

THE TASMANIAN NATURALIST



THE JOURNAL OF THE

Tasmanian Field Naturalists' Club.

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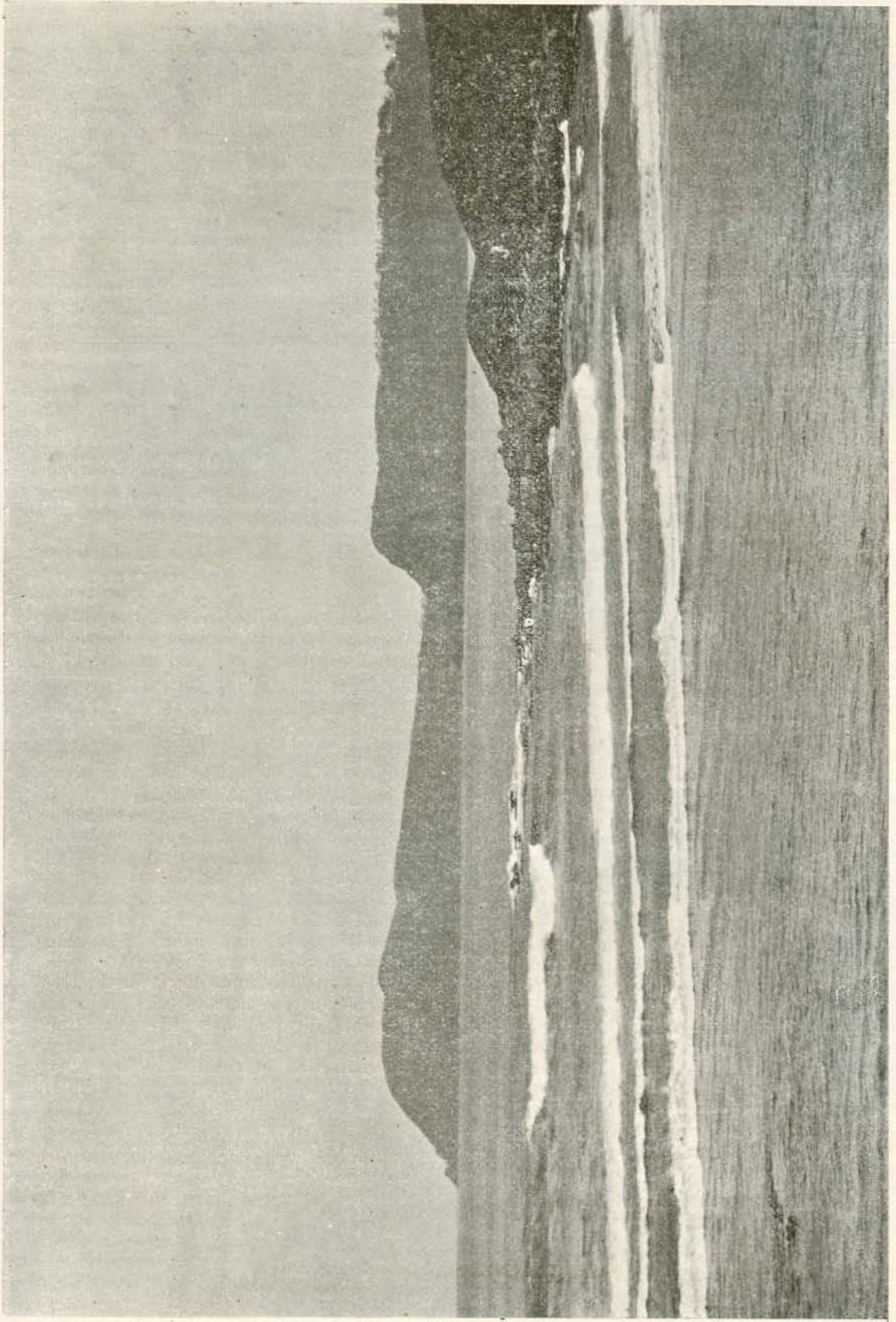
No. 2.

Camp Out of the Field Naturalists' Club on Bruni Island, Easter, 1907.

By the HON. SECRETARY.

It was arranged to hold the third Easter camp-out of the club at the south of Bruni Island, landing on the channel side at the head of Great Taylor's Bay, from where Cloudy Bay Lagoon is easily reached, and of the locality thereabouts good reports were heard. This year the party numbered 25. They met at the steamer *Waldemar* on Thursday evening, March 28, and started on the trip at 7 o'clock, expecting to land at the camping ground some time before midnight. A good trip down channel was made, though when the Huon River was reached it was seen that the ship did not head for our destination, but was going straight up this river. Upon interviewing the captain it was learnt that in his opinion the wind was too strong to make a safe landing at Taylor's Bay, and as arguments were in vain, we had to suffer a trip up to Franklin, which was reached about half an hour past midnight. A number of the party made an unsuccessful attempt to obtain lodging in one of the hotels. Some went for walks in the moonlight, along the roads, passing many fine apple orchards; these, of course, making the district a famous centre of apple-growing. There was little sleep for most. A start down stream was made the following morning, and many cases of apples were taken on board ere the river was left behind and the ship headed for Bruni. Disappointment was again our lot, for this time we were landed in Daniel's Bay, which is one of the chief settlements on South Bruni, and some seven miles from the locality we desired to reach. The steamer landed us at

5 p.m., and as a fairly good camping ground was found near by, most of the party at once carried their impedimenta there, and set about erecting the tents; returning it was found that the shed at the end of the jetty had been commandeered as a dining hut, and as the evening meal was ready, this was soon made but a happy memory. There were eight tents for the 25 campers, so that no tent was too full, and the first night was one of rest to all. At daybreak on Saturday morning many birds made their presence known. They were chiefly of the honey-eaters, and contained in their number the wattle-birds (*Acanthochaera induris*), whose voices, having benefited by their night's rest, made too frequently their unpleasant, croaking call, certain it is that they were there more noisy in early morning. After breakfast some of the party went fishing; others left for South Bruni lighthouse, ten miles or more distant. The country of the district was seen to be hilly and covered with fairly large eucalypts, with thick undergrowth in places, making progress very slow when roads or tracks were left. That is to say, that part resembled greatly the most of Southern Tasmanian country. After walking four miles the large swamp at the rear of Cloudy Bay Lagoon was seen, and soon afterwards the lagoon itself, one or two miles broad, came in view. There is a neck of land 500 yards wide from here to the channel side of the island at Great Taylor's Bay—where we had expected to land and form the camp. A narrow channel con-



WEST HEAD OF BRUNI ISLAND, FROM CLOUDY BAY.

nects the lagoon with the ocean, and by setting nets across this many fish may be caught, whereas in Daniel's Bay, where the camp was, fish were very few. At the lighthouse the party was hospitably received by Superintendent Hawkins, who is in charge there, and who showed the members over the buildings, which were kept in praiseworthy condition. In conversation, Mr. Hawkins stated that the weather would easily have allowed the boat to land our party in Great Taylor's Bay on the Thursday night, when taken direct to Franklin. Other trips were made to Adventure Bay, Mount Bruni, and elsewhere, which were enjoyable, but there was little scope for natural history research. Between Cloudy Bay and the lagoon a long arm stretches, having a fine beach on the ocean side, where shells are to be found after a storm, but few shells were seen during our visit. Many gulls, terns, and cormorants were flying about the lagoon, and as the water is very shallow over most of its area, it must be an easy matter for them to catch the fish. Out in the middle were some black swans, and ducks of different kinds were also observed. A large flock of white-fronted herons was there too, and sooty and white-breasted oyster-catchers occasionally flew in from the sea. On the hills the chief birds seen were black cockatoos, green parrakeets, and wattled-birds. Two summer birds and a few

swallows were seen, showing that these had not then left the north. Near Daniel's Bay the numbers of small birds were remarkable; three of the robins—scarlet and flame-breasted and dusky—were continually in sight. The spine-bill, crescent, New Holland, yellow-throated, and black-headed honey-eaters were common, and showed by their numbers that the pea rife was practically unknown there. Quail and ground birds (*Cinclosoma punctatum*) were also seen. Whilst fishing in Little Taylor's Bay our attention was attracted by the hawk-like cackling cries of a Caspian tern, which was trying to take a fish from a smaller species, the latter probably being the white-fronted tern. At different times one or two sea eagles were observed, sometimes soaring, at others flying heavily in the still air. Probably there are several nests of these birds on Bruni, but local residents at Daniel's Bay were unable to tell us where they were situated. No wedge-tailed eagles were seen. Fish were remarkably few; only small catches of flathead and rock-cod were taken with hand lines, and the nets brought up usually nothing at all—sometimes a few mullet. The other kinds taken were flounder, pike, saw-fish, sting-ray, and a small kind of leather-jacket. On Tuesday, April 2, at midday, the members were grouped on the beach and photographed, and at 2 p.m. the steamer called and took the party back to town.

Tasmanian Quail and Game Propagation.

By A. R. REID.

