THE TUI AND ITS FOOD PLANTS.

By Charles McCann, F.L.S., Wellington.

The role some birds play, directly and indirectly, in the economy of plant-life is well-known. Some act as "controls," keeping the balance in both the animal and vegetable kingdoms; some act as distributors for the plant world, inadvertently carrying seed from one place to another; others perform the duties of scavengers; and yet again there is a group of birds whose relation to the plant world is not so obvious, yet they play a most important role, for in their absence, some plants would not produce sufficient seed to ensure the survival of the species. To this group belong the nectarivorous birds (or nectar-feeders) which serve as cross-pollinators. Although self-pollination is not wholly harmful in itself, there is the danger of the perpetuation of an unwelcome character becoming established to the detriment of the plant itself; hence cross-pollination is to be preferred. It produces a more balanced set of characteristics enhancing the possibility of survival.

Although these generalizations are common knowledge, we have yet much to learn of the interrelation between plants and their specific avian or other visitors. As is usual in this world, "there is nothing for nothing, and mightly little for nought!" Usually, the association is of mutual benefit to the partners. In some instances the life-cycles of the two, plant and bird (or insect), are so intricately interwoven that there is a possibility of one or the other (or perhaps both) disappearing in the absence of its associate unless a new partnership is established. Happily, in most instances, the coupling is not so restricted, and so the security of the species is assured. Nature, herself, often steps in to provide means of self-pollination, thus giving the species another chance of survival.

A point worthy of note is that when there is a linkage of avian and plant life-cycles both betray reciprocal adaptations. Naturally, the question arises: "Did the bird adapt itself to the plant or the plant to the bird?" The question is unanswerable; but it seems fairly certain to assume that in the course of the slow process of evolution the necessary "inter-serviceable characters" were gradually evolved together so as to bring about the mutual relationship between plant and bird. With these brief observations I must leave the subject of the evolution of adaptations and turn to the subject in hand. Here I propose to deal with the nectarivorous habit of the tui (**Prosthemadera novaeseelandiae** Gmelin) and some of the food plants associated with and adapted to it: the kowhai (**Sophora tetraptera** Mill.) and the puriri (**Vitex lucens** Kirk). These observations are based on a close field study and on a comparative study of the inter-related characters.

It is well-known that the tui is a nectarivorous bird or honey-eater and that the extremity of its tongue is brush-like, a special provision admirably suited to its nectar feeding habit. Although the tui is predominantly a nectar feeder there is ample evidence to show that it supplements its diet with various insects and also succulent fruits, particularly at times when suitable nectariferous flowers are in short supply. The supply of flowers undoubtedly controls the movements of the tui in a district, reappearing in the same area when the edible fruits are available. However, there is good reason to believe that during the "active feeding period" the bird obtains sufficient nectar, which is stored in the shape of fat, to tide it over the lean period of the winter months, when but a few plants are in bloom. This would mean that the tui is at the peak of fitness by the beginning of winter. (A similar tiding-over of lean periods I have observed in nectarivorous bats of the family **Pteropidae.**)

As already observed, the tongue is brush-like, and is, perhaps, the most highly evolved organ of the bird adapted to its nectar-feeding habit. A brush-like tip is most suitable to collection of the viscid fluid. On closer examination, under high magnification, the brush-like tip is found to be composed of four finely attenuated arms, each arm being provided with very fine bristles. Each of the arms is provided with a large blood vessel. The advantage of these divisions of the extremity appears to be that they

can be separated or united 'like forceps' to collect the nectar more readily and in greater quantity. The main body of the tongue is deeply canaliculate, enabling the nectar collected to flow more easily towards the gullet.

In addition to the specialized tongue, the curvature of the bill must be taken into account. Its curvature is such that the curve closely conforms to the curvature of the filaments of the adapted flowers. This relationship we do find between the tui and the kowhai and the puriri. The filaments form a guide, restricting the direction of the inserted bill, to the base of the flower, where the nectar is secreted and imprisoned. So far we have been dealing with the adaptations observed in the bird, but what of the reciprocal adaptations of the flowers? Although the main principle is similar in the case of both plants, it will be more convenient to treat each species separately.

