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Notornis

In continuation of New Zealand Bird Notes.

Bulletin of the Ornithological Society of New Zealand.
Published Quarterly.

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CONTENTS.

ANNUAL MEETING—In accordance with the society's constitution, notice is given that nominations of officers of the society for the ensuing financial year are to be in the hands of the secretary not later than April 14. Such nominations must be in writing, be signed by two members, and be accompanied by the written consent of the nominee. Where no nomination is received for any office, the retiring officer is deemed to be re-nominated. The retiring officers, listed above, are eligible for re-election. Notice of business to be discussed at the annual meeting must also be in the hands of the secretary by April 14. The meeting will be held this year in Christchurch on the evening of Friday, May 16, and a notice calling the meeting will be posted later.

MEETINGS IN MASTERTON.—Masterton and district members, at a meeting held at Wairarapa College on September 28, 1951, saw a fine series of films of sub-antarctic bird-life, shown by the president, Mr. E. G. Turbott. There was a large attendance and supper was served. On August 4, about 20 members visited a large starling roost near Masterton. At that date it was estimated that there were about 80,000 birds in the roost.

RINGING.—Members are requested to complete their ringing schedules and return them immediately to the convener of the Ringing Committee, Mr. J. M. Cunningham. All rings used up to March 31 should be shown, together with all "repeats" and "recoveries."

NOTORNIS IN MARCH, 1951.

A REPORT OF THE SIXTH EXPEDITION.

By G. R. Williams (N.Z. Wildlife Service).

Between the dates of 13th and 19th March, 1951, a sixth party of observers comprising F. L. Newcombe, F. Woodrow and C. E. McIvor and the writer carried out a reconnaissance in that part of the Murchison Range in the Fiordland National Park that is the only known habitat of the takahe **(Notornis hochstetteri)**. One of the party, F. Woodrow, had spent a great deal of time in the area snaring deer and trapping possible predators between early November, 1950, and the initial date of this expedition. He had also reconnoitred new country, finding further small colonies of takahe to the south and west. The principal objects of our visit were three-fold:—

(i) To assess the results of the 1950-51 breeding season;

(ii) To add further to our knowledge of the general behaviour of the birds by making a visit at a time at which there had been no previous study;

(iii) To make a census which would include those areas where more takahe were recently found.

This paper is a record of the pooled observations of the members of the party.

The results obtained, together with those from earlier parties (Falla 1949, 1951; Fleming, 1951; Miers, 1950; Turbott, 1951; Williams, 1950) furnish a record that covers the year except for that part between mid-autumn and late winter. Most of these authors have described the habitat in some detail but so far no mention has been made of rainfall which is probably at least 100 inches annually.

RESULTS OF THE 1950-51 BREEDING SEASON.

The last few months of 1950 and the first three months of 1951 were unusually dry and mild in the South Island and the autumn was notable not only for the low levels to which all the lakes fell (that in Takahe Valley was approximately one foot below the February, 1950, level) but also for the heavy crops borne by the berry-producing native shrubs. It is quite possible that this mild season had its effect on the outcome of the breeding season of **Notornis**. Hatching of chicks had occurred as early as the end of October or the beginning of November, for that member of our party on duty in the area in mid-November saw a chick at that time being fed by the parents. By March, a total of five different chicks had been recorded at one time or another and there was evidence in the way of fairly recent chick droppings that two more had been hatched. In February, 1950, only one chick was known to be surviving in an area where three were found in this following season. The five definitely recorded chicks were distributed as follows: Two in Takahe Valley, two in the Point Burn and one in the so-called Mystery Burn which saddles with the south-western side of the Point Burn. The two chicks whose existence was supported by only circumstantial evidence were located, one in a corrie on the Point Burn side of the ridge between that valley and the Mystery Burn, and the other on the southern side of the head of Takahe Valley. It will be convenient when describing the whereabouts of the chicks in the two main valleys to refer to Fleming's map of the area given on page 117 of Notornis 4 (5), July, 1951. In Takahe Valley pairs A and C (the latter probably the same as pair J) hatched a chick each; and in the Point Burn, pair G had a well-grown youngster, and yet another was accompanying a pair which might be called "L" found occupying ground at over 3,000 feet a.s.l. at the north-western head of the Point Burn. Evidence will be offered later which suggests strongly that pairs A and C are the same as those known to have hatched and at least partially-raised chicks in the 1949-50 season. Pair A presumably raised a chick in the 1948-49 season also (Falla 1949). Pair D, who were known to have hatched a chick in early

December, 1949, were not seen to have done so this year. However, one of this pair was reported on January 11th, 1951, to still be sitting on an empty nest which it had occupied for at least 36 days. To the quota of addled and infertile eggs listed by Falla (loc. cit) may be added yet another found by F. Woodrow in the Ettrick Burn. Its dimensions were 7.32cm. x 4.94cm.

THE MOULT.

