THE

VICTORIAN NATURALIST:

THE JOURNAL & MAGAZINE

OF THE

Field Naturalists' Club of Victoria.

VOL. XII.

APRIL, 1895, TO MARCH, 1896.

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

Melbourne:
WALKER, MAY & CO., PRINTERS, MACKILLOP-STREET
(OFF 390 LITTLE COLLINS STREET).
1896.

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VOL. XII.

ILLUSTRATION.

THE

Victorian Naturalist.

Vol. XII.—No. 1. APRIL, 1895. No. 137.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 8th April, 1895. Professor W. Baldwin Spencer, a vice-president, occupied the chair, and some 90 members and visitors were present.

CORRESPONDENCE.

A letter was read from Mr. G. E. Shepherd, of Somerville, asking if the reported finding of the eggs of the Curlew on Robin Island, Bass Strait, was authentic. Dr. W. Macgillivray remarked that he had seen the eggs on which the report was founded, and that they were, in his opinion, those of the Sooty Oyster-catcher. As is well known, the Curlew breeds in Siberia, and migrates through China and Japan to Australia every year.

REPORTS.

Reports of the recent excursions to Willsmere and Maribyrnong were received from the respective leaders, Messrs. J. and W. Stickland and Mr. T. S. Hall, M.A.

ELECTION OF MEMBER.

On a ballot being taken Mr. Pratt was duly elected a member of the Club.

VISITOR.

Baron von Mueller, K.C.M.G., introduced to the meeting Mr. C. Egeberg Borchgrevink, the scientist who accompanied the whaler *Antarctic* on her recent voyage to the South Polar regions. In his introductory remarks the Baron laid great stress on the importance of Antarctic exploration for commercial as well as for scientific reasons. Although the land lies under our own regions it must be remembered that South Africa has also facilities for reaching it. The importance of Antarctic research to geology and geography cannot be over-estimated. In the North there are no less than three expeditions engaged under far less favourable circumstances, the most notable being that of Mr. Borchgrevink's daring compatriot, Nansen, which has now been out for nearly two years.

Mr. Borchgrevink, who was well received, then proceeded to give an outline of the zoological results of the voyage as follows:—

"I have not prepared any set lecture for this evening, but am

asked to give my views on animal life down south. As to whales, we went to get right whales and did not find any. Do they exist? It is very difficult to say. We did not go as far down as Ross; still, in my opinion, Ross has mistaken finned whales for right whales. The finned whale was seen in large numbers, spouting about in all directions. It is very strong, and is the last of the animal kingdom to be conquered by man—a conquest chiefly due to the enterprise of the late Captain Svendfoyn, of Norway. We did not have the proper appliances to catch them, but I have no doubt that in the near future expeditions will be sent out to secure them. We were not sorry to fall in with a small kind of whale, also found in Norway, which affords a splendid meat. I regard it as of great importance as food for the coming scientific expedition. We met with five kinds of seals. One, which has not previously been described, had absolutely no ears, inside or outside. I regret very much that the skull, which I prepared, was accidentally crushed. The seals had cuts and scars about their skin resembling greatly the cuts given by the Polar Bear in the north, so that old sealers concluded that there were bears in the south too. I do not agree with Sir James Ross that these wounds have been inflicted in battles amongst themselves, as there are no scars about the head; nor are they caused by grampuses. I have no doubt that a large animal, hitherto undiscovered, exists on the Antarctic Continent, and this may explain the great scarcity of seals in these regions.

"Of birds, we saw many of the White Petrel; it is a sure sign of ice. I was asked by members of this Club to observe how far the Mutton Bird extended. It was only met with on our return in latitude 54°. On Campbell Island the Albatrosses had young at the time of our visit, but no eggs were to be found. While shooting ducks, which were very numerous there, I secured also several Godwits. We landed at Possession Island, which is covered with myriads of Penguins. Near a conspicuous Cape, to which we gave the name of Sir Ferdinand von Mueller, I was fortunate in finding a lichen. This is the first recorded instance of vegetation in such southern latitudes. Possibly the temperature of the island has changed since the time that Ross visited it. I go to London immediately to urge the sending out of an expedition. I will offer myself for the land party, for which my ability in the use of the Norweigan snow shoe will be of great assistance."

On behalf of the members, the Chairman thanked Mr. Borchgrevink for his address, and remarked that when we remember that there were absolutely no conveniences for collecting, and that Mr. Borchgrevink had practically to go before the mast in order not to miss the opportunity, it must be admitted that far more had been done than could have been expected.

PAPERS.

1. By the Rev. E. Halford Hennell, entitled "Notes of a Gippsland Trip."

Taking the form of a diary, the paper dealt with a camp-out expedition through the Gippsland Lakes. At Metung and on the Tambo good shooting and fishing were obtained, but insects were scarce. At Lake Tyers the collecting results were better, numerous fossils being obtained in the Nowa Nowa arm. An enjoyable trip was brought to a conclusion in the Morwell district, where several tiger snakes were obtained.

2. By Mr. H. P. C. Ashworth, entitled "The Dispersal of Mistletoe."

The agent in the dispersal of the Australian mistletoes, belonging to the genus Loranthus, was declared to be a small bird—the Swallow Dicæum—which extracts the seeds from the capsules in which they are enclosed. The discarded shells are found in great numbers under gum-trees. The bird is so small that when the seeds are passed they stick to the bough on which it sits, and in course of time germinate there. Experiments made by the author show, contrary to popular opinion, that it is not necessary for germination that the seeds should first pass through the bird's body. Specimens of the bird and of the mistletoe in various stages of growth were shown in illustration of the paper.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening:—By Mr. C. E. Borchgrevink.—Specimens of the White Petrel, *Procellaria navea*, and Wilson's Petrel, *Procellaria Wilsoni*, from the Antarctic; also, Godwits from Campbell Island. By Mr. C. French.—Rare moths, comprising *Pielus imperialis*, from Victoria, and the following Queensland species, viz.:—*Charagia splendens*, *C. Lewini*, *Chærocampa Cleopatra*, *C. Tryoni*, *Panacra Turneri*, *P. Joanna*, and *P.*, sp.; *Macroglossa*, n. sp.; *Dianassa suffusa*, and *Exotrocha liboria*. By Mr. C. French, jun.—Eggs of the following Queensland birds, viz.:—White-throated Gerygone, Black-breasted Cincloramphus, Black-throated Crow Shrike; also, curious Cactus flower *(Stapelia stellulata)*, from Cape of Good Hope. By the Rev. E. H. Hennell, in illustration of paper.—Fossils from Nowa Nowa arm, Lake Tyers; corals, *Cellepora Gambierensis*, various corals belonging to the family Turbinolidæ, Echinoderm, *Clypeaster Gippslandicus;* shells, viz., *Pecten coarticus (?)*, *P. Yahlensis*, and two other species, *Hinnites Corioensis*, *H.* sp.; *Spondylus pseudoradula*, Ostrea, four species, the largest weighing 2½ lbs.; species belonging to Terebratula, Limopsis, &c.; Polyzoans, not determined; Coleoptera, Arachnidæ, and shellfish from Gippsland Lakes; reptiles, viz., two Tiger Snakes, *Hoplocephalus curtus*, and skin of same tanned; *Hinulia Quoyi*, *Liolepisma*, sp., &c. By Mr. G. A. Keartland.—

Eggs of the Red-backed Kingfisher, *Halcyon pyrrhopygius*, Crested Wedge-bill, *Sphenostoma cristatum*, Yellow-tinted Smicrornis, *S. flavescens*, Black-backed Warbler, *Malurus melanotus*, Banded Xerophila, *X. pectoralis*, Large Striated Wren, *Amytis macrourus*, Striated Wren, *A. striatus*, and several others not yet identified, all from Central Australia. By Mrs. W. Martin. —Two extra large old shells *(Carris cornuta)*.

The meeting terminated with the usual conversazione.

EXCURSION TO WILSMERE.

Those members of the Club who had made up their minds to visit the picturesquely situated pools at Wilsmere Park were much disappointed when Saturday, 16th March, turned out showery. However, the leaders and a small party met at the Kew station at the appointed time, and after a walk of rather more than a mile, during which shelter had to be taken from another shower, the entrance to Wilsmere was reached, and work soon commenced in earnest. Naturally, when banks, grass, shrubs, &c., are wet and sloppy the conditions for pond-life hunting are not the best, and consequently the party soon showed signs of the nature of their occupation. Good spoil, however, was obtained. The ponds abound in Entomostraca, water-mites, water-boatmen, and many kinds of larvæ. Amongst these was a remarkable form having six disc-like gills on each side of the body. Numerous quaint, transparent young shrimps attracted attention. Sponges were found in great numbers; almost every stick yielded several. Many of these showed interesting phases of development, numerous statoblasts or gemmules being present. Similarly interesting reproductive stages were seen in several of the hydras taken. Polyzoa were abundant, and can be obtained in one of the ponds, growing on reeds, in an unusually clean condition, suitable for mounting. A jar of weed and water, taken from the first pond, supplied the greatest variety of microscopic objects. The sessile forms of collared monads were noted, and especially a Rhipidodendron which is very abundant at Wilsmere. It closely resembles, if it is not identical with, the *R. Huxleyi* of Saville Kent. This remarkable animalcule builds an elaborate brown-coloured structure, branching densely like a tree. Each branch, examined closely, is seen to consist of four parallel tubes; at the tips of these are the tiny zooids, which require a very high power for their study. Ciliata were comparatively scarce. One noted was the very odd-looking *Trachelocerca olor*; this has a neck as long as its name, and so flexible that its owner could without any difficulty tie it in a knot. Many examples of the tube-building *Stentor Roeselii* were taken. This is dis-

tinguished from the ordinary form not only by the presence of the tube, but by the projection of long setæ, three or four times the length of the cilia, from the cuticle down the whole length of the body. These setæ are well seen with a 1-inch objective under dark ground illumination. Other Protozoa taken belonged to the genera Vorticella, Epistylis, Vaginicola, Acinita, and Pyxicola. The last named deserve a word. They build a small vase-shaped sheath as a dwelling, and have, just beneath the head, a round disc attached. Upon any alarm they retire into their tube in such a manner that this disc is drawn down over its mouth, closing all up snugly. Sun animalcules, Acinetadæ, and Amœbæ complete our list of these humble forms of life. In the botanical side were noted the strangely twisting and coiling Oscillatoriæ, Closteria, and diatoms. Of the last a long, narrow species of Pleurosigma was swimming about freely. Some good rotifers were taken. The lovely rolling clusters of *Lacinularia natans* were caught by dozens. Of tube-builders we noted handsome specimens of *Floscularia coronetta*. *Cephalosiphon limnias* and *Limnias ceratophylli* were plentiful. Many compound tubes of the latter were noticed, two groups containing eight individuals each. *Oecistes longicornis*, with its two long arm-like antennæ, were found, but no Melicerta. *Asplanchna Brightwellii* and its near relative, *Sacculus viridus*, were taken. The latter uncommon rotifer, when extended, as its name implies, resembles a little green bag. The usual forms of the genera Brachionus, Dinocharis, Scaridium, Mastigocerca, and Euchlanis were observed, as also *Pterodina reflexa*, and a form apparently identical with *Taphrocampa Saundersiæ*, but differing in colour; the English one is yellow, but all we have seen here green.

The great capture of the day, however, was the strange *Pedalion mirum*, a rotifer of which our friend Mr. Shephard had a tantalizing glimpse a short time ago. On this occasion, however, we had ample opportunity of observing a specimen. The peculiar interest attaching to this little creature arises (according to Dr. Hudson), from its affording a connecting link between Rotifera and Arthropoda. Added to the usual organization of its class it possesses six hollow limbs, very muscular, each terminating in eight symmetrically curving spines. By the aid of these limbs it skips, and between the skips it swims, like its congeners, with its ciliary wreath. This rotifer's unique structure necessitated the establishment of the fourth order of Rotifera for its accommodation. It has already been reported from Brisbane.

A start was now made for home, and though a rough street toilet slightly improved the appearance of the party, they were not sorry that night's kindly shades to some extent concealed their mud-bedaubed condition while homeward bound.—W. and J. Stickland.

SOME NATURAL HISTORY NOTES FROM TOWNSVILLE, QUEENSLAND.

COMPILED BY H. KENDALL.

(Read before Field Naturalists' Club of Victoria, 11th March, 1895.)

THE following notes, mostly written by Mr. E. M. Cornwall whilst residing at Roseneath, near Townsville, consist of extracts from a "journal," into which I have worked portions of later letters referring to the same subjects.

After alluding to the wildness of his surroundings (as quoted in a previous paper), Mr. C. says :—"I often go and sit on the bank of the waterhole at the bottom of the garden. It is deep, broad, and long, and when the creek bed is dry for miles and miles water is abundant there. The banks, except at each end, are steep, and present a mass of tangled roots which press down to obtain the moisture necessary to sustain the trunks above. Huge native fig trees grow around; the Leichhardt Tree, or Canary Wood, *Sarcocephalus cordatus*, with large paired leaves and yellow globes of flower, besides many strange to me. Those who have never seen a forest creek within the tropics can have no idea of the luxuriance of the vegetation. During October many of the trees and shrubs along the streams round here were in bloom, and looked really beautiful—some a perfect blaze of scarlet and gold. When out riding at night one can always tell when near a creek, by the perfume, which at blossom time is almost overpowering, long before the dark fringing belt comes into view. The odour is like that of orange, cestrum, daphne, amaryllis, gardenia, &c., blended together—at a distance delightful, near at hand positively unpleasant. By the pool, however, in the daytime, one does not long to get through the belt of trees, but rather to linger and drink in the beauties of the place. The water lilies seem here to have found an abiding place safe from the despoilers, and flourish amazingly. White, blue, and pink, and through the many shades between—it is hard to find two flowers of exactly the same shade. In one corner, overshadowed by a Leichhardt Tree, quite a patch of blossoms is seen. One is a delicate mauve, another a deeper shade; that one almost white; a fourth is lovely flesh pink. They all spring from the one cluster of roots, but, like a family of fair women, no two are alike. Over yonder, where the sun holds power for almost the whole day, the colours are more defined. Some blossoms are deep purple blue, with a clear white centre; others are pink, but far more ruddy than those grown in the shade. The broad green leaves of these lilies nearly cover the surface of the pool, making it apparently safe to walk upon. Here and there the crimson under surface of a leaf is shown, veined with

purplish lines. There is no doubt the colours of these lilies (grown on one plant) vary according to the age of the flowers. When they first expand they are of a pale indefinite blue, which gradually intensifies, and fades through changing tints of pink. I think that in Queensland we have three distinct species of water-lilies. In the Ross River a pink one is quite plentiful." (I may here remind members that Mr. Bayley catalogues three Nymphæas as growing in Northern Queensland—a pure white-flowered species, a smaller one of purplish colour, and a third—blue—which he takes to be *N. cærulea*. There is also the pink water-lily, *Nelumbium speciosum*, the Lily of the Nile.) "The flower stems grow to an almost incredible length, and I look shudderingly back to a day when one entwined its slimy folds about my legs whilst bathing, and gave me a hard struggle to gain the bank. Careful measurement showed that stem to be 15 feet long.

"At almost any time of day an Azure Kingfisher, *Alcyone azurea*, may be found on one of the lower branches of the spreading fig tree. He watches for fish, and when one is secured betakes himself to a shelving bank beneath the Leichardt Tree, between whose roots fishbones fairly litter the bank. Several half-eaten fish prove that food is not scarce to-day. A White-breasted Sea Eagle, *Haliaetus leucosternus*, with bright chocolate back and throat, used often to sit upon the topmost bough of the last-named tree, but disappeared for some time. One day, about Christmas time, when my patience had become exhausted by the continuous rain, I wandered down by the brown, swollen waters of the creek, and spent some time in following a specimen of this bird for nearly a mile through the sodden grass. The chase was unavailing; but the bird looked so handsome, sitting on the very top of a very tall gum, that the memory of his appearance almost compensates for the loss of his skin. The wild flowers were some compensation also. Amongst the tall grass the scarlet Hibiscus shone like a ball of fire, whilst white ("Wild Rosella," *H. heterophyllus*) and yellow (*H. tiliaceus*) varieties were also noticed. The great cup-shaped blooms of the Native Convolvulus were abundant, and seemed to have gained a waxy appearance from the rain. The orchids on the giant ti-tree had already thrown long arms into the moist air, *Dendrobium undulatum* being the most common sort here. Over a stunted Melaleuca a climbing pea, whose perfume (reminding one of daphne) made its presence known before the blooms were visible, was growing and flowering luxuriantly. The flower is very pretty—light pink, with a tendency to mauve, and streaked with hair-like white lines. A beautiful yellow blossom, like a gaillardia, showed star-like from the grass on every side."

(To be continued.)

CORRESPONDENCE.

MICROSCOPICAL TEST RULINGS.

To the Editor of the Victorian Naturalist.

SIR,—I regret to have to request space for a personal matter with reference to an article entitled "Note on Microscopical Test Rulings," and signed H. J. Grayson, which appeared in the last number of the *Naturalist* (vol. xi., p. 163). When the note was read I pointed out that Mr. Grayson had omitted to mention that, as was well known to several members of the Club, I had been associated with him for several months in the production of test plates. This was admitted by him; nevertheless he has allowed the note to be printed with a sentence allotting the whole matter to Mr. Stone and himself.

I may add in explanation that the project was entered into and carried on by Mr. Grayson and myself, not as a scientific enterprise, but as a commercial one, and in applying scientific usage to the note in question I take it in the light in which Mr. Grayson apparently desires it to be read. On retiring from the partnership I pursued the project alone, and through my firm was able to announce test plates and other rulings as commercial articles prior to the reading of the note in question. Regretting having to trouble you, I am, &c. J. SHEPHARD.

PRACTICAL GEOLOGY.—The *Geological Magazine* for December, 1894, contains a short article by Mr. H. M. Bernard, M.A., F.L.S., entitled "Application of the Sand-blast for the Development of Trilobites." The article records the results of some recent experiments, and throws out hints which may be of use to other palæontological workers in getting at hidden parts of their specimens.

PRACTICAL USES OF LADYBIRDS.—The *San Francisco Examiner* of 8th January, 1895, contains a long report by Mr. A. Craw, Entomologist to the State Board of Horticulture, on the benefit resulting from the colonization of the Australian Ladybird, *Rhizobius ventralis*, among the orchards of that State. Scale-insects disappear rapidly before their advance, while their rate of increase is so rapid that in one orchard over a million beetles have been collected for further distribution.

VICTORIAN LEPIDOPTERA.—Mr. G. Lyell, Gisborne, reports the following entomological captures :—

Callidryas lactea, Butler (first record for Victoria), taken at Bendigo, March, 1895. Received from A. Purdie, Esq., M.A., B.Sc.

Hesperilla peronii, Latrielle (once previously recorded from Victoria), Ocean Grange, Lake Victoria, Gippsland, February, 1895, by Miss May Wise, Sale.

Clauca struthias, Meyrick (first record for Victoria), taken near Sale, 4th April, 1895, by Miss May Wise.

A CATALOGUE OF VICTORIAN HETEROCERA.

By Oswald B. Lower, F.E.S.

Part XIV.

PYRALIDINA *(continued).*

VITESSA. Moore.

ANEMOSA. Walk.

*435. A. isadalis, Walk. (*isadasalis*, Walk., 849; Meyr., Tr. Ent. Soc., 194, 1887).
Melbourne.

DRYMIARCHA. Meyr.

*436. D. exanthes, Meyr. (Tr. Ent. Soc. Lond., 441, 1885).
Kew.

PERSICOPTERA. Meyr.

437. P. pulchrinalis, Gn. (*Endotricha pulchrinalis*, Gn., 220, pl. iii, 7; *Persicoptera pulchrinalis*, Meyr., Tr. Ent. Soc. Lond., 284, 1884).
Sandringham, Gisborne, Melbourne, Windsor, &c.

On page 284 of the "Transactions of the Entomological Society of London," 1884, Mr. Meyrick makes *Scopula gavisalis* (Walk.) synonymic with this species. In the Melbourne Museum collection there is a specimen of *Mecyna rhodochrysa* (Meyr.) labelled in Walker's *own handwriting* as *Ebulea gavisalis*, and described by him in "Characters of Undescribed Lepidoptera," p. 73, 1869, consequently Meyrick's name becomes synonymic; but it would be interesting to know if *Scopula gavisalis* and *Ebulea gavisalis* are identical. I have not the description of the first-named at hand, but I may say that the two species—*i.e.*, *pulchrinalis* and *gavisalis* (*rhodochrysa*)—are superficially somewhat similar.

ŒDEMATOPHAGA. Meyr.

438. Œ. ægalis, Walk. (*Pyralis ægusalis*, Walk., B. M. Cat., 912; (?) *Gauna subferralis*, *ib.*, Supp., 1,253; *Œdematophaga ægalis*, Meyr., Tr. Ent. Soc. Lond., 74, 1883).
Melbourne, Gisborne, Healesville, &c.

ŒNOGENES. Meyr.

439. Œ. fugalis, Feld. (*Botys fugalis*, Feld., Reis. Nov., pl. cxxxiv., 37; *Œnogenes fugalis*, Meyr., Tr. Ent. Soc. Lond., 75, 1883).
Melbourne, &c.

SCENEDRA. Meyr.

440. S. DECORATALIS, Walk. (*Pyralis decoratalis*, Walk., B. M. Cat., Supp., 1,242; *P. contentalis*, *ib.*, 1,242; *Scenedra decoratalis*, Meyr., Tr. Ent. Soc. Lond., 76, 1883).
Melbourne.

*441. S. EXTERNALIS, Walk. (*Curena externalis*, Walk., B. M. Cat., Supp., 1,253; *Scenedra* (?) *externalis*, Meyr., Tr. Ent Soc. Lond., 77, 1883).
Toorak.

ENDOTRICHA. Zeller.

*442. E. HELIOPA, Meyr. (Tr. Ent. Soc. Lond., 78, 1883).
Melbourne.

442A. E. PYROSALIS, Gn. (Pyr., 219, male; *E. ignealis*, *ib.*, 220, female; *Pyralis stilbealis*, Walk., B. M. Cat, 913, female; *P. docilisalis*, *ib.*, 913, female; *Messatis sabirusalis*, *ib.*, 918, male; *Paconia albifimbrialis*, *ib.*, Supp., 1,255, male; *Tricomia auroralis*, *ib.*, 1, 259, male; *Rhodania robina*, Butl., Ann. Mag., N. H. (5) ix., 96, male).
Melbourne, Stawell, &c.

*443. E. ÆTHOPA, Meyr. (Tr. Ent. Soc. Lond., 79, 1883; *E. obscura*, Butl., *loc. cit.*, 427, 1886).
Melbourne.

444. E. AGLAOPA, Meyr. (*loc. cit.*, 196, 1887).
Victoria.

MYRMIDONISTIS. Meyr.

DIPLOSEUSTIS. Meyr.

445. D. MINIMA, Butl. (*Cymoriza minima*, Butl., Proc. Zool. Soc., 684, 1880; *Diploseustis minima*, Meyr., Tr. Ent. Soc. Lond., 285, 1884).
Melbourne.

446. D. PROPHETICA, Meyr. (*loc. cit.*, p. 198, 1887).
Warragul.

FAMILY—MUSOTIMIDÆ.

TRICHOPHYSETIS. Meyr.

*447. T. CRETACEA, Butl. (*Hydrocampa cretacea*, Butl., Ill. Het., iii., 75, pl. lix., 8; *Trichophysetis neophyla*, Meyr., Tr. Ent. Soc. Lond., 287, 1884).
Melbourne.

MUSOTIMA. Meyr.

448. M. NITIDALIS, Walk. (*Isopteryx nitidalis*, Walk., Supp., 1,417; *Diathrausta timaralis*, Feld., cxxxv., 23: *Musotima nitidalis*, Meyr., Tr. Ent. Soc. Lond., 290 1884).
Melbourne, Gisborne, &c.

449. M. OCHROPTERALIS, Gn. (*Isopteryx ochropteralis*, Gn., 230; *Musotima ochropteralis*, Meyr., Tr. Ent. Soc. Lond., 291, 1884).
Gisborne, Fernshaw, Cape Otway Forest, &c.

FAMILY—HYDROCAMPIDÆ.

ANYDRAULA. Meyr.

450. A. GLYCERIALIS, Walk. (*Cataclysta glycerialis*, Walk., 450: *Anydraula glycerialis*, Meyr., Tr. Ent. Soc. Lond., 428, 1885).
Melbourne.

CATACLYSTA. Hb.

MARGAROSTICHA. Ld.

PARAPONYX. Hb.

*451. P. POLYDECTALIS, Walk. (*Cataclysta polydectalis*, Walk., 451; *Paraponyx polydectalis*, Meyr., Tr. Ent. Soc. Lond., 430, 1885).
Melbourne.

452. P. NITENS, Butl. (Cist. Ent., ii., 556; *Hygraula nitens*, Meyr., Tr. N.Z. Inst., 122, 1884).
Melbourne, Mount Macedon.

HYDREURETIS. Meyr.

*453. H. TULLIALIS, Walk. (*Hydrocampa tullialis*, Walk, 462; *Hydreuretis tullialis*, Meyr., Tr. Ent. Soc. Lond., 436, 1885).
Melbourne.

454. H. EURYSCIA, Meyr. (Tr. Ent. Soc. Lond., 435, 1885).
Sale, Gisborne.

SCHŒNOBIUS. Dup.

455. S. IMPARELLUS, Meyr. (Proc. Linn. Soc., N.S.W., 176, 1878).
Melbourne.

SCIRPOPHAGA. Tr.

456. S. PATULELLA, Walk. (*Tipanæa patulella*, Walk., Tin., 522; *Scirpophaga exsanguis*, Meyr., Proc. Linn. Soc., N.S.W., 161, 1882).
Melbourne, &c.

Family—BOTYDIDÆ.

MARGARODES. Gn.
PACHYARCHES. Ld.
GLYPHODES. Gn.
EUCLASTA. Ld.
SYNCLERA. Ld.
MOROCOSMA. Ld.
LEPYRODES. Gn.
PHALANGIODES. Gn.
CIRRHOCHRISTA. Ld.
PHACELLURA. Lusd., Gld.
SIRIOCAUTA. Ld.
RHIMPHALEA. Ld.
SAMEODES. Snell.
LONCHODES. Gn.
HYDRIRIS. Meyr.
SPANISTA. Ld.
FILODES. Gn.
DRÆCENURA. Meyr.
PLEONECTUSA. Ld.
SCELIODES. Gn.

*457. S. CORDALIS, Dbld. (*Margaritia cordalis*, Dbld., Dieff., N.Z., ii., 288; *Sceliodes mucidalis*, Gn., 400; *Darala extensalis*, Walk, Supp., 1,311; *Eretria obsistalis*, Snell, Tijd., v., Ent., 206, 1880; *ib.*, 1883, pl. vi., 12; *Sceliodes cordalis*, Meyr., Tr. Ent. Soc. Lond., 303, 1884).
Gisborne, Melbourne, &c.

CNAPHALOCROCIS. Ld.

*458. C. MEDINALIS, Gn. (*Salbia medinalis*, Gn., 201; *Botys rutilalis*, Walk., 665; *B. iolealis*, *ib.*, 666; *B. mersialis*, *ib.*, 724; *B. acerumnalis*, *ib.*, Supp., 1,449: *Cnaphalocrocis iolinalis*, Ld., pl. xii., 7; *C. medinalis*, Meyr., Tr. Ent. Soc. Lond., 216, 1887).
Melbourne.

DOLICHOSTICHA. Meyr.

*459. VENILIALIS, Walk. (*Asopia venilialis*, Walk., 373; *Botys marisalis*, *ib.*, 717; *Dolichosticha venilialis*, Meyr., Tr. Ent. Soc. Lond., 304, 1884).
Melbourne, Gippsland.

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VOL. XII.—No. 2. MAY, 1895. No. 138.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 13th May, 1895. The president, Mr. H. T. Tisdall, F.L.S., occupied the chair, and some 80 members and visitors were present.

REPORT.

A report of the excursion to Beaumaris on Saturday, 20th April, was received from the Rev. W. Fielder, who acted as leader.

MEETING FOR PRACTICAL WORK.

The hon. secretary reported that a meeting for practical work was held on the 24th April, when a second meeting was devoted to the Tunicata, under the direction of the Rev. W. Fielder.

GENERAL BUSINESS.

After the nomination of office-bearers for the ensuing year had been made, Messrs. D. Best and H. R. Hogg were elected to audit the accounts for 1894–5.

PAPER READ.

By the Misses May and Lilian Wise and Muriel Bennett, entitled "List of Orchids collected near Sale."

This paper was communicated by Mr. Alex. Purdie, M.A., and written by three of his pupils, contained valuable notes on the flowering times of many orchids rare in other parts of the colony.

POND LIFE.

The rest of the evening was devoted to a microscopic examination of pond life collected from the lake in the Botanical Gardens. A special visit had been made by several members of the Club, and the objects procured were shown by the aid of about twenty microscopes.

Mr. J. Shephard delivered a few introductory remarks, describing the methods employed in collecting and preparing for examination under the microscope, also touching briefly upon the different classes of objects and their place in the animal kingdom.

The Rev. W. Fielder then gave an interesting description of the fresh-water sponges and hydroids, and subsequently demonstrated the method of making permanent preparations for the microscope.

Microscopical exhibits of pond life, from lake in Botanical Gardens, were given by Prof. Spencer, supplying microscopes from Biological School, Melbourne University; Rev. W. Fielder, who also gave a demonstration of cutting sections of sponge; Messrs. Stickland, living Rotifers; Mr. R. S. Sugars, who took Spirogyra; Mr. M'Caw, living and mounted Cordylophora; Messrs. G. J. Page and Gabriel, Diatoms; Messrs. Stone, Hill, Hayes, Scott, Cox, Shephard, and others showing Hydra, Entomostraca, insect larvæ, &c.

The living objects especially were examined with evident interest by those present, and the general opinion was expressed that an agreeable innovation on the usual procedure had been made.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening:—By Miss Cochrane.—Painting of rare Victorian orchid, *Pterostylis grandiflora*. By Mr. A. Coles.—White Goshawk, *Astur Novæ-Hollandiæ* and hybrid between Lady Amhurst and Golden Pheasant. By Mr. J. E. Dixon.—Orchid in bloom, *Liparis reflexa*, from New South Wales. By Mr. W. E. Ellemor.—36 species of mosses, including *Fissidens leptoloma*, *Weissia flavipes*, *Cryphæ*, *Polytrichum (Muelleri)* and *Cyathophorum (Hookeri)*. By Mr. C. French, F.L.S.—39 species Australian Hawk Moths, including *Macrosila severina*, *M. Edwardsi*, *Panacra Turneri*, *P. Joanna*, *P. automedon*, *Melittia chalybescens*; also Victorian Lepidoptera, including *Heteronympha paradelpha*, *Xenica correæ*, *X. orichora*, *X. Hobarti*, *Hesperilla Doubledayi*; also rare Victorian orchid, *Pterostylis grandiflora*, collected by exhibitor at Cheltenham. By Mr. C. French, jun.—Pecten and other shells from the sewerage works near Port Melbourne, found at a depth of 52 feet from the surface. By Mr. H. J. Grayson.—Slides of micro. rulings (improved mounting). By Mr. R. Hall.—Albino specimen of Dasyurus from the Dargo plateau. By Baron von Mueller, K.C.M.G.—*Elacholoma Hornii*, F. v. M. and Tate, a minute annual, constituting a new genus of Sesameæ, characterized by bistaminate flowers with very short and slender almost lobeless corolla and capillary stigmas. This remarkable plant was discovered by Professor Tate at Carmichael's Creek, Central Australia, during the Horn expedition. By Mr. G. J. Page.—Two slides of Diatoms.

After the usual conversazione the meeting terminated.

Just as we are going to press the death is announced of Mr. D. Sullivan, F.L.S., of Moyston, an old member of the Field Naturalists' Club. A notice of his work will appear in the next *Naturalist*.

SOME NATURAL HISTORY NOTES FROM TOWNSVILLE, QUEENSLAND.

COMPILED BY H. KENDALL.

(Continued from page 7.)

"A pair of little Mangrove Bitterns built near the pool, and a couple of Crested Hawks lingered about the gardens for many weeks, but vanished without nesting—I fear the gardener could tell why. He takes a practical view of things, and reckons chickens far ahead of science. By the edge of the pond at night Southern Stone Plovers, *Œdicnemus grallarius*, hold revels, making the bush ring with their yells. They often come close to our door, but morning drives them to their haunts among the grass."

Orioles also frequent the pool: "A nest hangs on a Sheoak bough, and a few weeks ago—this would mean October-November—was tenanted by three young Orioles. They have since taken to their wings, but the old home remains, with that appearance of loneliness about it which one finds in an empty house. There is now no clamour of hungry little ones, no angry cry of anxious mother as the men working in the garden approach to what she considers dangerous limits. In times of drought the White Ibis, *Threskiornis strictipennis*, comes here—in company with the Yellow-Legged Spoonbill, *Platylea flavipes*, and the White Crane—to feed about the margin of the water. Their snow-white plumage contrasts well with the dark shadows and the bright colours of the water-lilies. A Black-eared Cuckoo, *Mesocalius palliolatus*, lives in the top of the Leichardt Tree. Day and night his melancholy voice is lifted up, and if he sleeps at all it must be just when I do; at all other times he may be heard. The Spotted Bower Bird comes to the garden to feed upon small tomatoes and the chilies. The latter are grown as food for fowls, and when swallowed whole are not hot, so the meal is not so strange as it sounds. The Bower Bird also loves the guavas and other fruits, especially those of a bright colour, so war is declared against him. Some half-mile from here these birds have, like the legendary Bessie Bell and Mary Gray, 'biggit a bower on yon burn-brae'—the 'burn-brae' being on a small branch of this creek.

"On the other side of the pool, affixed to a branch overhanging the water, but very high up, is the mud nest of the Pied Grallina, *Grallina picata*. The mud hereabouts contains so large a proportion of sand that the birds have had to use an unusual quantity of grass to bind it together, the ends of which stick out on every side. The complaining cry of these birds is almost incessant. When the Melaleuca was in bloom I noted many honey-eaters by this pool, amongst them one, *Myzomela sanguinolenta*, with bright crimson head and shoulders; the

Yellow Honey-eater, *Ptilotis flava*, whose nest of bark and grass and spiders' webs one sees about September, the white eggs tinged at the smaller end with blotches of light red; also *P. flavescens*, and others, of whose identity I am yet in doubt. My knowledge is all too limited, particularly as to the habits of birds. In the garden beside the pool the mangoes were recently eaten off the trees. We suspected those gardeners' enemies the Flying Foxes, which come in towards nightfall in enormous numbers, sometimes darkening the air, and accordingly watched; but the depredators turned out to be a pair of Pale-headed Parrakeets, whom we caught in the morning eating the fruit." The Flying Foxes play havoc with both fruit and blossoms in the garden. In June they were amongst the Acacia and Sheoak blooms in the bush. "The ground beneath these trees was carpeted with the flowers which the foxes had thrown down in their quest for honey. Among the birds present on this occasion were a large dark honey-eater (unidentified), the Sanguineus Honey-eater, Friar Birds, &c. But I was surprised to note the almost total absence of honey-loving lorikeets. There were a few 'Blue Mountains' about, but flying high, and I only saw two or three among the blooms."

Some undesirable neighbours were "a pair of White Goshawks, who nested and reared a brood near the pool. I was tender-hearted and spared the young ones too long, as loss of chickens told, but at last shot one old bird, and put a bullet through the branch on which the nest was built. In it were the remains of a fair-sized Brown Snake. Are goshawks in the habit of feeding on such reptiles?

"When the streams cease running many animals come to the pool by night to drink. The tracks of the Great Black-faced Kangaroo, or Wallaroo, *Macropus robustus*, sink deeply into the sandy margin of the waterhole. Smaller kangaroos and wallabies come too. The wallabies, after drinking, pass on into the garden, where sweet potatoes offer a luxury not to be missed. The tracks of the Kangaroo Rat, Bandicoot, Native Cat, Opossum, and sometimes of the Dingo, are also to be seen. The Dingo never comes close to, and even into the water, as other animals do, but stands well back and never lingers long. Whilst drinking the neck is stretched well out, and when thirst is quenched the dog turns tail at once, like the coward he is, and slinks away amongst the trees. His tracks are always straight to water and straight back; he never wanders up and down as though loth to leave it. If one wanted to get amongst the marsupials he should have been here in September, when the old grass had been burnt and a nice young growth was springing. One Sunday all sorts and sizes were seen during a ride which I took. There were over 20 very large kangaroos in one mob, besides several twos

and threes. Had it been a week day some skins, scalps, and tails would possibly have parted from the remainder of the animals.

"All my attempts to capture a huge lizard who has his home amongst the roots of the fig tree have proved abortive, and I shall have to try what a cunningly-devised snare will do.

"Occasionally a Cormorant, *Graculus melanoleucus*, makes his way into this sequestered corner, and finds good living too, for the pond is full of fish. He sits upright on a stranded log until a fish is seen. Then—a splash, a gleam of silver, and he is back on his perch, spreading his wings and pluming himself in the sun. But if the gardener sees him the gun comes out, and the Cormorant dies."

Birds are not the only anglers in this pool. Our friend casts his own line therein at times, and has drawn from this and other waters a problem which often confronts naturalists, accounts of which are often received doubtingly, and concerning which some of the explanations given do not always meet the case. Mr. C. says:—"The variety and number of the fish are amazing. Before the rainy season there was only the one permanent water-hole in the creek near me, and at that time there did not seem to be many fish in it. But within a fortnight from the time the creek started to run, in every hole for miles up (where they could not apparently have travelled because of obstacles in the shape of rapids and falls) there were multitudes of tiny fish. How they come is somewhat of a mystery. Is it possible that before the water dried up the ova were deposited, and that they remain in the dry bed of the creek until the fresh flow of water causes them to hatch? This hardly seems possible, since, if such be the case, the eggs must sometimes remain unhatched for years. Very long intervals—several years sometimes—elapse without the creeks running." In another letter he says:—"Here is another puzzle: Castle Hill is the eminence overlooking Townsville—a mountain, we call it. During the wet season many little streams run down its sides, forming here and there small pools, which, however, are dry for nine or ten months of the year—sometimes for several years together. But when these pools have only been filled a few days small fish appear, which grow rapidly for the few weeks the water remains. Some years ago a man took up land over the range, but there was no water on it, nor any creek or river within miles. A dam was made, but as no rain fell for more than two years, this remained dry. One night a thunderstorm—a very local one—broke over the place and filled the dam. In a few days many fish were noticed in the bywash of the dam. This is vouched for by a most observant naturalist friend—a member of the literary staff of the local *Bulletin*.

"In the waterlily pool I caught, the other day, eight distinct varieties of fish, and noticed three, if not four sorts which

disdained to bite. Amongst those caught were eels 4 ft. long and quite 3 in. in circumference, and Garfish as large as and very like the saltwater variety—excellent eating, save for the many bones, and having mouths armed with sharp teeth. Another species is known locally as the Jew Fish; it has a smooth skin, and is armed at each side with sharp spines, while several flabby appendages hang from its lips. It is good eating, though repulsive to look at. There is a Cat Fish here; also a pretty little fish of light silvery colour, much like the English herring. Some of the many smaller species are beautifully barred and striped with colours—one resembling very much the 'Cowfish' so common in Westernport Bay, but less in size, and not so robust. The 'Bony Bream' (one of the Clupeidæ) well earns its name—it is so full of bones that it is almost impossible to pick them out. It is certainly not the food a hungry man would choose. Altogether there are some fifteen different sorts in the pool. Tortoises are here, and shrimps, and water-beetles great and small. There are many small molluscs, too, on the water weeds which grow so thickly." In the Ross River, of which the stream spoken of is an affluent, crocodiles sometimes appear, concerning which Mr. C. writes:—"There was a great outcry here the other day, when it was reported that an alligator had scared a man nearly into fits over by the Ross. Some of Townsville's crack shots sallied out to deal destruction to this monster of a few feet in length. They report having bombarded him thoroughly, but forgot to bring his body home." On a subsequent occasion my friend had a close view of one. Whilst near the mouth of Armidale Creek he and his wife "saw an immense alligator, which was fully 16 ft. long, and as it swam across the creek several times and in a very leisurely manner we had ample time to note its ugliness. I had my rifle, but the alligator would not remain quiet long enough for me to get a sure shot." Armidale Creek is described as a paradise for collectors. There are big snakes, alligators, kangaroos, wallaroos, wallabies, birds and insects galore, and plentiful material for the botanist too. But the whole district seems rich in "specimens." On the ranges towards Mount Elliot (separated from Townsville by "miles of untrodden fastnesses") adiantums were found amongst the grass with fronds quite five feet high; and on a mountain between the heads of the Bluewater Creek and Black River (ascended last May) "the heads of splendid specimens of the Hoop Pine, *Araucaria Cunninghami*, rose high above the surrounding timber in a spot where the gully became precipitous." As the party mounted upwards, on this trip, ferns and orchids (chiefly Dendrobiums) became more plentiful, the ferns much battered by the torrent which during the recent rainy season poured down the mountain side. The summit was reached after "a scramble over moss and lichen-

covered rocks and rotten logs, and through a perfect maze of vines and creepers which twined round one's legs and became twisted round one's neck in an unpleasantly suggestive manner. Here every rock and stump carried its crown of ferns and orchids, whilst nearly every tree sustained a load of Bird's Nest and Stag-horn ferns, some of the former being of gigantic proportions." Time was too brief and other circumstances did not favour collecting. Believing the peak to be unnamed, the travellers called it "Mount Langton," in honour of a member of the party who was certainly the first lady to reach the summit.

The ascent of Mount Langton is the last expedition of which I have any record, and my supply of notes from Townsville district has (I trust temporarily) ceased.

THE LATE HON. DR. DOBSON, F.L.S.

We regret to have to record the death, on Saturday, 1st June, of the Hon. Dr. Dobson, M.L.C., for many years a member of the Field Naturalists' Club of Victoria. Having a natural taste for botany, the hon. gentleman became a member of the Club in 1881, and succeeded Prof. M'Coy as president for the year 1883-4. Though a frequent attendant at the earlier meetings of the Club, he was the author of only one paper, entitled "Some Remarks on the Term 'Fruit,'" read in April, 1886 (*Victorian Naturalist*, iii., page 1). He also took part in several excursions where botany formed the chief object of research. In his presidential address, delivered at the Royal Society's Hall, at the fourth *conversazione* of the Club, on 30th April, 1884, and which appeared in the first volume of the Club's journal, he advocated the publication of a Victorian Botany for students, on the plan of the Rev. W. W. Spicer's "Handbook to the Plants of Tasmania," which was drawn up as a dichotomous key. The suggestion was taken up by the Club, and at the instance of the Government of the day, urged by Dr. Dobson, as a member of the Legislative Council, Baron von Mueller (the Government Botanist) was instructed to carry out the work, which it is needless to say was done with that thoroughness which characterizes all his work, and resulted in the publication of the "Key to the System of Victorian Plants," a much more elaborate work than we venture to think Dr. Dobson had in his mind when throwing out the suggestion. The learned doctor's services were always at the disposal of the Club when it was desired to approach any of the Government departments on such questions as the extension of the protection of native birds, the reservation of Wilson's Promontory as a national park, &c., while his position for many years as a trustee of the Public Library, National Museum, &c., enabled him to assist in the advancement of natural science by those institutions.

THE GANNETS OF MALDEN ISLAND.

In placing these few incomplete notes on the Gannets which frequent Malden Island before the members of the Club, I have not thought it necessary to enter into any description of the island itself, as those who desire to know more about it may find a description of it in a previous number of the Club's journal (*Victorian Naturalist*, vi., p. 123). Through the kindness and energy of my cousin, Mr. John M'Cullough, who holds the position of field overseer on Malden, I am enabled to exhibit to-night the eggs of the three species of Gannets which resort there for the purpose of nidification, viz.:—Masked Gannet, *Sula cyanops*, Brown Gannet, *S. fiber*, Red-legged Gannet, *S. piscator*. As far as I am aware, the egg of the latter has not been previously exhibited here, and for that reason I have shown the eggs of the whole four species which inhabit Australia, for purposes of comparison by those who care to do so.

The egg of the Red-legged Gannet is the smallest of the four species, is of a dirty white colour, and in size and shape closely resembles an ordinary hen's egg—measuring roughly $2\frac{3}{8}$ in. in length by $1\frac{7}{8}$ in. in breadth. The shell is slightly rough, but is smoother than any of the other three. The nest consists of twigs or stems of hibiscus, built just high enough to be clear of the water in the lagoon at high tide, and situated on a ledge of rock or coral. Eggs have been taken as early as 18th August, and as late as the end of November, but I have not yet ascertained definitely whether the birds raise more than one brood in the year. Their period of incubation is 45 days, in the instance which I have caused to be observed the egg being laid on the 17th November and the young bird hatched out on the 31st December; and as eggs are laid in the middle of August, it gives ample time for this to be a second brood.

Of the habits of the Masked and Brown Gannets I have not obtained so full particulars. The former builds a rude nest composed of a few twigs of pig's face weed laid around a slight depression in the guano, and raises very decided objections to her eggs, of which she sometimes lays three in a clutch, forming a subject of examination by the naturalist, whose wily endearments and suspicious approach she vigorously resents. The eggs in my possession were taken on the 18th August. The Brown Gannet usually lays two eggs, making no further attempt at nest building than the scraping of a slight depression in the guano.