It has always seemed strange to me that so little has been done in Tasmania to increase our supply of winged game. One can form some little idea of the extent that game rearing is carried on in the old country when it is noted that over two millions of money are annually spent on its propagation and rearing. But before going into the subject of propagation it might be as well to consider the reason why one particular game bird is rapidly getting scarcer. I refer to our grey or stubble quail. Let us follow the life history of a bevy. About the middle of November a pair of birds build their nest under a tuft of grass on the verge of a field of growing wheat, and in it lay nine pretty spotted eggs. After nineteen days of patient sitting nine little downy chicks are hatched, and almost immediately run

with their parents into the standing grain, there to feast on insects and small grubs. All goes well for the first week or two, till the rattle of the reaper and binder is heard, and as the golden sheaves are gathered and bound the birds creep more and more into the middle of the paddock; when the last strip is about to be cut the parent birds call their little ones together, and saying "Follow us, stretch their wings and fly to the grass that grows long and rank around their once secure home. But two of the little ones are too timid to trust their wings, and squat close to the earth, thinking they will not be noticed; but, alas, the wheels of the binder pass over their tiny bodies, and the family circle (including the old birds) is reduced to nine. Next morning the survivors leave their home in the grass to feed amongst the stubble

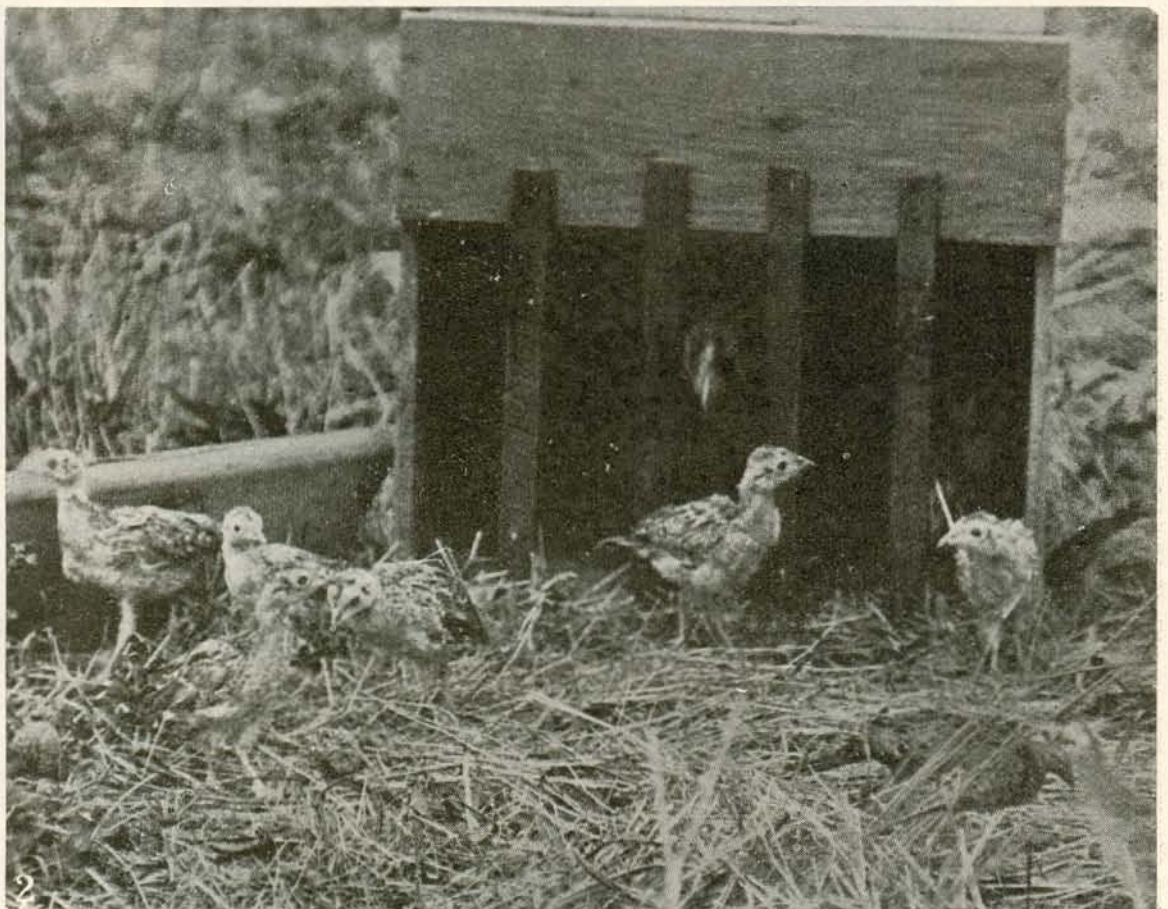
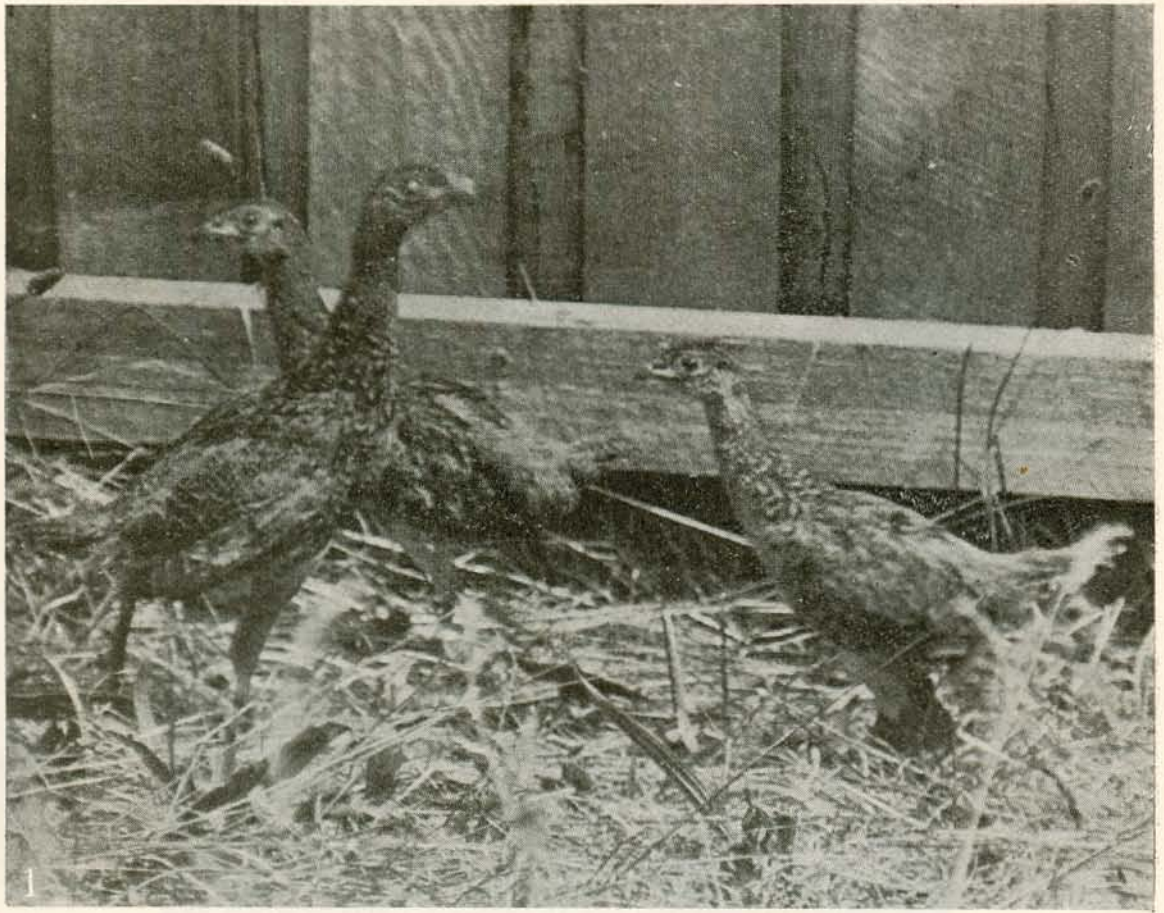
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and bask in the sun; but a hawk, like a bolt from the blue, swoops down and picks one up in his talons, then leisurely flies to the nearest tree to enjoy his meal. Learning sense as the days go by, they emerge from their cover only early in the morning or late at evening, thus escaping the sharp-eyed birds of prey. A worse enemy, however, has heard the whistle of the cock bird as he calls his children to their evening meal, and the arch-enemy of all feather game, the domestic cat, sneaks along the fence, and with one swift spring reduces the bevy to seven. New lodgings are sought without delay, and the young birds grow and wax fat. On the first of May there arrives on the scene one of the lords of creation, attended by a faithful servant in the shape of a keen-nosed pointer, who stands statue-like some twenty yards from where our bevy is concealed. They hear the command, "Hi, boy! put them up!" The dog advances two yards, when up they rise with whirling wings, and are saluted with two sharp reports. A brace is stowed away in the spacious game-bag, and the rest are followed from paddock to paddock till the whole seven are accounted for. Next year the shooter scours the same land in vain, and straightway petitions Parliament to have the quail protected for a period of three years. Our brown or swamp quail are not so likely to get exterminated, as they protect themselves to a large degree by inhabiting rough, wet land, where cover is always plentiful, and cats, by their dislike to water, are prevented from raiding their sanctuary. Brown birds will not stand the same amount of shooting as their grey cousins, and will very quickly leave a locality if disturbed too often. They have one peculiarity, which should be more widely known than it is at present. A bevy of birds, if not broken up, will remain in company and not breed for a number of seasons. You will often hear the remark in the country when you enquire about quail from the farmer, "There is a nice lot of brown birds in my swamp, but though I never allow them to be shot, they do not increase." Some years ago, at Riedon, a bevy of eight birds arrived on my shooting ground, where not a bird had been seen for years. The time was about the middle of June, and I was sorely tempted to have a crack at them, but knowing that they were not likely to come under the notice of other shooters owing to the almost barren ground they occupied, it was decided to leave them for another season, fondly picturing splendid sport on the opening day of the following year. I used to go over there every Wednesday afternoon, rain or fine, taking a small packet of canary

