WINTER OBSERVATIONS ON NOTORNIS IN 1949.

By E. G. Turbott, Auckland Museum.

The party which I accompanied in August, 1949, was the second to carry out observations in the valleys inhabited by **Notornis**, following upon Dr. G. B. Orbell's original visits of discovery on 11th April and 20th November, 1948. The field investigation of **Notornis** began with a visit in January, 1949, by a party including Dr. R. A. Falla and Dr. Orbell, which surveyed habitat and nesting habits in some detail, and discovered the second **Notornis** colony in the valley of the Point Burn (Falla, 1949). (References are to selected bibliography at end.—Ed.)

Now a visit was planned to examine these valleys under the conditions characteristic of this high country in winter. The object was to record winter habits and distribution, and possibly pre-breeding behaviour in preparation for observations during the next nesting season. As described in Dr. Falla's account in this issue, these expeditions have been followed by three in the summer of 1949-50, so that during the two seasons since its rediscovery, a fairly comprehensive survey has been made of the behaviour and life history of **Notornis**.

Our party of three—K. H. Miers, Field Officer and G. R. Williams, Biologist of the Department of Internal Affairs, and the writer, climbed to Takahe Valley from the shore of Lake Te Anau on Monday, 22nd August. We spent seven days at the camp established in January, 1949, returning to Te Anau on Monday, 29th August.

Our stores and equipment were dropped by air at the end of the preceding week, when Mr. Miers with Mr. C. E. McIvor, officer of the Department of Internal Affairs at Te Anau, had made a preliminary visit, to which further reference is made below.

Before our departure word was also received through the Department's office in Queenstown from Dr. Orbell, who had made a brief trip into the **Notornis** country on Saturday, 13th August: nine days before we reached camp. Dr. Orbell's information was that the Lake had proved to be thickly frozen over and that around the camp were large patches of snow and ice. The remainder of his report, as described in the present account, proved of very considerable interest in relation to our observations. On his visit Dr. Orbell saw two birds in Takahe Valley, three in the Point Burn Valley and two more in the lower part of the latter valley.

CLIMATE OF TAKAHE VALLEY: WEATHER DURING THE VISIT.

Experience of this region had suggested that the winter climate must be rigorous. This had been indicated during the January investigation, when the north-westerly aspect of the valley and strips of snow still lying at the valley head suggested cold wind and heavy snow in winter. Although the valley (approximately 3000 feet above sea level) is below the winter snow-line, the combined effect of altitude and aspect would be sufficient to render winter conditions particularly bleak, especially during the period from June to September.

This was our experience during the present visit, when severe weather conditions were encountered. Heavy rain fell at Te Anau on Sunday, August 21st, followed by cloudy weather on Monday, 22nd, during the climb to the valley. Snow was lying on the forest floor at c. 1500 feet, increasing towards the valley, which was covered unevenly to a depth of some 12-14 inches. Tuesday, 23rd, brought rain until 11 a.m.: a survey of the valley in the afternoon revealed snow-bound conditions, the subalpine scrub being heavily snow-laden and the snow-grass partly buried. The lake occupying the centre of the valley was heavily frozen, but for dark clear water at the entry and outlet of the vigorously flowing stream; this day rain began again at 4.30 p.m., with north-westerly winds, becoming continuous and heavy by nightfall. On

Wednesday, 24th, snow began just after daylight continuing to noon, approximately three inches having fallen, but the afternoon was clear and sunny. Snow was continuous throughout Thursday, 25th, the total fall being some 9-10 inches. The two following days, Friday, 26th, and Saturday, 27th, were fine and partly sunny with westerly winds. The depth of snow, approximately two feet, was now sufficient to cover all but the tips of the snowgrass, and lay heavily on the scrub and forest floor; but heavy snow bearing down the beech forest canopy was shed fairly rapidly, especially on the southern face of the valley. Sunday, 28th, brought intermittent falls of snow and rain, becoming heavy towards evening, and continuing until the morning of our departure, Monday, 29th.

Our visit thus coincided with a period of north-westerly weather bringing deep snow, but had evidently been preceded by a thaw period, during which the depth of snow had been to some degree reduced.