I hope to be able at some future date to add to these notes further particulars as to the habits of these and other birds which constitute very nearly the entire fauna of Malden Island.

My cousin has furnished me with a few extracts from his diary relating to his feathered friends, which I shall anticipate his permission to read, but I cannot, of course, publish them.—R. S. Sugars.

A CATALOGUE OF VICTORIAN HETEROCERA.

By Oswald B. Lower, F.E.S.

Part XV.

PYRALIDINA *(continued).*

MARASMIA. Ld.

SYNGAMIA. Gn.

AGATHODES. Gn.

DIATHRAUSTA. Ld.

DIASEMIA. Gn.

*460. D. RAMBURIALIS, Dup. (Gn., 334; Z., Caff., 30; *Isopteryx melalencalis*, Walk., 402; *Diasemia reconditalis*, *ib.*, Supp., 1,325; *D. leucophœalis*, *ib.*, Supp., 1,326; *Lineodes leodocusalis*, Walk., 947).

Melbourne.

ISCHNURGES. Ld.

*461. I. ILLUSTRALIS Ld. (418, pl. xv., 12; *Nesolocha autolitha*, Meyr., Tr. Ent. Soc. Lond., 240, 1886).

Melbourne.

PESSOCOSMA. Meyr.

*462. P. IOLEALIS, Walk. (*Lepyrodes iolealis*, Walk., 466; *Pessocosma iolealis*, Meyr., Tr. Ent. Soc. Lond., 301, 1884).

Kewell.

BÆTARCHA. Meyr.

ARCHERNIS. Meyr.

ZINCKENIA. Zeller.

463. Z. RECURVALIS, F. (*Phalœna recurvalis*, F., E. S., 407; Z., Caff., 55; Gn., 225; *P. angustalis*, F., Mant., 309; *P. fascialis*, Stoll., pl. xxxvi., 13; *Hydrocampa albifascialis*, Bdv., Mad., 119, pl. xvi., i.; *Zinckenia recurvalis*, Meyr., Tr. Ent. Soc. Lond., 308, 1884).

Melbourne, Sandhurst, Gisborne.

*464. Z. PERSPECTALIS, Hb. (*Pyralis perspectalis*, Hb., Exot., 101; Gn., 226; *Zinckenia primordialis*, Zeller, Caff., 56; *Spoladea exportalis*, Gn., 227; *Zinckenia perspectalis*, Meyr., Tr. Ent. Soc. Lond., 309, 1884).

Springvale, Melbourne.

SEMIOCEROS. Meyr.

*465. S. MURCALIS, Walk. (*Nacoleia murcalis* (*murcusalis*), Walk., 935; *Isopteryx sordidalis*, *ib.*, Supp., 1,317; *Botys hypsidesalis*, *ib.*, 1,006; *Semioceros murcalis*, Meyr., Tr. Ent. Soc. Lond., 319, 1884).

Gisborne, Ararat, Sandringham.

PROTERINA. Meyr.
CERATOCLASIS. Ld.
EREBANGELA. Meyr.
STREPSIMELA. Meyr.
ŒDIODES. Gn.
TETRACONA. Meyr.
AGROTERA. Schrk.
NOSOPHORA. Ld.
PELECYNTIS. Meyr.
COMPSOPHILA. Meyr.
PYNCARMON. Ld.
NOTARCHA. Meyr.

*466. N. CLYTALIS, Walk. (*Astura clytalis* (*clytusalis*), Walk., 550; *Botys clytialis*, Ld., pl. x., 16; *Notarcha clytalis*, Meyr., Tr. Ent. Soc. Lond., 312, 1884).
Melbourne.

APHYTOCEROS. Meyr.
CONOGETHES. Meyr.
MOLYBDANTHA Meyr.
STEREOCOPA. Meyr.
PACHYZANCLA. Meyr.
BOTYODES. Gn.
PTERIGISUS. Butl.
HELLULA. Gn.

467. H. UNDALIS, Fab. (*Phalæna undalis*, Fab., E. S., 362; Gn., 416; *Hellula hydralis*, Gn., 416; *Scopula criasusalis*, Walk., 1,016; *Scoparia optatusalis*, *ib.*, 1,018; *Pyralis subtrigonalis*, *ib.*, 1,244; *Leucochroma phidilealis*, Walk., 972; *Leucinodes exemptalis*, *ib.*, Supp., 1,313).
Gisborne, Melbourne, &c.

DYSALLACTA. Ld.

ATELOCENTRA. Meyr.

468. A. CLORASPIS, Meyr. (Tr. Ent. Soc. Lond., 323, 1884).
Fernshaw.

ISOCENTRIS. Meyr.

BOTYS. Tr.

*469. B. PHÆOPTERALIS, Gn., 340 (*B. otreusalis*, Walk., 637 ; *B. triarialis*, *ib.*, 639 ; *B. nelsalis*, *ib.*, 643 ; *B. abstrusalis*, *ib.*, 663 ; *B. pharaxalis*, *ib.*, 725; *B. immundalis*, *ib.*, Supp., 1,448 ; *B. licarsisalis*, *ib.*, 686).
Melbourne.

GODARA. Walk.

HYALOBATHRA. Meyr.

SCOPULA. Sck.

*470. S. DICEALIS, Walk. (792 ; Meyr., Tr. Ent. Soc. Lond., 325, 1884).
Melbourne, Gisborne.

MECYNA. Gn. (*nec* Steph).

471. M. POLYGONALIS, Hb. (*Mecyna ornithapteralis*, Gn., 411).
Melbourne, Gisborne, Fernshaw.

*472. M. GAVISALIS, Walk. (*Ebulea gavisalis*, Walk., Char. Und. Lep., 73, 1869 ; *Mecyna rhodochrysa*, Meyr., Tr. Ent. Soc. Lond., 447, 1885).

NOMOPHILA. Hb.

473. N. NOCTUELLA, Schiff. (*Stenopteryx hybridalis*, Hb. ; *Scoparia itysalis*, Walk., 828).
Gisborne, &c.

MYRIOTIS. Meyr.

MIRESICTENA. Meyr.

MYRIOSTEPHES.

*474. M. MATURA, Meyr. (Tr. Ent. Soc. Lond., 328, 1884).
Melbourne.

DEUTERARCHA. Meyr.

*475. D. XANTHOMELA, Meyr. (*loc. cit.*, 313, 1884).
Brighton.

METALLARCHA. Meyr.

*476. M. DIPLOCHRYSA, Meyr. (*loc. cit.*, 332, 1884).
Grampians.

PROTERÆCA. Meyr.

EURYCREON. Ld.

*477. E. FAMILIARIS, Meyr. (*loc. cit.*, 336, 1884).
Gisborne, Melbourne.

*478. E. CAPNOCHROA, Meyr. (*loc cit.*, 338, 1884).
Melbourne, &c.

*479. E. MASSALIS, Walk. (*Scopula massalis*, Walk., 792 ; *Dosara celatalis*, *ib.*, 829 ; *Eurycreon massalis*, Meyr., Tr. Ent. Soc. Lond., 338, 1884).
Moonee Ponds.

*480. E. APHRARCHA, Meyr. (*loc. cit.*, 239, 1887).
Caulfield, Melbourne.

Meyrick has recently merged his genus Eurycreon into Metasia (Gn.) I adopt the latter name.

CRIOPHTHONA. Meyr.

*481. C. FINITIMA, Meyr. (*loc. cit.*, 340, 1884).
Melbourne.

SEDENIA. Gn.

482. S. RUPALIS, Gn. (*Sedenia rupalis*, Gn., 250).
Melbourne, &c.

483. S. CERVALIS, Gn. (*Sedenia cervalis*, Gn., 250, pl. iii., 3; Ld., pl. viii., 4; *Scopula itonusalis*, Walk., 794; *S. pictoralis*, *ib.*, 1,016).
Wimmera, Gisborne, Caulfield.

TRITÆA. Meyr.

484. T. USTALIS, Walk. (*Scopula ustalis*, Walk., Supp., 1,477; *S. turbidalis*, *ib.*, Supp., 1,477; *Botys affinitalis*, Ld., 475, pl. xii., 4; *Nymphula sordida*, Butl., Tr. Ent. Soc. Lond., 432, 1886; *Tritæa ustalis*, Meyr., *loc. cit.*, 342, 1884.)
Melbourne, Gisborne, &c.

FAMILY—SCOPARIADÆ.

ECLIPSIODES. Meyr.

*485. E. CRYPSIXANTHA, Meyr. (Trans. Ent. Soc. Lond., 343, 1884).
Fernshaw.

486. E. DROSERA, Meyr. (*loc. cit.*, 245, 1887).
Melbourne, Gisborne, Windsor, Toorak.

NYCTARCHA. Meyr.

*487. N. PERSUMPTANA, Walk. (*Orosana presumptana*, Walk., Tortricina, 459; *Nyctarcha persumptana*, Meyr., Trans. Ent. Soc. Lond., 344, 1884).
Healesville.

SCOPARIA. Hw.

488. S. EXHIBITALIS, Walk. (*Scoparia exhibitalis*, Walk., 1,500).
Melbourne.

489. S. OXYGONA, Meyr. (MSS.)
Gisborne.

490. S. CLEODORALIS, Walk. (*Scopula cleodoralis*, Walk., 793; *Scoparia cleodoralis*, Meyr., Tr. Ent. Soc. Lond., 348, 1884).
Mount Macedon.

THE

Victorian Naturalist.

VOL. XII.—No. 3. JUNE, 1895. No. 139.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE fifteenth annual meeting of the Club was held in the Royal Society's Hall on Monday evening, 10th June, 1895. The president, Mr. H. T. Tisdall, F.L.S., occupied the chair, and some 70 members and visitors were present.

REPORT.

A report of the dredging excursion in the Bay, on 24th May, was received from the leader, Mr. J. Gabriel, F.L.S. The steamer *Firefly* and the yacht *Starlight* were kindly placed at the disposal of the Club by their respective owners, Mr. E. F. Cooke and Mr. C. J. Cottell, the former being in charge of Mr. Gabriel and the latter of Mr. J. Shephard. Excellent results were obtained off Beaumaris and towards Rickards Point. The dredges and grapnels brought up many molluscs, diatoms, foraminifera, and sponges. Tow nets were also used for securing some interesting medusoid forms. A valuable report by Mr. G. B. Pritchard on the shells obtained was appended.

On the motion of Mr. Gabriel, seconded by Professor Spencer, it was decided to send the thanks of the Club to Messrs. Cooke and Cottell for their repeated kindness in placing their boats at the disposal of the Club.

ANNUAL REPORT.

The hon. secretary (Mr. H. P. C. Ashworth) then read the fifteenth annual report, 1894–95, which was as follows :—

"To the Members of the Field Naturalists' Club of Victoria. Ladies and Gentlemen,—Your committee have much pleasure in presenting to you the fifteenth annual report of the Club's work, being for the period ending 30th April, 1895.

"It is a matter of regret that the accessions to our ranks during the past year have not been sufficient to compensate for the large number removed from the roll, chiefly on account of non-payment of subscriptions. Twenty-one new members have been elected, and the membership may at the present time be reckoned at about 180, including life and honorary members.

"Your Committee would urge the members to use their best endeavours to induce any friends interested in natural history to join the Club, bearing in mind that an extension of our membership will enable us to enlarge the sphere of our actions in many directions from which we are at present debarred for want of funds.

"Sixteen papers were read during the year, of which six were zoological and two botanical, while four dealt with general subjects and four with trips and excursions. Several new contributors have come forward, and the success attending their efforts will, we hope, encourage others to follow their example. This number shows a falling off as compared with previous years, but we trust renewed activity will be shown in this direction, and also that a more hearty response will be made to the invitation to bring forward natural history notes.

"The attendance of members at the ordinary meetings has been very satisfactory, the average attendance being about seventy. Members are reminded that they enjoy the privilege of introducing a visitor at each meeting. This might be more freely used to the advantage of all. The exhibits at the monthly meetings have been unusually good, and the thanks of the Club are due to those members who have taken the trouble to thus interest and instruct their fellow-workers.

"The excursions have, on the whole, been well attended. Your committee would point out, to new members especially, the value of attending these excursions, and thus gaining the benefit of the experience of older members in practical field work. No extended Club excursion was held, but among those undertaken by individual members may be mentioned those to Central Australia by Professor Spencer, and to Albatross Island by Messrs. Ashworth and Le Souëf. The descriptions of both of these trips were illustrated by limelight views prepared from photographs taken by the members mentioned.

"The meetings for practical work have been continued and supported with unabated interest. They have been devoted mostly to microscopic work, but a few evenings were usefully spent in imparting instruction in taxidermy, a departure which was much appreciated, and was noted by an English journal as an example for similar societies in the old country. The course in structural botany was completed early in the year, and it is hoped that a course in systematic botany will be carried out during the ensuing spring.

"The eleventh conversazione of the Club was held at the Athenæum Hall on 14th and 15th June, 1894, and, notwithstanding the inclement weather prevailing, was a pronounced success. The experiment of holding it on two evenings and the intervening afternoon was greatly appreciated, and by making a charge for admission to the general public the expense was considerably reduced. The display of natural history specimens in the body of the main hall was one of the best yet brought together, special mention being due to the microscopic section. The conversazione was opened by Sir F. M'Coy, ably supported by Baron von Mueller, and during its currency lecturettes were delivered

by Messrs. C. A. Topp, F.L.S., A. J. Campbell, F.L.S., and Rev. W. Fielder. In former years the work of the conversazione has fallen principally to a few members, but on this occasion a much larger number shared in the work, and deserve the thanks of the Club for so doing.

"The event of the year for Australian naturalists was the despatch of a scientific expedition to Central Australia by Mr. W. A. Horn, M.L.C., of South Australia. Two members of the Club, Professor W. Baldwin Spencer and Mr. G. A. Keartland, were selected to accompany it, and the valuable results obtained in the zoological section have been due in no small measure to their exertions. The results are to be recorded in a volume to be published shortly, so that we were precluded from publishing in our journal the descriptions of their experiences, which were so graphically presented to the Club.

"We are glad to be able to congratulate members on the improved state of the finances. The receipts for the year amounted to £168 7s. 11d., and the expenditure to £178 14s. 6d., leaving a credit balance of £16 7s. 1d. This balance is somewhat less than that carried forward last year, but it will be seen that £23 2s. 6d. has been paid off the account for printing the *Naturalist*, owing from previous years. The receipt of a dividend from the Metropolitan Bank reduces the amount at present locked up in that institution to £53 2s. 8d. As this amount is not at present available, it has not been taken into account in the balance-sheet. The only liability existing is about £46 for printing the *Naturalist*, which, however, is more than covered by arrears of subscriptions, which we trust will be received at an early date.

"The eleventh volume of the Club's journal, the *Victorian Naturalist*, has been completed, and the thanks of members are due to Mr. F. G. A. Barnard for continuing to act as editor. Among other useful contributions, the "Catalogue of Victorian Moths" has been continued. A noteworthy feature has been the increase in the number of illustrations presented, for which we have to express our thanks to Messrs. Anderson, Ashworth, Le Souëf, and Stickland. The journal is now sent free or in exchange to 44 libraries, societies, &c., in all parts of the world, and also to the leading natural history periodicals. This circulation, coupled with the fact that it is the only monthly natural history magazine published in Australasia, should induce persons desirous of publishing their observations in natural science to become members of the Club. During the year the library has received numerous donations from various scientific societies, &c., and in order to make the publications easily accessible it was found necessary to purchase a third bookcase.

"In conclusion, your committee would once more urge their

fellow members not to relax their efforts towards making membership of this Club of real value to all who may join its ranks.

"Signed, on behalf of the committee,

"HENRY THOS. TISDALL, *Chairman.*
"H. P. C. ASHWORTH, *Hon. Sec.*

"10*th June*, 1895."

FINANCIAL STATEMENT.

The hon. treasurer, Mr. C. Frost, F.L.S., then read the financial statement for 1894-95, which, condensed, was as follows:—

RECEIPTS.

To Balance, 30th April, 1894							£26	13 8
,, Subscriptions			£113	15	6			
,, *Victorian Naturalist*—								
Subscriptions and Sales	£9	16	0					
Advertisements ...	7	10	0					
Sundries... ...	8	13	6					
				25	19	6		
,, Conversazione—								
Donation ...	1	0	0					
Sale of Tickets ...	16	18	6					
				17	18	6		
,, Donations, Juvenile Prize Fund ...				1	5	0		
,, Dividend Metropolitan Bank				9	9	5		
							168	7 11
							£195	1 7

EXPENDITURE.

By *Victorian Naturalist*—								
Printing, on account 1892-4	£23	2	6					
,, 1894-5 ...	71	14	0					
				£94	16	6		
,, Rooms—Rent and Attendance... ...				15	19	6		
,, Library—								
Bookcase	3	0	0					
Periodicals... ...	9	15	0					
Binding, &c. ...	3	13	6					
				16	8	6		
,, Conversazione—								
Rent of Hall ...	12	0	0					
Printing, Advertising, &c.	12	9	6					
				24	9	6		
,, Prizes, Juvenile Competition				1	11	0		
,, Postages, Stationery, &c.				18	10	0		
,, Printing				5	1	6		
,, Collector's Commission				1	18	0		
							£178	14 6
,, Balance							16	7 1
							£195	1 7

C. FROST, *Hon. Treasurer.*
1*st June*, 1895.

Audited and found correct.

H. R. HOGG, } *Auditors.*
D. BEST, }

MELBOURNE, 7*th June*, 1895.

On the motion of Mr. C. French, F.L.S., seconded by Mr. F. Wisewould, the report and financial statement were received and adopted.

OFFICE-BEARERS FOR 1895–96.

The following office-bearers for 1895–96 were declared duly elected, being the only nominations received :—President, Professor W. Baldwin Spencer, M.A.; vice-presidents, Mr. C. French, F.L.S., and Mr. J. Shephard; hon. librarian, Mr. O. A. Sayce; hon. treasurer, Mr. C. Frost, F.L.S.; and hon. secretary, Mr. H. P. C. Ashworth.

A ballot for five members of committee resulted in the election of Messrs. D. Best, J. Gabriel, F.L.S., T. S. Hall, M.A., F. Wisewould, and Dr. W. Macgillivray.

A vote of thanks to the retiring office-bearers was carried with acclamation. The retiring president, Mr. H. T. Tisdall, F.L.S., then delivered a short address, after which he vacated the chair in favour of Professor Spencer, the newly elected president.

PAPERS.

1. By Mr. C. French, jun., entitled "Observations on the Flowering Times and Localities of Victorian Orchids."

As the result of observations extending over nine years, the author was enabled to compile a list comprising 72 out of the 90 species of Victorian orchids, which should be of great value to the many members interested in these beautiful flowers.

2. By Mr. R. J. Fletcher, entitled "Notes on a Recent Visit to Some Basalt Caves near Skipton."

These caves, situated on the side of Mt. Widderin, contain a large deposit of guano of some commercial value, said to have been produced by bats. A list of the different minerals and deposits was given and samples exhibited on the table.

In the discussion which followed, Mr. T. S. Hall, M.A., referred to the importance of a thorough exploration of these and similar caves for the bones of extinct animals. As to the formation of caves in basalt, he thought they were accounted for by the liquid larva flowing away after the crust had hardened.

NATURAL HISTORY NOTES.

Mr. G. E. Shepherd, of Somerville, contributed a note on the occurrence of a variety of the White-backed Magpie in that district, distinguished by the possession of a black band or saddle across the back. The Black-backed Magpie is never found in the district, and is a much smaller bird.

Mr. D. M'Alpine read a note on a specimen of the edible mushroom, *Agaricus campestris*, with a second smaller inverted pileus on the top. This curious double development of gills, as in the specimen shown, has so far as known not been previously recorded.

Mr. C. Frost, F.L.S., drew attention to the fact that the migratory spiders may now be observed on every point of vantage, letting out their threads and drawing them in again until a ball of web is formed, on which the spider floats away. The spiders which have the migratory instinct at this time of the year mostly belong to the genus Lycosa.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening:—By Mr. A. Coles.—Specimens of White-backed Crow-Shrike, *Gymnorhina leuconota*, and three specimens of variety with black saddle on back. By Mr. F. J. Ellemor.—Pair of New Holland Honeyeaters, *Meliornis Novæ-Hollandiæ*; pair of Lunulated Honeyeaters, *Melithreptus lunulatus*, and pair of Warty-faced Honeyeaters, *Meliphraga phrygia*. By Mr. C. French, F.L.S.—New and rare beetles from the Congo: Cetonidæ—Goliathus, viz., *Chœlorhina Savagei*, *Megalorhina Harrisi*, *Mephista Bertolonii*, *Cœlorhina ruficeps*, *Astenorhina Turneri*, *Eccoptocemis superba*, *E. Thoreyi*, *E. relucens*, *Taurina nereus*. By Mr. C. French, jun.—Eggs of *Ephthianura tricolor* from Central Australia, *E. aurifrons* and *E. albifrons* from Victoria; also, egg of *Acanthiza magna* from Tasmania. By Mr. J. C. Mitchell.—Minerals, comprising Limonite, composed of hydrous sesquioxide of iron, from Broken Hill (this specimen is a pseudomorph, or "false crystal," after siderite crystals); Pyrolusite, composed of manganese dioxide, from Gordons, South Australia; also, Metallic Aluminium, not found in a metallic state in nature, extracted from clay by aid of electricity in Switzerland, Europe. By Mr. G. J. Page.—Two malformed Primrose flowers; slides of Foraminifera and Diatoms from dredging excursion. By Rev. W. Fielder.—Lizard, *Hinulia Quoyii*, with two tails.

After the usual conversazione the meeting terminated.

Microscopical Test Rulings.—The following extract from a report by Mr. E. M. Nelson, F.R.M.S., on some micro. rulings forwarded by Mr. H. J. Grayson is taken from the *Journal of the Royal Microscopical Society* for February last. Mr. Nelson says:—"The ruling seems to be very perfect, and inequalities in spacing, often seen in Noberts's plates, could not be detected. The tenth band on the closer ruled plate was resolved. Another similar plate was too faintly ruled for resolution in the higher bands. Both the closer ruled plates were, of course, completely resolved, but one was stronger than the other. I think the lines might be cut deeper with advantage. The very faintly cut plates are not of much use for microscopical purposes; even the coarse bands are too faint for micrometrical work."

OBSERVATIONS ON THE FLOWERING TIMES AND HABITATS OF SOME VICTORIAN ORCHIDS.

By C. French, jun.

(Read before Field Naturalists' Club of Victoria, 10th June, 1895.)

As many members of the Field Naturalists' Club have from time to time asked for information regarding the flowering times and localities of Victorian orchids, I desire to submit a list of my observations, extending over nine years, in the hope that they may be of some use to lovers of these interesting plants.

The flowering time of our native orchids varies but very slightly, according to the seasons. My father, in volumes i.–iv., 1884–88, of the *Victorian Naturalist*, described the Victorian Orchideæ then recorded, with the best modes of cultivating them, and although he gave many localities, as well as the flowering times, since then our knowledge in these respects has been considerably extended. I desire to express my thanks to Baron von Mueller for his kindness in naming the specimens, and for other information afforded me.

This list comprises about 72 species, the total number of species of orchids found in Victoria, according to Baron von Mueller's "Census of Australian Plants," being about 90. It is hoped, therefore, that other members of the Club will, at some future time, make the list complete by recording their observations as to localities and times of flowering of the few remaining species.

To avoid too much repetition I give first a systematic list with habitats, using such obvious contractions in the names of places as Chelt. for Cheltenham, Oak. for Oakleigh, Dand. for Dandenong, Sand. for Sandringham, H'ville for Healesville, And. Ck. for Anderson's Creek, &c., and then a monthly calendar of the flowering time of each species, alphabetically arranged according to the genus.

ORCHID.	LOCALITIES.
SARCOCHILUS	
parviflorus, Lindley	Yarragon, Dandenong Ranges
DIPODIUM	
punctatum, R. Br.	Box Hill, Croydon, Healesville, Anderson's Creek, Greensborough
GASTRODIA	
sesamoides, R. Br.	Box Hill, Croydon, H'ville, And. Ck., Dand. Ck., Moondara
SPIRANTHES	
Australis, Lindley	Cheltenham, Frankston
THELYMITRA	
ixioides, Swartz ...	Box Hill, Croydon, Oak., Dand. Ck.
epipactoides, F. v. M.	Sandringham, Cheltenham
aristata, Lindley ...	Sand., Chelt., Box Hill, Croyd., Werr.

THELYMITRA—*continued.*	
longifolia, Forster	Werr., Box Hill, Spg. Vale, Dand. Ck.
carnea, R. Br. ...	Box Hill, Blackburn, Croyd., Spg. Vale
flexuosa, Endlicher	Spring Vale, Croydon
antennifera, Hooker	Sandringham, Cheltenham
Macmillani, F. v. M	Oakleigh, Castlemaine, Bendigo
DIURIS	
punctata, Smith ...	Dandenong Ck., Spring Vale, Berwick
maculata, Smith ...	Sand., Chelt., Box Hill, Berwick
pedunculata, R. Br.	Sand., Chelt., Spring Vale, Dand. Ck.
sulphurea, R. Br....	Albert Pk., Sand., Chelt., Frank., Berwick
longifolia, R. Br. ...	Sand., Chelt., Oakleigh
alba, R. Br. ...	Box Hill, Upper Murray
ORTHOCERAS	
strictum, R. Br. ...	Sandringham, Cheltenham
strictum (var.) ...	Sandringham, Cheltenham
CALOCHILUS	
Robertsoni, Bentham	Oak., Spg. Vale, Berwick, Moe, Croyd., Upper Murray
CRYPTOSTYLIS	
longifolia, R. Br. ...	Sand., Mord., Oak., Lilydale, H'berg, Greensborough
leptochila, F. v. M	Dandenong Ranges, Mt. Mueller
PRASOPHYLLUM	
Australe, R. Br. ...	Healesville, Moondara
elatum, R. Br. ...	Sandringham, Cheltenham
patens, R. Br. ...	Werribee, Sand., Chelt., Dand. Creek
fuscum, R. Br. ...	Werribee, Dandenong Creek
nigricans, R. Br. ...	Sand., Chelt., Croydon
despectans, Hooker	Box Hill, Frankston
alpinum, R. Br. ...	Mt. Mueller, Mt. Hotham
Archeri, J. Hooker	Oakleigh, Frankston, Croydon
intricatum, C. Stuart	Frankston
Frenchii, F. v. M.	Spring Vale, Dandenong Creek
Dixoni, F. v. M. ...	Oakleigh
MICROTIS	
porrifolia, R. Br. ...	Studley Pk., Albert Pk., Sand., Chelt., Box Hill, B'field, Werribee, &c.
atrata, Lindley ...	Cheltenham, Oakleigh
CORYSANTHES	
pruinosa, Cun'gham	Sand., Chelt., Mordialloc
unguiculata, R. Br.	Oakleigh
PTEROSTYLIS	
concinna, R. Br. ...	Sand., Chelt., Carrum, Frank., Oak., Queenscliff, &c.
curta, R. Br. ...	Sand., Chelt., Oak., Dand. Ck., B'field, Box Hill
acuminata, R. Br.	Sand., Oakleigh

PTEROSTYLIS—*continued.*	
nutans, R. Br. ...	Sand., Mord., Oak., Dand. Ck., Drouin, Moe, Lilydale
pedunculata, R. Br.	Sand., Chelt., Dand. Ck.
nana, R. Br. ...	Sandringham, Cheltenham
cucullata, R. Br. ...	Sand., Chelt., Mord., Frank., Dand. Ck., Beaconsfield
cucullata, var. alpina	Dandenong Ranges
præcox, Lindley ...	Cheltenham
obtusa, R. Br. ...	Anderson's Creek (Warrandyte)
parviflora, R. Br. ...	Sand., Chelt., Oakleigh
barbata, Lindley ...	Sandringham, Cheltenham
mutica, R. Br. ...	Dunolly, Upper Murray
rufa, v. Mitchelli, R. Br.	Anderson's Ck., Pine Mt. (Up. Murray)
longifolia, R. Br. ...	Sand., Oak., Dand. Ck., Berwick, Box Hill, Croydon
vittata, Lindley ...	Sandringham
aphylla, Lindley ...	Sand., Chelt., Oakleigh
grandiflora, R. Br.	Cheltenham
pedaloglossa, Fitzg.	Cheltenham, Sandringham, Oakleigh
Mackibbini, F. v. M.	Queenscliff
CALEYA	
major, R. Br. ...	Oakleigh, Spring Vale
ACIANTHUS	
exsertus, R. Br. ...	Sand., Chelt., Mord., Oak., Q'cliff
CYRTOSTYLIS	
reniformis, R. Br.	Sand., Chelt., Mord., Oak., Q'cliff
LYPERANTHUS	
nigricans, R. Br. ...	Sand., Chelt., Oakleigh
Burnettii, F. v. M.	Frankston, Oakleigh
ERIOCHILUS	
autumnalis, R. Br.	Sand., Oakleigh, Box Hill, Croydon, Lilydale, Healesville, &c.
fimbriatus, F. v. M.	Sandringham, Cheltenham
CALADENIA	
Menziesii, R. Br....	Sand., Chelt., Spring Vale
Patersoni, R. Br. ...	Sand., Frankston, Spring Vale, Q'cliff, Bendigo, Wodonga, &c.
latifolia, R. Br. ...	Sand., Chelt., Mordialloc
latifolia, v. alba, R. Br.	Sandringham
suaveolens, Reich.	Croydon, Upper Murray
carnea, R. Br. ...	Werr., Berwick, Pakenham, Dand. Ran., Anderson's Ck., Plenty River, &c.
cœrulea, R. Br. ...	Sandringham, Cheltenham
deformis (var.), R. Br.	Sandringham, Cheltenham
deformis, v. alba, R. Br.	Sandringham
Cairnsiana, F. v. M.	Healesville
testacea, R. Br. ...	Box Hill, Croydon

CHILOGLOTTIS
diphylla, R. Br. ... Oakleigh
Gunnii, Lindley ... B. Hill, Doncas., And. Ck., B'field, Werr. Gorge, Myrniong, Mt. Blackw'd, &c.

GLOSSODIA
major, R. Br. ... Sand., Chelt., Mord., Spg. Vale, Box Hill, &c.

CALENDAR OF FLOWERING TIMES.

JANUARY.—Cryptostylis leptochila, C. longifolia, Dipodium punctatum, Spiranthes Australis.

FEBRUARY.—Chiloglottis diphylla, Cryptostylis leptochila, C. longifolia, Dipodium punctatum, Prasophyllum alpinum, Spiranthes Australis.

MARCH.—Chiloglottis diphylla, Cryptostylis leptochila, Eriochilus autumnalis, Prasophyllum alpinum, Pterostylis grandiflora.

APRIL.—Eriochilus autumnalis, E. fimbriatus, Prasophyllum Archeri, P. despectans, P. Dixoni, Pterostylis acuminata, P. aphylla, P. curta, P. grandiflora, P. nana, P. obtusa, P. parviflora, P. pedaloglossa.

MAY.—Acianthus exsertus, Eriochilus autumnalis E. fimbriatus, Prasophyllum Archeri, P. Dixoni, P. intricatum, P. nigricans, Pterostylis acuminata, P. aphylla, P. curta, P. nutans, P. parviflora, P. pedaloglossa, P. præcox, P. vittata.

JUNE.—Acianthus exsertus, Corysanthes pruinosa, C. unguiculata, Cyrtostylis reniformis, Eriochilus fimbriatus, Prasophyllum Archeri, P. Dixoni, P. intricatum, P. nigricans, Pterostylis aphylla, P. barbata, P. concinna, P. curta, P. Mackibbini, P. nana, P. nutans, P. parviflora, P. pedaloglossa, P. præcox, P. vittata.

JULY.—Acianthus exsertus, Corysanthes pruinosa, C. unguiculata, Cyrtostylis reniformis, Lyperanthus Burnettii, Pterostylis barbata, P. concinna, P. curta, P. longifolia, P. Mackibbini, P. nana, P. nutans, P. pedunculata, P. præcox, P. vittata.

AUGUST.—Acianthus exsertus, Caladenia carnea, C. Patersoni, C. testacea, Caleya major, Calochilus Robertsoni, Corysanthes pruinosa, Cryptostylis longifolia, Cyrtostylis reniformis, Diuris longifolia, D. pedunculata, D. sulphurea, Lyperanthus Burnettii, Microtis porrifolia, Pterostylis barbata, P. concinna, P. cucullata, P. cucullata, var. alpina, P. curta, P. longifolia, P. nana, P. nutans, P. pedunculata, P. præcox, P. rufa, var. Mitchelli, P. vittata, Thelymitra Macmillani.

SEPTEMBER.—Caladenia carnea, C. cœrulea, C. latifolia, C. Patersoni, C. testacea, Caleya major, Calochilus Robertsoni, Cyrtostylis reniformis, Cryptostylis longifolia, Diuris longifolia, D. maculata, D. sulphurea, D. pedunculata, D. punctata, Glossodia major, Lyperanthus nigricans, Microtis

atrata, M. porrifolia, Prasophyllum elatum, P. Frenchii, P. patens, Pterostylis barbata, P. concinna, P. cucullata, P. curta, P. longifolia, P. mutica, P. nana, P. nutans, P. pedunculata, P. præcox, Thelymitra antennifera, T. aristata, T. carnea, T. epipactoides, T. flexuosa, T. longifolia, T. Macmillani.

OCTOBER.—Caladenia Cairnsiana, C. carnea, C. cœrulea, C. deformis, C. deformis, var. alba, C. latifolia, C. latifolia, var. alba, C. Menziesii, C. Patersoni, C. suaveolens, Calochilus Robertsoni, Chiloglottis Gunnii, Cryptostylis longifolia, Diuris alba, D. longifolia, D. maculata, D. pedunculata, D. punctata, D. sulphurea, Gastrodia sesamoides, Glossodia major, Lyperanthus nigricans, Microtis atrata, M. porrifolia, Prasophyllum Australe, P. elatum, P. Frenchii, P. fuscum, P. patens, Pterostylis barbata, P. concinna, P. cucullata, P. curta, P. longifolia, P. mutica, P. nana, P. nutans, P. pedunculata, P. rufa, var. Mitchelli, Thelymitra antennifera, T. aristata, T. carnea, T. epipactoides, T. flexuosa, T. ixioides, T. longifolia.

NOVEMBER.—Caladenia carnea, C. deformis, C. Menziesii, C. Patersoni, C. suaveolens, Caleya major, Calochilus Robertsoni, Chiloglottis Gunnii, Cryptostylis longifolia, Dipodium punctatum, Diuris longifolia, D. pedunculata, D. punctata, D. sulphurea, Gastrodia sesamoides, Glossodia major, Microtis atrata, M. porrifolia, Orthoceras strictum, O. strictum (var.), Prasophyllum Australe, P. fuscum, P. patens, Pterostylis cucullata, var. alpina, P. pedunculata, P. rufa, var. Mitchelli, Thelymitra antennifera, T. aristata, T. carnea, T. flexuosa, T. ixioides, T. longifolia, Sarcochilus parviflorus.

DECEMBER.—Caleya major, Calochilus Robertsoni, Chiloglottis Gunnii, Cryptostylis leptochila, C. longifolia, Dipodium punctatum, Gastrodia sesamoides, Microtis porrifolia, Orthoceras strictum, Prasophyllum Australe, Pterostylis cucullata, Sarcochilus parviflorus.

EGG-SHELLS OF ECHIDNA AND OTHER VERTEBRATES, by R. Neumeister ("Zeit. Biol.," 1894, 31, 413–420).—The egg-shells of *Echidna aculeata (E. hystrix)* consist of a keratin-like substance containing 5 per cent. of sulphur. It is, however, digested neither by gastric nor by pancreatic juice. Some other keratins are similarly resistant. In invertebrates the organic basis of egg-shells is chitin or some other skeletin. Keratin appears to be only present in the egg-shells and membranes of vertebrate animals. In the frog only has mucin been described. The eggs of some birds and reptiles are briefly referred to in this connection. Calcium carbonate is the principal inorganic constituent.—*Jour. Chem. Socy. Abs.*, 1895, lxviii., 54.

THE LATE D. SULLIVAN, F.L.S.

THE death of Mr. D. Sullivan, F.L.S., as mentioned in the last *Naturalist*, removes another of the comparatively small band of Victorian field botanists. Mr. Sullivan occupied the position of head master in the State school at Moyston, a village situated midway between Ararat and Mount William, the highest peak of the Grampians. Here, living in a district noted for the beauty and variety of its flora, and having previously done a little botanical work, he was encouraged by the Government Botanist, Baron von Mueller, K.C.M.G., to devote his spare time to working out the plants of the Serra and other ranges from Mount Sturgeon in the south to Mount Zero in the north; the result being that—having been elected a member of the Field Naturalists' Club in July, 1881—in August of that year he contributed "A Census of the Grampian Plants" to the proceedings of the Club, and which, enumerating about 600 species, was published in vol. ii. of the *Southern Science Record*—at the same time presenting a set of the dried specimens for the Club's herbarium. In December, 1883, he contributed a supplement to the census. In August, 1882, "The Droseraceæ of Victoria" was the subject of a paper from his pen, followed by "The Leguminosæ of Victoria," in October and November; these also appeared in the *Southern Science Record*. In February, 1884, he read a paper on "The Ranunculaceæ of Victoria" (*Victorian Naturalist*, i., 3); and in August and October, 1887, two papers on "The Mosses of Victoria," which were published in the *Victorian Naturalist*, iv., 7. Since which time he has not contributed to the proceedings of the Club, though continuing to take great interest in his favourite study. He was the means of adding many new habitats for Victorian plants, and was the discoverer of an orchid of the genus Caleya, at Hall's Gap, which Baron von Mueller named "Sullivani," after him; also a species of Calycothrix (Myrtaceæ), and many new mosses and other of the lower cryptogams. He was elected a Fellow of the Linnean Society (London) in 1885. Although he had not reached the age of 60 years, he was compulsorily retired by the Education Department in 1894, which seemed to greatly affect his health and spirits, and he passed away on 2nd June, after a few weeks' illness, deeply regretted by his family and the many friends made during a residence of about 27 years at Moyston.

PROFESSOR W. BALDWIN SPENCER, M.A., has been appointed a trustee of the Public Library, National Gallery, and Museum of Victoria, in place of the late Hon. Dr. Dobson, F.L.S.

VICTORIAN natural history is being further popularized by a series of illustrated articles in the *Australasian* from the pen of Mr. E. Anderson.

THE

Victorian Naturalist.

VOL. XII.—No. 4. JULY, 1895. No. 140

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary meeting of the Club was held at the Royal Society's Hall on Monday evening, 8th July, 1895. The president, Professor Baldwin Spencer, M.A., occupied the chair, and some 80 members and visitors were present.

REPORT.

A brief report of the excursion to Flemington Bridge, on Saturday, 22nd June, was received from Mr. T. S. Hall, M.A. The excursion was well attended, and was devoted mainly to an examination of the geological features of the railway cutting.

MEETING FOR PRACTICAL WORK.

The monthly meeting for practical work was held on Monday evening, 24th June, when Mr. J. Shephard gave a demonstration on the measurement of objects under the microscope. The different methods of executing measurements were described, and stress laid on the fact that the simplest, and the one needing the least apparatus—camera lucida and stage micrometer—gave good results. A simple method of constructing a camera lucida was shown. Afterwards those present practically carried out measurements of a number of microscopic objects with their own apparatus.

VISITOR.

Mr. A. H. S. Lucas, M.A., B.Sc., of Newington College, Sydney, formerly editor of the *Victorian Naturalist* for many years, was cordially welcomed by the chairman, and briefly responded.

PAPERS.

1. By Professor Baldwin Spencer, entitled "Notes on the British Museum."

The author's remarks referred to the natural history department of the Museum at South Kensington, and, opening with a brief history of the Museum, the rapid development of this fine institution, now the largest and most complete in the world, was described. A beautiful series of limelight views from photographs of the buildings and specimens gave a better idea than words could convey of the extent and variety of the collection. Not the least interesting were the groups of birds mounted in their natural surroundings—a department which might be considerably extended in our colonial museums.

2. By Mr. R. Hall, entitled "The Birds of the Box Hill District."

Records of the birds noted in this district for the past two years show a total number of 94 species, of which 75 were found breeding. The paper was illustrated by lantern slides from drawings of the birds described and photographs of their nests.

In the discussion which followed, Mr. J. Cox called attention to the tendency of young naturalists to shoot every bird they came across. His remarks were endorsed by the chairman, who urged that bird-life should be studied with as little indiscriminate destruction as possible.

A unanimous vote of thanks was accorded Mr. J. Searle for his kindness in showing the views illustrating the two papers read.

NATURAL HISTORY NOTES.

A note was contributed by Mr. T. S. Hart, M.A., giving additional localities of Victorian orchids and referring to 45 species.

Mr. R. S. Sugars read a newspaper cutting referring to the curious discovery in the Port Darwin district of an inscription on a baobab tree.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening :—By Mr. A. Coles.—Subcrested Honey-eater, *Ptilotis cassidix*, and Death Adder, from New Britain. By Rev. W. Fielder.—Glass-rope Sponge (Hyalonema), with parasitic Palythoa, from Japan. By Mr. C. French, F.L.S.—Butterflies—*Nyctalemon monoctus*, *Bindahara sugriva*, and *Ismene Doleschalli*, from Queensland; *Cerura Australis*, from New South Wales; and *Ornithoptera Urvilleana*, from New Ireland. By Mr. C. French, jun.—Eggs of the following birds, viz. :—Little Bittern, from Victoria; Australian Egret, from New South Wales; Northern Swamp Quail, Spotted Nightjar, White-shafted Ternlet, Double-barred Finch, Harlequin Bronzewing Pigeon, and Sordid Kingfisher, from North Queensland. By Mr. J. Gabriel.—Eggs of Spotted Bower Bird, *Chlamydodera maculata*. By Mr. A. E. Kitson.—Paper Nautilus, *Argonauta oryzata*, fish, ova, and shell, from Spring Creek, near Geelong. By Mr. A. H. S. Lucas, M.A.—Live lizards, from Sydney—*Gymnodactylus platyurus* and *Siaphos æqualis*; spirit specimens from New Zealand—*Naultinus elegans* (three varieties) and *Liolepisma grande*. By Mr. Jas. Mitchell.—Specimens of Opal and Silica, comprising Siliceous Sinter, Hydrated Opal, from Rotorua, New Zealand; Wood Opal, Hydrous Silica, from Snowy River, Gippsland; Silicified Wood Silica, from Queensland; Silicified Wood, from Ross River, Tasmania; and Brazilian Agate Silica, from Brazil, polished. By Mr. J. Shephard.—Ephra stage of Medusa. By Mr. G. E. Shepherd.—Owlet Nightjar, *Ægotheles Novæ-Hollandiæ*, Spotted Owl, *Ninox maculata*, and Southern Stone Plover, *Œdicnemus grallarius*.

After the usual conversazione the meeting terminated.

MARINE DREDGING EXCURSION.

THE large number of members of the Club who took part in the dredging excursion on Queen's Birthday (24th May, 1895) were favoured with beautiful weather, which, however, strange as it may seem, led to an alteration of their plans. The intention was to try the vicinity of Altona Bay, on the western side of Port Phillip Bay, the contingent from Williamstown in the steam yacht *Firefly* to meet the party from Brighton in the yacht *Starlight* about midway across the Bay and proceed in company to the scene of operations. However, the absence of wind prevented the *Starlight* from carrying out her share of the plan; consequently the *Firefly* had to steam right across to Brighton, when after a council of war it was determined to again work the eastern shore. Taking the yacht in tow, we headed for Beaumaris, and during the run down lunch was disposed of, so that on arrival off Rickard's Point about 1 p.m. all were ready for work.

During the run down several kinds of birds were noted. Off Brighton beach a large flock of Musk Ducks, *Biziura lobata*, attracted attention by their frantic efforts to get out of our reach. Numerous specimens of the Little Penguin, *Eudyptula minor*, were seen. These birds are not nearly so timid as the Musk Ducks; in fact, when fishing off the mouth of the Yarra I have frequently seen them within a few yards of the boat. Overhead two species of the ubiquitous shag were to be seen—*Graculus strictocephalus* and *G. melanoleucus*; Silver Gulls, *Larus Novæ-Hollandiæ*; Richardson's Skua, *Lestris Richardsoni*; and the pretty Bass Straits Tern, *Sterna poliocercus*.

The dredges soon brought a large quantity of material for the naturalist on board, such as sponges, tunicata, crustacea, mollusca, sea-urchins, algæ, polyzoa, hydrozoa, &c., so that we were kept busy bottling up specimens for future examination. On board the steamer we were again successful in obtaining two perfect specimens of the rare mollusc, *Nucula Grayii*. It is singular that perfect specimens have never been reported from the adjacent beach, though single valves have been occasionally found, and it has been obtained on each of the three dredging trips in this locality.

