6 ft. high, arising from a widely creeping rhizome and each bearing 1-4 pairs of primary pinnae, the bases of which are surrounded by clusters of large lobed pinnules. The primary pinnae are forked twice or thrice with widely divergent branches and at first the rachises bear large broadly-triangular scales but become glabrous later. The pinnules are widely spreading (about 80° to the rachises) and are long, tapering, entire, light-green and glabrous above and below, with broad concurrent basis. Sori are numerous and consist of 3-5 sporangia. A common species ranging from south-east Queensland through eastern New South Wales to eastern Victoria. *S. lobatus* is figured by Bailey[7] (as *G. flagellaris*), and in the F.N.C.V. book on Victorian Ferns (as *G. laevigata*). Material collected by the author during the past few years from east Gippsland has been placed in the Melbourne National Herbarium to typify the species. *Figs. 1 (a. to d.).*

HOLO-TYPE from Mt. Drummer, Vic., N.A.W. 6/7/1941.

S. tener (R.Brown) Ching, in *Sunyatsenia*, V. (1940) 283. Synonyms: *Gleichenia tenera* R.Brown; 4 *G. flabellata* var. *tenera* Bentham;[5] and *G. flabellata* (partim) of Brown,[4] Bentham[5] and subsequent writers.[1] Primary pinnae 1-3 pairs, each branched acutely twice or thrice fairly close to the main rachis; rachises densely scaly-hirsute or rarely almost glabrous; pinnules acutely angled, dark green, rather dull, finely silky-pubescent beneath, obscurely lobed or nearly entire. The few scattered pinnules on the primary rachises are often somewhat lobed, but are longer than in the preceding species and distant from each other. Distribution: Widespread in Tasmania, Victoria and New South Wales. *Figs. 2 (a. and b.).*

For this plant Bentham[5] remarked: "var. *tenera*, a small alpine form, Mount Wellington, Tasmania," while both he and Robert Brown[4] listed the following species for Tasmania; so it is evident that Brown himself failed to delimitate correctly between two of his own species.

S. flabellatus (R.Brown) *nov.comb.* (Syn. *Gleichenia flabellata* R.Brown.[4]) Primary pinnae 1 or 2 pairs, each branched acutely once or twice very close to the main rachis; rachises glabrous or rarely slightly scaly-hirsute; pinnules acutely angled, distinctly toothed, dark-green, shiny, glabrous above and below. There are no lobed pinnules, nor do the primary rachises bear pinnules. Distribution: Abundant in Queensland and New South Wales; also in eastern Victoria, and extending to New Caledonia and New Zealand. *Figs. 3 (a. and b.).*

The only known Victorian locality for this species is Boggy Creek, near Genoa, where a large patch was found in a rocky gorge towards Genoa Peak by the writer in September, 1939—a new Victorian record.

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1. *Flora of Victoria*, by A. J. Ewart.
2. "Filicinae," by C. Christensen, in Verdoon's *Manual of Pteridology*.
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4. *Prodromus of the Flora of New Holland*, by Robert Brown.
5. *Flora Australiensis* (Vol. VII), by George Bentham.
6. *Index Filicum*, by Carl Christensen.
7. *Lithograms of Queensland Ferns*, by F. M. Bailey.
8. *Fernflora of Queensland*, by C. Domin.

"EARLY" BLACK SWANS IN ENGLAND

The following extract (sent by Mrs. A. Hargreaves, of Ararat) is from the *Illustrated London News* of August 20, 1859:

"Everyone now knows that the Latin proverb which speaks of the rarity of Black Swans has ceased to convey a truth. Excepting that, on the whole, a white swan is a prettier object, there is no reason why the black fowl of that species should not be as common as the white one. At any rate, the breed which is in existence at Calvers, near Carshalton, the seat of Mr. Samuel Gurney, M.P. for Penryn, is prolific enough to warrant an assertion that there is no chance of the proverb being reinstated in its truth and integrity. In justification, however, of the ancients, it may be stated that, according to Mr. Gould, in his work on Australian Birds, the first notice on record respecting the existence of the Black Swan occurs in a letter written by Mr. Witsen to Doctor M. Lister about the year 1698, in which he says 'Here is returned a ship which by our East India Company was sent to the south land, called Hollandia Nova'; and he adds that Black Swans were found there. In 1726 two were brought alive to Batavia, having been procured on the west coast of Australia, near Dirk Hartog's Bay. Captain Cook observed the bird on several parts of the coast, and from that time it has attracted the attention of every traveller in Australia. It has not been found in a state of nature out of Australia, and it has not yet been seen on the north coast; while, on the other hand, it is as generally distributed over the whole of the southern portion of that vast continent, the islands in Bass's Straits, and the still more southern country of Van Diemen's Land, wherever there are rivers, estuaries of the sea, lagoons, and pools of water of any extent. In some instances it occurs in such numbers that flocks of many hundreds may be seen together. These birds have been in different parts of Australia much sought after and destroyed by the settlers, one mode pursued being to chase them in a boat at the time when they shed their primary quill-feathers, when, being unable to fly, they are easily captured. In disposition, unless seriously molested, the Black Swan is tame, gentle, and harmless; and, as it readily becomes domesticated, there are few of the aviaries of Europe which do not contain some specimens of the bird. The breeding season, in its state of nature, commences in October and continues to the middle of January, and the eggs laid are from five to eight in number; they are of a pale green colour, stained all over with buffy brown, four and a half inches long by two inches and three-quarters broad. The whole of the plumage is brownish black, the under surface paler than the upper, the feathers of the back tipped with greyish brown; primary and secondary feathers pure white, bill beautiful pinky scarlet, crossed near the tip with a broad band of white, eyelashes pinky scarlet, and feet black. The specimens of the Black Swan possessed by Mr. Gurney, and of which we give an Illustration, have proved singularly prolific. The parent-bird has laid no less than ninety-two eggs and hatched seventy-three cygnets between January 1854, and July 1859."

TIGER SNAKE'S CALLS

A correspondent states that on a warm evening he heard dogs barking in his garden, and on going down found that they were interested in a tiger snake which was on guard with its head and neck raised about 4 inches off the ground. "I stopped within about 5 feet of the snake and distinctly heard it call six times, and could not be mistaken about the source of the calls. To describe it, take the word 'sit,' put in front of it the letter T, with a barely perceptible pause between the two. Otherwise it might be described as the escape of a very small jet of steam. After six such calls it tried to escape, and then I intervened. This snake had evidently just shed its skin and the colour bars were most distinct."

THE DOMESTIC CAT AS A HUNTER

Most folk are aware of the fact that the domesticated cat is not necessarily in need of food when pursuing rat, mouse or bird; love of the chase being excited in it by a rolling tennis ball or a trailed feather. In my youth I had a tabbied cat which habitually retrieved wounded parrots and leatherheads which had fallen to my gun, but beyond the orchard fence. He always brought the birds to me, but would eat one given to him and later regurgitate the feathers. The ringing noise of the ramrod when loading would rouse him from sleep and send him running to reconnaissance which often scared the birds.

Near Alexandra there dwelt a lonely widow known to the youths as Mother de Vries. She was a farmer and was bothered by hares feeding on her young oat crop. Her cat hunted in the early morning and added to the widow's food supply by dragging home—about 150 yards—the hares which he caught. In summer, failing a hare he would bring a snake—black, brown or tiger—and occasionally a blue-tongued lizard.

In some districts house cats "gone native" are numerous and prey on rabbits and birds. Some years ago a farmer near Narbethong told me that about every 18th rabbit caught in his traps was a cat!

It was not until recent years that possum-eating cats came to my notice. On several occasions I had been shown a cat in the country which was a reputed possum hunter, but I had not seen the hunt or the kill. At Kew a few years ago we had two white cats of different size and temperament. Both had excellent hearing. The larger animal rarely left the premises about which he caught mice, sometimes a bird, occasionally a rat. Of these he ate only the mice. The other and smaller cat, dodging street traffic, would cross into a neighbour's paddock, where, notwithstanding the neighbour's three dogs, he successfully hunted rabbits, bringing home his quarry over a wire-netted gate. On two occasions he brought a ringtail possum which apparently was not so toothsome, as he ate only portion of it.

At Mt. Eliza, Mrs. V. Tremayne has a cat which catches possums. This animal, which she described as "a generally good and respectable cat, but sometimes disgusting," devours all but the jaw bones of the possum (mostly ringtail, but sometimes silver-grey), including the fur, which she has not seen him regurgitate. After such an orgy he (swollen like a melon) goes into retreat for a time and misses many meal-times. On one occasion, when Mrs. Tremayne visited a nest to note the progress of a ringtail twins' development, she found the baby possums "missing" and the cat comfortably resting on the nest—thus adding insult to injury. A.D.H.

HAWK AND MUTTON-BIRD

An unusual incident is mentioned by Mr. J. F. Bourchier, of Kangaroo Ground: "On April 22, my attention was attracted by the peculiar flight of, to me, a strange bird, and on looking a little more closely, I was surprised to see that, instead of one bird only, there were two. The second bird was clinging upon the first one's back. After flying some two or three hundred yards the birds fell to the ground. I ran to where they fell, and found a sparrowhawk with what was afterwards identified as a mutton-bird. The mutton-bird was just dead, the hawk having torn the skin on the back of the neck and injured the back or neck bones. On the night previous there was a heavy south wind, and the mutton-bird may have been blown inland. When first seen the birds were about 200 feet in mid-air, and flew for approximately 250 yards. The descent was gradual, until, when about 50 feet up, they fell heavily. The hawk was making no attempt whatever to use its wings, the mutton-bird flying frantically. The weight of the mutton-bird was 1 lb. 7¾ oz. The air-line distance from Phillip Island to Kangaroo Ground would be about 60 miles."—(The *Argus*, Melbourne.)

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PROCEEDINGS

The monthly meeting of the Club was held at the Royal Society's Hall on November 8, 1943. The President (Mr. P. F. Morris) presided and about 100 members and friends attended.

BEREAVEMENTS

It was announced that a country member of many years' standing, Mr. George Aiston, of Maree, C.A.; a recently joined ordinary member, Mr. Lance Le Souef; and a very good friend of the Club, the Rev. C. C. Woolf, had recently passed away. Regret of members was suitably expressed.

SIR JOSEPH BANKS

The subject for the evening was a symposium on the subject "Sir Joseph Banks, Father of Australia," in commemoration of the bicentenary of his birth. Mr. Ivo Hammet spoke on "Banks, the Man"; Mr. Noel Lothian, "Voyages and Discoveries," and Mr. J. H. Willis, "Banks as a Botanist." The information given in these lecturettes made the evening one of outstanding interest, not only to the F.N.C. but to a number of members of the Historical Society who were present by invitation.

Mr. C. Daley added to the notes given by pointing out that Banks had suggested the use of Port Jackson as a penal colony, and that Macarthur had sent sheepskins, emus and black swans back to England. He also mentioned that some 40 years ago a memorial to Banks in Sydney was suggested and certain subscription lists were arranged for and a considerable sum of money collected, but as yet nothing had been done.

Mr. H. C. E. Stewart stated that Dr. Johnson was a friend of Banks and apparently nearly came out to Australia at one time, and he speculated on how the early history of Australia would have been affected if this visit had taken place.

Mr. A. Wolskel stated that Johnson respected Banks and proposed him as a member of a literary club; that Banks was one of the pall-bearers at Johnson's funeral, and that it was on record that at Banks's request Johnson had commenced a poem on a pet goat that belonged to Banks.

REPORTS OF EXCURSIONS

Reports of excursions were given as follows: Mt. Evelyn-Lilydale, Mr. R. G. Painter; Montmorency, Mr. A. S. Chalk; Bayswater-Ringwood, Mr. C. French.

ELECTION OF MEMBERS

The following were elected as ordinary members of the Club:—Misses J. S. Stevenson, D. L. Haywood, Margaret Fowler, Helen Alexander, Violet E. Baleem; Messrs. P. R. McFarlane, T. Byrne and F. Hallgarten.

PLEA FOR KOALAS

Plight of the Koalas at Quail Island. Mr. R. K. Monro stated that conditions as he found them on the island were very bad and that in a matter of weeks the animals would be without food. He suggested that with the offers of help he had received from the general public it would not be difficult for a properly organized party to take the animals off the island and crate them for transport to other localities.

Mr. Colliver moved that a sub-committee to inquire into the matter be selected from the general committee. This was seconded by Mr. Noel Lothian and carried. It was announced that Mr. S. R. Mitchell had offered the use of his truck as a means of transport.

NATURE NOTES

(a) Mr. A. S. Chalk reported on a Sparrow nesting on the ground under a piece of corrugated iron, and also stated that a Mud-Lark had nested in a tree at the corner of Exhibition and Bourke Streets.

(b) Mr. C. French reported on a Brown Thornbill nesting in a pot of Cineraria, in the Botanical Gardens glasshouse; it was also stated that the young birds had left the nest on 8/11/43.

(c) Mr. J. H. Willis spoke on some herbarium specimens that were collected by Banks (exhibited at this meeting).

(d) Mr. R. G. Painter mentioned in particular among his exhibits a garden-grown example of the Blue Leschenaultia, native to W.A.; and also an example of *Grevillea Barklyana*.

EXHIBITS

Miss G. Auchterlonie: *Dryandra formosa* and *Telopea speciosissima*, both garden-grown at Narracan.

Mrs. C. French: Vase containing seven varieties of *Leptospermum scoparium*, all garden-grown at Canterbury, comprising *Keatleyi, Walkeri, grandiflorum, album, rubrum, Sandersi* and *Nichollsii*.

Mrs. M. E. Freame: Marine shells (*Risella melanostoma*), gathered at Altona 8/10/43; eggs were laid under water at top of jar at 2 p.m. each day 10th, 11th and 12th October; hatched 5th November.

Mrs. F. H. Salau: Garden-grown specimens of *Banksia ericifolia*.

Master Robert Gwynne: Specimen of the Victorian thorny oyster, found in an aboriginal midden at Sorrento.

Mr. C. J. Gabriel: Thorny oysters (*Spondylus tenellus*, Bass Strait; *S. imperialis*, China Seas; *S. aurantius*, Philippines; *S. gaederopus*, Mediterranean).

Mr. Ivo Hammet: Garden-grown native flowers.

Mr. J. H. Willis (on behalf of the National Herbarium): Specimens collected by Banks.

Mr. R. G. Painter: 25 species of garden-grown native plants.

KOALAS ON QUAIL ISLAND

Statements having been made that some of the Koalas on Quail Island were in a bad way, several members of the Committee of the F.N.C., on various occasions, have paid visits to the area. Some of the results of their investigations have appeared in the Press, and have been the subject of comment by the Chief Inspector of Fisheries and Game (Mr. F. Lewis), who also visited the island. The matter of the removal of the animals from the island remains in abeyance at present. It will be discussed later. At present it seems certain that there are about one thousand Koalas on the island—a remarkable increase on the number (165) released between 1929 and 1933—and that there is now not sufficient food to maintain such a large colony. (See plate in this issue.)

PERSONAL NOTES

Mr. J. H. Willis, of the National Herbarium, has been appointed Assistant Editor of the *Victorian Naturalist*.

Members of the F.N.C. have sympathized with Dr. C. S. Sutton, an old member of the Club and former Librarian, who met with an accident and has since been laid aside. Dr. Sutton is now recovering.

Bombardier N. A. Wakefield, author of many papers on ferns in the *Vic. Nat.*, sends greetings to members from Somewhere in New Guinea.

LOOKING BACKWARD

By J. A. KERSHAW, C.M.Z.S., Melbourne

Looking back over the years to the opportunities available to the naturalist in the 'eighties for pursuing his hobbies within easy reach of the metropolis, one misses the wide stretches of heathlands with their gums, acacias, banksias and tea-trees through which one used to ramble in quest of birds, insects and plants.

Practically all those favoured haunts have long since gone—have been replaced by innumerable houses, attractive gardens and well-made streets. Looking at these places to-day it is difficult to realize that one used to wander here for half a day without seeing another human being, where nature was in undisturbed possession and where one could find so much of interest.

In those days, when entomology and birds and their eggs were my chief hobbies and the enthusiasm of the beginner in search of new discoveries took one into out-of-the-way places, the extensive areas of heath and scrub around Caulfield, Oakleigh, Brighton and Sandringham, still in their native state, had their special attractions. Similarly, Gardiner's Creek, Heyington, Glen Iris and the banks of the Yarra around Kew appealed to the nature-lover.

Studley Park, so well known to our early collectors, with its gums, acacias, casuarinas and abundant flowering shrubs, was a convenient and favourite resort. It was here that my father, in company with Henry Edwards, a distinguished actor of those days and a keen entomologist, did much of his collecting, dating back to the late 'fifties, the results of which, with material from other localities, formed the nucleus of the entomological collection in the National Museum. It was here, too, that other well-known collectors—Charles French, Senr., Dudley Best, F. DuBoulay, F. E. Dixon and others—all ardent coleopterists, found a profitable hunting-ground. Few localities so conveniently situated could yield such good results.

The extensive heath paddocks around Caulfield, long since taken over by the builder, but then densely massed with *Leptospermum*, *Epacris* and Wedding-bush (*Ricinocarpus*), and in places by old gums and acacias, was one of my early collecting-grounds. This class of country was particularly suitable for lepidoptera and it was surprising the variety of species one could obtain during the long summer evenings. Micro-lepidoptera -*Tortricidae*, *Oecophoridae*, *Tineidae* and *Gelechidae*,, etc.—were very plentiful and many of the larger groups such as the Geometrina, Noctuina, Liparids, etc., were by no means uncommon.

The Caulfield Park, then known as Paddy's Swamp, extending from Hawthorn Road towards the Caulfield railway, now laid out in lawns, ornamental trees and attractive flower-beds, was then in its wild state of trees and shrubs. The reedy swamp then occupying its centre, now an excellent sports oval, was frequented by wild ducks, coots and an occasional white-faced heron. Blue wrens, white-fronted chats, yellow-tailed thornbills and black-and-white fantails nested in the low shrubs and gums, and magpies, mud-larks, scarlet robins and honeyeaters were numerous. One could spend hours there with profitable results.

A little further to the south, in Kooyong Road, were open paddocks timbered with stretches of healthy scrub, well worth exploiting. Dr. Godfrey Howitt, one of our earliest coleopterists, whose collection (still as he left it) is in the National Museum, lived close by and no doubt obtained much of his material there.

But of all the localities within easy reach of the metropolis none could compare in abundance of animal and plant life with the wide stretches of heathlands which then extended from Brighton to Hampton and on to Sandringham and beyond. Now densely populated, the area was then in its primitive state. In parts timbered with old gums and acacias, the greater part was thickly overgrown with the usual tea-tree, young gums, banksias, leptospermums and other shrubs characteristic of that area, affording ample scope for investigation by the naturalist, be his subject birds, insects or plants.

Within a few minutes' walk from the Brighton railway station, Smith's paddock, the property of the late Mathew Smith, a keen bird-lover, extended from South Road to the railway at Hampton and back towards the Bluff Hotel. This was an excellent collecting-ground and my favourite resort, where I spent many enjoyable rambles, often in company with the late Frank Spry and W. H. A. Rogers, and, during his frequent visits from Sydney, with the late A. J. North. From there one could wander through open heathlands to Sandringham and right on to Mentone and Cheltenham.

Birds were numerous. They included the bronze-wing pigeon, scarlet robin, black-and-white fantail, black-faced cuckoo-shrike, butcher-bird, shrike-tit, and various honeyeaters. On two occasions I saw the sacred kingfisher and on another found the nest of the ground thrush with three eggs placed in a sheltered position on the ground within a few yards of South Road. Painted quail were often flushed from among the low shrubs and many birds nested in the dense scrub, including the white-fronted chat, white-browed scrub-wren, blue wren, yellow-tailed thornbill, crescent, white-plumed and white-bearded honeyeaters, silver-eyes, etc.

For the entomologist a more enticing collecting-ground could hardly be found. The abundance of Leptospermum and other flowering shrubs were a never-failing attraction for insects of all kinds, and lepidopterous larvae in great variety could be obtained on the young gums, acacias, banksias, native cherries and smaller shrubs, the rearing of which added considerably to one's interest and knowledge of their life-histories.

Among the larger butterflies, apart from the more common and widely-spread painted lady (*Pyrameis cardui kershawi*), the Australian admiral (*P. itea*) and the common brown (*Heteronympha merope*), one would be fortunate to find the handsomely-coloured imperial white (*Delias harpalyce*) in this locality, though fairly common in eastern districts. The blackish larvae are gregarious and feed exclusively on the mistletoe (*Loranthus*), and before pupating spin a broad expanse of silken web extended between the stems of their food-plant, to which they attach themselves in groups of thirty to fifty or even more. A fine example of the web with thirty-three pupae attached was taken in Smith's paddock at Brighton. The wood white (*Delias aganippe*) was more common, its dark-brown, white-spotted larvae feeding gregariously on the native cherry (*Exocarpus*). The smaller browns, *Xenica acantha* and *X. kluggi*, were plentiful, and the small grass yellow (*Terias smilax*) was occasionally taken. Several species of the blues (*Lycaenidae*) flitted among the smaller shrubs, including the attractive imperial blue (*Ialmenus evagoras*), the larvae of which feed gregariously on the wattle and are invariably attended by ants, *Nacaduba biocellata*, *Neolucia agricola*, *N. serpentata*, and *Candalides acasta*. At Black Rock Mr. Rogers and I were lucky enough to find several pupae of the rather rare mistletoe blue (*Ogyris abrota*), whose larvae, like all the *Ogyris*, feed only on the mistletoe.

The skippers (*Hesperidae*) were restricted in species, the smallest (*Taractrocera papyria*) being the most plentiful from December to March among patches of sword-grass (*Cladium*). *Hesperilla donnysa*, *Dispar compacta*, *Anisynta tasmanica* and *Padraona lascivia* also occurred in this locality.

Moths, as one might expect, were abundant and in great variety, so much so that it would be out of place to give more than a glimpse of the species. Among the larger kinds was the heavy-bodied, night-flying goat-moth (*Trictena argentata*), dark greyish-brown with broad silvery-white bands on the fore-wings and measuring about five inches in expanse. It could frequently be found by day at rest on the larger tree-trunks, though more often attracted to the light of street lamps. The larvae are subterranean in habit, boring deeply into the soil and feeding on the roots of

the eucalypts. They are often attacked by a species of *Cordiceps*, a curious fungus which transforms them into the so-called "vegetable caterpillars." Other species of this family (*Hepialidae*) are often similarly attacked, as well as the larvae of some beetles.

The wattle goat-moth (*Endoxyla eucalypti*), measuring some five inches across the expanded wings, could occasionally be taken at rest on trunks of the larger wattles, in the wood of which its larvae feed. The largest and one of the most handsome species (*Chelepteryx collesi*) measures up to six inches across the wings. It is of a beautiful chestnut-brown with greyish-brown base and towards the outer edge of the upper wings. The lower wings are chocolate-brown with brownish-yellow outer borders. The bulky, hairy larvae, which feed on the eucalypts and pupate under loose bark, are nearly five inches long and covered with fine blackish hairs with several rows of conspicuous yellow spiny tubercules.

The so-called cherry-borer (*Cryptophasa unipuncta*), a handsome satiny-white moth with a small black spot on each upper wing, feeds in the stems of the common honeysuckle, but has also adapted itself to fruit trees of various kinds. The Banksia-moth (*Danima banksiæ*), whose prettily-marked brownish larvae, spotted with black-margined white spots, feed on young banksias and hakeas, was common. When disturbed the larva raises both head and tail over its back, at the same time protruding a red, fleshy, forked protruberance from under the first segment and ejecting a sticky fluid from the mouth, no doubt as a means of defence. It pupates under the soil. Another striking species, not often taken on the wing though easily reared from the larva, is *Hyleora inclyta*. The larva, about three inches long, is green, the dorsal area flattened and finely serrated along the margin. It feeds on the leaves of the young gums.

The large group of the Geometers, represented by numerous genera—*Crypsiphona, Selidosema, Chlenias, Hydriomena, Xanthorhoe*, and many others—are characteristic of these heathlands. Many of the larger species are usually to be found resting on tree-trunks or old fences, their expanded flattened wings so closely assimilating their immediate surroundings that they are easily overlooked. Others, such as the smaller "Carpets" (*Xanthorhoe, Hydriomena, Taxeotis*, etc.), camouflage themselves on the ground among low-growing shrubs. Their slender naked larvae, the well-known "loopers," feed on a variety of trees and shrubs. When resting they remain perfectly rigid at an acute angle supported by a fine silken thread from the spinneret beneath the mouth, and so closely resemble a twig or leaf as to deceive the most careful observer.

Micro-lepidoptera, including the *Pyralidina*, the *Tortricidae*, *Oecophoridae*, *Gelechidae*, *Tineidae*, etc., most of which are beautifully marked and brilliantly coloured, were well represented and well repaid the efforts of the collector.

Among the Coleoptera one could always rely on good results. Buprestids, particularly the smaller species, longicorns, weevils, click-beetles (*Elateridae*), *Cleridae*, *Mordellidae*, *Chrysomelidae*, and other families, were abundant. Hymenoptera, Diptera and the smaller groups, attracted by the abundance of flowering trees and shrubs, were in great variety.

Although those delightful hunting-grounds have long since had to make way for the ever-growing demands of settlement, it is good to look back to those earlier days and to live over again in retrospect the enjoyment and experiences of those quiet and profitable rambles.

A NEW CAPSID ON *BYBLIS GIGANTEA*

Professor F. E. Lloyd's new book, *The Carnivorous Plants*, reviewed in the *Vic. Nat.* for September, 1943, has an appeal alike to entomologist and botanist. Of particular interest is the chapter on two species of *Byblis*, the genus of insect-catching plants confined to Western and North Australia. *Byblis gigantea* harbours a bug, which Professor Lloyd states is a capsid (wingless). This capsid turns out to be a new genus, and is to be described by Dr. W. R. China, of the British Museum, a task doubtless delayed by the exigencies of war. The extraordinary feature of the new insect is that it has a commensal relation to the plant, actually feeding on other insect victims imprisoned by the sticky secretion, but itself immune to imprisonment. To quote the book: "While small insects in general are caught by the mucilage secreted by the stalked glands, this capsid moves about freely without difficulty, just as do similar insects, also capsids, over the surface of *Drosera* leaves in Australia, and of the African genus *Roridula*, once thought to be carnivorous. How the insect manages this is a bit puzzling. It is noticeable that it prefers to walk on the upper leaf surface where there are a very few and usually smaller glands, but when alarmed it progresses rapidly in any direction without becoming entangled with the mucilage." With characteristic thoroughness, Professor Lloyd enhances the chapter by photographs on the plant with insect inset.

H.C.E.S.

MOVEMENTS IN MASS

Referring to a report about great numbers of frogs crossing the road one night between Dandenong and Caulfield, Mr. R. E. Baker (Larpent) says that a friend told him of a similar occurrence in the Stony Rises on the Prince's Highway, between Pirron Yallock and Pomberneit. The reason for such migrations, he suggests, may be that the season having in many localities been a very moist one, a greater number of frogs than usual reached maturity, and running short of food were moving out on the first convenient wet night. As such movements always occur at night, they may, except on a road or in some bare spot, easily escape notice.