That such conditions are characteristic of the area in winter can best be judged over the longer period covered by Dr. Orbell's visit on August 13th; and by the trip in preparation for the present expedition by Messrs. Miers and McIvor between August 18th and 20th. Dr. Orbell described the snow in Takahe Valley as lying in patches, perhaps less deeply than at any time during our stay. Messrs. Miers and McIvor found the valley under a recent fall of snow. Both parties referred to the thickly frozen lake, the firm ice providing an easy passage up the valley.

OBSERVATION OF NOTORNIS: FEEDING HABITS AND DISTRIBUTION IN TAKAHE VALLEY.

The rain temporarily eased by the early afternoon of Tuesday, 23rd. It was then that at last we came out through the fringe of beech forest about the camp, through the waist-high scrub and on to the snowgrass, upon which a patchy accumulation of thick snow was beaten flat by rain.

We listened to the clear whistle of a pair of blue ducks as we ascended a slope beside the stream. Then, on reaching the top, we found that we could look far up the valley over the frozen lake to the peaks of the main range. The valley gleamed under a white mantle, with the lake glistening icily in the afternoon light. The tall beech forest rising up the steep sides of the valley was dark green, as yet without its canopy of snow; but below this the spreading fringe of subalpine scrub was snow-laden.

A few moments later we had our first sight of **Notornis** as we walked over partly-buried tussock and through low scattered scrub along the northern shore of the lake. We had been moving in line abreast, covering the distance between the bush and lake shore, when we heard behind us the double whistle, ending sharply on the second note. Gordon Williams shouted as he saw the bird: it had remained hidden close to us as we passed, and now ran swiftly towards the forest. It kicked up a spurt of snow as it plunged beneath the fringing scrub. All gained a brief glimpse, and it was last seen 30-40 yards away beneath the open forest.

My first impression was of the massive body and long stride, and of the running posture with neck stretched well forward. The gait is strong, yet not clumsy; and the large triangular bill is a marked character in silhouette.

Examining the ground a little off our tracks, we found that the bird had been feeding on the leaf-bases of snowgrass.* A characteristic litter of discarded leaves was scattered about, as described in accounts of the January investigation, the leaf bases having been nipped cleanly

* **Danthonia (flavescens) affine. For this and following plant identifications I am grateful to Miss Alison Lush, Botanist, Dominion Museum, who compared material with the comprehensive collections made in January by Mr. J. H. Sorensen.**

off. In many cases the leaves had been pulled out in tufts, the bases of which were scooped away, evidently with the tip of the beak. Such material included that of the smaller tussock **Poa colensoi**, but was mostly of **Danthonia.**

Continuing up this northern shore of the lake, we found footprints of different size, droppings and remains of tussock indicating that as far as could be judged three additional **Notornis** had been feeding.

Evidence of the presence of several birds was found again on Wednesday, 24th, but there were no signs of feeding when we examined the valley after the subsequent heavy snowfall of Thursday, 25th. As mentioned above most of the tussock and other ground vegetation was by this time deeply covered, and evidently could not have been reached by the **Notornis.** The period of thaw up to Wednesday, 24th, had uncovered a small amount of tussock, but enough to provide only a limited food supply.

After the heavy snowfall on Thursday, 25th, tracks were seen in the snow, and could be traced for some distance across the valley; in one case a bird had stepped out of the main stream below the lake, apparently after wading for some distance through the water.

We identified the double whistle which revealed the birds on Tuesday, 23rd, with that referred to by Falla (1949) as a scream "kee-ew," the first note like that of the kiwi, but the second more clipped. This call also bears some resemblance to the whistle of the paradise duck and oystercatcher. The loud piping call variously described was also heard from across the lake.

Altogether it was considered that there was evidence of five **Notornis** in the valley, one being heard on the south side of the stream opposite the camp. This last bird had a particularly weka-like call heard after dark on three evenings, and again on the morning of our departure; Ken Miers found unmistakable **Notornis** footprints, which we considered verification that the call was of **Notornis.** The observation is of interest as an indication of nocturnal habits, and of some degree of territorial behaviour.

On Dr. Orbell's visit on 13th, two **Notornis** were seen in the upper part of the valley at the edge of the bush, and there was little sign of feeding. None was seen by Messrs. Miers and McIvor, August 18th-20th.

Of vegetation other than ground plants which might have provided food, the seed heads of grasses mentioned as an important item in January reports were merely weathered remains. There were a few small red fruits on the low shrub **Coprosma (rigida)** affine which could have been reached by the birds, and may prove to be present in the droppings collected.