Kowhai.—It is necessary to pay a little attention to the structure of the plant in order to explain the behaviour of the bird more clearly. The branches of the kowhai are somewhat flaccid and the inflorescences are mainly towards the extremity of the branches. These bend or sway readily with each puff of wind. In addition, the individual flowers are pendulous and move freely on the rather long pedicels—they are almost versatile. Both of these points are rather important factors when considering the method of nectar extraction employed by the bird. The calyx is obliquely cup-shaped, the ventral portion (the part covering the keel petals) is longer and turned slightly upwards. The petals are clawed at their bases. The stamens, 10 in number, arise from the margin of a rayed saucer-shaped disc. The disc secretes the nectar. The bases of the filaments are closely set, with the exception of the dorsal-most pair, under the claw of the standard. Between them there is a greater gap than between any of the other filaments. The reason for this separation we shall see presently. The lower portions of the filaments are connivent and form a 'cage' immediately above the disc, in which the nectar is held. Arising from the centre of the disc is the pistil. It forms a 'stopper' to the connivent filaments. The nectar imprisoned in this cage is not easily displaced.

On opening, the flowers are a greenish-yellow; the stamens and pistil are subequal in length, but the nectar is not profuse. Soon after opening, the stigma overtops the anthers (before the latter dehisce) thus obviating the possibility of immediate self-pollination. At the same time the secretion of nectar increases and the colour of the flower deepens to a more pronounced yellow. Old flowers become cadmium yellow. The stigma matures before the anthers dehisce. As birds are known to be able to discriminate between different hues, it seems possible, and even likely, that the differential colouring acts as a guide to the bird, leading it to the blooms containing the most nectar.

Usually, the visiting bird perches above the flowers and lifts each bloom in turn by probing its bill into the depths of the flower. In doing so the standard is used as the lever and the flower is turned upside down, thus bringing the extremity of the bill to the point where there is the greatest division between bases of the stamens (the dorsal pair). At the same time the inversion of the flower brings the stigma in contact with the bird's forehead and the stigma ploughs its way through or over the feathers of the forehead and crown, followed by the anthers. The pollen from the anthers besmears the forehead and lores. Should the bird have visited a flower previously, the stigma is dusted with extraneous pollen before the bird receives a fresh coating of pollen to carry to another stigma. Thus the supply of fresh pollen is maintained and fresh stigmas dusted, cross-fertilization resulting. However, although the plant and the bird appear to be admirably adapted to each other, it seems evident that the plant is not entirely dependent on this mode of pollination alone, but that chance self-pollination does occur. This is effected by insect visitors, such as small Staphalinids and thrips, which tenant the flowers, and possibly, also, by flies (**Diptera**). That the plants are not entirely dependent on their avian visitors for the propagation of the species is borne out by the fact that plants not visited by tuis also produce viable seed.

Apart from the tui, which appears to be the legitimate pollinating agent, some other birds have learned of the presence of the nectar in the flowers of the kowhai, and, although not adapted for the 'job,' have found a means of getting at the nectar store. This they do by nibbling a hole out of the calyx into the 'cage' in which the fluid is imprisoned. The two species which have devised this means are both Fringillids, the house sparrow (**Passer domesticus** Linn.) and chaffinch (**Fringilla coelebs** Linn.).

When feeding from flowers situated above it, the tui adopts the same method of insertion of its bill, with the standard below its chin, and the stamens and stigma above. In no instance have I observed the tui probe the flowers from a pendant position on the kowhai. The weakness of the branches makes this an inconvenient stance.

Puriri.—The branches of the puriri, unlike those of the kowhai, are rigid. Likewise, the blooms stand away from the branches on rigid peduncles and pedicels. The calyx and corolla are campanulate, the latter with four spreading lobes. The dorsal surface of the corolla is distinctly arched. The four stamens are adpressed to, and conform to the curvature of the corolline cup and the dorsal segment. The ovary is situated in the calyx and is surrounded by a long pistil which very slightly exceeds the length of the stamens but hangs more ventrally than they do, so that it contacts the head of the visitor before the anthers. The ovary is surrounded by nectar and the entrance to the calyx cup is guarded by the bases of the filaments which are angularly bent over it. The bent portion of the filaments are villous, a character which enhances the protection to the stored nectar. Once more, as in the case of the kowhai, the curvature of the dorsal portion of the corolla and the stamens conform closely to the curve of the tui's bill.