For further details of the molluscan fauna obtained by dredging I am indebted to Mr. G. B. Pritchard, who reports as follows:—

"The principal work done was off Beaumaris and towards Rickard's Point, with a couple of casts off Brighton, but owing to the lateness of the hour when at the latter place there was not time to do much, and what was brought to the surface consisted mostly of dead shells. The deepest dredge was about five fathoms, off Beaumaris, where the bottom was a fine sandy mud, containing a large number of dead shells of *Cardium tenuicostatum*, while a few examples were still living; also *Nucula Grayii*,

D'Orbigny—two very fine living examples were obtained and six single valves of dead specimens. Other shells seemed scarce, *Macoma Mariæ*, T. Woods, being the only other obtained alive at this spot, while dead shells of *Dosinia grata*, *Chione striatissima*, *Tellina (Arcopagia) decussata*, *Cytherea Diemenensis*, *Cardita bimaculata*, *Chione lamellata*, *Natica conica*, and *Peristernia Paivæ* were also to be seen. Coming in closer to the land we left the muddy bottom and got on to a rocky bottom, on which we remained until some distance round Rickard's Point. From the dredging here a very fair number of living examples of several species were secured. By far the commonest shell in the dredge from this ground was *Mytilus chorus*, and though specimens of this shell were not much sought after, it not infrequently had attached to it several more interesting forms of molluscs, the commonest being *Crepidula unguiformis*, *Calyptræa calyptraformis*, and *Hipponyx Australis*. A large number of *Turbo aureus* were attached to the pieces of stone brought up, as also were specimens of *Clanculus plebeius*. A few fine examples of *Fasciolaria coronata* were hauled up, and one dead example of this species had no less than ten specimens of *Crepidula unguiformis* in the mouth of the shell, while the inside was tenanted by a fair-sized Hermit Crab, and the outside acted as a basis of attachment for *Hipponyx Australis*. *Murex triformis* was also found living, and an interesting feature in connection with this was that the operculum was covered by an almost exactly equivalent-sized *Crepidula unguiformis*. The other living species obtained were: —*Raphitoma anomala*, *Cerithium dubium*, *Thalotia (?)*, sp., *Haliotis nævosa (?)*, *Chamostrea albida*, *Barbatia Carpenteri*, *Modiolaria Cumingiana*, *Venerupis (?)*, sp. We then went about a mile or so further from the shore, and again the dredge showed a muddy bottom. In the molluscan line nothing of special note occurred; a few living examples of *Cytherea Diemenensis* and dead shells of *Pecten laticostatus* were to be seen. Nothing worthy of note was obtained off Brighton, though dead shells were extremely numerous."

We were successful in obtaining more of the diatomaceous material mentioned in my report two years ago, and from which Messrs. W. M. Bale and H. Grayson have now obtained over 100 species, thus proving it to be by far the richest deposit of these interesting forms on the Australian coast. Mr. H. Grayson has promised to read a detailed account of the deposit before a meeting of the Club, and as much of the other material obtained requires time for working out it is proposed on an early date to make a special exhibit of the results of the dredging.

The Brighton contingent of the party were accommodated on board the yacht *Starlight*, kindly placed at their disposal by Mr. C. J. Cottell, and were under the leadership of Mr. J. Shephard, who reports as follows:—

"While waiting for the yacht some free-swimming larval ascidians were picked up on the beach, and a small grapnel brought by Mr. Page, used from the Middle Brighton pier, brought up seaweeds to which were attached small sponges of the Sycon type.

"On arriving off Beaumaris the dredge was used about half a mile from shore, and the bottom was found rather muddy; however, molluscs and echinoderms were fairly plentiful. Going in closer with a view of obtaining forms from near low-water mark off the beech, which, worked from the shore, has yielded good results on former excursions of the Club, the dredge showed the bottom to be less muddy, and attached to the rocks and shellfish brought up were living polyzoa and ascidians, also echinoderms and a number of sponges, including some apparently in the Olynthus stage. It was intended to try the deeper water some distance from the shore for the finer mud deposit, but a signal from the steamer had to be obeyed, and the homeward trip commenced. Off Black Rock several hauls were made, the dredge showing the bottom to be of a promising character and worth attention at a future time. Every stone brought up was thickly encrusted with animal growths, and among them was noted the sponge *Sycandra gelatinosum*. Here the grapnel before mentioned was used with good results, bringing up one of the most perfect specimens of sponge obtained during the day. Unfortunately the grapnel was lost, but a device for saving future ones was suggested, and with such an addition this instrument appears likely to yield good results as a supplement to the dredge. A tow-net was tried for a short time off Beaumaris, and among the captures were several young Medusoid forms, which Professor Spencer has identified as Ephyræ soon after their release from the strobila or nurse stock which is the early form of development of the common jellyfish.

"The following genera of Diatomaceæ and Foraminifera were recognized by Mr. G. J. Page in the material taken home by him: — Diatomaceæ — Actinocyclus, Actinoptychus, Auliscus, Amphiporora, Biddulphia, Coscinodiscus, Cocconeis, Campylodiscus, Climacosphenia, Euphillodium, Fragillaria, Gonphomena, Grammatophora, Hylodiscus, Melosira, Navicula, Nitzschia, Orthosira, Pleurosigma, Podosira, Podosphenia, Rhabdonema, Surirella, Synedra, Tabellaria, Triceratium, &c. Foraminifera—Gaudryina, Lagenia, Planorbulina, Polystomella, Rotalina, Textularia, Truncatulina, &c."

Soon after 5 p.m. a start was made for home, and a westerly wind having sprung up, the yacht merrily followed in our wake, getting to her moorings about 6 p.m. We delayed for a short time dredging the "Brighton shell bank," without much result, then heading for Williamstown, passing through a ram-squall on the

way, we arrived soon after 7 p.m., and were hospitably entertained at tea by the captain and crew of the *Firefly*, thus pleasantly winding up a most enjoyable day. Much of the pleasure of the day's outing is attributable to the unselfish attention of the respective owners of the steamer and yacht, Messrs. E. F. Cooke and C. J. Cottell, who so willingly again placed their vessels at our disposal. We have now had the use of the *Firefly* on five occasions, and the yacht *Starlight* twice.

JOS. GABRIEL.

NOTES ON A GIPPSLAND TRIP.

BY REV. E. HALFORD HENNELL.

(Read before Field Naturalists' Club of Victoria, 8th April, 1895.)

OUR party, consisting of Rev. A. Maxwell, his son, my brother, and myself, having decided on a "camping-out expedition" in Gippsland for the various purposes of shooting, fishing, reptile and insect hunting, collecting fossils, &c., left Melbourne by an early train for Sale on 1st January last, with the necessary luggage, made up of tents, guns, ammunition, and provisions. After a somewhat uninteresting journey we arrived at Sale in due course, and transferred ourselves and luggage to the s.s. *Dargo*, for the Lakes journey. This proved a welcome change after the monotony of the train travelling, and although the time (six hours) occupied in the trip is long, still the scenery is rather pretty after leaving Sale, the river being fringed with wattles and other foliage, though the lakes are not quite so picturesque, being chiefly fringed with ti-tree. About 9 p.m. we arrived at Metung. Here we decided to make our first camp, having previously arranged for a boat to meet us, intending to cross the lake and go into camp, but we were met by the Rev. G. Poynder, who with kind forethought had obtained permission for us to occupy the local school building, which we were glad to do, as we should have had great difficulty in effecting a landing, owing to the shallow water and the darkness.

WEDNESDAY, 2ND.—After breakfast we rowed across the lake and made our way to what is locally known as the "back lake," a very beautiful though small sheet of water in a basin. Flying over the lake and towards us a large eagle was seen, and coming within range, was fired at and wounded, yet it continued its flight as if nothing unusual at all had taken place. Game of all kind was scarce; two pelicans were seen in a small creek quietly feeding, tracks of wallaby visible here and there, insects *nil*. Going through the scrub and tall rushes we were very much troubled with the webs of spiders, which were spun chiefly by two spiders, specimens of which are exhibited. On returning, we made arrangements with the owner of a yacht to take us up the River Tambo the next day.

THURSDAY, 3RD.—After breakfast we started in the yacht with our boat in tow for the River Tambo, leaving the choice of a camping ground to the boatman, who knew the locality. We sailed about one mile up stream from the mouth, and found a suitable spot for our tents under some "boobyallas." So, landing, we soon had the billy boiling and some lunch, after which our boatman left us, with instructions to return on the following Monday to take us back. Tents were pitched, our beds being made of tussocks of grass, which surrounded us in abundance. One large tent fly made a comfortable dining room, with the boat boards fastened up to ti-tree for a table. The afternoon was spent in fishing, but with no luck, and exploring the locality, which appeared favourable for collecting, &c.—swamps on both sides of the river, and just behind us a strip of land separated us from Tambo Bay. We stalked some swan which were feeding in the shallow water, and after crawling through tussocks, thistles, &c., reached the edge of the bay, but to our disgust found the birds were out of range. In the evening we tried fishing again, but without success.

FRIDAY, 4TH.—We pulled down the river and round into Tambo Bay, where black swan were feeding and swimming in hundreds. After lunch the swamps were tried for game, while I went after coleoptera, &c. I took several species of beetles under the bark of the gum trees, and some scrub being in flower I also tried it, but without result. Then we again embarked, but had a difficulty in making the land again, as both wind and tide were against us; however, camp was reached at last, but rain coming on our diningroom had to come down and take its own place, and trenches had to be made round the tents.

SATURDAY, 5TH.—Up before 5 a.m. A lovely morning. Clothes lines were soon up, and wet garments hung out to dry.

After dinner we divided into two parties, the one going across the river for game, and my brother and I going round the bay. In turning over a log a Tiger Snake was discovered asleep, but was rudely awakened, and soon bagged. Not a single insect was taken. In the evening the others returned with another Tiger Snake, which was captured after a lively fight. Both snakes are exhibited here to-night. In the evening fishing was tried again, with the result that an eel turning the scale at 11 lbs. was caught, and afforded some excitement when trying to land it. When it was being prepared for a meal a piece of beefsteak about half a pound weight was found in its stomach, and appeared quite fresh. Boiled in salt water and then fried the eel was very good eating.

The next day we rowed up the river towards Swan Reach, and seeing a saw-mill, landed and inspected it. The caretaker informed us it had been deserted for nearly three years, and that there was still a great deal of valuable timber in the locality, but like other mills it is now a relic of the "boom" period.

Monday, 7th.—Our yatchsman was up to time, and we were soon on board and returned to Metung. Landing, we tried the scrub for wallaby, game, and insects, but were not successful. In the evening we went by steamer to the Lakes' Entrance, and made arrangements to go on to Lake Tyers in the morning.

Wednesday, 9th.—Arriving at Lake Tyers after a pleasant drive of about an hour and a half, we hired the only boat available and rowed over to the Aboriginal Mission Station, over which we were courteously shown by Mr. Bulmer, the superintendent, who also gave us some vegetables and a barrel of fresh water. Rowing across the lake, we landed for lunch, and here we found two ticks—the only ones seen during the trip. Resuming our journey, we rowed up the Nowa Nowa Arm for a distance of 10 or 12 miles, when we landed in the moonlight, pitched tents, had tea, and turned in. Next day bream fishing was tried. We could see the fish swimming about in the clear water in numbers, but as shrimps were the best bait and few were to be obtained, we were not very successful. Of different baits tried, the gizzard of the plover seemed to be appreciated most by the fish. We afterwards rowed down the arm and up Spring Creek to the selection of Mr. Bulmer, jun., who made us welcome. Tea over, accompanied by Mr. Bulmer, we tried duck shooting, but after a long wait succeeded in getting only one, so we made our way back to camp, after bidding farewell to Mrs. Bulmer.

Friday, 11th.—Up and had the billy boiling before 4 a.m. After a hasty snack all were aboard, and we rowed down to Spring Creek again, and arrived just as the sun was beginning to rise, but as no ducks were seen, fishing was tried, with our usual non-success. After breakfast I landed to collect fossils, the others fishing; soon they espied a snake swimming across the arm, which was shot and hauled into the boat. It proved to be a Tiger Snake over four feet long. I cut its head off and skinned it. After being opened, the heart was seen beating regularly, and the pericardium was still distended; this continued for some minutes. I subsequently tanned the skin, and it is now on the table for exhibition.

Saturday, 12th.—We struck our tents and made our way back to Lake Tyers, collecting fossils as we went. These are to be found in great profusion, being exposed in great numbers in the weathered surface of the rocks, and easily accessible, the stone in which they are embedded being soft, and consequently easy to work. The Rev. A. W. Cresswell, M.A., has kindly given me the names of some of those obtained, which I give at the end of these notes. We arrived at our destination about 5 p.m., and had a bathe in the open ocean. Our coachman being up to time, we were soon back at the Lakes' Entrance. I

did not take a single beetle near Lake Tyers, while I saw but one butterfly. Several specimens of the lizard *Hinulia Quoyi* were noticed.

MONDAY, 14TH.—Our party broke up after a most enjoyable holiday, although the sportsmen did not obtain much game of any kind—my collection, though not large, being most satisfactory. I then came back to Morwell, but found nothing interesting to naturalists there.

Next day I went to Boolarra on my way to a place called Budgeree. In one of the gullies I took the only beetle I obained here. This locality should be a good collecting ground for the botanist, as ferns and mosses, besides other plants, grow in the greatest profusion. At the house where I was staying two snakes had been seen going under the house about three weeks previously. Soon after my arrival, a gentleman who was also on a visit called out, "A snake here!" Going out I found he had dispatched a Tiger Snake. I went inside, and soon after heard him call out, "Another snake!" Going out I found he had another Tiger Snake at bay, which was also killed. Within an hour I saw another basking in the sun, which also proved to be a Tiger Snake. This was not a bad record for less than two hours. Singular to say, they were the only snakes that had been seen on the selection. My holiday was now over, and I returned to Spring Vale on Saturday, the 19th.

The following are the fossils collected at the Nowa Nowa Arm, Lake Tyers:—Corals.—*Cellepora Gambierensis*, also several species of the family *Turbinolidæ*. Echinoderms.—*Clypeaster Gippslandicus*, *Psammechinus Woodsii*. Shells.—*Pecten coarticus*, *P. Yahlensis*, and two other species; *Hinnites Corioensis*, and one other species; *Spondylus pseudoradula*; Ostrea, 4 species (the largest weighing 2½ lbs.); Terebratula, Limopsis, &c.; also several species of Polyzoa not determined.

LIST OF ORCHIDS COLLECTED NEAR SALE,

By the Misses MAY and LILIAN WISE and MURIEL BENNETT.
(Communicated by ALEX. PURDIE, M.A.)

(Read before the Field Naturalists' Club of Victoria, 13th May, 1895.)

THE following orchids were collected by us in the neighbourhood of Sale, Gippsland, during the years 1894 and 1895, with the exception of *Caladenia latifolia*, which was found at Ocean Grange, Gippsland Lakes.

Several of the plants are now for the first time recorded from this district, and one, *Caladenia Cairnsiana*, found somewhat plentifully, has hitherto been a rarity, having been found only once before in this colony. We have to thank heartily the Government Botanist, Baron von Mueller, for his great kindness in identifying and naming all the specimens for us. The months

given after the names of the plants show the time in which the respective orchids were most fully in flower.

Besides these orchids collected by ourselves, *Orthoceras strictum* has been found by Mr. Alex. Purdie near Merriman's Creek, and *Cryptostylis longifolia* is said also to occur in that locality. *Caladenia Cairnsiana* occurs also at Ocean Grange, as well as near Sale.

ACIANTHUS		
exsertus	... ...	April, May
CALADENIA		
carnea	... ...	October, November
cœrulea	... ...	September, October, November
Cairnsiana	... ...	September, October
latifolia	... ...	October
Patersoni	... ...	September, October, November
CALEYA		
major	... ...	October, November
CALOCHILUS		
Robertsoni	... ...	November
CHILOGLOTTIS		
Gunnii	... ...	October
diphylla	... ...	June, October
CORYSANTHES		
pruinosa	... ...	August, September
CYRTOSTYLIS		
reniformis	... ...	August, September
DIPODIUM		
punctatum	... ...	December, January
DIURIS		
longifolia	... ...	September, October, November
pedunculata	... ...	September, October
maculata	... ...	September, October
sulphurea	... ...	September, October, November
punctata	... ...	October, November
ERIOCHILUS		
autumnalis	... ...	March, April
GLOSSODIA		
major	... ...	September, October
LYPERANTHUS		
nigricans	... ...	November
MICROTIS		
porrifolia	... ...	November
PRASOPHYLLUM		
patens	... ...	October, November
fuscum	... ...	November
PTEROSTYLIS		
præcox	... ...	April
curta	... ...	July, August, September

PTEROSTYLIS—*continued.*		
concinna	... ...	August, September
nutans	... ...	August, September
mutica	... ...	October, November
cucullata	... ...	September, October, November
rufa	... ...	November
parviflora	... ...	May
THELYMITRA		
longifolia	... ...	October, November
ixioides	... ...	October, November.

NOTE ON AN EDIBLE MUSHROOM, *AGARICUS CAMPESTRIS*, L.,

WITH A SECOND SMALLER INVERTED PILEUS ON THE TOP.

THIS mushroom was found by Mr. Stewart Neilson, in the grounds of the Royal Horticultural Society's Gardens, on 2nd June, and although he has gathered scores of pounds of mushrooms, this is the first of the kind ever seen by him. The cap of the normal mushroom was 3½ inches across, and about half an inch from the margin on the upper surface there was a large wart-like projection about one inch in diameter. The upper surface of this wart-like projection, which stood out about one-quarter of an inch from the general surface, was very rough, and covered with irregularly arranged and much convoluted short gills. On examination they were found to produce abundance of spores, which resembled the normally produced spores in being oval to elliptical in shape, an average size of 9.5 μ. long by 5.5 μ. broad, but decidedly paler in colour, being of a greyish-brown compared with the nut-brown shade of the other. The specimen grew amongst tall grass, and not in an open meadow, and this may have been an "effort of Nature" to produce spores where they might have a better chance of being spread to a more congenial spot.

Dr. Masters, in his "Teratology," p. 53, refers to a case, and gives an illustration where one mushroom carries another on its back, as it were; but they are two *adherent* mushrooms, and not a double development of gills on the same mushroom as in the present instance. The description of it is short, and may be quoted:—"A not uncommon malformation in mushrooms arises from the confluence of their stalks, and when the union takes place by means of the *pilei*, it sometimes happens during growth that the one fungus is detached from its attachment to the ground and is borne up with the other, sometimes even being found in an inverted position on the top of its fellow." The twin-like arrangement here is quite distinct from the other, where it was an excrescence—an outgrowth from the mushroom itself—and there was not the slightest indication of the production of a stalk.—D. M'ALPINE.

THE LATE DR. P. H. MacGILLIVRAY, F.L.S.

By the death of Dr. P. H. MacGillivray, M.A., LL.D., F.L.S., of Bendigo, on 8th July, Victorian natural science has lost one of its most brilliant workers. Dr. MacGillivray's papers on the Polyzoa of Victoria contributed for a number of years to the proceedings of the Royal Society of Victoria, and his descriptions of Victorian Polyzoa in Sir F. M'Coy's "Prodromus of the Zoology of Victoria," entitle him to rank with such European authorities as Hincks and Busk. He was for many years a member of the Field Naturalists' Club of Victoria, and took an active interest in the working of the Bendigo Science Society, the Bendigo School of Mines, and other institutions, in consequence of which it is proposed to erect a memorial to him in that town.

We are pleased to learn that Mr. C. French, jun., has been appointed to the vacancy in the Entomological Branch of the Department of Agriculture, which is in charge of his father, Mr. C. French, F.L.S.

The *Christchurch* (N.Z.) *Press* of 12th June reports that Mr. H. B. Coles, son of Mr. A. Coles, taxidermist, of Melbourne, has purchased two deposits of moa bones from Mr. M'Donald, of Kapua, Waimate. One of these deposits was partly worked by Captain Hutton, who obtained a number of bones from it, and the other, about six chains distant, is now being opened out by a man in Mr. Coles's employ. This new deposit proves to be a very valuable one, and already Mr. Coles has obtained sufficient bones to make up from sixty to seventy complete skeletons. The bones are in an excellent state of preservation, some of the pelvis and breast bones and tibias being exceptionally good. From this deposit has also been obtained bones of the extinct species of swan, the same as was dicovered by Mr. H. O. Forbes in a cave at Sumner. Mr. Coles hopes to find enough of the bones to enable him to complete a skeleton. He has also found some of the bones of an extinct species of large weka. This deposit of bones was found in an old quicksand, and Mr. Coles is of opinion that the birds on going there to feed were drawn in, and so lost their lives. The sand is still dangerous in parts, and the man who is engaged in getting out the bones had some difficulty on one occasion in freeing himself from it.

Entomologists are notified by advertisement on the cover that Messrs. Cherry and Sons, of Gisborne, are prepared to supply all requisites for the ensuing season, having just landed a shipment of natural history apparatus.

THE

Victorian Naturalist.

VOL. XII.—No. 5. AUGUST, 1895. No. 141.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th August, 1895. The president, Professor W. Baldwin Spencer, M.A., occupied the chair, and some 70 members and friends were present.

REPORT.

A report of the recent visit to the Entomological Branch of the Department of Agriculture, under the direction of Mr. C. French, F.L.S., Government Entomologist, was read by Mr. F. G. A. Barnard. There was a large attendance of members, who evinced great interest in the specimens, &c., on view. Special attention was given to the splendid series of life-histories of destructive insects prepared in England and obtained by the Government for comparison with the injurious insects of this colony.

ELECTION OF MEMBERS.

On a ballot being taken, Mrs. Cherry and Messrs. A. Lord and R. J. Dawes were duly elected members of the Club.

PAPERS.

1. By Mr. C. French, F.L.S., entitled "Notes on Some Newly-described Australian Buprestid Beetles, Part I."

The paper called attention to the large number of recent additions to the favourite family of Buprestidæ, and gave brief descriptions of some 42 species, including several Victorian.

2. By Mr. D. M'Alpine, F.C.S., entitled "Entomogenous Fungi."

The author dealt with a few species of fungi growing upon insects which had come under his observation, and advocated a patient study of these growths, which might become of great economic importance in checking the increase of injurious insects. An entomophyte, probably a species of Botrytis, on a cockroach was described, but further information is required before it can be determined whether it is the cause of death or merely an after-growth; also, a new species of Isaria, found growing on a grub of a beetle belonging to the Melolonthidæ, which it is proposed to call *Isaria surmatodes*.

In the discussion which followed, Professor Spencer referred to the actual results which had been obtained in France and

America by cultivating such fungi. In Kansas the Chintz Bug plague has been effectually kept in check; and in France it was estimated that 70 per cent. of a very destructive pest, second only to the Phylloxera, was killed by this means alone.

NATURAL HISTORY NOTE.

Professor Spencer announced that, as the result of experiments by Professor Fraser, of Edinburgh, and Dr. Martin, of Sydney, it has been satisfactorily demonstrated that the serum of animals which have been injected with small doses of snake poison is a powerful antidote to snake-bite. The new remedy is therefore analogous to anti-toxin for diphtheria. The blood has the power of putting out the antidote and this property can be cultivated to such a degree that an injection fifty times greater than would be necessary to cause death may be administered with impunity.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening:—By the Department of Agriculture.—Proof plates of part iii. of the "Handbook of Destructive Insects of Victoria." By Mr. A. Coles.—Specimen of Powerful Owl (*Ninox strenua*), with opossum. By Mr. C. French, F.L.S.—45 species of Buprestid Beetles new to science, in illustration of paper, including *Calodema plebeijus* and *Metaxymorpha gloriosa*, *Megacephala cylindrica*, *Howitti*, and *Frenchi*, the latter being new; also Cetonias, *Ischiopsopha Bourkei* and *Dilochrosis Frenchi*, both new. By Mr. C. French, jun.—Rare Queensland eggs, viz.—*Pitta similima*, *Graucalus hyperculacus*, *Podargus Papuensis*, *Mimeta flavocintra*, *Philemon buceroides*, *Collyriocincla parvissima*; also the very rare eggs of the Pink-naped Bower Bird, *Chlamydodera orientalis*, first time exhibited in Victoria. By Mr. J. Gabriel.—Egg of *Calyptorhynchus Banksii*, Banksian Black Cockatoo, from Western Queensland. By Mr. James Mitchell.—Specimen of Older Basalt, showing Gmelenite, Analcite, and Natrolite; Victorian Zeolites from Flinders, also another specimen showing Natrolite; specimen of Newer Basalt, showing Phacolite and Calcite, from neighbourhood of Melbourne. By Baron von Mueller, K.C.M.G.—Specimens of *Helichrysum apiculatum* from more than 400 localities, demonstrating the geographical distribution of the species through all Australia; specimens of *Dodonæa viscosa* from more than 200 Australian localities, to show variability of this species; specimens of Australian plants collected and named by R. Brown, 1802-1805; specimens of Australian plants collected by Professor Kerner, to show perfection and elegance of preparation; specimens showing dissections of plants; medicinal plants, prepared by Mr. Buysman in Holland, accompanied by tubes containing dissections in alcohol; specimen of *Carex agas-*

tachrys, named and collected in the last century by Ehrkart, one of Linnæus' disciples at Upsala; plants recently collected in the Malayan Peninsula, and described by Brigade-Surgeon Dr. G. King, Director of the Botanical Gardens of Calcutta; new species from S. W. Australia, *Eucalyptus Kruseana*, named in honour of Mr. J. Kruse, remarkable for its small orbicular apposite leaves; *Claytonia Battii*, discovered lately by Mr. J. D. Batt (new for Victoria); *Olax striola*, obtained on the Cann River by Mr. John Cameron, the first of an order of plants, Olacineæ, new to Victoria.

After the usual conversazione the meeting terminated.

THE DISPERSAL OF MISTLETOE.

By H. P. C. Ashworth.

(Read before Field Naturalists' Club of Victoria, 8th April, 1895.)

The wide prevalence of parasitic mistletoes high up in the branches of even our loftiest eucalypts is noteworthy, and although it has long been known that birds are the agents in dispersing the seeds, still the extent to which one small bird contributes does not seem to have been recognized. The bird referred to is the pretty little Swallow Dicœum, *Dicœum hirundinaceum*, which, so far as my observations go, seems to be the exclusive agent in Australia.

The general facts of the inter-relation of plants and animals are now fairly well understood, the broad deductions being that by the process of variation and natural selection all our brightest flowers have been evolved to attract insects to fertilize them, and our most delicious fruits to entice birds and mammals to eat them and disperse their seeds. As an instance of the latter, Wallace cites the case of the nutmug, which is eaten by Fruit Pigeons for the sake of the mace surrounding it, this latter being merely an adventitious growth to attract attention. The nutmeg passes through the bird's body and germinates where it falls.

In Europe the chief agent in the dispersal of mistletoe appears to be the Mistletoe or Missel Thrush, *Turdus viscivorus*, the specific name of which, signifying "mistletoe-eating," was given to it by Linnæus on that account; indeed, it was long thought that this bird was a sort of foster-parent to the mistletoe, and that the seeds would not germinate unless they had first passed through its body. The European mistletoe (Viscus) has a soft skin, and is eaten by the birds whole, but our mistletoes belong to the genus Loranthus, the seeds of which are encased in a hard capsule, and the wonderful adaptation of the Swallow Dicœum to the *rôle* of extracting them is remarkable. The fruit of the mistletoe ripens about the month of May, and the Swallow Dicœum then appears in large numbers. Intent on observing them, I set off one day with a telescope to the junction of Gardiner's

Creek with the Yarra, where there is a fine clump of box trees, covered with mistletoe. After watching the birds for some time through the telescope, I found that they first plucked a berry, then repaired to a larger bough, whence after a few moments the berry was dropped. I had always thought that the berry was eaten whole, but on picking one up the mystery was solved, for it was empty; the seed, with its glutinous covering, had been abstracted through an opening in the top, formed by biting it nearly through, leaving a lid. Nor is this all, for in the act of picking the fruit, a small hole is left where the stalk joined it, and this must greatly facilitate the sucking or squeezing out of the contents. During the whole process the bird uses only its beak. The ground underneath each of the trees was strewn with several hundreds of these discarded berries, each with its lid at one end and the small hole at the other.

The bird is so small that when the seed is passed it sticks to the bough on which it sits, and is glued there by its viscid covering. On climbing the trees I was surprised to find what a large number of seeds were sticking to the branches.

Consul Layard, writing to *Nature* from Noumea (see *Victorian Naturalist*, vol. v., p. 72). speaks of the Indian species of the genus Dicœum as the agent of dispersion of the banian, and says that the seeds require to pass through the bodies of birds to enable them to germinate. To determine whether this holds with our mistletoes I planted and marked a number of seeds on several trees. Two months afterwards, in July last, they began to sprout, and send their roots into the wood of their hosts, and continued to grow equally as well as those passed by the birds. Schoolboys are fond of the berries for the sake of the glutinous covering of the seeds, which is very sweet, and suck them in exactly the same way as the birds.

The Swallow Dicœum is recorded from all parts of Australia, and its migrations are probably regulated by its food supply. I am convinced that in Victoria, where it only stays in any number for three or four months, it is the exclusive agent in the dispersal of mistletoe, and should be glad to hear from observers in other colonies the time of its appearance, and the extent to which it is noticed feeding on the berries.

Surrey Hills Boys' Field Club. — This society has now completed the third year of its existence. The hon. secretary's report states that during the year just closed the members have shown considerable interest in its proceedings, both in the fortnightly outings and the monthly evening meetings. These latter have on several occasions been addressed by members of the Field Naturalists' Club of Victoria, to whom the committee express their gratitude for the aid so freely given.

NOTES ON A RECENT VISIT TO SOME BASALT CAVES NEAR SKIPTON.

By Richard J. Fletcher.

(*Read before the Field Naturalists' Club of Victoria, 10th June*, 1895.)

On the side of Mount Widderin, and in that vicinity, are many funnel-shaped depressions, and at the bottom of one of these is the entrance to some locally well-known caves. After crawling for about 15 feet, the visitor enters the main cave, the roof of which rapidly rises to a height of 70 feet. The walls and roof are of rough basaltic rock, generally free from incrustations, no stalactites being observable, except a few diminutive specimens, an inch or so in length.

The main chamber is roughly circular, with a length of 48 yards and extreme breadth of 40. At its widest part is the entrance to a second cave, as long as the former, but with a maximum width of only 25 yards, nor is the roof quite as lofty; fibrous roots have penetrated the ceiling and hang down in switches a few feet long.

The main cave narrows off into a corridor, which leads into a small oval cave, 27 yards in the longest diameter, the floor being much more elevated than that of the main cave. A still narrower passage than that by which it is approached leads to a hole down which you can drop, though generally at the risk of tearing one's clothing on the rocks in transit. Here the visitor is confronted by a cool, clear pool of water, which bars further progress.

The floors of all the caves are covered with a deposit varying from a few inches to 15 feet in thickness, and which I classify as "organic" and "non-organic," and may be said to be guanos.

In many parts of Australia caves have been found containing guano, but as far as I am aware, in none but this is it of any commercial importance. The organic deposit in the main cave contains abundance of nitrogen as ammonia, nitrates, and what is termed by agricultural chemists organic nitrogen, together with phosphates of lime and magnesia, which indicate its value as a plant food.

Bats are credited with being the producers of this deposit, with what truth I cannot say, as "the oldest inhabitant" has never seen a bat in the caves. A few of these animals are to be found, however, in the hollow trees about Skipton.

Signs of an opossum were observed, and near the entrance a small brown owl conscientiously kept guard; he was in his sentry-box every day of the week we spent at Mount Widderin. The only insect life noticed during our visit was a few mosquitos.

A mould (or fungus) was observed presenting distinctly the cabalistic characters which spell "Jennie." We could not understand this at first, but subsequently noticed that it occurred only

where visitors had inscribed their names with chalk upon the walls; it is a delicate fungus, and grows somewhat trumpet-shaped, white, light, and what I daresay ladies would call in "open work." On handling its beauty departs and it assumes the appearance of a damaged piece of white kid.

In regard to minerals, three or four rather uncommon ones occur in the organic deposit. This is in the centre of the main cave, where a black, loose and friable matrix carries thickly studded white, colourless, and buff-coloured crystals. The largest ones are known as Struvite, and consist essentially of phosphate of ammonia and magnesia. Adhering to these and also in the non-organic deposit are found small more or less needle-shaped crystals, probably produced by alteration of the Struvite, and consisting also of magnesia, ammonia, and phosphoric acid, which have been named Hannayite. Three other minerals—Newberyite (named in honour of the late Mr. J. Cosmo Newbery, C.M.G.), a phosphate of magnesia; Dittsmarite, and Muellerite—are also found in the cave.

Below the "organic" deposit is a thin bed of brown rock, which is easily powdered, and looks like powdered basalt; this contains white specks and small crystals, probably some nitrates. The "organic" deposit gradually merges into the "non-organic," which latter contains about 77 to 88 per cent. of mineral matter, a small quantity of organic matter, and water. Through this brown earthy bed are found nodular concretions of magnesia and lime phosphates, with occasional pencilings of a white phosphatic mineral. In most places, at a depth of from half an inch to perhaps 8 inches from the surface, a whitish layer is found of varying thickness, averaging the width of a chalk mark, occasionally increasing into a fairly large pocket, from which a lump as big as a loaf of bread can be taken of this phosphatic mineral —sometimes white, often yellow.

Samples of the different deposits are exhibited on the table; and in conclusion I might say that, although we turned over some six or seven tons of stuff, no bones or fossilized forms were met.

ADDITIONAL LOCALITIES FOR VICTORIAN ORCHIDS.

As Mr. C. French, jun., expressed a wish that other members of the Club would from time to time publish their observations on the flowering times and localities of Victorian orchids, I have much pleasure in recording the following species, with some additional localities, which, in many cases being distant parts of the colony, may not have been visited by Mr. French :—

ORCHID.		LOCALITIES.
DIPODIUM		
punctatum	...	Carrum, S. Gembrook, Hall's Gap (Grampians)
GASTRODIA		
sesamoides		Darlimurla, Monbulk Ck.
THELYMITRA		
ixioides	...	St. Albans, Keilor Plains
aristata	...	Darlimurla
longifolia	...	Preston
flexuosa	...	Sandringham
antennifera	...	Ringwood
DIURIS		
punctata	...	Preston, Mentone
maculata	...	Ringwood
pedunculata	...	Nar-Nar-Goon, Connewarre, Fairfield Park, Balmoral, Stawell
sulphurea	...	Portarlington
longifolia	...	Nar-Nar-Goon
alba ...	...	St. Albans, Keilor Plains
palustris	...	Bayswater
ORTHOCERAS		
strictum	...	Clyde
CALOCHILUS		
Robertsoni	...	Darlimurla, Monbulk Ck., Doncaster
PRASOPHYLLUM		
Australe	...	Darlimurla, Grampians (Hall's Gap)
elatum	...	Ringwood
patens (?)	...	Darlimurla, Keilor Plains
fuscum	...	Sandringham
MICROTIS		
porrifolia	...	Darlimurla, S. Warragul, Keilor Plns., Monbulk Ck., Clyde, Grampians (Hall's Gap), Brighton
PTEROSTYLIS		
curta ...	...	Fairfield Park
nutans ...	...	Frankston, Nar-Nar-Goon, Colac, N. of Greensborough
pedunculata	...	Nar-Nar-Goon, Wandong, Mt. Corranwarrabul
nana ...	...	Stawell
cucullata	...	Burwood, Kooyongkoot Ck., Springvale, Mt. Corranwarrabul
præcox ...	...	Lakes' Entrance
obtusa ...	...	Nar-Nar-Goon, near Ferntree Gully
barbata	...	Ringwood, Oakleigh
mutica ...	...	N. of Stawell

PTEROSTYLIS—*continued.*		
longifolia	...	Nar-Nar-Goon, Lilydale, N. of Riddell's Ck., Wandong
Mackibbini	...	Near Brighton Beach
CRYPTOSTYLIS		
reniformis	...	Stawell, Black Ranges, S. of Stawell
ERIOCHILUS		
autumnalis	...	Pakenham, Eltham, Barnedown, Campaspe R.
fimbriatus	...	Stawell
CALADENIA		
congesta	...	Darlimurla ; a small variety, Oakleigh
Menziesii	...	Ringwood, Nar-Nar-Goon, Frankston, Colac
Patersoni	...	Ringwood, Nar-Nar-Goon, Polkemmit, Balmoral, Wandong, Stawell
suaveolens	...	Ringwood
carnea ...	...	Sand., Stawell
cœrulea	...	Stawell
deformis	...	Ringwood, Polkemmit, Stawell
CHILOGLOTTIS		
Gunnii ...	...	Darlimurla, South Warragul, Mount Corranwarrabul
GLOSSODIA		
major ...	...	Nar-Nar-Goon, Lower Ferntree Gully, Balmoral, Wandong, Ledcourt Quarry (Grampians).

T. S. HART.

FORMAL AS A PRESERVING FLUID.—A thoroughly reliable preserving fluid is a desideratum to the ordinary collector as well as the museum curator, therefore any additional information on the subject is welcome. In the January number of the *American Naturalist*, Mr. F. C. Kenyon describes Prof. T. Blum's employment of formal, the usual name of a forty per cent. solution of formaldehyde in water. It is a clear opalescent fluid with a sharp odour. It has the advantage of being cheaper than alcohol, of having a more penetrating action, and in many cases preserving colours and microscopic details. Whole mammals, reptiles, fishes, &c., placed in a ten per cent. solution of the fluid were hardened, and after nine months' immersion were unchanged, though the fluid had not been changed.—*Natural Science*, April, 1895.

A CATALOGUE OF VICTORIAN HETEROCERA.

By Oswald B. Lower, F.E.S.

Part XVI.

PYRALIDINA *(continued).*

491. Scoparia chiasta, Meyr. (Tr. Ent. Soc. Lond., 246, 1887).
Melbourne.

*492. S. spelæa, Meyr. (*loc. cit.*, 247, 1887).
Gisborne, Stawell.

*493. S. homala, Meyr.
Gisborne.

*494. S. gomphota, Meyr.
Melbourne.

495. S. Meyrickii, Butl. (*Tetraprosopus Meyrickii*, Butl., Ann. Mag. N. H. (5), ix., 1887, 97).

496. S. leucomela, Lower (Tr. Roy. Soc. S.A., 165, 1893).
Melbourne, near Prahran.

*497. S. philonephes, Meyr. (Tr. Ent. Soc. Lond., 247, 1887).
Melbourne.

EROTOMANES. Meyr.

498. E. euspilella, Walk. (*Canuza euspilella*, Walk., Supp., 1,771 ; *Anerastia mirabilella*, Meyr., Proc. Linn. Soc. N.S.W., 213, 1878 ; *ib.*, 333, 1879 ; Tr. Ent. Soc. Lond., 451, 1885).
Melbourne.

Family—CRAMBIDÆ.

DIATRÆA. Guild.

CALAMTOROPHA. Zeller.

PTOCHOSTOLA. Meyr.

499. P. microphæella, Walk. (*Crambus microphæella*, Walk., Supp., 1,758; *Ptochostola dimidiella*, Meyr., Proc. Linn. Soc. N.S.W., 190, 1878 ; *ib.*, 154, 1882).
Melbourne, Gisborne.

THINASOTIA. Hein.

500. T. claviferella, Walk. (*Aquita claviferella*, Supp., 1,765 ; *Aphomia strigosa*, Butl., P. L. S., 1877, 398, pl. xlii., 10 ; *Crambus strigosus*, Meyr., Tr. N.Z. Inst., 31, 1882).
Melbourne, Sandringham.

501. T. lativittalis, Walk. (*Crambus lativittalis*, Walk., B. M. Cat., 171 ; *C. halterellus*, Zeller, Crambites, 33 ; Meyr., Proc. Linn. Soc. N.S.W., 183, 1878).
Gisborne, Melbourne, &c.

TALIS. Gn.

*502. T. PEDIONOMA, Meyr. (*Thinasotia pedionoma*, Meyr., Tr. Ent. Soc. Lond., 453, 1885 ; *Hednota pedionoma*, *ib.*, 249, 1887).

503. T. TOXOTIS, Meyr. (*Hednota toxotis*, Meyr., Tr. Ent. Soc. Lond., 249, 1887).
Melbourne.

*504. T. PANTEUCHA, Meyr. (*Hednota panteucha*, Meyr., *loc. cit.*, 453, 1885).
Melbourne.

*505. T. PANSELENELLA, Meyr.
Melbourne.

506. T. RELATILIS, Walk. (*Crambus relatilis*, B. M. Cat., 172 ; Meyr., Proc. Linn. Soc. N.S.W., 191, 1878).
Melbourne, Gisborne, &c.

507. T. OPULENTELLUS, Zeller (*Crambus opulentellus*, Zeller, Cr., 46 ; Meyr., Proc. Linn. Soc. N.S.W., 192, 1878).
Gisborne, Melbourne, &c.

*508. T. HOPLITELLUS, Meyr. (*Crambus hoplitellus*, Meyr., *loc. cit.*, 188, 1878).
Gippsland.

509. T. PLENIFERELLUS, Walk. (*Crambus pleniferellus*, Walk., B. M. Cat., 173 ; *Crambus aurosus*, Feld., Reis. Nov., 31, taf. 137 ; Meyr., Proc. Linn. Soc. N.S.W., 187, 1878).
Melbourne.

*510. T. MILVELLUS, Meyr. (*Crambus milvellus*, Meyr., *loc. cit.*, 181, 1878).
Melbourne, &c.

511. T. BIVITTELLUS, Don. (*Crambus trivittatus*, Zeller, Cr., 34 ; *C. vivittellus*, Walk., B. M. Cat., 171 ; *C. trivittatus*, Meyr., Proc. Linn. Soc. N.S.W., 185, 1878).
Melbourne, &c.

512. T. GRAMMELLUS, Zeller (*Crambus grammellus*, Zeller, Cram., 46 ; Meyr., Proc. Linn. Soc. N.S.W., 213, 1878 ; *C. enneagrammas*, Meyr., *loc. cit.*, 194, 1878).
Melbourne, Mt. Macedon, &c.

513. T. ARGYRONEURUS, Zeller (Cr., 47).
Melbourne, &c.

514. T. LONGIPALPELLUS, Meyr. (*Eromene longipalpellus*, Meyr., Proc. Linn. Soc. N.S.W., 196, 1878 ; *Crambus longipalpellus*, Meyr., *loc. cit.*, 212, 1878).
Melbourne.

515. T. ACONTOPHORA, Meyr.

*516. T. IMPLETELLUS, Walk. (*Crambus impletellus*, Walk., Cat., 175; Meyr., Proc. Linn. Soc. N.S.W., 1,210, 1878).
Melbourne.

517. T. CRYPSICHROA, Lower (Tr. Roy. Soc. S.A., 166, 1893).

CRAMBUS. F.

518. C. CUNEIFERELLUS, Walk. (Cramb., 175; Meyr., Proc. Linn. Soc. N.S.W., 189, 1878).
Sandhurst.

EUCHROMIUS. Gn. (*EROMENE.* Hb.)

DIPTYCHOPHORA. Zeller.

519. D. OCHRACEALIS, Walk. (*Cataclysta ochracealis*, Walk., Suppl., 1838; *Eromene prematurella*, Meyr., Proc. Linn. Soc. N.S.W., 198, 1878; *E. dilatella*, *ib.*, 199).
Gisborne, &c.

ARGYRIA. Hb.

FAMILY—GALLERIADÆ.

ACHRÆA. Hb.

520. A. GRISELLA, F.
Melbourne (introduced).

GALLERIA. F.

521. G. MELLONELLA, Linn.

HETEROMICTA. Meyr.

522. H. PACHYTERA, Meyr.
Melbourne, Gisborne.

APHOMIA. Hb.

*523. A. LATRO, Zeller.
Melbourne, &c.

MELISSOBLAPTES. Zeller.

*524. M. ÆGIDIA, Meyr. (Tr. Ent. Soc. Lond., 252, 1887).
Melbourne.

FAMILY—PHYCITIDÆ.

CEROPREPES. Zeller.

*525. C. ALMELLA, Meyr. (Proc. Linn. Soc. N.S.W., 210, 1878).
Grampians.

CONOBATHRA Meyr.

CANTHELEA. Walk.

MYELOIS. Zeller.

525A. M. FENESTRATA, Meyr., MSS.
Melbourne.

EUZOPHERA. Zeller.

526. E. SUBARCUELLA, Meyr. (*Myelois subarcuella*, Meyr., Proc. Linn. Soc. N.S.W., 211, 1878; *Euzophera subarcuella*, *ib.*, Tr. Ent. Soc. Lond., 255, 1887).
Gisborne, Melbourne, &c.

527. E. ENSIFERELLA, Meyr. (*Eucarphia ensiferella*, Meyr., Proc. Linn. Soc. N.S.W., 208, 1878).
Melbourne, Oakleigh.

CATEREMNA. Meyr.

*528. C. MICRODOXA, Meyr. (*Euzophera microdoxa*, Meyr., Proc. Linn. Soc. N.S.W., 231, 1878).
Healesville.

EUCARPHIA. Hb.

529. E. TRITALIS, Walk. (*Hypochalcia tritalis*, Walk., Cramb., 47; *Crambus vetustellus*, *ib.*, 176; *Eucarphia vulgatella*, Meyr., Proc. Linn. Soc. N.S.W., 207, 1878; *E. Cupheœlla*, *ib.*, 227, 1879).
Melbourne, &c.

TETRALOPHA. Zeller.

ETIELLA. Zeller.

530. E. CHRYSOPORELLA, Meyr. (Proc. Linn. Soc. N.S.W., 206, 1878).
Melbourne, Kewell.

531. E. BEHRII, Zeller (Is., 883, 1848).
Melbourne, &c.

EPICROCIS. Zeller. SALEBRIA. Hein.

531A. E GYSOPA, Meyr.
Melbourne.

*532. E. DIGRAMMELLA, Meyr. (Proc. Linn. Soc. N.S.W., 223, 1878).
Melbourne.

