

definitely settled the matter. Meanwhile her mate, who had still a good deal of care of three dapper young robins in the evergreens (their first family), had apparently selected a heavier crotch in a better place, and he busied himself about that spot, not making any attempt to build, but merely showing his preference.

Madam would not look at him. Finally while she was absent, he came down to a vase on the lawn, a favorite perch of his, where he had sung away many a twilight hour, and began a very low, sweet song. It was alluring; hard indeed must be the heart that could resist it.

She did come, but she did not join him on the vase. She had another load of material, and flew at once to her chosen tree. He stopped singing and looked at her. She alighted and ran out on the branch as she had done before, and, as before, the material she had collected fell to the ground. Then she flitted herself over the crotch in a petulant way that tumbled off every scrap that had lodged there. Plainly she was "mad" and did not seriously intend to build there at all.

After this display she flew away, and her observer on the vase went to the ground where he could look through the passage she had taken. Presently the captious little dame returned with an empty beak, and alighted near him on the lawn. To our amazement he instantly ran away several feet, then paused. She advanced toward him, and he ran farther, keeping always a few feet from her. It actually appeared as if he were on the defensive.

This sort of performance went on for some time. Occasionally both were out of sight behind the low-growing evergreens, then both would return and go on as before, he never letting her get nearer to him than five or six feet. It was painful to see this bad state of things in our heretofore amiable couple, and we sorely regretted having torn down the nest.

It is one of the maddening things to the bird-student that he cannot keep his game always in sight. No matter how great the crisis in their lives, nor how absorbing his interest, a flit of the wings carries them out of sight in a moment. Then again they are such distressingly early risers. If the student tear himself away from his pillow before the sun shows his face, he will find bird-life in full blast. Before it is light enough to see well, their day of work and play is begun. We shall never thoroughly know the feathered folk till we rise at their uncanny hour and learn to fly!

Before we got the robin fairly in view again—probably in those tantalizing morning hours—their difficulties had straightened out, and building was going on seriously in a maple tree a little down the road, quite near the other, but out of sight from the veranda.

Two or three weeks passed in peace, and we hoped the robin troubles were over. Every day we saw the hard-working sire, followed around by his three young folk, as big as he was, calling and teasing for food.

Then one evening the robin treated us to a strange performance. He stood on the ground in the middle of the carriage way, crouched, so that he almost rested on the gravel, his head sunk between his shoulders, and looking as if he were at his last gasp. But he was uttering low notes, and we listened. It was a constant repetition of the queer unmusical sort of "que-e-e" with which many robins end their song. This is neither a trill nor a distinct note, but a sound as if the bird had tried to reach a high note and the voice had broken.

The bird repeated it again and again, and with varied inflections and movement. Plainly he was practising it. What could be his object? and why that unnatural attitude? Had he been crazed by his troubles, and was he a candidate for the lunatic asylum? or was he perchance a genius, evolving a new song for the robin tribe? Evi-

dently he was bound to evolve something, for he practised without ceasing.

After awhile he moved a little so that his tail—still resting on the ground—was deflected to one side, in a very unnatural position, and there he stood motionless for half an hour or more, still constantly making the strange noises. All this time we had not been positive of his identity, but now he turned his head up as though addressing some divinity in the tree with his grotesque strains. He was not ten feet from us, and it was eight o'clock and perfectly light, so that we saw him distinctly. Just as we were concluding that some accident must have befallen him and we ought to go down to see, he suddenly straightened himself up on his legs, shook himself out, and sang out loud and clear his regular song. That made it certain that it was our friend of the maple tree, and we were fearful that his mate being at last settled and in her right mind, he had himself broken down. Our host, however, refused to take this desponding view. He insisted that the bird felt within him the stirrings of genius, and that he was founding a race of robins with a new song.

Certain it is that he kept up the strange practisings evening after evening, though never again on the ground. Madam, his spouse, sometimes came down and looked at him, as if to make up her mind whether he was simply unfortunate and to be pitied, or whether he were vicious in deliberately violating all robin traditions, and she ought to discipline him. Apparently she was unable to decide, for she returned to her undoubted duty, and he kept up his droll entertainment till the next instalment of his family came on to demand all his time and strength, and robin music ceased altogether.