PLATE VIII

Section of western side of Quail Island (Nov., 1943), showing dead and dying trees and a Koala. Note thick undergrowth.

Photo. by A. H. Chisholm.

RECOLLECTIONS OF RAMBLES AROUND PORTLAND

By J. ROS. GARNET, Melbourne

In the spring of 1936 my wife and I journeyed to Portland to spend a holiday with our two friends, Mr. and Mrs. Mellblom. Now, readers of the *Victorian Naturalist* who interest themselves in botany and more especially in our native orchids will readily guess that with such a host and hostess our time would not be devoted entirely to examining the relics of early settlement at Portland, interesting as they undoubtedly are. In fact our holiday was crammed with excursions to spots where wild flowers flourished and orchids abounded—sometimes in startling profusion.

In the preceding summer many parts of the district had been swept by fire of unknown (but by our hosts not entirely unsuspected) origin and the heathlands had responded to the treatment by providing a wild flower show far more pleasing and instructive than many we had seen previously. Portland, one need scarcely say, has far more to offer the botanist than rare orchids, but as our interests were restricted by both inclination and limited time, we almost ignored the Portland Boronias, Correas and ferns and stuck to our orchids.

Our recollections of this very pleasant series of trips by foot, by horse, bicycle and car have been stirred by reading Mr. C. Beauglehole's list of the orchids of the Portland district (*Vic. Nat.*, 1943, lx, 23), and rather to our satisfaction we noted that we had, in our short sojourn there, come across almost 60 per cent. of the species recorded in that list. In only two other localities had we unearthed a greater number of species—58 from the Beaconsfield area, a tally resulting from several rambles covering all four seasons, and 69 from the Grampians, in a crowded fortnight in the spring of the previous year (1935).

Scanning Mr. Beauglehole's list the first interesting item to catch our eye is "*Thelymitra pauciflora* var. *Holmesii*," marked as being peculiar to the Portland district. Two years previously Mrs. Mellblom had geen good enough to obtain for us, from Murray Holmes, a plant of this orchid described in 1933 as a distinct species (*Vic. Nat.*, 1933, xlix, 263), and the plant was kept in cultivation for some years, during which time it flowered at the appropriate season on several occasions. We were thus able to examine it carefully and at leisure and familiarize ourselves with its characteristics, which, we agreed, were not very peculiarly different from those of some forms of *Th. pauciflora*. This conviction was brought home to us very strikingly during the last week in October of last year (1942).

We were holidaying at McCrae at the time and through a grassy slope hard by Point Nepean road we often trod our way through dozens of small sun orchids. The 28th of the month was one of those muggy days presaging rain and the Thelymitrae of the district responded in their peculiar way by expanding their flowers for all to see.

Among the hosts of *Th. pauciflora* in this spot were the commonly seen pale-mauve, lilac- or blue-petalled star-like forms, with one, two or three flowers and slender stems and leaves, together with a number of striking variants with richly coloured sepals and petals—violet, heliotrope, purple, and with columns also deeply coloured, hooded and cleft to various degrees. Several of these variants fitted perfectly to the original description of *Thelymitra Holmesii*, while others varied even more strikingly from the little star-like type form of *Th. pauciflora*.

Next on the Portland list comes "*Microtis atrata*—Gorae, very rare." We had journeyed out to the district near Mt. Clay and on a bright humid day *Caladenia Patersonii* var. *suaveolens* was seen in great abundance, its rather olive-green flowers emitting a slightly musky and faintly lemon-scented odor. Picking a bunch of a hundred flowers would have made little difference to the display in those sodden turfy paddocks. The plants averaged about 12 inches in height and 2- and 3-flowered specimens were not unusual. This variety is not peculiar to Portland, as is generally believed, since three or four years ago Miss E. Rossiter (now Mrs. Ross), of Hedley, South Gippsland, sent us a collection of "spiders" from her South Gippsland haunts and among them were several good specimens of this scented spider orchid.

Further rambles on the gentle and very moist slopes approaching Mt. Clay brought us upon colonies of *M. atrata* not yet in flower but distinguishable from *M. orbicularis* by its yellowish colour and the lack of that peculiar angular kink at the point of emergence of the flower stem. In this spot there were hundreds of plants to be seen that October. Near Heathmere we hoped to see the regal specimens of *Thelymitra grandiflora* that are common in that area. Although Mrs. Mellblom had seen them but a short time previously, all had vanished, we guessed, into the hands of the school children who roam the area. However, we did have the satisfaction of discovering a large colony of what would almost certainly be *Chiloglottis reflexa* in a stretch of heath and Hibbertia just beside the Heathmere railway station, and then further along the road a small clump of *Gastrodia sesamoides*, 13 of them in bud at the foot of an old tree-stump.

Another excursion in the direction of Cashmore rewarded us with by far the best display of *Burnettia cuneata* we had ever seen. In a paddock at that time in process of being converted into a tomato garden, were several small lagoons fringed with burnt sticks commemorating the grass trees and other tea-tree and heathy vegetation that grew there in the previous spring. Among the sticks gleamed the waxy-white flowers of plants of the Lizard Orchid, some with stems hardly an inch high carrying but one or two flowers, others with sturdy five-inch stems and four, five or six flowers. One specimen from this area, now treasured in my own herbarium, has seven flowers, but this unusual floral exuberance is remarkable in that five of these flowers arise from the main rachis while the other two arise from a subsidiary stem which emerges from the subterranean portion of the main rachis. It may be of interest to record, in passing, a similar phenomenon occurring in *Calochilus campestris* (the plant which we in Victoria have, for so long, labelled *C. cupreus*). We collected two of several such curiosities in the swamp to the north of the recreation reserve at Upper Beaconsfield in November, 1936.

Although in our pursuit of orchids we have roamed many miles and explored many districts, we have yet to find a district where "spider" orchids thrive so well and in such variety as at Portland.

At what Mrs. Mellblom identified as the "Hard-up Hills" we found the South Australian form of *C. reticulata*—practically the typical form—a small, predominantly red-flowered plant, growing on the gravelly slopes in great profusion. At the opposite end of the district, out towards Cape Nelson, we rode one fine day and while sitting in the saddle we spotted what, to Mrs. Mellblom, was a new record for Portland—a solitary specimen of the dark crimson flower of *C. filamentosa*. We quickly tethered our horses and searched the sandy coastal slopes for more and were soon rewarded by finding dozens of flowering plants, all under six inches high and generally with one or two flowers. One plant had three flowers and another two, one of which consisted of only two perianth segments, without even the vestige of a column, labellum or ovary.

In this same direction, but nearer the town, we came upon the robust form of *C. reticulata*, which at the time puzzled us as to just where it should fit in the taxonomic scheme. Mr. Nicholls has since settled that point, and rightly so, by classing it as variety *valida* (*Vic. Nat.*, 1943, lix, 189). Near the old racecourse we saw another type so far only known from Portland. In my herbarium specimens of this plant, received from Portland in previous years, had been kept apart as a probably new and unnamed species and when we finally saw it in its habitat, growing

abundantly and not noticeably intermingled with its congeners, we were quite convinced that the plant merited specific rank. Happily Mr Nicholls has also been impressed with its distinctiveness and Mellblom's spider orchid now carries the label *Caladenia hastata*.

It was during one of our excursions around Portland that young George Bennett—a very enthusiastic wild-flower hunter—found a Caladenia with two leaves! As it was a non-flowering plant we were unable to learn to just what species it belonged. Anyhow, George's "find" is worthy of note as being quite unusual in plants of this genus.

Turning to the Portland greenhoods, we recollect noticing numbers of *Pterostylis cymocephala* out at the "Hard-up Hills" (in the direction of Cashmore and fully six miles from Bridgewater), hence Mr. Beauglehole's record of "Bridgewater only" for this species could be amended by this addition, as could also that of *Diuris palustris*, which grew on the same sandy hillside as the greenhood.

Out towards Heywood we saw a number of *Pt. foliata* and among them were several double-flowered specimens. These Portland greenhoods were of much more solid construction than are those found on the Dandenong Ranges and its foothills. The stems were sturdy, the leaves of rather tougher texture, and the whole plant was rather scabrous—features generally absent from the near-Melbourne "gracilis" variety.

At the Bridgewater lakes we were shown *Pt. cucullata* growing in crowded colonies on the steep grassy slopes above the lakes and among them was one double-flowered plant which was sacrificed to the ardor of the collector of the party.

It is, in passing, interesting to recall that *Pt. concinna* has not been recorded from the Portland district, although the plant is so widespread in Victoria and, in fact, known from all States except Western Australia. My own records indicate that it extends from Cape Howe, in far eastern Victoria, right along the coastal strip to Port Philip. Further west it is found in sundry areas from Coimadai through to the Grampians. This apparent inconsequent distribution is, of course, common enough in botanical records and one readily realizes that it would be far more astonishing if it did not exist.

Such are the recollections, and the digressions they have evoked, that were aroused simply by a list of plants. There were many more that are hardly pertinent to the pursuit or hobby of orchid-hunting; they are the subject of other interests not worth recording. When more peaceful days come upon us we may hope to revisit Portland and see for ourselves some of those treasures we missed in 1936.

PLANT NAMES SUB-COMMITTEE

First List of Recommended New and Changed Vernaculars

Since its re-constitution last May, the Plant Names Sub-committee of our Club has met regularly once a month at the National Herbarium, by kind permission of the Director and Government Botanist, Mr. A. W. Jessep. It has been agreed that any matter affecting the nomenclature of Victorian vegetation shall come within the scope of this sub-committee's activity, but the primary aim will be production and maintenance (at least in manuscript form, available for publication) of a completely up-to-date Census, paying due attention to the scientific and vernacular names of all vascular plants, both indigenous and naturalized.

Many additional species have been recorded for the State since the appearance of our 1928 Census, and where good common names are not already employed elsewhere, it has been necessary to invent appropriate ones in such instances. Then, it is considered that a number of existing vernaculars leave much to be desired—some were ill-chosen, others faulty translations of the Greek or Latin epithets, and still others in disagreement with names already standardized outside Victoria. The C.S. and I.R. (Bulletin 156) has recently established standard common names for most Australian pasture plants and weeds, this admirable work representing the general opinions of many experts throughout the Commonwealth. Where vernacular names in our Census differ, we would do well to replace them by the standards which the C.S. and I.R. has now adopted.

It will thus be appreciated that a systematic revision of the State's vascular flora (embracing probably 2,800 species) is no small undertaking, inasmuch as the Plant Names Sub-committee must consider each proposed nomenclature change in the light of the six principles prefacing the 1928 Census and reach unanimity in every instance.

From time to time, as successive groups of names are revised, the sub-committee intends to publish its recommendations in the *Naturalist*. This will apprise all Club members of what is being done and at the same time afford them the opportunity to alter or improve any suggested vernaculars which they deem still unsuitable; the absence of such criticism will be interpreted as an expression of general approval by the Club.

Revision of the 106 Victorian ferns and fern allies being now complete, all new and/or changed common names are submitted as hereunder. Those bearing an asterisk (*) are not regarded as wholly satisfactory, and specimens of the plants concerned will be exhibited at a monthly general meeting so that members may offer helpful suggestions for more appropriate naming.

PTERIDOPHYTA

For *Todea barbara*, change "King Fern" to "Austral King Fern."
Add *Schizaea asperula*, "Rough Comb Fern."
" *Marsilia angustifolia*, "Narrow-leaf Nardoo."
" *Sticherus tener*, "Silky Fan Fern." (Confused with *Gleichenia flabellata*.)
For *Mecodium rarum*, change "Rare Filmy Fern" to "Narrow Filmy Fern."
" *Mecodium australe*, change "Austral Filmy Fern" to "Winged Filmy Fern."
Add *Mecodium dilatatum*, "Handsome Filmy Fern."
" *Hymenophyllum peltatum*, "Alpine Filmy Fern."
For *Hymenophyllum cupressiforme* (not *H. tunbridgense*), change "Tun-

bridge —" to "Common Filmy Fern."
For *Macroglena caudata*, change "Large Bristle Fern" to "Narrow-lobe Bristle Fern."
" *Polyphlebium venosum*, change "Bristle Fern" to "Veined Bristle Fern."
Add *Cyathea Leichhardtiana*, "Prickly Tree-fern."
" *Cyathea marcescens*, "Giant-frond Tree-fern."
For *Culcita dubia* (formerly *Davallia*), change "Rainbow Fern" to "False Bracken."
" *Hypolepis punctata*, change "Ground Polypody" to "Sticky Hypolepis."
Add *Hypolepis rugosula*, "Rufous Hypolepis."
" *Hypolepis Muelleri*, "Pale Hypolepis."
" *Lindsaya microphylla*, "Lacy Wedge Fern."
For *Pteris vittata* (not *P. longifolia*), change "Long Sickle Fern" to "Chinese Brake."
" *Pteris umbrosa*, change "Shade Brake Fern" to "Jungle Brake."
" *Pteris comans*, change "Hairy Bracken" to "Netted Brake."
" *Blechnum penna-marina*, change "Alpine Fern" to "Alpine Water-fern."
Add *Blechnum procerum*, "Hard Water-fern."
" *Blechnum filiforme*, "Climbing Water-fern."
" *Doodia media*, "Common Rasp Fern."
For *Doodia aspera*, change "Rasp Fern" to "Prickly Rasp Fern."
" *Asplenium obtusatum*, change "Shore Spleenwort" to "Blunt Shore Spleenwort."
Add *Asplenium sclerophyllum*, "Large Shore Spleenwort."
" *Asplenium adiantoides*, "Willow Spleenwort."
" *Diplazium japonicum*, "Small Shade Spleenwort."
For *Dryopteris Shepherdii* (confused with *D. decomposita* q.v.), change "Shiny Shield Fern" to "Shiny Wood Fern."
Add *Dryopteris decomposita*, "Trim Wood Fern."
" *Dryopteris tenera*, "Broad Wood Fern."
For *Dryopteris nymphalis* (not *D. aristata*), change "Soft Shield Fern" to "Soft Wood Fern."
" *Cyclophorus repestris* (not *C. serpens*), change "Creeping Polypody" to "Felt Fern."
" *Polypodium pustulatum*, change "Scented Polypody" to "Fragrant Polypody."
" *Lycopodium fastigiatum* (not *L. clavatum*), change "Common Clubmoss" to "Mountain Clubmoss."
" *Lycopodium varium*, change "Tall Clubmoss" to "Variable Clubmoss."
" *Selaginella Preissiana*, change "Tiny Clubmoss" to "Tiny Selaginella."
" *Selaginella uliginosa*, change "Swamp Clubmoss" to "Swamp Selaginella."
Add *Selaginella Kraussiana*, "Krauss Selaginella" (introduced—not *S. stolonifera*).
" *Isoëtes humilior*, "Covered Quillwort."
For *Isoëtes Drummondii*, change "Quillwort" to "Naked Quillwort."
Add *Tmesipteris Billardieri*, "Long Fern Clubmoss." } All previously
" *Tmesipteris ovata*, "Blunt Fern Clubmoss." } included in
" *Tmesipteris parva*, "Small Fern Clubmoss." } *T. tannensis*

J. H. WILLIS, Secretary, Plant Names Sub-committee.

THE GRACEFUL MUDLARK

Dr. Jackson (Brisbane) has been impressed by the qualities in the grallina or peewit (more frequently called the mudlark in Victoria). "I wonder whether you would agree with me that it holds at least two records amongst birds? In the Australian Bird Book there is some brief acknowledgment of its dainty, cleanly appearance, but no suggestion that it holds the record in this respect. I have been watching it for half a century almost daily, and for some years I have been on the look out for a dirty peewit. I have never seen such a thing. This strikes me as being all the more remarkable because the bird seems to frequent the muddy banks of rivers and swamps, etc. and it even builds its nest of mud. Yet I can almost be sure that I have never seen a specimen of this little bird with its feathers even ruffled. One would think that somehow or another it would get some of its feathers smeared with mud, or dirt of some kind.

"The second record which I think this bird holds is that it has more calls, each different from the other, than any other bird. The call from which it derives its name of 'Peewee' is perhaps the most common of these, but I am sure I have counted between 20 and 30 different calls from this bird at various times. Indeed, even now I frequently hear something that strikes me as different, though my ear has been listening to it, as I say, for half a century. Among its frequent calls is one that sounds like 'Spill his tea—Spill his tea,' and another one like 'Who took it? Who took it?' the last being quite metallic in its character." (From Nature Notes in the Melbourne *Argus* some years ago.)

MID-VICTORIAN VANDALISM

Field naturalists in common with decent-minded citizens everywhere are often angered at the defacement of national and natural monuments by what someone has aptly termed the "basest form of autography." Scratching and carving of names on public property is a senseless habit which would seem to reflect the only bid for fame (or infamy) of which a certain element in our community is capable.

The F.N.C.V. has more than once aired its views on such wilful damage to unusual geological features, as rock outcrops near Stawell, and to rare survivals of aboriginal art, and it is not long since the authorities were obliged to put a metal casing round the wooden mast-head on the observation tower at Ferntree Gully National Park (One-tree Hill) in order to prevent a collapse through continued whittling with pocket-knives. But are we any worse than our grandparents in this regard? An interesting negation is implied by the following extract from Bailliere's *South Australian Gazetteer* of 1866:

"There is a good carriage road to the very summit (of Mt. Lofty), where a roofed shed, with table and seats, has been erected for the convenience of picnic and pleasure parties, and whence a most magnificent view over the fertile Adelaide flat, the intervening ranges, and far out into the gulf of St. Vincent, may be had on a clear day. A cairn of stones supporting a flagstaff has also been erected, and the table and seats in the arbour are literally covered with the names of persons who have visited the place."

J. H. Willis

Mr H. J. Blackie, of Ararat, reports having found recently a Red Rosella's nest containing nine eggs. Eight young ones were hatched. It is a rare event for a parrot to have so many eggs in the one clutch.

DEATH OF MR. HENRY TRYON

The death of Mr. Henry Tryon, former Government Entomologist of Queensland, which occurred in Brisbane on November 15, severs one of our last links with the pioneering period of natural history in Australia. Aged 87 years at death, Mr. Tryon was an accomplished scientific "all-rounder," and in earlier years he enjoyed the friendship of Dr. George Bennett, Sir A. C. Gregory, and many other men notable in the annals of science in this country.

Mr. Tryon was born in England and came to Australia at an early age. In 1884 he assisted to found the Royal Society of Queensland, of which he became first hon. secretary, with A. C. Gregory as president. In 1885 he organized subscriptions in Queensland for H. O. Forbes to resume and complete explorations in New Guinea (Baron von Mueller did the same in Victoria), and in 1886 he delivered an inaugural address to the newly-formed Field Naturalists' Section of the Royal Society of Queensland. In later years Tryon took a leading part in all scientific and natural history movements in Queensland, and his versatility became apparent in the writing of papers on subjects ranging from rock-paintings to ornithology. His chief interest, however, was economic entomology; in this he did valuable work over many years. Moreover, he was a member of a Commission to inquire into the extermination of rabbits by disease, and a member of the Commission which, as a result of a world tour introduced the cochineal insect to Queensland for the destruction of prickly pear. When he retired from the Department of Agriculture, in 1929, he had completed nearly 50 years in the service of the State Government.

Personally Tryon was a quaint mingling of staid scientist and practical joker. He loved to indulge in "leg-pulling" on occasion, and his solemn demeanour usually enabled him to get away with it. Sometimes, too, he could be a bit "difficult," but his tantrums never lasted long. All in all, he was a very distinctive figure and one whose memory will ever be recalled by those who knew him.

A. H. Chisholm.

"RADIAL RAYS" OR "INSTINCT"?

To the Editor.

Sir,—All scientists no doubt will agree with Mr. Colliver (*Vic. Nat.*, Nov., 1943) "that until some definite proof could be had that such rays [radial rays at present unknown] existed and affected the birds in any way at all, it would be better to call the reason for the flight 'instinct.'" The hereditary impulse for all animals to seek for food and to complete the sexual act, and the migration of certain birds such as Swallows, can best be described as instinct; and if, at any future period, it may be possible to give some definite reason of how this instinct is caused, based on definite experimental evidence, then it might be known by some other name. If the Reef Heron dwells on the mainland, is he not able to see the state of the tide from his perch before flying to his feeding ground? The islands are usually not far from the mainland shore.

H. Flecker

Cairns,
North Queensland.

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PROCEEDINGS

The monthly meeting of the Club was held at the Royal Society's Hall on December 13, 1943. The President (Mr. P. F. Morris) presided and about 80 members and friends attended.

BEREAVEMENT

Mr. F. S. Colliver announced the death of Mr. F. Chapman, A.L.S., F.R.M.S., F.G.S., etc., a Club member of over 40 years' standing, and members paid a tribute of respect to his memory. (An obituary notice will appear in the February issue of this journal.)

"CONTINENTAL DRIFT"

The subject for the evening was a lecture on "The Theory of Continental Drift," and was given by Mr. A. C. Frostick. Mr. F. S. Colliver and Mr. J. H. Willis spoke on the subject from the zoological and botanical points of view. All speakers were cordially thanked for an interesting discussion.

KOALAS AT QUAIL ISLAND

Mr. A. H. Chisholm gave a summary of the controversy that had continued upon this matter during the past month, with naturalists holding that the Koalas were in danger of starvation in some parts of the island and officials claiming that the situation was satisfactory. At least four parties of naturalists, including several officers of the F.N.C., had visited the island, and all had agreed that many of the Koalas—the total was estimated to be nearly 1,000—should be moved to suitable areas on the mainland. Mr. Chisholm added that, in order to attempt to reach some finality in the matter, he had interviewed the Chief Secretary (Mr. Hyland), and, after considerable discussion, the Minister stated that he was having a careful watch kept upon the island, with a view to removing some of the Koalas if developments proved them to be in danger.

The matter was referred back to the Committee, it being agreed that, as responsibility rested with the Minister, we must accept his pledge that the Koalas would not be allowed to die.

EXCURSIONS

The President asked members to bear in mind that the conduct of any excursion was entirely in the hands of the leader of that outing. Members should never go ahead of the main body of the party and collect items of interest before others had seen them.

Excursions were reported on as follows:—Flemington Racecourse, Mr. A. M. Steinfort; Botanic Gardens, Mr. H. C. E. Stewart.

ELECTION OF MEMBERS

The following were elected as ordinary members of the Club:—Mrs. Paul Fisch, Miss Isla Goodwin, Miss Vera Rasmussen, Mr. Alex. W. McKenzie and Mr. Hugh McKnight: and as country members Mrs. Seccombe, Miss Lorna H. Davies, and Messrs. W. E. Richards, William Ricketts and Albert A. Cook.

EXHIBITS

Mr. H. P. Dickins: Three water-colour drawings of wildflowers and a model of the *Endeavour*, the ship mentioned frequently during the Banksian discussion at last meeting.

Mr. T. S. Hart: Hakea seedlings, collected near Croydon, Vic.

Mr. V. H. Miller: Two stems of *Cymbidium lowianum*, one 4 ft. long with 19 blooms, the other 4 ft. 6 in. long also with 19 blooms; also a flowering plant of *Dendrobium chrysotoxum*.

Mr. Ivo C. Hammet: Garden-grown specimens of *Kunzea sericea*, *Halgania cyanea*, *Melaleuca pulchella*, *Verticordia plumosa*.

Mr. C. J. Gabriel: Marine shells, *Livonia mamilla*, Gray; from Bass Strait. (This is the largest living Victorian gasteropod.)

Mr. H. T. Reeves: Hand-coloured photographs of native flowers.

Mr. A. A Brunton: Concretion collected near the level at which the Keilor skull occurred at the type locality.

Mr A. D. Hardy: *Phebalium squameum* (Satinwood) fruiting twig from tree 25 ft. high at Kew; grown from a seedling collected in the Otway Forest, 1905.

Just as this issue was going to press Mr. David Fleay, Director of the Healesville Sanctuary, telephoned to report that he had succeeded in breeding the Platypus All naturalists will cordially congratulate Mr. Fleay on this fine achievement, which is a matter of world-wide interest.

HERBS AND BIRDS

By EDITH COLEMAN, Blackburn, Victoria

A handsome herb with fragrant silvery foliage, a slip of which was given to me three years ago by Mrs. Woodburn (Black Rock) has proved of extraordinary interest. The exquisite daisy-like flowers, with prominent white ray-florets, are honey-scented.

The bitterness of leaves and stems suggested an Artemisia, and because of the colour and large size of the flowers I hoped the plant would prove to be *A. lactiflora*, which I had vainly tried to obtain. This, according to the late Sir A. Hort, is the only species of Artemisia with notable flowers, and the only one which likes moisture. (Hybridists are now offering large-flowered "varieties.") Specimens were sent to the National Herbarium but could not be traced, and so were sent on to Kew. The authorities at Kew were puzzled and asked for more material.

In the meantime I came upon an illustration (leaves only) in the London journal *Gardening* (Feb., 1939), labelled *Pyrethrum ptarmicaeflorum*. As the silvery leaves fitted the mysterious plant perfectly it was sent to the Herbarium. With this illustration Mr. Willis was able to "verify" our plant as *Chrysanthemum ptarmicaeflorum*, originally described by Webb and Bertholet, between 1836 and 1850, in an uncommon French publication. Mr. Willis wrote: "Unfortunately there is neither description nor figure among the thousands of tomes at the Herbarium, and all I can discover is that the species is a native of Canary Islands, where it was very rare in 1908 and may now even be extinct." There the matter rested.

A further reference (*My Garden*, 1942) by Professor E. S. Lyttel to *C. ptarmicaeflorum* as "perhaps the most beautiful of all silver plants, with elegant white, ferny foliage," confirmed the name determined by Mr. Willis. I tried in vain to trace the source of the plant. It had been given to Mrs. Woodburn by Mrs. T. Imrie of Ivanhoe, who thought it could only have come to her through a Melbourne nurseryman.

This season my daughter saw a very large plant of it, in full flower, at a Bayswater nursery in which we have discovered other very rare herbs—an example of traditional interest in these fascinating plants, since it seems that the father of the Bayswater nurseryman had published a book on the subject. The flowers of the Bayswater plant are larger than mine, with several more ray-florets—probably due to better cultivation.

The long-sought *Artemisia lactiflora*, too, is now firmly established in my garden, and has fully justified all that Sir A. Hort claimed for it. The small white flowers, borne in incredible

numbers on long, graceful stems, are indeed "notable," but the plants need shelter from hot winds and plenty of water. This and the silvery Pyrethrum are certainly two of the most beautiful herbs known to me.

The prettiest part of the story follows.

At the end of October, 1942, I found every leaf stripped from my small Canary Islands Pyrethrum. Many lay beneath the plant as though they had been cut off by hail. Only the flowers were left. Fortunately new shoots soon appeared. Late in October the same thing happened to this plant, now very much larger, and to another smaller one. Fallen leaves with pieces of stem-bark attached showed that they had been torn off by force.

My daughter, who saw goldfinches close to the plant, stood quietly and watched the leaves being carried away. She tracked the culprits to a nest in a tall pittosporum tree some 40 feet distant. It was being woven with the silver leaves. The nest was examined later and found to be constructed almost entirely of the rare Pyrethrum, with a few wiry stems which proved to be fallen, infertile flower-stems of Cootamundra wattles. An attempt to pull out the knotted flower-stems showed how wonderfully they keyed-in, short as they are. The nest was lined with horsehair and thistledown.