533. E. OCULIFERELLA, Meyr. (*Pempelia oculiferella*, Meyr., *loc. cit.*, 222, 1878).
Gisborne and Melbourne.

PEMPELIA. Hb.

534. P. HEMICHLÆNA, Meyr. (Tr. Ent. Soc. Lond., 260, 1887).
Melbourne, Kewell.

TYLOCHARES.

535. T. COSMIELLA, Meyr. (*Myelois cosmiella*, Proc. Linn. Soc. N.S.W., 212, 1878).
Melbourne, &c.

THE

Victorian Naturalist.

VOL. XII.—No. 6. SEPTEMBER, 1895. No. 142.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 9th September, 1895. The president, Professor W. Baldwin Spencer, M.A., occupied the chair, and there was an attendance of some 80 members and visitors.

REPORT.

A report of the excursion to Cheltenham was received from Mr. C. French, jun. A pleasant ramble over the heath ground resulted in the collection of a large number of orchids and other plants in flower.

LIBRARIAN'S REPORT.

The hon. librarian reported the receipt of the following donations to the library:—"Report of Secretary for Mines, Victoria, for 1894," from the Department; *Geelong Naturalist* for June, from Gordon College Natural History Society; "Transactions Royal Society of South Australia," vol. xix., part 1, from the Society; "Report of Trustees Australian Museum, Sydney," 1894, from Trustees; "Proceedings Royal Society of Queensland," vol. xi., part 1, from the Society; "Proceedings Natural History Society of Queensland," vol. i., 1892–3–4, from the Society; "Journal of Bombay Natural History Society," ix., No. 3, from Society; "Nature Notes," May, 1895, from Selborne Society; "Proceedings Academy of Natural History, Philadelphia," 1893, parts 2 and 3, from Academy.

VISITOR.

Mr. E. D. Atkinson, an honorary member of the Club, formerly of Tasmania, was introduced to the meeting by the chairman, and received a hearty welcome.

PAPER.

By Mr. Dudley Le Souëf, entitled "Trip to Mallacoota Inlet."

The paper gave an interesting account of an overland trip to this beautiful spot during last March, and was illustrated by limelight views prepared from the photographs taken. The discovery of gold-bearing reefs has greatly stimulated settlement, and with the increased facilities for ocean communication now

available it was contended that it would well repay the Club to organize a camp-out in the spring. The views, kindly shown by Mr. J. Searle, certainly showed that the locality is not wanting in beautiful scenery.

NATURAL HISTORY NOTES.

Mr. T. S. Hall, M.A., read a note on a new method for the extraction of friable fossils in sandy strata.

Mr. D. Le Souëf exhibited portion of the stomach of an eel, showing where a crayfish which it had devoured had perforated the lining of the stomach of its captor. The fish was caught by Mr. Macgregor at Macedon on a night line, showing that the injury did not prevent its feeding.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening :—By Mr. A. Coles.—Five bones forming complete toe of the extinct New Zealand Moa, *Moa giganticus*. By Mr. C. French, F.L.S.—Exotic moths: *Actias luna*, from North America ; *A. selene*, from Himalayas ; *A. mimosæ*, from South Africa. By Mr. C. French, jun.—Eggs of the following Australian birds, viz. :—Yellow-necked Mangrove Bittern from Queensland, White Tern from Norfolk Island, Princess of Wales Parrakeet, Red-backed Kingfisher, and White-breasted Turnix (new) from Central Australia, Australian Jabiru and Cat Bird from New South Wales. By Mr. W. H. Ferguson.—Photograph of Rock Wallaby on trees. By Mr. J. H. Gatliff.—*Struthiolaria papulosa*, Mart., *S. inermis*, Sowb., from New Zealand, and *S. (Pelecaria) scutulata*, Dish., from New South Wales. By Mr. S. A. Masters.—Orchid, *Pterostylis vittata*, from Healesville (new locality). By Mr. James Mitchell.—Specimen of Dendritic markings on Gneissose Rock from Broken Hill.

After the usual conversazione the meeting terminated.

EXCURSION TO CHELTENHAM.

This excursion took place on Saturday afternoon, 17th August, its principal object being the collection of botanical specimens. The route taken was down Charnwood-road to the beach. Among the first plants found in the ti-tree were the little hooded orchid, *Corysanthes pruinosa*, and *Cyrtostylis reniformis*, in flower. On the track down to the "fossil beds" splendid specimens of *Pterostylis curta* and the beautiful *Clematis microphylla* were collected, specimens of the latter measuring several yards in length. Proceeding further along the ti-tree towards Sandringham, the following orchids were collected, either

in flower or in bud :—*Acianthus exsertus, Pterostylis nutans, P. pedunculata, P. nana, P. concinna, Caladenia latifolia, Caladenia Patersoni*; also a large specimen of *Pterostylis longifolia*, this orchid being now very scarce in this neighbourhood. Returning towards the station across the heath ground, the following plants were noticed in flower :—*Hibbertia densiflora, H. stricta, Acacia oxycedrus, Styphelia virgata, S. humifusa, Craspedia Richea, Microseris Fosteri* (the native edible yam), *Hypoxis glabella, Aotus villosa*, &c.—C. FRENCH, jun.

ENTOMOGENOUS FUNGI.

By D. M'ALPINE.

(Read before Field Naturalists' Club of Victoria, 8th July, 1895.*)*

ENTOMOGENOUS fungi, or fungi growing upon insects, have already been brought under the notice of the Club, so that it will be unnecessary to dwell upon their general features. They seem to have reached their highest development in Australia, and are therefore worthy of our special attention and study.

During the month of May I received from Mr. French, Government Entomologist, the larva of a moth, *Darala* (sp.), obtained by the Rev. E. H. Hennell, as well as a cockroach, *Panesthia Australis*, with fungi growing upon them. I propose in this paper giving a general account of the latter, together with the description of a species of Isaria kindly handed to me by Mr. Kershaw.

1.—ENTOMOPHYTE ON COCKROACH (*Panesthia Australis*).

The insect is covered on the under surface of the body and sides as well as on the legs and slightly on the back with a white felty mould, inclining to cream colour. Under the microscope this is seen to consist of innumerable delicate threads or hyphæ, which are very fine, colourless, repeatedly branched, septate, and on an average about 2.5 to 3 μ. broad. The conidia, or reproductive bodies, are borne in tufts at irregular intervals along the hyphæ, and are also colourless, spherical, and averaging from 3 to 4 μ. in diameter. From the above description the fungus is seen to belong to the group of what are popularly called "moulds," or scientifically, *Hyphomycetes*. Next, it belongs to the order *Mucedinaceæ*, because the hyphæ are finely filamentous, pale in colour, lax and crowded, but not agglutinated together. Then it belongs to the section *Amerosporeæ*, because the conidia are spherical, continuous, and colourless; and to the sub-section *Macronemeæ* because the hyphæ are elongated and distinct from the conidia; to the tribe *Botrytideæ* because the conidia are inserted on simple or branched hyphæ. It is probably a species of

Botrytis, but I prefer to leave that point for the present undetermined. A similar fungus was found on larvæ of the Codlin Moth at the School of Horticulture, Burnley, by Mr. Hill, and if it should turn out to be a parasite preying upon the living and causing their death, then it might become of great economic importance if the spores were used to propogate the fungus upon the larvæ of injurious insects.

2.—ISARIA SURMATODES, M'Alp. (n. sp.)

A fungus growing upon a grub belonging to one of the Melolonthidæ was handed to me by Mr. Kershaw, of the Natural History Museum, Melbourne, for determination. The entomophyte proceeded from the under surface of the head, just immediately behind the mouth, and a specimen grew out on each side. They were slender, stiff, and strong, curving outwards like a horn, and of a dirty fawn colour. One specimen forked at the end of the horn-like curve, one of the branches projecting forward and downward relatively to the grub, about $\frac{3}{8}$ of an inch, twisting about in worm-like fashion and terminating in a blunt end of equal thickness with the rest. The other branch curved over the twisted one to the other side of the grub and terminated bluntly. The second specimen was comparatively short, projecting forward only about $\frac{3}{16}$ of an inch, and resembling a miniature antler of which one branch was broken off, leaving a knob. Microscopic examination revealed minute spherical, colourless conidia at the tips of the hyphæ towards the blunt ends, averaging about 3 μ. in diameter.

There is a Cordyceps described by Tulasne on a species of Melolontha—viz., *Cordyceps melolonthæ* (Tulasne, "Select. Fung.," carp. iii., p. 12, pl. i., fig. 32, 1865)—and popularly known as the Cockchafer Club, but the clubs are simple, and swollen above into a clavate head. This may be a conidial condition of some species of Cordyceps, but we have only evidence of its being an Isaria, and I propose to call it *Isaria surmatodes*, the specific name from the Greek, on account of its slender, stiff, *wiry* nature. It was found at St. Kilda (a suburb of Melbourne) about twenty years ago.

ON A METHOD FOR MOUNTING SMALL INSECTS FOR THE CABINET.

THE method of mounting small insects set on fine pins which is known as staging has been adopted by most of our leading systematic entomologists. Briefly, it consists in fixing the pin passed through the specimen into a block of soft substance mounted at some height up a stout pin, by means of which the

staged insect is pinned in the collection. In this way very fine and short pins can be employed to transfix the insects. There is no risk of bending them by forcing them into the cork of the drawer or by subsequent handling; the insects can be brought as near as desired to the glass, and the necessary label can be put on the stouter pins.

Staging has been but little adopted by collectors of British insects, who have less often to remove specimens from their collections for comparison, and who are sometimes remiss about labelling their specimens.

Its neglect is perhaps due to the want of satisfactory material from which to make stages. Pith (usually that of the Jerusalem artichoke), cork, pasteboard, and felt have all been tried.

At a recent meeting of the Entomological Society of London I exhibited a substance for staging which appears to be entirely satisfactory. My attention was called to it by examining the blocks on which were mounted some *Coleophora laricella* sent out by Herr Fric, of Prague. In answer to an inquiry, Herr Fric told me that his curiosity had also been aroused, and that he had vainly tried to learn their nature from the collector, an old man who, from his silence, was now probably dead. It was therefore necessary to make out the nature of the substance from examination of the blocks, and this investigation has proved successful.

The stages were made of the felted mass of a fungus fructification (strictly, the hymenophore of *Polyporus betulinus*). This material is as nearly as possible perfect. When of good quality it is pure white, dense, and even in texture, without holes, flaws, or hard places. It can be cut into any desired size, and when smoothly cut has a surface almost resembling that of fine plaster. It admits the very finest pins without turning the points, and it holds the pins firmly, which pith will not do. If fresh or slightly moistened by a sojourn in the relaxing box it is tough and cuts smoothly; when quite dry it is harder to cut and is slightly friable, though not materially so; when wetted it becomes soft and spongy, and a pin fixed in it can be easily released by applying a brushful of water round the insertion.

As to its lasting qualities, pieces used in Zeller's collection, which must be many years old, show no signs of deterioration, nor have they corroded the pins in any way. It has been suggested that the fungus may encourage the growth of mites or mould. This there is no reason to suspect. Though it absorbs moisture and will grow mouldy if kept damp, it does so only under conditions in which the insects themselves would be injured.

As it is not obtainable everywhere, and special apparatus and some skill are required to cut it uniformly and without waste, Messrs. Watkins and Doncaster, Strand, London, have under-

taken to supply it. The difficulty of cutting has been fairly well surmounted, and the material will be sent out in strips, which can be divided transversely into the required lengths with a very sharp knife (such as an old table knife well ground). An ounce of strips will mount from 750 to 1,500 or more specimens, according to the size of stage required. They should be handled as little as possible, as they easily show finger marks or forceps dents. The latter will come out if the strip is placed for an hour or two in a relaxing box, after which it cuts better, but it must not be allowed to touch the moist surface or it will be spoiled.

A drawerful of micro-Lepidoptera carefully staged on this material looks extremely neat. That the specimens are more secure against injury, and that the value of the collection is thereby increased can hardly be disputed.

It may be interesting to note that the fungus affords an excellent surface on which to print, so that it is perhaps possible to combine label and stage in one.—WALTER F. H. BLANDFORD, M.A., F.Z.S., in *Entomologist's Monthly Magazine*, August, 1895.

[Perhaps it would be possible to use one of our Victorian Polypori for the above purpose. We shall be glad to hear of experiments in this direction.—ED. *Vict. Nat.*]

DESCRIPTIONS OF NEW AUSTRALIAN PLANTS, WITH OCCASIONAL OTHER ANNOTATIONS;

BY BARON VON MUELLER, K.C.M.G., M. & PH.D., LL.D., F.R.S.

(Continued.)

PSORALEA WALKINGTONI.

Shrubby, erect, glabrous; leaves conspicuously petiolated, mostly trifoliolate; leaflets large, narrow-lanceolar, entire; flowers very large, on rather short peduncles; bracts small, as broad as long, acuminate; pedicels of very considerable length; calyx divided to the middle into deltoid-semilanceolor lobes; petals pale-lilac and partly white, all very much longer than broad, the two lateral petals somewhat shorter than the others; nine of the stamens high-connate; fruit much surpassed by the calyx, oblique-ovate, compressed, glandular-dotted.

Near Frew-Creek; W. B. Walkington.

Branchlets slightly streaked. Petioles to 1½ inches long; rachis to 1 inch. Leaflets to 5 inches long, to ⅔-inch broad, pale-green on the underside and also on the surface, minutely and copiously dotted, faintly venulated, on very short stalklets. Racemes to 3 inches long and remarkably broad. Pedicels

⅓–½-inch long. Bracts about ⅛-inch long. Calyx measuring about ⅓-inch in length. Petals to fully 1 inch long; the two lowest white except near the summit, producing a singular contrast in the colouration of the whole flower. Style as long as the stamens. Fruit about ⅙-inch long.

A highly ornamental plant, in its affinity nearest to *P. leucantha*, but with very much larger flowers, in which respect it surpasses all its numerous congeners.

A NEW METHOD FOR THE EXTRACTION OF FRIABLE FOSSILS.

In the *Compte-Rendu* of the Geological Society of France, 7th May, 1894, M. Charles Janet gives an ingenious method for the preservation and extraction of decomposed fossils in sandy strata. The beds at which he was working contained a great number of Turritellas, which were decomposed to a very friable condition, so that their extraction was impossible. He says that he obtained sufficient consolidation by pouring a fairly large quantity of boiled water over the rock *in situ*. The water was very slightly acidulated with sulphuric acid, and saturated with sulphate of lime. The sulphuric acid changed the carbonate of lime into the sulphate, and as the water, having been recently boiled, had no gas in solution, the relatively small amount of carbonic acid liberated in the process was readily dissolved. As, moreover, the water was already saturated with sulphate of lime, no more could be taken up. The fossils were superficially transformed into gypsum, and were then firm enough to be released by simply washing the sand. As M. Janet points out, this process of transformation of shells into gypsum takes place in nature under certain conditions, the sulphuric acid being produced by the decomposition of pyrite. The chief requisites for success seem to be very dilute acid and a fair length of time for the operation.

T. S. H.

ARTICLES OF INTEREST TO VICTORIAN NATURALISTS IN RECENT PUBLICATIONS RECEIVED.

In "*Transactions of the Royal Society of South Australia*," vol. xix., part 1 :—

"Correlation of the Marine Tertiaries of Australia," part 2 (Victoria continued), by Prof. R. Tate, F.G.S., and J. Dennant, F.G.S. Contains special notes on the Eocene beds at Cape Otway and River Aire, with lists of species and numerous illustrations.

In "*Transactions of New Zealand Institute*," vol. xxvii., 1894 :—

"Synoptical List of Coccidæ reported from Australasia and Pacific Islands up to December, 1894," by W. M. Maskell, F.R.M.S. Contains many Victorian species of Coccus.

GLACIERS.—An interesting article, entitled "The Discovery of Glacier Bay (N.W. America)," by John Muir, appears in the *Century Magazine* for June, 1895. It is well illustrated, and gives much information in a popular way on the progression and effects of glaciers.

MAGPIES.—During the last 20 years I have noticed from time to time a species of magpie which I am at a loss to understand. I at one time thought them to be the Black-backed (*Gymnorhina tibicen*), but during 1893 I had the pleasure of observing the true Black-backed bird in the Goulburn Valley, and they are decidedly smaller, besides which their song is very different to the birds I wish to draw attention to, and whose notes resemble those of the White-backed (*G. leuconota*). I am unaware if anyone has previously drawn the attention of the members of the Field Naturalists' Club to the existence of this particular magpie, and in doing so myself I would like to state that the birds are by no means rare, hence I cannot think them a freak, and, failing this, they must be either a cross between the Black-backed and White-backed, or another species altogether. My friend, Mr. A. Coles, has kindly promised to exhibit three of the Black-backed birds I am speaking of, also one White-backed one, all shot by myself in this district (Somerville), the latter bird for comparison as regards size. I would like further to say that the *true* Black-backed Magpie (*G. tibicen*) is never found here, and never, apparently, gets so far south. Though the three birds exhibited are, I believe, all males and old birds, I have seen many females, and also younger birds, though I never found them nesting at any time. They are not solitary in their habits, and I have always found them in company with the White-backed. Between Cranbourne and Dandenong, in the Lyndhurst district, they are fairly numerous during the autumn and winter months. As will be easily noticed, the amount of black on the back varies considerably, from a complete saddle to little more than a ring. Probably some members of the Club may be able to give some information regarding them.—GEO. E. SHEPHERD. Somerville, 3rd June, 1895.

A CATALOGUE OF VICTORIAN HETEROCERA.

By Oswald B. Lower, F.E.S.

Part XVII.

PYRALIDINA *(continued).*

LASIOSTICHA. Meyr.

536. L. ANTELIA, Meyr. (*Lasiocera antelia*, Meyr.)
Victoria.

HEOSPHORA. Meyr.

537. H. PSAMATHELLA, Meyr. (*Anerastia psamathella*, Meyr., Proc. Linn. Soc. N.S.W., 234, 1878; *A. nitens*, Butler, Tr. Ent. Soc. Lond., 440, 1886).
Fernshaw.

ANERASTIA. Hb.

*538. A. DISTICHELLA, Meyr. (*Homœosoma distichella*, Meyr., Proc. Linn. Soc. N.S.W., 215, 1878).
Melbourne, Mount Macedon.

CROCYDOPORA. Meyr.

539. C. CINIGERELLA, Walk. (*Nephopteryx cinigerella*, Walk., Supp., 1,719; *N. stenopterella*, Meyr., Proc. Linn. Soc. N.S.W., 200, 1878).
Fernshaw, Melbourne, &c.

ERNOPHTHORA. Meyr.

HYPOPHANA. Meyr.

540. H. HOMOSEMA, Meyr. (Tr. Ent. Soc. Lond., 264, 1887).
Melbourne.

BALANOMIS. Meyr.

HOMÆOSOMA. Curt.

541. H. VAGELLA, Zeller (Is., 863, 1848; Meyr., Proc. Linn. Soc. N.S.W., 214, 1878).
Melbourne, &c.

*542. H. FORNACELLA, Meyr. (*Nephopteryx fornacella*), Meyr., *loc. cit.*, 219, 1878).
Gisborne.

EPHESTIA. Gn.

543. E. ELUTELLA, Hb.
Melbourne.

544. E. DESUETELLA, Walk. (*ficulella*, Barrett).
Melbourne.

545. E. INTERPUNCTELLA, Hb.
Melbourne, &c.

Family—OXYCHIROTIDÆ.

OXYCHIROTA. Meyr.

Family—PTEROPHORIDÆ.

COSMOCLASTIS. Meyr.

TETRASCHALIS. Meyr.

TRICHOPTILUS. Wlsm.

*546. T. SCRYTHRODES, Meyr. (Tr. Ent. Soc. Lond., 13, 1886).
Kewell.

*547. T. CERAMODES, Meyr. (*loc. cit.*, 14, 1886).
Melbourne.

*548. T. XERODES, Meyr. (*loc. cit.*, 1886).
Gisborne, Ararat, Sandhurst.

SPHENARCHES. Meyr.

*549. S. CAFFER, Zeller (*Oxyptilus caffer*, Z., Lin., Ent., vi., 348; Caff., 118; *O. anisodactylus*, Walk., 93; *O. Walkeri*, Wlsm., Tr. Ent. Soc. Lond., 279, 1881; *Sphenarches synophrys*, Meyr., *loc. cit.*, 17, 1886).
Windsor.

PLATYPTILIA. Hb.

*550. P. EMISSALIS, Walk. (*Platyptilus emissalis*, Walk., 930).
Dandenong Ranges.

ACIPTILIA. Hb.

*551. A. APTALIS, Walk. (*Aciptilus aptalis*, Walk., 950; *Aciptilia aptalis*, Meyr., Tr. Ent. Soc. Lond., 425, 1885).
Melbourne.

DOXOSTERES. Meyr.

*552. D. CANALIS, Walk. (*Pterophorus canalis*, Walk., 948; *Doxosteres canalis*, Meyr., Tr. Ent. Soc. Lond., 425, 1885).
Gisborne, Melbourne.

MIMESEOPTILUS. Wallgr.

CENOLOBA. Wlsm.

AGDISTIS. Hb.

Family—ALUCITIDÆ.

ALUCITA. Zeller.

*553. A. PHRICODES, Meyr. (Tr. Ent. Soc. Lond., 20, 1886).
Prahran.

TORTRICINA.

Family—TORTRICIDÆ.

MICTONEURA. Meyr.

554. M. FLEXANIMANA, Meyr. (Proc. Linn. Soc. N.S.W., 490, vi., 1881).
Sale.

PROSELENA. Meyr.

555. P. PHILERIS, Meyr. (MSS.)
Melbourne.

PALÆOTOMA. Meyr.

556. P. STYPHELANA, Meyr. (Proc. Linn. Soc. N.S.W., 423, vi., 1881).
Gisborne, Castlemaine, Melbourne, &c.

ISOCHORISTA. Meyr.

*557. I. PANÆOLANA, Meyr. (*loc. cit.*, 425).
Melbourne, Gisborne.

ATELODORA. Meyr.

ARISTOCOSMA. Meyr.

ADOXOPHYES. Meyr.

THRINCOPHORA. Meyr.

ACROPOLITIS. Meyr.

*558. A. MAGNANA, Walk. (*Tortrix magnana*, Walk., B. M. Cat., 330; *Acropolitis magnana*, Meyr., Proc. Linn. Soc. N.S.W., 434, 1881).
Gisborne, Healesville.

559. A. DOLOSANA, Walk. (*Tortrix dolosana*, Walk., B. M. Cat., 331; *Acropolitis dolosana*, Meyr. Proc. Linn. Soc. N.S.W., 435, 1881).
Gisborne, Melbourne, &c.

*560. A. LIGNIGERANA, Walk. (*Paedisca lignigerana*, Walk., B. M. Cat., 380; *Acropolitis lignigerana*, Meyr., Proc. Linn Soc. N.S.W., 437, 1881).

561. A. SIGNIGERANA, Walk. (*Tortrix signigerana*, Walk., B. M. Cat., 332; *Sciaphila radisana*, *ib.*, 377; *Acropolitis signigerana*, Meyr., Proc. Linn. Soc. N.S.W., 438. 1881).
Melbourne, Gisborne, Kew, &c.

PYRGOTIS. Meyr.

562. P. INSIGNANA, Meyr. (Proc. Linn. Soc., N.S.W., 440, 1881).
Melbourne, Gisborne, Stawell.

CAPUA. Stph.

563. C. DECOLORANA, Walk. (*Grapholita decolorana*, Walk., B. M. Cat., 392; *Capua decolorana*, Meyr., Proc. Linn. Soc., 447, 1881).
Gisborne, Mt. Macedon, Melbourne.

564. C. VACUANA, Walk. (*Conchylis vacuana*, Walk., B. M. Cat., 367; (*Grapholita mutatana*, *ib.*, 393; *Capua vacuana*, Meyr., Proc. Linn. Soc. N.S.W., 448, 1881).
Melbourne.

565. C. HEMICOSMANA, Meyr. (Proc. Linn. Soc. N.S.W., 449, 1881).
Warragul.

*566. C. MELANOCROCANA, Meyr. (*loc. cit.*, 450, 1881).
Melbourne.

*567. C. CHIMERINANA, Meyr. (*loc. cit.*, 452, 1881).
Melbourne.

568. C. SORDIDATANA, Meyr. (*loc. cit.*, 452, 1881).
Melbourne.

*569. C. OBFUSCATANA, Meyr. (*loc. cit.*, 453, 1881).
Gisborne.

570. C. OPHTHALMIAS, Meyr. (MSS.)
Melbourne.

ACROCEUTHES. Meyr.

ASTHENOPTYCHA. Meyr.

ANATROPIA. Meyr.

ANISOGONA. Meyr.

571. A. SIMILANA, Walk. (*Teras similana*, Walk., B. M. Cat., 300: *Pandemis mediana*, *ib.*, 311; *Anisogona similana*, Meyr., Proc. Linn. Soc. N.S.W., 466, 1881).
Melbourne.

DICHELIA. Gn.

572. D. ISOSCELANA, Meyr. (Proc. Linn. Soc. N.S.W., 471, 1881).
Gisborne, Richmond, &c.

573. D. CLARANA, Meyr. (*loc. cit.*, 475, 1881).
Melbourne.

574 D. COSMOPIS, Lower (Tr. Roy. Soc. S.A., 97, 1894).
Gisborne, Melbourne.

575. D. SOLANA, Walk. (*Teras solana*, Walk., B. M. Cat., 300; *Dichelia solana*, Meyr., Proc. Linn. Soc. N.S.W., 476, 1881).
Melbourne.

THE

Victorian Naturalist.

VOL. XII.—No. 7. OCTOBER, 1895. No. 143.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 14th October, 1895. The president, Professor W. Baldwin Spencer, M.A., occupied the chair, and about 80 members and visitors were present.

REPORTS.

The hon. secretary reported that the first meeting of a course of practical meetings for systematic botany had been held on Monday evening, 23rd September, when there was a good attendance. Mr. C. A. Topp, M.A., LL.B., F.L.S., who had kindly undertaken the duties of demonstrator, briefly pointed out the main divisions of flowering plants, and then the distinguishing features of several orders, such as Ranunculaceæ, Dilleniaceæ, Tremandreæ, Myrtaceæ, Leguminosæ, specimens of each being dissected by those present.

A report of the excursion to Sandringham on 14th September was received from the leader, Mr. C. French, F.L.S., who reported a good attendance of members and an interesting afternoon spent on the heath ground towards Cheltenham, which was almost a mass of wild flowers, some 60 species of plants in flower being collected, though nothing of any great rarity was obtained.

ELECTION OF MEMBERS.

On a ballot being taken, Messrs. S. W. Jackson, G. Mowling, D. Le Souëf, and Webb were duly elected members of the Club.

PAPERS.

1. By Mrs. W. Martin, entitled "Notes on Fertilizers."

This paper referred to the parts played by fungi and earthworms in fertilizing or otherwise improving the soil for agricultural purposes.

In the discussion which followed, Professor Spencer, in referring to the influence of earthworms in opening up the soil, questioned whether, for example, the Giant Earthworm of Gippsland was of especial use in this respect. He was rather of opinion that, as had been suggested to be the case in Africa by Professor Drummond, so in Australia, ants were of greater service than earthworms for the purpose.

Mr. D. M'Alpine complimented the authoress on a very sugges-

tive paper, and hoped that other ladies would follow her example and share in the scientific work of the Club.

2. By Mr. F. L. Billinghurst, communicated by Mr. T. S. Hall, M.A., entitled, "Notes on the Fauna of the Castlemaine District—Butterflies."

The author pointed out the necessity and desirability of all collectors recording their observations, as an aid to other workers in the same fields, and as a means of working out the geographical range of animals and plants. He then gave a list, with notes, of the butterflies he had met with in the Castlemaine district, comprising some 23 species.

NATURAL HISTORY NOTE.

Mr. H. T. Tisdall, F.L.S., read a brief note on the occurrence of a white substance, evidently thistledown, which had fallen like snow at the Barwon River.

LOUIS PASTEUR.

Baron Sir F. von Mueller, K.C.M.G., who had been detained by another engagement, then addressed the meeting with reference to the death of the great French scientist, Louis Pasteur, as follows:—"It behoves us in a union like ours, when a great leader in scientific thought has passed away, to offer our mournful homage. Now it is Louis Pasteur, whose luminous career has come to a close. As an original thinker, as a close investigator, and as an operator of the most practical tendencies, he has earned the admiration of the human universality, and has 'left his footprints on the sands of time.' The light he shed on what we might call the organized atoms must call forth the most grateful recognition also within our own circle here, where the individually vitalized cellules become so often objects of research. Whether we consider these minutest of beings in their action on the human and animal organisms, or in their relation to technical industrial pursuits, mankind will ever remain under a deep obligation to Pasteur. Well do the elder of us remember, how he, nearly thirty years ago, unbound the spell, which paralyzed, through the Nosema- and Botrytis-diseases, the great silk-industry far beyond France, Baron Dumas drawing his illustrious disciple into those lines of restorative measures, which Pasteur independently laid out. But it was long before, that he whose loss we now lament arose on the horizon of knowledge in youthful brightness, as at the age of 23 he was called to a prominent professorship, and at the age of 32 he was chosen to organize, in the elevated position of dean, one of the greatest science faculties in a land celebrated for its learning. At 36 he commenced those memorable inquiries on fermentive germs, which exercise such important bearing on one of the largest of rural efforts, and will ever continue to do so. His star rose still

higher when late in life he led in many directions the way, by adopting a great hygienic principle, emanating empirically in Britain precisely 100 years ago, with strict scientific application and with unequalled exactitude, to subduing maladies, which might decimate the human population and threatened to deprive it of a chief share of its sustenance. To such a man the triumphs of his achievements are his greatest rewards! But his compatriots remain not unmindful in recognizing the worldly blessings conferred. It seems out of place to draw into this public eulogy individual feelings of my own, yet emotions of gratitude, especially at this moment of sadness, do prompt me to allude to a gracious act of Pasteur's scientific influence, of which I must remain ever conscious and proud. It signalizes the sense of such a hero in science, when, as a last wish, he desired his worldly rest within the precincts of his own institution, when his tomb could have been in the Pantheon—the Westminster Abbey of the French—while the significant fact that the President of the Republic followed as a national mourner the remains to their last resting-place.

EXHIBITS.

The following were the principal exhibits of the evening:—By Miss Cochrane.—Wild flowers from Ringwood and Sandringham; also, paintings of Victorian orchids. By Mr. J. Gabriel.—Wild flowers from Western Australia, including *Anigozanthus Manglesii* (Kangaroo Paw). By Mr. R. Hall.—Skins of Spotted Rail, from Box Hill, and White-breasted Swallow, from Swan Hill. By Baron F. von Mueller, K.C.M.G.—A new Psoralea, discovered by Mr. W. B. Walkington at Frew's Creek, with larger flowers than any of its congeners, numbering fully one hundred, from all parts of the world; very minute specimens of *Plantago coronopus*, variety *Husseyana*, found by Miss Hussey near Encounter Bay: from the weight of a number of dried specimens, with flowers, roots, &c., it is estimated that it would take 5,280 to make up half an ounce, the weight of an ordinary letter; such a minute form is never produced in the British home of the species, where a single specimen will average ½ oz., our winterless climate causing it to appear as an early spring plant; *Pimelea Husseyana*, from Encounter Bay; a Caladenia of the series *C. Cairnsiana*, approaching *C. dilatata*, found by the Misses Wise near Sale; also specimens of *Glossodia major* with double labellum, found near Mt. Alexander by Mr. F. L. Billinghurst, of Castlemaine; a collection of wild flowers from Sandringham, and local wild flowers on behalf of the Field Ramblers' Club, Castlemaine, Mr. G. Knight, J.P., of Bendigo, Miss Henley, of Beechworth, and Miss May Wise, of Sale. By Mr. G. Sweet, F.G.S.—Types of scales, neural spines, and vertebræ of *Cladocyclus Sweeti*, figured and described by Mr. A. S. Woodward, F.G.B.,

British Museum, in the *Annals and Magazine of Natural History* (6th series, vol. xiv., p. 445, pl. x., figs. 2–6), from the Cretaceous rocks of Flinders River, Central Queensland. By Mr. H. T. Tisdall, F.L.S.—Flowers of *Hakea grammatophylla*, a rare species, grown by Mr. Adcock, Highton, near Geelong.

After the usual conversazione the meeting terminated.

TRIP TO MALLACOOTA INLET.

By D. Le Souef.

(Read before Field Naturalists' Club of Victoria, 9th September, 1895.)

We left Melbourne on Monday, 4th March, by the first train, and on arrival at Sale went on board the steamer for the Lakes' Entrance. On passing down the Thomson River we noticed that Coots (*Fulica Australis*) were very numerous on the banks, quite flocks of them in places, and the tops of the rushes along the water's edge were in many places broken and bent together by the birds to enable them to secure a foothold. The swamps about here were mostly quite dry, which accounted for so many birds being on the river banks.

Several Whistling Eagles were also noticed, and we saw some of their old nests situated high up in the redgum trees. When passing through the Lakes many hundreds of Black Swans were seen on their favourite feeding grounds in the shallow water close in to the shore. The steamer passed very near to one lot of about 150 birds, and with a great deal of noise, caused by their running on the surface of the water when getting under way, they took to flight, and it was a beautiful sight, the white on their wings showing in contrast against the dark background. There was nothing very beautiful about the Lakes themselves, the water being muddy and the shores low, but when the narrower parts were reached, not far from the entrance, the scenery became much more interesting. Very few ducks were seen.

We arrived at the Lakes' Entrance at 8 o'clock in the evening. The following morning we left in a buggy and four horses for Orbost, on the Snowy River, a distance of thirty-five miles, over a very bad road. Fortunately it was dry and dusty when we passed over it, but, judging from the numerous dried-up holes and deep ruts, we could easily see what it must be like in the winter. While driving along we noticed or heard the Coachwhip Bird, Gang-Gang Cockatoo, Grey Crow-Shrike, Shining Fly-catcher, Fire-tail Finch, Harmonious Shrike-Thrush, White-backed Magpie, Laughing Jackass, and the Bell Bird, with its clear note. A spider's nest was noticed. There were 16 cocoons, and the one I opened had 256 young spiders in, and if each of

the cocoons had the same number in it would make a total of 4,096 young spiders—not a bad brood. At one place on the roadside the scrub was on fire, and we had some difficulty in getting our horses past. The scenery was for the most part very monotonous, with heavy timber more or less all the way, and most of the country had been recently burnt, which did not add to its beauty. A few tracks of lizards and snakes were seen on the dusty road, but they were not numerous. Bush rats and mice were plentiful, and their footprints often seen. Although a considerable distance from the ocean we could occasionally hear the noise of the surf breaking on the shore.

We arrived at Orbost at 5 o'clock. The town is situated on the banks of the Snowy River, which we had imagined as being a clear, pellucid stream, but found on the contrary that it was very muddy. Every now and then a heavy flood comes down and submerges most of the river flats, destroying any crops that may be growing there and covering the soil in many places feet deep with sand. The occurrence of these floods is a great drawback to the prosperity of the place.

There were wonderful crops of maize and flax growing here. The latter especially looked well, and although a recently-tried plant, seems to be a thriving one. We were shown some plants 15 feet in length, and the average height of the crops was about 12 feet. We were told that it grew about one foot a week. When ready it is cut and made into bundles and then steeped in water for about eight days; it is then dried and crushed to get the bark and pith off.

We left Orbost again for Marlo at 6 o'clock, on horseback, a pack-horse carrying our luggage. As the punt over the Brodribb River was not working, we had to go over the bridge along a very rough road, which made the distance 15 miles, and we reached Marlo about 10 o'clock p.m. The situation of this place is very fine, overlooking the valley of the Snowy River on one side and the open ocean on the other, both being but a short distance away. Early next morning a start was made for the Bemm River, a distance of 25 miles. On the way a detour was made up the Cabbage-tree Creek to see some of the Cabbage-tree Palms, and we found a specimen, some 60 ft. in height, growing on the banks of the creek. Continuing our journey along a fairly good road, the Bemm River Hotel was reached during the evening. The country passed through was mostly very poor and covered with Bayonet Grass and Eucalyptus. Shortly after leaving Marlo we passed close to the ocean beach, but on high land, and on the unruffled surface of a backwater, separated from the ocean by a low sandbank, numbers of Musk Duck, Black Duck, and Teal were enjoying themselves. The first named were generally in small companies of about seven birds, possibly the young with

their parents. In the neighbourhood of Bemm River we were told that Dingoes were very numerous, and also Platypus in the waterholes. Emus are also seen in the open country, as well as Kangaroos, but they are not numerous. The last flood in this river rose to a height of 30 ft., and occurred in January, 1894, and must have destroyed an immense number of birds' nests and their contents, which were built near the river bank—a favourite place for birds. We left next morning for the Cann River, 20 miles distant, and during the day noticed the Black Cockatoos, *Calyptorhynchus Leachii*, Sulphur-crested Cockatoos, Leather-heads, *Philemon corniculatus*, Coachwhip Birds, White Goshawks, Reed Warblers, Emu Wrens, Ground Thrush, Little Grass Bird, Gang-Gang Cockatoos, White-throated Nightjar, Bell Birds, Superb Warblers, Pipits, Flame-breasted Robins, Lewin's Honey-eater, King Parrots, and other birds, and at the various stopping places we generally saw, fastened up on the wall, the tail of the Leach's Black Cockatoo, with the red bars across. At the Cann River there is an accommodation house, where we stayed for the night, and left again in the morning for the Genoa River, 35 miles

This part of the journey was by far the most interesting. The road was for the most part over a roughly and newly cut track, which in some places went down a steep hillside and up again on the other at an equally acute angle. Now the track lay over a hill of granite, then again over another hill of slate and quartz, and so on. In many places there was every indication of gold-bearing country, but being difficult of access it is mostly untried. Splendid forests of ironbark and other trees were passed through, and fern trees were plentiful in the deep beds of the creeks, and we heard the clear call of the Lyre-Bird on several occasions in such localities, and every now and then we had beautiful glimpses of distant views from our mountainous track, as it wound along the crests of the hills. Occasionally we passed through belts of stunted timber on swampy ground, but not often. Black Cookatoos were seen on several occasions among the tall timber, but only one snake was seen and despatched, a Copper-head, though, as the weather was very hot during our journey, we had expected to have seen more of them. Lizards were numerous, and two Iguanas, *Varanus Gouldi*, were noticed, and one Copper-head Snake killed; also the tracks of an Echidna and many holes were seen in Termites' or White Ants' mounds which these animals had burrowed in their search for food. Near the house at the Cann River was a large blackberry hedge, which was in full bearing at the time of our visit. Numbers of Grey Crow-Shrikes came to it to eat the fruit, and I watched a little Collared Sparrow Hawk, which was sitting on a neighbouring willow tree, suddenly swoop down and fly along the hedge on one side and return to his willow tree along the other side, upsetting

and disturbing all the Shrikes that had settled on the hedge to feed. They were all driven off, and one or two that the little hawk had struck in passing called out loudly in their fright, yet the Sparrow Hawk was not nearly as large as they were. He seemed to disturb them for amusement, as I watched him do the same thing several times, and it evidently was not for the purpose of procuring food. These Shrikes took other fruit besides the blackberries, in the same way that crows occasionally do, and being large birds, soon destroyed a good deal. We noticed a few Harmonious Shrike-Thrushes, Spur-winged Plovers, Southern Stone Plovers, White-fronted Herons, Brown Hawks, Brown Tree-Creepers, Yellow-breasted Robins, and Black-faced Graucalus. Bell-Birds were numerous, and it is puzzling why they should be so local, as you come across large numbers of them in a certain place—of course, always near water—both in low and high timber, and yet you may pass many other such places and not hear a bird, and then come across them again, generally a good many miles away. Not only do they appear to be very local, but they seem always to live in large flocks, and you rarely, if ever, come across a single pair of birds far away from the others. The beautiful nest of a Flame-breasted Robin was noticed, snugly built between the interstices of a rough piece of bark.

We reached the accommodation house at Genoa at sundown, and turned all our horses out, as the rest of the journey was to be by boat. On the river flat here were large crops of maize, and when nearly ripe store pigs were turned into them, where they rapidly became fat, rooting up the maize plants and feeding on the corn. The pigs were then sent to Twofold Bay, a distance of 60 miles, to be shipped to market—it paid better than selling the grain. Black, Tiger, and Copper-head Snakes are found here, and the Water Lizard is often seen lying basking in the sun on the rocks or logs close to the water's edge, but directly they are disturbed down they go into the water, and consequently are difficult to capture alive. In the river eels are plentiful, and we were informed of some having been caught weighing 28 lbs. each —a large size—and if set nets are used many of the fish caught are eaten by the eels before the morning. On one occasion a Water Lizard, which had been partly disabled, jumped into the water, and while it was swimming on the surface a large eel seized it and dragged it down, and it did not reappear. Platypus were also numerous, and one large specimen was caught in a net during our visit, but escaped from captivity during the night. They will climb out of almost anything, and Echidnas are equally as proficient in the same art. The Platypus are generally caught here in nets, and as far down the river as Gipsy Point, where the water is quite salt; and in times of flood they have

gone down the river to the Upper Mallacoota Inlet in fresh water, and when the river returned to its normal condition they have been caught in the salt water; they were plentiful enough where the water was brackish. We left the next morning by boat for Mallacoota Inlet, a distance of 25 miles down the Genoa River.

The stream for the first few miles was narrow, occasionally partially obstructed by fallen timber, but as we got further down it widened out considerably, and gradually became brackish as it neared the Upper Mallacoota Inlet. When being rowed down the river we occasionally disturbed some Black Ducks, but very few, and we passed a colony of small Black Shags resting over the water on the exposed limbs of an old dead tree which had fallen into the river. Some swallows were noticed high in the air chasing a hawk, when the latter bird took a rapid dive almost in a perpendicular line towards the earth and alighted on a tree near the river. A pair of Ospreys watched us as we passed by, and further on we saw a pair of the beautiful White-bellied Sea Eagles, which let us pass comparatively near them, and within easy shooting distance, but they were not disturbed. A few Nankeen Night Herons were also seen, and several specimens of the Little Black and White and the Australian Cormorants, but waterfowl were not plentiful. When in the salt water we trailed a line behind the boat and caught a few Skipjack. The Upper Inlet was about three miles long and two broad, and was connected with the Lower by a passage about a mile in length, with fairly high land on each side. On passing through this we came to Mallacoota Inlet, which is about seven miles long by four broad.

We had often heard of its beauties, but it far exceeded our expectations. The water is salt and very clear, and the banks covered with timber to the water's edge. Many of the gullies that ran down to the inlet were clothed with thick, dark scrub, often festooned and matted together with creepers, and their dense shade afforded a cool retreat for the birds. It has various arms running inland some distance, and the coast line is very broken, making numerous little bays, some with sandy shores, others rock or gravel. Quartz and sandstone reefs are to be seen in places on some of the steep banks running into the inlet, and some of these are now being worked and proving highly gold-bearing, and Mallacoota, at no distant date, will be doubtless the centre of a large mining district. The clear waters teem with fish of various kinds, Mullet, Skipjack, Schnapper, and Flathead being especially plentiful. On the shore the Brush-tailed Wallaby and Red-bellied Wallaby are abundant, as well as Wonga-Wonga and Bronze-wing Pigeons. Some parts of the inlet are shallow, and at low water sandbanks are left exposed

here and there, and on them are generally to be seen Black Swans, Ducks, Gulls, &c. Near the bar are several islands of various sizes and shapes, and they are the favourite haunt of the Spur-wing Plovers and White-fronted Herons. Away in the distance all round may be seen various ranges of mountains, the highest point being Genoa Peak, over 1,000 feet high, the Howe Range, Table-top Mountain, Nad-gee Range, &c., &c.; and the views over the inlet, being backed by these mountain ranges at varying distances, are very beautiful, of which photographs give a very faint representation. The bar has a high cliff on one side, and a long range of low sandhills on the other. The depth of water at low tide is about 9 feet, and small steamers and schooners can go in and out, weather permitting. All the coast line about here appears to be rising, and various old sea beaches, now covered with scrub, can be seen. There is a comfortable hotel here, which is situated on a high point overlooking the inlet, and boats can be hired by visitors. The inlet can be reached by schooner from Melbourne *(Orbost)* or by a weekly steamer from Bairnsdale, the *Lady Harriet*, or overland the way described. We spent the whole day there, returning on the afternoon of the next day to Genoa, and so on back to Melbourne by the same route we had come by, after having had a most enjoyable and interesting outing.

[The paper was well illustrated with lantern slides from photographs taken by the author.—Ed. *Vict. Nat.*]

THE LATE J. BRACEBRIDGE WILSON, M.A., F.L.S.

It is with great regret we record the death of another Victorian naturalist—the fourth such loss during the current year. Mr. Jno. Bracebridge Wilson, M.A., F.L.S., passed away at the age of 67 on the 22nd October. In his position as head master of the Church of England Grammar School, Geelong, for the past twenty-two years, he had made hosts of friends all over Australia, who will deeply feel his loss. Among biologists his name will long be remembered as an enthusiastic collector of the sponges and algæ of the vicinity of Port Phillip Heads, where he was accustomed to spend all his holidays dredging for fresh material to be forwarded for working out to such friends as the late Dr. Macgillivray, of Bendigo, Baron von Mueller, Professor M'Coy, F.R.S., Melbourne University, or Dr. Dendy, now of Christchurch, New Zealand; or through them to the leading specialists of England or the Continent. He was for a number of years a member of the Field Naturalists' Club of Victoria, and took considerable interest in the work of the Geelong Field Naturalists' Club.