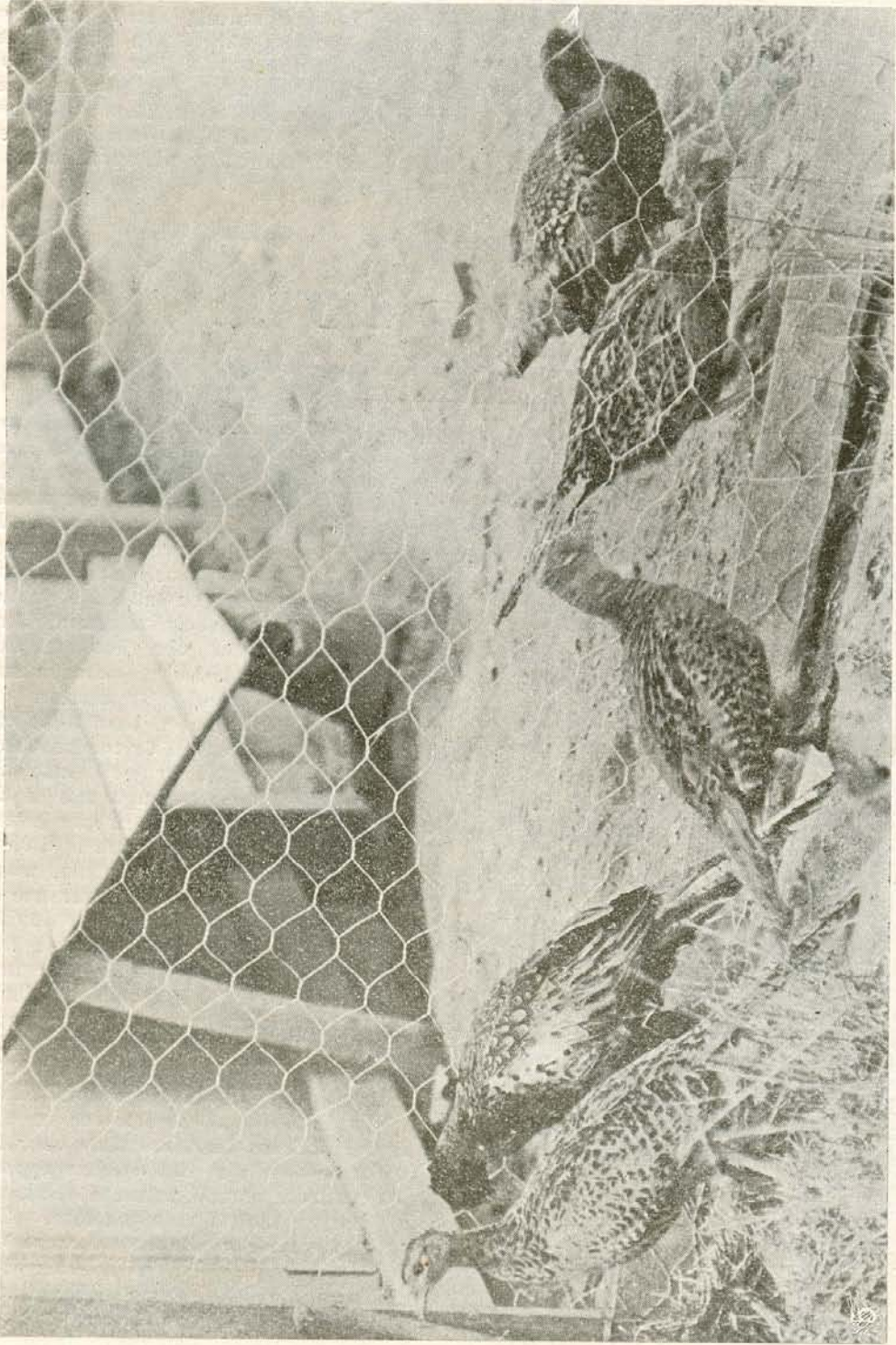
seed to sprinkle about their haunts. Often none were seen, but from the marks amongst the grass and rushes it was evident that they were still there. The long-looked-for day arrived at last, but all I could find were seven birds. Afterwards I put into practice knowledge gleaned from the gamekeepers in Scotland, and shot the old birds, but let the young go. Next year twenty brace were bagged and a few were left for next season. The only way that I can suggest to restock land that has been shot out is—to use an American expression—"plant" quail. Secure two or three pairs of adult birds, and confine them in small aviaries, say about ten feet square, with the earth for a floor, and, if possible, growing tufts of grass in the corners. They will nest behind these, and if not disturbed, will rear their young without much trouble. A plentiful supply of hard-boiled eggs and canary seed will be sufficient food. They will most likely rear two broods in the one season. My birds laid five times this year, and hatched a goodly number of young. The young birds should be kept in the aviaries until the end of October, and then turned out in pairs, selecting spots some little distance apart, as the males are great fighters. Both varieties can be treated in the same manner. If our sportsmen would only practice a little self-denial while in the field, by levying toll, say up to two-thirds of the birds they find, we should have a brighter prospect to look forward to. Another suggestion I should like to make to farmers would be that they limit the number of brace their friends shoot each season. Most farmers can form a pretty accurate estimate of the number of birds on their lands, and, by limiting the number shot, they could always ensure having a good breeding stock left at the end of each shooting season. In dealing with imported game, the pheasant claims premier position. I can see no reason why pheasants should not be reared in thousands in this fair isle of ours, with all its natural advantages. When one has seen the thousands of birds reared by hand in England, when during the rearing months there is often a continual down-pour of rain, and contrasts it with the beautiful weather experienced here, it will be seen that Tasmania has many advantages. There are plenty of estates where everything would be in favour of the young birds. We who live in the city can, and do, rear pheasants with everything against us, and can form a good idea of how the birds would succeed in more favoured circumstances. A beginner should start with a pen of birds consisting of four hens and one rooster, from which he should get about two hundred eggs, and with any sort of luck should rear quite half that number.



THE PHEASANT IN TASMANIA.—A BEAUTIFUL BIRD WHICH WOULD
THRIVE IN THE STATE. Nest and Eggs.



THE PHEASANT IN TASMANIA.—A BEAUTIFUL BIRD WHICH WOULD THRIVE IN THE STATE.
1—Well-grown Chickens, three months old. 2—A healthy young brood.



THE PHEASANT IN TASMANIA.—A BEAUTIFUL BIRD WHICH WOULD THRIVE IN THE STATE. Adult pheasants in breeding pens.

The feeding of the chicks is the all-important item, and I shall at all times be pleased to render any assistance and advice to anyone desiring the same, feeling confident that the pleasure he will derive from watching the handsomest and finest game bird the world knows grow up under his hand will amply repay him for the trouble he has taken to rear them. Many of us hope to see the pheasant amongst our game birds within the next few years. Another bird that warrants our attention is the Virginian quail, or Bob White; it is the game bird of America, and has been introduced into Japan, Jamaica, Holland, and New Zea-

land, in each of which places it has established itself. In New Zealand it is doing remarkably well. It is larger than any of our native quail, a swifter flier, is more prolific, and possesses one splendid trait ensuring its protection if once established here—when disturbed from the stubbles where it feeds it seeks shelter in the nearest scrub, and one who has hunted our brown birds under these conditions knows how it is an almost impossible task to find them again in cover of this description. A few immigrants of this class would be welcomed to Tasmania by all sportsmen.

A Parasite upon Flies.

By H. M. NICHOLLS (Garden Island Creek).

This curious little creature first came under my notice while I was engaged in preparing the proboscis of a March fly (*Tabanus* sp.) for mounting. Happening to look at it under a dissecting microscope, there seemed to be a number of little black specks sticking to the pseudo-tracheal tubes—a very unfamiliar appearance. In picking them off with needles, in nearly every case a portion of the tube they were attached to came away with them. This led me to examine them more carefully, when I found they were parasites of a very unusual nature. Later on, I found precisely the same thing upon the proboscis of the common blow-fly, and more extended investigations showed that it was by no means uncommon upon both blow-flies and March-flies, in this part of the country at least. Upon showing specimens to our able Government Entomologist, Mr. A. M. Lea, I found that it was unknown to him, and no references to anything like it were to be found in any scientific work available. This little creature is very remarkable in many ways. It is less than the 130th of an inch in length, hardly bigger than some of the rotifers, but it possesses a hard chitinous exo-skeleton, and its abdominal portion is divided into segments, just as that of a flea is. The head appears to be merged with the thorax, as is the case with spiders, and there are a pair of powerful hooked mandibles, which the little creature drives through the pseudo-tracheal tubes of its host, and thus hangs on. There are no visible signs of any locomotive organs, such as legs or wings, nor any antennae to be seen. There is a very curious hood-like arrangement situated upon the

anterior end of the head, and just over the hooked jaws. This fits down over the pseudo-trachea of the host, when the parasite is in position, and completely covers up the jaws and mouth parts. In some specimens there can be seen what appear to be eyes, in the shape of unpigmented lenses, one on each side, just as the eyes of some fleas are situated. Just below the base of the hooked jaws there is a little tube-like arrangement which suggests a sucking apparatus. It appears to be so situated that when the parasite has fastened on to the proboscis of the host it would project into the pseudo-tracheal tube through one of the horseshoe-shaped openings in the latter. The opening of the little tube is divided at the anterior end by a septum, which gives it something of the appearance of the muzzle of a very minute double-barrelled gun. This would suggest that the parasite only feeds upon the food matter that the host has collected for itself as it passes through the pseudo-trachea on its way to the main tube, which carries it to the stomach. The parasites are nearly always found upon the pseudo-tracheae, and never in any case that I have seen are they very far away from them; so it therefore appears to be rather a partial parasite of an unusual nature than a true parasite. The hooked jaws seem simply to serve the purpose of holding on, while the little-sucking tube takes a share of the dinner that the blow or March fly has procured for itself. When detached from the host these little creatures have a slight power of movement, bending their tails feebly from side to side, as many chrysalids do, but they are unable to move from one place to another, at least under