At the time of this survey the adult post-nuptial moult was virtually over as only a few shed feathers were found and the adult birds were in magnificent plumage. In early February of the previous year the moult was in full progress and numbers of dropped feathers were found in the moulting places which were usually situated beneath shrubs. From observations made by me on previous visits and from reports already published (Falla, 1949) it appears that the post-nuptial moult begins about the latter part of January and continues until about the beginning of March. As for the chicks, they have shed most of their down at about eight weeks of age and have assumed in its place a first teleoptyle plumage similar to that of the adult . (Fleming, loc. cit.) The time at which this change occurs has been calculated from observations made on the live downy chick, then less than six weeks of age belonging to pair A that was seen by the party in February, 1950, and from the appearance of the dead chick found at the same time which had almost certainly been seen alive in mid-December and so was approximately eight to ten weeks old During our stay only one young bird was seen at close quarters—it belonged to pair G and was about three-quarters of the adult size. This is larger than any chick previously observed and it is assumed therefore that the age in this case was somewhere between three and four months. The untidy plumage of the head, neck and dorsal surface appeared, in the short glimpses that were had of it, to be a very dark brown with paler mottling and the colour of the bill was still the dull slatey grey of the fledgling stage but without any white at the tip. Falla, in a personal communication, has recalled that some first teleoptyle plumages lose their bright colours rather rapidly and Fleming has remarked (loc. cit.) that the down of adolescent rails soon fades. In the pukeko **(Porphyrio poliocephalus)** to which the takahe is closely allied (Mayr 1949) the appearance of the downy chick is very similar indeed to that of **Notornis** and incipient quills faintly blue in colour appear six weeks after hatching. Between the eighth and twelfth week tail feathers become well-developed but the frontal shield and legs are at this time still only tinged with red. At about fourteen weeks the assumption of adult plumage is almost complete (Guthrie-Smith, 1927).

BEHAVIOUR OF THE CHICK.

Observations were confined to the young bird belonging to pair G, as the other two seen (that belonging to pair L and the one in the Mystery Burn) were so wary and shy as to make any useful observation impossible. Pair G's chick was shy also but fortunately was more suitably placed for careful stalking. Although the birds of pair A were observed many times at close range during the course of our visit, the well-grown December-hatched chick that, from time to time, was seen to be regularly in their company until the end of February was now no longer with them and so in the absence of any evidence to the contrary is presumed to have left them permanently. It was last seen during the first week of March feeding independently of the parents and was then extremely shy. Pair C (or J) and their youngster were last reported together in late December. The party was unable to find them on their territory although fresh feeding signs and droppings were present. When undisturbed, pair G's chick was always found in company with its parents and on one occasion was observed between them moving at a good walking pace through the beech forest and keeping up a continuous hoarse whistle (a bass version of the juvenile "cheep") which was frequently answered by a soft "klowp" from one or both of the closely-

attendant adults. On catching sight of the observer all broke into a very fast run and made off in different directions, the young bird moving with great speed, its head held so low that no part of the body was visible above the tussocks of the snow grasses. After being separated from the parents for a short time it uttered what was perhaps a distress cry or an attempt to make the adult assembly call. This was a peculiar harsh and jangling medley of sounds difficult to describe and unlike any call yet heard from an adult. Observations made at a slightly earlier date on the chick belonging to pair A have indicated that about this age the young bird is quite able to feed itself without any assistance from the parents.

ADULT BEHAVIOUR.

Feeding.—The following plants are now known to be used as food, the list being compiled from a collection of those species that the birds have actually been seen to be eating or those showing the typical feeding signs of fallen shoots with cleanly-nipped leaf bases. Analysis of the droppings has not proceeded very far because of the difficult and time-consuming nature of the work.

Family.	Species.	Parts Eaten
Gramineae	**Agrostis dyeri**	Seeds
	Danthonia crassiuscula	Leaf bases
	„ **flavescens**	Seeds and leaf bases
	„ **rigida**	Leaf bases
	„ **setifolia**	Leaf bases
	„ **teretifolia**	Leaf bases
	Festuca matthewsii	Seeds
	Hierochloe alpina	Seeds
	Poa colensoi	Seeds and leaf bases
Cyperaceae	**Carex testacea**	Leaf bases
Violaceae	**Viola filicaulis**	Leaves
Umbelliferae	**Aciphylla cuthbertiana**	Leaf bases
Compositae	**Celmisia petriei**	Leaf bases
	„ **verbascifolia**	Leaf bases

Most of these items, except, of course, the seeds, seem to be eaten all the year round, but the **Danthonias** make up by far the bulk of the food. When available, the seeds of **Festuca matthewsii** are taken in great quantity. It is not claimed that the list is exhaustive, for in winter at least there is evidence that the diet includes other material—some change being made necessary because of occasional heavy snowfalls covering up the usual foodstuffs. The insectivorous habit of the fledgling has already been the subject of some discussion by Gurr (1951).

OCCUPATION OF TERRITORY.

This was still a well-marked feature of the behaviour of paired birds and it would be as well here to list those grounds upon which evidence for it is based:—

(i) The Occurrence of Droppings: These are generally long-lasting, perhaps remaining for years in dry sheltered positions although likely to be destroyed by heavy rain when fresh; and the distinction between fresh, recent and old droppings is easily and readily made—being indicated in the recent and old by the degree of bleaching and the shrinkage of the components. It is noticeable that fresh and recent droppings are usually found in well-defined areas separated by expanses where only a few old droppings exist.

(ii) Feeding Signs: Once again classification into age classes is possible. The limits of these cannot be defined as clearly as those of the droppings but there is close accordance in the distribution of corresponding age classes of droppings and feeding relics.