FLOWERING TIMES OF ORCHIDS.

By C. M. Maplestone.

In a recent paper on the above subject by Mr. C. French, jun., the hope was expressed that other members of our Club would publish their observations on the flowering times of the Victorian orchids. This order of plants has been a favourite study of mine for many years past, during which I have accumulated a quantity of notes respecting their flowering times, and have thus been enabled to draw up an "Orchid Calendar." My notes having been made in various parts of the colony consequently give a greater range of flowering times than those recorded by Mr. C. French, whose observations were chiefly confined to the Melbourne district. As these additional records might be somewhat misleading by themselves, in the table herewith is given the whole of the Victorian orchids, with their flowering times, principally from my own observations, but including also all records of such in the *Victorian Naturalist* to date. It will be seen from the list that there are still several species whose flowering times have not yet been recorded in the *Naturalist*, and the attention of the student is thus directed to its deficiencies.

Orchid Calendar.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Dendrobium speciosum ...	...	...	...	...	...	...	...	...	...	...	*	...
striolatum ...	...	...	...	...	...	...	...	...	...	...	...	...
Sarcochilus parviflorus ...	...	...	...	...	...	...	...	...	...	...	*	*
falcatus ...	...	...	...	...	...	...	...	...	...	...	...	...
Dipodium punctatum ...	*	*	...	...	...	...	...	...	...	...	*	*
Gastrodia sesamoides ...	*	...	...	...	...	...	...	...	...	*	*	*
Calochilus Robertsoni ...	...	...	...	...	...	...	...	*	*	*	*	*
Spiranthes Australis ...	*	*	...	...	...	...	...	...	...	...	...	...
Thelymitra aristata ...	...	...	...	...	...	...	...	...	*	*	*	*
ixioides	...	...	...	...	...	...	...	...	...	*	*	...
epipactoides ...	...	...	...	...	...	...	...	...	*	*	...	...
longifolia	...	...	...	...	...	...	...	...	*	*	*	...
antennifera	...	...	...	...	...	...	...	...	*	*	*	...
Macmillani	...	...	...	...	...	...	*	*	*	*	...	...
carnea	...	...	...	...	...	...	...	...	*	*	*	*
flexuosa	*	...	...	...	...	...	...	...	*	*	*	...
Elizabethæ	...	...	...	...	...	...	...	...	...	*	...	...
fuscolutea	...	...	...	...	...	...	...	...	...	...	*	*
M'Kibbini	...	...	...	...	...	...	...	...	*	...	...	...
Diuris maculata	...	...	...	...	...	...	...	*	*	*	*	...
palustris	...	...	...	...	...	...	...	...	...	*	*	*

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Diuris punctata ...	...	...	...	...	...	...	...	...	*	*	*	*
alba ...	...	...	...	...	...	...	...	...	...	*	*	...
longifolia ...	...	...	...	...	...	...	...	*	*	*	*	...
sulphurea ...	...	...	...	...	...	...	...	*	*	*	*	*
pedunculata ...	...	...	..	...	...	...	...	*	*	*	*	...
M'Kibbini ...	...	...	...	...	...	...	...	...	...	...	...	...
aurea ...	...	...	...	...	...	...	...	...	...	...	...	...
Orthoceras strictum ...	...	...	...	...	...	...	...	...	...	...	*	*
Cryptostylis longifolia ...	*	*	..	...	...	...	...	*	*	*	*	*
leptochila ...	*	*	*	*	...	...	...	...	...	...	...	*
Prasophyllum elatum ...	...	...	...	...	...	...	...	...	*	*	*	*
flavum ...	...	...	...	...	...	...	..	...	...	*	*	...
Australe ...	*	...	...	...	...	...	...	...	...	*	*	*
brevilabre ...	...	...	...	...	...	...	...	...	...	...	...	...
Frenchii ...	...	...	...	...	...	...	...	...	*	*	*	...
patens ...	*	*	...	...	...	...	...	...	*	*	*	*
nigricans ...	...	...	...	...	*	*	...	...	...	...	...	...
fuscum ...	...	...	...	...	...	...	...	...	...	*	*	...
alpinum ...	...	*	*	...	...	...	...	...	...	...	...	...
rufum ...	...	...	...	*	*	...	...	...	...	...	...	...
despectans ...	...	...	...	*	*	...	...	...	...	...	...	...
Archeri ...	...	...	*	*	*	*	...	...	...	...	...	...
intricatum ...	*	*	...	*	*	*	...	...	...	...	...	...
Dixoni ...	...	...	*	*	*	*	...	...	...	...	...	...
fimbriatum ...	...	...	..	...	...	...	...	..	...	...	...	...
Microtis porrifolia ...	*	...	...	...	...	...	...	*	*	*	*	*
minutiflora ...	*	...	...	...	...	...	..	...	*	*	*	*
Corysanthes pruinosa ...	...	...	...	...	...	*	*	*	...	...	...	...
unguiculata ...	...	...	...	...	...	*	*	...	...	...	...	...
Pterostylis concinna ...	*	...	...	...	*	*	*	*	*	*	*	*
curta ...	*	...	...	*	*	*	*	*	*	*	*	*
M'Kibbini ...	...	...	...	...	...	*	*	...	*	*	...	...
acuminata ...	...	...	...	*	*	...	...	...	...	...	...	...
nutans ...	...	...	...	...	*	*	*	*	*	*	*	*
pedaloglossa ...	...	...	...	*	*	*	...	...	...	...	...	...
pedunculata ...	...	...	...	...	...	...	*	*	*	*	*	*
nana ...	...	...	...	*	*	*	*	*	*	...	...	...
cucullata ...	*	...	...	...	...	...	...	*	*	*	*	*
grandiflora ...	...	...	*	*	*	...	...	*	...	...	...	...
reflexa ...	...	...	*	*	*	*	*	...	...	...	...	...
præcox ...	...	...	...	*	*	*	*	*	*	...	...	...
obtusa ...	...	...	...	*	...	*	*	...	...	*	...	...
parviflora ...	...	...	...	*	*	*	*	*	...	...	...	...
aphylla ...	...	...	...	*	*	*	...	...	...	...	...	...
barbata ...	...	...	...	...	...	*	*	*	*	*	*	*

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Pterostylis mutica ...	...	...	...	...	*	*	*	*	*	*	*	...
rufa ...	...	...	...	...	...	...	...	...	...	*	*	*
longifolia ...	...	...	...	...	...	...	*	*	*	*	*	*
vittata ...	...	...	...	...	*	*	*	*	*	*	...	...
Caleya major ...	*	...	...	...	...	...	...	*	*	*	*	*
minor ...	...	...	...	...	...	...	...	...	...	...	*	*
Acianthus caudatus ...	...	...	...	...	...	...	...	...	...	...	*	*
exsertus ...	...	...	...	*	*	*	*	*	...	...	...	...
Eriochilus autumnalis ...	...	...	*	*	*	...	...	...	...	...	...	...
fimbriatus ...	...	...	...	*	*	*	*	...	...	...	...	...
Lyperanthus nigricans ...	...	...	...	...	...	...	...	...	*	*	*	...
Burnetti ...	...	...	...	...	...	...	*	*	*	*	...	...
Cyrtostylis reniformis ...	...	...	...	...	...	*	*	*	*	*	*	...
Chiloglottis Gunni ...	*	...	...	...	...	...	...	...	...	*	*	*
diphylla ...	...	*	*	...	...	*	...	...	...	*	...	...
Glossodia major ...	...	...	...	...	...	...	...	*	*	*	*	...
minor ...	...	...	...	...	...	...	...	...	...	...	...	...
Caladenia Menziesii ...	...	...	...	...	...	...	...	...	*	*	*	...
Patersoni ...	...	...	...	...	...	...	...	*	*	*	*	*
latifolia ...	...	...	...	...	...	...	...	...	*	*	...	...
suaveolens ...	...	...	...	...	...	...	...	...	*	*	*	*
carnea ...	...	...	...	...	...	...	...	*	*	*	*	*
congesta ...	...	...	...	...	...	...	...	...	...	...	*	...
cœrulea ...	...	...	...	...	...	...	...	*	*	*	*	...
deformis ...	...	...	...	...	...	...	...	*	*	*	*	...
Cairnsiana ...	...	...	...	...	...	...	...	...	*	*	*	...
Drakea irritabilis ...	...	...	...	...	...	...	...	...	...	...	...	...

Select Extra-Tropical Plants.—Owing to an oversight we have omitted to announce the recent publication of the ninth edition of this well-known work, one by which the author, Baron F. von Mueller, K.C.M.G., Government Botanist of Victoria, has, if possible, added further lustre to his name, and at the same time conferred great benefits on the pioneers of agricultural and allied pursuits throughout Australasia. The present edition extends to 655 pages, exceeding the eighth (issued in 1888) by some 140 pages. The articles have received considerable revision. Particulars of several new economic plants have been included, together with notes of the experience gained with regard to others recommended in previous editions. Merely as a work of reference on botanical matters the book is a valuable addition to any library, while to any persons desiring to turn their attention to the productions of the soil it is simply invaluable, as the fact that it has run through so many editions amply proves.

THE

Victorian Naturalist.

VOL. XII.—No. 8. NOVEMBER, 1895. No. 144.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 11th November, 1895. The president, Professor W. Baldwin Spencer, M.A., occupied the chair, and some 60 members and visitors were present.

REPORTS.

Reports of the recent Club excursions to Melton and Berwick were received from the respective leaders, Mr. G. A. Keartland and Mr. D. Best.

The hon. secretary reported that the second practical meeting of the course in systematic botany was held on Monday evening, 4th November, under the direction of Mr. C. A. Topp, M.A. The attendance was good, and some useful work was done in dissecting plants, illustrating various orders.

ELECTION OF MEMBERS.

On a ballot being taken, Messrs. J. Harvie, A. Mattingley, and W. H. Terry were duly elected members of the Club.

PAPERS.

1. By Mr. O. A. Sayce, entitled "Formalin as a General Preservative for Animal and Vegetable Structures."

The author drew attention to the advantages of this newly introduced preservative over alcohol—namely, its cheapness, portability, and better results in the preservation of natural history objects with their original colours, and especially for those required for microscopical examination. The chemistry of the subject was briefly explained, and some original methods for increasing its penetration were also given. A large number of plants and animals preserved in formalin and in alcohol for comparison were shown in illustration of the paper.

Some discussion ensued, in which Professor Spencer and Messrs. J. Shephard and D. M'Alpine took part. Professor Spencer advocated a mixture of alcohol and formalin, as it had been found that formalin alone swelled up the tissues of some animals. Mr. D. M'Alpine remarked that he had found glycerine and kerosene very useful in preserving fruits.

The author, in reply, stated that he was inclined to think that

the reported failures with formalin arose from the fact that a too-diluted solution had been used, as it should be borne in mind that "formalin" is the commercial name for a saturated solution of formic aldehyde in water.

2. By Mr. H. T. Tisdall, F.L.S., entitled "Symbiosis between Fungi and Certain Dicotyledons."

After referring to the well-known symbiosis between algæ and fungi in the constitution of lichens, the paper dealt with the recently discovered partnership between many flowering plants, including not a few large trees and the hyphæ of fungi, which take the place of root hairs, and supply the tree with sap. The paper concluded by exhorting some of the members of the Club to follow up this line of research.

In discussing the paper, Mr. D. M'Alpine stated that they should not lose sight of the fact that many fungi are parasitic, and cause the destruction of their hosts.

NATURAL HISTORY NOTE.

Mr. G. Lyell, jun., of Gisborne, contributed a note on the life-history of the rare butterfly *Xenica Hobartia*, with detailed observations by Mr. E. Jarvis, of Macclesfield.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening:—By Mr. C. French, F.L.S.—Newly described beetles, *Ceratognathus Gilesi*, from Victoria, and *Rhytiphora Frenchi*, *Fornax coloratus*, *Stigmodera alternata*, and a moth, *Spilosoma Frenchi*, from North Queensland; also life-history of *Xenica Hobartia*, from larvæ, taken recently for the first time in Victoria by Mr. E. Jarvis, Dandenong Ranges. By Mr. C. French, jun.—Nest and eggs of Orange-winged Sittella, from Werribee. By Mr. W. H. F. Hill.—Fungus, *Isaria surmatodes*, M'Alpine, from South Yan Yean. By Mr. G. A. Keartland.—Skins and eggs of Western Black Cockatoo, *Calyptorhynchus stellatus*; Black-backed Superb Warbler, *Malurus melanotus*; Red-lored Pardalote, *Pardalotus rubricatus*; Crested Wedgebill, *Sphenostoma cristatum*; Port Lincoln Parrot, *Platycercus zonarius*; Keartland's Honey-eater, *Ptilotis Keartlandi*; also eggs only of Yellow-collared Parrakeet, *Platycercus semitorquatus*, Swift-flying Lorikeet, *Lathamus discolor*, Yellow-bellied Parrakeet, *Platycercus flaviventris*, and Brown Red-throat, *Pyrrholæmus brunneus*. By Mr. J. A. Kershaw.—Top of Tree Fern stem covered with the orchid *Chiloglottis Gunnii* in flower; third year of flowering since taken; grown by Mr. W. Kershaw, at Narracan, Gippsland. By Messrs. P. J. Ryan and W. H. F. Hill.—31 specimens of rare butterfly, *Ialmenus myrsilus*, with ova of same, from Gordons. By Mr. F. Spry.—Larva of butterfly, *Epinephile abeona*, Don.

After the usual conversazione the meeting terminated.

A RAMBLE AMONGST FERTILIZERS.

By Mrs. Flora Martin.

(*Read before the Field Naturalists' Club of Victoria, 14th October*, 1895.)

Amongst the various means or ways of fertilizing the land we may commence with weeds, which play a prominent part wherever overstocking has been done. If it were not for many plants noxious to animals the soil would be all washed away by the rains or blown away by the winds. The dictionary meaning of the word is misleading—namely, a useless or troublesome plant; a misplaced plant is more exact, as they can be turned to use when their various peculiarities, and even diseases, are studied—even those condemned by our laws, such as some of the thistles, brambles, Bathurst burr, and many plants of ill fame at present. Frequently the more noxious or offensive to stock the better the fertilizer when used in the proper manner and in the right time and place. The so-called Scotch thistles, having long tap-roots, feed deeply, and bring to the surface much that is required for herbaceous plants; also, as it is an annual, when the plant dies, where the long tap-roots have been the autumn rains penetrate quicker and to a greater depth; also, when thistles have been planted thickly and ploughed under, the spiny leaves do not collapse readily, so they aërate the soil as well as feed it with mineral matter nicely prepared for herbaceous plants, especially wheat. In ploughing under green plants for fertilizing, it is desirable to sow a plant causing fermentation in the land. After many experiments, straw, after having been used for animals' bedding, has always been found to give a quicker fermenting series. Thus sowing suitable fermenting plants before turning over the sod is the same as putting yeast in bread, and with care inducing a degree of warmth. This accounts for the great difference of opinion in the time to plough, some liking the warmth of autumn, others waiting for the spring heat; and it is important to turn under a warmth and a ferment with green herbage to have the greatest benefit in causing the so-called nitrification in the soil.

Many of these invaluable plants (though microscopic) are very touchy in having alkalies, or even too much acid (they frequently produce acidity) applied, and in this lies the want of success of many mineral fertilizers sold to feed plant life—often, as the farmer says, giving the best return in the second season. They have been too strong for the ferments to flourish, and thereby aërate the land, instead of which they, the "fertilizers," have to lose part of their strength before being of service. It does not follow that these ferments belong to a particular family. Though rust on straw quickly causes fermentation, other plants have accompanying plant-life, often causing disease in them, which

also cause fermentation in suitable nutrients. This is one reason for rotation of crops, as by changing the host-plant the spore of the disease-plant cannot live the next season on the new host-plant. If a spore of the wheat rust plant is sown with the wheat seed, and obtains a suitable amount of moisture and heat for its wants, but not sufficient to start the wheat seed into growth, the rust spore vegetates, and not finding the wheat plant ready for it, dies, and it then actually feeds instead of injuring the young wheat plant; so wheat seed from a field which has suffered from rust sometimes produces actually a crop free from disease. The slimy disease of potatoes also causes fermentation, but at this I have not worked much, but have seen sufficient to see in it a great source of animal diseases. As these so-called lower orders of plant life play such an active part in preparing food for the higher plants, we can only call these rusts or slimy diseases weeds when they are misplaced plants. Many common plants belonging to the Compositæ, such as the daisy, flat weed, &c., are liable to fungus disease, and offer a large field for work.

If thick stems of roses (brambles), chopped short (not too woody, a mistake made by the writer of this paper, using rotting —not rotted—wood as a fertilizer), are placed in the ground down too deep for ordinary cultivation to reach them, they form a source of good to the plants growing over them for many years. There is no doubt much of our scrub could be used advantageously in the same manner, instead of, as happened around the house where this was written (Drouin), last autumn, when quantities of plants, full of good oils, flamed around in all the grandeur and beauty of a forest fire, even appreciated in spite of the dread feelings it engendered. Grass seed quickly *sown* after these bush fires starts rapidly, as the fires bring up moisture from beneath, but also leaving it drier; they are often followed by light showers, seemingly attracted by the smoke; but, though six months ago, the hills before the window are black, and only the strongly protected seeds, or the lightly blown seeds from unburnt places, and the mosses, which prefer carbon, are starting into growth with the warmth of spring (August), and the waste of burning is written on the page of Nature. Though these fires consume much that is valuable, the result—wood ashes—are a most serviceable fertilizer on a farm. They can also be very profitably used, either there or on board of a ship where there are stock, in the feeding of pigs, horses, and fowls, but must be kept dry and clean for this purpose. Fire, of course, cleanses the land from objectionable animal and plant life as well as destroying useful life.

Many of the diseases of our fruit trees and vines are plants which cause fermentation—yeasts belong to these; and the well-

being of the trees is greatly benefited by keeping the trees clean and free from all their own decaying matter. This is best done directly all the leaves are off deciduous trees, or flowers and fruit are over in evergreens, dusting with dry ashes, lime, or sulphur —before syringing them with water, hot or cold—instead of using poisonous chemicals, while judiciously fertilizing them with the ferments necessary; the fermented foods, usually vegetable matter, but containing mineral ingredients also, if possible, and suitably prepared, are most readily used in a liquid state, and given frequently, but not too much at a time. This, however, is far too expensive for ordinary crops for market; still there are times when it can be profitably made and used. In our dry land we have to replace, as far as we can, the work of the earthworm. In part of a paddock fertilized by the burrowings of the Giant Earthworm, ten tons of potatoes were dug. Where no earthworms have been found, not three tons grew: so, ploughing in either spiny or herbaceous plants with tap roots, seems the nearest approach to aërating the land after the manner of the worms, and adding vegetable matter in a moist state, as well as a ferment plant, while alternating with the cultivation of peas and beans to improve the growing capabilities of the land.

Thirty years ago the attempt to turn into a garden a small piece of ground where the original surface soil had been covered with yellow clay gave an insight into the folly of burying the rich soil under air-tight clay, as when the soil was brought up to the surface it was positively injurious to plant life. If the same quantity of clay had been worked into the soil it would have been beneficial. This shows the want of success in trenching soils too deeply without any means for the air to penetrate. If the air can penetrate, then trenching is most valuable, provided the summer rains do not run down too deep too quickly, as in some of the deep rich forest soils, after the forests are removed, when they soon deteriorate. From this perpetual motion is necessary for the fertility of a field or garden. This is to be seen in a forest constant replacing, by fallen leaves and other fermentable matter, the nourishment derived from the soil. The value of trees as fertilizing agents is often not fully appreciated, for immediately under the trees, except in forests or dense jungles, it is often very dry and barren—some think from too much tannin or other injurious droppings from the trees, but more probably from an insufficiency of moisture for plant life. In a field the benefit of a tree with the pendulous or easily moved leaves of our Eucalypts, or Aromadendrons, can be seen on a still, scorching day in gently agitating and thereby cooling the air, or on a still, chilly day in warming the air, with the slightest breath of wind, at the same time drawing up by its roots mineral matter from the subsoils and scattering it over the fields by its leaves; so amongst fertilizers

trees must be classed, and like all good servants deserve their wages—a small portion of a field for themselves, and proper attention to their wants: not all the grass eaten bare around them, as in our parks near Melbourne; the gum-trees near Dandenong are fast going from this treatment. After many years' work at the diseases of our Aromadendrons we plead for their wants to be thought of, for they serve us well—indeed, we cannot guess at the dire results there will be if we continue to neglect their wants as we are doing—we may say cheating them out of what is due to them for their services as fertilizers alone. The remarkable manner some fern-trees (*Alsophila*) rapidly recover their luxuriant growth by young saplings of the eucalypts being allowed to grow near and shelter them, shows a fellowship between two remarkably different plants—we might almost say fertilizing each other. This good fellowship of one plant to another will be, most probably, more used every day, and can be classed as a fertilizing factor. This is put in practice by growing maize and pumpkins in alternate rows in some parts, and will be probably put into service in order to grow, say, root crops in our hot districts, by alternating peas or beans with roots; and as these are removed before the roots are ready, the cultivator can be run through—another fertilizer—the soil keeping more moist through stirring. Water, as a fertilizer, means only a sufficiency of moisture is required, and my axiom, which applies to plant or animal life, comes in here—"Enough is health, more is disease," and, in using water there must be fermentable matter about, or water gives alone a poor return. Weeds do very well, as the Nile when it overflows is full of decaying matter, and has fertilized the land for thousands of years, man assisting as far as his means and knowledge went.

The use of inorganic matter, such as lime—for even the slimiest or most gelatinous of fungi requires for its well-being lime. When lime is scattered in our drains to kill germs, there are some germs, in little corners where the hot lime has not reached, which will feed on the slacked lime and thrive by-and-by. Charcoal used in filters is the home of some germs after it has been clogged with vegetable matter to suit them. Arsenic after a time feeds plant-life; salt, of course, if not applied too strong; and a midge of a plant I have kept alive for years on sulphide ores. When the sulphur has been appropriated by this midge the ores fall into fragments, and this midge, in its turn, will provide food for some other plant-life requiring sulphur daintily prepared. It would take too long to mention the various mineral matters that are used in cultivation, and the plants which require them or do not use them. Zinc is known to be where the violet grows a pale lavender. This can be seen near Sale. Some years, after very dry seasons there, a creek, when winter

rains come, overflows, and wherever its waters reach the violets are very large and pale.

It has been the greatest pleasure of my life, feeding plants, toiling early and late at it, growing plants in all situations, and often, for years, being beaten—to succeed at last, when the right plant was found out for the place. This paper would not do without drainage, especially underground, being mentioned. It is the gardener's best friend—half the quantity of water or fertilizers are required.

THE FAUNA OF CASTLEMAINE DISTRICT—BUTTERFLIES.

By F. L. Billinghurst,
President of the Castlemaine Field Ramblers' Club.

Communicated by T. S. Hall, M.A.

(Read before the Field Naturalists' Club of Victoria, 14th October, 1895.)

I once knew a gentleman in Cape Colony who was an ardent naturalist. He lived for some years in a small town on the coast —a veritable naturalist's paradise—and during his residence there had made large collections of the insect fauna of the neighbourhood, and worked hard at the natural history of the district generally. He was the first, and for a long time the only, naturalist who had visited the place. After I made his acquaintance I often used to say it was a pity he did not give the world the benefit of his researches, either by writing a book or by records sent to scientific journals; but he obstinately refused to do so, or even to make notes. His argument was that he had had to work things out for himself, and had done it for his own pleasure, and he did not see why anyone else should benefit by his labours. After a time circumstances occurred which caused him to remove to an inland town some forty miles distant, and his collections were piled with his other goods and chattels on the orthodox ox waggon for removal, and then Nemesis overtook him and overturned the waggon while crossing a drift, and his splendid collection was utterly ruined, and his years of labour virtually lost. It seems to me, however, that my friend's case is by no means an isolated one. Take our Victorian fauna, for instance. Until the last two or three years our general records were very few in number, consisting, I think, of the lists of mammals, birds, and snakes published in the first, and Mr. J. H. Gatliff's list of the marine mollusca published in the fourth and fifth volumes of the *Victorian Naturalist*. Now we have Messrs. Lucas and Frost's list of the lizards, and Mr. Lucas's

list of the fish, in the "Royal Society's Proceedings;" Messrs. Anderson and Spry's excellent work on the "Victorian Butterflies," Mr. O. Lower's splendid list of the Victorian moths now appearing in your journal, and the revised lists of the Victorian mammals and birds recently published in the *Geelong Naturalist.*

These are all steps in the right direction; but I was taught in England that local lists were of greater scientific interest than general lists, and, besides, the latter could always be compiled from them. So, when I settled down in Castlemaine, I determined to work away at the local fauna, and after a while offer the results of my work to your society for record in your journal, if you should feel disposed to accept them.

From the outset I have been met by two difficulties. Firstly, the time I am able to devote to the subject is limited; and secondly, and this is the most serious, the difficulty I have experienced in getting my specimens identified. My opportunities of visiting the Melbourne Museum are few and very far between, and what descriptions there are of Victorian fauna are spread over a mass of periodical and other literature unobtainable or beyond my reach. Thanks, however, to the extreme kindness of Mr. C. Hedley (of Sydney) and Messrs. Lower and Blackburn (of Adelaide) my Mollusca, Lepidoptera, and a goodly number of the Coleoptera have their distinguishing names pinned over them. My list of land and freshwater shells you have already been good enough to record (*Victorian Naturalist*, vol. x., p. 61), and I now propose to give a list of the butterflies I have met with so far. Of course my lists cannot be looked upon as complete—since I recorded the shells I have found two more species—but still they go some way towards a permanent record of what is to be found here, and some time later I will give a supplementary list of subsequent finds.

Castlemaine, as you are aware, is a little north of the Dividing Range. It is not a first-class collecting ground. The hills are comparatively bare of undergrowth and the shrubs on which insects delight to feed; there are very few eucalypts of any size in the immediate neighbourhood—nothing but saplings, too thin for the trunks to be any good and yet too tall to get at the tops. Coming from a country like South Africa, where from an area of about four square miles I had taken 98 species of butterflies alone, I was disappointed when I first came here. However, I have obtained a fair number of insects of the various orders, and hope to do better yet. My hunting ground extends to Harcourt and Mount Alexander to the north, Chewton and Elphinstone to the east, Muckleford to the west, and Guildford and Fryerstown to the south. I do not think, from what I can learn, that the district has ever been worked for insects before, but I have met

with but little new. However, that does not matter much. I would only remark here that I shall be thankful to enter into correspondence with any specialist during the coming summer, and now proceed with my list :—

Terias smilax.—Not uncommon in spring. Took several on Maldon railway line, October, 1894.

Pieris teutonia.—Common in December. I have seen two distinct travelling flocks since I have been here, each time going due west. Transit of flock in each case occupied a whole day.

Delias aganippe.—Fairly common round tops of trees.

Delias harpalyce.—Not so frequent as last.

Danaus petilia.—A few specimens seen on Maldon railway line in October.

Danaus erippus.—One specimen seen in my garden. This seems to be the *Danais chrysippus* of the Cape, which is mimicked there by the female of *Diadema bolina.*

Xenica achanta.—Common on Mount Alexander.

Xenica Klugii.—Very common everywhere, December and January.

Heteronympha merope.—Our commonest fly.

Pyrameis itea.—Frequent, but not nearly so common as on the coast.

Junonia vellida.—Fairly frequent. I once came across a little waterhole in a gully, in November, around which they simply swarmed.

Lucia lucanus.—Fairly frequent on open grassy spots.

Chrysophanus œnea.—A few specimens seen in Botanical Gardens last summer. Two males captured.

Lampides boeticus.—Fairly common in November round Cape Broom.

Lycæna biocellata.—One specimen taken at Expedition Pass Reservoir.

Lycæna labradus.—Very common.

Lycæna agricola.—Common in bush in October and November.

Holochila erinus.—One specimen taken on hills south of Chewton.

Ialmenus evagoras.—Common in a few localities, but very local.

Ialmenus inous.—One specimen taken at Expedition Pass Reservoir.

Trapezites phillyra.—Common in spring.

Hesperilla lutea.—Messrs. Anderson and Spry do not give this name, which I obtained from Mr. Lower. I have taken only one specimen, and that rather old.

Taractrocera papyria.—A few specimens taken at Expedition Pass Reservoir, in long grass, November.

LIFE-HISTORY OF *XENICA HOBARTIA*, WESTW.

THIS (as mentioned in "Victorian Butterflies") is one of the rarest of our Nymphalidæ. Prior to November, 1890, it was known to be present in but two Victorian collections, those of Mr. Wm. Kershaw and the National Museum, having been taken by the Messrs. Kershaw in 1886. On the 4th of that month (Nov. '90) Mr. F. P. Spry secured two specimens at Fern Tree Gully, and on the same day the writer captured three more upon the slopes of Mt. Riddell, Healesville.

So far all the specimens taken had been females—the male was unknown. A few weeks later, during the excursion of the Field Naturalists' Club to the Yarra Falls, the writer took a number of both sexes. The first male was captured on 23rd November (see *Vict. Nat.*, vol. vii., Nos. 11–12) at a spot near the Wood's Point road, about 22 miles beyond Marysville.

Last November (1894) Mr. Edmund Jarvis, of Macclesfield (Dandenong Ranges), was successful in breeding this species from the egg, and has handed me the following details for publication in the *Naturalist*:—

TRANSFORMATIONS OF XENICA HOBARTIA.

Ova.—The eggs of *X. Hobartia* are laid upon the stems and blades of the common "wire-grass," and are shining green in colour, exactly matching the shade of the food plant. The female insect lays from 20 to 30 eggs, which are usually placed from about ¼ to ¾ of an inch apart, but sometimes from 1 to 6 may be found laid close together. About 5 or 6 eggs are usually deposited on a grass blade, and, as far as I have observed, they seem in most cases to be placed near the top of the food plant and on the under surface of the blades. On this latter point, however, the insect does not appear to be particular.

In shape the eggs are slightly elongated, one end is broader than the other, and both ends are somewhat depressed. They are fastened to the grass blades at their larger ends. When just deposited they are beautiful objects, their glassy surfaces causing them to glisten in the sunlight like tiny emeralds.

The female lays readily in captivity, requiring only sunlight and the presence of the food plant. Some specimens which I caught this spring (1895) and kept in confinement laid several eggs on the glass sides of their breeding cage and on the muslin which covered the top; a few eggs were also deposited on the earth near the stem of the food plant. The two females from which I bred in 1894 both laid at midday—one on the 8th, and the other on the 14th of November.

Larvæ.—The larvæ emerge in about a fortnight, the eggs laid on 8th November producing the larvæ on the 23rd of the same month; these, when just out of the shell, measured a line in

length, and were pale yellow with brown heads. In a couple of weeks' time, just after the second moult, they were 4 lines long, pale green with a darker dorsal line of same colour, light yellow side lines, and brown heads with two minute horns; two protuberances had also appeared on the terminal segment. On 15th December, twenty-two days after leaving the eggs, these larvæ changed their skins for the third time, being now five lines long and dull greenish brown in colour; dorsal line indistinct, dark green, and with a row of minute black dots; side lines yellow, very thin, and shaded above with brown; head dull pink, with two red horns. After the fourth moult, 23rd December, they measured seven lines, and the green had completely disappeared: general colour brownish; dorsal line consisting of grey suffused markings, one on each segment, those on first two thoracic segments very dark; sides of body dark brown, darker beneath, and with distinct irregular dashes of same colour on each segment between dorsal and lateral lines; head brownish, hairy, and with two horns; terminal segment with two appendages.

On 14th January the larvæ were 12 lines long (1 inch), and fully grown; general colour dirty brown, with irregular markings of a darker colour; head hairy, with two small red horns, minute black eyes, and red mandibles; terminal segment with two short fleshy appendages. The larvæ in general shape resembles that of *X. Klugii*, but differs in the body being thicker in the middle. It is extremely sluggish in its habits, clinging closely to the food plant and feigning death if knocked off. It assumes the chrysalis state about the beginning of February.

Pupæ.—Chrysalis, 6 lines in length, dull brown with outlines of head, wings, &c., darker and dusted over with dull red specks. It is suspended by the tail and by a thread round the middle.

Imago.—The perfect insects of the spring brood emerge in October, the male on or about 10th October, and the female a week or so later.

Mr. G. Lyell, jun., having advised me of the importance of being sure of the correctness of dates of appearance of this species, the following notes (taken from my diaries for 1894 and 1895) may not, perhaps, be out of place:—

1894.

Oct. 12. *X. Hobartia* emerging; took a perfect male.
,, 13. Saw *Hobartia* frequently.
,, 20. Caught a splendid specimen of female *Hobartia*, and saw several specimens on the wing.
,, 21. Caught six females and two males of *Hobartia* flying about young eucalypts (nearly all rubbed or torn).
,, 25. Saw female of *Hobartia* in good condition.
,, 28. Good specimens of *Hobartia* still to be met with.

1895.

Oct. 5. *Hobartia* emerging; saw a specimen on the wing.
,, 12. Saw *Hobartia* twice.
,, 17. Caught a good specimen of female *Hobartia* just emerged, wings slightly crumpled.
,, 18. Caught six specimens of *Hobartia*, all females—two in splendid condition, the others a little worn.
,, 24. *Hobartia* fully out, and in good condition.
Nov. 6. Good specimens of *Hobartia* still procurable.

The males of *X. Hobartia* seem to fly principally at midday, and are very fond of circling about the tops of tree-ferns; they may be easily captured by waiting at the foot of a fern whose head is within striking distance of the net. They rarely settle on the fronds, but seem to like fluttering and dancing around them, travelling from one frond to another until they have made the round of the fern head. When so engaged they apparently care little for repeated strokes of the net, and if narrowly missed will frequently continue their flight, and without appearing alarmed return again to within reach of the net.

My chrysalides of *X. Hobartia* passed the autumn in the same state, and the butterflies emerged with the spring brood.

Devondale, Macclesfield. EDMUND JARVIS.

There are still a number of Victorian butterflies whose early life-histories have not yet been noted, and it is to be hoped members will lose no opportunity of securing for the Club the credit of having placed them upon record.—G. LYELL, JUN., Gisborne.

THE MILDEW OF WHEAT.—In his presidential address to the Norfolk and Norwich Naturalists' Society, delivered at the twenty-sixth annual meeting, held on 25th March, 1895, Dr. Chas. B. Plowright, the well-known worker in Micro-fungi, particularly the Uredinaceæ, devoted considerable time to a review of the life-history of the too well known mildew of the wheat, or "rust," as it is called in its second stage. It has long been known that the common Barberry *(Berberis vulgaris)* acted as the host of one of the stages of this fungus, and it now seems that the berries of the Mahonia *(Berberis fascicularis)* will suit equally well. Dr. Plowright refers to the great injury done by rust to the wheat crops of Australia, greater than in any other part of the world, and suggests that the Mahonia may be more common in gardens, &c., there than in England. He asks why the berries only of the Mahonia should be affected, and, taking into consideration the host plant, whether the English and Australian diseases are identical. Altogether his remarks open up a wide field for research for Australian mycologists.

THE

Victorian Naturalist.

Vol. XII.—No. 9. DECEMBER, 1895. No. 145.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 9th December, 1895. Mr. C. Frost, F.L.S. occupied the chair, and some 40 members and visitors were present.

REPORTS.

Reports of the Club excursions to Springvale and Warrandyte were received from Mr. C. French, F.L.S.

The hon. secretary reported that a large party of members had visited the Botanical Gardens at the invitation of the Director, Mr. W. R. Guilfoyle, F.L.S., and had spent some hours in inspecting the specimen plants in the new systematic arrangement for students, from which they derived much valuable information.

The hon. secretary reported that a meeting for practical work was held on Monday evening, 2nd December, under the direction of Mr. C. A. Topp, M.A. This was the last meeting of the course in systematic botany, in which much interest has been taken. Special thanks are due to Mr. Topp for the trouble he has taken to procure native flowers to illustrate his remarks.

The hon. librarian reported the receipt of the following donations to the library:—"Special Report, Department of Mines, Victoria," No. 4, 1895, from Mining Department; "Descriptive Catalogue of Rocks of Victoria," 1894, from the Public Library, Melbourne; "Transactions of Royal Society of Victoria," vol. iv., 1895, from Society; "Journal of Royal Society of New South Wales," vol. xxviii., from the Society; "Proceedings Linnean Society of New South Wales," vol. x. (new series), parts 1 and 2, from the Society; "Transactions of Royal Society of South Australia," vol. xix., part 2, from the Society; "Reports of Smithsonian Institution," 1892 and 1893, and "Report of National Museum," 1892, from the Smithsonian Institution, Washington, U.S.A.; "Proceedings Academy of Natural Sciences," Philadelphia, 1894, parts 2 and 3, 1895, parts 1 and 2, from the Academy; "Proceedings Boston Society of Natural History," vol. xxv., parts 1, 2, 3, and 4, xxvi., parts 1, 2, and 3, from the Society; "Missouri Botanical Garden Sixth Annual Report," 1895, from the Directors; "Proceedings Nova Scotian Institute," vol. i., part 3, from the Institute; "Journal of Bombay Natural

History Society," vol. ix., part 4, from the Society; "Botany Bulletins," 11 and 12, from Department of Agriculture, Queensland.

PAPER.

By Mr. C. M. Maplestone, entitled "Calendars, and the Indexing of Natural History Observations."

The paper dealt firstly with calendars such as the orchid calendars published in recent *Naturalists*, pointing out the advantages of such an arrangement over long lists of names. The great importance to every working naturalist of keeping an index to his diary of observations was then touched upon, the author's remarks being illustrated by his own index containing references to records of upwards of 30 years' observations.

PROTECTION OF MAGPIES.

A discussion on "The Advisability of Removing Magpies from the Protected List" was opened by Mr. C. Frost, F.L.S., who thought the Club should give an expression of opinion for or against the protection from magpies. He said there could be no doubt that the bird's tastes had become more granivorous since the Club was instrumental in having them protected, and we should consider whether the evidence now available justifies the removal of that protection. It would be remembered that a specific charge against the bird of having destroyed a crop of maize at Mitcham last year had been shown to be without foundation, but this year, owing to the dry season and the scarcity of insect life, the birds have undoubtedly eaten wheat and oats in some quantity.

Mr. A. Coles was in favour of removing the protection, as in many birds dissected by him the stomach contained grain. A farmer at Kyneton had shown him crops destroyed by magpies, of which he had shot forty in one morning.

Mr. D. Le Souëf proposed that the birds should be protected like game birds, only during the breeding season. He had known many magpies to be killed by eating poisoned grain laid for rabbits.

Mr. J. Gabriel mentioned that in the Whittlesea district the poisoned grain laid for magpies had killed numbers of Satin Bower Birds.

Mr. H. P. C. Ashworth pointed out that protection during the breeding season would cover the period during which the damage was done. He was in favour of continuing the protection, owing to the large amount of good done by the birds; but farmers who thought otherwise and killed the birds which were destroying their crops could rest assured that they would not be prosecuted.

Written contributions were received from Messrs. G. A. Keart-

land and H. Giles, who were in favour of protecting the birds, and from Mr. C. C. Brittlebank, of Myrniong, stating that one-third of his crop of forty acres of oats had been destroyed this year by magpies.

On the conclusion of the discussion Mr. H. R. Hogg moved —"That the Club request the Customs Department not to remove magpies from the protected list." This was seconded by Mr. D. Le Souëf, and carried, with one dissentient.

NATURAL HISTORY NOTES.

Mr. R. Hall read a note on a curious egg of the Laughing Jackass, *Dacelo gigas*, being evenly marked with light greyish-brown streaks and small blotches. The egg was one of three, the other two being normal white; also a note on a Sulphur-crested Cockatoo, *Cacatua galerita*, which succumbed to an internal complaint last month, after being in domestication nearly forty years, the principal feature of the bird being its enormous proportions. From tip to tip of the wings measured 46¼ in., total length 21½ in., anterior crest-feather 6¼ in., and middle rectrice 9 in.

Mr. W. H. F. Hill read a note on the life-history of the butterfly *Ialmenus myrsilus*.

Mr. C. Frost drew attention to Professor Ray Lankester's article in the *Argus* on Dr. Chalmette's discovery of an anti-venine perfectly effective against snake-bite. Professor Lankester advances the theory that snakes are immunized owing to the absorption of poison from their own glands, but this would not account for lizards and non-venomous snakes not being affected. Mr. D. Le Souëf confirmed Mr. Frost's remarks, and stated that snakes always hold and do not let go frogs, lizards, &c.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening :—By Mr. A. Coles.—Specimens of New Zealand Bell Bird, *Anthornis melanura;* New Zealand Yellow-Head, *Clitonyx ochrocephala;* pair of New Zealand Huias, *Heteralocha acutirostris;* and New Guinea Parrakeet, *Charmosyna paynenis;* also, pair of pictures made of Victorian birds' feathers. By Mr. J. Gabriel.—Eggs of the following rare birds :—White-fronted Falcon, *Falco lunulatus;* Grey Falcon, *Falco hypoleucus;* and Little Eagle, *Aquila morphnoides*. By Mr. D. Le Souëf.—A clutch of three eggs of the White-headed Osprey, from Western Australia. By Baron von Mueller, K.C.M.G.—Plants new for Queensland, *Drymophila Moorei* and *Fieldia Australis*, found by Messrs. Collins and Taylor at the sources of the Logan River; neither of the genera having been previously recorded from that locality.

After the usual conversazione the meeting terminated.

EXCURSION TO MELTON.

SATURDAY, 26th October, was the date fixed for an excursion to what may be considered one of the best districts near Melbourne for the study of ornithology; but the weather was very unfavourable. Whilst on our way to Spencer-street a strong north wind accompanied by clouds of dust betokened an unsuccessful day, and gave rise to the query as to where all the birds go when the north wind blows. Owing to the force of the wind our train journey occupied more than twice the usual time. On arriving at Melton railway station a start was at once made for the race-course paddock, but the gale came with such force across the open country that if the train was slow, walking was slower. Birds were scarce, and when disturbed from some sheltered spot were blown away too quickly for observation. After going further into the timber broods of young *Geobasileus chrysorrhœa* were disturbed, and several discarded nests of the Butcher Bird, *Cracticus torquatus*, seen. Nests containing fresh eggs of the Spotted-sided Finch were found in the box saplings, and occasionally rabbits were disturbed as we worked along. Approaching the margin of the timber a pair of young White-backed Crow-Shrikes, *Gymnorhina leuconota*, were observed. Across the open plain a course was now taken to the deep gullies, hoping that the shelter there afforded by the high walls of rock would be the means of attracting most of the birds in that direction. At Mr. Raleigh's farm a halt was made, and, as is always the case when any members of the Field Naturalists' Club pass that way, we were invited to partake of a cup of tea. This was not declined, as the long walk against the wind made us all thirsty, and the short stay gave time to rest before starting to work the timber close to this homestead. With renewed energy we commenced work in earnest, our entomologist vigorously rolling over logs or scanning the mallee and other bushes in search of insects; but I am afraid that an umbrella ten times the ordinary size would be too small for his work, as instead of shaking one branch the whole tree or forest had already been well shaken. The birds were now more numerous, and several new to the district noted. In a mallee clump a fine female Shining Flycatcher, *Myiagra nitida*, was shot, and the following other birds noted :— Rosella Parrots, Black Fantails, White-shafted Flycatchers, Red-eyebrowed and Spotted-sided Finches, Rufus-breasted and White-throated Thickheads, Black and White Lalage, Scarlet-breasted, Yellow-breasted, and Hooded Robins, Pallid and Bronze Cuckoos, Wattled, White-plumed, New Holland, Spiny-cheeked, Yellow-faced, and Yellow-tufted Honey-eaters, &c. Along the creek Superb Warblers were numerous, and, with the Sericornis, were found in the undergrowth. On the high ground beyond the bell-like note of the Crested Oreoica was heard. The latter bird,

I may mention, was shot near the same spot in June, 1894. After wandering backwards and forwards in all classes of timber many other well-known birds were noted, and in one thick bush the nest of the Yellow-tufted Honey-eater, *Ptilotis auricomis*, was found, containing two eggs. These were carefully boxed, and a start made on the homeward track. On the way the following additional birds were shot, and since forwarded to the National Museum :—*Pardalotus ornatus*, *Acanthiza nana*, and *Pachycephala rufiventris*, male and female. A return visit to partake of Mrs. Raleigh's kind hospitality was now made, and as the wind had dropped to a gentle breeze the homeward walk was very pleasant. Near the farm-house a small flock of crows were seen, and one bird slightly wounded and captured. As some time ago a good deal of interest was taken in endeavouring to decide whether the White-eyed and Hazel-eyed Crows were distinct species, it may be interesting to know that this bird, which is still alive, has one white eye and the other a bright yellow one. —G. A. KEARTLAND.

FORMALIN AS A GENERAL PRESERVATIVE FOR ANIMAL AND VEGETABLE STRUCTURES.

By O. A. SAYCE.

(Read before Field Naturalists' Club of Victoria, 11th November, 1895.)

OF late years formalin, or formol, as it is sometimes called, has won a position of eminence amongst preservatives of animal and vegetable structures, and it is with the desire of making it known amongst the members of our Club that these remarks are made.