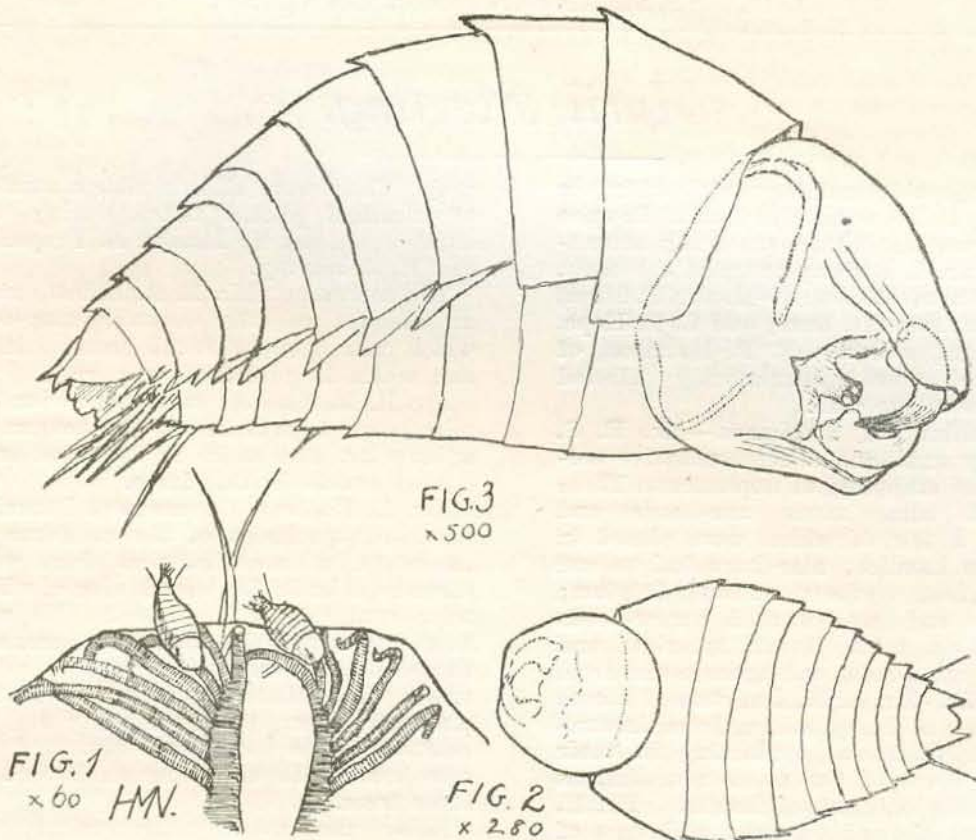


Fig. 1. Two parasites attached to tip of tongue.
 Fig. 2. View of parasite from above.
 Fig. 3. Side view of parasite.
 (All greatly enlarged.)

the microscope. They are not found upon every fly, and are commoner upon March-flies than blow-flies, but a March-fly has seldom more than three or four on its proboscis, while a blow-fly may have ten or a dozen. During the middle of summer nearly every March-fly had one or more, and they were common on blow-flies, but in May, when my last specimens were taken, I only found one blow-fly that had them out of about 50 I examined. It had eleven. The microscopic measurements of these parasites are as follow:—Length (exclusive of bristles), $194\frac{1}{2}$ microns; length of head, 63 microns; greatest width (to edge of segments), 110 microns. The length, making allowance for alterations produced by pressure of cover-glass, was very similar in all specimens. It may be mentioned that a micron is the unit adopted for microscopic measurements. It equals the one-thousandth part of a millimetre, or, roughly, the 25,000th part

of an inch. Fig. 1 shows the tip of a blow-fly's proboscis, with two of the parasites fastened to the pseudo-tracheae, enlarged 60 diameters. Fig. 2 shows a back view of one of the parasites detached, and magnified 280 diameters. The hooks are seen through the semi-transparent shell of the head. Fig. 3 is a view of another turned upon its side, giving an oblique view of the under surface of the head. It is enlarged 500 diameters. The hooks, tube, and hood-like arrangements are shown. In some specimen the ventral edges of the abdominal segments are produced into long, wavy filaments, but I have reserved this appearance, which may possibly be a sexual characteristic, for further study. The life-history and family connections of the creature are quite unknown to me, and I would be very much obliged to any reader of this journal who could supply information regarding it.

The Tasmanian rock cod is attacked by one of the most remarkable parasites known, and belonging to the genus *Lernæa*. This creature fastens itself to the cod by a three-hooked head; from this

there extends a long thin neck with a stout curved body, from which extend two white appendages exactly like spiral springs. The parasites themselves are often covered with a species of zoophyte.

April Meeting.

An enjoyable meeting was held in the Masonic Hall on the 25th April. In spite of wet weather, there was a fair attendance. Mr. L. Rodway occupied the chair.

Election of Members.—Messrs. R. Stops, G. Richardson, D. Burn, and C. T. Hope, of Hobart, and Mr. E. P. Harrison, of Bellerive, were unanimously elected members of the club.

Exhibition of Specimens.—Mr. E. S. Anthony exhibited a representative collection of ethnological implements. These included some stone axe-heads and chisels, a few of which were placed in elk-horn handles; also horn knives and chisels from Switzerland and Belgium; chipped and well-worked arrow-heads and knives from North America; and knives, axe-heads, and spear heads from Australia. Mr. A. M. Lea showed a case of beetles of Scarabaeidae, from Australia and Tasmania, containing in their number some of the most beautiful, as well as the bulkiest, of insects. Mr. H. Pottenger showed the nest and eggs of the olive thickhead (*Pachycephala Oliva-*

cea). There were also on view a number of excellent photos taken during the club's camp-out by Messrs. A. Propsting and R. C. Harvey.

The secretary (Mr. E. A. Elliott) read an account of the Easter camp-out, which was held on South Brunni Island, and which is published on page 1.

Mr. H. M. Nicholls exhibited under the microscope a parasite on the tongue of a blow-fly, and which is described in a special article in this issue.

Mr. L. Rodway, Government Botanist, exhibited specimens of the coniferae of Tasmania. He stated that there were eleven species in the island, nine of which were confined to Tasmania. He said there were no native pine trees here, and those so-called really belonged to other tribes. The Huon pine and celery-top pine were yews; the Oyster Bay and its relatives were cypresses. Mr. Rodway also dealt with the economic aspect of these trees.

After the usual conversazione, the meeting terminated.

May Meeting.

The monthly meeting for May was held on Tuesday, the 28th, in the Town Hall committee-room. Mr. S. Clemes presided, and there was a good attendance of lady and gentlemen members.

The Late Mr. Alexander Morton.—The chairman said that, before they proceeded with the business of the evening, he was sure they all desired to express their deep sorrow at the death of Mr. Alexander Morton, which was a sad blow to the cause of science in Tasmania, and sympathy with his bereaved family. They would all greatly miss Mr. Morton; in fact, the whole community would. As to sympathy with the immediate family, it came close home to the hearts of every one of them. He moved, "That a suitable letter of condolence be forwarded to Mrs. Morton." The secretary had been thoughtful enough to provide a wreath, which he was sure the club would approve.

Mr. L. Rodway seconded the motion, remarking that he had been associated with Mr. Morton for many years, and appreciated the splendid work he had done for the institution he represented, and for Hobart outside of that institution.

Mr. Arthur Butler, in supporting the motion, mentioned how ready Mr. Morton was at all times to assist young people and students generally in the study of different branches of science. An exceedingly useful man had been lost to the community, and one who could ill be spared.

The motion was then formally passed.

A letter was received from Mr. J. E. Smith, tendering his resignation as vice-chairman of the club, on account of leaving to reside in Adelaide. The club had his sincere good wishes. The resignation was accepted, with thanks for past services.

Mr. P. Astrella, Smith-street, was elected a member.

There were tabled copies of the first issue of the club's journal, the "Tasmanian Naturalist," with illustrations, and (by Mr. Rodway) a copy of "Australian Bird Life," by R. S. Hall, illustrated.

Mr. A. E. Brent sent for exhibition splendid specimens of the kestrel (*Cerchneis Cenchrroides*) and sparrow-hawk (*Accipiter Cirrhocephalis*), which he had captured and stuffed. Mr. A. R. Reid showed a case of Australian snipe, which he had shot, stuffed, and mounted. Mr.

H. L. Pottenger exhibited eggs from New South Wales of the White Corcorax, the quail or magpie lark, and the grey jumper.

Mr. Clive Lord read a paper on Bird Photography, showing how to go about it. He advised commencing by photographing the nests the first season, at the same time observing the habits of the birds, and learning how best to procure pictures of them. He mentioned some devices which have been used by naturalists for approaching nests, but impressed the need of untiring patience. Details of the camera he would recommend were also touched upon.