Why was the Pyrethrum chosen? The silvery colour could hardly have been the sole attraction, since many other silver plants grew near, one of them (the Ghost-bush) almost touching the Pyrethrum. The fact that the leaves were worked into the foundation of the nest seemed to preclude their selection for decoration. Their feathery shape would certainly lend them to lacing and entangling in the fabric, keying-in almost as securely as the knotted wattle-stems.

Was it perfume? It is an interesting fact that all the Pyrethrums are regarded as "insect flowers." Both leaves and flowers are used to protect beds, wardrobes and upholstered furniture from insects. Insect powders are made from the dried flowers of several species, and oils extracted from them are made into toxic fly-sprays, chiefly from those of the Dalmatian species.

Did the goldfinches know that these leaves are repellent to insects? If birds are clever enough to employ ants to combat body vermin, why not repellent leaves for their nests?

An odd circumstance in bird-life is the report that a pair of Mud-larks (*Grallina*) have nested recently in an elm at the intersection of Bourke and Exhibition Streets, Melbourne, practically in the centre of the city. Mud for the nest appears to have been obtained from watered grass-plots in the street. Where the birds get food is best known to themselves.

SAFEGUARDING A RARE SEABIRD

By A. H. CHISHOLM

Representations made recently to the Minister for the Army by the ornithologists of New South Wales and Victoria have saved a colony of rare seabirds—the only group of its kind known to breed in Australian waters—which for many years have had their headquarters on Cabbage Tree Island, Port Stephens, N.S.W. The plain fact is that the island was being used by military forces as a bombardment area, and when this came to the notice of bird-students they called the Minister's attention to the danger thus constituted—the extermination of a colony of birds which Australia could not afford to lose. The Minister acted promptly—he directed the bombarding forces at once to turn their attention to some other island.

The species in question is the White-winged Petrel (*Pterodroma leucoptera*), sometimes known also as the Gould Petrel. Dark above and white below, with a freckled face, this bird is one of the most charming of Australia's seabirds. Petrels in general are bulky and aggressive; the white-winged species is smallish and gentle—its actions are coy and its voice resolves into a pretty parrot-like piping. Moreover, its appeal is increased by its rarity, since it is not known to breed anywhere in Australian waters other than on Cabbage Tree Island.

The species was first made known by John Gould, who, soon after his return from Australia to England in 1840, received a specimen said to have been taken on Cabbage Tree Island. There is no record of any naturalists visiting the island for seventy years after that date, so that A. J. Campbell presumed that the species no longer bred there. However, certain Sydney ornithologists strayed on to the island in 1910-11 and found the birds breeding, and in November of 1928 various members of the Royal Australasian Ornithologists' Union, when camped on the mainland near by, made a point of visiting the spot.

We found Wedge-tailed Petrels and Fairy Penguins abundant on the islands, but neither of those birds held for us the appeal exercised by the quaint little petrels. The colony was found to be in possession of a rocky gully on the hillside of the island. Many pairs were nesting, each breeding bird being tucked away in a crevice or beneath a rock, and in each instance the sitting bird uttered only a soft "Tee-tee-tee" on being disturbed.

All of us became very attached to those pretty sea-wanderers. That was why we acted promptly, when apprised of the recent situation, in appealing to the Minister to save the birds from the war-time menace that threatened to exterminate them.

A PUZZLING RECORD

By BLANCHE E. MILLER, Melbourne

A recent paragraph in the newspapers intimating that action had been taken to ensure the safety of the nesting colonies of the White-winged Petrel on Cabbage Tree Island, N.S.W., reminded me of a record that has caused me, from time to time, considerable thought.

A memorable visit to the island in question, in 1928, was followed closely by the acquisition of the early volumes of our journal. The intriguing story of "White-wings" was still fresh in my mind when I read the "Descriptions of some Australian Birds' Eggs not previously described," amongst them being that of the White-winged Petrel. The eggs had been exhibited at the Club (October 13, 1884) by Dr. T. P. Lucas, brother of A. H. S. Lucas, the first Editor of the *Victorian Naturalist*. The list, as printed, is remarkable for its inconsistencies, in that some of the specific names are spelled with capitals. For the information of those readers not having ready access to Vol. I it may not be amiss to re-publish the description:

Distrellata Leucoptera. White-winged Petrel. Early last season a friend brought me the eggs of this species from some of the small islands off East Gippsland. It lays one egg at the end of a hole, about one foot in depth. The eggs vary considerably. Some are rounded, others rounded ovate, creamy white, slightly chalky appearance, and with the peculiar musty, fishy smell. 1 inch 6 lines × 1 inch 3 lines, to 1 inch 7 lines × 1 inch 6 lines. Breeding season, August and September.

At Cabbage Tree Island no nesting burrow was made, the single egg being laid on the fallen debris, sometimes under it, and even in crevices between rocks and stones.

Whatever doubts may have obtained concerning the authenticity of the egg exhibited by Dr. Lucas, the record appears to have passed unchallenged, so far as the journal can show, yet A. J. Campbell, in his *Nests and Eggs*, writes of the White-winged Petrel: "Nest and eggs undescribed."

Of the other six "new" descriptions by Dr. Lucas, Campbell gives full credit for four, but is discreetly silent regarding the remaining two. I have been told that some authorities considered that the egg exhibited and described by Dr. Lucas was referable to the Cook Petrel, which was given full specific rank in the *Official Checklist*, 1913, but placed with "White-wings" in the second edition, 1926. So, the question still arises: Was Dr. Lucas's description of the egg actually the first?

We are now assured that Cabbage Tree Island is the sole habitat of this chaste Petrel, but there used to be no hesitation about placing it on the various lists of *Victorian* birds. Previous to the

PLATE IX

White-winged Petrel breeding among rocks, Cabbage Tree Isle.

Photo.: A. H. Chisholm.

Canary Islands Pyrethrum, the leaves of which were used by Goldfinches for nesting purposes.

Photo.: Edith Coleman.

publication of the new descriptions, a list of Victorian birds, compiled by T. A. Forbes Leith and A. J. Campbell, was printed in the *Vic. Nat.* and included therein: "No. 359. *Pterodroma* (*Æstrelata*) *leucoptera* Gld, White-winged Petrel." A revised edition, edited by A. J. Campbell for the *Geelong Naturalist* and published in June, 1894, deleted some names and added others, so that although the number differs we again find the Petrel exactly as above. It was also placed on the Victorian list, some years later, by J. A. Leach, who not only employed the opinions of leading ornithologists and oologists, but had the advantage of the advice of the authorities at the National Museum. Even more surprising was the distribution given to the species by Dr. Ramsay in his *Tabular List*, and by Robert Hall in his *Key to the Birds of Australia*, 1906.

WHAT CONSTITUTES A NEW BOTANICAL SPECIES?

By the Rev. H. M. R. Rupp, Northbridge, N.S.W.

The question is undoubtedly an important one, but the person who attempts to answer it may perhaps be reminded of the old proverb concerning the venture of fools on ground where angels hesitate. Nevertheless I propose to take the risk, at least by discussing the matter; but I preface my remarks by making it clear that what I have to say is based upon my experience with the *Orchidaceae* alone, that being the only family of plants within which I have ventured the establishment of new species.

Criticisms of the work of both professional and amateur taxonomic botanists most frequently come from one or the other of two opposite schools of thought. On the one hand are those who seem to view with grave suspicion every publication of a new species, and who are ever ready with the charge of hair-splitting. On the other hand are those to whom every variation from a type, or at least from a typical form, appears to indicate the necessity for a new species. Between these extremes are the more open-minded folk, who endeavour to form an impartial judgment upon the questions whether a plant is sufficiently distinctive in its characteristics to merit specific rank, or whether it should be included within the limitations of a species already described and recognized.

J. C. Willis, in his *Dictionary of Flowering Plants and Ferns* (5th ed., pp. 451-2), remarks that exactly to define a species is impossible. A species is an artificial unit of classification invented by man; Nature pays no heed to specific rank. As Willis goes on to say: "Each man in practice arrives at his own conception some-

where between (or at) the extremes usually called Linnean and Jordanian species." Jordan might be termed the protagonist of "hair-splitters," for he gave specific rank to forms exhibiting only minor and insignificant divergences from a given type, provided such divergences were constant, and reappeared in successive generations. The Linnean system, on the other hand, makes allowance for small variations within one species, and sometimes retains even more considerable variations by creating *subspecies, varieties, subvarieties,* and *forms.*

It should be fairly obvious that a too rigid adherence to either of these systems may give rise to irritating confusions; on the one hand by multiplying species on very trivial grounds, on the other hand by "dumping" into one species several forms exhibiting characters quite outside the bounds of the original description. On the whole, if err I must, I should prefer to err by an excess of Jordanian rather than of Linnaean method. For it is annoying to have to deal with what one considers a superfluity of species, it is far more annoying to be unable to discover the identity of a plant which has been dumped into a species in spite of outstanding distinctions. It is sometimes argued that original descriptions can always be amended to cover variations which were not contemplated by the author; but such a course is open to most serious objection, and is highly undesirable unless it is unavoidable. What right have you or I to alter another man's description? Generally speaking, none whatever.

As usual, however, the rule has exceptions, and cases do occur where amendment is inevitable. For example, Robert Brown (Prodr. 331) described the labellum of *Cymbidium suave* as entire, that being the only form he had seen. But since flowers of this species are known to have labella varying from entire, through several obscurely-lobed forms, to one which is definitely trilobate, either Brown's description must be amended, or else one or more new species must be created solely based upon the degree of lobation of the labellum; which is absurd. Similarly, some of Bentham's descriptions are unsatisfactory because he worked upon herbarium specimens only, and sometimes missed features which are obscured or obliterated in the drying process.

Nevertheless it remains true that we should avoid as far as possible any alterations in an original description which is not our own. In most cases it is better to give a new description in our own terms, indicating wherein the original description has proved to be defective.

The difficulties confronting any attempt to decide whether a particular plant is merely a variant from the typical form of an older species, or is so distinctive in its important features that it

should be given specific rank, are much greater in some genera than in others. Among Australian orchids, such difficulties are notorious in the following genera: *Habenaria, Diuris, Microtis, Prasophyllum, Caladenia*, and *Dendrobium*. They are most acutely felt in connection with species which by common consent are recognized as variable; and in all probability they are accentuated by the existence of natural hybrids.

Strictly speaking, however, we are not warranted in assuming that a flower which exhibits a combination of important characteristics of two known species is *ipso facto* a natural hybrid between them. The circumstantial evidence in that direction may be strong, and should certainly be mentioned, but it is not conclusive. Clear proof of hybridization could only be secured by crossing the suspected parents; and even that might fail, since the dominant influence of one parent might produce an artificially raised hybrid differing considerably from the supposed natural hybrid.

Occasionally the circumstantial evidence for natural hybridization is so overwhelming that we may reasonably accept it, as in the case of the so-called hybrid between *Glossodia major* and *G. minor*, not uncommon in some areas of New South Wales. Here we have a flower exhibiting features of both supposed parents, and it only occurs where both are present in considerable numbers. It does not appear to reproduce itself; and there is no other species of *Glossodia* known within 2,000 miles (approximately).

One or two features may be mentioned which, though conspicuous, should be given little weight in determining the status of a plant. The *colour* of the flower is an unreliable criterion. In many species it is so nearly constant that it is usually included in the description; but even among these the unexpected may occur, and flowers supposed to be consistently mauve or blue may appear in some locality clad in white or yellow. *Dimensions*, whether of the plant or its flower, are by no means unimportant, and should never be ignored in descriptions; but their value may be discounted by the strange occurrence of giants and dwarfs, and by differences due to climatic or soil conditions.

Morphology is the factor which must weigh most with us when determining the status of a plant; and in particular the morphology of the flower. That of the plant, of course, is important, independently of its flower, but generally speaking it is more obvious, and calls for less study. You would not waste time debating whether a *Pterostylis* habitually bearing basal leaves on the stem and an inflorescence of several very small flowers, could be identical with one devoid of basal leaves on the stem and having one large flower.

But when you come to the morphology of the flower, things are not so easy. It is impossible to formulate rules defining what shall constitute a variety and what shall constitute a new species, because it would first of all be necessary to have an exact definition of a species to base the rules on. Common sense, and the desire to avoid causing confusion either by the unnecessary multiplication of species or by including too many different forms in one species, must guide our treatment of the plants we are dealing with. In a discussion in this journal (Vol. LIX, Dec., 1942, pp. 137-140) on the section *Genoplesium* of the genus *Prasophyllum*, I have pointed out the fallacy of ignoring morphological distinctions between small flowers because they cannot be detected without the aid of a magnifier. If such distinctions would constitute specific difference between flowers as large as a dinner-plate, then they constitute specific difference between flowers no bigger than a pin's head. Size simply has no bearing on the matter at all.

If I am doubtful of the identity or status of a particular flower, I must begin my investigations by comparing it with what seem to be its nearest relatives. For example, let us suppose someone has sent me flowers which, as I can tell at a glance, belong to the genus *Diuris*. They bear considerable resemblance to those of more than one species of *Diuris* known to me; let us say *D. sulphurea*, *D. palachila*, and *D. brevifolia*. By studying the published descriptions of these, and by comparing the strangers with actual specimens or drawings if that be possible, I am to rule out *D. sulphurea* and *D. brevifolia*. My flowers are so like those of *D. palachila* that the non-botanist would probably call them identical, and accuse me of hair-splitting if I demurred. But I observe that, apart from minor differences, the stranger has a rhomboid labellum with very small lateral lobes, whereas that of *D. palachila* is spatulate or shovel-shaped, with large and prominent lateral lobes. If this distinction is consistently maintained in all the available specimens, it is of too much importance in the morphology of the flower to be dismissed as a mere variation: I am justified in giving the new flower specific rank. If, on the other hand, some of the labella are almost spatulate, and some have large lateral lobes like those of *D. palachila*, I should probably only cause confusion by creating a new species, and it would be far better to recognise that *D. palachila* sometimes varies from the typical form.

Mistakes, of course, will sometimes be made: even the great ones of the botanical world are not infallible, so we need not worry if occasionally we find ourselves wrong. To make mistakes is not fatal: to refuse to admit our mistakes is!

EXTRA-TERRESTRIAL LIFE

By E. E. LORD, Melbourne

Is life, as we know it here, or indeed any other sort of life possible or probable on other worlds but our own? What is the present state of knowledge on this subject?

The question as to what life really is, naturally presents itself at this stage, and is extremely difficult to answer. The living cell feeds, grows, responds to environment and reproduces its kind. The force behind this process we call life. Certain conditions have been observed and found essential to the maintenance of such life.

Professor Hartung (Melbourne University) has summarised these essential requirements under five headings:—

1. SUITABLE CHEMICAL ENVIRONMENT. The protoplasm of the living cell is built of carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, and other elements. It is practically certain that all of these are present on neighbouring worlds.

2. LIQUID WATER. That is, neither frozen nor vaporous. Water is the one liquid in which nature performs all her work on earth. It is difficult to conceive of any suitable substitute for water.

3. SUITABLE TEMPERATURE. In spite of the vast range of temperatures prevailing in the universe, known life can only exist within a very narrow margin.

4. FREE OXYGEN.

5. LIGHT. In the laboratory of a plant's leaf, light, by the process of photo-synthesis, together with chlorophyll, water and carbon dioxide, plays an essential part in the production of starch and sugars for the maintenance of all forms of life.

With our present knowledge of the Solar System and the Universe, can we find, then, these five basic conditions obtaining on another world; and if so, have we any further indications that life is probably existing there? The temperature margin seems at once to rule out all members of our system excepting the Moon, Venus and Mars. It eliminates also all other hot stars in the universe with the exception of possible distant planetary systems, and the cool dark partners of binary or double stars. Of such systems or partners our knowledge is hopelessly inadequate on account of their vast distances. We are left therefore to consider the Moon, Venus and Mars.

The Moon. A reference to H. G. Wells' delightful fiction, "First Men in the Moon" is justified here, because the scientist-author's description of lunar surface conditions are very true to ascertained facts—his principal error being his allowance, at lunar sunrise, of a very slight atmosphere. Careful observations have since disproved this. With neither air nor water, and alternations

of severe heat and cold, the moon's surface is most unfavourable to life; but it might conceivably exist in the deep cavernous interior where remaining supplies of air and water might be retained near the central core.

Venus. Being closer to the sun than the earth—67 compared with 93 millions of miles—the surface of Venus would be much hotter but for one factor: it is completely shrouded in dense cloud, which is all that we see when observing. The composition of the cloud was thought to be water-vapour, but Drs. Adams and Dunham (Kaempffert, 1940) claim to have proved it to be largely carbon dioxide. Seventy per cent. of the sun's light is reflected, and much of the remainder is probably absorbed, by the cloud material. The atmosphere is rarer than on earth. Water, oxygen and light therefore are all in short supply on Venus, and conditions for life are probably hazardous, though not impossible. Carbon dioxide is certainly favourable to vegetation. So much for our nearest planetary neighbour until, perhaps, advanced photography using ultra-violet rays can penetrate the cloud envelope.

Mars. Here fiction has surely had free play since, in 1877, Schiaparelli declared he saw the famous "canali" (Italian, channels) on the surface of this planet. But let us face the facts in order:

Martian atmosphere is rare, resembling the upper levels of Mt. Everest. Temperature is necessarily low on account of distance from the sun (140 million miles). But not so low as was thought. Latest measurements according to Kaempffert (*Science To-day and To-morrow*, 1940) give a minimum of 15° F. at south pole in summer, and 65° F. south temperate zone. Nights would be cold, but nor more than New York in winter. Chemical environment would be favourable to cell structure as found in earth life. The water content is low, and certainly the areas once called "seas" are not water. Dr. Wright has photographed Mars at Mt. Wilson with light of different colours and discovered yellow watery clouds floating at a height of 15,000 feet, while Dr. V. M. Slipher at Flagstaff claims to have conclusive evidence of water vapour. Oxygen on Mars is scarce—between one hundredth and one thousandth of a given area on earth. Waterfield (*Hundred Years of Astronomy*, 1938) states: "The spectroscopic evidence that oxygen exists, if at all, only in the smallest amounts, seems indisputable, and practically excludes the possibility of animal life"; also, "it is extremely probable that there is some form of vegetation on Mars." Bernhard, Bennett and Rice (*New Handbook of the Heavens*, 1941) state: "Many reputable astronomers—

probably a majority of them—believe there is at least plant life on the planet. And the existence of vegetation presupposes conditions which might possibly support some kind of animal life." The positive argument for vegetation is based on seasonal colour changes from greenish to brown, observed over much of Mars' surface by M. Antoniadi and others.

We have yet to consider the so-called "canals." From 1894, at the famous Flagstaff Observatory in Arizona, Professor Percival Lowell, with his assistants, using a splendid 24-inch telescope, made prolonged observations of Mars. Maps were ultimately produced showing a network of straight but very fine lines, radiating from "centres," and linked in an amazing design over the whole of the planet. But trouble was pending. Other famous astronomers, particularly at Mount Wilson, where larger telescopes had been installed, became openly critical of Lowell's claims, affirming that no such "canals" were visible through their instruments, nor would the camera record any such network. Lowell's reply was that Flagstaff was better placed atmospherically and that due to air currents and slight earth tremors photography of such delicate lines was not possible. It is interesting to note what Sir James Jeans wrote in 1934 (*Through Space and Time*): "Photography is for technical reasons unsuited to the recording of very fine markings and it is quite possible, as the canal observers claim, that these are best seen by the eye."

Should the existence of "canals" be established, the following hypothesis may be borne in mind: The Martian water supply to-day is utterly inadequate to fill a vast network of waterways; but Mars is a far older planet than the Earth, and if, long ages ago when both water and oxygen were plentiful, intelligent beings took action to conserve the planet's dwindling water content, what we view to-day might be the monuments of their ancient work, lower forms of life only now persisting.

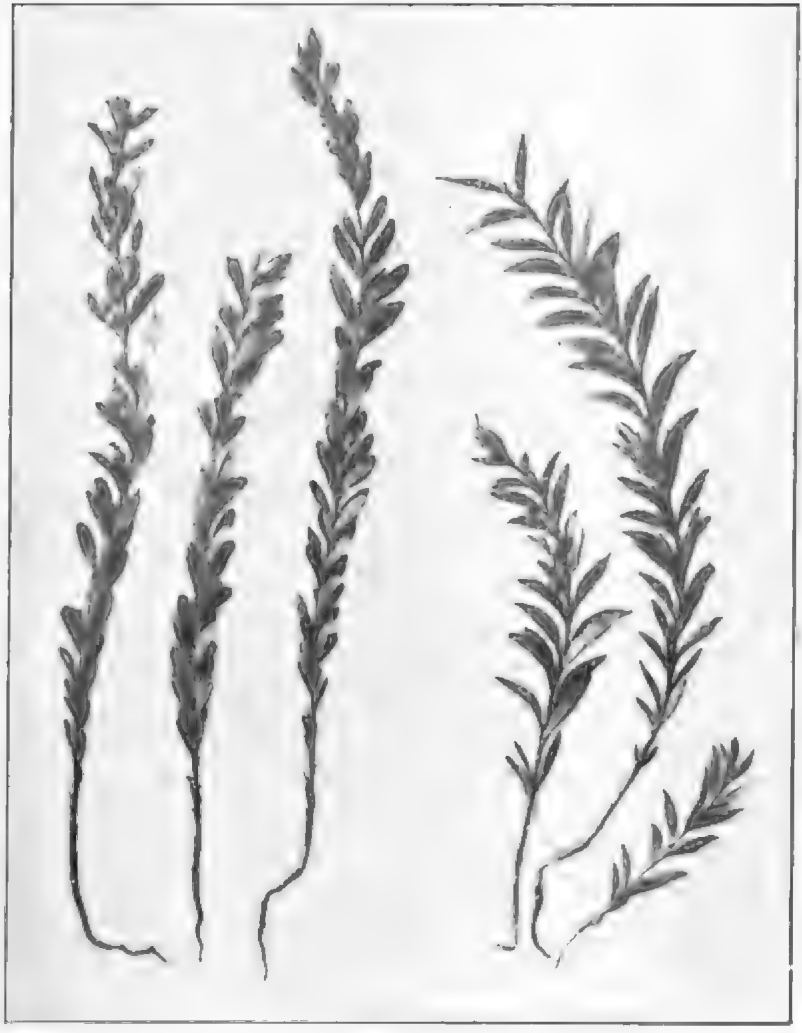
One may yet ask: Cannot life elsewhere be of a basically different kind to that found here? Consider this for a moment. The substance of earth-life is built around carbon, with which no other element can compare for its ability to form countless compounds. Sherwood Taylor (*World of Science*, 1938), states that "chains of more than three or four atoms cannot be made by any other element except carbon."

There we must leave our inquiry for to-day. Science of to-morrow may blaze new trails. Perhaps improved photographic technique, coupled with the great 200-inch telescope being erected on Mount Palomar, may yield further knowledge. Who can tell?

TWO NEW SPECIES OF *TMESIPTERIS*

By N. A. WAKEFIELD, ex-Genoa, Victoria, now on Active Service

The genus *Tmesipteris* was first discovered in New Zealand and other Pacific Islands (R. G. Forster), and the original species (*T. tannensis*) was described by Sprengel[1] in 1799 under the genus *Lycopodium*. In 1800, Bernhardi[2] originated the genus *Tmesipteris*, typified by Sprengel's species. Labillardiere,[3] in 1806, referred a Tasmanian plant to *T. tannensis*; but this



T. parva and *T. ovata*, new species.

was described by Endlicher[4] in 1833 as *Tmesipteris Billardieri*; though Robert Brown[5] had, in 1810, included it in his *Psilotum truncatum* from the Port Jackson area. Endlicher[6] had previously described *Psilotum Forsteri*—a form found in New Zealand and Norfolk Island.

Subsequent botanists included all the above, and several other forms, under the original species (see discussion by George Bentham[7]); P. A. Dasgard[8] attempted to set up several forms as species. He originated the names *T. lanceolata* and *T. elongata*; but, unfortunately, he disregarded the work done by earlier botanists whose names have priority.

This is unsatisfactory; for investigation has proved that there is a number of well-defined species, with constant differences in habit, size and shape of leaves and fruits, and in geographical range. The purpose of this paper is to deal with the four Australian species, which are as follow:

Tmesipteris Billardieri Endl.[4] "*foliis apice truncatis mucrone setaceo. T. tannense* Lab." Stems ½ to 2 feet long; leaves large, ¾ to 1¼ inches long, sparse, 4 to 6 to the inch, very broad especially at the upper base, tips truncate and then with mucronate points; capsules very large, pointed. The form illustrated by Labillardiere is plentiful in Tasmania and Victoria, and extends into New South Wales (Mount Dromedary, Blue Mountains). *Psilotum truncatum*, which Endlicher included as a synonym, is a distinct species. (See below.)

TMESIPTERIS PARVA sp. nov. Plantis parvis; foliis parvis, numerosis, angustis, sub-falcatis, acuminatis, non setaceo-mucronatis; capsulis parvis rotundis.

Stems short, 3 to 5 inches long; leaves numerous, about 15 per inch, narrow, sub-falcate, hardly mucronate at the tips, about ½ inch long; capsule very small and rounded.

Habitats: Karlo Creek, 1/3/1941 (type); Mount Drummer, 14/6/1941; Harrison's Creek (Mallacoota Inlet), 7/2/1943; all in East Victoria and collected by the author. Also, "Terra Gippsland," Dallachy; Waratah Bay (South Gipps.), Rossiter and Heathcote, 1939; Dandenong Ranges, Chas. Walter, 1883; Mount Dromedary (N.S.W.), Reader, 3/8/1880.

TMESIPTERIS OVATA sp. nov. Plantis parvis; foliis parvis, ovatis, numerosis, apicibus earum obtusis setaceo-mucronatis; capsulis parvis rotundis.

Plants small, up to 6 inches long; leaves small, up to ½ inch long, crowded, numerous, about 15 per inch, ovate, tips rounded and mucronate; capsules small, rounded.

Habitats: Mount Drummer, 1/6/1941 (type); Howe Ranges, 8/2/1943 (both in East Victoria); N. A. Wakefield. Also, Dandenongs, Dallachy, Jan., 1850; and probably South-east New South Wales.

In the accompanying plate, the two new species are shown, about natural size.

Both *T. parva* and *T. ovata* are very abundant in the East Gippsland "jungles" on trunks of treeferns.

Tmesipteris truncata (R. Br.) Desv.[9] (Psilotum truncatum R. Brown,[5] excluding the synonym *T. tannense* Lab., and the Tasmanian locality.) Stems up to 9 inches long; leaves up to an inch long, narrow-linear, tips very truncate or bilobed, and with mucronate points; capsule usually rounded, rarely pointed. Typified by Brown's Port Jackson specimens, and extending from Mount Dromedary, N.S.W., to Cairns, Queensland.