(iii) Calling and Sight Records: These are most frequent in the vicinity of those places where they have been reported on previous visits

and are separated by areas where the birds are rarely seen or heard even though the habitat seems suitable.

(iv.) Distribution of Nests: New and old nests have been found concentrated in much the same places for three seasons now.

(v.) The Movements of "labelled" Pairs: By studying pairs accompanied by a chick—pair A in the 1949-50 season and pair G in the 1950-51 season—it has been possible to get a clear picture of the territory each family was occupying.

(vi.) Fighting: Disputes over what were apparently territorial infringements have been seen by a number of observers during the spring and early summer months (e.g. Falla 1949).

All the criteria mentioned above show an excellent degree of correspondence in the areas in which they occur. However, the fact that droppings and feeding signs can be found linking the areas of concentration indicates that more extensive movements do occur and there is evidence that these are commonest in winter and early spring when food is in shorter supply and has to be sought more actively. Unmated birds, too, would be expected to show a greater tendency to wander than mated pairs.

Territorial behaviour so constant in its manifestation (c.f. Cramp's comments (1947) on territory in the coot, **Fulica a. atra)** indicates that the pair bond once formed is of long duration and that the life span of a bird is at least of the order of the total period the species has been under observation to date—that is, about three years. This is not unlikely for a bird the size of a takahe. To what extent a very low replacement rate in the number of chicks successfully hatched and raised yearly is offset by a correspondingly long expectation of life will not be known until more has been discovered about the population trends. This must await the institution of a banding programme which will, at the same time, supply important and reliable information on territory and general behaviour.

Fleming (loc. cit.) has discussed in an interesting fashion the functional morphology of **Notornis** and has compared it with that of **Porphyrio,** drawing attention to Mayr's remarks already cited on the systematic affinities of the two genera. In behaviour, too, there are points of resemblance although there is surprisingly little of real value in the literature concerning the behaviour of **Porphyrio** in detail and, of course, there has been little chance yet to study **Notornis** intensively. But for those who are interested there is much that is suggestive to be gleaned from a reading of the papers of Berney (1907) and Mathews (1911) and the book of Guthrie-Smith (1927) already quoted in reference to the moult. Further, it is well-known that in the **Rallidae** both sexes very frequently share the task of incubation and this is so with the pukeko. So far, it seems to have been generally assumed that only the female attends to this task in the case of the takahe. Since there are no obvious secondary sex characteristics in this species except, perhaps, the rather unreliable one of size to allow for discrimination, the possibility should be entertained that the male and female both take part in this activity.

THE CENSUS.

The party covered as much as possible of the known range of the takahe and in this it was greatly assisted by the more extensive and solo explorations made earlier in the year by F. Woodrow. It was in the course of this work that he found the small colonies further to the south and west just beyond the limits of the previously known range.

Using Falla's (1951) enumeration of pairs as a basis we may summarise the position as we found it in March, 1951, as follows:—

Pair A.—Still on territory. Had a well-grown chick last seen at the end of February.

Pair B.—Not seen, but as was the case in the previous year, their existence is presumed from fresh feeding signs and remains of recent nests. The territory of this pair is on the open tops bounding the northern side of Takahe Valley and is well-separated from the valley itself by steep slopes and limestone bluffs.

Pair C.—Presumed by us to be the same as pair J. Seen last with a chick in late December. None of these birds were seen during this expedition, but the presence of at least one bird is suggested by the occurrence within the bounds of their territory of fresh droppings and feeding signs. The **Danthonia** grasses grow particularly luxuriantly hereabouts and afford excellent and ample cover.

Pair D.—Apparently not breeding this year. Hatched a chick last year which later died.

Pair E.—No nest found. Two addled eggs laid last year.

Pair F.—In an unpublished report Miers records this pair as near the head of Takahe Valley. Its existence was stated to be doubtful by Falla (1951). The party found two pairs in the vicinity of the valley head—seeing one pair whilst hearing a second pair call. One I will call F, the other K.

Pair G.—Seen with a well-grown chick. Had one egg in the previous season, the fate of which is unknown.

Pair H.—Reported by Miers to be above the forest line on the southern side of the Point Burn. This record is based on the hearing of a call. Falla reports it as doubtful, with which opinion we agree.

Pair J.—I feel that the evidence for two pairs, one on either side of the stream running into the head of the lake, is not satisfactory. The two suggested territories are very close together and do not show any clear separation, and the supposed two pairs have not yet been seen or heard under conditions that make their separate existence seem reasonably certain.

Pair K.—A new record. On the northern side of the cirque at the very head of Takahe Valley. This pair was further to the west and higher up than pair F which was also on the northern side of the valley at this time.

Pair L.—A new record. Occupies the cirque at the north-western end of the Point Burn. One chick was also present. This territory is perhaps two miles from that of pair G which had been seen earlier in the day.

Pair M.—Suggested by very fresh signs found in a hanging valley high above the northern side of Takahe Valley. This territory is directly above but some distance from (perhaps half a mile) the nearest known part of pair D's territory. It is possible, therefore, that pairs D and M may be one and the same.