An interesting observation was made in examining the base of the limestone cliffs along the north side of the valley on Friday, 26th, after the heavy snowfall of the previous day. Beech forest rises to these cliffs from the open valley for about 500 yards but immediately below the cliffs and on wider ledges, there is a fringe of the soft tussock **Poa colensoi** mixed with such herbaceous plants as **Hydrocotyle novae-zealandiae.** This band of ground vegetation, being partly sheltered by the overhanging forest, was frequently quite free of snow, but although much sought after by deer, showed no sign of having been eaten by **Notornis** (see below).

DROPPINGS.

The fresh droppings found where the birds had been feeding were dark green in colour with no visible limy coating, and different in texture from the chaff-like material of most of those collected in January. Most were cylindrical, but some were soft and formless and in two cases

almost liquid. Older but fairly recent droppings (unweathered) were found, these also containing less fibrous material than in summer.

NOTES ON THE VEGETATION.

The following brief notes were made for the purpose of description, but may be of interest pending a full botanical account of the area:—

The beech forest of the lower slopes and on the ridge between the two valleys is composed as far as could be seen mainly of mountain-beech **(Nothofagus cliffortioides)**. Silver-beech **(N. menziesii)** occurs in the underscrub together with **Archeria traversii.**

The vegetation of the valley floor, especially in Takahe Valley, is particularly colourful. The golden snowgrass along the northern side of the lake was snow covered during the greater part of our visit; and between this and the dark green beech forest is a many-coloured zone of scrub. The latter consists principally of the red **Dracophyllum uniflorum**, fresh green **Hebe buxifolia**, golden-green **Dacrydium biforme**; together with mountain toatoa **(Phyllocladus alpinus)**, **Olearia lineata** and **Coprosma (rigida)** affine.

DISTRIBUTION IN POINT BURN VALLEY.

The considerably lower Point Burn Valley was visited twice, on Friday, 26th, and Saturday, 27th, our only two fine days. Although snow was heavy on Takahe Valley after the heavy fall of Thursday, 25th, we found the covering in this milder valley only patchy and the tussock almost free of snow.

The climb between these two valleys, often in deep snow drifts, impressed us particularly with its contrasting views—looking back we could survey the bleak expanse of the snow-filled Takahe Valley, with the frozen lake over which we had just walked. On the other side, we looked down on the tussock flats of the Point Burn with its comparatively benign aspect, and obviously less severe conditions.

In the Point Burn Valley, tussock stretches vividly to scrub fringing the beech forest. The scattered scrub of the often boggy flats here contains the same species as in Takahe Valley, although grey-green **Olearia lineata** and **Coprosma (rigida)** affine are more abundant, with correspondingly less of the reds and yellow-greens of **Dracophyllum, Hebe** and **Dacrydium.**

When we reached the western end of the flat early in the afternoon on Friday, 26th, a **Notornis** was seen almost immediately, feeding amongst the snowgrass. This, the second bird seen by our party, remained in full view some twenty yards away, keeping at this distance as it walked between the tussocks of tall snow-grass. We were able to watch it closely, and hear the soft alarm note, "oomp, oomp . . . ." which is not easily heard unless close at hand. In walking, the tail is flicked in the manner of the pukeko.

Its plumage was bright and no sign of moult could be observed. The colour of the bill—pink with scarlet base—was the same as in summer, but a slight difference from Dr. Falla's sketch was noted in the greater extent of the scarlet area at the base, an excellent colour photograph of this sketch being available for comparison. This pattern on the beak may differ both in individuals and seasonally.

When we came closer the bird broke suddenly into a run towards an isolated clump of beech forest, but was easily approached again. At last, when further disturbed, it ran straight through the shallow, swiftly-flowing Point Burn, lurking behind the tussock but finally breaking into a strong run towards the forest.

The tussock flat was examined at some length on both visits, but no further **Notornis** were seen although a set of tracks at the eastern end

was taken as evidence of the presence here of one additional bird. Although a considerable amount of broken tussock was observed during our examination of the valley, only a small amount of this was recently pulled out, and there was no other evidence of the presence of **Notornis.**

Fresh and fairly recent droppings found here were lighter in colour and more fibrous than those from Takahe Valley, and closely resembled specimens collected in January.

Dr. Orbell referred in his report to two adult and one young **Notornis** seen here on his visit of August 13th; in addition two were seen in the bush about one mile below the flats.