Mr. Arthur Butler supplemented Mr. Lord's helpful paper, mentioning some birds it was easy to photograph.

Mr. A. R. Reid gave a paper on "Propagation of Game," which is printed in full herein.

Mrs. H. L. Roberts and others commended Mr. Reid's paper. Mrs. Roberts mentioned that she had successfully bred Mallard ducks during the past season.

The hon. secretary read a report, prepared by a committee, suggesting to the Government certain amendments to the Game Protection Act, which were approved.

August Meeting.

A meeting and conversazione was held in the Masonic Hall in August. Mr. S. Cames, chairman of the club, presided, and there was an excellent attendance. The secretary reported that letters had been received from eminent naturalists in Australia, praising the club's journal, the "Tasmanian Naturalist," and wishing it every success.

The following new members were elected:—Mrs. Cyril Cameron, Fordon, Nile; Mr. J. H. Gould, and John Graham; as juniors, Masters C. Cane, V. Hickman, F. Duff, of Hobart, and Richard Dawson, of Bellerive.

The illustrations of a new publication by Mr. L. Rodway, printed by the club, entitled "Trees and Shrubs of Tasmanian Forests," were shown and admired. A number of illustrated booklets on English nature objects, published by McGowan, were tabled.

Specimens Exhibited.—By Mr. H. J. Colbourn, skull of sword-fish, on which interesting observations were made. The secretary (Mr. Elliott) showed an unusually good collection of aboriginal implements, archaeoliths, which he had recently collected on the East Coast, at Melvedon. Dr. Noetling offered remarks on some of the more interesting of them. Mr. F. L. Brownell had some similar ones, which he had collected near Hobart. Mr. A. M. Lea showed a small live whip snake, which excited interest

among members. Mr. L. Rodway, Government Botanist, showed and explained a rare fern, *Cystopteris fragilis*. Mr. B. E. McDonald had some snells from Trinidad, which had unusual growth of long seaweed on them.

Mr. A. M. Lea, Government Entomologist, gave a lecturette on marine life, with limelight illustrations. He showed forms of corals, and explained the growth of the coral reefs, and showed many of the invertebrate animals which are to be found there. The lecturette was not confined to marine life, however, and several slides were shown illustrating the life history of the mosquito, which spends its larval stage in the fresh water pools. The difference was shown between the common mosquito and the species which is known to spread malarial fever.

Dr. Fritz Noetling then gave an interesting account of the geology of the Barnuff. He described carefully the enormous ore deposits of that comparatively unknown district. He stated that the ore in sight at present represented several millions of tons, and he expressed himself as being sure that a big future lies before this great mineral field, especially referring to the Derwent and Lake Windermere mines.

Mr. E. L. Piesse proposed votes of thanks to those who had taken part in the meeting, after which those present examined the specimens.

A remarkable Tasmanian beetle (*Amblyopinus Jansoni*), which lives at the base of the tail of one of our bush rats, has recently been taken by Mr. H. M. Nicholls, at Garden Island Creek. The only other reported capture of this species was by Mr. Aug. Simson, at Ben Lomond, about 30 years ago. The nearest relative of this beetle lives at the base of the tail of a species of mouse in South America.

In January, 1906, bush fires burnt many beautiful gullies on Mount Wellington. The ground thrush (*Geocichla macrorhyncha*), amongst other birds deprived of their customary haunts, had to seek fresh nesting grounds, and during last spring more than usual of these birds were found building by the New Town Creek and other places untouched by the fires.

An Entomologist's Cycling Trip to Cloncurry (Queensland).

By HENRY HACKER.

Business matters requiring my presence in Cloncurry, I decided to take boat from Brisbane to Townsville, and cycle from there onwards, annexing such insects as were come across on the journey. Time did not allow of any regular collecting, but a few small bottles of formalin were taken to preserve the insects in. When Townsville was reached, to save time and incidentally to escape the rigours of cycling over the Haughton Range, the train was taken to Charters Towers, the queen city of North Queensland, now somewhat of a fallen queen. However, a start from that town was made on the morning of February 7; at the end of the day Pentland, a distance of 76 miles from the Towers, was reached; the country between proved to be ridgy and bushy. During the heat of the day a spell for an hour or so was taken at a shady creek. Here a very beautiful *Symphyletes* was taken on a tea-tree overhanging the water; a yellow Spanish fly, *Zonitis*, was common on the coarse grass; a pretty little *Laius* (*bellulus*) was first taken here, and proved to be plentiful throughout the trip, although not previously recorded from Queensland; other captures at this place were two species of *Cryptocephalus* (one probably new to science, the other being the handsome *gracilior*), *Elaphodes larinus* (hitherto known only from North-Western Australia and plentiful on gum saplings), two kinds of *Paropsis*, two of *Rhyparida*, and an *Oxyops*, all on young gum trees, whilst the beautiful little *Tachys bipustulatus* was plentiful on mud at the water's edge. The next day's journey was a hard one. The road proved to be so rough that I had to leave it and ride on the footpath alongside the railway line. It was not an enviable journey, for I had to jump off every few yards to dodge culverts and loose stones on the line, and constant irritation was caused by grass seeds. I was not sorry to reach Torrens Creek—the North Queensland meat works—where a night was put in. During the day the widely-distributed tiger-beetle, *Cicindela semicincta*, was plentiful in muddy places, whilst another and apparently a new species like *Hackeri* was running about on sandy roads. The other insects taken were *Hathlodes quadrilineatus*, common on reeds, five kinds of *Myllocerus*, a *Stenocorynus*, very

plentiful on bushes and abundant all over North Queensland; *Philonthus subcingulatus*, plentiful in decaying vegetation; a beautifully speckled *Belus*; a tortoise beetle, *Coptocycela*; a small *Calomela*, and a fine *Rhyparida*, whilst a rainbow-hued *Chalcopterus* was found in numbers on the bark of a mimosa tree. At Torrens Creek one of the "great natural resources" of Western Queensland was experienced, consisting of half a hurricane of wind and dust, and reminding one of the willy-willies or duststorms of Kalgoorlie. They are very plentiful in this district, this one doing considerable damage to the roofs of the houses. The next day's journey to Hughendon was monotonous and dry, the only water on the road being at a Government dam about half-way between Prairie and Hughendon. The country towards Hughendon begins to change from forest to treeless black-soil plains, consequently the captures consisted mostly of *Tenebrionidae*, *Curculionidae*, and such *Carabidae* as are peculiar to downs country. From Hughendon to Richmond, a distance of 80 miles, the road travels over what is called the North-Western Downs of Queensland. As the wet season has not yet started, the country was in a desolate condition, not a blade of grass nor an animal of any kind being visible; the only vegetation to break the monotony was a few reeds and thorn bushes along the bore drains that cross the road, one at Telemon sheep station and the other at Marathon, and a few stunted trees round the edge of waterholes, which were then quite dry. On this stage the captures consisted of *Gnathaphanus pulcher*, *Chlaenius australis*, an ordinary-looking *Diaphoromerus*, *Phorticosomus grandis*, a *Saragus*, two kinds of *Pterohelaeus* (one much resembling an *Encara*), a *Polyphrades*, the peculiar goat-treaded *Rhinaria tragocephala*, *Alcides bubo*, and a short *Lixus*. Richmond is a little galvanised iron town, chiefly noted for heat. During my stay the inhabitants suffered from a plague of beetles, the most abundant of which was a very distinct species of *Pterohelaeus*, but others, especially *Phorticosomus grandis* and a large *Gnathaphanus* (midway between *pulcher* and *Riverinae*), were also very numerous. They were

such a pest that at night-time most business places were compelled to close up. To stop the nuisance one ingenious business man procured two powerful acetylene gas lamps and put them on the footpath outside his shop, while turning the inside lights low. He thus managed to keep most of the insects outside. At present Richmond is the terminus of Queensland's northern railway, although the line to Cloncurry is under construction; so after leaving the former place the road began to assume quite a busy appearance, from the number of teamsters and camel caravans carrying supplies to the Cloncurry copper-fields, where there is just now considerable mining activity. My journey still lay over the monotonous downs country, the most plentiful beetle here being the beautiful and very variable longicorn, *Zygrita diva*; *Cenogmus rotundicollis*, a peculiarly mottled *Cryptocephalus*, and the remarkable *Microtragus pictus* were found crawling on the ground all over the downs. Here a very pretty little *Laius* was taken on a weed, and seen nowhere else. Four days from Richmond Lillyvale out-station was reached. Up to here the weather had been dry and exceedingly hot, but here the real troubles commenced. The rain fell in torrents, and all the watercourses were flooded. It was impossible to ride or even to push my bicycle through the wet black soil, so I shouldered it at sunrise and started to walk to the next stopping-place, Fisher's Creek, a distance of forty miles. With the help of a little riding in the harder parts of the country, my halting-place was reached at midnight, after having to leave the bicycle on the road. On arrival the hotel was closed, and I was compelled to sleep in wet clothes on the footpath. Next day I walked back to the bicycle, picking up on the road *Phortocosmus grandis*, a beautiful green *Chlaenioidius*, *Gnathaphanus pulcher*, and the grand tiger beetle, *Megacephala cylindrica*, which the wet had evidently driven out of their holes. Here it may be mentioned that, although they were looked for, no species of *Carenum* or *Amycteridae* were seen throughout the journey, probably owing to the lateness of the season. Fisher's Creek, which is about 18 miles from Cloncurry, marks the westerly boundary of the North-Western Downs. After leaving here the country assumes the desert sandstone formation, with light forest, which is characteristic of the Cloncurry belt. It was quite a pleasant change after seven days toiling through those awful black-soil downs, to encounter good hard roads for the last few miles of my journey. Cloncurry was reach-