Single Birds.—One seen on the Point Burn Flat in or near pair G's territory. Pair G was seen and heard by two observers almost immediately afterwards about half a mile away, so there is no possibility of confusion here. Long observation of this bird afforded no evidence that it was paired. A further single bird was seen in January in the corrie referred to previously on the ridge between the Point Burn and Mystery Burn and what was possibly another single bird was reported to be heard calling from the southern side of Takahe Valley near its head on the occasion when pair K was under observation.

Thus, in Takahe Valley, we now know fairly definitely of seven pairs (A, B, C, D, E. F, K) and two chicks, with the possibility of one other pair (M) and one solitary adult. In the Point Burn we know of two pairs (G and L), two chicks and two single birds—a total population

for the main area at the approximate time of our visit of between 23 and 27.

From F. Woodrow's previous work in the explored portions of valleys to the south and west of the Mystery Burn and the Ettrick Burn there is evidence of one pair and one chick, with two single birds in the Mystery Burn and one single bird in the Ettrick Burn. The known total for the at-present explored range of this species lay, then, at this time, somewhere between 30 and 35 individuals. It is worth noting at this point that nowhere within the entire known range has the species been seen (or signs of its presence found) below an altitude of 2000 feet. In this, the four specimens taken last century are notable exceptions.

DEER AND TAKAHE.

Apart from the danger that may exist during the birds' breeding season of deer treading on nest or chicks, there is perhaps a greater danger of increased or even uncontrolled deer herds so altering the environment in the sub-alpine meadows where the birds feed for most of the year and make their nests, that food and cover will eventually be greatly diminished. Already in the northern basin that forms part of the great amphitheatre at the head of the Point Burn there is evidence that the presence of deer is accelerating the normal processes of erosion, for on the tops of the ridges (here about 4,500 feet high) that separate this valley from the southern branch of the Ettrick Burn, deer trails are common; the bare earth is exposed, and steep and narrow scree slopes mar the otherwise smooth curves of the snowgrass-covered walls of the cirque that encloses this end of the valley. Lower down on the boggy glacial benches there are places where the thick covering of the various grasses and herbs has been totally destroyed over many square yards and turned into muddy deer wallows. Deer feed on species of **Danthonia** that the takahe have been shown to depend upon in large part for food and nesting cover and on species at least closely related to those other alpine grasses whose seeds form what is probably a most important part of the birds' diet in late summer and autumn. At present, fortunately, the deer population is not high and is denser in those valleys to the south and west of the main colony, possibly because the other valleys are at a lower altitude. For instance, in the Point Burn (which is about 2500 feet above sea level and 500 feet below Takahe Valley) deer trails are common in the beech forest and fresh droppings are frequent throughout; whereas in Takahe Valley such sign is much less abundant.

Although predator control is generally considered to be an inefficient method of protection of a prey species it is felt to be specially justified in this case as the most dangerous potential predator—the stoat—is quite foreign to the original environment, so adaptation to its presence has not been developed through natural selection, and a tribute must be paid to F. Woodrow for his long and conscientious work, which in addition to ensuring the safety of the birds, has added much to our knowledge. The following is a list of the animals destroyed within the range of the takahe since its rediscovery in 1948. (Numbers are approximate only):—

Red deer **(Cervus elaphus)**	38
Stoats **(Mustela erminea)**	19
Australian opossums **(Trichosurus vulpecula)**	54

OTHER BIRDS.

A total of 19 native and four exotic species were seen or heard during the time of our party's stay. A new record for this part of the Murchison Range was that of a pair of rock wrens **(Xenicus gilviventris)** seen among shrubs on a talus slope at the head of the Point Burn at an altitude of about 3500 feet. The redpolls, chaffinches, goldfinches and yellowhammers reported from Takahe Valley on most of the previous visits, including that of late winter in August, 1949, were on this occasion conspicuously absent.

ACKNOWLEDGMENTS.

Acknowledgment is made to Mr. F. Newcombe for field notes and the contribution of certain facts unknown to the writer; to Mr. F. Woodrow, for information and for his energy and enthusiasm which contributed much to the success of the expedition; to Mr. C. E. McIvor, for continued assistance; and to Messrs. V. Zotov and B. Hamblin, of the Botany Division, D.S.I.R., for advice in the identification of food plants.

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HUDSONIAN GODWIT AT RUAKAKA.—On 12/12/51, Messrs. R. N. Buttle, S. C. Rutherfurd, V. M. Rutherfurd, T. J. Short and I were fortunate in finding a Hudsonian godwit **(Limosa l. haemastica)** at Ruakaka, and in being able to watch it at leisure. A solitary godwit which was intently feeding within a chain of the footbridge which crosses the Ruakaka Stream to the A.A. camp, was noticed to have a black tail and when it raised a wing, a white rump. Fearless to the point of absurdity as I walked it up, it ran about ten yards ahead and, to make it fly in order that its diagnostic pattern (v. N.Z.B.N. 3, 199) might be seen by my companions who were watching from the bridge, I was forced to hustle it. Even then it alighted almost immediately. On the two occasions when I put it up, it uttered a sharp but not far-carrying double-note "kit-kcet," quite distinct from the noisier and more tuneful "kew-kew" of the common N.Z. godwit **(L. lapponica baueri)**. I was glad to hear this call as I have not been able to record any note from the four Hudsonian godwits which I have seen before, all of which have been in flocks of other waders. Before we left, a fairy tern **(S. nereis)** flew up the estuary and hovered not far from the Hudsonian godwit, so that these two rare N.Z. birds could be seen at once. We revisited the estuary on 20/12/51 and the tide being at the same low level, found presumably the same two rare birds again feeding within a few yards of one another. It is to be hoped that the Hudsonian godwit did not suffer for its fearless or foolish indifference to man, as the estuary becomes a bedlam of campers over Christmas. This is not the first record of the Hudsonian godwit for the east coast of Northland. Messrs. C. A. Fleming and S. D. Potter and I saw one at Mangawai, 16 miles to the south, on 24/11/40. (Emu 43, 136).—R. B. Sibson, Auckland.