Our experience was the same as that of previous observers that **Notornis** is at first slow to react to human intrusion, but makes off at a fast run when finally disturbed. At neither locality in which **Notornis** was seen could the birds be found on the following day, possibly to be taken as an indication of their greater tendency to wander afield during the winter.

CONCLUSION: HABITS AND RANGE IN WINTER.

Although the time available for the work was so short and travelling conditions were difficult, our observations would seem to point to the dispersal of at least part of the population away from Takahe Valley with the coming of winter. The summer population is estimated at less than 20, five pairs being known to have been established in the area during the 1949-50 nesting season following the present expedition. Until the status of the breeding population is better known conclusions on the basis of the winter observations must remain indefinite.

Thus we could not account for more than five birds in the open portion, and as far as it was possible to examine the forest we obtained no evidence that there were others in the area around the valley floor, or on the neighbouring ridge. After the heavy snowfall on Thursday, 25th, the only signs on the floor of the valley were the footprints of the birds which had wandered widely across the snow. As mentioned above, there were no signs that **Notornis** had fed upon ground vegetation at the base of the cliffs, and we could find no other evidence of feeding except in the open valley.

Whether the birds of which we found evidence were individuals which had not dispersed, or were seen in the valley by chance could be decided only by much longer periods of observation; and possibly it may be found that the marking of individual birds might be undertaken without danger of disturbance. It was apparent that heavy snowfalls, such as must occur throughout the winter, would make it impossible for **Notornis** to feed regularly upon snow-grass and other ground vegetation. Should **Notornis** remain in the valley throughout the winter, thaw periods between successive cycles of north-westerly weather (e.g. during Dr. Orbell's visit and the first few days of the present expedition) would enable a certain quantity of snowgrass and other ground plants to be obtained, although, as suggested by Mr. Miers' local experience, heavy snow may lie for a period of at least a fortnight.

We kept a careful watch for any evidence of the extent of the area over which the birds may wander, both between the Takahe and Point Burn valleys and on the route down to Lake Te Anau. The only indication found was a track of **Notornis** in the snow on the forest floor seen by Mr. Miers (18th-20th) about halfway up the ascent to the valley from the Te Anau landing. There is, in addition, Dr. Orbell's record of two seen in the bush about a mile below the flats of the Point Burn. This observation is the more significant as, unless the Point Burn has a greater population of **Notornis** than the single pair recorded so far, these birds must have come from Takahe Valley; or, as Dr. Falla suggests, a surplus population of immature and non-breeding **Notornis** may exist which would remain scattered over the surrounding country at all seasons.

Evidence of the feeding habits of the birds observed in Takahe Valley may be furnished by the droppings brought back for analysis. These, as mentioned above, differed in colour and texture from those collected in summer, and may show that they had been feeding largely upon animal food, together with mosses and vegetation which would be obtained within the forest.

In the milder Point Burn Valley the one bird observed was feeding, as in summer, on the readily available snow-grass, and it would seem possible for **Notornis** to remain under normal conditions in this valley during the winter. The chaff-like droppings found here provided evidence that the birds were existing mainly on a diet of snowgrass and associated plants.

As mentioned above, no birds were seen in this valley after the early part of our first visit, which indicates their readiness to stray into the neighbouring forest. Dr. Orbell observed two adult **Notornis** and one young one on these flats on August 13th.

The problem remains as to whether dispersal may simply occur at random into the forest or whether the birds descend to lower levels. The latter view is to some degree supported by the discovery of the 1898 specimen on the shore of Middle Fiord, Lake Te Anau, on 7th August; and, apart from uncertainty as to the exact date of capture, by the first two specimens taken near sea level respectively in Dusky Sound and Thompson Sound.

Unfortunately there appears to be no evidence in the case of these two first specimens of **Notornis** as to the month in which they were taken, although in the case of the first, Dr. Gideon Mantell's description (Mantell, 1850) refers to the "snow with which the ground was then covered," undoubtedly suggesting that this was in winter. This specimen, as is well known, was obtained by Dr. Mantell's son, Mr. Walter Mantell, from sealers "pursuing their avocations in Dusky Bay."*

Neither have I been able to find evidence of the season in which the third was captured in 1879 south-east of Lake Te Anau.† It remains an interesting conjecture as to whether this and the 1884 specimen found as a skeleton in the same area (Parker, 1886) had been driven down from higher level or were from colonies which were locally resident. It is of interest to note in relation to these early specimens Benham's comment, quoted by Buller (1905) in a description of the capture of the fourth specimen in the "Otago Daily Times" of 23rd August, 1898:— "Like its predecessors, it was caught in winter on low-lying grounds near the water; but there is no doubt that it lives usually in the higher and rougher bush, and that it was probably driven down to the water's edge by stress of weather and the consequent difficulty of getting enough to eat."