ed about midday on February 20, after having ridden over five hundred miles. The chief beetles captured in the Cloncurry district were two species of *Symphyletes*, one of which was the pretty species before mentioned, *Zygrita diva*, *Microtragus pictus*, one dead specimen of a *Stigmodera* washed up by the Cloncurry River, one specimen each of two brilliant species of *Chalcophora* (*Fairmairei* and *Saundersi*), which were taken on the wing, a small *Storeus* common under bark, an *Oxyops* much like the South Australian *Bilunaris*, *Bryachus squamicollis*, abundant everywhere on saplings; an apparently new *Leptops*, with small prothorax and very large elytra; another species somewhat like *Musimon*, and a *Polyphrades*, crawling along the ground. A blue and yellow *Aulacophora*, the male of which has very remarkable antennae, was found on a vine locally called "Chinese cucumber," a small spotted *Rhyparida* under bark, a large *Elapaodes*, and three species of *Ditropidus*, one being very large and resembling *antennarius*, and another having an enormous head, with powerful jaws, all taken on foliage, where also a yellow *Calomela* with black knees was common; a *Cestrinus* was taken under logs, as was also a *Cistelid* close to *Homotrysis*, but having most remarkable sculpture; two species of click beetles were taken here, both of the genus *Monocrepidius*, and one of which was flying at dusk in great numbers; two species of *Onthophagus* (*Consentaneus* and *Comperi*) were captured in refuse, and *Ataenius semicaecus* round lights, and a very curious and probably new *Rupilia* on watermelon vines. Cloncurry is naturally a rather rough though lively little town, owing no doubt to the present boom in the copper market. Money is very plentiful there. On my arrival business matters engrossed all my attention, so not much collecting was done, the above representing practically all the insects captured.

NOTE BY ARTHUR M. LEA.

Mr. Hacker has sent me for examination all the species mentioned above, and many others taken during his trip, altogether 128 species. The collection contains some very beautiful insects, probably more than half of them being new to science. In addition to those mentioned, he took the very peculiar *Bledius insignicornis*, hitherto known only from Victoria, a remarkable spotted jumping beetle, probably an *Arsipoda*, a *Saragus* remarkably close to one occurring in the Northern Territory, and many typical beetles of North Queensland.

Excursion to Botanic Gardens.

On Saturday, 11th May, members paid a visit to the Botanic Gardens, to gain information as to the many useful and ornamental trees from foreign parts which are growing there.

They were met at the gates by Mr. Wardman, and as it was late in the season for deciduous trees, attention was directed chiefly to the coniferae. The party went along the top path above the pond, where there are well-grown specimens of trees on either side. In this part also were the cedars and cypresses, and as the party proceeded, several

species of evergreen oaks from North America, and also the cork oak, were seen.

Owing to the interest now being taken in forestry, interesting discussions were held as to the best trees for this purpose, and as Mr. Wardman is well up in this subject, he gave much information, illustrating his remarks from the trees around him.

Seeds of many kinds were taken by several members of the party to experiment with.

Excursion to South Bridgewater.

On Saturday, 18th May, Dr. Noetling led an excursion to examine the limestone quarries at South Bridgewater. The quarries are about one mile from the railway station, and in excavating limestone for burning in the kiln the rock has been cut away to a depth of about 30ft., and a fine bed of fossils exposed. The formation is of slightly inclined alternating beds of limestone and shale, in which there are many fossils, including *Spirifer*, *Productus*, and *Pecten*, though the majority had been pressed out of shape during the formation of the rock. There were many kinds of corals of ex-

trict forms, and crystalline carbonate of lime was found to be common.

A little way from the scene where members were most busy a striking example of an anticline was observed. This is an upward turn of the beds of rock caused by immense pressure from below, and is rarely seen.

The hardness of the limestone, and consequent breaking of many fossils in trying to extract them, was at times cause of disappointment, but those attending were well satisfied with the success of the outing.

Printing Fund.

The subscription to the club (5s. for adult and 2s. 6d. for junior members) is so low that it will not cover all our expenses, and for many reasons it is desirable not to increase the same. Contributions are therefore invited to a print-

ing fund. The following members have already contributed to the fund:—Dr. G. Smith, Mr. L. Rodway, Mr. A. L. Butler, Mr. E. Maxwell, Miss D. Kermode, Mr. W. Tarleton.

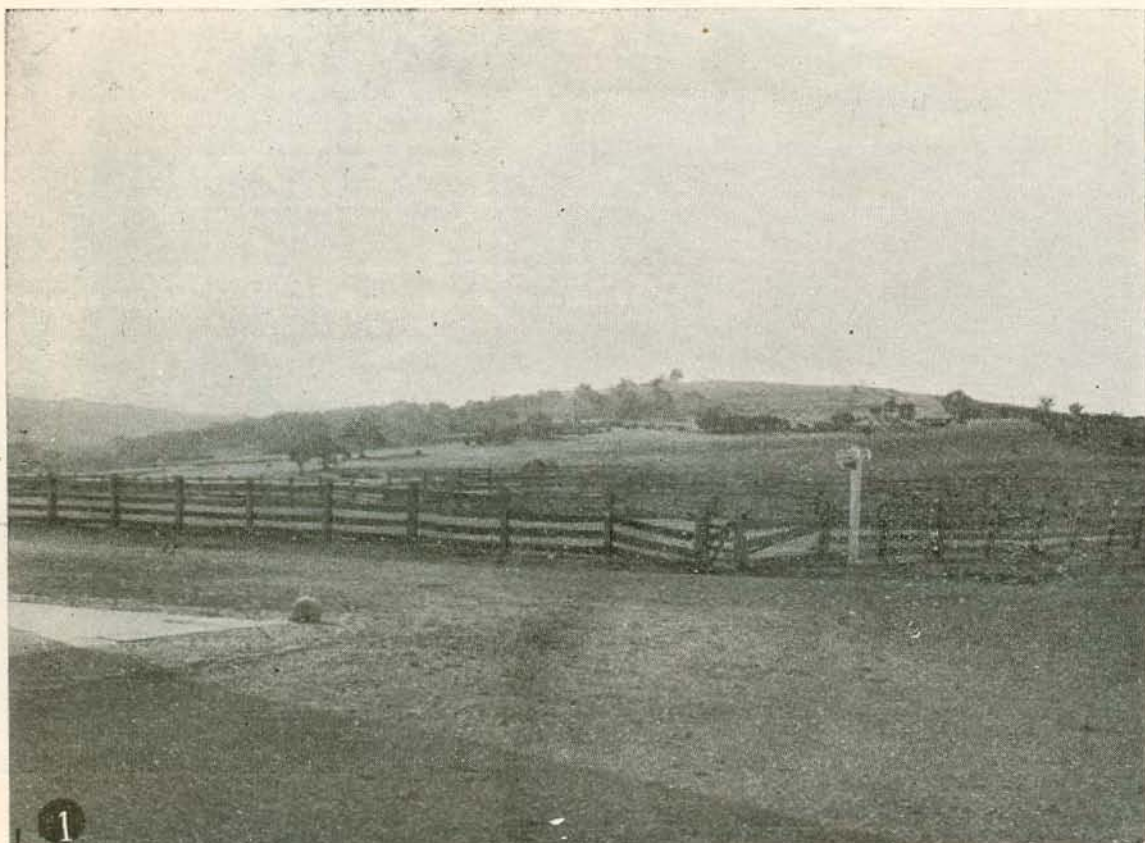
Notes on the Amorpholithes of the Tasmanian Aborigines.

By FRITZ NOETLING, M.A., Ph.D., etc.

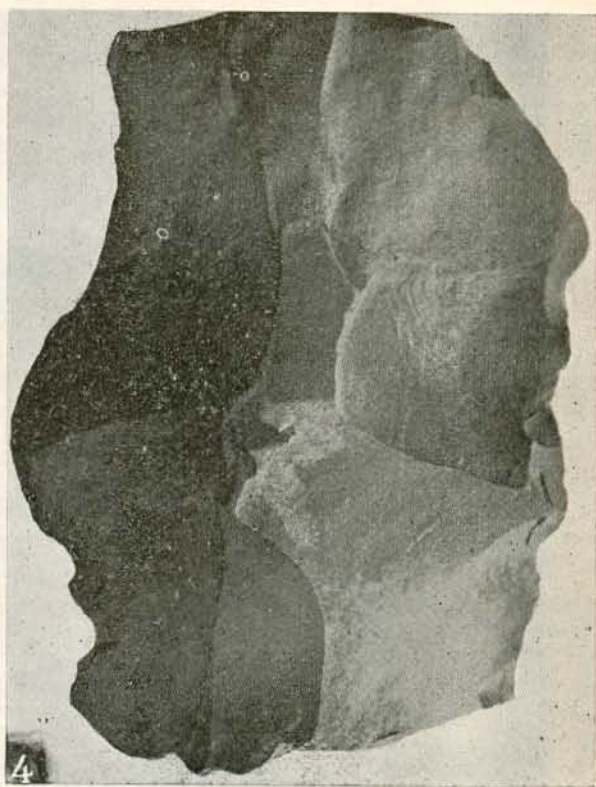
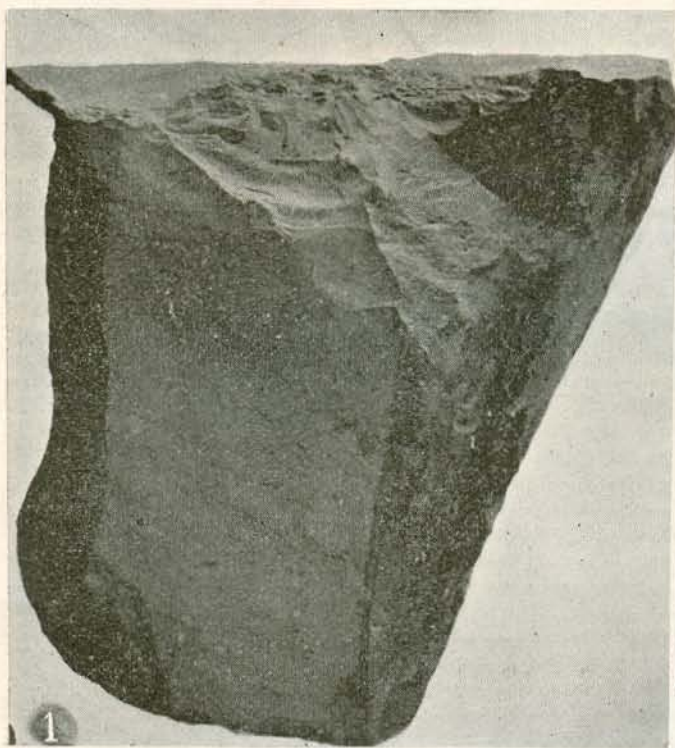
No. 1.—The Native Quarry on Coal Hill, near Melton Mowbray.