As field naturalists we all recognize the importance of preserving what we may collect in as natural a condition as possible, but let me emphasize the need to preserve, not alone a specimen's general appearance, but its anatomical and histological structure, and to do this it is of the utmost importance to treat the specimen as quickly as possible after its death, and so avoid *post-mortem* changes, which so soon take place ; for should we, or any specialist we may pass our specimen on to, have to submit any part to microscopical examination it is in the highest degree important that the structure should have been faithfully preserved. For this to be done the specimens have to be treated frequently in the field, for there are comparatively few objects we can conveniently carry home alive. We have many chemical solutions that are satisfactory in this respect for special and laboratory work, but are impracticable for general field work. For instance, for the earthworm and soft-bodied animals we have picro-sulphuric acid, but this will not do for vertebrates, as it swells the cells ; nor will it do for mollusca, as it attacks the lime of the shell. There is corrosive sublimate in solution, but this is a

violent poison, which alone makes it unsafe to use in the field; also, animals left too long in it become very brittle. There is chromic acid and its salts in various strengths, and others. These all affect the natural colours to a very great extent, and it is also important that specimens only remain in them for varying periods of duration before being passed into alcohol, which alone allows of extended times of immersion. Therefore, none are suitable for a general preservative to take with us in the field, especially if we are on a few days' outing. Alcohol, so far as I know, has been the only preservative used for general work, but I venture to think formalin will be found to be much better. Do not, however, let me appear as an authority, for my practical experience of it only dates back some eight months, and I have not had opportunities for collecting a sufficiently varied assortment of material. I have, however, brought for your inspection and criticism enough for you to form an impression from. They comprise some 44 examples, all of which have been preserved for at least a month, and most of them longer. They are contained in different strengths and admixtures, and, in some cases, similar structure is preserved in alcohol for comparison.

I have been unable to meet with any complete paper on formalin, but have seen various short extracts in different scientific magazines, the authors all bearing testimony to its efficacy.

Before I speak of the properties of formalin, I will endeavour to explain its chemistry—presuming you know nothing about it—and those who have had more experience of it than I have will, I trust, bear with me until the close of my remarks.

Formalin is not a chemical compound, but is the name of a saturated watery solution of the gas formic aldehyde. Aldehydes are a series of compounds formed by partial oxidation of the various alcohols, each alcohol forming a particular aldehyde, which on further oxidation is changed into its acid—for instance, ethyl alcohol, or spirits of wine, C_2H_6O, by oxidation has the chemical affinity holding its atoms together broken, and two atoms of hydrogen are displaced, and a molecule of aldehyde is formed, having the composition C_2H_4O, which on further oxidation is changed to acetic acid, $C_2H_4O_2$. Formic aldehyde is produced from wood alcohol, and is one of the simplest carbon compounds. One molecule contains CH_2O.

Formalin is water in which 40 per cent. of this aldehyde is contained. All percentages of formalin, or formol, mentioned by any writer, therefore, are not to be considered as percentages of formic aldehyde, but percentages of 40 per cent. of the aqueous solution of that product. (You must note the difference between formalin solution and formalin. The strength of "Formalin Solution" is 1 oz. of formalin to 80 ozs. of water, so is only 1¼ per

cent. It is sold in this way for disinfecting purposes, and is not strong enough for general purposes of preserving tissues.) Formalin is colourless and neutral, and has a penetrating and pungent odour. The fumes are said to be not harmful unless inhaled for some hours. It is important to remember that it is very volatile, and must be kept in tightly-closed vessels, or the strength will diminish. I have estimated the specific gravity to be 1.078. It is free from corrosive properties, and is not poisonous or combustible. It is a most powerful antiseptic agent. I have seen it noted that Drs. Stahl, Berlioz, and Trillat proved that in a dilution of 1 to 50,000 it killed anthrax bacilli. It is, therefore, as powerful in this respect as corrosive sublimate. But, enough on this head.

Now, as to its use in preserving animals and plants. For general purposes I consider the best strength is between 5 and 10 per cent., certainly no stronger. I have many successful examples in which I have used only 2 per cent. strength, but I have also had a few failures with it. I think 5 per cent. will be found strong enough for nearly all substances, provided it is changed to a fresh supply after the first day or two of treating a specimen; and in larger specimens it should be changed every day for a longer or shorter time, according to the size of the specimen, or, failing this, a drop or two of formalin should be added occasionally, according to what the tissue is, to make up the loss of strength occasioned by mixture with the water of organization.

You will notice from my specimens that it preserves animal structure without causing any perceptible shrinkage, nor does it coagulate the albumen, as alcohol does, by extracting the water from the tissues. The colour of the blood in tissues changes to a brownish shade, but may be restored at any time by immersion in strong alcohol. Methylated spirit answers; and I will give you a few practical examples, when you will notice the colour reappear as fresh as ever, and the blood-vessels become defined with the greatest fidelity. Dr. Blum, I think, was the first to publish this.

With formalin the chlorophyll in plants is not dissolved out as with alcohol, and the colour of flowers is more or less preserved; but I have not experimented to any extent in this department. I exhibit five examples to-night.

I have noticed, as others have frequently done, that the microscopical structure of the tissues is faithfully maintained, the cell contents are well preserved, and the nuclei in those from 5 per cent. solutions or stronger remain distinct; also they allow of staining with carmine and aniline dyes.

Formalin mixes readily with many chemical compounds, and for special work I have experimented with it in varied combinations.

After further work in this direction I hope to give you my results. My purpose to-night is only to speak of it in a general way. However, as so many animal forms are invested with a thick integument, I will just mention two plans I have adopted with success for the sake of hastening the penetration of formalin to all parts of the specimen. This object is a most important one for faithful preservation of detail of structure. One is to kill by immersing in glacial acetic acid for a minute or two, or less, according to circumstances, and without washing the acid out place the specimen at once into 5 per cent. formalin, then the next day wash the acid out with fresh 5 per cent. formalin. Penetration is also, of course, greatly facilitated by heat; but the strength of the solution is readily weakened, on account of the formic aldehyde being driven off—but, bearing this in mind, it will be found at times useful. I have also used various strengths of sulphuric acid, mixed with 5 per cent. formalin, for insects, &c., but, of course, not on vertebrate structure, as it would cause swelling of the tissues. Alcohol also may be used with it.

As to the cost of formalin, it can be procured at any chemist's at the rate of six shillings a pound. Seeing that one pound weight contains 15 fluid ounces, it will therefore make 300 ounces or 1⅞ gallons of a 5 per cent. solution; so, compared with methylated spirit, it will be found cheaper. Its portability will be apparent; when travelling it can be carried in strong solution, and reduced as required.

With these remarks my purpose is served, and if they stimulate any to work with greater care, and help by the more faithful preservation of detail in material collected, I shall feel that I have not taken up your time for nothing.

NOTES ON *CHLAMYDODERA ORIENTALIS*, GOULD.

By Alfred J. North, F.L.S. (Ornithologist to the Australian Museum, Sydney).

Chlamydodera orientalis, Gould, Ann. & Mag. Nat. Hist., ser. 5, vol. iv., p. 74 (1879); Sharpe, Cat. Birds Brit. Mus., vol. vi., p. 392 (1881); Ramsay, Tab. List Austr. Birds, p. 11, No. 335 (1888); Sharpe, Mon. of Paradis. and Ptilono., part i., pl. ix. (1891).

The peculiar habits of the Ptilonorhynchidæ in forming playing-grounds or bowers, in some instances of a highly ornate character, adds an additional charm to all the members of this interesting family. *Chlamydodera orientalis*, the species under consideration, was separated by Gould, in 1879, from *C. nuchalis*, of the north-western coast, on account of having whitish tips to the feathers of the head, and broader white margins and tips to

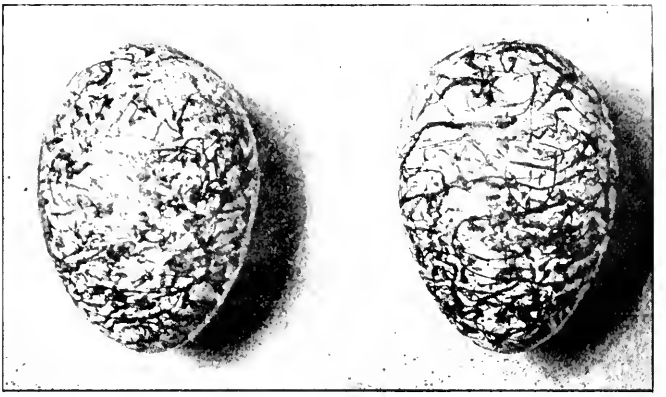
most of the feathers on the upper surface, giving it a mottled appearance. These distinguishing characteristics are easily discernible when the two forms are compared. In Dr. Ramsay's "Tabular List of Australian Birds" the geographical distribution of this species is recorded as "Port Denison" from specimens in the Australian Museum collected there by Mr. George Masters in June, 1863, and "Rockingham Bay" from examples in the Dobroyde collection, obtained about ten miles inland from Cardwell. Since the publication of that work, however, in 1888, our knowledge of the range of this species has been considerably extended, for we have now specimens in the reference collection procured by Clarke in the open country on the western side of the Seaview Range; by Beveridge at Croydon; and there is a beautiful group of these birds together with their bower in the National Museum, Melbourne, obtained by Mr. Kendal Broadbent at Normanton. The latter localities are in the Gulf District, and lie between seven and eight hundred miles in a direct line south east of Port Essington, in the Northern Territory, where Mr. Alexander Morton collected specimens of *C. nuchalis* for the Trustees of the Australian Museum in 1879. I have never seen any *Chlamydodera* from the western shores of the Gulf of Carpentaria, and it would be interesting to learn where the eastern and north-western races, *C. orientalis* and *C. nuchalis*, meet.

Regarding this species, Mr. W. S. Day, who has made large collections of north-eastern Queensland birds, and who has travelled through the principal mining districts of North Queensland, writes me as follows:—"I found *C. orientalis* fairly common all the way from Charters Towers to Croydon and Normanton, and from the latter locality south and west to Cloncurry and on towards Winton. These birds had a perfect craze for bones. While camped on the Leichardt River I used to shoot a number of pigeons for the pot. When eating them the Bower-Birds would watch me from the trees, and the moment I threw the bones away the birds would descend on to the ground, pick them up, and carry them away to their bowers. Most of the bowers I examined had a quantity of small bones of mammals heaped up near the entrance, and around them as a rule a number of shells and a few coloured stones. In one bower I found a very bright specimen of gold in white quartz, and when in the opal country I used frequently to find pieces of precious opal in and around them. At a bower near a mining camp I found two tin teaspoons, portion of a steel watch chain, a bright sixpence, eleven tin tobacco tags, and a few horse-shoe nails. The miners do not like these birds, as they pilfer any small bright articles lying about the camps to ornament their bowers; also for the depredations they commit in their gardens, especially among tomatoes."

During my visit to Melbourne last month I had the pleasure of examining many rare and beautiful eggs in the collections of various members of the Field Naturalists' Club of Victoria. None, however, probably possess greater attractions for Australian oologists, or are more worthy of notice, than the eggs of the different species of the genus *Chlamydodera*, and it is through the courtesy of Mr. Charles French, F.L.S., the Government Entomologist of Victoria, that I have been permitted to describe and figure a set of the eggs of *C. orientalis* that now grace his son's collection. These eggs, two in number, were taken by one of Mr. French's collectors near the Gregory Range, in the Gulf District of Northern Queensland, during the month of August, 1895. Similar specimens, obtained from different nests in the same locality, were also exhibited by Mr. Charles French, jun., at the August meeting of the Club. As there are many members, like myself, who are unable to be present at the monthly meetings, I trust that the following descriptions and figures of the eggs of the Eastern Lilac-naped Bower Bird may prove of interest.

The eggs of *Chlamydodera orientalis* closely resemble those of *C. maculata*, but are larger and more swollen in form. One specimen is of a faint greenish-grey ground colour, with bold linear markings and numerous wavy thread-like lines of different shades of umber-brown and purplish-grey, crossing and recrossing each other at different angles, and intermingled with curved wavy lines and faint irregular-shaped smears. These markings are equally distributed over the surface of the shell, except on the thicker end, where on one side there are only a few hair-like streaks. Many curious forms are assumed by these labryinthine markings, one towards the centre of the egg resembling a man's face, near it one like a shield, another a Maltese cross, and one on the larger end the figure 8. The other specimen is of a yellowish-stone ground colour, and the linear markings are less conspicuous, being intermingled with small irregularly-shaped confluent blotches of light umber-brown and a few clouded sub-surface markings of faint purplish-grey; on the larger end are two blackish-brown linear markings, terminating in a spot at one end of each line. The texture of the shell is very fine, and the surface of the latter specimen has a fine gloss on it; the other egg, although smooth, is almost devoid of lustre. One of the eggs exhibited by Mr. French, jun., and at present in the collection of our enthusiastic member, Mr. G. A. Keartland, is slightly larger than the specimens here figured, and the markings on it consist principally of irregularly-shaped blotches and thick, short, wavy streaks of ochraceous and purplish brown on a fine network of zig-zag hair-like lines. In all the specimens examined the umber-brown markings predominate, and most of the purplish-grey

lines, or clouded smears, appear as if beneath the surface of the shell. The eggs vary in length from 1.56 to 1.67 inch, and in width from 1.1 to 1.16 inch.



Eggs of *Chlamydodera orientalis* (natural size), reproduced from a photograph.

THE LATE DR. J. E. TAYLOR, F.G.S.

THE *Eastern Daily Press* (Norwich, England) of 1st October gives a lengthy obituary notice of the well-known popular science writer, Dr. J. E. Taylor. He commenced life in the engineers' shop of the London and North-Western Railway, and in his spare time studied languages and scientific subjects. Taking a strong liking to geology, he took up field work, and contributed articles to a Manchester journal. This led to a connection with journalism, and the publication of "The Geology of Manchester," his first work. About 1862 he removed to Norwich as sub-editor of a newspaper. Here he began his studies of botany, and did much to popularize natural science in the district. He was mainly instrumental in founding the Norfolk and Norwich Geological Society, and was hon. secretary for many years. He gave up newspaper work after about eight years, preferring to depend upon what he could earn as a science writer for magazines, more particularly for *Science Gossip*, of which he afterwards became editor. In 1872 he was appointed curator of the Ipswich Museum, where from his popularity as a lecturer he soon gave such an impetus to the spread of scientific knowledge that it led to the building of a new museum, of which he had the organizing and arrangement. For his services to the town he was presented

with a testimonial of the value of £700. In 1885 he visited Australia as a popular lecturer, when he was present at one of the monthly meetings, and was afterwards elected an hon. member of the Field Naturalists' Club of Victoria. On his return to England he resumed his scientific and journalistic work, which he kept up almost until his death.

ANTS AS FUNGUS GROWERS.—In that extremely interesting work, "A Naturalist in Nicaragua," Belt has given us much insight into the habits and manner of working of the "leaf-cutting" ants of the tropics. The German botanist, Alfred Möller, has lately given some attention to the habits of a Brazilian species, *Atta discigera*, which like its Nicaraguan congener stores up the so-called "ant food." This is usually a soft, brown, spongy mass, grown over and over with the mycelium of a fungus, and Belt hazarded the opinion that the ants used the leaves as vegetable matter on which to grow the fungus, and were in fact "growers and consumers of mushrooms." The mycelium was found to be covered with groups of little white dots, which under close examination proved to be the club-shaped ends of filaments, and it was on these the ants fed, besides which, by their constant attention, they were able to prevent any further development of the fungus. Möller has now, by a series of experiments, proved that Belt was correct in his surmise, and has been fortunate in obtaining a fully developed specimen of the fungus produced by the mycelium, and from the spores of which he successfully grew the mycelium with its club-shaped filaments, upon which the ants readily fed. The new species has been named *Rosites gongylophora*.

ANTS AND ORCHIDS.—According to J. H. Hart, the presence of ants seems to be essential to the well-being of certain orchids. Whether the effects produced are directly due to ants, or to some indirect cause, has not yet been determined. The author is inclined to think that the ants confer benefit on the plant by providing it with the mycelium of a fungus to cover its roots, this organism enabling it to take up food which would otherwise be unavailable. It may be that the presence of stinging ants protects the plant, but Mr. Hart thinks it is almost certain that the fungus, which grows in the material that the ants accumulate around the root, plays an important part in the nutrition of the plant by providing it with food material.—*Nature*, lii., 627.

A BRONZE bust of Robert Brown, the botanist, the earliest student of Victorian plants, has been placed in a niche of the house at Montrose, Scotland, where he was born in 1773.—*Natural Science*, November, 1895.

A CATALOGUE OF VICTORIAN HETEROCERA.

By Oswald B. Lower, F.E.S.

Part XVIII.

TORTRICINA *(continued).*

576. D. MONTIVAGANA, Meyr. (*loc. cit.*, 477, 1881).
Melbourne.

577. D. HYPERETANA, Meyr. (*loc. cit.*, 479, 1881).
Melbourne.

578. D. ARGILLOSANA, Meyr. (*loc. cit.*, 479, 1881.
Melbourne.

CACŒCIA, Hb.

*579. C. AUSTRALANA, Lewin (*Tortrix Australana*, Lewin, Ins. N.S.W., ii., pl. xvii. ; *Teras immersana*, Walk., B. M. Cat, 302; female *Cryptoptila immersana*, Meyr., Proc. Linn. Soc. N.S.W., 481, 1881).
Tangil Track, Melbourne, Gisborne.

580. C. POLYGRAPHANA, Walk. (*Tortrix polygraphana*, Walk., B. M. Cat., 330 ; *Cacœcia polygraphana*, Meyr., Proc. Linn. Soc. N.S.W., 495, 1881).
Gisborne, Lal Lal, Ballarat, &c.

*581. C. PYROSEMANA, Meyr. (Proc. Linn. Soc. N.S.W., 496, 1881).
Gisborne, Croydon.

*582. C. LYTHRODANA, Meyr. (*loc. cit.*, 497, 1881).
Melbourne.

583. C. RESPONSANA, Walk. (*Teras responsana*, Walk., B. M. Cat., 297 ; *Cacœcia responsana*, Meyr., Proc. Linn. Soc. N.S.W., 500, 1881).
Melbourne, Gisborne.

584. C. POSTVITTANA, Walk. (*Teras postrittana*, Walk., B. M. Cat., 297 ; (?) *T. retractana*, *ib.*, 288 ; *T. dotanana*, *ib.*, 298 ; *T. scitulana*, *ib*, 298 ; *T. basialbana*, *ib.*, 299 ; *T. secretana*, *ib.*, 300 ; *Pandemis secundana*, *ib.*, 310 ; *P. consociana*, *ib.*, 311 ; *Dichelia reversana*, *ib.*, 321 ; *D. fiedana*, *ib.*, 321 ; *D. sobriana*, *ib.*, 322 ; *Pædisca immersana*, *ib.*, 380 ; *Cacœcia postrittana*, Meyr., Proc. Linn. Soc. N.S.W., 502, 1881).
Melbourne, Gisborne, &c.

*585. C. MNEMOSYNANA, Meyr. (Proc. Linn. Soc. N.S.W., 504, 1881).
Melbourne.

586. C. LIQUIDANA, Meyr. (*loc. cit.*, 505, 1881).
Melbourne.

587. C. TESSULATANA, Meyr. (*loc. cit.*, 506, 1881).
Melbourne, Daylesford, Brighton.

588. C. ARCARIANA, Meyr.
Lilydale.

TORTRIX. Tr.

*589. T. AMÆNANA, Walk. (*Conchylis amœnana*, Walk., B. M. Cat., 366 ; *Conchylis semirectana*, *ib.*, 987 ; *Conchylis galbana*, Feld., Reis. Nov., pl. cxl., 29 ; *Tortrix amœnana*, Meyr., Proc. Lynn. Soc. N.S.W., 510, 1881).
Gisborne, Melbourne.

590. T. SUBFURCATANA, Walk. (*Conchylis subfurcatana*, Walk., B. M. Cat., 368 ; *Tortrix subfurcatana*, Meyr., Proc. Linn. Soc., N.S.W., 611, 1881).
Melbourne, Brighton.

591. T. AULACANA, Meyr. (Proc. Linn. Soc. N.S.W., 513, 1881).
Mt. Macedon.

592. T. TRYGODANA, Meyr. (*loc. cit.*, 515, 1881).
Sale.

593. T. GLAPHYRANA, Meyr. (*loc. cit.*, 516, 1881).
Gisborne, Dandenong, Oakleigh, &c.

594. T. CONCORDANA, Meyr. (*loc. cit.*, 519, 1881).
Melbourne.

595. T. STANDISHANA, Newman (Tr. Ent. Soc. Lond., N.S., iii., 286 ; Meyr., Proc. Linn. Soc. N.S.W., 522, 1881).
Melbourne, Gisborne, &c.

DIPTERINA. Meyr.

596. D. TASMANIANA, Walk. (*Conchylis Tasmaniana*, Walk., B. M. Cat., 365 ; *Dipterina Tasmaniana*, Meyr.)
Melbourne, Gisborne, &c.

597. D. TRIBOLANA, Meyr. (Proc. Linn. Soc. N.S.W., 525, 1881).
Mt. Macedon.

598. D. REFLUANA, Meyr. (*loc. cit.*, 525, 1881).
Ararat, and near Melbourne.

AROTROPHORA. Meyr.

*599. A. XYTHOPTERANA, Meyr. (Proc. Linn. Soc. N.S.W., 529, 1881).
Oakleigh.

*600. A. ARCUATILIS, Walk. (*Scorpula arcuatilis*, Walk., B. M. Cat. (Pyral.) ; *Crambus submarginellus*, *ib.*, 1,760 ; *Eromene transcissella*, *ib.*, Supp., 1,763 ; *Arotrophora arcuatilis*, Meyr., Proc. Linn. Soc. N.S.W., 530, 1881).
Melbourne.

*601. A. LIVIDANA, Meyr. (*loc. cit.*, 531, 1881).
Sale, Colac.

*602. A. CONFUSANA, Walk. (*Padisca confusana*, B. M. Cat., 381 ; *Arotrophora confusana*, Meyr., Proc. Linn. Soc. N.S.W., 532, 1881).
Near Sandringham.

FAMILY—GRAPHOLITHIDÆ.

PHRICANTHES. Meyr.

HELICOTOPHANES. Meyr.

ANTITHESIA. Gn.

PENTHINA. Tr.

SCOLIOPLECTA. Meyr.

*603. S. COMPTANA, Walk. (*Sciaphila comptana*, Walk., B. M. Cat., 353 ; *Scolioplecta comptana*, Meyr., Proc. Linn. Soc. N.S.W., 646, 1881).
Gisborne, Melbourne.

(*EPALXIPHORA.* Meyr.)

A New Zealand genus.

EUDEMIS. Hb.

APHELIA. Stph.

604. A. LANCEOLANA, Hb. (Meyr., *loc. cit.*, 651, 1881).
Melbourne.

STIGMONOTA. Hw.

605. S. ZAPYRANA, Meyr. (*loc. cit.*, 653, 1881).
Near Melbourne.

*606 S. FLORICOLANA, Meyr. (*loc. cit.*, 656, 1881).
Oakleigh.

CARPOCAPSA. Tr.

607. C. POMONELLA, Linn. (Meyr., *loc. cit.*, 657, 1881).
Melbourne, &c.

EPITYMBIA. Meyr.

CROCIDOSEMA. Zeller.

608. C. PLEBEIANA, Zeller (Meyr., *loc. cit.*, 659, 1881).
Gisborne, Melbourne, &c.

PALÆOBIA. Meyr.

609. P. VOLUTANA, Meyr. (*loc. cit.*, 663, 1881).
Warragul.

*610. P. HIBBERTIANA, Meyr. (*loc. cit.*, 665, 1881).
Near Melbourne.

611. P. CREPUSCULANA, Meyr. (*loc. cit.*, 668, 1881).
Warragul.

612. P. SEGETANA, Meyr. (*loc. cit.*, 669, 1881).
Warragul.

HOLOCOLA. Meyr.

613. H. TRIANGULANA, Meyr. (*loc. cit.*, 670, 1881).
Melbourne, Gisborne.

614. H. PERSPECTANA, Walk. (*Grapholita perspectana*, Walk., B. M. Cat., 393; *Holocola perspectana*, Meyr., Proc. Linn. Soc. N.S.W., 671, 1881).
Melbourne, Gisborne.

BATHROTOMA. Meyr.

STREPSICEROS. Meyr.

615. S. EJECTANA, Walk., B. M. Cat., 350, (?) *Sciaphila absconditana*, *ib.*, 351; *S. servilisana*, *ib.*, 356; *S. saxana*, *ib*, 357; *Conchylis ligniferana*, *ib.*, 363; *Strepsiceros ejectana*, Meyr., Proc. Linn. Soc. N.S.W., 681, 1881).
Melbourne, &c.

616. S. MACROPETANA, Meyr. (*loc. cit.*, 683, 1881).
Gisborne, Melbourne, &c.

FAMILY—CONCHYLIDÆ.

HELIOCOSMA. Meyr.

617. H. RHODOPNOANA, Meyr. (Proc. Linn. Soc. N.S.W., 694, 1881).
Melbourne.

618. H. INCONGRUANA, Walk. (*Conchylis incongruana*, Walk., B. M. Cat., 363; *Eromene apertella*, *ib.*, Supp., 1762; *Heliocosma incongruana*, Meyr., Proc. Linn. Soc. N.S.W., 695, 1881).
Melbourne.

PARAMORPHA. Meyr.

619. P. AQUILANA, Meyr. (Proc. Linn. Soc. N.S.W., 697, 1881).
Gisborne, Mordialloc, Trafalgar.

OISTOPHORA. Meyr.

620. O. MEDIELLA, Walk. (*Enopa mediella*, Walk., Supp., 1738; *Oistophora pterocosmana*, Meyr., Proc. Linn. Soc. N.S.W., 699, 1881).
Gisborne, Melbourne (Footscray).

THE

Victorian Naturalist.

Vol. XII.—No. 10. JANUARY, 1896. No. 146.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting was held at the Royal Society's Hall on Monday evening, 13th January, 1896. The president, Professor W. Baldwin Spencer, M.A., occupied the chair, and some 90 members and visitors were present.

REPORT.

A report of the excursion to Heidelberg was received from the leader, Mr. J. Shephard. The object of the excursion was pond life. Among the objects obtained was an apparently new rotifer, which will form the subject of a paper at a future meeting. Another most interesting discovery was that of a fresh-water snail containing two stages of the Liver Fluke.

ELECTION OF MEMBER.

On a ballot being taken, Mr. G. C. Goudie was duly elected a member of the Club.

PAPERS.

1. By Mr. J. Gabriel, F.L.S., entitled "Further Notes from Albatross Island."

This almost inaccessible islet was revisited last October, in company with Mr. H. P. C. Ashworth, for the purpose of obtaining additional information on the nidification and flight of the Shy Albatross, *Thalassogeron cautus*. Owing to rough weather the island was only reached after ten days' waiting, so that but six hours were spent there. The birds were found to be as numerous as ever, and most of the eggs were well advanced in incubation. This isolated rock is the only known breeding-place of the species. The crayfish industry throughout the islands was described to be in a languishing state, owing to the selfish policy pursued by some fisherman in taking the female fish with spawn, the latter being removed before being sent to market. It was suggested that the Club should move for the protection of the female fish altogether during the spawning months.

Professor Spencer thought that the Club would do well to take up the question of the protection of crayfish, and on the motion of Mr. F. G. A. Barnard, seconded by Mr. Dudley Le Souëf, it was decided that the Committee be empowered to take action in the matter.

The second part of the paper, on "The Flight of the Albatross," by Mr. Ashworth, was postponed till next meeting.

2. By Mr. Dudley Le Souëf, entitled "A Trip to Mallacoota."

A second and more leisurely trip to this beautiful inlet enabled the author to make a large number of interesting observations on the habits of the birds, snakes, lizards, fish, &c., in which the country abounds. Especially may be noted a photograph of a prettily situated bower of the Satin Bower Bird.

Both of these papers were illustrated by limelight views, kindly shown by Mr. J. Searle in a creditable manner.

NATURAL HISTORY NOTES.

Mr. H. Bullen questioned the advisability of using strong solutions of formic aldehyde, or formalin, stating that in a concentrated solution it is toxic, and should be labelled a poison.

The Rev. W. Fielder read a note on the discovery of the earlier stages of the Liver Fluke, and gave some account of its life-history, illustrating his remarks with a limelight illustration of its different forms.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening :—By Baron von Mueller, K.C.M.G.—Specimens of *Dillwynia gracillima*, collected by Dr. Preiss more than fifty years ago in Western Australia, and on which Professor Meissner founded the name and description of the *Aotus gracillima*. The transfer to the genus Dillwynia was decided on by Baron von Mueller some few years ago, and the plant will appear in the third Census (soon due) as a Dillwynia. The very broad upper petal of the original type Dillwynia does not occur in several others later discovered. By Mr. A. Coles.—Specimen of Nankeen Night Heron, *Nycticorax Caledonicus*. By Rev. W. Fielder and Mr. Howard Cummins.—Larval stages of the Liver Fluke, found in a freshwater snail occurring near the Yarra at Heidelberg. By Mr. C. French, jun. —Rare nests and eggs of Victorian birds—viz., Tabuan Water Crake and Frontal Strike Tit, collected at Western Port by Mr. G. E. Shepherd ; and Swallow Dicæum, collected by Messrs. Brittlebank at Werribee. By Mr. J. Gabriel, F.L.S., and Mr. H. P. C. Ashworth.—Specimens of Shy Albatross, *Thalassogeron cautus (Diomedia cauta)*, and eggs ; eggs of Australian Pelican, *Pelicanus conspicillata* ; shells and photographs from the Hunter Group. By Mr. G. E. Shepherd.—Pair of White-shouldered Campephaga, *Campephaga humeralis*, with nest and eggs ; pair of Leaden-coloured Flycatcher, *Myiagra plumbea*, with nest and eggs.

After the usual conversazione the meeting terminated.

EXCURSION TO HEIDELBERG.

On 6th January six members met at Collingwood and proceeded to Heidelberg. The lagoon near the river, which has always proved prolific, was made the fishing ground. The water was low but clear, and a short search revealed an abundance of microscopic forms of animal life. One circumstance in regard to Volvox is noticeable. It is always found at this place, though never plentiful, while the localities where it is to be found in large numbers might be visited nine out of the twelve months without seeing any. Some weed of the genus Nitella was very rich in sedentary forms, later examination showing many representatives of Protozoa and Rotifera. Of the Protozoa there was a remarkable variety of species of Vorticellidæ, some of the colonies of Carchesium rivalling in the extent of their arborescence the plates of Kent's "Manual," which are often regarded with more or less incredulity. Many of the colonies of Carchesium had rotifers of the genus Philodina parasitic upon them, and in some cases there were as many rotifers as protozoons on the same stem. Some elongated forms were exactly similar in external outline to the rotifers living with them. Among the rotifers a somewhat interesting case of parasitism was noticed. An individual *Limnias ceratophylli* had attached to its tube two species of the rotifer *Œcistes longicornis*, two of the genus Philodina, two specimens of Vaginicola, and a number of Vorticella. A large number of fixed colonies of rotifers were met with, some being the common *Lacinularia socialis*, and others representatives of a species of Lacinularia presenting distinct and unique features, which will probably turn out to be new to science. A cursory examination of the material revealed, as well as those alluded to, species of Acineta, Rhizopoda, Polyzoa, Sponges, and Entomostraca.—J. Shephard.

SYMBIOSIS BETWEEN FUNGI AND PHANEROGAMS.

By Henry Thos. Tisdall, F.L.S.

(Read before Field Naturalists' Club of Victoria, 11th November, 1895.)

It is a well-recognized fact that a number of plants live, either partly or entirely, by taking the juices of other plants as a means of nourishment; in other words, there are parasites in the vegetable as well as in the animal kingdom. There are, however, degrees of parasitism—for instance, the Dodder plant (Cuscuta) puts forth no leaves in order to secure the necessary carbon from the atmosphere, but takes all its nourishment from its host; the Mistletoe, on the other hand, bears leaves, and only takes part of its food from its victim. The celebrated Prof. Kerner, of Vienna, states "that although the roots of several species of Euphrasia join on to the rootlets of neighbouring grasses, and take a certain portion of nourishment from them," yet, he adds, "it is not in-

conceivable that the useful substances existing in the green leaves of the Euphrasia may be transferred to the host plant, and deposited at a convenient time in the permanent part of the root as reserve material, and that in this way the host plant ultimately derives benefit from the so-called parasite." Now this is a supposed case of symbiosis, but on looking further in this direction we can get undoubted cases of "associated existence for the purposes of nutrition," which is Prof. Kerner's definition for symbiosis.

This association is found most strongly developed amongst the lichens. Take an instance: on the surface of stagnant water may be found small lumps of mucilage, and within these may be observed moniliform rows of round cells, coiled up in the jelly like miniature snakes. This jelly mass is a colony of unicellular algæ, termed nostocs. Suppose, now, that the stagnant water be dried up and the jelly mass be broken up into tiny dust-atoms, so small as to be blown away by the wind, and that some of this dust falls upon stones, rocks, or tree trunks. It has been ascertained by experiment that the atmosphere always contains an immense number of the spores of fungi, therefore, when rain comes on the spores, the nostoc atoms may lay side by side on the same stone, the moisture acts on both, the atoms swell up into beautiful green cells, and the spores sprout and lengthen into long hair-like filaments, termed hyphæ, which wind themselves beween and around the nostoc cells. By repeated division of the cells and by the growth of the hyphæ a complete mass of plant substance is formed—this substance is a distinct thallus plant, and is called a lichen. In such a case we find that two totally opposite plants combine to help one another to live, for the thin-walled hyphæ are well adapted to absorb moisture and the small quantity of mineral substances required to make cell-sap, and the green nostoc cells are enabled by their chlorophyll, under the influence of sunlight, to obtain carbon from the air in order to turn the inorganic cell sap thus obtained into proper plant food. By this means the algæ can multiply the number of its cells, and so increase in volume, whilst the hyphæ is enabled to increase as rapidly as the substance of the lichen requires. That this is not mere theory is proved by the following experiment, which was made in a mountain valley of the Tyrol. "A plane surface covered with white filter paper, which was kept moist, was exposed to a south wind. In the course of a few hours numerous particles, like dust, adhered to the paper, and amongst them were discovered cell-groups of nostocs, in addition to organic fragments of the most various kinds, such as spores of fungi, &c. These bodies were deposited in the little depressions on the sheet of paper." The above is related in Kerner and Oliver's "Natural History of Plants." Here we see an exact counterpart of what happens in the origin of lichens. It is further stated

that the ascospores of lichens cannot germinate without fresh algæ cells.

De Barry is very confident on this point. He states :—"If the ripe ascospore of the lichen fungus is placed on a moist substratum, it in most cases puts out germ tubes. These may in some cases form numerous branches, but they always perish after a certain time if they do not encounter suitable algæ, even when the germination has taken place on a substance favourable to the nutrition of the lichen. It must be remembered that there are many other algæ besides nostocs which are incorporated with fungi to produce lichens. In fact, so many and so various are the combinations that the difference of species depends greatly upon the chemical condition of the substratum and the amount of light and moisture."

Kerner gives the following evidence upon this point :—"Near the famous castle of Ambras, in Tyrol, there is an octagonal marble column which has been standing in its place for more than 200 years, with all its sides exposed to wind and weather. Lichens have settled on all the eight faces. . . . And on this column there are a dozen different species, the germs of which can only have been brought by winds. These species are, however, by no means uniformly disposed. Some prevail on one side and some on another, and a few are confined exclusively to one of the eight faces. Of three species of Amphiloma, one is restricted to the face exposed to the south-west, a second is to be seen on the upper part of the southern face, whilst the third is found on the same face, but close to the ground. On the side with a northern aspect a different genus predominates, whilst the prevailing forms on the north-west face are entirely different from those already mentioned." The symbiosis between fungi and algæ in the constitution of lichens is now a well-established fact, and is acknowledged by all botanists.

The consequence of this partnership is that plants are formed which have a powerful influence in the economy of nature. The fungoid partner not only has the power of closely adhering to the rock, but it can exude acids which reduce the substratum of the rock into powder. This desiccation of rock surface, together with the mass of vegetable matter created by the algæ partner, forms the basis of most of the vegetable mould required for the growth first of mosses and ferns, and finally of flowering plants. Thus we see that the partnership of these—some of the lowliest plants in creation—is a mighty factor in clothing the earth with verdure.

In Crabbe's poem of "The Borough" the following beautiful lines appear, which faithfully describe such a process as it occurs on ruined buildings :—

> "Seeds to our eyes invisible, will find
> On the rude rock the bed that fits their kind ;
> There in the rugged soil they safely dwell,

Till showers and snows the subtle atoms swell,
And spread the enduring foliage ; then we trace
The freckled flower upon the flinty base ;
These all increase, till in unnoted years
The stony tower as gray with age appears,
With coats of vegetation thinly spread,
Coat above coat, the living with the dead.
These then dissolve to dust, and make a way
For bolder foliage, nursed by their decay :
The long-enduring ferns in time will all
Die and depose their dust upon the wall :
Where the winged seed may rest, till many a flower
Shows Flora's triumph o'er the fallen tower."

Following out this theory of mutual help between plants, we find that it is not only in connection with lichens that the hyphæ of fungi take an active part, but that many of our flowering plants—aye, some of our largest trees—do not disdain to enter into partnership with them.

The usual mode by which plants obtain nourishment is by the action of tiny cylindrical outgrowths from the outermost layer of cells which surrounds the smaller rootlets. These outgrowths are called root-hairs, and they absorb the moisture from the surrounding soil. This moisture holds certain salts and other minerals in solution, which are essential to make up cell sap. The sap ascends through the roots and stem until it arrives at the leaves, and here it is converted into an organic substance by the assimilation of carbon, which the leaves obtain from the atmosphere. The organic substance thus obtained, and which is termed elaborated sap, passes from the leaves into special cells and vessels in the stem, and is finally brought into contact with every minute portion of the plant.

Here we see that it is necessary to have two sets of organs—one to provide the water and food-stuffs from the ground, and the other to obtain organic matter from the air.

It is well known that many plants, such as Roses, Ivy, and Pinks, can be easily propagated by placing slips in pure damp sand ; on the other hand, if slips of Oak, Broom, Heath, or Rhododendrons be placed in such sand, they may strike root, but no further progress will be made. If, however, the sand be mixed with soil taken from heathy, or forest land, the plants will thrive. These facts roused the curiosity of botanists, and it was found that the heathy and forest soil was thickly intermingled with the hyphæ of fungi. Further experiments showed that the younger fibres of the roots of Broom, Oak, Birch, Spurge-Laurel, and more particularly heath plants, as Erica and Epacris, were completely surrounded by a felted coat of hyphæ, also that very few or no root-hairs were found on some of these plants : whereas the hyphæ not only enveloped, but actually pierced the outside cells of the roots, and their other ends straggled far and wide into

the neighbouring soil. Prof. Kerner proves conclusively that the hyphæ actually take the part of the root-hairs. Here then we have true symbiosis, for one partner, the mycelium of fungi, absorbs nourishment and moisture from the surrounding soil; having no chlorophyll to elaborate this sap it pierces the roots of the other partner, which, on the other hand, is not properly endowed with root-hairs, and pours in the cell sap; this reaches the leaves of the host, where it is converted into elaborated sap, and after nourishing the one partner, the remainder is passed out to the mycelium to enable it to grow and flourish. The partnership commences from the moment the secondary roots of the plant appear; they become surrounded by hyphæ, and as the growing point of the root pierces the ground and spreads far and wide up and down, so the hyphæ follows and surrounds the younger roots, nor do they ever part until the plant dies, and both partners perish together.

To prove that such a partnership is not injurious to the higher organization, it has been ascertained that while young plants of Oak have their young roots surrounded by hyphæ, so the mature Oaks of one hundred years have the fibrous extremities of their roots clothed in the same manner. The range of species which live in this social union is certainly very large. Professor Kerner gives the following list:—"All Pyrolaceæ, Vaccineæ, and Arbutæ, most if not all Ericaceæ, Rhododendrons, Daphnoidæ, and species of Empetrum, Epacris, and Genista, a great number of Conifers, and apparently all the Cupuliferæ, as well as several Willows and Poplars, are dependent for nutrition on the assistance of mycelia."

Here I would like to mention my own experience in the matter. Noting that Roses, Pinks, and Ivy were known to grow from slips placed in pure sand, I carefully examined the smaller root-fibres under the microscope, but found no trace of mycelia. I then obtained roots of Rhododendron, Genista, Ericaceæ, and Epacridæ. On the Rhododendron roots I found a number of hyphæ placed in a straggling manner between and around the fibres; I was not so successful with the Genista, for the roots were rather too old, but the small ends of the fibrous roots both in the Ericas and Epacrids were covered. I do not consider that my experiments were a sufficient test, as the weather had been very dry, and the hyphæ are easily destroyed, still I was greatly impressed by the fact that the Rose, Ivy, and Pinks were totally devoid of fungi, while the Ericas and Epacrids were fairly covered. I trust some of the younger members of our Club will take the matter in hand. It opens a wide field for experiment and research, and as the theory, at least that part relating to the symbiosis of fungi with phanerogams, is comparatively new even in Europe, the Australian student will have a good chance of distinction in this neglected branch of botanical knowledge.

CALENDARS AND THE INDEXING OF NATURAL HISTORY OBSERVATIONS.

By C. Maplestone.

(Read before the Field Naturalists' Club of Victoria, 9th December, 1895.)

When the list of the times of the flowering of orchids, compiled by Mr. C. French, jun., appeared in the *Victorian Naturalist*, I at once compared it with my records and found that I could make many additions to it. I made a list of them and gave it to the editor. I intended to have made some remarks then upon the construction of a calendar, but found that the subject of keeping records of natural history observations generally could not well be separated from it, so I thought a paper dealing with the subject and my experience would be acceptable to members of the Club. For the reasons stated, when my calendar was published it was thought better to give it in its entirety, though I had intended to have held it over and made it an addendum to this paper. It was made for the purpose of showing me, by simple inspection, what orchids were likely to be found in any particular month, as I was then, and still am, anxious to complete my collection of them. It was compiled from my own observations and the records in the *Victorian Naturalist*: the former being extracted from a general calendar of plants in which, when I found any flowering, I entered them, having first drawn them in my diary. Often (as when I commenced I knew not all their names) only the number of the drawing appeared; the name followed when I obtained it. In this calendar I ruled twelve columns, one for each month of the year, and put a dot opposite the name or number in the column devoted to the month in which it was found. If found in the succeeding month a dot would be placed in the next column, and whenever afterwards the same plant was found flowering in any month in which it was not already recorded, a dot was placed in the proper column, and these dots were connected by a line, so that a glance at the calendar showed at once when any plant flowered, and also all the plants flowering in any particular month, which is much easier than looking through a long list of names, and very much more compact. I would note that in the calendar of orchids, which was made for a special purpose, the entries are in due order, but in the general calendar they are entered among the plants as found; the month only is indicated in them, but the day of first and last appearance can also be shown when considered necessary. The same plan can be adopted by ornithologists for recording the arrival and departure, nesting, singing, &c., of birds; by entomologists for records of captures. &c., of insects; and by naturalists generally for observations, the time of which may be of importance.

Separate calendars may be kept for different classes of observations, though they are not *necessary*, but even if a calendar

be not kept every naturalist ought to keep an index of his observations, for without it many are lost. I have kept a diary since 1861, and though it is not consecutive—that is, there are several periods, sometimes reaching to months, in one case to years, in which no entries have been made—yet all of importance are indexed, and I can at once refer to them. I use Letts's No. 8 Diary; it has a page for every day of the year, and the faint lines do not interfere with any ink or coloured drawings. At first I adhered to the dates at the head of the pages, but now I use it as a simple MS. diary. It is of convenient size (7½ by 5 inches) for use and for the bookshelf. If an object is too large to draw in it I make a drawing on a larger piece of paper and insert it, folding it up, as is done in many books with maps, &c.

My experience in indexing has been as follows:—Before I commenced the study of natural history in the field I procured and used Todd's "Index Rerum," in which I indexed my reading in various subjects; this I subsequently used as an index to my diary. An index of observations must necessarily be different from an index to a book—in the latter everything is entered in alphabetical order, in the former the entries must be made one after the other as the observations are made. The "Index Rerum" enables one in a great measure to minimize the inconvenience of not having the entries in a truly alphabetical order. As it may not be known to many of you I will describe it. Primarily it is simply a ruled book with the letters of the alphabet printed on the outside top corner of the pages, and there are six leaves (not pages) for each letter, which I have used in the way recommended—that is, to place the vowels *a*, *e*, *i*, *o*, *u*, and *y* on the top of leaves 1, 2, 3, 4, 5, 6 respectively, belonging to each letter. Every entry is made under the first letter of the word and the first vowel in that word, thus:—Caladenia under C, *a*; Thelymitra under T, *e*; Dipodium under D, *i*; Corysanthes under C, *o*; Bursaria under B, *u*; and Lyperanthus under L, *y*. Of course in words beginning with a vowel the second one is the guide, thus:—Acianthus under A, *i*; Acacia under A, *a*, &c. This subdivision of the letters into six divisions is very convenient, as, to find what you want, you have to look through at most only one-sixth of the names that you would have to do were not the letters subdivided. This system gives ample room for the indexing of many years' observations, especially if the pages are ruled into two columns, and letters can be continued into others seldom used, as X, Y, Z. I have brought mine with me to-night, and shall be happy to show it to any of the members. Though commenced in 1857 they will see that there is room for several years' more work, notwithstanding that now I have more leisure my observations are consequently more numerous than formerly. It is hardly necessary to say that the references in the index may be either to the volume and page of the dairy or to the

date of the observation ; where the object is drawn I often merely put the number of it, the drawings being numbered consecutively. This can also serve as an index to any calendars that may be kept ; for calendars, if lengthy, or not arranged systematically, require indexing ; it is only necessary to add the number or page in the calendar to the entry. I would also point out that it has been my practice to enter in the index each object once only (not every time it is observed or noted in the diary), unless any subsequent matter of importance with reference to it should transpire, and then an additional date or page to the original entry is all that is required : it is not necessary to enter it again unless the line should be filled up with references, then a note to "see below" should be added, and also to the second entry to "see above," but this will not occur very often. It may and does sometimes happen that a second entry is made inadvertently ; if so, notes to see above and below should be made. Any ruled MSS. book can be used for the purpose of an "Index Rerum," it is only requisite that it should contain a sufficient number of leaves to enable you to devote six of them to each letter of the alphabet, and be large enough for all future requirements.