SOME FOOD OF THE NORTH ISLAND KIWI.

(APTERYX AUSTRALIS.)

By L. Gurr, Nelson.

In spite of the extensive literature on the kiwis, Buller (1888) appears to be the only writer to record in any detail the food of these birds. The stomach contents of two birds, both females, taken during a collecting trip in the Pirongia Ranges in October, 1882, were examined and found to contain the following:—

Three wetas **(Dienacrida)**, ten huhu grubs **(Prionoplus)** mostly of large size, and a small brown beetle **(Coptomma)**, several earthworms and a large earthworm egg-cocoon. Some berries of the maire **(Olea spp.)** and of taiko **(Fusanus cunninghamii)**. The second bird contained a number of insect remains (not identified), some minute land snails and a large number of the hard kernels of taiko berries, these Buller suggested the kiwi swallowed in lieu of quartz pebbles for triturating the food. In the stomach of another which he opened afterwards, he found a number of angular pieces of pebble; others contained the hard kernels of pohaka **(Elaeocarpus hookerianus)**, miro **(Podocarpus ferrugineus)**, maire, and hinau **(Elaeocarpus dentatus)**.

In view of the dearth of specific statements in the literature and the erroneous, but popular idea that kiwis live almost entirely on earthworms, it seems worth while to record in detail the stomach contents of a kiwi submitted to me for examination.

The bird, a female, which was knocked down and killed by a car on the Waihi Beach Road, 4 miles from Waihi, had been sent to the Auckland Zoological Park and it is through the courtesy of the Director, Mr. R. W. Roach, that I received the stomach contents.

They are as follows:—

Twenty-three stones ranging in size from 2.0 x 1.7 mm. to 12.2 x 11.0 mm. Most of them showed signs of considerable erosion, several igneous ones being differentially eroded, leaving a very efficient grinding surface.

ANIMAL REMAINS.

Crustacea—

Isopoda—

Oniscidae (woodlice), 2, 1 entire 1 fragmentary.

Myriapoda—

Chilopoda (centipedes), 5; 3 **Cormocephalis rubriceps**; **Paralamyctes validus** 2; all entire.

Diplopoda (millipedes), 4; 1sp., 1 entire, 3 fragmentary.

Insecta—

Orthoptera (weta), 1, fragment of prothorax.

Lepidoptera (moths), 2, 1 larva, fragment of skin; 1 pupa, entire.

Hemiptera (cicada), 1, larva, forelegs only.

Coleoptera (beetles)—

Carabidae (ground beetles) 5, 3 spp., 3 entire, 2 fragmentary.

Curculionidae (weevils) 5, 2 spp, Elytra only.

Scarabaeidae (chafers) 1, 1 sp Elytra only.

Arachnida—

Opiliones (harvestmen) 2, 2spp. pro. and opisthosoma's only.

Araneida (spiders) 2 Araneomorphae (web spinners) fragments. 1 Mygalomorphae (trap-door spiders) fragment.

VEGETABLE REMAINS.

For the identification of these I am indebted to Miss Ruth Mason, of the Botany Division of the Dept. of Scientific and Industrial Research.

Eparidaceae (the Australian heath family).

Leucopogon fasciculatus (tall mingi-mingi): 3 leaves.

Cyathodes acerosa (pungent mingi-mingi): 2 leaves.

Myrtaceae (myrtle family)—

Leptospermum sp (manuka): 2 leaves.

Loganiaceae—

Geniostoma ligustrifolium (hangehange): 2 valves of capsule.

As well as the above, two lumps of material that appear to be the *endosperm of a seed.*

In addition to the above, I have been able to examine the insect parts only from some kiwi droppings. These had been preserved and kept at the Entomology Research Station, Cawthron Institute, Nelson. They were collected in September, 1949, by Mr. E. Rye, in the Tangahua Ranges, North Auckland. They were as follow:—

Myriapoda—

Chilopoda (centipedes): Head and several segments of the body.

Insecta—

Coleoptera (beetles)—

Carabidae (ground beetles): Fragment of an adult.

Elateridae (click beetles): 1 sp. 2 larvae, entire.

Scarabaeidae (chafers): 1sp. 9 larvae, 1 entire, the rest, head capsules only; 1 sp. 1 adult, fragmentary.

Hymenoptera (ants, bees, wasps, etc.)—

Formiciodae (ants): 1 adult, entire.

Arachnida—

Araneida (spiders): 1 palp only.

It appears, therefore, from the foregoing, that the kiwi's range of *animal food is wide both in variety and size and the nature of the* vegetable remains suggest that the kiwi could serve as a dispersal agent for seeds.