It is of the greatest interest to ascertain where the aborigines of Tasmania procured the raw material for their crude implements. There is no doubt, as is conclusively proved by numerous specimens, that the rolled pebbles of the diluvial boulder beds contributed

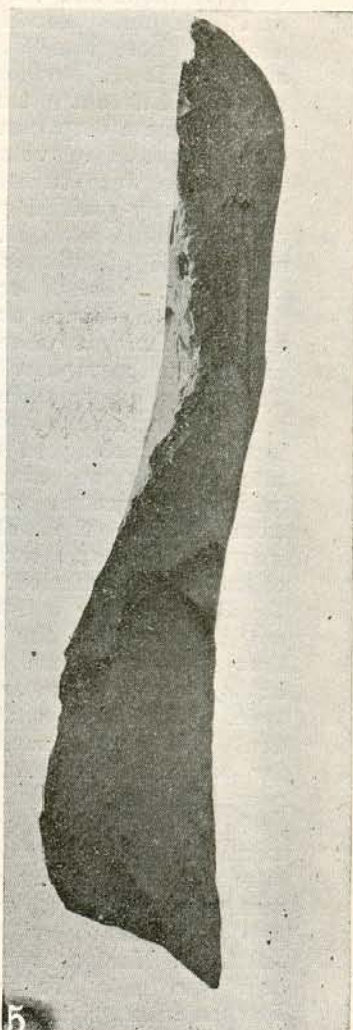
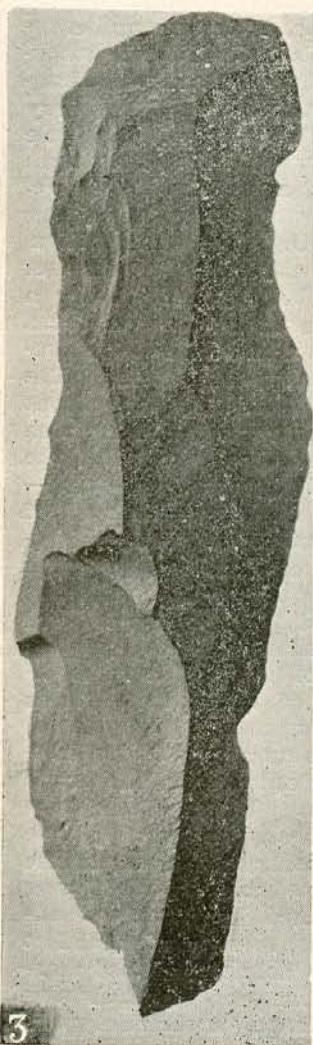
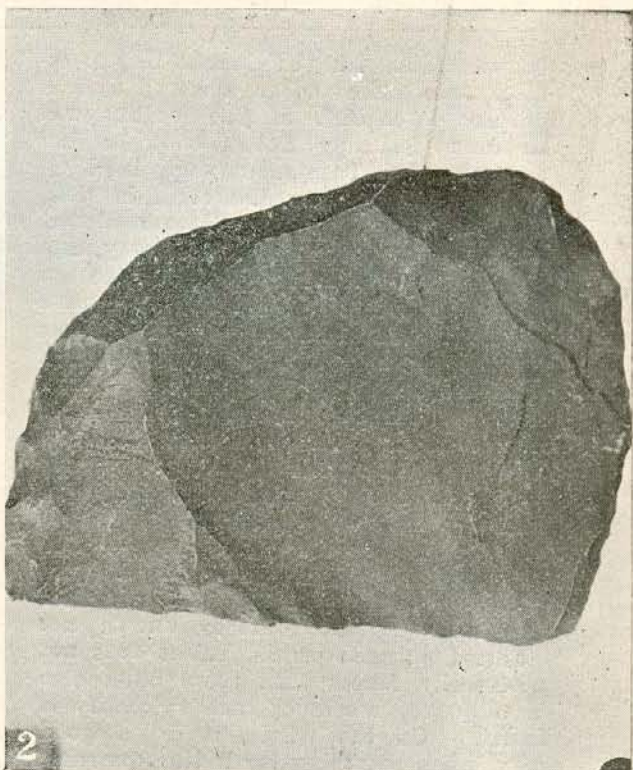
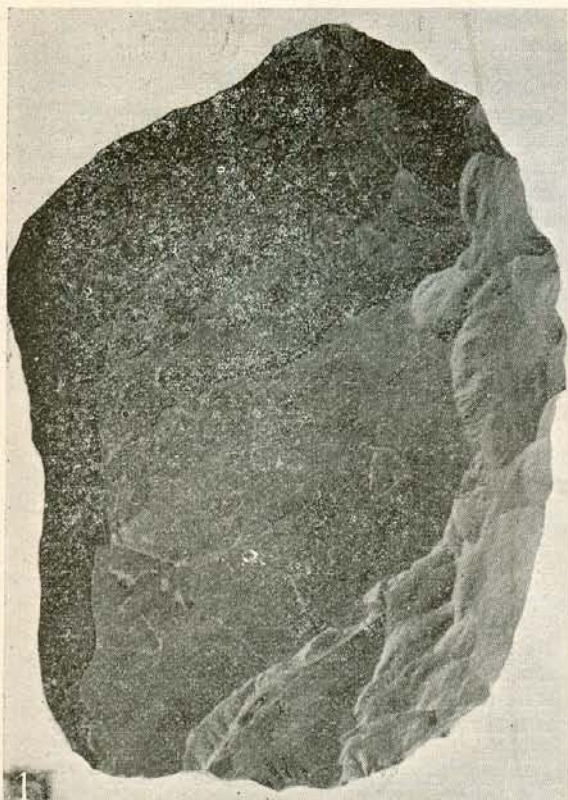
a considerable share, but it is also equally certain that the aborigines knew numerous places where a suitable material could be found in situ. As far as I know the first "native quarry," as these places were called, was discovered by Jas. B. Walker on the boundary line



RELICS OF AN EXTINCT RACE. NATIVE QUARRY ON COAL HILL, NEAR MELTON MOWBRAY, SOUTHERN TASMANIA. Photos by Dr. Noetling. 1—Coal Hill, where an Aboriginal Quarry is situated. 2—View of the Native Quarry.



RELICS OF AN EXTINCT RACE. NATIVE QUARRY ON COAL HILL, NEAR MELTON MOWBRAY, SOUTHERN TASMANIA. Photos by Dr. Noetling. 1—Fragment showing mark of percussion. Rejected by the Aborigines. 2—Well-finished Hand-Chopper. 3—Angular Fragment showing traces of use. 4—An Unfinished Specimen, showing a considerable amount of work on each side.