At the end of July I left the scene of this robin eccentricity, but my comrade, who remained, heard so late as the middle of October, the same sort of performance going on among thick berry-bushes, at some distance from the house, and on starting up the bird she found it to be a robin.

Could it be the same bird? And shall we have a new sort of robin music next spring?

## BIOLOGICAL NOTES FROM NEW ZEALAND.—II.

BY GEO. M. THOMSON, DUNEDIN, N. Z.

IN a previous paper (*Science*, Vol. XX., p. 323), attention was drawn to the fact that the plants of New Zealand are nearly destitute of all such structures as are correlated with the presence of mammalia. *A priori* this is what might have been expected in a country in which there were no indigenous mammals. Those plants which have defensive structures, such as spines, prickles, etc., and those whose seeds or fruits are fitted for adhering to the coats of passing animals belong in almost every case to species having a wide range outside of New Zealand, the inference being that the characters referred to have been developed outside the New Zealand region, and that such species have been introduced into these islands at a comparatively recent period.

Another interesting feature in the flora is the relation existing between the flowering plants and the various agencies which are necessary for fertilizing the blossoms. Visitors to these islands are usually struck with the prevailing dark hue of the evergreen vegetation and the apparent absence of flowers. Associated with this is a corresponding absence of conspicuous insects,—especially large Lepidoptera and Hymenoptera,—which are such active agents in this work in most other parts of the world. While it is true that there are a few species of flowering plants of exceptional beauty, such as *Clianthus puniceus* and the splendid white *Clematis* (*C. indivisa*), yet the general verdict is correct that the flowers of the

lowlands are chiefly inconspicuous. There is a beautiful flora on the mountains above the bush-line, i. e., from 3-5,000 feet, but with the exception of a very few striking species like *Ranunculus Lyallii*,—the so-called Mt. Cook Lily,—most of the flowers are only conspicuous by their aggregation; and nearly all such are white, with, in a few cases, a tinge of blue or lilac. The individual flowers of *Pygmæa*, *Helophyllum*, *Donatia*, etc., are small, but when one comes on hummocks of from one to three feet in diameter, with the flowering branches so densely crowded that the blossoms are in contact with one another, then such species may well be considered to be conspicuous. Some of the most singular of such aggregated flowers occur in the composite genus *Raoulia*. The individual plants are small, and are only a few inches in height, while their branches grow in dense masses, each ending in a small head of florets surrounded by pure white bracts, giving them a daisy-like appearance. When in flower on the mountain side, such masses are, when viewed at a distance, readily taken for sheep, and shepherds, unless provided with a good field-glass, may be, and often are, easily deceived; hence the popular name of Vegetable Sheep has been given to some of the species, especially to *R. mammillaris*.

Though conspicuous insects are rare, and the two orders already referred to are somewhat poorly represented, yet the number of flowering plants which depend on insects for fertilization is very considerable. Fully one-fourth of the total number are entomophilous, to judge by the fact that they are more or less conspicuous, and (or) are fragrant, and (or) possess nectar-glands; and of the hermaphrodite species which may or may not be insect-fertilised, about 37 per cent exhibit decided protandry, their stamens maturing before the pistils. This fact is almost always associated with insect-fertilization, while protogynous plants on the other hand are nearly always anemophilous or wind-fertilized.

The chief agents in fertilizing our indigenous flowers are flies and flower-haunting beetles. It is somewhat unfortunate from a biologist's point of view that the natural conditions have been very much obscured during the last twenty or thirty years by the introduction and very rapid increase of insectivorous birds. Many of the large hairy flies which used to be most abundant formerly are now comparatively rare, while the clearing and burning of the surface growth over great part of the country has thinned out the beetles and other insects to an amazing extent, not only by actually burning the individuals themselves and their eggs and larvæ, but also by destroying their breeding ground.