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BREEDING OF THE GREY DUCK AT MOA POINT.—On October 25, 1951, while in search of some material for a museum exhibit, I came upon a grey duck **(Anas superciliosa** Gmelin) with seven ducklings. The latter were in down, and, but a few days old. The birds were ashore, a few yards from the water's edge, and on my approach the parent bird made for the sea and the young followed. The ducklings kept close to the parent and she led them away between the rocks. At one time a black-backed gull **(Larus dominicanus** Lichstenstein) came overhead, and, for a moment, it looked as if the gull intended to swoop down upon them. The duck "gathered" her young under an overhanging ledge of rock while she remained on the outside. After a while the gull flew off. The ducks finally disappeared among the rocks. On referring the matter to Mr. R. K. Dell and Mr. J. Moreland, they informed me that they came upon a nest with eggs not far from the point where I made this observation, the previous season, at about the same time of the year. The nest was hidden under some taupata **(Coprosma repens** Rich.). Incidentally, it might be of interest to add that I found two ducklings, in down, washed up on the beach at Pukerua Bay in September of 1948. From these records it would appear that the grey duck does occasionally breed along the coast within reach of the sea.—C. McCann, Dominion Museum.

MEETING OF DUNEDIN MEMBERS.—On October 1, 1951, a well-attended meeting of Dunedin members and friends was held in the Biology Lecture Room at the Otago Museum. Professor B. J. Marples occupied the chair, and the local regional organiser spoke briefly on the need for members to be active recorders, and suggested ways and methods of activity. Recordings of bird-songs, some of native birds recorded in Dunedin, and some of introduced birds, were heard, and films of bird-life shown.

RANDOM NOTES ON THE KIWI.

By J. D. Clark, Opotiki.

On Thursday, June 23, 1949, an injured kiwi caught on the night of June 21, in an opossum trap on Mr. E. Pratt's property, about ten miles up the Waioeka Gorge, from Opotiki, was brought to me. Its right leg was badly broken just above the foot. On the following day, Dr. Armstrong dressed the wound and reduced the compound fracture of the foot, which was placed in splints. Considerable difficulty was experienced in getting the bird to swallow worms, a feat which was achieved only by placing them at the back of the tongue with a pair of tweezers. On June 25 a tin of worms covered with earth, and a tin of water were placed in the box with the kiwi. By 10 a.m. the next day the kiwi had eaten all the worms in the tin and pushed off the lid of its box and escaped, to be found an hour later in a dark corner under old timber and boxes. The kiwi slept with its bill under its rudimentary left wing.

On July 11, the dressing was taken off the foot, which had gone gangrenous. I amputated the foot and dressed the stump, and in subsequent days further dead tissue and pieces of bone were removed either by Dr. Armstrong or myself. By the time the bird left for the Auckland Zoo, the foot had healed. The kiwi showed fight when a dog came near by raising the feathers on its back, similar to a cat raising its hair. The bird then raised its head and made a vigorous forward kick with its good foot at the dog, at the same time hissing. The kiwi, under the name of "David," left for the Auckland Zoo on August 20, 1949.

Inquiries were made as to the presence of the kiwi in the district. Thirty-five were reported and of these 28 were checked on for details of trapping or finding, these being distributed as follows: Waimana, 4; Waioeka Gorge area, 9; Woodlands, 13; coast, 1; Kutarere, 1. Waioeka and Woodlands are adjoining areas, separated from the Waimana area by the Waiotahi Valley, from where I can get no reports of the kiwi.

The locality where "David" was caught in the Waioeka Gorge was about 2000 feet high. In three seasons (1947, 1948, 1949) six had been caught near the same place. Some had only the centre toe injured, others their legs broken. The birds were liberated. All were caught in high beech country on rough, stormy nights.

A farmer further up the Waioeka Gorge showed me a range opposite his cowshed where some kiwis have been for about the last four years. They call more frequently on dull or wet evenings. The ridge is a good place for wild pigs. On account of the kiwis being there the farmer endeavours to keep all pig hunters off the area so as not to disturb the birds.

In the high country at Woodlands, a farmer who is a keen observer of nature, states there are plenty of kiwis in the bush there. A trapper who operated there in 1942 and 1943 caught four each year. Some were killed and others injured were liberated again. Other kiwis have been caught in the farmer's traps. One, a very large bird, fiercely attacked him when he tried to liberate it and with its bill and claws injured his hand so severely that he still carries the scars. After the bird was liberated it followed him for some distance, showing fight before it took cover. He says kiwis make scratchings among fallen leaves much deeper than those of the domestic fowl.

In the middle of August, 1949, a nest containing two eggs was found at Waimana by a farmer's daughter. The nest was in a hole about a foot deep, at the bottom of a bank on the edge of the bush. The kiwi was almost invisible when sitting on the nest which was under a punga trunk lying among ferns. The nest was well concealed and there was another hole about two yards away as if the bird had changed the site of the nest, or perhaps had used the second nest the previous year.

TEREK SANDPIPER AT MIRANDA.

By H. R. McKenzie, Clevedon.

The appearance of a Terek sandpiper **(Xenus cinereus)** at Miranda on 22/11/51 is the first recorded occurrence for New Zealand. I was scanning some small waders when I saw a sandpiper flying with some wrybill **(Anarhynchus frontalis)**. The party settled on the mud near the tide line and I immediately focussed with my binoculars to ascertain the species of the odd bird. At once I saw the bright orange legs and then the long dark upturned bill. R. B. Sibson has long maintained that we should see in New Zealand any migrant birds which visit Australia. Acting upon this theory I have studied the descriptions of such birds so had no trouble in recognising this one, which has such distinctive features.