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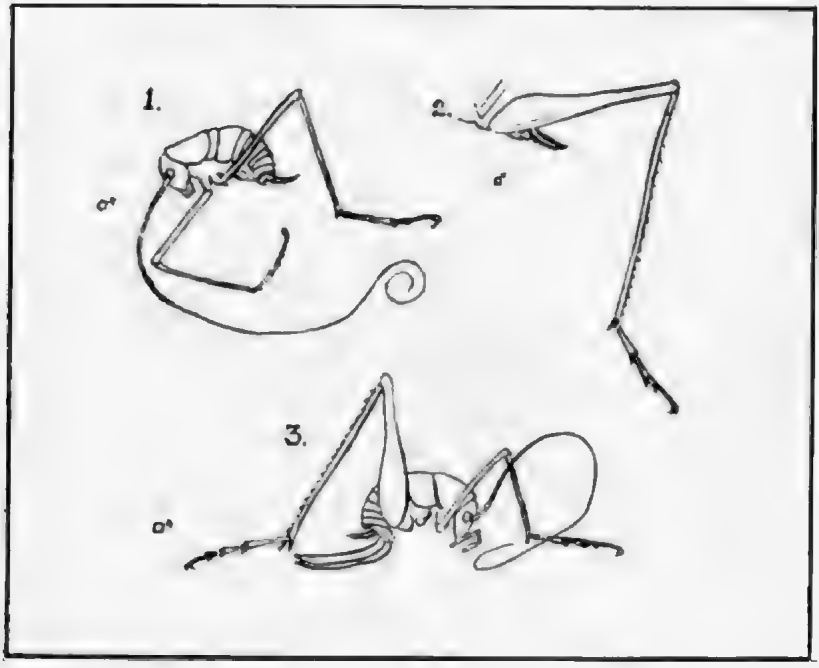
A NEW (?) VICTORIAN CRICKET

The following notes, with sketch, were sent to me by Mr. F. O'Donnell, of Newbridge, Victoria. They relate to what appears to be a cricket hitherto unrecorded for Victoria.

In a period of 15 years Mr. O'Donnell has found specimens only three times, at various localities about Pooyong, where he was stationed until recently. They were found in rabbit burrows, some ten feet from the entrance. There were adult male and female and newly emerged young. From Mr. O'Donnell's sketch the insects seem identical with, or closely related to, a cricket illustrated in Froggatt's *Australian Insects* as *Pachychamma* sp.



THE NEW (?) CRICKET. 1. Male without hind leg (actual size). Body, 11 mm.; hind leg, 62 mm.; overall, 125 mm. (5 ins.). 2. Hind leg of male (62 mm.). 3. Female without second leg. Body and ovipositor, 19 mm.; hind leg, 43 mm.; overall, 83 mm. (3¼ ins.). Found with young (2 mm.) 10 feet in rabbit burrow, April, 1942. No sign of wings or elytra.

Tillyard records *Pachychamma fascifer*, the weta of New Zealand, as occurring abundantly in old tunnels near Wellington. In this species both sexes measure 8 to 9 inches from tip of the antennae to end of hind leg. The absence of wings or elytra in Mr. O'Donnell's insects points to an entirely subterranean existence.

From the absence of descriptive matter in both Froggatt and Tillyard, little or nothing seems to be known of the life-history of this interesting cricket. Mr. O'Donnell was digging for ferrets in the burrows. Country members may find this a clue.—EDITH COLEMAN, Blackburn, Vic.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the F.N.C. was held on January 10, 1944. Mr. Ivo Hammet, Vice-President, presided in the absence through illness of the President, and about 100 members and friends attended.

A welcome was extended to several new members and country members, and to Flying-Officer C. C. Ralph, on leave from New Guinea.

"VARIOUS BIRD PROBLEMS"

Lecturing on this subject, Mr. A. H. Chisholm discussed briefly certain remarkable developments among birds generally and Australian species in particular. He dealt with the curious habit of certain Wood-swallows of sleeping in swarms like bees; the striking nesting habits of the Mistletoe-bird, Painted Honeyeater, and Shrike-tit; inter-tropical migration; the problems created by the extraordinary play-habits and vocal mimicry of Bower-birds; the practice of "anting" by certain birds; the nesting association of certain birds with other living things, notably wasps; the puzzle caused by birds which decorate their nests with snake-skin, and the problem of injury-feigning by various birds. Several decorative nests were exhibited as illustrations of one portion of the lecture.

Mr. A. S. Chalk followed with an address on "Some Aspects of Melbourne Bird-life." He made general remarks on native birds seen in the city and suburbs and suggested that these could be increased considerably in numbers if more native trees were cultivated. Attention was given also to introduced birds, and it was stated that Melbourne carried 11 species in varying strength, a greater number than any other city in Australia.

Mr. Fulton inquired regarding the range of the Spotted and Northern Bower-birds. Mr. Chisholm replied that the break between the two species was at a point slightly north of Central Queensland.

Miss N. Fletcher reported having seen a White-throated Tree-creeper near Sydney apparently "anting" itself. She asked if this had been observed previously and also what Australian species

had been seen to "ant." Mr. Chisholm replied that this was the first record of the practice with the Treecreeper, and that the species known to have applied ants to their bodies in Australia were the following: Starling, Thrush, Blackbird, Minah (introductions), Grey Jumper, Magpie-lark, Rufous Whistler, Satin Bower-bird, and Lewin Honeyeater (natives). Much the most consistent follower of the practice was the Starling, and the best time to watch for exhibitions was at present or in early autumn.

Mr. V. H. Miller mentioned that when lime was placed in a bird-bath more Starlings and Doves than usual seemed to be attracted, and he asked if this might be regarded as a variant of "anting." Mr. Chisholm replied that this was possible, adding that some years ago a discussion arose on the practice of certain birds dropping pepperina berries in baths, apparently to "strengthen" the water.

Mr. F. S. Colliver suggested (and Mr. Chisholm agreed) that live shells found on birds could not reasonably be ascribed to the birds arranging food supplies, but rather could be taken to mean that the shells attached themselves to the birds when disturbed.

GENERAL BUSINESS

Mr. Chisholm reported that the platypus had been bred, for the first time in captivity, at the Healesville Sanctuary, and showed photographs of the baby platypus taken by Mr. David Fleay, together with other interesting pictures of immature platypuses and echidnas. In this matter the meeting agreed unanimously to accord a hearty vote of congratulation to the Sanctuary Director, Mr. Fleay.

Mr. P. Crosbie Morrison showed films of wild life on Lake Corangamite, of the breeding of a Brown Thornbill in a flowering shrub, and of the plight of the koalas on Quail Island. This last film aroused much sympathy in the audience, and the committee was urged to continue to watch the situation closely.

Reports of excursions were given by Messrs. A. S. Chalk (Blackburn Lake) and C. French (Seaford).

The following were elected as Ordinary Members: Miss V. Crawford, Mr. Philip Greenway, Mr. Raleigh Black, W/O. J. A. Blackburn; and as Country Member, Mrs. V. Tremayne.

WILD LIFE IN THE MURRAY FORESTS

By E. M. Webb, Melbourne.

The Murray River, from Echuca upstream, runs mostly through a huge forest of swamp redgum. Where the forest ends I do not know, but recently I travelled 85 miles upstream from Echuca in the logging steamer *Adelaide* and we were still in the redgum region.

The rivermen have two names for this area, namely, the Barmah Forest and the Yeilima Forest. The Barmah Forest begins at the township of Barmah, some 30 river miles from Echuca and about half the distance by road. I take it that the Yeilima Forest starts at Yeilima, which is represented by a very attractive farmhouse surrounded by green lawns and paddocks of rich soil. After that one break some 65 miles from Echuca, the forest closes in again on both sides of the river.

This is a most attractive trip not available to the many. The *Adelaide* is no pleasure steamer. She hauls empty barges upstream and brings them down loaded with something like 200 tons of logs chained to the outriggers of each. They could dispense with the barges if redgum would float, but it won't.

These forests are all in country subject to inundation. The swamp redgum must have access to the Murray water or it will die. Also, if it is inundated all the time it will die, and the same thing happens if it is never inundated. On the banks, of course, where the river never overflows, the tree roots strike down below water-level and the redgum lives until erosion clears away the soil from the roots, when the tree falls into the river and becomes a snag.

Since the forest is all in swamp country, it is likely to remain a forest for all time. I hope it does anyway. There is nothing more alluring or stimulating than the primitive wilderness of this country. It is timeless and ageless. It was there thousands—possibly millions—of years before the white man came here, and I trust it will be there thousands of years hence—even though I won't be here to enjoy it.

These swamp redgums are the "Yarra" trees mentioned many times by Major Mitchell in his books of exploration. They are on the Murray and all its tributaries. Mitchell found them on the Darling, the Lachlan and the Murrumbidgee. They sit around the billabongs of these streams, and they are beautiful trees. Stand in a Murray forest when the sun shines and look up. Above in the foliage you will find a jewel house.

The rivermen tell me that if a sapling is completely covered by flood waters it will die, but if one leaf is showing above the water

it will live. They should know, for they live with the forest and it is an open book to them.

I made two trips upstream. The first was in the *Hero*, which hauls a firewood barge and is skippered by Captain Hilary Hogg, the youngest skipper on the Murray. Half way to Barmah and just after rounding Cape Horn, we ran into a Mallee duststorm. I had made the remark that there were no storms at this Cape Horn, but I was wrong.

This storm was a magnificent sight. It rose before us in great grey cumulus clouds, like the smoke from a bushfire. Up and up it piled in the sky until it blotted out the sun. The air was deathly still.

A sort of dim yellow light was about us, in which the trunks of the redgums turned a ghastly white and the leaves paled as if with fear. Suddenly we were in the thick of blinding red dust and then rain began to pour down. A great wind arose and bent the trees in gale fury, stripping some of them of branches and sending a few of the giants crashing. It was an awesome time.

Cape Horn is a peninsula jutting out into a sharp river-bend, but there are many worse bends farther up. Nine Panel Bend and Green Engine Bend are real hairpins where steamers going upstream on the one side and downstream on the other side are travelling in the same direction.

On this trip you pass the entrance of the Goulburn River and the Broken Creek and the offshoot of the Edward River and Gulpa Creek which latter runs into the Edward farther along.

As soon as you pass Barmah you are in the forest proper and the lake country, with Lake Moira on your left and Lake Victoria on your right. Here is where a crowded bird-life begins. White egrets flew before us, alighted on trees, waited for us to catch up and went on again. The steamer's speed is 3½ to 4 miles an hour upstream, which was a bit slow for these graceful fliers

Here we were in the country of the nankeen heron, with its copper-coloured wings and back. White ibis floated among the trees, but the straw-necked ibis was absent—there was a grasshopper plague further north and the straw-necks were up there having a feast.

Black duck and teal winged swiftly past and thousands of wood-duck fled before us. Many small families of duck could be seen scurrying away into the bush. The swans and pelicans are few this year but I was told they were absent nesting.

The sky was sometimes black with cormorants. Flights of screeching white cockatoos went on all day long. Once at a landing-stage, while taking on firewood, I saw blue wrens.

Past Barmah and the lakes the Murray narrows to what the

rivermen call the Little River. Here there is barely room for two steamers to pass and to make matters worse someone years ago planted a few willows on the bank. These make the river narrower still.

Up by Tony's Bend there is a reach of osiers and weeping willows that achieves a rare beauty. The willows are increasing because every time a log barge hits the willows—and it does that often—the broken bits of branch float downstream until they are held up by a snag. These bits then take root in the bank and more willows are born.

Tony's Bend, by the way, has a history. It is named after an Italian who many years ago built himself a house right on the bend. An empty outrigger barge took the corner too close one day and the outriggers ripped the side out of Tony's house. Tony came out, wrung his hands and screamed: "You pulla my house down! Oh, you pulla my house down!" So it is always Tony's Bend now, and a nasty corner it is. Coming downstream in the *Adelaide* the skipper and mate fling themselves frantically on the wheel to put it hard over. The *Hero* can get round in one try, but generally has two stabs at it.

Going up in the *Hero* we saw a platypus swimming and on another occasion, from the deck of the *Adelaide*, I saw a fox paddling across from Victoria to New South Wales.

Somewhere above Tony's Bend a white kangaroo used to be seen hopping about. Many a riverman or a timber-cutter tried to shoot it but it seemed to have a charmed life. Then a sleeper-cutter wrote to the Zoo to ask what it would pay him to capture the white kangaroo alive. He had visions of £20 or £30 for such a prize, but he was offered only £2 so he never tried.

Far up in the forest we saw kangaroos—two mobs of them—with half-grown joeys speeding away with mother and father. About the same place on the New South Wales side Captain Barney Binks, of the *Adelaide*, drew my attention to a couple of emus with their half-grown flock of little ones. The emus were quite unmoved by the presence of the vessel so we had a good look at them.

From the deck of the *Adelaide* I saw at different times two snakes swimming across the river—both black as far as I could see. Up at Black Engine, beyond Yeilima, where the *Adelaide's* crew was loading logs, a foolish snake swam across from New South Wales past the nose of the barge. As soon as it landed it died. It too was black but not very big.

The rivermen tell me that all animals in the forest have been seen swimming across the river. These include kangaroos and emus. I can't say that I ever heard of these two swimming, but

Barney assures me that they do. Barney has been on the river all his young life and knows it thoroughly.

These men of the river are keen observers. I sat in the wheel-house of the *Hero* with "Tiny" Tuck, the long and strong mate, and whenever a bird flew by Tiny named it for me. He too has spent long years on the river.

One morning there was Murray cod for breakfast, caught the night before. It came from a 12-pounder and it was delicious. Alf. Maslon, the engineer of the *Adelaide*, cooked it, and he is a pretty good cook.

I have been dreaming of the Murray forests ever since.

EMERGENCE OF ADULT SAWFLIES

By MAURICE F. LEASK, A.I.F.

Adult sawflies observed in the Ballarat (Vic.) district emerged chiefly in the month of March. There were some few emergences in early and late summer, but a large number appeared in March, beginning on the 17th, when no fewer than twelve cages yielded adults on the same day.

This prompted me to compile a separate list for one day. The counting on the 27th showed a total number of sixteen cages producing a total of seventy-three adults. These results are from some 160 experiments conducted during four years. However, the larvae concerned here were all captured in the spring of 1939.

As the method of collecting larvae determined that several bunches were taken in the same area, the coincidence of species over a restricted series is readily understood. The identifications are based on samples sent to Mr. H. Hacker, of the Queensland Museum, who determined Experiment Number 108 as *Perga dorsalis*, Experiment Number 118 as a species of *Pseudoperga*, and Experiment Number 121 as a species of *Pergagrapta*. The other identifications are my own.

Detailed weather reports from official charts were kept in an attempt to trace the control of weather factors over emergences, and the influence of the periodical droughts.

A table is appended to show in convenient form the numbers of individuals concerned in the emergences. This table has been isolated from the general record of the numbered experiments. It will be seen that the females far outnumber the males, though a glance at further totals reveals that there is apparently no fixed proportion. However, it is as yet too early in the investigations to make dogmatic assertions on this or any other point.

If a slight compromise may be made in the way of a summary,

it has been found that *Perga dorsalis* from Ballarat previously had emerged in December, and again in February; now the same species (which is from Carapook in the Western district of Victoria) emerges in March.

At least the results indicate that the adults can be bred in large numbers. In the case of these in particular, too, it is proved that some of the many species remain underground only from spring till the following autumn, and from autumn till the following spring.

Perhaps the most decisive assertion, if the only definite one, is that *Perga dorsalis* and an unidentified species of the genus *Pergagrapta* emerge on the same day. By further comparison it is hoped that a more complete list may be made of the adults which emerge at the same time.

With final conclusions still far in the future, these results at least form a useful addition to the series of investigations into the months of emergence, the influence of weather and the food-plants favoured by the larvae; in turn, this study will aid the systematic classification of the adults of the various species.

RESULT OF EMERGENCES ON ONE DAY (27/3/40) FROM CAGED SPECIMENS

Experiment Number	No. of Females	No. of Males	No. of Adults	Identification
95	2		2	*Pergagrapta*
97	4		4	*Pergagrapta*
98	4		4	*Pergagrapta*
101	1		1	*Pergagrapta*
105	6		6	*Perga dorsalis*
107	19	1	20	*Perga dorsalis*
109	5	1	6	*Perga dorsalis*
110	2		2	*Perga dorsalis*
113	1		1	*Perga dorsalis*
116	6		6	*Perga dorsalis*
117	5		5	*Perga dorsalis*
119	3		3	*Pergagrapta*
120	2		2	*Pergagrapta*
121	7		7	*Pergagrapta*
123	2		2	*Pergagrapta*
124	2		2	*Pergagrapta*
Totals 16	71	2	73	

Weather: Bar., 30 in.; Temp., 81-5; Rain, nil; for mth. to date, 40 pts.; sunny conditions controlled by high pressure belt.

THE LATE FREDERICK CHAPMAN

By the death of Frederick Chapman, A.L.S., F.R.M.S., etc., which took place suddenly at his home at Kew on December 19, 1943, in his 80th year, we have lost one who, during a period of scientific work extending over more than sixty years, contributed greatly to the development of a popular interest in the wonders of natural science.

He once described himself as a broad naturalist rather than a geologist and his remarkable range of knowledge justified this view, for, in addition to that associated with his profession of palaeontologist, he was a fine entomologist, a good botanist, and could speak with authority on almost every phase of natural history. Apart from this, he had the personality which inspired others with some of his own enthusiasm for the things which, throughout his long life, were such a joy to him.

Mr. Chapman was born in London on February 13, 1864. It is not surprising that he became a scientist, for his father was technical assistant, first to the famous Michael Faraday, and then to Professor John Tyndall, and took part in many of their epoch-making experiments. The most powerful influence in Mr. Chapman's early life, however, was his elder brother, Robert, who was a physicist but had made microscopy, photography and botany his 'extra hobbies'. Of him, Mr. Chapman has written: "In many ways he imparted to me, especially in my early boyhood, a great love of nature, both artistic and technical. In particular, I owe to him a debt beyond words for so early enthusing in me the study of that most beautiful and intriguing group of marine organisms, foraminifera."

In 1881 Frederick Chapman was selected by Professor J. W. Judd as laboratory assistant in the geology department of the Royal College of Mines. Then 18 years of age, he remained in the department until he came to Melbourne in 1902, twenty years later. While there, he qualified as a teacher of geology and physiography and made a number of friendships with men who did much to direct the course of his life.

Mr. Chapman's energy during that period, as later, was apparently inexhaustible, and a constant stream of papers on palaeontology, geology and zoology flowed from his pen. Probably the best-known of these, in view of the subsequent application of micro-palaeontology to oil search, is his "Foraminifera of the Gault of Folkestone," a work which was practically the first piece of stratigraphical zoning by means of the foraminifera. This was greatly valued by him and one of the last acts of his life was to give one of the writers of this notice his bound copy of the work—an act which led the recipient to feel that the end of his old friend was near.

His first paper on the foraminifera, written with Sherborn and published in 1886, was on the London Clay of Piccadilly. This was followed by many others, and in 1902 he published the pioneer text-book on the foraminifera, which until 1928 remained the only work of its kind.

The second period of Chapman's life began in 1902, when he was selected for the post of palaeontologist to the National Museum, Melbourne, on the recommendation of Professor Judd. Prior to this, Professor McCoy had acted as State Palaeontologist in addition to his duties as Professor of Zoology at the University of Melbourne, where the fossil collections were then located. Mr. Chapman's first duty on his arrival in Melbourne was to arrange and name the collections of fossils, both Australian and foreign, in the National Museum, a very large task which he carried out with conspicuous success.

He then began the publication of the long series of works on Australian fossils, general geology, and natural history, for which he will best be remembered here. These include "New or Little-known Fossils in the

National Museum," the reports on the Mallee and Sorrento Bores, his text-book *Australian Fossils*, and many others. He also wrote reports on collections of fossils sent to him from New Zealand, South Africa, and elsewhere, as well as on the recent foraminifera dredged by the Shackleton and Mawson expeditions to the Antarctic.

Regarding Chapman's work published in the *Victorian Naturalist*, the first was on the Shoreham Camp-out in 1902, very shortly after he joined the society. Since then approximately 100 papers and notes by him have been published in this journal. Of these, foraminifera took the greater part, but some important papers on fossil plants were included.

Mr. Chapman continued his work as Palaeontologist to the National Museum until 1927, when the beginning of serious oil search in Australia led to his appointment by the Commonwealth Government as first Commonwealth Palaeontologist. He held this position until his retirement in 1936 at the age of 72. During this period he was assisted by Miss Irene Crespin, B.A., who succeeded him as Commonwealth Palaeontologist. From 1902 onward he also served as Palaeontologist to the Geological Survey of Victoria, and from 1920 to 1932 was part-time Lecturer in Palaeontology at the University of Melbourne.

In addition to his professional work, Mr. Chapman, from the time of his arrival in Victoria until two or three years ago, took an active part in the life of the scientific bodies of the Commonwealth and of Victoria, where he held office for many years in the Royal Society, the Field Naturalists' Club, and the Microscopical Society, being for a time President of each. He also served as Australian representative on the International Commission on Zoological Nomenclature.

With the limited space at our disposal, mention can only be made of Mr. Chapman's work, apart from his lectures, in popularising an interest in natural science through his many newspaper articles and broadcast talks on scientific subjects and personalities, and his books such as *Open Air Studies in Australia* and *The Book of Fossils*.

Apart from his scientific activities, Mr. Chapman was keenly interested in gardening and his garden at Balwyn and later at his son's home in Kew was a Mecca for all those who shared with him a love of our native plants. For many years and up to the time of his death he was Honorary Curator of the Maranoa Native Plant Garden in Beckett Park, Balwyn, where he was particularly proud of the number of rare native shrubs and trees which were being successfully cultivated.

Those who took part in the Field Naturalists' Club's excursions when he acted as leader will always remember his small active figure and the kind of information which he made so freely available to his listeners. To all he was the same—a simple, unassuming scientist. He had an old-world courtesy—unfortunately rarely met with to-day—which never deserted him.

To his scientific work Chapman brought an active, alert, well-furnished mind and a great determination, the presence of which was not always suspected because of his quiet, almost gentle demeanour. As a writer he possessed a gift of popular exposition of his subject, and was also interesting as a speaker, although he was at times inclined, when before an audience, to speak too quietly. Like every true scientist he was always ready to admit when he had been in error, for he frequently said that the only man who never made a mistake was the man who never attempted anything. During his lifetime his work was recognized by many scientific societies. The list of honours he received is too long to be given here, and the reader is referred to the 1938 edition of *Who's Who in Australia* for particulars. It can, however, be noted that in 1941 he was awarded the Australian Natural History Medallion. One of the most eloquent tributes to his work came from the late Sir Edgeworth David who said:

"No one since the time of Robert Etheridge, Jun., has more enriched our knowledge of the past forms of life in Australia and adjacent regions than has this worker, whose ability is matched to a marvellous industry. He has been long and favourably known as a writer of popular scientific articles in the Australian press, and deserves the gratitude of the public for the happy interest he has added to human life."

In his private life Mr. Chapman was more fortunate than most, for not only did he have work which he loved, but he enjoyed good health up to his death, and in his wife, who will be remembered with affection by all who knew her, he had a wonderful companion and help to him in his work. He leaves a son, Brigadier W. D. Chapman of the A.I.F., and a daughter, Miss W. M. Chapman, to whom our warm sympathy is extended.

W. J. Parr,
F. S. Colliver.

I would like to add my token of esteem to my friend the late Frederick Chapman, Honorary Curator of Maranoa Gardens. While I have been in charge over several years, Mr. Chapman's frequent visits were always a delight to me. Full of enthusiasm, he would roam around the grounds keeping an eye on the labels and admiring the flowers or pruning some out-of-hand shrub. Only a few days before his death he told of his plans for a glass-house so that he could raise some of our native plants for the gardens. I shall miss him keenly, for his kindly advice will always be valued by me, and one can only hope his successor will carry on the work planned by this learned and loved man.

W. G. Bury,
Maranoa Gardens.

EXHIBITS AT JANUARY MEETING

Master Leslie Woolcock: Scale insect on tea-tree from Seaford. (Noted by Mr. French as probably a new species.)

Mr. C. C. Griffiths: Larvae of Banksia Moth (*Danima banksiae*), taken at Seaford.

Mr. R. G. Painter: Seven species of native flowers, garden-grown.

Mr. T. K. Griffiths: Native fern, *Adiantum cuneatum*, var. *grandiceps*.

Mr. C. G. Gabriel: Australian marine shells.

Mr. J. H. Willis: Deeply-pigmented egg of a domestic duck, which had previously laid only white eggs, and which died upon passing the blue-green sample. (Cloaca also heavily stained with blue-green.)

Mr. R. D. Lee: Leaves of *Eucalyptus ficifolia*, showing peculiar markings and colours. Specimens from a tree in the Brighton Grammar School grounds.

Mr. F. S. Colliver: Silver Bream skeleton and skin, all that was left after sea-lice had attacked the fish.

Mr. F. Hallgarten: Specimens of the Banksia Borer taken during the Seaford excursion.

Plate X

Last photograph of Frederick Chapman (right), with Mr. F. S. Colliver (Hon. Sec., F.N.C.), taken at Maranoa Gardens on September 4, 1943.

A NEW COMBINATION IN *DRYOPTERIS*

By CARL CHRISTENSEN, Copenhagen.

Dryopteris Shepherdi (Kunze) C.Chr. comb. nov.

Syn. *Aspidium Shepherdi* Kunze, Linnaea *23*: 230, 1853 (nomen). Mettenius, *Fil.Hort.Lips.* 94, 1856, with descr., *Aspid.u.Pheg.* no. 163.

Nephrodium Shepherdi Fée, *Gen.Fil.* 305, 1852 (*?, nomen purum*).

Lastrea atrovirens J. Smith, *Cat.cult.Ferns*, 59, 1857 (not *Dryopteris atrovirens* C.Chr. 1907).

Aspidium acuminatum Lowe, *Ferns*, *6* pl. 11, 1857 (not Wildenow, 1810).

Lastrea acuminata Moore, *Index Fil.* 84, 1858.

Dryopteris acuminata Watts, *Proc.Linn.Soc.N.S.Wales* 41: 380, 392, 1916. C.Chr. *Index Fil. Supp.* III, 80, 1934.

The three specific epithets were all applied to plants cultivated in European gardens, and supposed to have originated from Australia; first in England (1822), and later in Germany by Kunze; and it seems probable that the species might have been raised from spores from Sieber's Australian collection.

The best description was given by Mettenius in *Fil.Hort.Lips.*, p. 94, 1856, which is here copied:

"Rhizoma obliquum; folia 1' (foot) longa, membranacea, rigida, in utraque pagina, in costis costulisque, una cum petiolo, pubescentilosa, paleis tenuibus intermixtis, deltoideo-ovata, acuminata, basi tripinnatisecta vel omnina bipinnatisecta, segmenta primaria petiolata, ovata, acuminata; secundaria infima breviter petiolata, superiora adnata et ala decurrente juncta, e basi cuneata vel inferne cuneata, superne truncata, ovato-oblonga, obtusa; inferiora inaequaliter serrata; laciniae basales, subsolutae, oblongae vel semioblongae, obtusae, antice acute serratae, nervum ramis indivisis, rarius furcatis, pinnatum, superiores nervum furcatum in ramo antico fertilem excipientes. Sori dorsales, majusculi, utrinque ad costam segmentorum vel laciniarum basalium uniseriati; indusium reniforme, membranaceum, glabrum, cum sori maturitate deciduum.