As the flowers stand out on somewhat stiff peduncles and pedicels, the tui has to reach out to them to obtain the nectar, without putting undue strain on the joints. This the tui achieves by performing all manner of gymnastics on the branches. The stiffness of the branches, unlike those of the kowhai, makes the performance possible. On the puriri, the tui may be seen holding on to the branches at all possible angles, including the pendant posture.

The stigma is the first to contact the head of the tui, and it is followed by the anthers. Thus the pollen of one flower is conveyed to the stigma of another. The anthers and stigma of this smaller (than the kowhai) flower do not reach to the same height on the head as do those of the kowhai, the anthers just reaching the feathers posterior to the nostrils. A point worthy of notice here is that, in the tui, the feathers of lores are markedly different from the rest of the head, appearing like black velvet. Are these feathers of special value in the collection of pollen? If so, we have a further adaptation of the bird towards its service to the plant. However, I must leave this an open question until more light is available on the subject.

The Tui.—The tui is too well-known to need description, although it is more often heard than seen, but a few brief remarks on the habits observed will not be out of place. Its loud metallic and liquid notes betray its presence in the forests or in the garden. During the breeding season it establishes territorial rights over certain areas and over certain trees when in bloom. When feeding, it will not tolerate the presence of any other birds, no matter how small, on the same tree. It will pursue the intruder through the branches until it leaves the tree. However, it will tolerate another one of its own species.

During the intervals between feeding, it sits on one of the inner branches of the tree, and, after wiping its bill on the bough, commences its song. Usually it starts off with a couple of loud metallic notes and then lapses into a 'whispering' song of fine high-pitched notes* (some quite inaudible—the beak and white bib keeping time the while) and these are terminated by a couple of harsh squawks, the head, with open bill, being thrown backwards with each squawk. This may be followed by other

* Similar to the habit and notes of a starling (**Sturnus vulgaris** Linn.).

metallic notes or the bird will relapse into the 'whispering' song, before it embarks on another further brief period of feeding. Each song is frequently interrupted by much bill-wiping on the branch.

When not feeding, the tui will often sit upon some bare twig in the open and continue for a considerable time in full song. On the arrival of the mate, she is greeted with a small courtship dance which is comprised of an up-and-down motion accompanied by some feeble notes. The greetings over, the pair settle down to feeding once more, or one flies off.

G. M. Thomson (Trans. N.Zeal. Inst. xiii (1880) p. 241) published an extensive and interesting article on the fertilization of flowers in New Zealand. In the course of his paper he refers to various ornithophilous flowers, and reference is often made to the tui in the role of a pollinating agent. Among the plants visited by the tui, Thomson makes special reference to: "**Clianthus puniceus, Sophora tetraptera, Metrosideros lucida,** etc., **Loranthus (Elytranthe) colensoi (?), Dracophyllum longifolium** occasionally, and **Phormium tenax.**" Of these, I have dealt with the interrelation between the kowhai and the tui. However, my remarks were confined to the arborescent forms, and, perhaps, would not apply equally well to the smaller prostrate forms (such as **S. prostrata**).

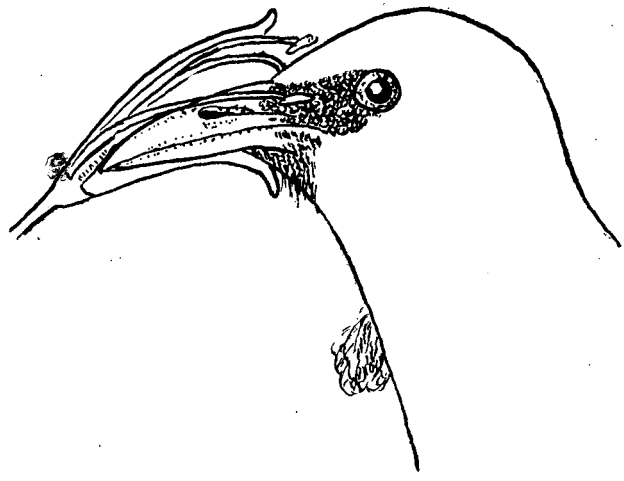
In the prostrate forms there is a marked reduction in the size of all the vegetative and floral parts, and, accordingly, there would be some difficulty in regarding them as truly ornithophilous forms adapted to the requirements of the tui. Whether the tui visits these dwarf forms is a moot point, but, as birds will often visit flowers not specially adapted to their particular needs, there is no point in pursuing this observation further.