Further observations were made as follow:—1/1/52, D. A. Urquhart; 2/1/52, R. B. Sibson and H. T. Revell; 4/1/52, C. A. Fleming, W. P. Mead, D. Mead and H.R.McK.; 6/1/52, Miss N. Macdonald and H.R.McK. It was not found on January 13, 19 and 20, but was located on March 1, three miles south-east along the coast, resting in a cultivated paddock with a flock of c. 900 wrybill. It rose, calling, at some distance, and flew right away.

The orange legs and feet and long, dark upturned bill have already been mentioned. The base of the bill was yellowish; head all grey; no definite eye-stripe; large rounded grey patch covering side of neck, shoulder and upper side of breast; the narrow space across the breast between the patches very light grey; white under; pronounced white hind edge of wing in flight. This description, compared with Witherby ("The Handbook of British Birds"), indicates that this bird was not fully mature.

Its actions on the ground were quick, very much like sanderling, as it fed on the mud among scattered wrybill and banded dotterel. It appeared to feed by quick dabs and was once seen to take a small crab which it apparently swallowed after shaking off the legs. The bill was held horizontally when the bird was standing or running. R.B.S. was reminded of the common sandpiper when it tilted or bobbed the after part of its body and also when it quivered its wings.

In flight it was quick and graceful, resembling Geoffroy's sand plover **(Charadrius leschenaulti)**. When chased persistently in the air by a red-billed gull it evaded the attacks with ease.

A variety of calls was heard, all during flight, and this was found to be the best indication of the presence of the bird. R.B.S. described a pleasant musical trill "weeta-weeta-weet," which corresponds well with the descriptin of Miss N. Macdonald and H.R.McK., "weet weet" and "weet wt wt." C.A.F., W.P.M., D.M., and H.R.McK. heard mostly a three-note call after the style of whimbrel or wandering tattler, but the third note was not so full, clear, sharp and musical. Sometimes a whistled ripple of about six notes run together was used.

The species is said by Witherby to be quiet, but D. A. Urquhart, on 1/1/52, using a telephoto lens, could only secure rather distant photographs, while on 6/1/52 Miss N. Macdonald, using a similar lens, was unable to get within range, the bird being quite wild and shy.

According to Witherby the Terek sandpiper breeds from Finland across to Siberia and winters from N.E. Africa across to India and down to the Malay Archipelago and Australia. It is extremely rare in Australia so it is fortunate to have an occurrence in New Zealand.

NEST RECORDS AND BEACH PATROLS.—Members are asked to complete these cards and forward them as soon as possible to the organisers of these schemes. Nest records should be sent to Mr. J. King, Box 448, Masterton, and beach patrol cards to Mr. J. M. Cunningham.

BROWN BOOBY IN THE HAURAKI GULF.

By P. A. S. Stein, Auckland.

When we were completing the ringing of the gannet this season on Horuhoru, north of Waiheke, on March 8, 1952, we were astonished to find in a small group of twelve full-grown chicks, a large brown bird with a blue beak. In general outline it was very like a gannet. The body was nearly as big as a gannet's, but the bird carried itself with the legs sloping further back, so that the gannets in the group appeared to be about an inch taller than it was.

The bird had obviously settled down temporarily with the others and allowed us to approach within thirty feet. We sketched and noted details for about ten minutes. The most startling aspect was the shining bluish horn-colour of the beak, at the base of which a narrow white band stretched across from eye to eye. This might be bare skin, but it protruded slightly above the eyes as if it were of feathers. Above this a rich brown cap stretched to the top of the neck. Under the beak was a lighter area which stretched back and upwards towards the cap. Right round the neck and extending well down on to the breast was a broad band of bright chestnut, in which the feathers fluffed out so far that the bird seemed to have a ruff. The wings and back were a shining chocolate. The abdomen was a lighter brown anteriorly, and still lighter between the legs. Here the brown was that delicate shade seen under a mushroom after the first pink tint has gone. The legs were sturdier than those of a gannet, and had bright orange-yellow feet.

The bird was identified as a brown booby **(Sula leucogaster)**, and later our drawings and notes were compared with museum specimens by Mr. E. G. Turbott at the Auckland Museum. It flew off as an adult gannet approached. Wheeling in behind the gannet, the booby followed, turning and swooping close behind the other bird. For twenty minutes they came and went, each time passing so close above our heads that we could see that the stranger had a feather missing from his right wing. The birds were within four feet of each other, so that we could easily compare their wing-span. The gannet, with a wingspread of seventy inches was about four inches wider than the booby. Three interesting differences between the two species were noted. The under surface of the wings was an ivory colour edged with chocolate The coloured border was very regular in width, about an inch in front and three inches behind. This gave the remaining area the appearance of a pair of white wings spread out below a larger pair of brown ones. The feet were not carried concealed in the feathers as in the case of the gannet, but were in sight, and so far apart that they extended to the sides of the broadest part of the tail. Behind the feet, the tail narrowed, forming a wedge with a comparatively sharp point. The whole was much longer than the gannet's tail.