Patria?"

I possess two leaves of a cultivated plant (Hort. Berol.) named *A. Shepherdi* Kunze and probably originating from the original stock. They match perfectly a specimen from Bulga Creek, N.S.W., coll. W. W. Watts, 1915, and kindly sent to me by Miss Alma Melvaine. It was named *D. acuminata*; and it is quite certain that the N.S.W. plant, in later years known under that name, is *D. Shepherdi*. The name *acuminata* is a year younger than *Shepherdi* and, moreover, invalid in the genus.

The species is very closely related to *D. decomposita* but clearly different by the oblique, thick rhizome and shape of the lamina, etc. The systematic position of *D. decomposita* and its allies is not quite certain, but I think it should be placed in the subgenus *Polystichopis*.

(The manuscript of the above was received by the Sydney National Herbarium through correspondence with C. Christensen in a letter dated August 22nd, 1938. It was held, however, until the completion of an investigation of several allied species, the results of which are embodied in the following paper.—N. A. Wakefield.)

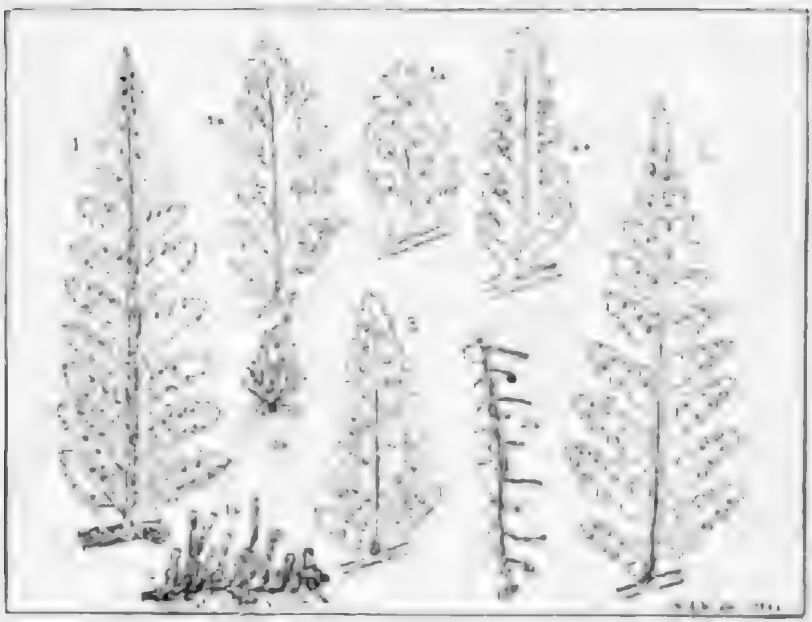
REVISION AND ADDITIONS TO *DRYOPTERIS*

By N. A. WAKEFIELD, A.I.F.

In 1810 Robert Brown[1] described two species of the present genus *Dryopteris*, namely, *Nephrodium tenerum* from the tropics, and *N. decompositum* from the Port Jackson area. George Bentham,[2] working in England with herbarium specimens and not having access to Brown's types, failed to distinguish between many closely allied species, so that his description of *Aspidium decompositum* embraces four species which are now rightly recognized as distinct. Strangely enough, one of these is *D. tenera*, while that specific name was applied to a different species native of north-eastern Australia.[3]

F. M. Bailey[3] began the splitting up of Bentham's *A. decompositum* when he described an ex-indusiate form from Queensland as *Polypodium aspidioides*, which is now a synonym of *Dryopteris queenslandica* of Domin.[4]

Then in 1916 W. W. Watts[5] recognized the tufted form of south-eastern Australia as Lowe's *Aspidium acuminatum*, but, as has been seen in the accompanying paper by Christensen, the specific name *Shepherdi* has priority, so that the species is *Dryopteris Shepherdi*.



KEY TO ILLUSTRATIONS

Fig. 1—*Dryopteris decomposita*, a secondary pinna (× 1); a, a pinnule (tertiary pinna) (× 2); b, a typical rhizome (much reduced).
Figs. 2 a, b, c—Corresponding parts of *D. tenera*.
Figs. 3 a, b, c—Corresponding parts of *D. Shepherdi*.

D. decomposita has been correctly recognized in New South Wales and in Queensland[3]; but in the former State the true *D. tenera* was lumped with it, while in Queensland the latter was given the name *D. albo-villosa*

by Watts.[6] *D. Shepherdi* has long been known in Victoria (as *D. decomposita*),[9] but it was only very recently that *D. tenera* and *D. decomposita* were discovered in this State. Our local species are as follow:.

D. Shepherdi (R.Br.) C.Chr. (Synonyms. *Nephrodium decompositum* of Rodway,[7] but not of R. Brown; *Dryopteris decomposita* of Black[8] and Ewart[9]). Rhizome erect; fronds tufted, 1-2 ft. high, narrow-triangular, light-green, shiny, glabrous but with pubescent stipes and rachises, twice or thrice pinnate with large lobed pinnules; lobes obscurely toothed and bearing a few large sori. The "Shiny Shield Fern" of Victoria. Distribution, Tasmania, South Australia (Mt. Lofty Range), Victoria, New South Wales, and south-eastern Queensland. In wet mountain gullies.

D. tenera (R.Brown) C.Chr. (Synonyms. *Nephrodium tenerum* R. Brown[1]; *Aspidium tenerum* Spreng., Mueller,[10] but not of Bailey,[3] Bentham[2] nor (*Dryopteris*) of Domin,[4] etc.; *Dryopteris albosiliosa* W. W. Watts.[6]). Rhizome long, thin and creeping, not scaly; fronds distant, 1-3 ft. high, deltoid, light green, shiny, glabrous, but with pubescent stipes and rachises, twice or thrice pinnate with long, rather narrow, lobed pinnules; lobes somewhat toothed and bearing numerous large sori. Distribution, Queensland, New South Wales and eastern Victoria. This species is a new Victorian record, first noted by Mr. Frank Robbins, who collected specimens from "The Spring" at Mount Drummer in 1936. It has since been found to grow abundantly in other parts of the Drummer area (Karlo Creek, 1940, N.A.W.) and about Mallacoota Inlet, forming very extensive patches on "jungle" floors.

D. decomposita (R.Brown) Kze. (Synonyms: *Nephrodium decompositum* R.Brown[1]; *Aspidium decompositum* Spreng., Bailey[3] and partly of Bentham[2]; *Nephrodium lanceolosum* Baker; *Dryopteris lanceloba* Domin[4]). Rhizome short, thick, scaly, slightly creeping; fronds close together, 1-3 ft. high, deltoid, greyish-green, rather dull, finely pubescent throughout, thrice to 4-pinnate with deeply dentate pinnules; sori small and very numerous. Distribution, Queensland, New South Wales and eastern Victoria. This is another new Victorian record, the only known habitat for the State being a gully beside Mallacoota Inlet, opposite Gipsy Point (20/9/41, N.A.W.).

The fourth Victorian species belongs to a different section of the genus; it is recognized by its once-pinnate fronds with long dentate pinnules, the lobes of which each bear several sori in two rows. Its name is *D. nymphalis* (Forst.) Copeland. (Synonyms: *Polypodium nymphale* Forster; *Polypodium molle* Jacq.; *Nephrodium molle* R.Brown[1]; *Aspidium molle* Swartz, Bentham[2]; *Dryopteris parasitica* Domin,[4] Black[8] and others, not of Linn. and O.Kize.; *Dryopteris dentata* Ewart,[9] not of Forsk. and Christensen.) *D. nymphalis* has been recorded for Victoria only from the western district (e.g., Curdie's River), and it is otherwise found in the warmer parts of all the mainland States, and from New Zealand to Malaya.

Dryopteris glabella (A.Cunn.) C.Chr. is a New Zealand species, not recorded from Australia, for which it has at times been reported due to errors in determination.[9]

References:

1. *Prodromus of the Flora of New Holland*, by Robert Brown; 2. *Flora australiensis*, by George Bentham (Vol. VII); 3. *Lithograms of Queensland Ferns*, by F. M. Bailey; 4. *Fernflora of Queensland*, by C. Domin; 5. *Proc. Linn. Soc. N.S.W.*, Vol. 41, pp. 380-2, 1916; 6. ditto, Vol. 39, p. 771, 1914; 7. *Tas. Flora*, by L. Rodway; 8. *Flora South Aust.*, by J. M. Black; 9. *Flora Vic.*, by A. J. Ewart; 10. *Key Syst. Vic. Plants*, by F. Mueller; 11. *Index Filic.*, by Christensen.

BABY PLATYPUS INTERESTS THE WORLD

The birth of a baby platypus in captivity at the Healesville Sanctuary, as briefly recorded in the last issue of the *Victorian Naturalist*, is a matter of very considerable zoological importance. It will be reported upon in detail later, in this journal, by the Director of the Sanctuary (Mr. David Fleay). Meanwhile, it may be noted that the event aroused keen interest among the public as well as in natural history circles, a point that was neatly expressed by the Gossip writer of the Melbourne *Sun-Pictorial* in the following verse:

Jack and Jill
Have filled the bill,
And cleared up lots of mystery,
And now can claim
Undying fame
By making natural history.

The interest was not restricted to Australia. Newspapers in both Britain and the United States featured the novel event, and on the following day the London *Times* cabled for a photograph of the strange babe, which was sent immediately by beam wireless.

A curious development was that in their haste to feature the young platypus some London papers overlooked the war in New Guinea! This odd fact is mentioned in the following cable message to the Melbourne *Sun-Pictorial*, which appeared on January 7:

London, Thursday.—The birth of a baby platypus to Jack and Jill at the Healesville "platypussary" was widely featured in the London press. Australia gained some of the liveliest publicity since the battle of El Alamein. Londoners who turned their eyes from adjacent headlines announcing the monotonous Russian victories and the more monotonous Italian stalemate found Australia put back on the map with a vengeance. One business man on his way to London after a meagre wartime breakfast was heard to inquire if platypuses were edible. Australia's zoological sensation coincided with the omission by most morning papers of a single dispatch from the New Guinea and other Pacific fronts. Australians can be proud of their platypus.

Australia's platypus romance to-day inspired the *Daily Mail* rhymster to contribute the following two verses, headed "Lullaby for Platypus":

Hush-a-bye, Platypus, Pride of the Zoo,
Baby shall figure in Nature's Who's Who,
Mummy will fondle and Daddy will brag,
While all the zoologists' tongues are wag.

Shush, little mammal, you're not all that smart,
This is no time to expect a star part.
Sleep—and remove that smirk off your bill,
We are making more history than ever you will.

When this issue of the *Vic. Nat.* went to press the baby platypus had not emerged from the nesting burrow—it had previously been seen by Mr. Fleay only through opening the burrow, after which it was hastily returned. However, the mother has been eating ravenously of late, and it is supposed that this is due to demands made upon her by either one or two young, which may be expected to appear very soon.—A.H.C.

BANKSIAN BICENTENARY

Sir Joseph Banks was born on February 13th, 1743, and the occasion was commemorated by a symposium on his life and work at the F.N.C.V. November meeting, a vernal date having been fixed in consideration of the flowering plants then available to exemplify some of the actual Australian species discovered by the great explorer-scientist himself. A panel of three speakers gave 20-minute discourses, of which the following is a précis:

I. Banks, the Man

Mr. Ivo Hammet spoke of the family background and of Banks' insatiable thirst after natural history, even as a young Etonian when orthodox knowledge of the classics left him cold. Though born a child of fortune, with a handsome inheritance upon attaining his majority, he never used his wealth for self-aggrandisement, but spent it freely in the promotion of scientific knowledge for the benefit of humanity; he was magnanimous and democratically-minded in spite of all inducements to a life of easy luxury. He became successively president of the Royal Society, first and honorary director of Kew Royal Botanic Gardens, Baronet, Knight of the Bath, and Privy Councillor, yet withal remained humble and ever sought to avoid personal acclaim—his will expressly desired that there be no elaborate funeral rites and no monument to his memory.

Banks maintained a beautiful charity toward the investigations and opinions of fellow-scientists at home or abroad, those in enemy countries not excepted. So far did his sterling reputation extend that impecunious countrymen, stranded in distant parts of Germany and Russia, were able to raise loans through his good name and secure the wherewithal for their return to Britain.

During 42 years' continuous presidency of the Royal Society, the catholicity of his achievements is astounding—matters of moment from the coinage of the realm to town water supplies, from botanic gardens and crop diseases to navigation and exploration, all received the pronouncements of his wisdom. Besides his invaluable scientific work on the famous *Endeavour* Expedition (1768-71), he encouraged the colonization of Port Jackson and retained a lively interest in the welfare of the infant settlement, corresponding at great length with the various colonial governors up to the time of his death in 1820. More than all else it is his identification with the early charting and development of our continent that has earned for Banks the affectionate and well-deserved title "Father of Australia."

II. Voyages and Discoveries

Mr. Noel Lothian made use of and also quoted freely from the Banksian Journals to emphasize the characteristic thoroughness, keen observation, linguistic powers, wit, tact, and strong personality of the diarist. Banks loved travel and did not shirk uncomfortable experiences in out-of-the-way or unknown places. His first and last big journeys were to cold, inhospitable regions of the North Atlantic: he was the first man to study the flora of Newfoundland and Labrador, whither he went in 1766.

Banks' golden opportunity came with that momentous three-year expedition culminating in the discovery of eastern Australia. Highlights of the *Endeavour* voyage were dealt with in humorous vein by the lecturer. Encounters between Banks and the officialdom of both Madeira and Brazil are worth mentioning. The crew was forced to remain on board for one out of five precious days spent at Madeira in deference to a courtesy call from the governor, and Banks writes: "We contrived to avenge ourselves upon His Excellency by means of an electrical machine which, upon expressing his desire to see, we shocked him fully as much as he chose."

The Brazilian authorities further riled him by forbidding anyone to land without Portuguese credentials; nevertheless Banks smuggled himself ashore, saw all he could of the natives and vegetation, and, upon suffering further hostile delays in sailing from the harbour, wrote that "a more insolent people could not be found, many curses were this day expended upon His Excellency."

Glimpses of Tierra del Fuego and Tahiti are accompanied in the journal by faithful portrayals of the inhabitants, their manners and culture; New Zealand is circumnavigated and contact made with the warlike Maoris, whose food is stated to consist of "fish, dogs, and enemies"!

The coasting along Australia from Capes Howe to York revealed, among other wonders, those of our Great Barrier Reef, which Banks discovered to have "a size totally unheard of in the South Seas or elsewhere." Having touched southern New Guinea and Timor, the *Endeavour* berthed at Batavia for much-needed repairs, but her occupants suffered acutely from the unhealthy malarial surroundings. Despite a severe attack of fever, Banks never neglected to write up his impressions of the country and its inhabitants as accurately as possible.

Back in England, he immediately set about to describe and publish his scientific findings, but first essayed to accompany Cook again on a second voyage to the South Pacific. This project was defeated by a pettyfogging Admiralty, but Banks' annoyance was offset to some extent by his own specially commissioned excursion to Iceland—here he was among the first party of men to ascend the active volcano, Mt. Hecla. Thereafter Banks settled down in London, though continuing by every means to promote further global explorations. So, he has left a mark on Australian geography that few indeed have excelled.

III. Banks' Botanical Genius

Mr J. H. Willis, who concluded the symposium, expressed astonishment that such scant reference should be made to Banks in the standard histories of botany and botanists—Cambridge and Oxford University publications dismiss him with an occasional sentence or a mere footnote.

Banks really witnessed the emergence of botany as a noble science from the mythical trappings of medieval obscurantism. While a boy at Eton, he manifested strong botanical leanings, paying certain women sixpence per plant (presumably of different species) to scour the countryside in search of herbarium material for study. At this time his only text-book was Gerarde's old *Herball*—probably the 1633 edition—and when 74 he wrote in retrospect: "How immense has been the improvement of botany since I attached myself to the study, and what immense facilities are now offered students that had not an existence till lately!"

The painstaking methods of a good collector are well exemplified in his journal references to Australian vegetation: 800 new plants, all with descriptions in five folio volumes, were brought home to England as a result of the *Endeavour* expedition, but through pressure of official duties and subsequent departmental red tape they did not see the press for 130 years—alas, poor Linnaeus! Some idea of the intensive collecting done at Botany Bay during the week's sojourn may be gauged from the fact that it took Banks a whole day to carry ashore the 200 quires of pressing paper and dry it off in the sun, thereby safeguarding his valuable specimens from destruction by mould.

Summing up his impressions of New Holland, which was viewed after a considerable drought and found to be sadly deficient in water, fruits and native vegetables, our great scientist describes the land as "in every respect the most barren country I have seen . . . the soil could not be supposed to yield much to the support of man." The naive description of a banana—

first encountered at Rio de Janeiro—would evoke merriment nowadays, while the eulogies upon *Borassus flabelliferi* (the wonderful Palmyra Palm) fill three pages of Banks' journal.

As initial director at Kew, Banks laid an excellent foundation, employing experts in every department—the brilliant Austrian artist Francis Bauer completed 1484 plates of new plants, under the able supervision of Sir Joseph for more than 30 years. He was instrumental in the establishment of botanic gardens at Jamaica, St. Vincent, and Ceylon, where experimental plantings of tea and rubber were advocated, with what success we can now appreciate. The application of knowledge to men's needs was ever a primary concern, and all but one of Banks' nine known scientific writings are on agricultural subjects (blight, mildew, rust, apple aphis, potato culture, etc.).

At a period when France and England were more or less continually at war, Banks rose high above inflamed nationalism, and on no fewer than eleven occasions he had restored intact to foreign naturalists the collections that his own countrymen had seized as legitimate prizes of war; thus, Labillardière's extensive herbarium was returned to France unopened with the assurance that he would "not steal a single botanical idea from those who had gone in peril of their lives to get them."

It is true Banks did not publish much; nor can he be reckoned as a taxonomic master in the sense of Linnaeus, de Jussieu or Robert Brown; but he was great in discovering, encouraging, inspiring and materially assisting a battalion of younger men who soon outshone him in the written word, e.g., Dryander, Brown, Hooker, Cunningham, etc. They made use of his funds, his manuscripts, his collections, his amazing library, his ideas and suggestions—all through life he gave things away and took no credit; who would say this was anything but the quintessence of a great botanist?

The Linnaean Society sprang directly from a recommendation made to the ardent young botanist, Dr. (afterwards Sir James) Smith that Linnaeus' celebrated herbarium and library be acquired for the British nation. It was done. Some years later, when writing a panegyric on his old friend, Smith coupled his name with that of the immortal Isaac Newton.

NEW GUINEA SCENARIO

Scene: A jungle. Various case-hardened Diggers, carrying a variety of camouflaged weapons, alternately creeping and charging wildly around trees and through thick scrub. Cries of "There he goes; look out, look out, the little So-and-so is right on you." "By jove, I'd like to get this bloke." A soldier lunges and curses again. There is movement on the right flank; the men silently take up concealed positions and wait breathlessly. A tense stillness supervenes. Then hell breaks loose again. In their eagerness to join the fray and help their mates, men, caught in interminable creepers, fall to the ground, their clothes torn and faces and hands bleeding. Then a prisoner comes in; then another. Their captors, proud and smiling, guard them closely and refuse to hand them over. For a quarter of an hour the battle rolls on with grim ferocity. Away to the left, Diggers, veterans of desert and jungle, are crawling on hands and knees to make a wide encirclement. Cunning, resolute chaps these. Suddenly they charge again. They join forces with the men on the right. The battle is over and the party retires after carefully posting sentries. The prisoners are put to death. There is no quarter in this ruthless campaign. Australia must pay the cost, but, in the long run, many an Australian home will be brighter. Australians chasing Japs? No—Australians chasing butterflies.

—From the Sydney *Bulletin*.

THE THEORY OF CONTINENTAL DRIFT

(Précis of lecture by A. C. Frostick to the F.N.C., December, 1943.)

Even a cursory examination of the facts bearing upon the continental distribution of plants and animals is sufficient to disclose many anomalies, it being often difficult to account for deduced migrations of both living and fossil organisms, and to explain the climatic changes so frequently postulated by the palaeontologist. In illustration of the former problem, the occurrence of the Arctic beech in Australia, while its nearest living relatives appear in such widely separated areas as New Zeland and South America, is typical of innumerable similar examples.

In explanation of the first of the two problems mentioned, land-bridges linking the different continents, at various times, were long ago invoked. These land-bridges, or bridging continents as some geologists seem to require, having permitted the necessary exchange of life forms, were presumed to have foundered beneath the waters of the oceans they formerly bridged. It frequently happens, however, that the depth of water standing above the site of these supposedly vanished bridges is not merely moderate, but not infrequently achieves some thousands of fathoms. Consequently the disciples of the rival conception of the permanence of the ocean basins, invoking a doctrine which is now conceded to have amply demonstrated that the continents are isostatically balanced, claim that it is not possible for continental areas to be elevated as a whole above sea level; nor, conversely, is it possible for an unloaded continental area to sink to the level of the deep sea floor. Small changes of level, amounting to perhaps several hundred metres, do occur during marine transgressions at the margin of a continent, but it is not to be conceded that the difference between these and the abyssal submergence of a continent is merely one of degree.

The theory of continental displacement, or continental drift, implies a possibility that, in the past, certain of the continental blocks adjoined one another, and that they have subsequently drifted to their present position. It is thus in accord with the conception of the permanence of the ocean basins in so far as the latter cavils at land-bridges. At the same time, it goes far toward explaining the bulk of the anomalies connected with plant and animal distribution, without requiring large-scale vertical movements of land masses in defiance of isostasy. Moreover, it tends to reconcile these two rival doctrines, in one case by supplying land-bridges by direct continental contact, and in the other by postulating, not permanence of the continents and ocean basins as separate entities, but by relative permanence of continental and oceanic areas as a whole.

Of the many diverse attempts to explain climatic changes, that claiming migration of the poles appears to be the most feasible. However, since astronomers stoutly deny the possibility of a shift of the earth's axis of revolution, relative movement of the crustal layers alone in relationship to the poles has been invoked.

Indeed, it has been claimed by the protagonists of the theory of continental drift that it is highly improbable that this very difficult problem will ever be satisfactorily solved until the principles of orthodox geology are modified in recognition of the theory they uphold. This same theory, first given a practical form by Professor Alfred Wegener, is capable of assembling an immense number of otherwise isolated facts, chiefly geological and biological, into an intelligible whole, if the primary assumption of a relative change in position of the continents be conceded. Hence it is to be regretted that, so far, no force capable of bringing about such a change of position has been discovered, and attempts to obtain instrumental proof of it remain inconclusive.

BIRD NOTES FROM NEW GUINEA

I am writing mainly to send the description of the playground of one of the New Guinea Bower-birds. I found it during November in the scrub along a dry creek on a coastal plain, about a mile from the coast. It was situated above the creek bed under a canopy of twigs and creepers, about eight feet from the edge of the scrub. The particular area is inhabited by a small reddish wallaby and by wild pigs, in fact the latter had been rooting only a few feet from the actual bower.

The playground itself consisted of a raised platform of sticks on which the two walls and passage-way of the bower were built, the whole structure being about three feet in diameter and eighteen inches high. The foundation was of large and small sticks, with the surface irregular, being built up very neatly, however, about six inches above the ground, and finished off level with small twigs for several inches from each end of the passage-way. The upper part of the playground consisted of two walls, of thin twigs, the length being nine inches and the width about five inches. The general height of the walls was about nine inches, but many of the longer sticks reached well over a foot above the platform. The passage-way had very compact and straight inner walls and floor, and was only about three inches wide—which is rather narrow in comparison with the size of the bird.

The decoration of the bower consisted wholly of bunches of small green and greyish berries. Some were scattered about the platforms at each end of the passage, and some were on the sticks of the inner walls of the passage-way. All told, there were about a score of bunches of berries, representing three different kinds.

When I first came to New Guinea I had visions only of dense jungle, birds of paradise, hornbills, etc. It was quite a thrill to find that my first acquaintance was our old friend the Jacky Winter. A pair of them had their "nest" a few feet above the fly that we erected over our rations, and were worried neither by our presence nor by the constant roar of fighter planes passing low overhead as they rose from a nearby aerodrome.

It was not long before I renewed several more of my Victorian acquaintances—the screech and flashing colours of the rainbow-lorikeet, the friendly "Chirra-chirra" of the Willie Wagtail, and the many-hued beauty of the rainbow-bird. The Australian raven is quite common, and dollar-birds have passed over with their rolling flight once or twice. The white cockatoo seems quite out of place in the jungle when one has been used to it on the plains of Gippsland and northern Victoria; and the harsh cackling of the blue-winged kookaburra is a poor recompense for the loss of rollicking notes of our own laughing jack.

Another old friend is the peaceful dove, which made its nest about three feet from the ground on the edge of a truck track in our present camp area. It took no notice of the constant passing of men and trucks within two feet of the nest, and eventually became so tame that it would not leave the nest when handled. One of the two eggs failed, but the other produced a chick so healthy that its weight eventually broke the frail nest down, so the family shifted to a nearby stump. The mother presented a rather ludicrous figure, straddling the full-grown youngster, and raising her wings threatingly if it were interfered with.

NORMAN A. WAKEFIELD, New Guinea.

[The bird chiefly referred to above is probably the Fawn-breasted Bower-bird (*Chlamydera cerviniventris*), which occurs in the Cape York region as well as in New Guinea and the Louisiade Archipelago. It is strongly given to the use of green berries for decorative purposes.—Editor.]

HELP FOR THE HEALESVILLE SANCTUARY

A lady member of the Field Naturalists' Club has written to the committee offering to donate £25 to Mr. David Fleay, in recognition of his admirable work at the Healesville Sanctuary. She suggests that other members of the Club may be willing to increase the amount to £50 or more. The committee approves of this suggestion and invites members to show their appreciation of Mr. Fleay's valuable work by subscribing to the testimonial. Mr. Fleay has agreed to accept the money, but not for personal use; it will be devoted, at his discretion, to improvements in the Sanctuary. Donations should be sent either to the Treasurer or Secretary of the Club.

WHEN SPIDERS "BLUSH"

Recently, while attempting to draw a large wolf-spider (probably *Lycosa ramosa*) from its pit, I noticed that the two chelicerae were a brilliant red in colour, a feature which I had not previously observed. Upon capturing this spider and imprisoning her in a glass tube, I saw that this colouration was merely transitory, and was caused by some internal—rather than external—change of pigmentation. Further experiments revealed that these changes were due to physical reactions related to the spider's senses, i.e., to changes of surroundings, pain, excitement, etc. A fly placed in the observation box caused the spider to "blush" red, until some time after it was impaled upon her fangs, the colour fading gradually until it finally faded at the point that the chelicerae forms a junction with the carapace. I have not seen notes relating to these phenomena in any book on spiders, and would be glad of any information from observations.—BRIAN M. SLOGGETT (Cpl., 1st Aust. B.O.D.), Bandiana, via Wodonga.