The fourth specimen is of especial interest as it evidently might have come from the colony rediscovered by Dr. Orbell. This specimen was a young female (Benham, 1899 a, b); and in the article quoted above (Buller, 1905) Benham notes that "though thoroughly healthy in every way, there was no fat in the body such as one finds in a normally well-fed bird." The same author's reference (1899 b, p. 151, footnote) to a report on the gizzard contents by G. M. Thomson is significant in relation to winter feeding habits and may be given in full: "Mr. Thomson writes to me as follows: 'It is almost certain that the bird has fed chiefly on species of **Carex** and **Uncinia** (cutting-grasses), and what strengthens this view is that these plants are particularly common at the edge of the bush. . . . At the same time, there probably are some pieces of true grasses among the debris, but I looked at over a score of pieces and they all belonged to the Cyperaceous type."

* Dr. R. A. Falla has commented that at this time, c 1849, sealing was being carried out in winter in the south-west Sounds.

† After "exceptionally severe" weather (Buller, 1882, p. 240).

Thus as regards the data provided by this fourth specimen the point stands out that the marshy vegetation of the lake shore, despite the distance which the birds would travel, might well form an attractive source of food in winter while snow is in the Valley. Alternatively this particular specimen, a young bird, might, in accordance with Dr. Falla's suggestion (see his account in this issue) have wandered further afield than would the adults of the breeding population.

As regards the preservation of **Notornis**, the possibility that the birds disperse to a considerable distance and to lower levels gives support to the setting aside of the present large area of protective reserve.

BRIEF GENERAL NOTES ON BIRDS.

Kiwis were heard at night from the camp, and footprints and borings seen in the Valley. The double kiwi call, heard after experience of **Notornis**, seemed closely similar but the end whistle sounded slovenly and more drawn out in comparison.

A pair of grey ducks was seen in both Takahe and Point Burn valleys; and at least one pair of blue ducks in Takahe Valley, feeding in the rapids, from which their whistle could be heard after dark—this species was once seen at the head of the lake, although this may have been the same pair. One scaup was observed on the unfrozen water at the eastern end of the lake.

Single pigeons were recorded on two occasions. There was at least one kea close to the camp, calling from the southern limestone cliffs and once investigating the camp at close quarters.

The bush birds most frequently observed were rifleman and brown creeper, the latter, although not plentiful, being heard constantly in the beech forest, especially towards the eastern end of the Valley; the chirping note was that commonly heard, but on several occasions a creeper was noted singing quite strongly. Bellbird and yellow-breasted tit were noted only occasionally, and in fine weather passing between Takahe Valley and the Point Burn we heard the trill of a grey warbler strongly delivered.

One pipit was recorded on the swampy ground at the head of the lake.

Of introduced birds, chaffinches were heard in full song (the penetrating breeding-season call was noted near the shore of Te Anau). Redpolls were heard on the ridge between the Valley and the Point Burn; and a flock of 5-6 yellowhammers seen on the Point Burn flats. The full song of the hedge sparrow was heard several times by the camp.

Nothing was seen of paradise duck, robin, fantail, blackbird and song thrush recorded during the January visit, or of the orange-wattled crow, although a careful watch was kept for this species. On the other hand, the above represents a fairly well-established bird list for this high valley in winter, and it is noteworthy that the full song of two early-breeding species, hedge sparrow and chaffinch, was already to be heard.

On the trip down to Lake Te Anau there was a fairly marked increase in the amount of song, and apparently in the numbers of bush birds. Towards lower levels bell birds were heard more frequently and a kaka was noted; a flock of goldfinches was also observed.

ACKNOWLEDGMENTS.

I take this opportunity of thanking Mr. G. F. Yerex, officer-in-charge of the Wildlife Branch, Department of Internal Affairs, for giving me the opportunity of joining the party and of taking part in the work on **Notornis**. My thanks are due also to Mr. B. A. Vercoe, Conservator of Wildlife, Queenstown, for his kind assistance.