RELICS OF AN EXTINCT RACE. NATIVE QUARRY ON COAL HILL, NEAR MELTON MOWBRAY, SOUTHERN TASMANIA. Photos by Dr. Noetling. 1 and 2—Well-finished Hand-Choppers. 3, 4, 5—Knife, showing pollical and indical face and side view.

between Glenleith and Charlie Hope's estates, near the River Plenty; and a graphic description of this locality will be found in Ling Roth's book on the aborigines of Tasmania (page 149-151). Another quarry was discovered in 1890, if I am right, by Mr. Harold Bisdee, on Coal Hill, near Melton Mowbray, and I subsequently found a third one on Shene, near Pontville station. I have no doubt that many more native quarries will be discovered if a proper search is made, but for the present very little is known about their features. The most important part connected with them has already been pointed out by our veteran geologist, R. M. Johnston. Native quarries are invariably situated on such place where the palaeozoic mudstone or sandstone has been altered by eruptive diabas or basalt. It is certainly a fact that all quarries hitherto known are situated on such places, but it does not necessarily follow that there must also be a quarry wherever such a locality is found. On the whole, it is a good plan, when searching for native quarries, to keep to the contact line, between the eruptive rocks and the palaeozoic strata, and it is pretty certain to assume that after a short time success will be the reward. It is obvious that palaeozoic strata of different nature were differently altered (metamorphosed) by one and the same eruption of volcanic matter. The sandstones were turned into a more or less coarsely-grained porcellanite, while the mudstones were altered into the various kinds of splintery, silicious chert, commonly, though erroneously, called flint. In a future article I shall have an opportunity to dwell more especially on the petrographical features of the Tasmanian amorpholites, as I have already ascertained some very peculiar facts. According to the nature of the altered rock we can naturally distinguish two groups of quarries, those from which the altered mudstone was obtained, and those where the porcellanite was quarried. The quarry near the River Plenty and that on Coal Hill are instances of the first type, while that of Shene seems to be, as far as I know, the only instance of the second type. It seems that the quarry on Coal Hill is the most important, as far as extension and intensive work goes; and a detailed description, together with that of some of the implements found, is therefore of particular interest. As already stated, the quarry was discovered by Mr. Harold Bisdee, and subsequently visited by Messrs. Johnston, Morton, and Walker, but, except a note in Walker's paper on the Tasmanian aborigines, I only know that

a short account, accompanied by a photograph, was published in a southern weekly journal. It appears that the actual situation of this quarry was only known to the few persons mentioned, and even the local people hardly knew of its existence when I visited Melton Mowbray for the first time in 1906. I tried in vain to discover the quarry by following the contact of diabas and mudstone, but I soon found out that it would take me many days of diligent research to find it. However, on enquiry, Mr. Bisdee, on whose property Coal Hill is situated, kindly supplied the necessary information, and, guided by this, Mr. Nichols, of Melton Mowbray, who knows the country well, could show me the exact locality. Anybody interested in this subject could do no better than to communicate with Mr. Nichols, if he wishes to visit the quarry. Coal Hill is a low, fairly thickly wooded hill, about a mile and a half north of the hotel at Melton Mowbray (see Fig. 1). A shallow gully divides it in a western and eastern spur, on the crest of which the quarry is situated. It is a remarkable bit of scenery, this old quarry. Right on the top of the flat hill, in fairly open country, the ground is covered with thousands and thousands of angular fragments of a blue, hard, and splintery chert. It almost looks as if the whole ground had lately been covered with fresh road metal (see Fig. 2). This picture shows a view of the native quarry on Coal Hill. On close examination, shallow holes of about five to six feet in diameter will be observed, having a low wall of debris heaped around them. It is evident that these holes were produced by excavating the rock. The thickness of the debris strewn about may be about 1ft. to 2ft., and its area about 200 to 300 feet square. All the fragments are of a very even size—about five inches in length—though of course there are numerous smaller fragments, but there are hardly any larger than six inches. Every specimen we took up showed sharp edges, and most of them showed more or less extensive traces of use. The most interesting feature of these fragments is certainly the fact that every one of them, of all the thousands we saw scattered, had once gone through the hands of a human being. We may also take it as certain that all the specimens we now see in the picture are either refuse or specimens that broke while being shaped, or unfinished implements. Well-finished specimens are very rare, and it appears that the aborigines chiefly excavated the raw material, and, having perhaps roughly shaped a suitable speci-

men, took it to their nearest camp, in order to finish it. This being so it proved by the fact that in the old camps unfinished specimens were found, together with elaborately worked specimens. Of course, it is also probable that some specimens were finished at once, but this was apparently not the custom, otherwise more specimens of elaborate finish which had been rejected ought to be found. It is remarkable to say that if we find a specimen exhibiting a smooth, even face, which could have well served as a pollical face,* we may be certain that it also shows a more or less elaborate chipping on the indical† face. Very numerous are angular fragments showing marks of percussion, such as shown in Fig. 1, p. 16. This figure shows an extensive mark of percussion. The upper end of this specimen shows distinctly that a heavy blow with another instrument (stone) had been directed against it. But this blow failed to achieve its object; instead of breaking off a smooth flake its force was spent in shattering the stone into numerous irregular splinters. As this specimen had been rendered useless by this, it was apparently rejected at once, though already a considerable amount of work had been gone through in flaking off different parts. Very frequent are specimens of the following type:—Fig. 3, p. 16—Angular fragment, showing traces of use. These are simply angular fragments, which, having a sharp edge, have apparently been used. The edge is more or less serrated, but the chippings must be considered as traces of use, not as wilfully produced. The

next specimen is apparently an unfinished specimen. Fig. 4, p. 16 (unfinished specimen)—This shows a considerable amount of work on both sides; it is also fairly certain that this specimen was rejected, because the smooth pollical side, of which traces are to be seen, flaked off during the process of work. Better-finished specimens are figured in Fig. 2, p. 16, and Figs. 1 and 2, p. 17 (well finished hand-choppers). All these specimens have a fine smooth pollical face, and the indical face is more or less elaborately worked. The finest specimen I found is a knife measuring nearly $5\frac{1}{2}$ inches in length. Figs. 3, 4, 5, p. 17 (knife showing pollical and indical face and side view) — This knife shows by the broken edges that it has been very strongly used. The pollical face is very even and smooth; the indical face elaborately chipped. All these specimens prove that an enormous amount of work has been spent in shaping them, and if we consider that all those we now find are refuse or rejects we can only wonder at the patience of this primitive race, but this is mixed with a feeling of pity for their fruitless attempts to shape the unyielding material into a suitable implement, whose inefficiency was only too well known to them.

*Pollical (side of implement on which the thumb rested when used: always the flat side).

†Indical (that side of the instrument on which the first finger rested: always the chipped side).

Annual Report.

The committee of the Tasmanian Field Naturalists' Club have much pleasure in presenting their third annual report, as hereunder:—

It is evident that the club is becoming more and more popular, as 31 new members joined during the past session, bringing the total membership up to 92. The departure for England of Dr. Gerard Smith, who did so much for the club during its early days, is a distinct loss. Mr. J. Edgar Smith, a most active member, has also left the state; and we regret to record the death of Mr. A. Morton, late curator of the Tasmanian Museum, which deprives the club of one who did much to assist it. On the other hand, amongst the many joining is Dr. Fritz Noetling, who lately arrived in Tasmania from India, where he was on the Geological Survey, and he has already

done much to help the club as a member of committee, a speaker at meetings, and as a leader at excursions. The excursions have been well attended, and the meetings largely so. This is hardly to be wondered at, because the meetings are now of greater interest than during the past, owing to the fact that specimens for exhibition at them are now more numerous, and discussion more general. The papers read and lectures given have been of distinct scientific value. Eight meetings have been held, including an illustrated lecture on general natural history of Northern Queensland, by Mr. A. H. Mattingley, of Melbourne. This lecture was held in conjunction with the Australian Ornithologists' Union, and His Excellency the Governor presided. A resume of lectures at some of the chief meetings would include—"Modern Bo-

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tany," S. Clemes; "Aviculture," A. L. Butler; "Islands of the Pacific," A. Morton; "Bird Life of Beaumaris," Mrs. H. L. Roberts; "Geology of South Bridgewater," Dr. F. Noetling; "Coniferae of Tasmania," L. Rodway; "Game Propagation," A. R. Reid; and "Marine Life," A. M. Lea. Others matters of interest that have been dealt with are—"Insect Anatomy," Dr. Gerard Smith; "Easter Camp-out," E. A. Elliott; "Parasite of Blow-fly," H. M. Nichols; "Bird Photography," Clive Lord.

Botany, geology, and ornithology have been the branches of study followed up at the excursions held under leaders, besides which several general excursions have been held. Dr. Noetling, Messrs. L. Rodway, A. E. Brent, A. M. Lea, and J. Wardman have been the chief leaders.

An excellent publication has been issued on the trees and shrubs of our forests belonging to the order Myrtaceae. It is by L. Rodway, Government Botanist, has 22 full page illustrations, and will be of great value. A copy is given free to each member.

Our most important step has been the

bringing out of a journal entitled the "Tasmanian Naturalist," vol. 1, No. 1 of which appeared in April; the second is published with this report, and No. 3 will be printed at the end of the year. After then, we hope it will be issued at regular intervals of not more than three months. The publication of a journal has brought our club into proper recognition as a scientific body. On the mainland, the Victorian, Geelong, and New South Wales Naturalists' Clubs issue journals, which are received in exchange.

We tender our full appreciation of the generous help given by the Press—the "Mercury" for publishing reports of meetings and excursions, and the "Weekly Courier" for assistance with the journal.

The balance-sheet shows that we have passed the third session satisfactorily. The item "printing" does not cover the cost of the book on "Myrtaceae," and only the first number of the journal, and though this item will be so largely increased during the approaching session, your committee feels assured that generous response will be made in order to further the progress of the club.

Statement of Receipts and Expenditure for Year Ending 30th September, 1907.

Receipts.	£ s. d.
Balance from 1905-6	0 11 1
Sale of Tickets A.O.U. Lecture.	0 15 0
Motor Launch Trips	2 7 0
Subscriptions	15 7 6
Donations Printing Fund	1 10 0
Surplus Easter Camp-out	0 2 7
	£20 13 2

Expenditure.	£ s. d.
Advertisements	2 10 0
Rent of Hall	3 12 3
Charter Motor Launch	2 17 0
Cartage, etc.	0 8 0
Printing	7 9 0
Purchase Camp Utensils	0 7 6
Postage	2 6 3
Stationery	0 9 6
Notes of Camp-out	0 7 0
Balance in hand	0 6 8
	£20 13 2

Audited and found correct,

(Signed)

ARTHUR M. LEA.
R. A. BLACK.