Some may think I am exaggerating the importance of an index to observations, but I have found it very useful in working—indeed, I may say, almost indispensable. To give you some idea of the utility of it, allow me to give an illustration of what might happen. Most of the botanists of the Club possess, I have no doubt, Baron von Mueller's valuable "Key." Now suppose, instead of being systematically arranged, the descriptions of the various species of plants had been printed one after another, say, in the order in which they were made known to science, or in any other irregular manner—no two species of the same genus nor no two genera of any order within many pages of one another—and there was no index, of what use would the book be? And, further, suppose a book contained descriptions of the various species of the fauna as well as those of the flora, all mixed up in inextricable confusion (as in mine and I daresay many diaries) of what use would it be, even if it contained everything we wanted to know, if it had no index? With one it would be invaluable. Likewise an index will transform any records of observations from a heterogeneous mass of items into an orderly and accessible storehouse of information.

I hope you will not think that I wish to be didactic, for there are many members of the Club far more fitted to be so than I am, but the incentive to write this paper came from some of the members who have seen my calendar and my method of rendering my observations available at any time, so I thought my experience might be of some interest and use to you. If anyone is thereby induced to follow my example and so increase the value of their work, I shall not regret having brought the subject under your notice.

INTERMEDIATE HOSTS OF THE LIVER FLUKE.

It is interesting to note that the early stages in the life-history of the Liver Fluke are now being worked at by some of the members of the Club.

On a recent excursion to Heidelberg (11th January) specimens of the freshwater snail, *Bulinus tenuistriatus*, were obtained, and from some of these the Rev. W. Fielder and Mr. Howard Cummins obtained large numbers of the larval stages known as *redia* and *cercaria*, similar in form to those reported from the European intermediate host, *Limnæa truncatula*, and at the ordinary monthly meeting (13th January) living specimens were exhibited of these stages.

A few days later, whilst working through some of the material from the Heidelberg ponds, Mr. W. J. O'Neill found quantities of the larval stages in a snail of the genus Planorbis, whilst Mr. Fielder also noted in the same kind of snail the larval stages of a distinct variety, the *rediæ* being of comparatively large size and the *cercariæ* possessing a forked tail. This may be only a modification of the common fluke larva. It, however, occurs by itself, and not in company with the ordinary form. Another variety of *cercaria*, different in many particulars from the typical form, also occurs in Planorbis, but up to the present it has not been met with in sufficient numbers to allow of extended observations.

Mr. Fielder further reports the presence of fluke in the snail *Bulinus inflatus*, as also in *Ancylus Australicus*, a limpet-like form of very minute size. What causes surprise is the wonderful amount of ingenuity which the ciliated embryo fluke employs in obtaining admission to the pulmonary chamber of such snails as Planorbis and Ancylus. The former takes the shape of a disc only $\frac{1}{16}$ in. thick and $\frac{1}{8}$ in. across, whilst the latter can scarcely measure half that size. Our special climatic conditions evidently arouse desire in the embryo to widen its choice in the matter of suitable hosts. This fact unfortunately multiplies the chances of the increase of fluke, for whilst only one species of one genus favours the transmiss on of the pest in Europe, at least three or four different genera must be credited to Australia.

The special point of interest, however, in connection with the recent discoveries is that as regards the date of the encystment of the *cercariæ*, as at this stage the larval flukes become dangerous if eaten by sheep. It is asserted that in European countries the cyst is taken into the sheep whilst they are feeding upon grass or weed which has been submerged during the embryo life of the fluke, and left dry later in the season. What Mr. Fielder has observed, however, is a number of cysts *within* the snails Planorbis and Ancylus—forms so small that they can easily be swallowed by

sheep when drinking, and the future development of the fluke thus secured. Mr. W. McCaw has also noted, during the last few days, the occurrence of cysts within *Bulinus tenuistriatus*.

It has already been shown that the ciliated embryo fluke has enlarged its borders in Australia in the matter of the intermediate hosts. May it not be that the special climatic conditions have also influenced the last stage of its embryonic life? Mr. Fielder's observations point in this direction, and his future work will probably confirm this view.

DESCRIPTIONS OF NEW AUSTRALIAN PLANTS, WITH OCCASIONAL OTHER ANNOTATIONS;

By Baron von Mueller, K.C.M.G., M. & Ph.D., LL.D., F.R.S.

(Continued.)

Velleya Cusackiana.

Herbaceous, erect; leaves all basal but numerous, linear, acute, densely beset with long whitish mostly appressed hairlets; stems peduncular, slender, except towards the base only scantily bearing vestiture; flowers rather small, 10 to 15 in a simple raceme; pedicels thin, mostly longer than the flowers, near the upper end jointed; bracts very narrow, acute; bracteoles none; calyx quite small, provided outside as well as the bracts, pedicels and outer portion of the corolla with a thin almost velvety indument, divided to the base into lanceolar segments; corolla-lobes all equally expanding into yellow membranes; anthers blunt; style very short but stout, slightly beset with hairlets; stigma-cover ciliolated at the orifice; capsule turgidly ovate; dissepiment almost obliterated; seeds several, flat, ovate-orbicular, margined by a narrow membrane.

Near the Fortesque-River; W. H. Cusack, Esq.

Leaves about 30, crowded, to 1½ inches long, to only ⅛-inch broad. Stems and racemes together some few inches long. Calyx remaining almost unenlarged, thus hardly exceeding ⅛-inch in length. Corolla about half an inch long, its three lower lobes shorter than the connate portion, all lobes expanding on both sides equally into yellow membranes; the undivided lower portion of the corolla vitellinous and nearly glabrous inside. Fruit somewhat surpassing the calyx. Seeds comparatively large, but not obtained in a matured state.

This plant belongs to a group of species, restricted to Western Australia, and offers with some of them a transit to Goodenia, with some species of which they conform in aspect. In the system it should be associated with *V. cyonopotamica*, *V. Salmoniana*, *V. Forrestii* and *V. macroplectra*, but is amply distinct, and could be placed under Goodenia.

THE

Victorian Naturalist.

Vol. XII.—No. 11. FEBRUARY, 1896. No. 147.

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting was held at the Royal Society's Hall on Monday evening, 10th February, 1896. Mr. J. Shephard, a vice-president, occupied the chair, and some 70 members and visitors were present.

REPORTS.

The hon. librarian reported the receipt of the following donations to the library:—"Australian Fungi," by D. M'Alpine (reprints from *New South Wales Agricultural Gazette*, vol. vi., parts 11 and 12), from the author; "Proceedings Linnean Society of New South Wales" (second series), vol. x., part 3 and supplement, from the Society; "Records of Australian Museum," vol. ii., part 7, from the Museum; "Journal of Bombay Natural History Society," vol. ix., part 5, and vol. x., part 1, from the Society.

The hon. secretary reported that a meeting for practical work was held on Monday evening, 20th January, under the direction of Mr. O. A. Sayce, who dealt with "Killing and Fixing Agents for Microscopic Work." In spite of the great heat of the weather there was a satisfactory attendance.

PAPERS.

1. By Mr. R. Hall, entitled "Notes on the Habits of Victorian Wood Swallows."

The author remarked that seldom have the Wood Swallows been seen in such numbers around Melbourne as during the present dry season, and that he had taken the opportunity to make a few notes on the habits and nidification of the rarer species, *Artamus superciliosus* and *A. personatus*.

2. By Mr. H. P. C. Ashworth, entitled "The Flight of the Albatross."

The author stated that the observations made by him on the movements of soaring Albatrosses tended to support the theory that they take advantage of the difference in velocity between the higher and lower strata of the air to gain a continual increase in relative velocity sufficient to overcome the resistance to their motion. By always ascending against the wind and descending with it, moving in a plane inclined to leeward, they are enabled to soar for hours together without any movement of the wings

when there is sufficient wind. Various other theories were discussed and shown to be unsupported by the actual facts.

Some discussion ensued, in which Messrs. Barnard, Shephard, Frost, and T. S. Hart, M.A., took part.

3. By Mr. H. Bullen, entitled "Note on Turpentine as a Clearing Agent."

The author remarked that having lost several carefully prepared specimens of insects by using as a final clearing agent the ordinary turpentine of the shops he was induced to make inquiries as to the turpentine referred to in microscopic text-books, with the result that he found it was the natural balsam, which is recommended as having the power of rendering the chitinous textures of insects transparent.

In reply to Messrs. Sayce and Fielder it was recommended to obtain the natural balsam flowing from the trunks of *Pinus palustris* and allied species. Mr. Sayce mentioned that he had obtained perfectly satisfactory results with the use of oil of bergamot as a clearing agent.

NATURAL HISTORY NOTE.

The Rev. W. Fielder brought under the notice of the meeting some new hosts of the intermediate stages of Flukes. Variations in the structure of the different stages indicate that they may not all be the true Liver Fluke.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening:—By Mr. C. French, F.L.S.—Rare Australian Lepidoptera, comprising *Phyllodes* (sp.) and *Panacra testacea*, from Cape York; *Cryptophaga flavolineata*, *Xanthodes flava*, *Pilostibes enchidias*, and *Iodis rhodocosma*, from Queensland; *Monoctenia dictyodes*, collected by Mr. E. Giles in Victoria; drawings of Australian insects, including those of life-history of *Xenica Hobarti*, by Mr. C. C. Brittlebank. By Mr. C. French, jun.—Eggs of Blood-stained Cockatoo, from South Australia, and of Pacific Heron, from Victoria; also, rare nest and eggs of Short-billed Honey-eater, collected by Mr. G. E. Shephard at Western Port, January, 1896. By Rev. W. Fielder, Messrs. Howard Cummins and W. J. O'Neill.—Shells of freshwater snails which form the intermediate hosts of Flukes—viz., *Ancylus Tasmanicus*, *Segmentina Victoriæ*, *Planorbis* (sp.), *Isidora gibbosa*, var. *fusiformis*, *Isidora texturata*, *Limnæa lessoni*. By Mr. J. H. Gatliff.—Shells of *Bulinus tenuistriata* and *B. Newcombi*. By Mr. G. A. Keartland.—A young Echidna, taken from pouch of mother. By Messrs. R. S. Sugars and J. Shephard.—Octopus, living and in formol; Hydrozoa; species of Diphyes, living and in formol; and Medusæ in formol. By Messrs. W. and J. Stickland.—Starfishes, from Sandringham.

After the usual conversazione the meeting terminated.

NOTES ON THE BIRD FAUNA OF THE BOX HILL DISTRICT.

By Robert Hall.

(Read before Field Naturalists' Club of Victoria, 8th July, 1895.)

The district to which these notes refer lies to the east of Melbourne, and as its furthest point is within twenty miles of the city, it may almost be termed suburban. Its shape is somewhat triangular, the base extending from Doncaster on the north to Oakleigh on the south, a distance of about six miles, whilst its sides reach almost to the Dandenong Ranges at Bayswater, a distance of about ten miles.

On the whole the district is undulating, and is now rather thinly timbered, most of the larger trees having been cut down to supply firewood for the metropolis. Owing to the absence of much permanent water, certain classes of birds, such as the swimmers and waders, are almost absent. The creeks are small, and generally dry during February and March, with the exception of the Koonung and Dandenong Creeks, which form the northern and southern boundaries respectively. These are well lined with vegetation of various kinds, which forms the home of many of the species recorded.

My notes refer principally to observations made during the years 1893 and 1894, under ordinary circumstances as a collector. During the latter year, it will be remembered, neither extreme heat nor cold was experienced—in fact, the winter was so pleasant that the Welcome Swallow (*Hirundo neoxena*) did not migrate as usual. Spring came in with the 1st of August, and by the middle of the month the singing of birds could be heard in all directions.

The list of Victorian birds amounts to nearly 400 species. Of these I have noted 94 within the district, 74 of which have been found to breed here, the remaining 20 only occasionally making their appearance.

The passerine birds comprise seven-tenths of the total, thus showing the wooded nature of the country, the most numerous families being the Meliphagidæ, the Campephaginæ, and the Luscinidæ.

With a few exceptions the whole of the list was observed within twelve miles of Melbourne, more particularly in that strip of timber along the Koonung Creek, near Blackburn, a fairly reliable resort for a variety of birds breeding in the early spring. We may therefore safely say the list is a suburban one, merely extending to Bayswater, where the birds live more undisturbed, and are accordingly found more regularly and in greater numbers. On the whole, I venture to think Box Hill the nearest district to

Melbourne in which fairly satisfactory results can be obtained from half a day's collecting—not meaning thereby that such a bird as the Black Cockatoo (*Calyptorhynchus funereus*, Shaw) can be obtained at any time, although last year two, now in my cabinet, were shot within a mile and a half of the local post-office.

Soon after leaving the railway station, travelling in a north-easterly direction, you strike good country, and within three miles may possibly secure the Orange-fronted Fantail (*Rhipidura rufifrons*, Lath.); or you have the option of going south-east, to the Blackburn Creek, and following its course, where some excellent patches for birds are to be found. It must be borne in mind, however, that birds which "know a thing or two" discontinue building nests when disturbed, and with the advance of population will doubtless desert the district in a few years.

Of the 74 species found breeding during the season, 28 remain throughout the winter. Forty-one build in trees, such as the Zosterops, Honey-eaters, &c.; thirteen build in cavities of trees and creek banks, such as the Brown Tree-creeper, Funeral Cockatoo, &c.; twelve species on the ground, as the Pipits, Ephthianura, &c.; eight species in hedges, as the Acanthizas, &c. Another analysis of their nesting habits gives forty-four species as constructing nests exposed to the light; while thirty species construct dome-shaped nests, and are thus internally dark.

The dates of egg finding which I shall mention during my notes are not to be regarded either as the earliest or latest date on which the several eggs may be found, but are simply given for the sake of comparison and with the hope that other observers will bring forward their notes on the subject, and may thus throw some light on the breeding times of some of our birds.

I now purpose taking the birds represented in the district in the order in which they are usually placed by authorities, and briefly introducing them to your notice. The Falconidæ do not breed in the district, but are represented by

1. Brown Hawk (*Hieracidea orientalis*, Schb.)

2. Nankeen Kestrel (*Tinnunculus cenchroides*, V. & H.), W.†

First seen in November, more common in February and March.

If anyone would care to read a treatise on this nature of bird written in the purest and pleasantest of English I would recommend you to no less an authority than John Ruskin, in "Love's Meinie." It will do more than entertain you.

Of the Nocturnæ six species may be listed, but excepting the Boobook Owl, are seldom seen. The Sooty Owl is often enough noticed on the hills above Bayswater, but the remaining four merely fly across the country from the eastern ranges. The

† Species marked W remain in the district throughout the winter.

Grass Owl appears to be much more scarce this season than in the previous ones.

The Strigidæ are—

3. Chestnut-faced Owl (*Strix castanops*, Gould).
4. Sooty Owl (*Strix tenebricosa*, Gould).
5. Grass Owl (*Strix candida*, Tickell).
6. Delicate Owl (*Strix delicatula*, Gould).
7. Boobook Owl* (*Ninox boobook*, Lath.)
8. Powerful Owl (*Ninox strenua*, Gould).

Of the four known Australian Caprimulgidæ, we have—

9. Owlet Nightjar (*Ægotheles Novæ-Hollandiæ*, V. and H.)

On 2nd December, 1894, I found a 3-egg clutch, the usual number, in the hollow of a eucalypt.

In the same family is—

10. Tawny-shouldered Podargus (*Podargus strigoides*, Lath.)

The "British Museum Catalogue," xvi., p. 620, has the amalgamation of six Australian species into this one. The tawny appearance on the shoulder certainly characterizes this a distinct species, be the others so or not.

On 19th October, 1894, was found a nest containing two grey-downed young, with male parent sitting at angle of 45°, and motionless. After a few minutes' interval, as if to cast a shadow of doubt on the primates below, its eyelids were opened, and revealed a distinctive marking easy of observation in the broad yellow iris. The female was perched parallel with an almost horizontal bough above, and so motionless that it was mistaken for an iguana. Both were studies, and almost unrecognizable. However, a weighty stick carefully deposited destroyed the equilibrium of one and caused a movement of the wings of the other. The gizzards showed remnants of land crustaceans and coleoptera; and while on the topic of food I might mention these birds as destroyers of garden vermin, such as slugs. On 25th November, 1894, a nest was found placed at the junction of three nearly perpendicular limbs; this is an unusual place. The nest was disturbed, so the birds deserted, to the best of my belief for this cause. On the Flinders-street station, in November last, I was somewhat amused at being offered a young bird for the sum of one shilling. It was close season. The vendor either had a bold spirit, or found it folly to be wise.

The skin of a young male shows the light parts of the entire plumage to be grey, with extremities of primary wing feathers the same. This latter is quite lost in the adult.

Of the two Swifts that pass here in migration I have noted only the

11. Spine-tailed Swift (*Chætura caudacuta*, Lath.)

* The species marked * were also noted in January, 1895, at an altitude of 5,000 feet above sea level—the Dargo Plateau, North Gippsland.

Appearing in January or February, and a perfect master of flight, the short neck lending special aid to the dart-like quickness in its turnings. The breadth from tip to tip of wings is greater than the length of bird.

12. Welcome Swallow (*Hirundo neoxena*, Gould), W.

This is indeed a genuine insectivorous bird, for if you watch it hawking (as there is little doubt you often have done) the innumerable number of flies it captures totals hundreds, possibly thousands, in a day if the weather is favourable. Ever on the wing in daylight, feeding on the wing, exercising itself while on the wing, until in August when it alights on the damp side of a waterhole to obtain a first brick to form the foundation of its seasonal home for the family weal during September and the following months.

In a barn, attached to the roof is a nest with fibrous roots pendent to a distance of eighteen inches, and moving in the gentle breeze coming from the open door. The nest is coarsely built, and somewhat on a new principle. The lower half of the nest is composed primarily of roots, with earth more like a binder than the bound, and the upper half of mud, as is usual with the whole. The roof is a mass of hanging spider webs, new and disordered. In this a house is built to avoid detection; certainly it bears a resemblance to surroundings, but its primitiveness is not a shield of sufficient cover. In September last at Swan Hill, overhanging the river, I noticed a tree spout containing a nest with fresh eggs. This is an unusual building place.

A second species in the same devouring family is

13. Fairy Martin (*Lagenoplastes ariel*, Gould).

A colony completed its hamlet by the middle of November. To learn something I broke off the neck of one nest, and found a few minutes later the birds, by unity, had replaced a funnel similar to the broken one. The birds return to the nesting place of last year, and build among the dilapidated remains. In October of 1894 the new were tenanted, the old "to let."

The well-known member to us in the Alcedinidæ is

14.—Great Brown Kingfisher (*Dacelo gigas*, Bodd), W.*

One or two digestive feats by this bird may be of interest, for it is not an epicure.

A neighbour has a bird which has shown a weakness for a variety of animate things, besides home luxuries. A bandicoot as large as itself was the first trial of strength I knew of. The bird occupied three-quarters of an hour in pounding it to a jelly appearance; then the anterior end disappeared. A day was occupied in the digestion and recovery. A rat later in the week was similarly pounded and devoured whole, or, to be correct, devoured as a whole. Within the same month of experiments,

on two successive days, sixteen lizards (*Hinulia*, sp.) and seven Bloodsuckers (*Amphibolurus*, sp.) were successfully managed, as if the undertaking was quite a pleasure throughout. A Copper-headed Snake, two feet in length, having the head dismembered, was a third banquet, and it was similarly managed. The same bird in November killed its cage mate, a Collared Crow-Shrike, and, of course, swallowed it : this is a case of the biter bit. The last note was sufficient to satisfy me of its indifference to what comes first, providing it is substantial.

A poultry yard near by has chickens of good quality. A Jack-ass without trimmed wings sat upon a tree adjacent, when, without warning, as is only natural, our laughing friend, now silent, glided down, and quietly soared up to the same bough with a handsome chick, now laughed heartily, battered the spoil as usual to a pulp, swallowed it, and this time quickly flew away " for peace sake."

The eggs invariably are pure white, but I was surprised this last season to find two successive clutches of three uniformly marked near both ends of each egg with a circular group of grey blotches, the apices and greatest diameters being free. The first clutch had been thrown from the nest, which was exposed to the light above, being merely placed on the upper rotten portion of the central axis of the tree ; and both sets agreed in the regular markings.

In the first week of September several nests with eggs were observed, and in the same week of November several contained young.

15. Sacred Halcyon, or Rest-day Kingfisher (*Halcyon sanctus*).*

This species is more numerous than the Azure, for when you will find a dozen in the timber, only one may be seen by the creek side. On 18th November, 1894, birds were seen preparing hollow for eggs. On 11th and 16th December eggs were taken from other than these nests. In one case the sitting bird decidedly objected to be routed from its fresh eggs. These were extracted with the usual spoon, after which the bird made a dash for liberty, but did not get it at that moment. While being handled the little Halcyon showed some unconcern and courage.

16. Azure Kingfisher (*Alcyone azurea*, Lath.) has beauty in itself and grace in flight as it passes from one river bank to the other or lodges temporarily on a mid-stream stranded tree. This is a true fisher, and thoroughly understands the business of life.

On 1st January six unfledged young were sighted, nestled in the bowl at posterior end of hole drilled in creek bank.

17. Sordid Wood Swallow (*Artamus sordidus*, Lath.)

Three (3) species of the genus are here, with this as the most familiar. The bird, though congenial company, prefers the room of a naturalist to his observations, especially when the first twigs of its homestead are being placed. A pair of birds being watched

transferred their nest three times, and with a fourth move returned to the original place; eventually eggs were deposited.

In November four nests were found, with a fifth built near the apex of a tall, slim sapling, 25 feet from the ground, and containing three eggs. Although a nest was observed building during the last week of December, another had young in October.

18. Masked Wood Swallow (*Artamus personatus*, Gould).

The first notice I had of this bird's appearance was on 14th December of the past year, when some dozen birds in all were flocked with the White Eye-browed species, and both sexes of each kind were easily secured. A pair completed their nest and deposited eggs (two) by the fourth week in December. Although so few were here nesting, hundreds were enjoying the bountiful supply of grasshoppers on a hillside toward the end of February.

19. White Eye-browed Wood Swallow (*Artamus superciliosus*, Gould).

I saw nothing of this summer visitant until 12th December, 1894, when two pairs appeared flying in company. Next day one pair commenced building. Nests of all are similar.

20. Spotted Pardalote (*Pardalotus punctatus*, Temm.)

The little Diamond Bird has been obtained in pairs, but so far I have not been fortunate enough to find a nest.

21. Striated Pardalote (*Pardalotus ornatus*, Temm.)*

If you are resting on a log and focussing the timber facing, all may be quietness, but in a few minutes a rush of hurrying birds, scampering through the timber, will attract your attention. They are quickly visiting each tree in search of scale and other insects. You may then notice the bird take off each scale carapace, or house, and one by one devour the tenant of each. The call is a sound somewhat like "Pick it up." On 4th November, 1893, ten inches in the bank of a creek, I extracted four eggs, with the male bird close sitting. Of it I made a skin, to be sure that both sexes take part in incubation.

22. Allied Pardalote (*P. affinis*, Gould).

Habits similar with previous one, but preferring to keep to timber, in a hollow of which it makes its nest.

23. White-backed Crow-Shrike (*Gymnorhina leuconota*, Gould), W.*

In a paddock at Box Hill, familiar to fungi seekers of this Club, on 26th July, 1894, I noticed, for the first time in the season, two nests being lined for completion; the anxious whir-r-r overhead was the adviser. On 13th August took first egg; saw a juvenile essaying its first flight as late as 1st December, and later on in the month observed flocks under the newer circumstances. Amongst the Loranthus stems was a favourite position for a nest, several of which were found at varying times. August is a favourite month for incubation.

If, as many of our members think, this bird will probably take to a partly granivorous diet, we might easily allay any fear of future trouble, in amending the table act, not troubling the "Game Act," by adding it to our *menu*.

24. Collared Crow-Shrike (*Cracticus torquatus*, Lath.), W.*

It is very noisy with song throughout the autumn, though it does not confine its desire for Box Hill canaries to this season. An unfortunate Pectoral Rail was caged in the same aviary with one, and, to save its skin, we parted them. The whistle is a series of notes, often leading into a conversation as if for its benefit only, which is quite sufficient to make a silent spectator laugh, however large an "investment call" he may have paid that day. In the beginning down goes the head, elevated are the wings, through not spread, and with two crotchets—to make certain of the throat—the "Butcher Bird" gives you the full benefit of a rich, harmonious strain, and all for the walk only. One cannot fail to appreciate it, even though it be short and sweet.

On 1st December, 1894, two young were taken from a nest in the mistletoe, with one egg broken on ground below. The birds rebuilt in another mistletoe, out of which an egg was taken and nest again destroyed. They again built in a third cluster of mistletoe, 150 yards distant, and again two eggs were taken. The three nests formed triangle points, and all were placed in the parasite Loranthus. In October the majority of eggs were seen.

25. Pied Grallina (*Grallina picata*, Lath.)*

This one of our three mud-nest builders is also one of the most graceful of birds. The contrasted colours draw the eye at once. The nest seldom is placed other than on its horizontal branch position. In another district a nest was built as usual, but within two feet of a fork that attracted a White-fronted Heron, which I presume pleased the heron so much that it placed thereon a twig nest that came in close contact with the bowl-shaped nest of its neighbour. The two nests contained eggs, and all appeared to work in harmony. I trust the heron did not change its insectivorous diet as the young magpie larks began to have a plump appearance.

Earthen nests are generally the work of certain families; but, as an exception, there is little doubt a mud nest was built by the Wood Swallow, Leucopygialis, last year at Swan Hill. Although I cut down the nest and saw the swallows, the information is from authentic collectors.

On 10th and 20th October clutches of each five eggs were seen, and one taken. As late as last New Year's Day a salmon-coloured clutch was found.

26. Black-faced Graucalus (*Graucalus melanops*, Lath.)

On 25th October I saw a delicate piece of material being transferred to a nest in embryo; later on secured three eggs. The second and last notice to date was of a third bird desiring to jump a nest, and the two were fighting for possession—a broken egg lay beneath. I did not understand the quarrel, and though the third bird waited about for some days, I got no nearer to the answer, simply because a ruthless urchin came along with his catapult, devastated the circle, and carried off the nest for his immediate pleasure.

27. White-shouldered Campephaga (*Lalage tricolor*, Swains.)

This species is not an everyday object. I know of one nest only having been found, and that at Ringwood in October, the clutch being two eggs, hard set.

28. White-throated Thickhead (*Pachycephala gutturalis*, Lath.), W.

Juvenile collectors often go astray in the popular naming of this species, simply because the other here known species of the same genus has a white throat. "What is there in a name?" I should say, just enough to have this one designated by some other and prevent confusion. On 1st December, in an ordinarily constructed nest I found an abnormal egg. The ground was white, the graded blotchings similar to the type, and the dimensions were one-half as much again; the egg was the sole contents of the nest, and the chick was well developed.

29. Rufus-breasted Thickhead (*P. rufiventris*, Lath.), W.

Amongst the birds that partially feed on fruit of the Native Cherry is this species. The four weeks following 15th October revealed the majority of nests of this member occupied with fresh eggs. A fledgeling, on being caged, immediately caught flies, and for weeks lived on them alone, not requiring any aid. This is a partial answer to some folk who irritably ask the use of flies on hot days.

30. Harmonious Shrike Thrush, W. (*Collyriocincla harmonica*, Lath.)*

This creek-loving bird is at all times to be observed. It has a varied taste, and any creeping thing does not come amiss. Among many curious forms, a young lizard in good order, and in length two inches, I drew from the gizzard—it evidently had been a late find. The usual nest you know, but on two occasions on 25th November, 1894, the nests each contained eggs, and were neatly lined with mud, as if done with a trowel and an instrument for making the spherical form. There is a great likeness to the nest of the introduced Thrush in this particular build. November gave the majority of nests containing fresh eggs.

(To be continued.)

SOME NOTES ON THE LIFE-HISTORY OF *LAMENUS MYRSILUS*, Dbl.

The ovum.—Pale green, or pale blue-green, with well-marked white reticulated covering over the whole surface, giving it the appearance of being frosted when seen without the aid of the lens. The egg is approximately hemispherical, with the basal edge rounded off and the vertex sharply depressed. Average diameter, 0.93 mm. Deposited singly on bark.

The pupa.—Uniform dark brown, resembling in shape the pupa of *Hypochrysops delicia*, Hew. Length, 11 to 12 mm.; breadth, 4 to 4.5 mm. Attached at posterior end to small web, and supported by a fine belt round the body. The pupæ are usually found under old bark, and in cracks near the base of Blackwood trees *(Acacia melanoxylon)*, and occasionally in any sheltered place higher up the tree. I have found them at Camperdown associated with pupæ and larvæ of *Ogyris abrota*, about the roots of Mistletoe *(Loranthus)* growing on Blackwoods.

In cases where the food-plant affords insufficient shelter the larvæ often travel for many yards before spinning up on neighbouring trees. About one-half of the pupæ found at Gordons were on eucalypt trees, under loose bark, usually, but not always, near the ground. One lot of five was taken at about twelve feet from the ground. Although the pupæ are often found in numbers together on the Blackwood trees, they do not seem to be gregarious, as are the pupæ of *I. evagoras*. Their clustering together seems to be an accidental occurrence, due to the scarcity of good shelter on the tree, rather than to any well-defined course of action on the part of the larvæ, and this is borne out by the fact that they are seldom found other than singly on the eucalypts. Even when in clusters of nine or ten, there is no sign of a common network of silk for the support of the chrysalides, as with *I. evagoras*. Each has its own separate little net. Specimens of these pupæ were found in February, and again in September and October.

The imago.—The general description of this insect is too well known to need repetition. In some specimens, of both sexes, the upper surfaces of the wings, at and near the base, are lightly dusted with bluish-green scales of the same tint as the little wavy marginal line at the anal angle of the secondaries. The females show some variations in the markings on the under side of the secondaries. The marginal red band, and also the series of black spots extending from near the middle of the costa across the wing, seem very constant, but midway between these in some specimens is a well-marked line of black spots parallel to the red marginal line, beginning near the costa and terminating in a larger spot near the anal angle.

Of seventeen females, three have this characteristic well

marked, in ten others it is reduced to one spot on each wing, while in the remaining four there is one spot on one wing and two on the other. Eleven males out of sixteen have the one spot only near the angle of each wing, another has one on the left and two on the right wing, two have two on each, and two more have two on one and three on the other wing. Otherwise there seems to be little variation.

This butterfly emerges usually in the forenoon, develops in about twenty minutes, and is ready for flight in an hour or so. Of those reared this season the majority emerged during October, the extreme dates being 27th August and 9th November.—W. H. F. Hill.

NOTES ON THE NESTING OF *CALYPTORHYNCHUS BANKSI* AND *ERYTHRODRYAS ROSEA*.

By Alfred J. North, F.L.S. (Ornithologist to the Australian Museum, Sydney).

1.—Calyptorhynchus Banksi.

Psittacus Banksii, Lath., Ind. Orn., p. 107 (1790).

Calyptorhynchus Banksi, Vig. and Horsf., Trans. Linn. Soc., vol. xv., p. 271 (1826); Ramsay, Cat.

Psittaci, p. 17 (1891); Salvad., Cat. Bds. Brit. Mus., vol. xx., p. 109 (1891).

The range of Banks's Black Cockatoo extends from the neighbourhood of Cairns, in north-eastern Queensland, throughout the whole of New South Wales and most parts of Victoria. In North Australia it is represented by a slightly smaller and scarcely separable race, known as *C. macrorhynchus*, and in Central and Western Australia by a closely allied but specifically distinct species called *C. stellatus*. I can testify to the accuracy of Gould's remarks relative to the amount of caution required to approach *C. Banksi*, while at other times, especially when feeding, it can be easily accomplished. Near Ballarat, in Victoria, and in the Illawarra district of New South Wales, I found this species unusually wary, keeping to the tops of the tallest Eucalypti, and seldom coming within shooting range. But when the heavily timber-clad ranges of South Gippsland, in Victoria, were first settled upon by selectors, I have frequently stood under a dead Acacia while several of these birds have been busily engaged in searching the branches for the larvæ of insects, not more than forty feet above my head. Especially was this fact observable during a thick drizzling rain. Probably by this time they have learned to shun the presence of man, if they have not been wholly extirpated or driven away, as many other species have been, since that district was denuded to a large extent of its primeval forest.

When in Melbourne last year I had an opportunity of examining the rare egg of this species in the collection of our

esteemed fellow-member, Mr. Joseph Gabriel, F.L.S.; also another received from him in the possession of Mr. G. A. Keartland. Both were taken from different nesting places by Mr. W. H. Watson, in the Western District of Queensland, and who has also kindly supplied the following information, under date 28th July, 1895:—"I have forgotten the precise date of taking the eggs of the Black Cockatoo, but I think that I got one in the first week in May and the other in the first week of June. Both nests were in holes in big gum trees overhanging the river, and were so situated that a stone dropped from the nesting-places would fall into deep water. I was in a boat on both occasions, and the passengers who were with me also saw the Black Cockatoos fly out of the hollow limbs. These birds are rather scarce in Western Queensland, but as I was a keen collector of eggs when a boy, I cannot help observing a bird that is leaving its nest. At one time I used to manage Cultowa station, on the Darling River, and where I saw dozens of the nests of this bird; generally they were in very big trees in the river bends. Altogether I have climbed up to about twelve nests in New South Wales and Queensland, and have only found one egg or one young one in each. I once watched a nest on the Darling River, and when the single egg had been hatched for some time I took the young one, which was successfully reared by Mr. John Hearn. He was a nice quiet bird, but when full-grown got accidentally drowned."

One egg is elongate-oval in form; the other a slightly swollen oval. They are white, the surface of the shells being rather rough, minutely pitted, and lustreless. In one specimen are crack-like fissures in the shell. Length—(A), 2.1 inch x 1.38 inch; (B), 1.97 inch x 1.47 inch.

2.—ERYTHRODRYAS ROSEA.

Petroica rosea, Gould, Proc. Zool. Soc., p. 142 (1839).

Erythrodryas rosea, Gould, Proc. Zool. Soc., p. 112 (1842); Ramsay, Tab. List Aust. Bds., p. 7 (1888).

Petræca rosea, Sharpe, Cat. Bds. Brit. Mus., vol. iv., p. 170 (1879).

Although by no means a common species, the Rose-breasted Robin is distributed throughout the tropical jungles in the vicinity of Cardwell, in Queensland, the whole of the coastal brushes of New South Wales, and the humid scrubs of Eastern Victoria. During the winter months it frequents the contiguous open forest lands, and retires again in the spring to its thickly wooded retreats for the purposes of breeding. Near Sydney it is usually seen in pairs during May, June, and July, and are so familiar that I have frequently observed them in the suburban gardens on the outskirts of Ashfield and Croydon. It has a weak, piping little note, but when once heard it is sufficient to distinguish it from that of any other Robin. The nest of this

species has been known for some years past, from examples obtained at Cambewarra, in the Illawarra district of New South Wales, by Mr. J. A. Thorpe, the taxidermist of the Australian Museum. Although the birds were in both instances seen and obtained near the nests, unfortunately neither of them contained eggs. For an opportunity of describing the eggs as well as the nest of this Robin, I am again indebted to Mr. Gabriel, who has kindly sent me the birds, nests, and eggs lately procured by him at Bayswater, Victoria; also the following notes, under date 28th December, 1895:—

"My first nest of *E. rosea* was found in a Blackwood Tree *(Acacia melanoxylon)*, in November, 1893, and contained three hard set eggs; the second and third nests on 18th December of the same year, both containing fresh eggs; also a nest in a Hazel Tree *(Pomaderris apetala)*, with young; and the fifth nest in a Blanket Tree *(Senecio Bedfordi)*, with three eggs, on 18th November, 1894. About a dozen old nests we found in Hazel, Blanket, Blackwood, and Native Holly trees. The last clutch, the one which I am sending you with nest—oh, what a pretty one!—you will see is on a Musk Tree *(Aster argophylla)*, and was about twenty feet from the ground. These birds build at a height varying from twelve to sixty feet. The nesting season is November, December, and January, the second nest enclosed, which we found yesterday (27th December, 1895), being an unfinished nest, and pointing to the latter month. My boy Charlie pulled down the nest, much to my chagrin, for it probably meant a full clutch of three, but I do not despair of getting one yet this season, for we found and lost two more hens yesterday, and from their manner of hanging about we considered they had nests. Like the Flycatchers, they are continually on the move, and the note is merely an apology for a noise."

The nest of *E. rosea* is a beautiful structure, and closely resembles that of its congener, *E. rhodinogaster*. The one sent by Mr. Gabriel, which contained two eggs, is built at the junction of a forked horizontal branch of *Aster argophylla*, from which spring two thin curved branches, protecting the sides of the nest and sheltering it above with their leafy sprays and clusters of flowers. It is cup-shaped and outwardly composed of a green *Hypnum* held together with a fine network of cobwebs, and ornamented with pieces of apple-green lichen; inside it is warmly lined with opossum fur and the down from the freshly-budded fronds of a tree fern. Exteriorly it measures 2.5 inches in height and breadth, and internally 1.5 inch in diameter by 1.1 inch in depth. The rim, which is thick and rounded, is ornamented with lichens, and measures 0.6 inch in width. The unfinished nest, which was placed on a thick horizontal branch, is similarly formed, but has no lining of opossum fur. The nests found by

Mr. Thorpe at Cambewarra are more thickly covered with lichens—in fact, one nest, until closely looked at, appears to be wholly constructed on the exterior with this pretty and much-used nest decoration.

The eggs are of a very faint greenish-grey ground colour, minutely dotted and spotted with purplish-brown, dark slaty-brown, and wood-brown markings, which become larger on the thicker end, and form an ill-defined zone. Length—(A), 0.7 inch x 0.53 inch; (B), 0.69 inch x 0.53 inch.

SUPPLEMENTARY NOTE ON *Chlamydodera orientalis*, Gould.

Since the publication of my notes in last December's issue of the *Naturalist*, in which the eggs of this species are figured, Mr. French has kindly forwarded me for description the nest from which they were taken. His collector in the Gulf district of Northern Queensland informs him the nests are built in low trees, about fifteen feet from the ground, and that it is only by flushing the bird when sitting that they are discovered. It is a very primitive and nearly flat structure, placed at the junction of a forked horizontal branch, and is held in position by three thinner upright branches. The nest is externally constructed of very thin sticks loosely interlaced, and is lined inside, where there is a saucer-shaped depression, with fine twigs. It resembles very much some nests of *Podargus strigoides*, or a large one of *Phaps chalcoptera*, and averages externally eleven inches and a half in diameter, the egg-cavity measuring six inches. The eggs would be clearly visible through the bottom of the nest. It was taken near Cooktown, but was forwarded to Mr. French by his collector from the Gulf district; hence the mistake in the locality in my previous note.

INTERMEDIATE HOSTS OF FLUKE.—FIRST NOTE.

By REV. W. FIELDER.

(Read before Field Naturalists' Club of Victoria, 10th February, 1896.)

I PROPOSE during the next few months to supply short notes under this heading, calling attention not only to the snail hosts but also to some curious modifications in the fluke embryos which future investigations will probably explain. Before doing so, however, I wish to tender my best thanks to Mr. Chas. Hedley, F.L.S., of the Australian Museum, Sydney, and Mr. G. B. Pritchard, of Melbourne, for identifying the shells, and to Messrs. Howard Cummins, W. M'Caw, and W. J. O'Neill, members of the Club, and Mr. E. T. Edwards, of Camberwell, for valuable assistance in confirming observations; also to those who have given hearty assistance in securing specimens from different parts of the colony.

The observations here set down range from the middle of January to the same period of February. Fluke embryos were

first noted in snails from the pool near the bridge at Heidelberg. *Isidora* (*Bulinus*) *tenuistriata*, Sowerby, gave embryos closely agreeing with the typical form as figured by Professor Thomas in the Q.J.M.S, xxiii., 1883, all stages being met with except the free-swimming embryo and cyst. The same applies to embryos found in *Ancylus Tasmanicus*, Ten. Woods, a limpet-like form of very minute size.

Living side by side in this pool are species of two genera of minute snails very similar in outer form, viz., Segmentina and Planorbis. These have been identified as *Segmentina Victoriæ*, Smith, and *Planorbis Gilberti*, Dunker. In the former fluke-cysts were found, one of which was noted to contain an embryo provided with a circlet of spines in the region of the anterior sucker. Further observations will probably reveal the presence of other embryos of this form. The *Planorbis* (sp.) furnished flukes in sporocyst, redia, and cercaria stages. Three specimens gave cercariæ with very distinct pigment spots close to the anterior sucker, whilst three others produced a forked-tailed variety out of sac-like structures much larger than the ordinary rediæ. Want of material, unfortunately, did not allow of extended observations of these curiously modified forms.

Another pond at Heidelberg gave a large supply of *Isidora (Bulinus) gibbosa*, Gould, var. *fusiformis*, Nelson and Taylor, which yielded a distinct variety of cercaria, furnished with a very definite spine or stylet springing from the anterior sucker, minute spines also clothing the anterior part of the embryo. The cercariæ seem to be produced from a sac-like form like a sporocyst, no rediæ having been observed. Further attention, however, will be given to this point. Cysts were frequently met with in the shell.

The north-eastern parts of the colony have furnished two new intermediate hosts in the snails *Isidora (Bulinus) texturata*, Sowerby (the form referred to last month as *Bulinus inflatus*), and *Limnæa lessoni*, Deshages, which gave embryos in all stages of development up to and including encystment, the embryos also in these cases giving different characteristics.

It is not suggested that all the embryo fluke forms alluded to above are those of *Fasciola hepatica*, which reaches its mature state in the sheep Several of them are, doubtless, the embryo stages of flukes which come to maturity in fish or frog or bird. Indeed *Planorbis marginatus* has been reported as harbouring embryos of *Distomum lanceolatum*, and *Cercaria ephemera*, an embryonic form of *Monostomum flavum*, also makes its home in a species of Planorbis. The form, however, which agrees with that described by Professor Thomas is most probably the sheep fluke, and it has without doubt been seen in different species of the genera *Ancylus*, *Isidora (Bulinus)*, and *Limnæa*.

THE

Victorian Naturalist.

Vol. XII.—No. 12. MARCH, 1896. No. 148

FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 9th March, 1896. The president, Professor W. Baldwin Spencer, M.A., occupied the chair, and some 60 members and visitors were present.

THE LATE DR. JEAN MUELLER.

Baron von Mueller attended the meeting to offer a eulogy in memory of Professor Dr. Jean Mueller, of Geneva, the eminent lichenologist, news of whose death had just come to hand, remarking that our colony is greatly indebted to his researches for the elucidation of its lichen flora, more especially during recent years, from material contributed principally by the Rev. F. R. M. Wilson, a former member of this club.

PAPERS.

1. By Mr. T. S. Hall, M.A., entitled "The Weathering of Rocks."

The paper gave an interesting *résumé* of the forces at work in moulding the face of the earth. The characteristic appearance of various kinds of rocks exposed to atmospheric influence was described, and the localities where they could best be observed indicated. The action of water in wearing away rocks was also considered, the point being emphasized that water carrying sediment is much more destructive than clear water. Glacial action and the influence of changes in temperature were briefly referred to, the latter being shown in many cases to split up huge masses of rock with a loud report.

In the discussion which followed Mr. H. T. Tisdall, F.L.S., gave an instance of a basalt bar across the creek at Walhalla, which since the settlement of the district had been cut away much more quickly than before, although there is now only one-third of the quantity of water.

Professor Spencer referred to recent correspondence in the columns of *Nature* on the occurrence of loud noises in various localities, and considered the reference by Mr. Hall to splitting rocks a likely explanation. In Central Australia the influence of the violent changes of temperature was plainly discernible.

2. By Rev. W. Fielder, entitled "Further Notes on the Intermediate Hosts of the Liver Fluke."

Since the last meeting two new hosts had been discovered in shells forwarded from Port Fairy. These were described, together with a few points of interest in recent investigations. As many as 2,000 embryos have been found in one small snail. It was asserted that two different embryos are never found in the one snail, but this is disproved by some observations in which three kinds of cercaria were seen.

Some discussion ensued, in which Messrs. Frost, Wisewould, and Professor Spencer took part.

NATURAL HISTORY NOTE.

Mr. R. Hall read a note recording—as a supplement to the list of birds found in the Box Hill district—the following eight additional species, viz. :—Australian Goshawk, Collared Sparrowhawk, Australian Swift, Reed Warbler, Horsfield's Lark, Swainson's Lorikeet, Nankeen Night Heron, and Spotted Water Crake.

EXHIBITION OF SPECIMENS.