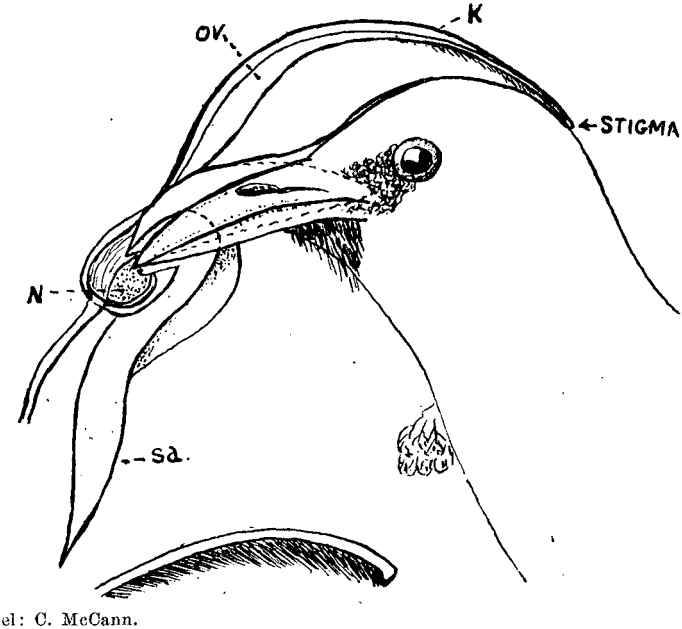
In keeping with the prostrate habit, and consequent reduction of the vegetative organs, the floral structures have altered their dimensions. The inflorescence is reduced to one to three blooms (two being more frequent). However, there appears to be an increase in the length of the pedicels. The standard is comparatively shorter in relation to the length of the other petals than it is in the arborescent forms. The most important change in structure, from our present angle, is the shortening of the stamens, and particularly the length of the pistil. Under such circumstances the stigmatic surface is brought nearer the anthers, thereby facilitating self-pollinization, either by direct contact, or by flower-inhabiting insects. That self-pollination does often occur in the species is, I think, beyond all doubt. There does not appear to be any outward difference in the appearance between the pollen of the arborescent and prostrate forms. The reduction in size of the entire plant may possibly have arisen from some genetic factors brought about by continued self-pollination on the one hand—the dwarf character being dominant—and the adaptation of the plant to wind-swept terrain. However, these suggestions are merely hypothetical and require thorough investigation from the angle of the geneticist.

In my opinion, the kowhai represents a single variable species, and possibly, some of the extreme variants are on their way to extinction. The rarity of some of the variants and the gradual restriction in the distribution of the species in the wild state suggests this.

Clianthus puniceus Banks & Sol.—Turning to another leguminous species **Clianthus puniceus**, Thomson regards it also as an ornithophilous flower. Quite rightly, but I think some explanation is needed. There appears to be no doubt that **Clianthus** was predominantly (I use the past tense deliberately) an ornithophilous species in the past and, perhaps, still is to a lesser degree, but it seems to be departing from this mode of pollination and becoming more readily self-pollinated. Why this change is taking place it is difficult to surmise. I will discuss this somewhat empirical statement after I have made some observations on the actual construction of the flower and an analysis of Thomson's remarks. Regarding the distribution of the species, Cheeseman writes: "Exceedingly rare and local in a wild state and fast becoming extinct."

Clianthus is a small underscrub with somewhat rigid branches. The inflorescence is many-flowered; the peduncle pendulous and very flexuous;