A few of the largest of the native flowers are fertilized by birds; the agents in this work being the Tui or Parson Bird, the Korimako or Bell Bird (Honey bird), the Kaka or large bush parrot, and the two or three species of paroquets. Fuchsias, Ratas (*Metrosideros*), Flax (*Phormium*), etc., seem to be quite dependent on the birds. In recent times the imported bees, both hive and humble (*Bombus*) have taken to visiting several of the native flowers.

A feature of interest, regarding which I have no adequate explanation to offer, is the occurrence of a very large proportion of unisexual flowers in the flora. About forty five per cent of the known flowering plants are unisexual, and of these a great number are dioecious. Several of these dioecious species are inconspicuous, such as the large liliaceous *Astelia*s, and the Mistletoe (*Tupeia antarctica*), yet their flowers are most distinctly entomophilous, being fragrant and nectariferous. It is a still more remarkable fact that in the outlying islands of the Lord Auckland and Campbell groups, which are distinctly oceanic, in the sense that they are isolated from all larger masses of land by a deep ocean, there are several re-

markably fine flowering plants, such as the Composites *Pleurophyllum speciosum* and *criniferum*, and *Celmisia vernicosa*; *Gentiana cerina* and the liliaceous *Anthericum Rossii*. The last-named is dioecious, and the others are most probably protandrous (judging only by the analogy of allied forms), but all have very beautiful and conspicuous flowers, and all are confined to these islands. Again in the Chatham Islands occurs the very fine for-get-me-not,—mis-called the Chatham Island Lily,—(*Myosotidium nobile*), retaining its beautiful pale-blue colors, as if evidently to attract insects. This plant, however, is self-fertile, but this characteristic must be an acquired one of comparatively late date. The flying insects of all these islands have never been investigated, yet it must be borne in mind that all the islands are of small size and are subject to strong winds; indeed the antarctic groups are swept by south west gales during considerable portions of the year. The question naturally arises, How are the flowers fertilized,—especially when dioecious as in *Anthericum*?

These are a few of the interesting points which botanists in New Zealand have met with during the few years since the insular flora began to be closely studied. The questions which arise are perhaps not so remarkable as those which the zoölogist meets with, but they bear on the same ground, and must be studied as closely in order that true views of the past biological history of these islands and of the geographical distribution of its organisms may be arrived at.

#### THE AMERICAN FOLK-LORE SOCIETY.

The fifth annual meeting of the American Folk-Lore Society was held in Montreal on Sept. 13th and 14th.

In the absence of Mr. H. Hale, of Clinton, Ontario, the president, and of Prof. Alcée Fortier, of New Orleans, the first vice-president, the task of presiding devolved upon Prof. J. P. Penhallow, of McGill University, Montreal.

The forenoon of the first day was devoted to the meeting of council, the report of which showed steady growth in membership and fair results in study, collection and contributions to the literature of the subject. The *Journal of American Folk-Lore* is now approaching the conclusion of its sixth volume, has proved both a stimulus to inquiry and a thesaurus of gathered data, curious and valuable. It is hoped that the scheme for the publication of special memoirs will shortly yield the first fruits of what may one day become a rich harvest. The members number more than six hundred, and there are flourishing local branches at New Orleans, Boston, Montreal and New York.

In the afternoon Professor Penhallow, as president of the Montreal Branch, delivered an address of welcome to the visiting members of the society. After touching on what had already been achieved in the working of the great northern field, he indicated several paths of folk-lore research that could be prosecuted best among the populations of Canada and called attention to many points of interest in the district of which Montreal was the centre.

Mr. W. W. Newell, general secretary of the society and editor of the *Journal*, expressed the pleasure that it afforded him to be again in Montreal. Hardly eighteen months ago he had shared in the organization of the local branch, and was naturally pleased to see it prospering. Coming direct from Chicago and the wondrous White City, which was "all mankind's epitome," it was a relief to survey a scene of repose and order and cleanliness, while still acknowledging the fascinations of the Fair, with its unique opportunities for seeing the world's diversities of speech, belief, costume and usage.

Professor Penhallow, having asked Mr. K. Boissevain to