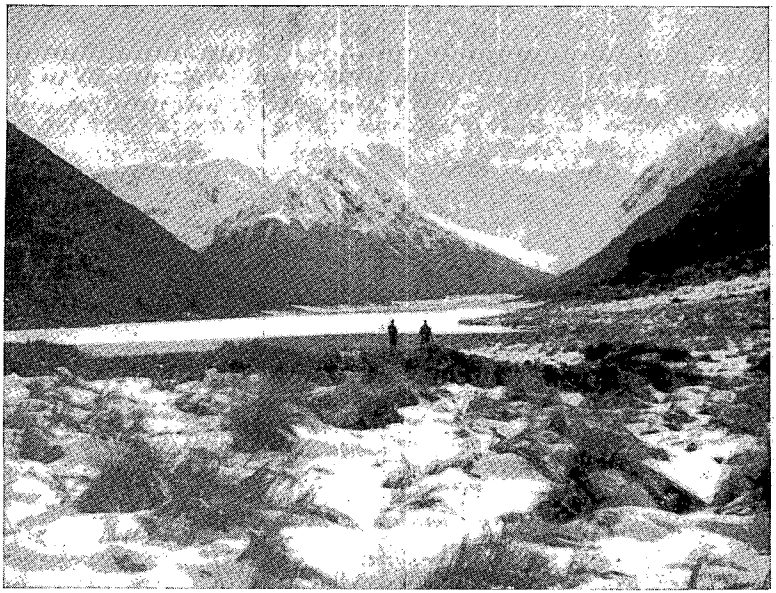

Photo: E. G. Turbott.

LOOKING UP TAKAHE VALLEY before heavy snowfall, showing clear water at end of frozen lake. 24th August, 1949.

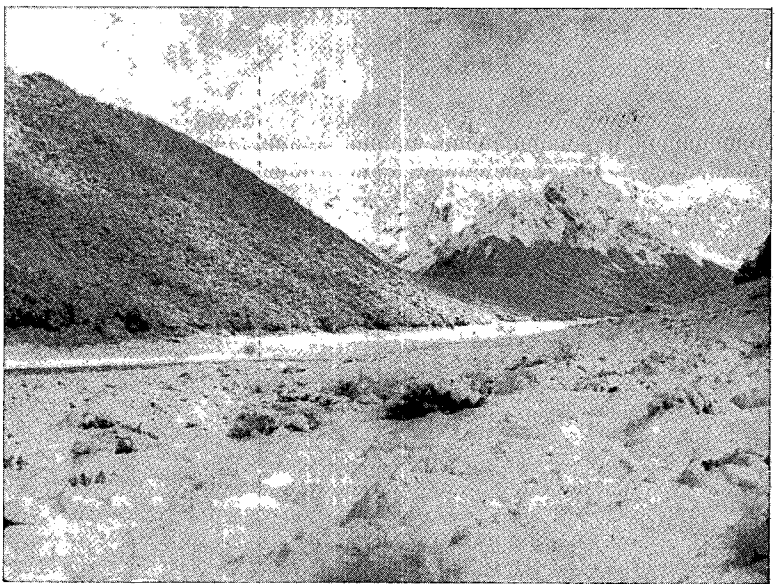

Photo: E. G. Turbott.

VALLEY IMMEDIATELY AFTER HEAVY SNOWFALL; the snow-grass and scrub of the nesting ground covered in foreground. 26th August.

Photo: E. G. Turbott.

TRACKS OF NOTORNIS IN SNOW, TAKAHE VALLEY, 28th August.