A PLEASANT HOBBY

You know, of course, that many of our lads in New Guinea have adopted hobbies of various kinds, the most popular, perhaps, being the catching and preserving of the beautiful butterflies of the region. Now I learn from a naturalist friend that Bombardier Norman Wakefield, an ex-schoolteacher from East Gippsland, has gone one better. An authority on ferns (of which he has found many new kinds in Victoria), Wakefield spends most of his leisure in the North in collecting ferns on the mountains, and he has now gathered no fewer than 180 species. How, you may ask, does he preserve his specimens? The explanation is simple: he dries them in magazines over the cookhouse fire, thus preventing mould and blackening, and I gather that results are entirely satisfactory. What the cook has to say on the point is not recorded.—"The Rousebout" in Melbourne *Herald*.

An odd circumstance in bird-life is the report that a pair of Mud-larks (*Grallina*) have nested recently in an elm at the intersection of Bourke and Exhibition Streets, Melbourne, practically in the centre of the city. Mud for the nest appears to have been obtained from watered grass-plots in the street. Where the birds get food is best known to themselves.

The Club Rooms were entered recently by a thief or thieves who destroyed some correspondence. Will anyone who has sent money to the hall and has not received an acknowledgement please write to the Hon. Treasurer.

The Victorian Naturalist

Vol. LX.—No. 11 March 9, 1944 No. 723

PROCEEDINGS

The monthly meeting of the F.N.C. was held on February 14, 1944. The President, Mr. P. F. Morris, presided and about 80 members and friends attended.

"INTRODUCING THE STARS"

Mr. P. Croshie Morrison gave a short account of astronomy and notes on the various items to be seen in the heavens. He followed with a practical demonstration with the aid of a 3¼-inch telescope. A very interesting evening was spent by all concerned.

GENERAL BUSINESS

Mr. David Fleay wrote thanking the Club for congratulations received on the birth of the baby platypus. The President mentioned the appeal launched to enable a worth-while donation to be given Mr. Fleay for use in the Sanctuary.

Reports of Excursions were given as follows: Altona, Mr. P. F. Morris (for Mrs. Freame); Ferntree Gully, Mr. Swaby.

The following were elected as ordinary members: Mrs. M. Kathleen Woodburn, Miss A. M. Burton, Mr. H. Fulton; and as country member, Mr. James Leverett.

Mr. A. D. Hardy reported on a fire at Sperm Whale Head, and stated that practically the whole of the reserve was burnt over.

The meeting endorsed the announcement by Mr. A. D. Hardy that Mr. R. H. Croll had consented to act as the Club's representative on the Bush Fire Prevention Committee, recently formed. Mr. Croll had been appointed chairman of the publications subcommittee of the new organization.

NATURE QUESTIONS

Question: What is the origin of the name *"aquilinum"* in Bracken Fern? Answer: Mr. A. D. Hardy suggested that the specific epithet was in allusion to the stelar outline of a "spread-eagle" plainly visible when a leaf-stalk is cross-sectioned near its attachment to the rhizome. Mr. J. H. Willis supported this explanation, which had been put forward by the English botanists Sowerby

and Smith in 1807. Miss Raff mentioned the similar case of "Solomon's Seal," in which slices of the tubers bear a fanciful resemblance to that wise ruler's imperial seal.

Question: What is the life-history of the fern *Azolla*? Answer: Mr. J. H. Willis explained that, unlike ordinary ferns, each fertile, floating Azolla frond bears two distinct kinds of sporangia—one with numerous microspores, the other with solitary macrospores; these spores are never shed from their respective sporangia, but germinate inside them. The resulting prothalli are very small, lack chlorophyll, and are wholly dependent on the parent sporophyte (i.e., the Azolla frond); they break through their containing sporangial walls into the surrounding water, and antherozoids from male prothalli on the microsporangia swim towards the macrosporangial female prothalli. The resulting zygote is apparently able to over-winter and then rapidly develop into a new Azolla plant when favourable conditions arrive.

Question (by Sir Frederick Mann): Is the Musk Duck decreasing in numbers, and why? Answer: Mr. V. H. Miller suggested that the decrease might be due to the bird being "good eating." Mr. E. S. Hanks said he thought the numbers were about stationary. Miss N. Fletcher stated that the bird is not seen on the saltpans at Altona now, and suggested that it is definitely decreasing near Melbourne.

EXHIBITS

Mr. C. C. Griffiths: Pupa of Banksia Moth (*Danima Banksiae*) from larva taken at Seaford, 8/1/44.

Mr. N. Lothian: Herbarium specimens of *Wahlenbergia*.

Mr. O. P. Singleton: Herbarium specimen of the newly-described tree-fern *Cyathea marcescens* Wakefield, from a tributary of the Parker River, southern Otways, 5 miles east of Hordern Vale; also a series of Australian Tertiary and Recent Trigonias, including a new species from the Eocene of Pebble Point, near Princetown. (Two Jurassic species included for comparison.)

Mr. H. C. E. Stewart: Adult moth, cocoon and eggs of *Anthela acuta*; also female short-horned grasshopper. *Monistria conspersa* (wingless); both collected at Mount Buffalo; altitude 4,500-5,600 feet.

Mr. A. N. Carter: A collection of recent and fossil Cowries, including the Victorian form *Cypraea angustata*, Gmelin, and its varieties *piperita*, Gray; *comptoni*, Gray; *bicolor*, Gaskoin; and *declivis*, Sowerby. All collected at Flinders, Vic.

Mr. C. J. Gabriel: Marine intecual shells: *Dolabella scapula*, Mart, N.S.W.; *D. gigas*, Rang, Mauritius; *D. rumphii*, Cuvier, Mauritius.

Miss Ina Watson: Nest of the Black Honeyeater.

Mr. R. G. Painter: Fourteen species of garden-grown native plants.

Mr. T. Griffiths: "Devil's Coach-horse" (*Creophilus erythrocephalus*); also *Pellaea* (*Pteris*) *falcata*, sickle fern, showing bipinnate fronds (found at National Park, Ferntree Gully).

Mr. E. Neuman: Fossil wood from Open Cut, Yallourn.

Mr. F. Hallgarten: A series of case-moth cocoons.

Mr. F. S. Colliver: Large land Mollusc found on the banks of the Nile after floods.

BASALT CAVE AT PANMURE, WESTERN VICTORIA

By the REV. EDMUND D. GILL, B.A., B.D., Melbourne

The large cave in basaltic rock at Panmure, which is the subject of this paper, is situated between the township of Panmure and Mount Warrnambool, a few hundred yards north-west of Princes Highway and south-west of the road to Framlingham.

I was taken to this cave by Mr. Alex. Wilkins of Warrnambool, who tells me that the cave used to be entered by a small hole at ground-level which led down steeply into the southern end of the cave. A couple of years ago the cave was partially opened during quarrying operations. The cave is now entered through a slit in the rock at the north end of the floor of a small quarry. The narrow opening admits one to a steep ramp 33 feet long, with a drop of 25 feet. The ramp consists of soil and small stones which have filtered through the entrance. As the quarry is about 15 feet deep, this means that the floor of the cave at the southern end is 40 feet below ground-level. However, the cave is not so far from the surface at the northern end, as the floor of the cave rises in that direction.

The cave was explored by means of torchlight, but even powerful torches seem to give very little light in such caves. I presume that this is due to the dark walls absorbing the light rays, and to the fact that the air is very pure in the sense that it is not full of light-refracting particles like the atmosphere outside.

By means of a half-chain tape it was determined that the southern arm of the cave is about 114 feet long, the western arm 230 feet, and the eastern arm 147 feet. The greatest length of the cave is therefore 344 feet.

A feature of interest is that the two northern arms of the cave are more or less parallel to one another. This is taken to be due to their following major joint-planes developing in the cooling lava. It is considered that the cave owes its origin to the draining of liquid lava from the solidified or semi-solidified lava round about it. The evidence in support of this origin may be summarized thus:

1. The cave throughout is roughly semi-circular in cross-section, *i.e.*, there is a flat floor and an arching roof. The floor is strewn in places with large pieces of rock which have fallen from the roof, which is thus also made irregular. Nevertheless, the flat floor is characteristic of the whole cave. The two northern arms terminate by the floor meeting the roof rather than by the sides coming together, or a general attenuation in all planes. This is particularly noticeable in the north-western arm of the cave where the termination is quite wide, and is formed by the floor rising to meet the roof. These facts are consonant with the theory of

lava drainage. By the action of gravity, the flowing lava would form a flat surface which would become the floor of the cave upon cooling. Caves formed by gas in the lava do not have flat floors because the gas pressure is more or less equal in all directions.

2. There is a general drop in the level of the floor of the cave from north to south. Such a drop of level would be necessary for drainage, particularly if the lava were viscous. The main vestibule of the cave is practically meridional in direction, indicating that the drainage was from north to south, and this corresponds with the general slope of the sub-basaltic terrain (Miocene limestone). Both in pre-basaltic times and in post-basaltic times the general drainage of the Western District has been from north to south.

A lava drainage cave ⅔ mile long and 20 to 50 feet high has been described from Arizona (Emmons, Thiel, Stauffer and Allison, 1939, p. 300). Skeats and James (1937) have brought to notice a number of lava caves at Porndon and Byaduk.

The floor of the Panmure cave is covered with chocolate soil and the rock debris to which reference has already been made. The cave is fairly dry, there being dripping water in but few places. The decomposition along the joint planes, the depth of soil on top of the basalt, and the physiography of the present terrain, suggest that the lava flow in which the cave occurs is not a recent one geologically. Some Western District flows have been shown to be probably as old as Pliocene in age (Hills, 1938; Gill, 1943).

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THE NATURE OF FIRE-BALLS

Replying to a question at the last meeting of the F.N.C. Mr. P. C. Morrison said that the nature of fire-balls was still imperfectly understood, but they were generally regarded as electrical and in the same group as the various types of lightning. Some fire-balls, however, were almost certainly masses of incandescent gas caused by the passage of a meteor that had burnt itself out. Messrs. Swaby, Hardy, Jenkins and McKenzie added to the discussion, which created a good deal of interest.

INTRODUCING THE STARS

SUBSTANCE OF AN ADDRESS DELIVERED TO THE F.N.C.V., FEBRUARY 14, 1944, BY P. CROSBIE MORRISON

"If the stars would appear one night in a thousand years, how would men believe and adore, and preserve for many generations the remembrance of the City of God which had been shown. But every night come out these envoys of beauty, and light the universe with their smile."

—*Ralph Waldo Emerson.*

Astronomy is the oldest of the sciences, and for thousands of years it was the people's science, requiring only simply-constructed instruments or none at all for its study. Only since the discovery of the telescope has it pushed its way beyond the reach of ordinary people. Yet there is much in the sky to delight the eye of the casual observer who has no instrumental aid.

In the early days the stars were the study of the shepherds who watched their flocks by night; they were the people who, thousands of years before Christ, recognized the difference between the fixed stars, which retained the same relative positions year in and year out and formed recognizable patterns or constellations in the sky, and the *stellae planetae*, or "wandering stars," of which they recognized five which continually changed their motions against the starry background. They also saw occasionally a third kind of "star" which they called *stellae cometae*, or "hairy stars"—the comets.

The names of the stars and of the principal constellations have come down from those misty corridors of history; they were associated with early mythology or with the seasons of the farmer's year in Babylon and Egypt. The progress made by early observers without optical instruments is amazing—for example, Eratosthenes of Alexandria, a Greek astronomer who flourished around 276-194 B.C., calculated the circumference of the earth from astronomical considerations. His answer was 25,000 miles, while the actual figure is 24,899 miles—an error of only 0·4 per cent.! And that was in a day when there was no agreement even that the earth was a sphere.

Now we recognize the earth as merely one of the planets, and not by any means the largest of them. We know that the planets are much closer to us than the fixed stars are—they are merely non-luminous satellites of our own sun, which is itself a star; all the planets shine by light reflected from the sun. If the sun were suddenly extinguished, the moon and all the planets would cease to shine, but the stars would not be affected.

The sun, the planets, and the moons which accompany many of the planets, are known collectively as the solar system. To

give an approximate idea of their relative sizes and their distribution in space, we may take the head of an ordinary pin to represent the earth. The slightly blunt point of a second pin ¾ inch away would represent the moon on the same scale, and the sun then would be represented by a 3-inch orange at a distance of 25 feet. Still on the same scale the nearest of the fixed stars would be somewhere about Eucla, on the Great Australian Bight, 1000 miles away. The nearest star visible to the naked eye is Alpha Centauri, the brighter of the two Pointers to the Southern Cross, distant 4½ light years or about 25 million million (25,000,000,000,000) miles.

To recognize the stars it is necessary to know the patterns of the more important constellations, and the easiest way to begin is with the twelve constellations of the Zodiac—the band in the sky stretching from east through a point somewhat north of the zenith and down to the west. This is easily recognized as the general path of the sun, the moon, and all the planets—none of the planets is ever found outside this band.

The Egyptians divided it into twelve "houses" or "signs" of equal size, and the sun traversed the whole band in the course of the year, moving from "sign" to "sign" month by month. Their order is remembered easily from the old mnemonic rhyme:

> The Ram, the Bull, the Heavenly Twins,
> And next the Crab the Lion shines,
> The Virgin and the Scales,
> The Scorpion, Archer, and He-Goat,
> The Man who holds the watering-pot,
> And Fish with glittering tails.

These twelve constellations are to be followed from west to east, through north. The Ram (Aries) is faint and difficult to pick out. The Bull, on the other hand, is easy; its major parts are a V inverted or lying on its side, formed of five main stars, and a little distance away the Pleiades or Seven Sisters, a tiny well-known group. The Twins (Gemini) are recognized by the two first-magnitude stars Castor and Pollux, looking much like our southern Pointers, but in the path of the Zodiac instead of in the southern sky. The Crab (Cancer) is also faint and fairly difficult to recognize, but Leo, the Lion, shows very plainly as the form of a sickle, with the bright star Regulus in the handle, followed by a triangle. The very brilliant star Spica marks the centre of Virgo, the Virgin; the Scales (Libra) are indistinct; but the Scorpion is one of the most easily recognized of the constellations, like an enormous question-mark on its side, liberally marked out in stars, and with the curl of the tail lying in the Milky Way. The

remainder are less distinct, but with these as a start, they may be followed from any star chart.

Now, using these constellations as landmarks (or better, perhaps, as "skymarks"), the others may be followed step by step. A puzzling stranger in an otherwise recognizable constellation near the Zodiac will prove to be a planet.

(At the conclusion of the brief address, members were invited to examine Jupiter, showing the four most brilliant of his 11 moons, and Saturn, with its remarkable system of rings, through a 3½-inch refractor set up in the grounds. Conditions were far from perfect, but these objects, and the Great Nebula in Orion, were well seen by most members.)

STRANGE ROOT FORMATION IN CHERRY-BALLART

By EDITH COLEMAN, Blackburn, Vic.

In July, 1943, it was necessary to have cut down a large Cherry-ballart (*Exocarpus cupressiformis*) which grew on our land at Healesville. It was a beautiful, three-pronged tree, almost as high as the house, which we had enjoyed for 25 years. Decay was evident at the base of one fork, and this had been cut down previously. The others, although apparently sound, were leaning over the house, and it was thought that they, too, might be unsound. We had been told by the woodcutter that these trees are apt to "snap off like a carrot."

When the tree was cut down it was seen that each of the stems contained within it a living root. The roots had started in a sound part of each stem, growing downward to feed on decayed matter beneath. The one illustrated commenced at 8½ feet from the ground. It was measured by the woodcutter, an experienced man, who drew my attention to the soundness of the wood in which the root had started, and to the distance it had travelled before reaching decay, and branching. Here more roots were produced, which spread out, forming a bed for themselves in the comparatively soft matter of what had seemed a perfectly sound stem. The freshly exposed roots were soft, moist and of a reddish colour.

When the photograph was taken, nearly six months later (12/1/44), they had dried and contracted. The thong-like part then measured 2¼ inches in circumference. It had dried with a bark-like formation resembling that of the stem of the tree. For the purpose of the photograph, the root was pinned to a white door. The left-hand picture shows the wedge-shaped section and the soundness of the wood in which the root was formed, also the distance it travelled before branching.

It seems surprising that the whole of this root formation, which

is 33 inches in length, was still 5 feet 9 inches from the ground, and was completely enclosed within an apparently sound stem. The right-hand picture shows the outside of the wedge in which development commenced.

The root in the second stem started at 3½ feet from the ground. The circumference of the stem which contained it was 25 inches.

Although I can suggest no certain reason for these strange interior root growths in *Exocarpus* they offer naturalists a fascinating study. They raise, too, an interesting question. Many leaning trees and shrubs send out new branches which secure balance. One may see this in the garden. Some trees, when erosion threatens their hold on the earth, send out fresh roots from the stem, often many feet from the ground. These, growing outside the stem, not inside as in the case of the Cherry-ballart, sometimes shoot outward at first, then downward, eventually reaching ground in which they become securely anchored.

Gertrude Jekyll (*Home and Garden*, 1901) gives a remarkable photo. of a Scotch Fir. It is growing near the top of a steep bank. The soil has been almost washed from its roots, which appear to have scarcely any hold on the bank. The situation has been saved by the transformation of its tap-root into a stem, with a root-system of its own. This tap-root stem is even thicker than the true stem above the normal roots. The new roots are securely anchored in the earth at the bottom of the steep bank. The transformation from tap-root to stem seems all the more complete because it is covered with what appears to be a true bark, like that of the upper stem, separating into scale-like plates.

It seems probable that the *Exocarpus* was sending down, from within, new roots the upper part of which would later be transformed into stem. These roots would serve, either to anchor the sound parts of the tree or, more probably, to take their place in the earth as new trees, when wind or decay should complete the destruction of the parent tree. This theory is strengthened by the bark-like covering of the thong-like roots which resembles that on the adult stem.

Root-parasitism in *Exocarpus* has been fully demonstrated by Dr. Margaret Benson and Dr. T. A. Herbert, and probably accounts for the grove-like growth of these trees. Such interior roots as the ones just described may also account for grove growth—more convincingly, I think, than seedlings, which are rare.

In April, 1943, a disastrous fire destroyed or scorched many of our Cherry-ballarts. A number of these has produced new growth showing reversionary leaves, which I have previously described (*Vict. Nat.*, Sept., 1934). It has been interesting to note a seedling of the Pale-fruit Cherry-ballart (*E. stricta*) which escaped the fire, showing these Tarragon-like reversionary leaves.

PLATE XI

Root of Cherry-ballart which developed in an apparently sound stem at a distance of 8½ feet from the ground. A wedge-shaped section cut from the stem showing (left) sound wood, (right) outside of the section.

DRYOPTERIS PENNIGERA, A NEW FERN RECORD FOR VICTORIA

By JAMES H. WILLIS, National Herbarium, Melbourne

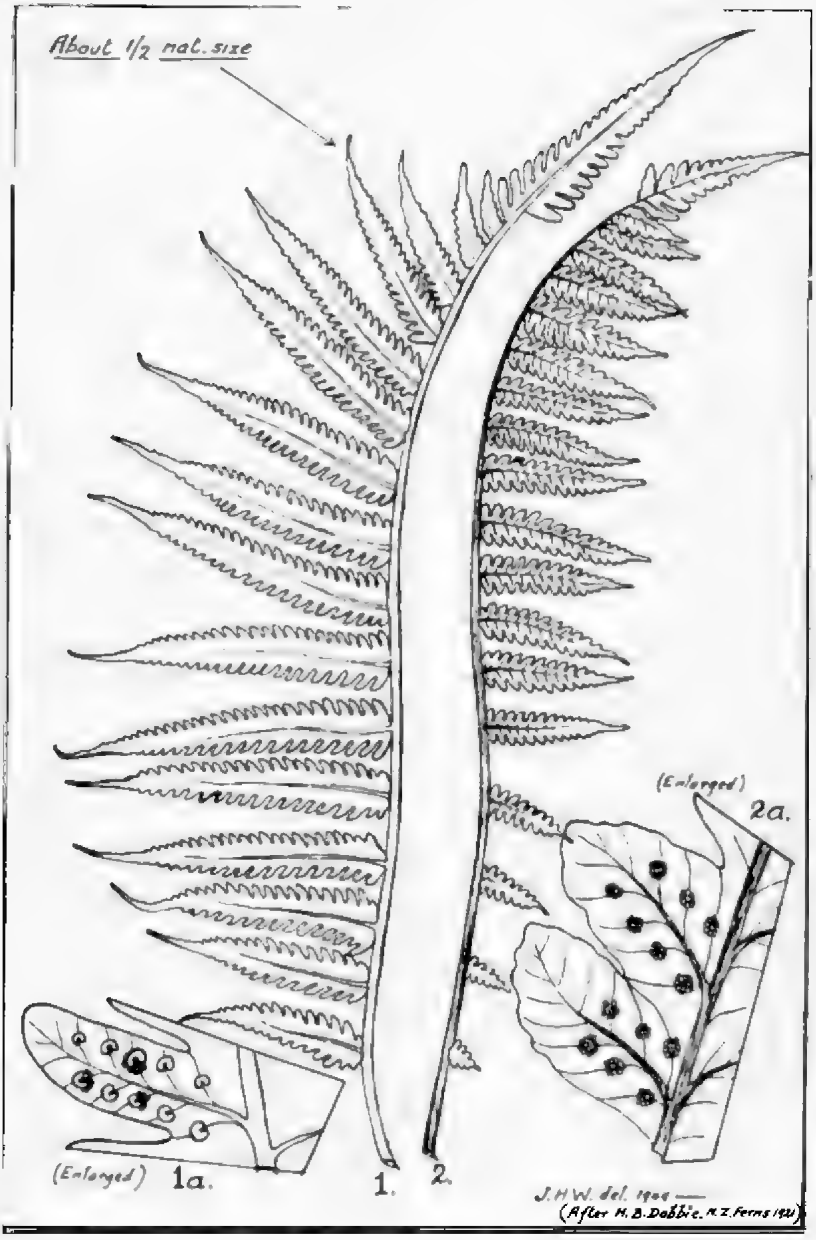
To Mr. Owen Singleton goes the honour of augmenting our list of Victorian pteridophytes (now 107) by yet another species and, as this latest discovery is of a *Dryopteris*, its record in our journal follows fittingly upon the revision of that genus by N. A. Wakefield in the February number.

The only once-pinnate species of "wood-fern" hitherto found in Victoria is *Dryopteris nymphalis* (syns. *mollis, dentata, parasitica*), and its occurrence is based on a solitary specimen from Curdie's River, 1883—preserved at the National Herbarium—the nearest other location being cliffs of the lower Murray near Blanchetown in South Australia. Late in January, 1943, Mr. Singleton came across a small clump of simple-pinnate *Dryopteris* on calcareous soil along the western branch of Sherbrooke River, Waarre pine plantation, west Otway region. Since this spot is less than 20 miles from the original Curdie's River site (farther west), it was presumed that he had established the survival of *D. nymphalis* 60 years after the first and only collection there. Specimens of this interesting find were lodged at the National Herbarium, and there they rested for a year under the name "*nymphalis*."

Last December, Miss J. Somerville (of Hobart Museum) brought to Melbourne some specimens from Mole Creek and Copper Creek (near Smithton), N.W. Tasmania, which she stated had been identified as *Dryopteris pennigera* by a New Zealand authority; these also grew on limestone formation and agreed perfectly with Mr. Singleton's recent Otway collection!

Thus followed a closer scrutiny of all exsiccate Australian and New Zealand material in the *nymphalis* and *pennigera* groups, and we were able to confirm both Miss Somerville's Tasmanian and Mr. Singleton's plants as true *D. pennigera*; the old Curdie's River sample and the lower Murray specimens typify *D. nymphalis*. This means that we have *two species* of once-pinnate "wood-ferns" in Victoria and, as both seem to be confined to a small area west of the Otways, they are among our rarest ferns.

The Sherbrooke River record of *D. pennigera* is also, apparently, the first undoubted one for the whole Australian mainland. Domin (in *Prodromus einer Farnflora Queenslands*, p. 46) mentions that the occurrence of this species in Queensland is based on a single frond which Amalie Dietrich gathered long ago at Port Mackay and which Luerssen provisionally included in *pennigera*; he knew of no other Australian collection but, as the species is distributed from the Philippines to New Zealand (where abundant), Domin considered its reappearance here very possible.



Dryopteris nymphalis: 1. Half frond (deltoid in shape).
1a. Ultimate lobe with indusiate sori.
D. pennigera: 2. Half frond (fusiform). 2a. Ex-indusiate sori.

Following are the chief points of difference between the species discussed above:

D. nymphalis (Forst.) Copeland	*D. pennigera* (Forst.) C.Chr.
1. Fronds narrowly deltoid, broader below.	1 Fronds fusiform, the pinnae gradually decreasing in length towards the base.
2. Lobes of pinnae in 20 or more pairs, almost entire.	2. Lobes of pinnae in 12 to 16 pairs, usually crenate.
3. Midrib paler than the frond in colour.	3. Midrib darker in colour than the frond.
4. Indusium present and conspicuous.	4. Indusium lacking, sporangia naked from the first.

DESCRIPTION OF A NEW EUCALYPT HYBRID

By RALEIGH A. BLACK, Melbourne

X EUCALYPTUS radiodives ("BUTTERCUP PEPPERMINT")

(*radiata* x *dives*) R. A. Black hybr. nov.

Arbor 40-50 pedes alta (circa 12-15 m.). Cortice, aspero, persistente simili "Peppermint"-arbori secundum partem truncum inferiorem, deinde in ramis leni et deciduo atque, segmentis longis decorticante. Folia Juvenilia angusto-lanceolata vel lato-lanceolata. Folia Matura alterna angusto-lanceolata vel lanceolata. Inflorescentia, in umbellis. Umbellae, axillares, 6-12 florae. Gemmae clavatae, pedicellatae. Operculum hemisphericum, apiculatum. Antherae reniformes. Fructus pedicellata globoso-urceolata, 6 mm. longa. 7 mm. lata, truncato, crassa, orificio contracti, 4-loculi.

VICTORIA.—On eastern slopes of Buttercup Creek, Booroolite, Mansfield, County of Delatite, in Silurian soil formation, in mixed eucalypt forest, mainly young of about 40-50 years old,, interspersed with vestiges of old forest; ca. 1060 ft. January 12, 1941. Black, No. 352-006—(1). (Type).

A small to medium-spreading tree, branching freely from about 5 ft. from the ground. Timber soft and gummy, of a pale colour. Juvenile leaves irregularly opposite, shortly stalked, 4-10 cm. long, 1-2-5 cm. broad; intramarginal vein somewhat near edge of leaf; lateral veins obscure, diverging at an angle of from 40-48 degrees, mature leaves shortly stalked, apiculate, dark green, 6-13 cm. long, ½-3½ cm. broad; lateral veins diverging from 15-17 degrees. Stalks of umbels angular to laterally compressed, ½-1 cm. long. Calyx-tube almost as long as operculum. Anthers reniform, 2-celled, but hardly or not at all confluent. Gland minute and terminal. Disk flush with edge of fruit, thin, 5-6 mm. in diameter. Valves triangular in shape, small and deeply sunk. Fruit stalked, broadly urceolate, 6 mm. long and 7 mm. broad, truncate, walls rather thickish, orifice contracted. All fruits examined, 4-celled.

The rarity of *E. radiodives* might be the result of land-clearing by stockmen, there being a comparatively large adjacent area of once forest-land, now turned into bush pasture.