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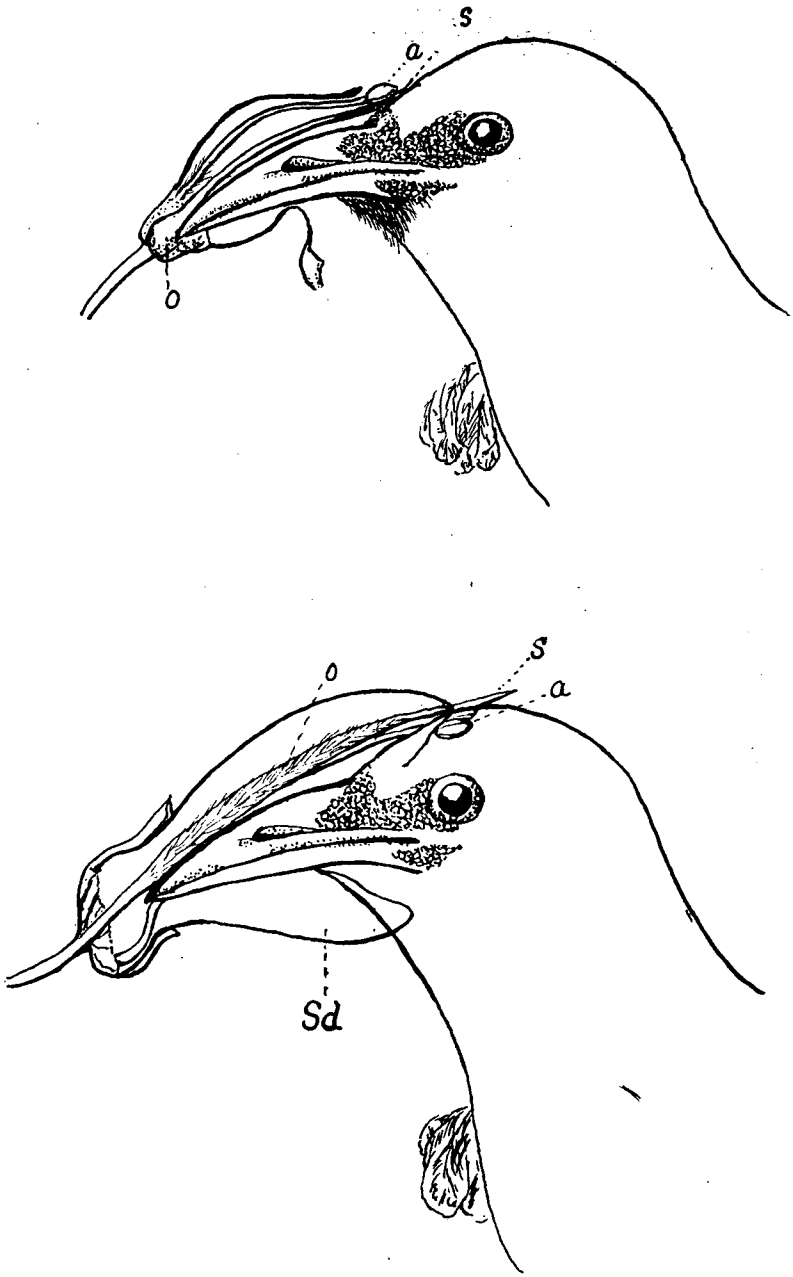
Upper.—TUI AND N.Z. FLAX.

Lower.—TUI AND KAKA-BEAK.

K, keel petal (in longitudinal section); N, nectar chamber; Ov, ovary; Sd, standard petal. Lateral petal shown detached at bottom of plate.



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Upper—TUI and PURIRI.

Lower—TUI AND KOWHAI.

A, anther; O, ovary; S, style; Sd., standard petal.

pedicels elongate and pendulous also. Under the circumstances the flowers swing readily and are able to rotate. The calyx is cup-shaped. Within the calyx is a disc from the margins of which arise the stamens. The standard is large and showy, and is strongly reflexed from its base; the lateral petals are about half the length (variable) of the keel and slightly spreading; the keel petals are united into a strongly curved, boat-shaped structure, the upper margins conniving above (often overlapping, and convolute, particularly towards the apex), but leaving a narrow opening at the base of the standard. The stamens, ten, are diadelphous, one free, and the remainder united to form a tube. The base of the free stamen forms a wide loop, arching above the nectariferous chamber before entering the keel; the bases of the remainder are united to form a 'bowl', below the arch of the free stamen, for the reception of the copious secretion, and thence continue united for about three-quarters of their length to form an open tube embracing the pistil; finally terminating in free ends for the rest of their length. The stamens are shorter than the keel and do not extrude. The pistil arises from the centre of the nectariferous disc, passes through the staminal tube, closely adpressed to the lower side of the keel, and, finally out through the convolute apex of the keel. The pistil is glabrous till above the ovary, thence a longitudinal row of dense, forwardly directed bristles extends along the upper surface of the style to its extremity. The significance of this 'brush' will be discussed below.