When we returned to Auckland and Mr. Turbott compared our notes with his specimens, it was evident that the bird we saw was in the wholly brown immature plumage. This is apparently the fourth brown booby recorded in New Zealand. We note that, for the past four weeks, we have had almost continual northerly winds in this area.

GIANT PETREL RECOVERY.—A giant petrel ringed as a fledgling, still in down, at North Point, Signy Island, South Orkneys, by the Falkland Island Dependency's scientific bureau on February 11, 1951, was found dead on the beach at Chaser Gorge, Dargaville, on September 14, 1951, by Mr. Percy Wright, of Urquhart's Bay. Its ring was marked SBL No. 63,526. By the shortest route, this is about 6,500 miles from where the bird was ringed. According to the Scientific Bureau most of the giant petrel chicks leave their nests where this bird was ringed in early May.—D. R. Purser, Whangarei.

A NORTH ISLAND COLONY OF SPOTTED SHAGS.—In N.Z. Bird Notes, Vol. 2, p. 40, mention is made of a colony of spotted shags **(Sticto carbo punctatus)** at the "south head of Kaawa Creek," some miles south of Port Waikato. The site of the colony is actually at Girdwood's Point, an impressively rugged headland lying between the Kaawa and Ohuka streams and exposed to the full force of the westerly gales. Through the kindness of Mr. K. M. Sorby, who has known the colony for many years, I was enabled on 19/10/51 to visit this rather inaccessible stretch of coast. The main shaggery is on what is locally and aptly called Cylinder Rock—the "inaccessible basalt stack" of N.Z.B.N., II., 40, which rises to a height of about 150 feet and is separated from the mainland cliffs by a narrow cleft. On the southern and south-eastern faces of this stack I counted respectively about 85 and 40 nests; and across the cleft on the mainland cliffs were about 40 more. On the top of Cylinder Rock there is some wind-torn scrub in which a few black shags **(P. carbo)** were sitting, though I was unable to see any nests. Seaward of Cylinder Rock is the Little Cylinder. There were no nests of spotted shags on this, but about 20 birds were resting on it. On the mainland cliffs a hundred yards or so to the south of the big colony, about 10 more pairs of spotted shags had their nests. Offshore there are two steep basalt pinnacles; but on neither of these did there appear to be any spotted shags breeding. About 40 shags were resting on the inner pinnacle. A considerable gale was blowing and even a spotted shag might have found it difficult to rest with comfort on the outer pinnacle. In this colony there must be at least 175 pairs of breeding birds, most of which had nests with eggs; but some were still building and one was seen flying with difficulty in the teeth of the wind carrying a large piece of seaweed. No nests were seen containing young. Most of the sixty birds which were resting on the Little Cylinder and inner pinnacle were young of the previous season. The only other known colony of spotted shags on the west coast of the North Island is fifty miles to the north, at Te Henga. Spotted shags also visit Oaia, the "gannet rock," which is visible from Te Henga and well out from the southern end of Muriwai Beach, but it is not known if they breed there. —R. B. Sibson, Auckland.

BIRD SONG RECORDS WANTED.—Mr. Noble Rollin, of the Bird Research Station, Glanton, Northumberland, asks for the co-operation of New Zealand bird watchers in assisting to time the passage of the first dawn singing of birds as it sweeps around the world with the dawn light. What is required is the exact time of the first call or song of one or more species in the morning and the exact time of the last call or song of one or more species in the evening. Particulars of locality, height above sea level, and weather conditions should be given. Records are to be taken on April 13 and September 21, 1952.—W. J. Noble, editor "The Evening Star," Dunedin.

GLOSSY IBIS IN WESTLAND.—Mr. Peter Lucas, of Hari Hari, South Westland, has forwarded a description, accompanied by a sketch, of a strange bird which appeared in September, 1951, on the property of Mrs. St. George. The identification of the bird as a glossy ibis **(Plegadis falcinellus)** was confirmed by Mr. E. G. Turbott, of the Auckland Museum, after reading the description and seeing the sketch. The bird frequented swampy drains and fed by wriggling its bill into the soft earth, sometimes up to its eyes, and extracting worms, grubs, etc.—E. L. Kehoe, Greymouth.

NEW MEMBERS.

Acres, Mrs. C. Laughton St., Taupo.
Barker, H. F., Box 25, Kaiapoi.
Clouston, W.F., 58 Louisa St., Invcargill
Coom, Mrs. J., Te Ore Ore, Masterton.
Dempster, A.G., 7 Wardlaw St., Dunedin
Evans, R. A., 25 Sullivan Av., Chch.
Ferdinand, Dr. L., Copenhagen, Dmrk.
Hart, A. J., 11 Benares St., Khandallah
Kimmel, Mrs. R. I., 154 Woburn Rd., Lower Hutt.
McDowall, R, 32 Worcester St. P.Nth.
Parlane. S. G., Dist. School, Mamaku.
Priest, D., District School, Bulls.
Smith, C., 44 Worksop Rd., Masterton.
Sorrell, C. C., 2 Priestley Tce., Napier
Todd, Miss L.R., Solway Coll., Maston.
Warburton, H. G., Ororu School, Kaitaia. R.D.
Williams, Miss D.N., Dept. of Maori Affairs, Gisborne.

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* Denotes illustration.

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