Before the lamented death of Mr W. F. Blakely, Eucalyptologist of the National Herbarium, Sydney, I had closely conferred with him with respect to this new hybrid.

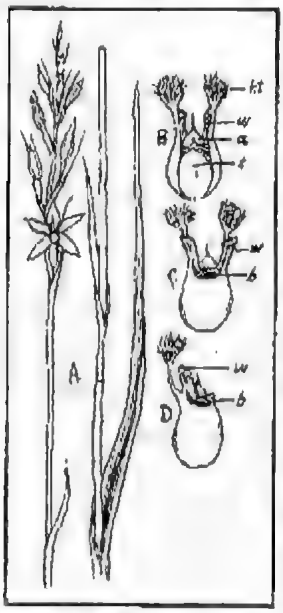
One night having disabled a tiger snake with a blow, I lifted it to a bare spot alongside a hurricane lamp I was carrying. This snake uttered a shrill call—a succession of high-pitched staccato notes—and was answered from a point perhaps 20 or 30 yards away. I have several times heard the call, but only this time was sure that it came from a snake.—"BUSHMAN."

A NEW SPECIES OF *THELYMITRA*
T. RETECTA sp. nov.

By REV. H. M. R. RUPP, Northbridge, N.S.W

Planta gracilis, 22-66 cm. alta. Folium crassum, canaliculatum, 9-20 cm. longum. Flores 3-20, circa 2·5-3 cm. trans diametrum, caerulei vel purpurei. Segalum dorsale latius quam segmenta altera. Labellum petaloides. Columna sine mitra, ad posteriorem abruptissime truncata, sed alis lateralibus oblongis duabis; lobi penicillati magni, erecti, flavi: alae et lobi penicillati altiores quam anthera. Anthera spiculo filiformi.

A slender plant 22-66 cm. high, with a thick channelled leaf 9-20 cm. long; stem bracts 2, leaf-like. Flowers 3-20, about 2·5-3 cm. across the diameter, blue, purplish, or pink, or combining these shades. Dorsal sepal broader than any other segment. Labellum resembling the paired petals but a little shorter. Column without any hood, very abruptly truncated behind at or below the base of the anther, but with an erect oblong lateral wing, orange-coloured, on either side, its margins minutely denticulate or crenulate except on the anterior side; the back of the column with a conspicuous dark orange band just under the summit. Penicillate lobes erect, with large dull yellow hairtufts. Anther with a long filiform point, scarcely as high as the top of the column wings, and considerably lower than the hairtufts.—Gravelly Beach, on the Tamar River below Launceston, December, 1943. Neil Burrows.



Thelymitra retecta, Rupp, *sp. nov.* A, plant about half natural size. B, column from the front; *ht*, hair-tuft; *w*, wing; *a*, anther; *s*, stigma. C, column from the back; *b*, deep orange band. D, column from the side, one wing and hair-tuft removed. B, C, D all greatly enlarged.

This interesting species was found in substantial numbers by Mr. Burrows, who is to be congratulated on his discovery. In addition to a living specimen, he sent excellent pencil sketches which were most useful. Morphologically, the flower is perhaps nearer to *T. truncata* Rogers than to any other known species, but it has very distinctive characters of its own, as a study of the description will show. The specific name ("uncovered") is in allusion to the complete absence of any protective hood above the anther.

Mr. Burrows reports that the new species grows in association with the Veined Sun-Orchid (*T. venosa* R.Br.), with which it has little in common morphologically beyond the generic character. He has also observed that although the flowers during cool and cloudy weather do not expand at all, fertilization of the ovary takes place, and the species is evidently self-pollinating, or at least capable of self-pollination.

Mr. P. Crosbie Morrison left recently for a lecture tour of North Australia under the auspices of the Army Education Service.

"INSTINCT" OR "RADIAL RAYS"?

To the Editor.

Sir,—The word "instinct," as applied to the actions of birds, animals and insects, has never professed to explain what the faculty is, but designated a sense of which we know nothing. Since we begin to know more about radiation and radial waves, the explanation of this sense appears to be clear enough. There does not seem to be any doubt that birds, etc., have the faculty of receiving the radial waves, which we now know are emanated from all things that are on the earth's surface.

There are innumerable instances of the actions of birds, etc., which could be given to substantiate that statement. Fabre, the French naturalist, observed that when a Great Peacock female butterfly emerged from the chrysalis one morning, in his laboratory, a whole swarm of males invaded the place that night. It seemed as if the sense of smell had been guiding the males. Fabre shattered this hypothesis, although he did not recognize the fact, by placing substances of overpowering obnoxious effluvia near the female, which had no effect on the collection of males. He placed the female under a glass bell, where the males could see her, and a tray containing a layer of sand, on which the female had passed the preceding day and night, covered with a piece of wire gauze, being in his way, he placed it on the floor at the other end of the room, where little light could penetrate. To his surprise no males stopped at the glass bell, where the female could be plainly seen, but they all flew to the tray and alighted on the wire dome.

Georges Lakhovsky, another observer, carried out a similar experiment with the same species of butterfly, with a piece of cotton wool for her resting-place, instead of the sand-tray, and came to the conclusion that it was not the splendour of her colouring, nor was it any smell given off by her, that attracted the males, but rather micro-organic cells, radiating according to a scale of determined wavelengths from infinitesimal particles given off by her ovaries. To support the latter contention, when he dipped the cotton wool into pure alcohol or corrosive sublimate (both of which would have no effect on odoriferous effluvia) the males stopped coming to the wool. These solutions would destroy the living cells which gave off the radiations that attracted the males.

Of bats, the latter observer says: "It is commonly believed that it is to the acuity of the senses of smell and hearing that the bat owes its ability of approaching its prey. This may be admissable under such conditions as the calm atmosphere of the countryside. In Paris, I have often watched bats from my balcony, on racing days, amid the uproar of a great crowd and the noises of thousands of cars, setting up vibrations in the air, saturated with the products of petrol combustion. Amid this deafening din and vitiated atmosphere, it is neither the sense of smell nor that of hearing that guides the bats straight towards insects which they catch as easily as in the undisturbed silence of the countryside. The bat is most probably attracted to these insects by the radiations they emit, which is not influenced by noise or by petrol fumes."

Consideration of your space forbids me giving further instances pointing to the use of radial waves by birds, animals and insects, as an explanation of the faculty or sense, which we cover by the word "instinct."

Yours,

ALBERT A. COOK.

Walkerston,
Mackay, Queensland.

RADIAL RAYS AND BIRD BEHAVIOUR

To the Editor

Sir,—It surprises me to find that Dr. H. Flecker is unaware that radial rays are at present unknown to him. Most rays, if not all, are classified as radiating in character. There is a multiplicity of radiating rays well known to scientists which emit or radiate energy. For instance, the rays of radium are emitted or radiated, likewise many others. There are also the rays which have been separated from the parent ray, like the various rays composing light, such as the violet ray and infra-red ray.

By using a comprehensive term embodying all radiating rays by the simple word indicative of their natural behaviour as radial rays I am in keeping with the strict sense of the classification of and nomenclature of radiating rays. This, therefore, needs no defence but the converse attitude. It is but a broad classification of what is at present known to exist.

I might be permitted to point out that the disputed word "instinct" has been rejected as redundant in the dictionary of basic English. This is exactly what I claimed for it and stated that it was a redundant word of little, if any, value as a criterion.

To indicate that radial action is not mere conjecture in its action on bird behaviour, let me cite the result of an experiment made with radial rays on the 2nd July, 1924, at a radio station near Valencia, Spain, with a flock of carrier pigeons. They were released when the station was transmitting and it was noted that these birds could not get their bearings and kept flying about in circles. When the station ceased transmission it was not long before the birds got their direction and flew away.

Dr. Flecker further mentions that the hereditary impulse of all animals to seek for food is instinctive. Now it is well known that animals respond to the stimulus or stimuli of their environment. It is likewise known that part of the environment is composed of radial rays of some of the many varieties composing the group of radial rays, or waves, or beams, or currents, by which some persons designate them. Without their organic structure plus environmental stimulus operating in conjunction, hereditary impulses would not arise in animals, hence since the environment is partly composed of radial currents, hereditary impulses are primarily due in part to radial action.

Electronic researches have revealed the electric currents of the brain and their movements throughout the nervous system. Radial rays are the subject of intense research at the present time, particularly for use in our war services.

I have shown that radial rays of the environment act upon the organic structure of animals which respond to it insofar as their organic mechanism permits. Surely this is not to be called "instinct."

The mystery of bird migration, as is the nature of electricity, are problems still unravelled completely, but what is certain is that some form of ray in the environment surrounding the bird acts upon it in directing its course and must motivate its action, as with the reef heron or other bird.

Rays are at present radiated to airmen for directional guidance. Why should not nature's rays act directly on birds and animals? These creatures do not require them to be harnessed for use as in some instances humans do for their benefit.

Yours, etc.,

Kew, Vic. ARTHUR H. E. MATTINGLEY.

BABY PLATYPUS MAKES DEBUT

The first baby platypus to be born in captivity, which caused world-wide interest when its birth was announced on January 3, made its first public appearance at Healesville on February 22.

It is now revealed that the infant is a "girl," and the only one of the brood. Hopes that twins, or even triplets, might be found in the long nesting-burrow have not been fulfilled. Nor has the soft eggshell, from which the babe emerged, been found.

When the Director of the Sanctuary, Mr. David Fleay, opened the burrow on January 3 and discovered the young platypus, the queer little creature, then about nine weeks old, was sightless and helpless and was covered with short silky fur.

Now her eyes are open, she is able to swim, and the fur has become long and rich. Her body-length, too, has greatly increased—by five or six inches since January 3—and the short beak of infancy has grown almost to maturity.

The mother platypus, Jill (who has now passed her sixth year in the Sanctuary), was only ten inches in length when she was picked up some three-quarters of a mile from water. Her babe is already fourteen inches long, only two inches shorter (at 3½ months) than her 6½-year-old mother.

Already, too, the babe has become a film star. She, together with both parents, gave an exhibition on February 22 for The Herald-Cinesound News Service.

The babe herself offered no objection to this publicity, other than to emit a few quaint growls, rather like those of a broody hen. Jill, however, was somewhat coy. She went to the length of seizing Mr. Fleay's fingers in her rubbery beak and trying to pull them away from her precious infant. Jack, the father, took a more detached interest in the proceedings.

The babe emerged from the nest on February 26—seventeen weeks after hatching. It is now on public view.

A.H.C.

NESTING ODDITY

Writing from Willigobung, J. W. Cunningham says: "While away on a visit to my nephew's place, Ti-tree, Keysunda, we occupied a room outside which a grape vine was growing. In this vine were two Wagtails, who were building two nests, within six inches of each other, and about the same level. We used to watch them every morning, from 5 to 7, and they used to build the two nests alternatively. There were not four Wagtails, as, not having much to do, I used to stand or sit in the garden for hours watching them, and there were never more than two building. As the Willie Wagtail is such a pugnacious and cheeky chap, one would not expect two birds to build close together. When we left, the two nests were nearly finished."

GENERAL NOTES

A number of members have responded cordially to the invitation to support the Field Naturalists' Fund for the use of Mr. David Fleay, of the Healesville Sanctuary, in recognition of his sound work. Further contributions will be welcomed.

The date of the death of Mr. Frederick Chapman was December 10, not December 19, as misprinted in the last issue of the *Vic. Nat.* The photograph accompanying the obituary notice was taken by Miss M. L. Wigan.

Copies of Dr. F. E. Floyd's *Carnivorous Plants*, reviewed in the *Vic. Nat.* last September, can now be obtained from Angus and Robertson, Sydney.

JOHN LEADBEATER OF THE NATIONAL MUSEUM

Benjamin Leadbeater established a natural history business in London at the beginning of the nineteenth century, after him Vigors, in 1831, named the Pink (Major Mitchell) Cockatoo *Plyctolophus leadbeateri* from a specimen supplied by the firm. In 1837 Gould named a parrot supplied by the firm *Platycercus ignitis*, but the species is not nowadays accepted, the type-specimen being considered to be a hybrid or an aberration.

Benjamin's son, John Leadbeater, born about 1800, was first in partnership with his father in the natural history business, and after the death of the senior partner, continued it. He was a Fellow of the Royal Society and "a man as well known abroad as at home, for his love of science and talented productions." He died on May 28, 1852, at his residence, 19 Brewer Street, Golden Square, London. It will be remembered that John Gould lived in Broad Street, Golden Square.

John Leadbeater had two sons, Benjamin and John. Benjamin carried on the business in London, at least for a few years, and, in 1851, was elected a Fellow of the Linnean Society of London. The second son, John, came to Melbourne and, with one Williams, established a natural history business, "collecting for the London House (sole agents) all the various branches of the Natural History of Australia on a large scale, especially Mammalia, etc., for anatomical examination, in spirits."

It is not known how long the Melbourne business continued—it possibly came to an end through the failure of the London establishment—but John Leadbeater became assistant and taxidermist at the National Museum. After him, E. P. Ramsay named the *Pardalotus leadbeateri* (the Spotted Pardalote) in 1867, and, in the same year, Professor F. McCoy named *Ptilotis leadbeateri* (the Helmeted Honeyeater). In 1874, Kendall Broadbent collected some Fig-Parrots at Cardwell, Queensland, and disposed of them to several museums in Australia. The specimen received at Melbourne was named *Cyclopsitta leadbeateri* by Professor F. McCoy, and the name nowadays has priority over names given to the bird at the same time by Gould and by Ramsay.

Thus we have John Leadbeater commemorated by the scientific names of three Australian birds; but there is little on record about his life. As he worked in Melbourne at a comparatively recent period, it should not be difficult for one on the spot to find some references in contemporary newspapers either to the firm of Leadbeater and Williams, or to Leadbeater alone. Will some member take up the task of placing on record some information about the life of this former taxidermist to the National Museum?

H. M. WHITTELL, Bridgetown, Western Australia.

[To the above bird-names awarded in honour of Leadbeater should be added that of a very distinctive mammal, *Gymnobelideus leadbeateri*, the very rare Leadbeater's Possum.—EDITOR.]

FERNTREE GULLY EXCURSION

The attendance at this outing, on February 12, was about 20. The afternoon was spent in pointing out species handy to the track and little real search was made. Only twenty species were noted. This is definitely not due to removal of ferns, for the hillside is well covered. A more diligent search should reveal many more species and I suggest that this be done by a small party of students of ferns to ascertain just what is left and where located. The only discovery of special interest was a large patch of *Pellaea falcata* (Sickle Fern), with many bipinnatifid fronds. This being the nearest gully to Melbourne now remaining, it might be of some value to introduce species, which are now missing, into some suitable sites. Thus, students might have available the majority of our ferns. It should be easy to obtain the co-operation of the management.

A. J. SWASY.

The Victorian Naturalist

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PROCEEDINGS

The monthly meeting of the Club was held at the Royal Society's Hall on March 13, 1944. The President (Mr. P. F. Morris) presided and about 100 members and friends attended.

REPORTS OF EXCURSIONS

Reports of excursions were given as follow: Rickett's Point, Mr. P. F. Morris (for Mr. P. Crosbie Morrison); Beaumaris, Mr. O. P. Singleton, who stated that a good outing was slightly marred by high tide; River Yarra trip, Mr. H. P. Dickins, who praised the descriptive commentary rendered throughout the afternoon by Mr. P. F. Morris.

ELECTION OF MEMBERS

The following were elected as Country Members of the Club: Messrs. Aldo Massola, H. E. Finlayson, F. O'Donnell; as Associate Member: Master Arthur Court; as Ordinary Members: Mrs. C. P. Phillips, Miss H. C. Down.

GENERAL BUSINESS

Mr. T. S. Hart drew attention to the present flowering in the Botanical Gardens of the Tree Geebung (*Persoonia arborea*), and Mr. J. H. Willis stated that there was at least one living specimen in the Dandenong Ranges near Sherbrooke Falls—probably the closest spontaneous example to Melbourne.

Mr. S. R. Mitchell reported on the Junior Branch at Hawthorn and thanked all who had contributed to the success of a plant demonstration (collection, preservation, photography and analysis of specimens) held last month; Mrs. Freame was especially mentioned for her interesting exhibit of microscope slides.

Messrs. E. E. Pescott and W. H. Ingram, two past officers of very long standing, were welcomed by the President, who also expressed pleasure at seeing the Messrs. Dunn, senior and junior, as well as other visitors.

NATURE QUESTIONS

Question 1: Is it only the female mosquito that bites? Answer: Mr. V. H. Miller cited an excellent article in the *Age* of several days ago which definitely attributed the spread of malaria and dengue fever to female mosquitoes. Mr. A. D. Hardy made a correction to the question—the female insect is a vegetarian except at breeding-time, when she does not bite but becomes a blood-sucker.

Question 2: Curvier is said to be responsible for naming the Frogmouth *Podargus* (supposedly derived from "gouty foot"). What is the explanation of the "gouty foot" as applied to this genus of birds? Answer: Mr. A. E. Mattingley surmised that the name would be in allusion to the curious limping gait of a frogmouth, which walks as if afflicted with gout in the feet. Mr. A. H. Chisholm suggested that Mr. H. Wolstenholme was uncertain of such a derivation, but recalled a humorous writer who breezily ventured to explain it in terms of *"Pod,"* a seed-vessel, and *"Argus,"* a newspaper! Mr. E. E. Pescott challenged the translation "gouty foot," and said that the first-named frogmouth was in all probability not an Australian species, thereby necessitating reference to older ornithological works in other countries.

Question 3: Does the Channel-billed Cuckoo visit Victoria and, if so, are there any recent records of parasitic nidification? Answer: Mr. Chisholm stated that although this northern bird did occasionally appear in East Gippsland (and there is one record even for Tasmania), it has never been known to deposit an egg in our State. For a cuckoo, it is a large species and has earned the name "storm bird" in Queensland; several young channel-bills may be hatched in a single nest and it is not customary for them to eject their foster-brethren.

Question 4: Is the Rufous Fantail a frequent suburban visitor in summer-time? Answer: Mr. Chisholm, supported by Mr. Mattingley, replied that the bird was more likely to be seen near Melbourne during spring, in course of its migration toward the mountain gullies where it nests in the summer months. Mr. Hanks mentioned the appearance of odd birds at Footscray and even in Flinders Street.

RETURN OF BOOKS ON LOAN

The Librarian requests that all borrowers of books from the Club library have these returned by the end of the month, for the purpose of a complete stock-taking.

MAKING THE DESERT BLOSSOM AT BROKEN HILL

Introducing this subject at the March meeting of the F.N.C., Mr. Royce H. Mew briefly sketched the physical and climatic environment of this rich mining centre—altitude about 1,000 feet, in the Barrier Ranges; rainfall 2 to 16 inches with an average of less than 10, but very reliable; temperature varying from winter frosts to frequent heights of more than 100° F. in summer; soil type mainly red clay and limestone, with the top layer badly eroded in recent years.

Settlement began a little more than fifty years ago, when Broken Hill was a mining camp, heavy inroads were soon made upon the natural timber resources, which gradually receded until all sound wood had been removed for a considerable distance around the growing town. The sparse undergrowth became trampled and eaten by droves of wandering stock and the wind had free play with a soil now denuded of its original plant cover.

Something *had* to be done and quickly, if the mines were to be manned for many years longer. Zinc Corporation invited suggestions for combatting this ugly problem of wind erosion and was impressed with one put forward by Albert Morris, a naturalist who had devoted his life to the study of inland vegetation. Morris's idea was to make a conveniently-sized area both stock and vermin proof and to plant it with trees suited to the district.

The scheme was adopted and an area of twenty-two acres was surrounded by a six-foot galvanized iron fence; the first trees (12-inch seedlings) were planted out in January, 1937, and waste water pumped into a reticulating system from showers and septic tanks at the mine. Drift sand which threatened to cover the fence was held in check by plantations of quick-growing Myoporum, Old-man Saltbush, and various Acacias. As the scheme evolved, trees were introduced along every possible road, unsightly hummocks were covered with rockeries of cacti and trailing native plants; vegetable patches sprang up in favoured sites, and special types of trees were found that would thrive on mineralized ground and slime dumps, e.g., Tea-trees and Athols (*Tamarix aphylla*).

Farther south than the original Albert Morris Park, plantings of citrus and nut trees were made and all seedlings were initially raised at the residence of Mrs. Morris, now acting as Botanical Adviser to Zinc Corporation in continuance of her late husband's magnificent work. Between 1936 and 1943 a total of 34,000 individual plants were transplanted from tins, including sixteen different kinds of eucalypt and nine wattles.

The speed with which natural regeneration of indigenous plants

followed the fencing, even without irrigation, was amazing, and the mine directors lost no time in having larger tracts fenced in and left for the native flora to stage a "comeback." At present ten areas, comprising a total of three and a half square miles, have been enclosed; these stretch in an arc from the south-east to the north-western portions of the city, and at the close of 1942 no less than 208 species of native plants were recorded as occurring in them.

Since the establishment of this protection belt, the ground surface has had constant protection and, even during drought seasons, dry herbage has acted as a sand binder. The result has been a marked diminution of local dust-storms, useful birds have followed the flora back again; but not the least benefit is the development of a "home consciousness" among district progress associations.

During 1938, 4,000 eucalypts and 500 athols were added to a public park. People have rebuilt over abandoned allotments and townsfolk are no longer so eager to visit Silverton (eighteen miles west) for their recreation. With changing public outlook has come a pride in the appearance and beauty of the town; the mine managements are to be congratulated on their whole-hearted efforts to render Broken Hill more pleasing and habitable for the people who depend on them.

The full value of the reclaimed areas will not be realized for some years yet, but the Albert Morris Park is a striking indication of what may be achieved against great odds, and an object lesson indeed for other inland towns.

With the aid of statistics, slides, and two strips of cinematograph film in colour, Mr. Mew supplemented his remarks on natural regeneration as a prime check to soil erosion in arid Australia. At the conclusion of this instructive address, enquiries were made regarding the source of water supply in such a low rainfall area and the cost per acre of regeneration. To these questions the lecturer replied that sufficient natural precipitation was held back during good rain years in reservoirs near Silverton and some ten miles to the north-east, but as to costs he could not divulge mine secrets; fencing was rather more than £50 per mile, but maintenance of the reserves was very cheap.

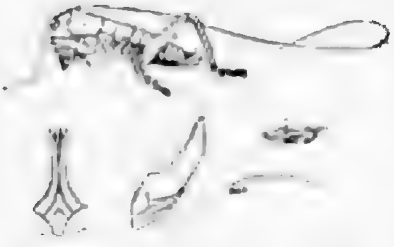
[Due credit should be given to James A. Keast, Manager of the Zinc Corporation, for his vision of the modern oasis at Broken Hill and for his determination to conquer unfriendly nature by science and to inspire good citizenship.—Ed.]

A LONG-EARED TREE-"GRASSHOPPER"—HERMIT OF THE GUM-TREES

By EDITH COLEMAN, Blackburn, Victoria

After a fire swept through several acres of our forest land at Healesville early in 1943, it seemed necessary to safeguard the cottage from further fires in the summer by having sapling-growth and underscrub removed, as well as some of the scorched trees. This work was commenced in June, 1943. It went to our hearts to see living trees felled, but there were compensations.

The unrestricted growth of twenty-five years had hidden all except the tallest of the white-gums, in which we delighted, and had veiled all but the summits of the mountains, Monda and St. Leonards, which had once seemed so near to us. Moreover, the dense growth had banished many birds that once haunted our valley. The woodcutter, known to everyone as "Bill," was an artist with the axe. His instructions were to thin out only enough trees to secure safety and to open up the view. It was some compensation to watch our axe-artist opening up long-closed vistas, and before long we almost ceased to regret the lost trees.



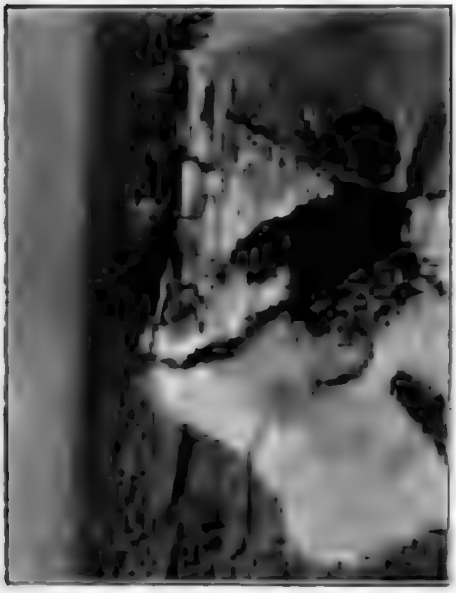
Long-eared Grasshopper (*Pachytillus longicornis*), natural size. Below, ovipositor from the rear and the side (×6), eggs and larva (natural size).

Best of all, he brought back many birds that had deserted it for more open forest land; and soon the valley was again full of bird voices. In war time it was not possible to have the trees grubbed. They were cut a foot or two from the ground. At first we were greatly troubled over the blackened stumps Bill left, but again there were compensations—so many birds seemed to choose the stumps for their sun-basking, and even, I thought, ate the charred bark. Does the red breast of a robin ever look more cheerful than when seen from a blackened stump? Another compensation was the chance afforded to study several creatures which nested within the trunks of trees, quite beyond my reach.

Three times in July, as Bill cut the fallen stems into lengths for stacking, he almost sliced into the nest of a large tree-dwelling, long-eared "grasshopper," which Mr. John Clark identified as *Pachytillus longicornis*, but which I cannot match with any creature described by Tillyard. Certainly the "ears" (antennae) are long, being 12 cm. in length, greatly exceeding the length of the body.

In each instance a V cut had exposed a large cavity in which a mother Long-ear "brooded" a mass of several scores of eggs which were held together by a little silk. When the cut was made in a still-standing tree the mother dropped to the ground. One antenna was cut near the tip. The other two mothers remained on guard. A well-directed bite reminded me that the female of the species is more deadly than the male.

The curious features of this grasshopper were the entire absence of wings and the shortness of the ovipositor. The "hopping" legs did not suggest the ability to vault. On January 12, 1944, I watched a female Tree-hopper (Katydid) emerge from her nymphal skin. The most astonishing stage was the withdrawal of such a long ovipositor (21 mm.) from a body only 17 mm. long. It seemed as if a silvery, almost fluid, organ were being withdrawn, with great effort. This soon hardened into the very efficient golden-brown tool with which we are familiar. Later I watched her "sew" gum-leaves into a little day-time house, using for the purpose a fine silk thread.



Nest and eggs of Long-eared Tree-"grasshopper" in stem of Eucalypt (Grey Box). Mother and half-grown specimen have been placed outside for photograph. (Healesville: July, 1943.) Note the very broad forepart of the body. Many eggs were dislodged and lost when the tree was felled.

My grasshopper used silk too, but her very short ovipositor seemed quite inadequate for penetrating bark, or even crevices, to cradle her eggs. She must, I think, take advantage of existing holes, although the sawdust entangled among the silk suggests that her mouth parts are capable of dealing with wood, as well as fingers.

Sections of the stems containing nests and two of the brooding mothers were brought to Blackburn. The outsides were sprayed from time to time to simulate rain and dew. A month later one mother died. Her eggs appeared to be infertile. In the other

nest the eggs gradually became swollen and darker in colour. On November 21st, 1943, two larvae emerged. Next day there were four more.