In bud, the free ends of the stamens are reflexed towards the opening in the keel at the base of the standard, but as the flowers open, the free ends of the stamens straighten out and surround the style (one or more may remain reflexed), the solitary one often remaining in its original position. As already remarked, the anthers dehisce before the flower opens (in bud) and the pollen collects around the style, and some of it works its way up to the upper margins of the keel. The pollen grains are ellipsoid, smooth, and adherent (viscid). Gradually the pollen moves forward towards the extremity of the style. Apparently, the forward progress of the pollen is maintained by the movement of the style within the keel as the flower is moved about by the wind or by visitors—the line of bristles moving the grains along the tube to the stigmatic surface. The whole mechanism is suggestive of a device suited to self-pollination, but the possibility of cross-pollination still remains. The latter mode may be achieved either by contact of the protruded stigma with the pollen on the margins of the keel petal of adjacent blooms, or by a visitor.

Experimentally, the slightest pressure on the keel forces the style out of the convoluted extremity of the petal, and, together with it, a quantity of pollen—the 'brush' acts in the same manner as does a brush in a flue. Repeated pressure and release merely brushes out more of the pollen—the tip of the petal cleaning the 'brush' as it retracts. In relation to the head of the tui the effect is the same. If the bill of the tui is inserted into the opening of the keel at the base of the standard the pressure forces back the keel and the extremity of the petal reaches to the occipital region. At this point the style is exerted and a quantity of pollen is deposited. In this manner cross-pollination could result. However, as bushes not visited by these birds produce a certain amount of viable seed, it stands to reason that the flowers must have been pollinated by some other means.

If we examine the contour of the keel petal more closely it will be noticed how nearly its lines conform to the shape of the head of the tui. The lateral petals appear to act as a guide to the opening at the base of the standard. As the flower is inverted by the tui, the contents of the 'bowl' naturally flow downwards to the point where there is the greatest space between the bases of the stamens.

Thomson had observed that the anthers dehisce before the flowers open (in bud) and that the pollen collects towards the apex of the keel (carina) and lodges in the hairs of the style (p. 242). As the anthers dehisce in bud and the pollen accumulates in the keel, there is no need for the extrusion of the anthers. The stamens are actually shorter than the keel, but Thomson states: "The filaments of the stamens are so long as to

exceed the carina, but many of them are bent completely back for part of their length." He remarks that the flowers are diligently searched by birds, and that "In inserting their heads into the flowers they push back the carina with considerable force; this retains its hold on the style for a time, until the pressure is too great, when the latter is jerked forward by its own elasticity, and throws out the accumulated pollen on the intruder's head." This last observation is not in keeping with the construction of the flower, and it would suggest that the bird's head is covered in a cloud of pollen dust! whereas in Nature the pollen is 'swept' out of the extremity of the petal by the 'brush'-like style.

As in the case of the dwarf forms of the kowhai, it seems possible that the continued inbreeding of this species is, perhaps, leading to its gradual but sure extinction in the natural state, unless some change comes about in its mode of pollination. However, much field observation and cytological study is needed before any definite conclusions can be reached.

Metrosideros spp.—Regarding **Metrosideros lucida** Thomson, (p. 263) appears to be uncertain, for he writes: ". . . but are probably aided in their fertilization by the numerous tuis and honey-birds which frequent **them for the sake of their honey.**" After much observation, I feel that none of the **Metrosideros** flowers are ornithophilous but are entomophilous. That nectarivorous birds visit unadapted flowers for the sake of the nectar there is no doubt, but they do so in the role of a 'thief' and are of no assistance to the plant, except by accident. As my observations are still incomplete, I must leave them for a future occasion. However, I cannot refrain from remarking that although there are many pohutukawas in flower in my neighbourhood, the tuis have not returned to the district.