The following were the principal exhibits of the evening :—By Mr. A. Coles.—Pair of eggs of Richardson's Skua Gull, *Lestris Richardsoni ;* Pacific Gull, *Larus Pacificus ;* and Crested Penguin, *Eudyptula cristata.* By Rev. W. Fielder.—Mounted specimens of fluke from shark taken in Port Phillip Bay, and shells of freshwater snails which form the intermediate hosts of the flukes, viz. : —*Isidora (Bulinus) alicice*, var. *surrita*, *Potomopyrgus* (sp.), *Amphipeplea papyracea* and *Limnæa* (two species). By Mr. W. M'Caw.—Embryo flukes mounted in formalin. By Mr. C. French, F.L.S.—Exotic beetles, *Goliathus giganteus*, *G. Druryi*, and *G. cacicius*, from West Africa. By Mr. C. French, jun.— Eggs of the following rare Queensland birds : Nankeen Night Heron, Ewing's Fruit Pigeon ; also, nest and eggs of Pink-naped Bower Bird, first time exhibited in Australia. By Mr. G. F. Hill. —Leaves of tobacco plant, showing destruction caused by larvæ of Potato Moth, *Lita solanella*, Bdv. By Baron von Mueller, K.C.M.G.—Specimens of *Osteocarpum salsuginosum*, bearing fruits provided with two prominent appendages, by which variety a transit is formed to the Babbagias, the latter thus merging into the genus Osteocarpums. These specimens were sent by Mr. R. Harvey, from the junction of the Rivers Murray and Darling. Also, a variety of *Senecio dryadeus*, with leaves densely white-velvety underneath, in the manner of the hypolemous variety of *S. odoratus*, gathered on Mount William by Mr. H. B. Williamson.

After the usual conversazione the meeting terminated.

NOTES ON THE BIRD FAUNA OF THE BOX HILL DISTRICT.

By Robert Hall.

(Read before Field Naturalists' Club of Victoria, 8th July, 1895.)

(Concluded.)

31. Frontal Shrike Tit (*Falcunculus frontatus*, Lath.)

The uncommonness lies more with the nest than its owner. There always is a difficulty in the procuration of it. First, you must find it; then you are to secure it. Two nests, taken in Peppermint Gums (*E. amygdalina*) some forty feet from the ground, in the consecutive years 1893–4, and in the same paddock, were obtained by a young member of the Surrey Hills Boys' Field Club, and I am indebted to him for both finds, each containing three eggs, and taken on 4th December, 1894 and same month of 1893. Had not the sitting bird continued to sing while on the nest it would not have been observed.

32. White-shafted Fantail, W. (*Rhipidura albiscapa*, Gould).

The district is somewhat favoured with representatives of the family Muscicapidæ, in having five species. This member certainly is most friendly; why, it will even attempt to alight on the gun while you are attempting to procure it or other kind. A straight line in flight is seldom followed for any distance, rather a wavy nature, and every moment forming flight angles. The call is a single "tinny" note at times, but at others it will break into an exquisite melody of varied notes.

15th October is the date of my memoranda when the majority of nests are being finished and eggs deposited, continuing on to December or early January.

A nest of three nearly fledged young, with two inside absorbing the whole interior, and the third on top, is a novel sight. Flycatchers' nests are open and small.

33. Rufous-fronted Fantail (*R. rufifrons*, Lath.)*

The home of this flycatcher is more in the mountains adjoining the "Basin," at Bayswater, than among the timber of the flats below. However, a nest was taken the season previous to last near Ringwood in a low position overhanging the creek, as the majority are placed.

34. Black Fantail, W. (*Sauloprocta motacilloides*, V. and H.)

The habits of this bird are too well known to need even a mention. Nest positions require seeking—one will build on dead timber three feet from the ground, another fourteen feet from the earth on living timber, a third a few inches from and overhanging a quickly flowing river, while others will build in lignum almost

on flood waters. Yet the birds will merrily sing all through the night.

35. Leaden-coloured Flycatcher (*Myiagra rubecula*, Lath.)

Somewhat rare.

36. Brown Flycatcher, W. (*Micræca fascinans*, Lath.)

The fascinating ways and the opportunity to note them are so readily secured that you are drawn to watch it and become interested also in its nest, one being built near a roadside, so prettily ornamented on that side, the one to view, that I feel inclined to maintain it has a sense of the beautiful. Passers by could easily observe the special uniform bark lamellæ, whereas the other side, away from view, was devoid of taste and uniformity — this decoration is not erratic. If the eggs are extracted from a nest and not returned, the bird will destroy the nest, and with the same material rebuild elsewhere near at hand. Both sexes are gentle, and to remove a sitting bird you will often enough require to despatch sticks before dislodging what our local boys call the "White Peter" or "White Robin."

Although two eggs form the clutch, on three occasions this season four was the number in all, and in one case as late as 26th February, 1895, in a Cleopatra apple tree, situate four feet from ploughed ground. October is the month for building.

37. Rose-breasted Wood Robin (*Erythrodryas rosea*, Gould).

Apparently it is only a visitor. I saw the bird during 1893, and on 8th September, 1894, obtained a male skin, so that of the six species here known this has been the least often seen.

38. Pink-breasted Robin (*E. rhodinogaster*, Drap.)

Preferring the ranges beyond Bayswater, where you may there observe its habits and obtain the nest if you are in favour with Dame Fortune; otherwise time may be better spent, judging by results. The nest, without doubt, is an elegant structure, built in a musk tree, and some 20 feet from the ground.

Although the birds are occasionally seen in the timber at Bayswater, I do not think a nest has yet been found there.

39. Scarlet-breasted Robin, W. (*Petræca Leggi*, Sharpe).*

Robins are low-flying, have peaceful natures, and are sensitive. The Robin is an earlier builder than the majority of its fraternity, for in August (though more especially this species) you will find eggs. 1st and 19th September to as late as 24th November clutches of three were found. The owners will keep away from the nest, while you may be there, making short flights at the distance.

40. Red-capped Robin (*P. Goodenovii*, V. and H.)

Once only have I seen this red-capped member, so quickly

recognized in the bright colour on the crown of head. To breed the preference is given to more northern latitudes.

41. Flame-breasted Robin, W. (*P. Phœnicia*, Gould).*

This species is musical. It has a set bar containing some seven notes, very sweet, varying, and occupying about two and a half seconds in production. After the passing of cold months, as May, June, and July, the first of bird-voices is decidedly welcome. The time to study bird-voices is at this period of the year, for with the incoming of spring they seem to vie with one another—the males do. Two clutches, each two eggs, were found on 24th October, 1894, and one young in nest on 9th November, 1894, some twelve feet up a eucalypt.

42. Yellow-breasted Robin, W. (*Eopsaltria Australis*, Lath.)*

The best known of the seven species of yellow-breasted robins that encompass our continent is this one. The silent, unobtrusive bird, that would not so much as disturb a thought of the naturalist in a glen, will remain for minutes together without any apparent movement of muscles or feathers, attached in a perpendicular position to a tree. Both watcher and watched are as if immovable and uncomfortable, and the thought naturally arises, in five minutes' time, who is to be first in the move; however, the bird settles it by noiselessly darting at a fly and regaining a position that warrants a change for you also. The bird will fly from undergrowth to stem of tree, clinging thereto as is the manner of the tree-creepers, but not creeping. One Saturday afternoon I approached a tree thinking to take off what I considered at the distance to be quite a new fungus for Box Hill, when, without any previous movement, the object became winged, and away went a Yellow Robin. This species is one of the foster parents of *Cuculus pallidus*, a bird somewhat similar to *C. flabelliformis*. Although nests are generally placed within a few feet of the ground, I noticed one at twenty feet from it. New nests are sometimes placed two feet above those of last year in the same shrub. Whin Acacia (*A. verticillata*) may support them, or a three-prong perpendicular sapling, or, which is usual, a horizontal light branch.

On 24th November I saw birds in many grades of plumage—juvenile to adult markings of this year's brood. The changes are rapid—first, yellow on the neck; second, chest yellow; third, nearly developed yellow, with straggling brown feathers showing irregularly along dorsal surface.

By November the nests become deserted. In one the fearless bird had to be pushed off before it would evacuate.

43. Coach-whip Bird (*Psophodes crepitans*, V. and H.)

Keeping to the shadows and the low-growth timber, the bird that is the source of the whip note is but seldom seen. You

may be fortunate enough to find it, and observe a nest also, but it is one of the sombre-plumaged forms that are now seldom seen out of the hills and their unfrequented valleys. 25th October and 17th November are the two only finds—each two eggs—I know of in 1894, without any previous to this time.

44. Downy Pycnoptilus (*Pycnoptilus floccosus*).

A cheerful bird in a gloomy gully! In the course of a few minutes it will give three distinct bars of music, the most familiar and most often uttered being somewhat similar to the name Wan-dil-gong. An examination of the crop of two birds in one district showed it to be powerful and full of seed, which it obtained only in the closest of shrub timber.

During December and January the bird will incubate, after building upon the ground a structure fac-simile in miniature of the nest of the Menura.

Before seeking a glimpse of the Pycnoptilus in its haunts you may safely be advised to develop the virtue of patience.

My remarks have, I find, occupied so much time, that, with your permission, I will reserve the remainder of my notes for a future occasion.

INTERMEDIATE HOSTS OF FLUKE.—Second Note.

By Rev. W. Fielder.

(*Read before the Field Naturalists' Club of Victoria, 9th March*, 1896.)

The observations referred to below extend from the middle of February to the present date.

In the last note seven species of snails were alluded to as harbouring fluke embryos, and to these five more must now be added in which embryos have been found, either in the active or encysted condition. The Ballarat district has furnished two hosts in the forms *Isidora* (*Bulinus*) *aliciæ*, Reeve, var. *turrita*, Tate, and a species of *Potomopyrgus;* Warrnambool supplied *Amphipeplea papyracea*, Tate; Port Fairy, *Limnæa Brazieri*, Smith. These, together with *Amphipeplea Melbournensis*, M'Coy, discovered some years ago in the Melbourne Botanical Gardens by Sir Frederick M'Coy, brings the number up to twelve.

Only a few facts bearing upon the living embryos need now be noticed. It may be interesting, however, to record that one Limnæa of the New South Wales specimens gave cercariæ with pigment spots in the region of the anterior sucker, thus confirming a similar find of this variety as occurring in *Planorbis Gilberti*, found in the Heidelberg waters. The habitat of the snails is at least 400 miles apart, which testifies to the wide distribution of this species of fluke. Reference was also made last month to a forked-tailed variety as occurring in Planorbis, at

Heidelberg. Later researches have discovered a like form in *Limnæa lessoni* and *Isidora texturata* from the North-Eastern district. The form, however, in the latter cases did not occur alone, but was in company with another form quite distinct from it. That two or more varieties can inhabit the same snail is further testified by the fact that *three* distinct kinds of cysts have often been found side by side in the same animal.

And this leads on to the question of cysts, around which has centred the chief interest of the work for the month. Before, however, entering into details as to our local forms, it may be as well to refer to the habit of the embryos of *Fasciola hepatica*—the fluke of the sheep—as narrated by Professor Thomas in his monograph quoted last month. He says :—"The life of the free-swimming animal never seems to last long, for, on coming in contact with the side of the aquarium or the water plants contained in it, the cercaria proceeds to encyst itself. It assumes a rounded form, whilst a mucous substance is poured forth all over the body, together with the granules forming the contents of the cystogenous cells. The whole process of forming the cyst is very rapid, and in a few minutes a layer of considerable thickness is formed, whilst its substance begins to harden." This passage has been quoted to draw attention to modification of habit in the formation of cysts in the Victorian forms of embryo flukes hitherto studied. Most of the encystation seems to take place *within* the snail. Out of thousands of free-swimming cercariæ of different forms, only one or two have been seen to encyst outside the snail, although batches of them have been kept under observation for nearly two days—the length of time they will live in water after removal from the snail. Encystation *within* the snail, in the case of flukes which reach their final stage in birds, secures easily future development, as the whole snail is swallowed bodily. And the habit presents very little difficulty in cases where the final host is not a snail-eater, since the cysts are doubtless left attached to weeds or grass when the snail crawls over them, having broken through the tissue in the neighbourhood of the liver, which has been rendered soft, and therefore easily broken, by disease. The act of crawling would secure such a result.

Five different varieties of cysts have been noted. The size and structure of these will be described in a future note.

LANGUAGE AND INSTINCTS OF THE DOMESTIC FOWL.—At a recent meeting of the Oxfordshire Natural History Society (England), a lecture was given by Mr. G. J. Burch, M.A., on the language of birds. He explained that he had been led to make a series of systematic observations on the language and instincts

of the domestic fowl some years ago, when the negligence of a sitting hen obliged him to undertake the care of some young chicks from the time of their leaving the shell. Hatched under these circumstances there were special opportunities for observing the inborn faculties of the birds, and the lecturer had found that all his preconceived notions of inherited instinct must give way before the utter helplessness of the chicks. Unable at first to balance themselves on their feet, repeated efforts had to be made before they could stand. They were without any notion of picking up food when hungry or swallowing it; indeed, the most rudimentary actions of life had to be learned by experience. Absurd attempts to reach an object were made before any idea of distance was gained; and, stranger still, the "clucking" of the hen only excited fear, though the chicks would run confidingly to the hand of the lecturer. Further details were given of the habits of young birds brought up away from the parent, giving evidence of intelligence and application, but showing a lack of the usual peculiarities when unable to learn them from other members of their species. The lecturer pointed out that there are two methods of communicating thoughts and wishes—the *visible* method, *i.e.* gesture, and the *audible*, or language, and that in man the latter had become so complete and accurate that the former was unnecessary, though in lower animals it was all-important. Keeping to the domestic fowl as a type, he admitted the great difficulty of learning its language, as the means of gesture and the organs of speech are so different from our own. Long and close observation of the poultry yard had enabled him not only to analyze the sounds produced, and to explain them physiologically, but also to learn their significance and imitate them so successfully as to be understood by the birds themselves. He pointed out that they would not notice or answer to ordinary pet names, but looked up at once if their own call-notes were imitated. They did not understand pointing with the finger, as they themselves pointed with the head and beak. Very close investigations of the call-notes of different individuals, the alarm-note, the call to food, and the cry of danger had been made. Gestures and expressions of fear and disgust, the modes of salute, and soothing, reassuring sounds heard at roosting time, in the darkness, were described and imitated. The brooding hen has a vocabulary of her own, modified and limited till her young ones are able to run about. The crowing of cocks, though similar to the ears of the uninitiated, differs in individuals, and varies with the emotions which it expresses. In conclusion, the lecturer urged the members of the society to undertake further investigation into the language of birds, a study for which there is special facility in the case of domesticated species.—*The Zoologist*, July, 1895.

A CATALOGUE OF VICTORIAN HETEROCERA.

By Oswald B. Lower, F.E.S.

Part XIX.

TORTRICINA *(continued).*

HYPERXENA. Meyr.

COSCINOPTYCHA. Meyr.

HERMINIAS. Meyr.

621. H. epidolana, Meyr. (MSS.)
Gisborne, Sandringham.

HETEROCROSSA. Meyr.

*622. H. mimica, Lower. (Tr. Roy. Soc. S.A., 168, 1893).
Melbourne.

*623. H. neurophorella, Meyr. (*Epischnia neurophorella*, Meyr., Proc. Linn. Soc. N.S.W., 232, iv.)
Melbourne.

BONDIA. Newman.

*624. B. nigella, Newm. (Tr. Ent. Soc., London, vol. iii., N.S., 289; Meyr., Proc. Linn. Soc. N.S.W., 182, 1882).
Gisborne, Melbourne, Windsor, &c.

625. B. dissolutana, Meyr. (*loc. cit.*, 182, 1882).
Melbourne, Gisborne.

HETEROCHYTA. Meyr.

Family—XYLORYCTIDÆ.

UZUCHA. Walk.

PILOSTIBES. Meyr.

CRYPTOPHAGA. Lewin.

(Note.—This genus was originally known as *Cryptophasa.* Meyrick, however, considered the second part of the word meaningless, and consequently altered the word to the above.)

*626. C. stochastis, Meyr. (Tr. Roy. Soc. S.A., 30, 1889).
Kewell, Warracknabeal.

*627. C. epigramma,† Meyr. (*loc. cit.*, 31, 1889).
Melbourne (? Sandringham).

*628. C. proleuca, Meyr. (*loc. cit.*, 31, 1889).
Melbourne.

† Note.—No. 627, *epigramma*, is referable to *Xyloryeta.*

629. C. ECCLESIASTIS, Meyr. (*Cryptophasa ecclesiastis*, Meyr., Proc. Linn. Soc. N.S.W., 1,040, 1886; *Cryptophaga ecclesiastis*, *ib.*, Proc. Roy. Soc. S.A., 32, 1889).
Fernshaw.

630. C. ALBICOSTA, Lewin (*Cryptophasa albacosta*, Lewin, Ins. N.S.W., Linn. Ent., ix., 350; *Cryptophaga albicosta*, Meyr., Tr. Roy. Soc. S.A., 33, 1889).
Melbourne.

It will be noticed that Meyrick has corrected the orthography as regards the spelling of the specific name of this species.

631. C. IRRORATA, Lewin (*Cryptophasa irrorata*, Lewin, Ins. N.S.W.; *Cryptophaga irrorata*, Meyr., Tr. Roy. Soc. S.A., 34, 1889).
Melbourne, Warragul.

632. C. LEUCADELPHA, Meyr. (*Cryptophasa leucadelpha*, Meyr., Proc. Linn. Soc. N.S.W., 1,040, 1886; *Cryptophaga leucadelpha*, Meyr., Tr. Roy. Soc. S.A., 35, 1889).
Wimmera.

*633. C. AGLAODES, Lower (Tr. Roy. Soc. S.A., 170, 1893).
Kewell.

MAROGA. Walk.

634. M. UNIPUNCTANA, Don. (*Tortrix unipunctana*, Don., Ins. New. Holl.; *Maroga gigantella*, Walk., 827; *Maroga unipunctana*, Meyr., Trans. Roy. Soc. S.A., 40, 1889).
Melbourne, &c.

COMPSOTORNA. Meyr.

CATORYCTIS. Meyr.

635. C. SUBNEXELLA, Walk. (*Œcophora subnexella*, Walk., 691; *Catoryctis subnexella*, Meyr., Tr. Roy. Soc. S.A., 43, 1889).
Melbourne.

PHTHONERODES. Meyr.

CRYPSICHARIS. Meyr.

LICHENAULA. Meyr.

*636. L. ARISEMA, Meyr. (Tr. Roy. Soc., S.A., 48, 1889).
Gisborne, Hamilton.

*637. L. UNDULATELLA, Walk. (*Cryptolechia undulatella*, Walk., 756; *Lichenaula undulatella*, Meyr., Tr. Roy. Soc. S.A., 47, 1889).
Ararat.

638. L. LICHENEA, Meyr. (*loc. cit.*, 49, 1889).
Melbourne.

*639. L. MONOSEMA, Lower (*loc. cit.*, 172, 1893).
Gisborne.

640. L. CHORIODES, Meyr. (*loc. cit.*, 50, 1889).
Melbourne.

641. L. MOCHLIAS, Meyr. (*loc. cit.* 52, 1889).
Melbourne.

*642. L. CALLIGRAPHA, Meyr. (*loc. cit.*, 48, 1889).
Melbourne (near Sandringham).

643. L. SCIASTIS, Meyr. (MSS.)
Melbourne.

NOTOSARA. Meyr.

CLERARCHA. Meyr.

644. C. DRYINOPA, Meyr. (*loc. cit.*, 54, 1889).
Melbourne.

PLECTOPHILA. Meyr.

*645. P. ELECTELLA, Walk. (*Œcophora electella*, Walk., 679; *Plectophila electella*, Meyr., Tr. Roy. Soc. S.A., 55, 1889).
Clunes.

TYMBOPHORA. Meyr.

*646. T. PELTASTIS, Meyr. (*loc. cit.*, 56, 1889).
Melbourne, Gisborne, Castlemaine.

XYLORYCTA. Meyr.

647. X. STRIGATA, Lewin (*Cryptophasa strigata*, Lewin, Ins. N.S.W.; *Xylorycta strigata*, Meyr., Tr. Roy. Soc. S.A., 59, 1889).
Melbourne.

648. X. ARGENTELLA, Walk. (*Cryptolechia argentella*, Walk., 750; *Xylorycta argentella*, Meyr., Tr. Roy. Soc. S.A., 60, 1889).
Melbourne.

649. X. LUTEOTACTELLA, Walk. (*Cryptolechia luteotactella*, Walk., 750; *C. cognatella*, *ib.*, 751; *Xylorycta luteotactella*, Meyr., Tr. Roy. Soc. S.A., 61, 1889).
Melbourne.

*650. X. SPILONATA, Scott (*Cryptophasa spilonata*, Scott, Aust. Lepid., 10, pl. 3; *Cryptophaga spilonata*, Meyr., Tr. Roy. Soc. S.A., 35, 1889).
Melbourne.

651. X. CHIONOPTERA, Lower (Tr. Roy. Soc. S.A., 173, 1893).
Fernshaw and Melbourne.

TELECRATES. Meyr.

*652. T. LÆTIORELLA, Walk. (*Œcophora lætiorella*, Walk., 677; *Telecrates lætiorella*, Meyr., Proc. Roy. Soc., 62, 1889).
Melbourne.

*653. T. PARABOLELLA, Walk. (*Œcophora parabolella*, Walk., 690 ; *Telecrates parabolella*, Meyr., *loc. cit.*, 63, 1889).
Gisborne and Melbourne.

*654. T. PLACIDELLA, Walk. (*Cryptolechia placidella*, Walk., 750 ; *Telecrates placidella*, Meyr., *loc. cit.*, 63, 1889).

CHALAROTONA. Meyr.

*655. C. INTABESCENS, Meyr. (Proc. Roy. Soc. S.A., 65, 1889).
Fernshaw.

*656. C. CRASPEDOTA, Meyr. (*loc. cit.*, 66, 1889).
Melbourne.

SCIEROPEPLA. Meyr.

*657. S. POLYXESTA, Meyr. (*loc. cit.*, 67, 1889).
Gisborne and Melbourne.

*658. S. RIMATA, Meyr. (*loc. cit.*, 69, 1889).
Sandringham.

PROCOMETIS. Meyr.

659. P. ORTHOSEMA, Lower (*loc. cit.*, 173, 1893).
Gippsland.

HYPERTRICHA. Meyr.

PHYLOMICTIS. Meyr.

660. P. MALIGNA, Meyr. (*loc. cit.*, 75, 1889).
Melbourne.

AGRIOPHARA. Rosen.

*661. A. CONFERTELLA, Walk. (*Cryptolechia confertella*, Walk., 758 ; *Agriophara confertella*, Meyr., Tr. Roy. Soc. S.A., 76, 1889).
Gisborne, Melbourne (Botanic Gardens).

*662. A. GRAVIS, Meyr. (*loc. cit.*, 77, 1889).
Gisborne.

*663. A. LEUCOSTA, Lower (Tr. Roy. Soc. S.A., 173, 1893).

664. A. CINDERELLA, Newm. (*Chimabacche Cinderella*, Newm., Tr. Ent. Soc. Lond. (N.S.), iii., 288 ; *Agriophara Cinderella*, Meyr., Tr. Roy. Soc. S.A., 78, 1889).
Gisborne, Melbourne.

I have seen specimens of this species measuring 58 mm. In the description in Tr. Roy. Soc. S.A. the size is given as 35 mm.

*665. A. DIMINUTA, Ros. (Ann. Mag. Nat. Hist., 440, 1885; Meyr., Tr. Roy. Soc. S.A., 79, 1889).

*666. A. FASCIFERA, Meyr. (*loc. cit.*, 80, 1889).
Melbourne.

VOL. XII.—NO. 1. APRIL, 1895.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED MAY 8, 1895.

Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions he records.

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PRICE SIXPENCE.

Agents for Europe:

DULAU & CO., 37 Soho Square, London.

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1895.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

Monday, 13th May, 1895, at 8 p.m.

1. Correspondence and Reports.

   Report of Excursion to Beaumaris, from the Rev. W. Fielder.

2. Election of Members.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

   Nominations (to be in writing) for Office-bearers for year 1895-96.
   Election of Two Auditors.

5. Reading of Papers and Discussions thereon.

   By the Misses May Wise and Muriel Bennett.—"List of the Orchids found near Sale."

   "Pond Life" (illustrated by living and mounted specimens obtained from the lake in the Botanical Gardens). Introductory remarks by Mr. J. Shephard and the Rev. W. Fielder.

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

7. Exhibition of Specimens and Conversazione.

   Members exhibiting specimens are requested to furnish the Hon. Sec. with written particulars of their Exhibits, for record in Minutes and *Naturalist*.

❋ EXCURSIONS. ❋

SATURDAY, 11TH MAY.—Botanical Gardens, under the leadership of the Rev. W. Fielder and Mr. J. Shephard. Meet at Office at 3 p.m. Object: Pond Life.

FRIDAY, 24TH MAY.—Altona Bay, under the leadership of Mr. J. Gabriel, F.L.S. Start from the Gem Pier, Williamstown, at 10 a.m. Object: Dredging.

VOL. XII.—NO. 2. MAY, 1895.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED JUNE 6, 1895.

Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions he records.

CONTENTS.

PRICE SIXPENCE.

Agents for Europe:

DULAU & CO., 37 Soho Square, London.

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1895.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

Monday, 10th June, 1895, at 8 p.m.

1. Correspondence and Reports.

   Report of Excursion to Altona Bay, from Mr. J. Gabriel, F.L.S.

2. Election of Members.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

   1. Consideration of Annual Report and Balance Sheet, 1894-95.
   2. Election of Office-bearers for 1895-96

      The following gentlemen have been duly nominated as Office-bearers for he coming year :—

      PRESIDENT—Professor W. Baldwin Spencer, M.A.
      VICE-PRESIDENTS—Messrs. C. French, F.L.S., and J. Shephard.
      HON. TREASURER—Mr. C. Frost, F.L.S
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      HON. SECRETARY—Mr. H P. C. Ashworth.
      COMMITTEE—Messrs. D. Best, J. Gabriel, F.L.S., T. S. Hall, M.A., G. R. Hill, Dr. W. Macgillivray, Messrs. R. S. Sugars, G. Sweet, and F. Wisewould.

   3. Presidential Address by Mr. H. T. Tisdall, F.L.S.

5. Reading of Papers and Discussions thereon.

   By Mr. C. French, Jun.—"Observations on the flowering times and localities of Victorian Orchids."

   By Mr. R. J. Fletcher.—"Notes on a recent visit to some Basalt caves near Skipton."

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

7. Exhibition of Specimens and Conversazione.

   Members exhibiting specimens are requested to furnish the Hon. Sec. with written particulars of their Exhibits, for record in Minutes and *Naturalist*.

✻ EXCURSION. ✻

SATURDAY, 22ND JUNE.—Flemington Bridge, under the leadership of Mr. T. S. Hall, M.A. Start from Spencer Street Station at 2.27 p.m. Object : Geology.

MEETING FOR PRACTICAL WORK.

The Monthly Meeting for Practical Work will be held on Monday evening, 24th June, when Mr. J. Shephard will give a demonstration on "The measurement of objects under the microscope." Members are requested to bring their microscopes and appliances connected with measurement.

VOL. XII.—No. 3. JUNE, 1895.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED JULY 4, 1895.

Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions he records.

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* PRICE SIXPENCE. *

Agents for Europe:

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1895.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

Monday, 8th July, 1895, at 8 p.m.

1. Correspondence and Reports.

   Report of Excursion to Maribyrnong, from Mr. T. S. Hall, M.A.

2. Election of Members.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

   By Professor Baldwin Spencer, M.A.—"Notes on the British Museum," illustrated by lime-light views.

   By Mr. R. Hall—"The Birds of the Box Hill District," illustrated by lime-light views.

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest to Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

7. Exhibition of Specimens and Conversazione.

   Members exhibiting specimens are requested to furnish the Hon. Sec. with written particulars of their Exhibits, for record in Minutes and *Naturalist*.

✻ EXCURSION. ✻

SATURDAY, 20TH JULY.—Entomological Department, under the direction of Mr. C. French, F.L.S., Government Entomologist. Meet at New Law Courts at 2.30 p.m.

MEETING FOR PRACTICAL WORK.

The Monthly Meeting for Practical Work will be held on Monday evening, 22nd July, when Mr. O. A. Sayce will give a demonstration on staining methods for microscopic preparations.

VOL. XII.—NO. 4. JULY, 1895.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED AUGUST 8, 1895.

Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions he records.

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PRICE SIXPENCE.

Agents for Europe:

DULAU & CO., 37 Soho Square, London.

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1895.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

Monday, 12th August, 1895, at 8 p.m.

1. Correspondence and Reports.

   Report of visit to Entomological Department from Mr. C. French, F.L.S.

2. Election of Members.

	Proposer.	Seconder.
Mr. A. Lord ...	Mr. R. Hall	Mr. H. P. C. Ashworth.
Mr. R. J. Dawes ...	Mr. J. Gabriel, F.L.S.	Mr. O. A. Sayce

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

   By Mr. C. French, F.L.S.—"Notes on some newly-described Australian Buprestid Beetles."

   By Mr. D. M'Alpine.—"Entomogenous Fungi."

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

7. Exhibition of Specimens and Conversazione.

   Members exhibiting specimens are requested to furnish the Hon Sec. with written particulars of their Exhibits, for record in Minutes and *Naturalist*.

✻ EXCURSIONS. ✻

SATURDAY, 17TH AUGUST.—Cheltenham, under the direction of Messrs. J. Shephard and C. French, jun. Meet at Prince's Bridge station at 1.10 p.m. Objects:—"Botany and Pond Life."

SATURDAY, 14TH SEPTEMBER.—Sandringham, under the direction of Mr. C. French, F.L.S. Meet at Flinders Street station at 1 p.m. Object:—"Botany."

Field Naturalists' Club of Victoria.

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Committee: MR. D. BEST, MR. T. S. HALL, M.A., MR. J. GABRIEL, DR. W. MACGILLIVRAY, and MR. F. WISEWOULD.

OBJECTS.

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VOL. XII.—NO. 5. AUGUST, 1895.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED SEPTEMBER 5, 1895.

Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions he records.

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1895.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING

Monday, 9th September, 1895, at 8 p.m.

1. Correspondence and Reports.

   Report of Excursion to Cheltenham from Messrs. O. A. Sayce and C. French, jun.

2. Election of Members.

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

   By Mr. D. Le Souëf—"Mallacoota Inlet" illustrated by limelight views.

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

7. Exhibition of Specimens and Conversazione.

   Members exhibiting specimens are requested to furnish the Hon. Sec. with written particulars of their Exhibits, for record in Minutes and *Naturalist*.

✻ EXCURSIONS. ✻

SATURDAY, 14TH SEPTEMBER.—Sandringham, under the leadership of Mr. C. French, F.L.S. Meet at Flinders Street station at 1 p.m. Object:—"Botany."

SATURDAY, 28TH SEPTEMBER.—Ringwood, under the leadership of Mr. F. G. A. Barnard. Meet at Prince's Bridge station at 1.35 p.m. Object:—"Botany."

MEETING FOR PRACTICAL WORK.

The Committee have much pleasure in announcing a course of demonstrations on Systematic Botany, under the direction of Mr. C. A. Topp, M.A. The first meeting will be held on Monday evening, 23rd September, when the characters of the principal orders of the Victorian Flora will be considered. Members should provide themselves with a simple magnifying lens, sharp knife, glass slips, &c., and are invited to bring specimens of the following plants:—Buttercup, Hibbertia, Tetratheca, Violet, Sundew, some Composite, Acacia, Peaflower, Epacrid, Lily, Orchid and Grass.

VOL. XII.—NO. 6. SEPTEMBER, 1895.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED OCTOBER 10, 1895.

Editor: F. G. A. BARNARD, Esq.

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1895.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 14th October, 1895, at 8 p.m.

1. Correspondence and Reports.

   Report of Excursion to Sandringham from Mr. C. French, F.L.S.
   Report of Excursion to Ringwood from Mr. F. G. A. Barnard.

2. Election of Members.

3. Nominations for Membership.

	Proposer	Seconder
Mr. S. W. Jackson ...	Professor Spencer ...	Mr. H. P. C. Ashworth
Mr. G. Mowling ...	Mr. D. Best ..	Mr. C. French, F.L.S.
Mr. Dudley Le Souëf ..	Professor Spencer ...	Mr. H. P. C. Ashworth
Mr. Webb	Mr. A. Coles ...	Mr. J. Haase.

   Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

   By Mrs. Martin—"Notes on Fertilizers."
   By Mr. F. L. Billinghurst—"The Butterflies of Castlemaine." Communicated by Mr. T. S. Hall, M.A.

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

7. Exhibition of Specimens and Conversazione.

   Members exhibiting specimens are requested to furnish the Hon. Sec. with written particulars of their Exhibits, for record in Minutes and *Naturalist*.

✻ EXCURSIONS. ✻

SATURDAY, 12TH OCTOBER.—Clayton, under the leadership of Mr. T. S. Hart, M.A. Meet at Prince's Bridge station at 1.30 p.m. Objects :—"Botany and Entomology."

SATURDAY, 26TH OCTOBER.—Melton, under the leadership of Mr. G. A. Keartland. Meet at Spencer Street station at 7.0 a.m. Object :—"Ornithology.

TUESDAY, 5TH NOVEMBER.—Berwick, under the leadership Mr. D. Best. Meet at Prince's Bridge station at 7.50 a.m. Objects :—"Botany and Entomology."

SATURDAY, 9TH NOVEMBER.—Korkuperrimul Creek, *via* Bacchus Marsh, under the leadership of Mr. C. C. Brittlebank. Meet at Spencer Street station at 7.0 a.m.—Object : "Geology."

EXHIBITION OF WILDFLOWERS.

Special exhibits of wild flowers are solicited for the meeting on 14th inst. The exhibits will be under the charge of Messrs. F. G. A. Barnard, C. French F.L.S., C. Frost and D. Best. The requirements of intending exhibitors should be sent to the Hon. Secretary as early as possible.

MEETING FOR PRACTICAL WORK.

The second meeting of the course of Systematic Botany will be held on Monday evening, 28th October, under the direction of Mr. C. A. Topp, M.A. Members are requested to bring plants illustrating as many orders as possible, and to provide themselves with hand or watchmaker's magnifying glass, sharp knife, &c.

VOL. XII.—No. 7. OCTOBER, 1895.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED NOVEMBER 7, 1895.

Editor: F. G. A. BARNARD, Esq.

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ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 11th November, 1895, at 8 p.m.

1. Correspondence and Reports.

   Report of Excursion to Melton, from Mr. G. A. Keartland.
   Report of Excursion to Berwick, from Mr. D. Best.
   Report of Excursion to Korkuperrimul Creek, from Mr. C. C. Brittlebank.

2. Election of Members.

	Proposer	Seconder
Mr. J. Harvie ...	Mr. H. P. C. Ashworth ...	Mr. C. Frost
Mr. A. Mattingley ...	Mr. D. Le Souef ..	Mr. H. P. C. Ashworth
Mr. W. H. Terry ...	Mr. J. Haase ...	Mr. H. P. C. Ashworth

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

   By Mr. O. A. Sayce—"Formalin as a Preservative for Museum Specimens."
   By Mr. H. T. Tisdall, F.L.S.—"Symbiosis between Fungi and certain Dicotyledons."

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

7. Exhibition of Specimens and Conversazione.

   Members exhibiting specimens are requested to furnish the Hon. Sec. with written particulars of their Exhibits, for record in Minutes and *Naturalist*.

✻ EXCURSIONS. ✻

SATURDAY, 9TH NOVEMBER.—Korkuperrimul Creek, *via* Bacchus Marsh, under the leadership of Mr. C. C. Brittlebank. Meet at Spencer Street station at 7.0 a.m.—Object: "Geology."

SATURDAY, 16TH NOVEMBER.—Springvale, under the leadership of Mr. C. French, F.L.S. Meet at Prince's Bridge Station at 1.30 p.m. Object: Entomology.

SATURDAY, 23RD NOVEMBER.—Botanical Gardens. Meet at the Museum at 2.30 p.m. (The Director has kindly consented to show members the new sheds, illustrating the orders of plants.)

SATURDAY, 30TH NOVEMBER.—Warrandyte, under the leadership of Mr. C. French, F.L.S. Meet at Prince's Bridge Station at 7.0 a.m. Object: General Collecting.

SATURDAY, 7TH DECEMBER.—Plenty River (via Regent Street Station). Under the leadership of Mr. D. Best. Meet at Spencer Street Station at 12.32 p.m. Object: Entomology.

MEETING FOR PRACTICAL WORK.

The next meeting of the course on Systematic Botany will be held on Monday evening, 2nd December, under the direction of Mr. C. A. Topp, M.A. The generic distinctions of the principal orders will be considered, and members are invited to bring specimens illustrating the Leguminæ, Compositæ, Liliaceæ, and Orchidaceæ, and to provide themselves with hand or watchmaker's magnifying glass, sharp knife, &c.

VOL. XII.—No. 8. NOVEMBER, 1895.

The Victorian Naturalist:

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The Field Naturalists' Club of Victoria.

PUBLISHED DECEMBER 5, 1895.

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Monday, 9th December, 1895, at 8 p.m.

1. Correspondence and Reports.

   Report of Excursions to Springvale and Warrandyte, from Mr. C. French, F.L.S.
   Report of Excursion to Plenty River, from Mr. D Best.

2. Election of Members.

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4. General Business.

5. Reading of Papers and Discussions thereon.

   By Mr. C. M. Maplestone, "Calendars, and the Indexing of Natural History Observations."

6. Reading of Natural History Notes.

   The discussion on the advisability of removing Magpies from the protected list will be reopened by Mr. C. Frost, F.L.S. All interested are invited to contribute to the discussion.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

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❋ EXCURSIONS. ❋

SATURDAY, 7TH DECEMBER, 1895.—Plenty River (via Regent Street Station). Under the leadership of Mr. D. Best. Meet at Spencer Street Station at 12.38 p.m. Object: Entomology.

SATURDAY, 11TH JANUARY, 1896.—Heidelberg. Under the leadership of Mr. J. Shephard. Meet at Collingwood station at 2.15 p.m. Object: Pond Life.

The excursion to Fern Tree Gully, fixed for Saturday, 14th December, has been abandoned owing to the dry season.

MEETING FOR PRACTICAL WORK.

There will be no meeting for practical work this month, on account of the Christmas holidays. As the course in Systematic Botany is now completed, suggestions are invited for other lines of study.

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VOL. XII.—NO. 9. DECEMBER, 1895.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED JANUARY 9, 1896.

Editor: F. G. A. BARNARD, Esq.

The Author of each article is responsible for the facts and opinions he records.

CONTENTS.

PRICE SIXPENCE.

Agents for Europe:

DULAU & CO., 37 Soho Square, London.

Melbourne:

WALKER, MAY & CO., PRINTERS, 9 MACKILLOP STREET.

1896.

Field Naturalists' Club of Victoria.

ROOMS—ROYAL SOCIETY'S HALL, VICTORIA ST., MELBOURNE.

BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 13th January, 1896, at 8 p.m.

1. Correspondence and Reports.

   Report of Excursion to Heidelberg, from Mr. J. Shephard.

2. Election of Members.

	Proposer	Seconder
Mr. G. C. Goudie ...	Mr. H. P. C. Ashworth ...	Mr. F. G. A. Barnard

3. Nominations for Membership.

   Members making nominations will oblige by handing the full name and address to Hon. Secretary.

4. General Business.

5. Reading of Papers and Discussions thereon.

   By Messrs. J. Gabriel and H. P. C. Ashworth, "Notes on a Second Trip to Albatross Island," illustrated by limelight views.

   By Mr. Dudley Le Souëf, "Trip to Mallacoota Inlet," illustrated by limelight views.

   By Mr. R. Hall, "Notes on the habits of Victorian Wood Swallows."

6. Reading of Natural History Notes.

   Members who may note any unusual occurrence, or see anything of interest in Foreign or Colonial papers, are requested to mention the same at our meetings for the purpose of discussion.

7. Exhibition of Specimens and Conversazione.

   Members exhibiting specimens are requested to furnish the Hon. Sec. with written particulars of their Exhibits, for record in Minutes and *Naturalist*.

❋ EXCURSIONS. ❋

SATURDAY, 11TH JANUARY.—Heidelberg. Under the direction of Mr. J. Shephard. Start from Collingwood station at 2.15 p.m. Object: Pond Life.

MONDAY, 27TH JANUARY.—Nar-Nar-Goon. Under the leadership of Mr. H. Giles. Start from Prince's Bridge station at 7.50 a.m. Object: General Collecting.

MEETING FOR PRACTICAL WORK.

The next meeting will will be held on Monday evening, 20th January, and not on the 27th as previously announced. Mr. O. A. Sayce will deal with "Killing and Fixing Agents for Microscopic Work." Members attending the meeting are requested to provide themselves with microscopes and as many living microscopic forms as possible.

VOL. XII.—NO. 10. JANUARY, 1896.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED FEBRUARY 6, 1896.

Editor: F. G. A. BARNARD, Esq.

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Monday, 10th February, 1896, at 8 p.m.

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2. Election of Members.
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4. General Business.
5. Reading of Papers and Discussions thereon.

   By Mr. R. Hall, "Notes on the habits of Victorian Wood Swallows."
   By Mr. H. P. C. Ashworth, "The Flight of the Albatross."
   By Mr. H. Bullen, "Note on the Use of Turpentine for Microsopic Purposes."
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❋ EXCURSIONS. ❋

SATURDAY, 15TH FEBRUARY.—Ringwood. Under the leadership of Mr. D. Best. Start from Prince's Bridge station at 1.30 p.m. Object: Entomology.

SATURDAY, 22ND FEBRUARY.—Beaumaris. Under the leadership of Rev. W. Fielder. Start from Flinders Street station at 1.40 p.m. Object: Marine Zoology.

SATURDAY, 7TH MARCH.—Willsmere, *via* Kew tram. Under the leadership of Messrs. W. and J. Stickland. Meet at Town Hall, Collins Street at 2 p.m. Object: Pond Life.

ANNUAL CONVERSAZIONE.

It has been decided to hold a Conversazione in the Athenæum Hall at the end of May. It will be on the lines of the last, and will extend over two days. The committee will be glad to receive offers of assistance as early as possible.

VOL. XII.—NO. 11. FEBRUARY, 1896.

The Victorian Naturalist:

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— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED MARCH 4, 1896.

Editor: F. G. A. BARNARD, Esq.

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BUSINESS PAPER FOR MONTHLY MEETING.

Monday, 9th March, 1896, at 8 p.m.

1. Correspondence and Reports.
2. Election of Members.
3. Nominations for Membership.

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4. General Business.
5. Reading of Papers and Discussions thereon.

   By Mr. T. S. Hall, M.A., "The Weathering of Rocks."
   By Rev. W. Fielder, "Further Notes on the Intermediate Hosts of the Liver Fluke."
   (Promises of papers for future meetings are desired.)
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SATURDAY, 7TH MARCH.—Willsmere, *via* Kew tram. Under the leadership of Messrs. W. and J. Stickland. Meet at Town Hall, Collins Street at 2 p.m. Object: Pond Life.

SATURDAY, 21ST MARCH.—Studley Park. Under the leadership of Mr. T. S. Hall, M.A. Meet at Johnston Street bridge, *via* Carlton tram, at 2.30 p.m. Object: Geology.

ANNUAL CONVERSAZIONE.

It has been decided to hold a Conversazione in the Athenæum Hall at the end of May. It will be on the lines of the last, and will extend over two days. The committee will be glad to receive offers of assistance as early as possible.

VOL. XII.—NO. 12. MARCH, 1896.

The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED APRIL 10, 1896.

Editor: F. G. A. BARNARD, Esq.

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Monday, 13th April, 1896, at 8 p.m.

1. Correspondence and Reports.
2. Election of Members.
3. Nominations for Membership.

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4. General Business.
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   By Rev. W. Fielder, "The Intermediate Hosts of the Liver Fluke—Third Note."
   By Mr. J. Shephard, "A New Rotifer."
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✻ EXCURSIONS. ✻

SATURDAY, 18TH APRIL.—Black Rock, *via* Sandringham. Under the leadership of Rev. W. Fielder. Start from Prince's Bridge Station, at 1.40 p.m. Object: Marine Zoology.

SATURDAY, 2ND MAY.—Biological School. Under the leadership of Professor Baldwin Spencer, M.A. Meet at the University Gardens, at 2.30 p.m. Object: Biology.

ANNUAL CONVERSAZIONE.

The Conversazione will be held at the Athenæum Hall on Thursday and Friday, 28th and 29th May. Members are earnestly requested to make the exhibition of specimens as complete as possible, and to send in to the hon. secretary a list of exhibits on or before 11th May, to ensure their insertion in the catalogue. The allotment of space will be strictly under the control of a sub-committee. Tickets will be available by next meeting. The price of admission for non-members will, as before, be one shilling, and the success of the conversazione will depend on the number sold.

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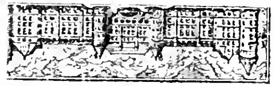
This Club was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

SPECIAL NOTICES.

Members are reminded that the Club's year ended 30th April last, and that subscriptions (15s.) for 1895-96 are now due. Subscriptions should be forwarded to the Hon. Treasurer, Mr. C. Frost, F.L.S., East Kew.



The Victorian [illegible]