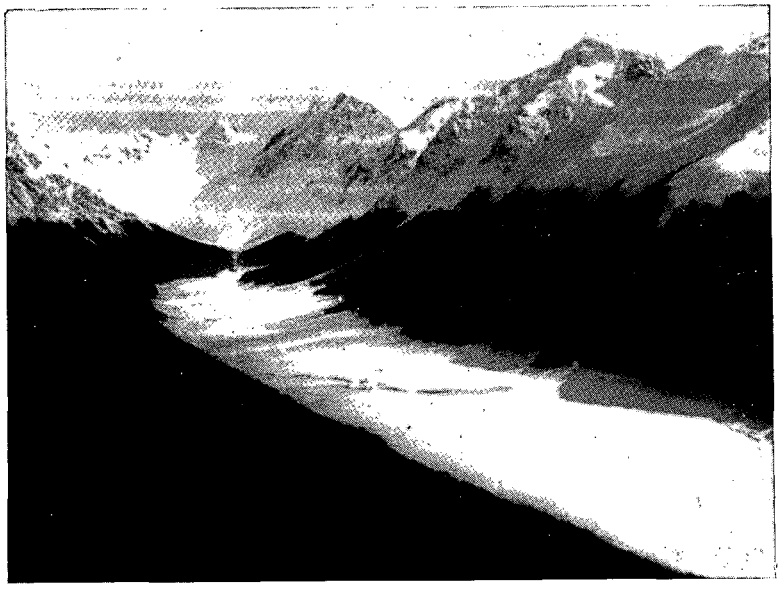

Photo: E. G. Turbott.

TAKAHE VALLEY from neighbouring ridge. The frozen lake in right foreground, tussock at head of valley in middle distance under cloud shadow. Note the dark band of beech forest. 27th August.

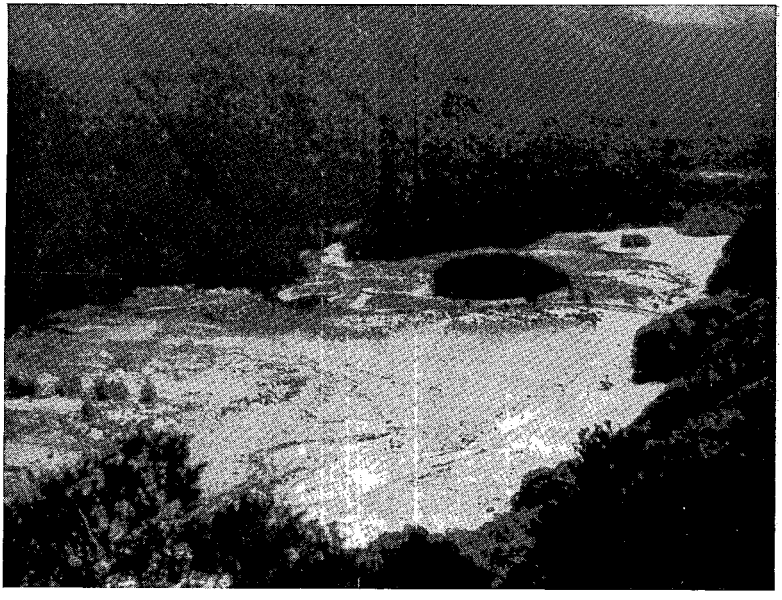

Photo: E. G. Turbott.

LOOKING DOWN ON THE POINT BURN VALLEY showing tussock flats, with less snow than Takahe Valley. 27th August.

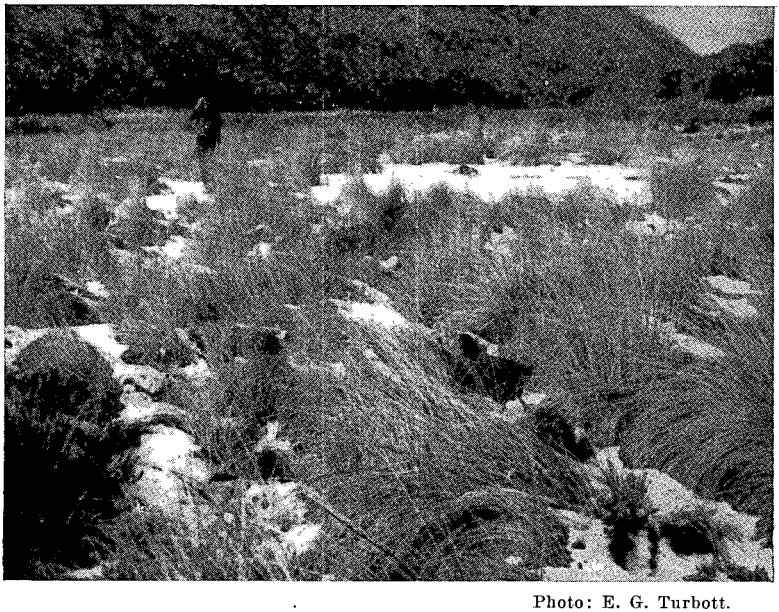

Photo: E. G. Turbott.

ON POINT BURN FLAT. Takahe in right foreground. 26th August.