Phormium tenax Forst.—There appears to be no doubt that the flowers of **Phormium tenax** are adapted to cross-pollination by the tui. The peduncles and pedicels are rigid, affording suitable and convenient perching facilities. Further, it will be noticed that the flowers themselves are curved along the lower surface, and the opening of the perianth is always turned skywards. The curvature of the pistil and stamens conform to the lower curvature of the flower. The nectar is held in place between the trequetrous ovary and the bases of the stamens, and the position of the open flower prevents it from oozing out. Nectar is profuse. The stamens bunch together and lie adpressed against the lower surface of the perianth. They overtop the corolla. The style is shorter than the stamens and curves slightly more upwards, thus being free from contact with the anthers. In this position the stigmatic surface contacts the 'brow' feathers of the visitor before the anthers, thus ensuring cross-pollinization if the head of the visitor is already dusted with pollen from a previous visit to another flower.

In the case of **Phormium**, the tui sits on the branch above the flower, and probes into its depth from above. As it does so, the up-turned style contacts the 'brow'; this is followed by the separation of the stamens (as the bill is forced in) into a semi-circle round the bill, and, as the maximum depth is reached, the anthers come in contact with the crown and lores, besmearing the feathers with a liberal coating of pollen. The pollen is tetrahedral and clings readily to the plumage.

Fuchsia excorticata Linn.—With regard to the flowers of **Fuchsia** (p. 264), Thomson writes: "They appear to be fertilized only by tuis and honey-birds. As in the case of other plants frequented by these birds, viz., . . . the fuchsia flowers are pendulous, affording no resting place for insects, while the great quantity of honey secreted would drown any but a large form furnished with a long trunk." Although I have seen tuis visit the flowers of **Fuchsia**, I am inclined to the opinion that it is not adequately suited to fill the role of a pollinating agent in this instance, as the curvature of its bill and the configuration of the flower are by no means adapted to each other. The strong constriction of the corolla above the ovary and the position of the stamens, together with the greatly elongated style, appear to rule this out. However, I have noticed that the bell-bird (**Anthornis melanura** Sparrm.) is a more frequent visitor to the flowers of

this species, but in the absence of sufficient data I cannot discuss the matter much further. Nevertheless, I feel I cannot leave the subject without commenting on Thomson's objection to the possibility of insect pollination. His main objections rent on the pendulous character of the flower and the absence of a 'landing stage' for the insect visitor. There are several moths with a sufficiently long proboscis to enable them to reach the nectar cup by landing on the flower itself and stealing the nectar without being of service to the plant at all. However, that is beside the point. The much exerted style, with its spherical stigma, provides a sufficient landing stage for a visitor, which if covered with pollen from other flowers would effect cross-pollination. Having landed on the pendulous style it would then proceed upwards along it to the nectar cup, and in doing so would have to crawl over the anthers which lie adpressed to the style and thus receive a fresh dusting of pollen. Under such circumstances, there is every possibility of some insects (moths) serving as pollinating agents. However, the pollination of the **Fuchsia** needs further study.

SILVEREYE IN RELATION TO AGRICULTURE.—The N.S.W. Gould League is carrying out an investigation concerning the food of the silvereye, with particular reference to the fruit-growing industry. A questionnaire has been prepared relative to the numbers of this species present in a district, evidence of migration, food in different seasons of the year, whether considered beneficial or harmful, control measures (if necessary) breeding and evidence of the bird spreading noxious weeds. Members having information on the lines indicated should send same to the Horticultural Division of the Department of Agriculture, Wellington.

NOTES ON SHEARWATERS.—Among the remains of petrels found during the summer by the writers were three birds of particular interest. The first two specimens were short-tailed shearwaters (**Puffinus tenuirostris**) one being found by M.B.G. at Muriwai on 21/12/51, and the other at Bethells on 29/12/51 by G.E.T. The plumage of these two birds was quite distinct from any examined in the Auckland Museum collection. The underparts were paler than the upper parts, with a definite whitish area round the chin and throat and also on the under wing coverts, the latter being quite as marked as in many sooty shearwaters (**P. griseus**). This variation from the normal wholly dark plumage has been noted by D. L. Serventy ("Birds of Western Australia") but does not seem to have been recorded previously in New Zealand. The following are the measurements of the Muriwai bird: Wing, 260 m.m.; tail, 111 m.m.; tarsus 49.5 m.m.; mid-toe and claw, 57 m.m.; culmen, 32.1 m.m. Bethells bird: Wing, 267 m.m.; culmen, 34.6 m.m. The third specimen was a sooty shearwater found on 27/12/51 at Bethells. (G.E.T.) This bird, which must have been ashore for at least ten days, had a fully developed and hard shelled unbroken egg protruding from its abdomen. The egg measured 71.1 x 49.0 m.m.—G. E. Thomas and M. B. Gill, Auckland.