Soon the cavity was animated by scores of long antennae, which crossed and recrossed the dark cavity like searchlights in a war-time sky. It was interesting to watch the tiny creamy-white grub-like creatures, with great dark eyes, struggling from the egg, crumpling it back towards the end of the body, and making a tremendous effort to release the long antennae (22 mm. in length). When several were placed in a box for closer observation, the fine white antennae were scarcely visible against the white lining of the box. In two hours the larvae became pale buff in colour. Five hours later they were dark, slaty-grey.

Here was a family I was puzzled to feed. Mr. Clark tells me that this grasshopper eats the under-bark of trees; but the bark covering these sections was no longer living and could afford, one thinks, little nourishment. I shirked the problem by leaving it to them. Within a week they had disappeared. Except for a few infertile eggs and a little silk, the cavity was empty.

In several other trees we found many half-grown specimens. These were in stems that were riddled with tunnels, so it seemed certain that our grasshoppers live, move, and have their being entirely within the trees. The name Long-eared "Grasshopper" seems rather inapt for a creature that neither hops nor eats grass. Although the long antennae probably do serve as additional hearing organs, as well as organs of touch and smell, a hearing organ is situated on the tibiae of the forelegs. Nor does the family name *Orthoptera* (straight-winged) fit a wingless creature. It is possible, of course, that the males are winged.

As Mr. O'Donnell had recently been interested in an insect which led a somewhat similar buried existence, I sent the specimens to him. In the sketch which he kindly made for me the short ovipositor is shown from the side and the rear. I had wondered whether it might carry an extrusible ovipositor and asked Mr. O'Donnell to decide this point by dissecting the specimen. He found it "neatly set into its own muscle system," but it did not appear capable of extrusion or withdrawal.

As Mr. Clark's species has a long ovipositor, and as I cannot check mine with anything in Tillyard, is it possibly an undescribed species?

FURTHER NOTES ON THE GREAT BROWN STICK-INSECT

By EDITH COLEMAN, Blackburn, Victoria

Little food was taken in June and July, 1943, by my domesticated Stick-insects, but feeding was resumed in August. At the end of the month the wire roofs were deserted and all were busy among the gum twigs in the evening. There were twice as many males as females in this second hatching. Mating commenced on October 15th, 1943. Before long there were many adult females swinging hammock-wise from roof or twig, the end of the abdomen reflected over the back in a half circle. Obviously egg laying was imminent.

An interesting feature of this brood was the retention of the green colour right to the final moult and even later. Some were bronzy-green, others pale buff, and three were quite grey. I wondered if this was due to some change in the properties of the gum-leaves.

On November 11th, 1943, one larva emerged from an egg dropped in the mixed cages (males and females) and soon there were many more (second generation under domestication). A strange feature of this second generation was the assumption of brown colouring at a much earlier period. Some were quite brown when only 2½ inches long (measured from end of abdomen to tips of outstretched forelegs).

There were now so many in the cage that it was not easy to check the number of moults, but the first one certainly takes place earlier than I had thought. One which I watched (January 14th, 1944) measured exactly one inch. The small transparent shed skin, which I have beside me, is almost invisible lying on deep gold paper. At this date there were about an equal number of browns and greens.

My first Stick-insects seemed to prefer adult foliage of various Eucalypts, although juvenile foliage of Messmate, Blue-gum, Peppermint and Mealy Stringy-bark was eaten.

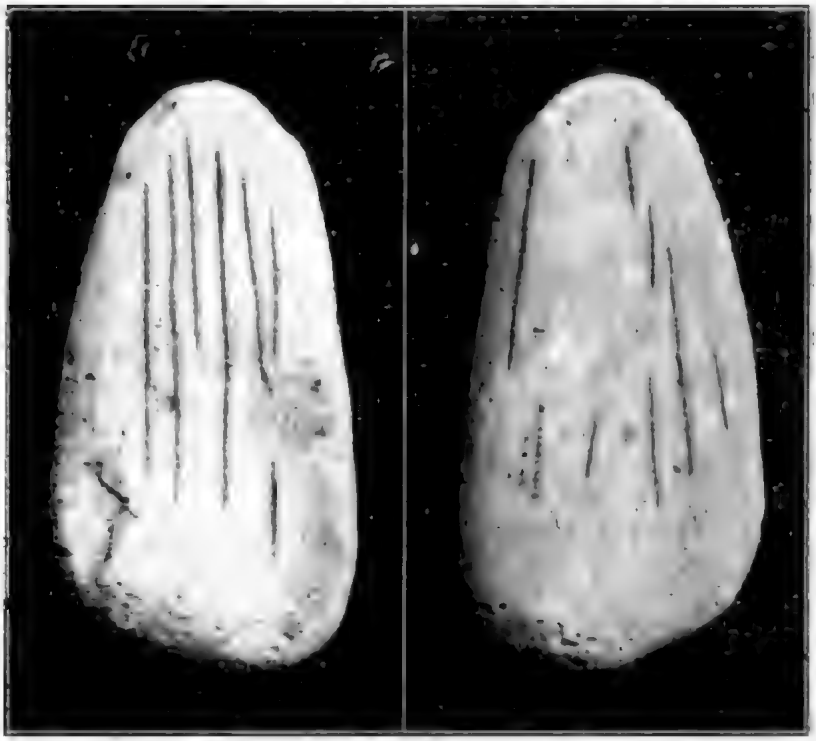
On February 11th, 1944, I gave them stump sprouts from three Sugar-gums which had been cut down. They looked so beautiful and so tempting that I felt sure they couldn't resist them. Next day scores of small Sticks were dead in the cages. Only those which found a little Messmate, or ones that fasted, survived. It seemed strange that they had become accustomed to the juvenile foliage or other species, including Silver-leaf Stringy-bark. Evidently that of the Sugar-gum contains some principle toxic to insects.

So far my suggestion of parthenogenesis appears groundless.

SMALL STONE SLAB SHOWING GROOVES MADE BY THE ABORIGINES

By C. C. Towle, Eastwood, N.S.W.

During a visit in the year 1940 to the aboriginal middens at Murramurang on the South Coast of N.S.W., I found the stone which is illustrated in the accompanying plate. It is a water-worn slab of fine-grained sandstone, 12 inches in length, 6 inches in greatest width and 2 inches in thickness.



Small stone slab showing grooves made by aborigines.
Photo.: C. C. Towle.

The aborigines did not modify its shape, but for some purpose or other they have made several very shallow longitudinal grooves on each of the two flat surfaces. The extent of the grooves actually made by the aborigines cannot now be fully ascertained, because one surface shows considerable weathering and the opposite surface was used as a grinding stone after the grooves had been made. As a consequence, some of the grooves have

been partly obliterated. On this surface there are also many pittings similar to the marks found on anvil stones. I have marked in pencil the grooves as they now appear on each surface. Several of them are not less than 7½ inches in length. Their greatest depth is one-sixteenth of an inch. They were made by an abrading or rubbing process, and not by scratching or scoring the surface.

A few somewhat similar but smaller stones have been found of late years near Cronulla, a few miles south of Sydney. (*Records Aust. Museum*, Vol. XXI, No. 1, 1941, p. 17.) Some of them have relatively deep grooves. A small specimen has recently been found near Dee Why, a few miles north of Sydney.

The use to which such stones were put is conjectural. All of them have been found on the coastal middens. This seems to indicate that their purpose was utilitarian. It has been suggested that the grooves were made during the process of sharpening the points of spears (E. Bramell, *op. cit.*, p. 18). There is no doubt that by rubbing a harder or more resistant material to and fro on the surface of the stone the grooves would be very rapidly formed. Because of this, it is not easy to understand why so few stones of the kind described have been found along the coast north and south of Sydney, where there are adequate supplies of suitable sandstone.

EXHIBITS AT MARCH MEETING OF F.N.C.

Mr. T. S. Hart: *Acacia Maidenii*, new for Victoria and collected by Mr. W. Hunter at Newmerella and Corringle near Orbost; flowers in long spikes (early winter), but in their absence the tree could be mistaken for the Lightwood (*A. implexa*).

Messrs. H. and A. Lindner, of Vectis South (per Mr. I. Hammet): Series of garden-grown native flowers from north-west Victoria.

Mr. Tom Griffiths: Specimen of Batswing Fern (*Histiopteris incisa*) cultivated in a fern-fibre basket.

Mr. A. A. Brunton: Bones of a blackfellow from the cliffs south of Red Bluff, Sandringham.

Mr. Fred. Hallgarten: A small but remarkable case-moth cocoon of uncertain identity; the case composed of varying materials arranged in distinct segments or "storeys."

Mr. Owen Singleton: Sharks' teeth of several species and associated fossils from Miocene strata at Beaumaris, including a very rare gastropod.

Mr. A. N. Carter: Collection of marine shells made at Rickett's Point on a recent Club excursion, including *Cerithium monachus*, *Diodora lineata* and *Eumarcia fumigata*. Also jaws of the fish *Heterodontus phillipi* and *Diodon blochii*.

Mr. C. J. Gabriel: Introduced land shells (*Vallonia pulchella*, *Vitrea cellaria*, *Helicella barbara*, *Helicella caperata*, *Helix pisana*, and *Helix aspersa*, the common or garden snail, which found its way to Australia on a pot-plant shipped from France in 1843).

Mrs. M. E. Freame: Gigantic crab from Portland, Victoria.

ASSOCIATION OF TWO TYPES OF SAWFLY LARVAE IN SINGLE COLONIES

By MAURICE F. LEASK, A.I.F.

In the past it has always been observed, as far as can be ascertained from the references, that colonies of sawfly larvae were monotyped as far as species is concerned.

In recording the habits of larvae, Yuasa (1922, *Illinois Biol. Mon.*) uses such terms as "larvae free leaf-feeders," "subgregarious," "sometimes semigregarious," "larvae solitary" or "solitary or gregarious." These terms imply that the larvae in a bunch all belong to the one species. The compilation of the notes of experiments in the present series was made with this idea in mind. Although several of the records show whether the larvae were in a compact bunch or scattered, and whether a single bunch split to go underground intermittently, no definite conclusions were reached.

The sketches accompanying my records sometimes show some slight variation in colour and size, presumably differentiating between females (larger) and males (smaller), a variation which is borne out by the adults. No definite separation has yet been made in the larvae to follow up this sexual character.

These remarks apply to all specimens collected in the Ballarat district (Victoria).

The first hint of some drastic new arrangement was discovered when collecting at Carapook, near Casterton, in the Western District of Victoria, and 150 miles west of Ballarat. Here, in Experiment 39, taken on Sept. 2, 1938, I collected larvae on the same tree and "mixing almost as one brood," that showed a great variation in colour. Some were black larvae and some were pinkish. They showed, in addition, a great variation in size; there were larvae up to two inches long and "adjacent to them and crawling over them" were tiny brownish larvae *only* five-eighths of an inch long.

In the light of the then known facts, these variations were assumed to be due to the presence of males and females or to moulting, and in the case of tinier larvae, to young ones mixing with the old. Experiment 39 yielded several emergences, beginning on March 19, 1939. The adults were apparently all the same species, "with white markings on sides of abdomen." These individuals were identified by Mr. R. B. Benson of the British Museum (Natural History) as "very close to *Pergagrapta gravenhorsti*."

To make a special investigation of the problem, a series of thirteen cages, totalling approximately five hundred larvae, were collected at Carapook on October 15, 1939.

The same feature, the "mingling" of larvae at rest on the food-plant, was again evident, but on this occasion it was approached more methodically. Some cages were filled with large black larvae only, some with small pinkish only, and some (as they occurred) with large black together with small pink larvae. On March 17, 1940, the emergences began, and for approximately one month cages yielded *Perga dorsalis* only. Then there was a lull of approximately one month. Thereafter, for approximately one month, *the same cages* yielded "a species of *Pergagrapta*."

This means the association of the two genera, that is, their living together in the larval stage.

NATURE OF THE ASSOCIATION

Some bunches contained large black larvae only; some contained small pink larvae only. Many bunches that were in a compact mass on the stem contained black and pink intermingled.

Other bunches of the larvae, in nearly every case, dropped off the stem when being picked. Then they revealed a number of small pink larvae inside the bunch of large black. When I climbed to the top of the tree to secure Experiment 107, eighty-five larvae of both types threw themselves off and tumbled over my head and shoulders. One cage recorded as "large black only" produced the two types of adults, showing that the pink remained hidden within the bunch of black.

Details of Emergences

The record shows *Perga dorsalis* from the Ballarat district emerging in December, February and March, with *Pergagrapta* in March (chiefly), whereas from Carapook *Perga dorsalis* emerged chiefly in March, with *Pergagrapta* in April and May.

Up to the present *Perga dorsalis* and *Pergagrapta* are the only two found to merge into single colonies. It should be noted, as detailed in the appended table, that in emergences *Pergagrapta* all came after *Perga dorsalis*, and not interspersed with them. Yet the date of going underground was intermittent, as with single broods, and it could not be said that *Pergagrapta* pupated a month after *Perga dorsalis*.

It is fortunate that this association is of two insects so distinctly differing in colour and size in both the immature and the mature stages. (*Perga dorsalis* adult is large, greenish blue; *Pergagrapta* adult is medium size, brown, with white-barred abdomen.) It is the association not of two species, but of two genera.

Conclusions

Originally, many of the earlier notes were not compiled deliberately to prove the fact of association, so that irrelevant observations occurred. The new habit is recorded from one restricted area only, namely, Carapook and Casterton. The most unusual feature in the case is the association of the two genera only in that district. This habit should be constant, and further investigations are required to find if it holds good in differing localities.

It may be a character with isolated range, owing to the special conditions which occur at Carapook. The schoolground is well planted with trees, forming an "oasis" in an otherwise treeless neighbourhood. Despite this, it cannot be assumed that association occurred due to lack of food, for many of the Red Gums are full-grown trees. It may be that the small larvae have sought the large for protection, and rest within the shelter of the fearsome outer layer.

As the larvae doubtfully seek shelter from enemies, and probably do not strive for extra temperature at night, as the *Pergas* scatter at night to feed, it is evident that the reason for this living in company lies in some obscure symbiotic relationship; each type of larva confers a benefit on the other. Evidently the relationship, whatever it be, ends after the larval stage.

Usually one species of larva inhabits one food plant. At Carapook both types were found on *Eucalyptus rostrata* and on *E. sideroxylon*. There may yet be found further connection between the food plants and the insects which tend to form single colonies.

Errors were eliminated in 1939 by placing the larvae in their cages and also entering the record on the spot. Furthermore, the records cover two seasons, several cages and several repeats, all with coinciding results.

A table comprising a summary isolated from the various records is appended.

TABLE OF EMERGENCES

Experiment.	Pupated	Emerged.	
		Perga	*Pergagrapta*
108.	*Perga* only, 4/11/39	14 f., 1 m., 17/3/40	
		3 f., 18/3/40	
		10 f., 1 m., 24/3/40	
		1 f., 3/4/40	
106.	*Pergagrapta* only, to 19/11/39		1 f., 29/4/40
			1 f., 5/5/40
			3 f., 6/5/40
107.	*Perga* and *Pergagrapta*, 29/10/39	4 f., 1 m., 17/3/40	1 f., 28/4/40
		3 f., 18/3/40	1 f., 29/4/40
		19 f., 1 m., 27/3/40	1 f., 6/5/40
			1 f., 7/5/40
109.	*Perga* and *Pergagrapta*, to 5/11/39	1 m., 17/3/40	1 f., 28/4/40
		1 f., 18/3/40	1 f., 29/4/40
		3 f., 1 m., 24/3/40	2 f., 6/5/40
		5 f., 1 m., 27/3/40	3 f., 7/5/40
110.	*Perga* and *Pergagrapta*, to 12/11/39	16 f., 2 m., 24/3/40	1 f., 6/5/40
		2 f., 27/3/40	

FERNS OF THE PORTLAND DISTRICT

By CLIFF BEAUGLEHOLE, Gorae West, Victoria

Although there is nothing near Portland to compare with the deep, shaded mountain gullies of Gippsland (or even of the Grampians, some 70 miles north-east), a casual visitor to this south-west corner of the State would be agreeably surprised if guided to such a spot as "Jackass," on the Fitzroy River, Mt. Deception. Here grow tree-ferns by the hundred, some with fronds of 11 ft. span, and at least nine other fern species are to be noted hereabouts.

Within a radius of approximately 20 miles from Portland post office no fewer than 22 different ferns have been collected; of these only seven grow abundantly throughout and are indicated by an asterisk in the catalogue which follows. The remaining species are restricted to certain areas; some are rarities, and two have never been re-discovered since their first location in the 1860's at Darlot's Creek by Mr. William Allitt (an early curator of Portland Gardens).

My thanks are due to the director and staff of the National Herbarium for many determinations, notes, and records of previous collectings here.

SYSTEMATIC ARRANGEMENT (with notes)

1. *Schizæa fistulosa*—"Comb Fern." Although known from the Grampians and in South Australia (Mt. Compass, Clarendon, etc.), this uncommon fern is apparently a quite recent addition to the flora of Portland. I have located (Nov., 1943) numerous plants in heathy country at Gorae West, most of them about 9 inches high.

*2. *Gleichenia microphylla*—"Coral Fern" (non *G. circinnata*—syn. *G. dicarpa*). For the four miles along Swan Lake Creek this lacy, durable and very popular fern is most prolific, scrambling to heights of a dozen feet amongst the swamp scrub; in places there are millions of young plants only a few inches high.

3. *Hymenophyllum cupressiforme*—"Common Filmy Fern" (non *H. tunbridgense*). Gathered in Darlot's Creek by Allitt some 80 years ago. I have not seen it there, nor anywhere else near Portland.

4. *Cyathea australis*—"Rough Tree-fern" (formerly *Alsophila*). Extremely rare, for I know of only two specimens in the whole district; these are both situated in a gorge opening on to the Surrey River at Gorae, and the larger plant has a trunk of 7 feet with fronds nearly 10 feet long. The record is interesting indeed, as it constitutes the western-most limit for this species in Australia.

5. *Dicksonia antarctica*—"Soft Tree-fern." There are only two locations now: the place called "Jackass" on Fitzroy River at Mt. Deception, where specimens range from tiny sporelings to ones with trunks up to 9 feet high, and along Surrey River at about 4 miles below the Gorge—here are the remains of plants with fairly large trunks, while many young ones are growing in the shelter afforded by Prickly Currant bushes (*Coprosma quadrifida*).

Tree-ferns (presumably of this species) once grew in Swan Lake Creek, but what were not "lifted" have been destroyed by fires. W. Allitt also collected Dicksonia at Glenelg River mouth, just two miles this side of the South Australian border, and Baron von Mueller in limestone caves west of Mt. Gambier, S.A., as early as 1857.

6. *Culcita dubia*—"False Bracken" or "Rainbow Fern" (formerly *Davallia*). Apparently confined to the same gorge as *Cyathea australis*, but extending in large colonies over an area of several acres; the prevailing yellow-green colour contrasts pleasantly with the bracken's sombre verdure. Heights vary from a few inches to about 4 feet, but I have seen 6 ft. specimens.

7. *Hypolepis punctata*—"Sticky Hypolepis." A puzzling fern to place on account of its variability—I would say our most variable species. There are only two occurrences to my knowledge, viz.: Surrey River, Gorae, where unusually big colonies occupy many acres, and Fitzroy River, Mt. Deception—fine examples here are more than 6 feet tall.

8. *Hypolepis rugosula*—"Rufous Hypolepis." A smaller fern than the preceding, fronds rarely exceeding 15 inches. I have only one definite record—a drain at Gorae West, but unfortunately some nocturnal animal has made tracks and tunnels through the heart of the small colony, which is now on the verge of extinction. (Melbourne Herbarium notifies an Allitt collection of *H. rugosula* from near Portland.)

9.**Lindsaya linearis*—"Screw Fern." After bracken, the most widely distributed of all our ferns. It favours sodden, peaty ground and occurs in mats often under two inches high, as a result of which one may easily overlook it.

*10. *Pteridium aquilinum*—"Common Bracken." Inhabits every type of soil, the most luxuriant growth occurring at the "Jackass," Mt. Deception, where 10 feet high fronds have been measured. Bracken is the only fern other than *Asplenium obtusatum* to be found on Lady Julia Percy Island.

11. *Histiopteris incisa*—"Batswing Fern." Gorae West and Cashmore are my only records for this elegant plant. In each instance it is limited to drains: tender, almost translucent uncurling fronds of pale blue-green rise majestically to 5, 6 or even 7 feet and project above the banks, thus claiming the interest of any passing enthusiast.

12. *Pteris tremula*—"Tender Brake." Observed at Mt. Deception, Gorae West and Swan Lake, large examples sometimes attaining 6 feet. The colour variation with development through different shades of green is a conspicuous feature.

*13. *Adiantum aethiopicum*—"Common Maidenhair." The largest colony I have found is along Surrey River, Gorae, clothing lofty banks at the deepest part of the stream. Though evincing a preference for damp, shady places, Maidenhair grows also on high hills at Heywood.

14. *Cheilanthes tenuifolia*—"Rock Fern." Here, as elsewhere, a very hardy species. Acres have been covered on the highest hills of Oak Bank (north-west of Heywood), and the rugged sides of Darlot's Creek at Tyrendarra exhibit an abundance of Rock Fern; the plant is a suspected stock poison.

15. *Pellaea falcata*—"Sickle Fern." A small colony only, comprising a few dozen plants, has been located among basaltic rocks along Darlot's Creek, Tyrendarra.

*16. *Blechnum nudum*—"Fishbone Fern" (non *B. discolor* of N.Z.). Popular, well-known species with fronds usually 3, but up to 5 feet long. I have counted 158 pinnules on out-size fronds. Sometimes the development of a little trunk gives the appearance of tree-ferns in miniature; this is particularly noticeable after bush fires.

*17. *Blechnum capense*—"Soft Water Fern." The best examples are to be viewed at Gorae (Surrey River) and Mt. Deception (Fitzroy River). In the former locality some specimens have grown trunks up to 2 feet high and fronds of almost incredible size—8 feet long by 2 feet wide! A handsome form (notably at Mt. Deception) has deeply and regularly serrated leaflets.

*18. *Blechnum procerum*—"Hard Water Fern." Practically co-extensive with the preceding and nearly as tall, but coarser and rhizomic—it does not tend to develop trunks. I have also observed this species with deep serrated pinnules at Mt. Deception and Swan Lake Falls.

19. *Asplenium flabellifolium*—"Necklace Fern." So far my only record for this hardy but charming little trailer is Tyrendarra, where the rocky walls of Darlot's Creek are inaccessible to rabbits. W. Allitt gathered it also at Glenelg mouth. Probably the "Blanket Fern" (*Pleurosorus*), which favours similar habitats, also awaits discovery here.

20. *Asplenium obtusatum*—"Small Shore Spleenwort." A very rare, but most interesting Victorian fern, since it flourishes under the influence of salt sea spray. The only State records are Mallacoota Inlet, a few islets off Wilson's Promontory, and Lady Julia Percy Island. The last-named location is actually just beyond our specified circle of 20 miles, but could be considered as an outlier of the Portland flora; the exact spot is "Fern Cave, Seal Bay, at south end of island." (Shore Spleenworts are more plentiful on the rocky cliffs of northern Tasmania and most abundant in New Zealand.)

21. *Asplenium praemorsum*—"Forked Spleenwort." Not collected since its discovery on Darlot's Creek last century by Allitt; incidentally, this is the sole Victorian record for the fern, which may now be extinct in our State. It is still to be found in South and Western Australia.

A. bulbiferum was taken by Allitt from the mouth of Glenelg River and perhaps may yet be located within the 20-mile arc around Portland.

22. *Polystichum aculeatum*—"Common Shield-fern." The vernacular is hardly true of our district, as I have seen only a few plants, viz.—at Gorae and Swan Lake Falls. Allitt had it from the latter place too.

ERRATUM

1. In the previous number of this journal (Vol. 60, p. 179) "Floyd" should read "Lloyd" in the second last line.

CORRECTIONS IN RECENT VICTORIAN FERN NOMENCLATURE

1. Distribution of *Asplenium praemorsum.* In Vol. 57 of this journal (p. 116, Oct., 1940), N. A. Wakefield reports the rare Forked Spleenwort from three localities in SW. Victoria, viz.—Darlot's Creek near Portland, Grampians, and Lady Julia Percy Island. Actually, only one collection has ever been made in this State and is labelled (Melb. Herbm.): "Darlot's Creek near the Grampians. Allitt." This information is no doubt responsible for Wakefield's second record, but the source of Darlot's Creek at Lake Condah is more than 40 miles south-west of the nearest Grampians and has no connection, physiographic or botanical, with that mountain chain. The third record from Julia Percy Island is obviously a mistake for the marine fern *Asplenium obtusatum*, which occurs in sea caves at the southern extremity of the islet.

2. Spelling of *Diplasium.* In placing this genus on our Victorian Census (*Vict. Nat.*, Vol. 58, p. 140, Jan., 1942), Wakefield has followed Bentham's adoption of the letter "s" instead of "z" (see *Fl. Aust.*, Vol. 7, p. 774), but most recent taxonomists are agreed on the use of "z," as in works by Domin, Christensen and Holttum.

3. Correct Citation for *Sticherus flabellatus.*—In establishing this binary (*Vict. Nat.*, Vol. 60, p. 110, 1943) N. A. Wakefield was apparently unaware that Dr. Harold St. John had already made the same combination eighteen months before (q.v. *Occasional Papers of Bishop Museum, Hawaii*, Vol. 17, p. 81, 1942); thus, the name of our rare eastern Fan Fern must be written *Sticherus flabellatus* (R.Br.), H. St. John.

4. Incorrectly Labelled Figures of *Tmesipteris parva* and *T. ovata.*—The epithets appearing beneath Mr. Wakefield's type illustration of the above in *Vict. Nat.*, Vol. 60, p. 142, 1944, should be transposed; the left-hand three fronds are of *T. ovata*, while those on the right represent *T. parva.*

J. H. Willis.

THE MUSK DUCK IS *NOT* "GOOD EATING"

Were it not that the *Victorian Naturalist* has such a wide circulation, the statement in the March issue (p. 166) that the Musk Duck is "good eating" might pass as an amusing example of the mistakes that sometimes appear even in staid scientific tomes. However, it may prove misleading, at some future date, to someone gathering together the published references to this rather odd species of duck. Most students of bird-life are aware that, for the pot-hunter, the overpowering odour of the Musk Duck is a more effective deterrent than legislation. Mr. V. H. Miller was not likely to make the remark attributed to him. As an angler, he is too well aware of the persistency of the repulsive smell to take a Musk Duck into any residence. Even the practical joker knows better than to "plant" a "Musky" in another man's boat! Briefly, the facts are: In answer to the President's query, I stated that any decrease would certainly *not* be due to the fact that they were being eaten! The distortion of that simple reply is due solely to war-time conditions.

Blanche E. Miller.

PERSONAL NOTE

At the February meeting of the Club, Mr. Noel Lothian intimated his recent transfer to a northern Army post and the consequent necessity of his relinquishing the office of assistant secretary. The President spoke in appreciation of Mr. Lothian's loyal services and extended to him the best wishes of the Club, expressing hope that he would find much beauty and interest in his new environment.