DISTRIBUTION OF KAKAPO.—The Department of Internal Affairs is asking for the assistance of members in efforts to locate areas in which the kakapo exists. A circular has been prepared for distribution to those likely to be able to assist the Department. The information is being sought with a view to taking steps to conserve this bird, as reports indicate that it is decreasing rather rapidly in numbers. The main kakapo signs that should be looked for are set out. These include small oval masses of well-chewed vegetation (pellets) to be found among tussock. They are about three-quarters of an inch long. The pellets may still remain attached to the roots by a short length of unbitten leaf blade. Although they are inconspicuous, the pellets are the most common sign left by the bird. Kakapo feathers are olive-green and yellow, barred with brown. Any likely feathers should be kept. The bird calls during the night, the male having a booming note in the breeding season, repeated five or six times and sounding like a muffled drum. A hoarse cough or a grunt also is uttered. The kakapo is not known to occur nowadays in the North Island and is confined to the mountainous country of the South Island.

several parts of New Zealand with the "zonal colour" rings, i.e., a different colour is used in each district. N.Z. dotterel and some blackbirds and thrushes have also been colour ringed, in these cases each bird being distinguished according to pre-arranged plans, with a different combination of colours. Members are requested to immediately report any ringed birds seen. Care should be taken to state the colour of the rings, and which leg or legs they are on, and also if both legs were examined to make sure all rings were seen clearly. The date and locality should be given.

Members are advised that the Dominion Museum has taken over the rings and records, and the society is indebted to the museum for this service. Mr. J. M. Cunningham has relinquished the convenership of the Ringing Committee, and Mr P. C. Bull has taken his place. All correspondence on ringing matters should, therefore, be addressed to Mr. Bull, 131 Waterloo Road, Lower Hutt.

NEST RECORDS.—This is an investigation in which almost all members can help. Cards should be filled in for all species—when nests with eggs or young are found, even if the nest is visited only once, or if it is deserted or destroyed. The commonest birds are worthy of attention as there are many gaps in our knowledge of these birds. Cards are available on request from Mr. J. King, Box 448, Masterton.

BEACH PATROL.—Mr. R. K. Dell, c/o Dominion Museum, Wellington, is now organising this investigation, and cards should be obtained from and returned to him. In the case of all petrels found, black-billed and red-billed gulls, and other species showing some similarity, the diagnostic feature should be mentioned in the square "identification confirmed by" or else the name of an authority who has examined the specimens and confirmed their identification.

INQUIRIES.

The following are still current. Members who have not yet supplied information they may have, are invited to give it to the respective organisers immediately.

DABCHICK SURVEY.—Organiser: Mr. R. B. Sibson. Information is still being gathered on the numbers and distribution of this bird in all parts of the country. The full questionnaire was published in the cyclostyled Bulletin No. 1, 1941-2.

BANDED DOTTEREL.—Organisers: Messrs. C. A. Fleming and R. H. D. Stidolph. The second interim report was published in Notornis, V. 4, No. 4.

GODWIT.—Organiser: Mr. R. H. D. Stidolph. The first interim report was published in Notornis V. 4, No. 6.

MYNA.—Organiser: Mr. J. M. Cunningham. Information supplementary to that published in N.Z.B.N., V. 3, No. 2 and Notornis V. 4, No. 4, is being collected for publication in a further report. Records of all birds seen in the Bay of Plenty area, Auckland northern suburbs and North Auckland, are desired, as well as any changes noted in the other parts of the North Island.

WEKA IN GISBORNE-EAST COAST.—Organiser: Mr. J. C. Davenport. The information required is of numbers and movements, and is detailed in Notornis V. 4, No. 2.

CORRECTION.—Portion of the caption on page 10 of the July, 1952, number should read: Part of the stigma shown detached at bottom of plate. Lateral petal is shown in dotted line in the main figure.

Date of publication.—October 1st, 1952.

The Masterton Printing Co., Ltd., Lincoln Road, Masterton.