BIRDS

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New Zealand Native Bird Protection Society

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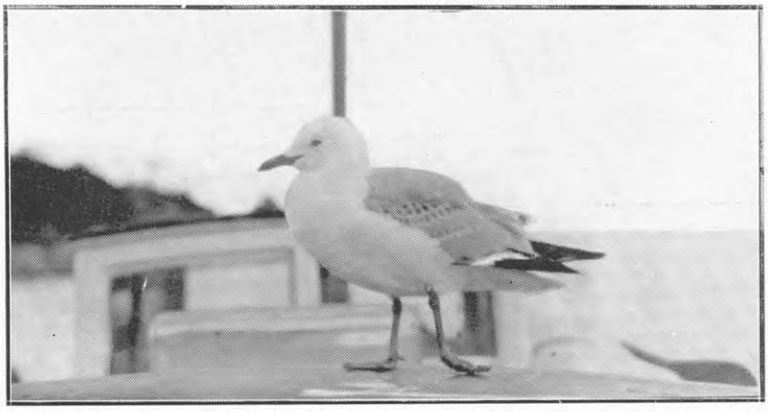


RED BILLED GULL—"A Free Passage."
[*Photo by B. Sladden.*

OBJECTS—To advocate and obtain the efficient protection and preservation of our native birds, a bird day for our schools, unity of control of all wild life, and the preservation of sanctuaries, scenic reserves, etc., in their native state.

Affiliated with the International Committee for the Protection of Wild Birds.

The foundation of true conservation is in the setting aside of sanctuaries efficiently and rigidly controlled by men who know how.

SUBSCRIPTIONS:

Life Members - £5.

Endowment Members, £1 per annum. Ordinary Members, 5/- per annum
Children - 1/- per annum.
(Membership open to all.)

New Zealanders! Protect Your Native Birds!

BULLETIN No. 22. **OCTOBER, 1930.**

WANDERING ALBATROSS.
[Photo by B. Sladden.

RED BILLED GULLS.
(Young Birds.)
[Photo by B. Sladden.

WHITE FRONTED TERN.
[Photo by B. Sladden.

There are no such things as "wild birds," they are merely scared of mankind.

[*Photo by Mrs. Gillanders.*

AFTER all! Are white people really ahead of the Maori or merely trying to get where he was? He had virility, which is the foundation of a race. We are losing it. He had hair to protect the top of his head and sound teeth to masticate his food and was, moreover, sound in limb and keen of eye. He tolerated no weaklings and worked not for the individual interest but in the interests of the community. He had good laws and enforced them, and understood the art of conservation which is preservation for the purpose of utilisation. The Maori lived on the interest Nature produced. We live on the capital. We may boast of our wireless, flying machines, motor cars, etc., but conveniently overlook the fact that Nature takes away that which we do not use as she did the use of the wings of the Kakapo, Weka, and Kiwi. In 100 years we have destroyed 90 per cent. of the forests which formed the soil upon which we grow our food, and a greater percentage of the bird-life which dwelt therein. The Maori lived in the same country for at least 800 years and kept the forests and birds intact. Shall we eventually succumb in an insect infested and eroded land or be wise in time and utilise the remnant of those gifts, which our Creator so bounteously bestowed, not in an endeavour to benefit the immediate individual interest, but in the interests of the community as a whole in perpetuity?

BACK TO THE ROCKS.

(By Captain E. V. Sanderson.)

In an instructive lecture delivered by Mr. B. C. Aston, President of the New Zealand Institute, at the annual meeting of the Wellington Horticultural Society, it was demonstrated how our forests developed upon the rock and pumice formation which at some remote period constituted the surface of this country. Initially moss-like growths, raoulia and such like obtained a footing depositing a modicum of humus as they lived and died. Thus were conditions prepared which were suitable for something of a sturdier growth such as tutu, wineberry, and other humus forming shrubs, while these in their turn prepared the soil for pohutukawas, manuka, tawhero, etc., and they in their turn deposited humus and eventually the forest was formed as we found it when our pioneers landed.

There is, however, a further aspect of the position when we come to consider how much of this humus-forming forest has been needlessly destroyed on the highlands which cannot continue to support pastoral industry beyond one or two generations, and add to this the ever-increasing destruction of the forests on our backbone ranges by plant-eating animals. Immediately these forests are sufficiently damaged or destroyed, surface erosion of the top soil sets in, and be it remembered that this top soil is rarely of any appreciable depth. Following upon this, the subsoil, loose stones and debris come down choking rivers and causing devastation and floods in our lowland agricultural lands. So the process goes on, if unchecked, eventually assuming such proportions that checking is beyond human power. Then, indeed, erosion has assumed the mastery. Rocks begin to show up on the mountain and hill tops, then later on the lower spurs, and eventually in the gullies, all the time spreading the debris over our once fertile lands lower down. Thus, in a country like New Zealand, where by far the larger proportion of our land is hill and mountain country, we are working back to the original rocks and at the same time forming other lands under the sea. All this is, however, nothing new. Plato warned us about 400 B.C., when writing of Attica which forms the eastern part of Greece, a country which has long since passed the heyday of its prosperity and where a once noble race ekes out a meagre existence. Apparently, however, the effect of forest depletion still goes unheeded in New Zealand. The following is the translation of Plato's words by Arnold J. Toynbee:—Contemporary Attica may accurately be described as a mere relic of the original

country, as I shall proceed to explain. In configuration Attica consists entirely of a long peninsula protruding from the mass of the continent into the sea and the surrounding marine basin is known to shelve steeply round the whole coastline. In consequence of the successive violent deluges which have occurred within the past 9,000 years, there has been a constant movement of soil away from the high altitudes; and owing to the shelving relief of the coast this soil, instead of laying down alluvium, as it does elsewhere, to any appreciable extent, has been perpetually deposited in the deep sea round the periphery of the country or, in other words, lost; so that Attica has undergone the process observable in small islands and what remains of her substance is like the skeleton of a body emaciated by disease as compared with her original relief. All the rich, soft soil has moulted away, leaving a country of skin and bones. At the period, however, with which we are dealing, when Attica was still intact, what are now her mountains were lofty soil-clad hills; her so-called shingle plains of the present day were full of rich soil; *and her mountains were heavily afforested*—a fact of which there are still visible traces.

There are mountains in Attica which can now keep nothing but bees, but which were clothed not so very long ago with fine trees producing timber suitable for roofing the largest buildings; and roofs hewn from this timber are still in existence. There were also many lofty cultivated trees, while the country produced boundless pasture for cattle. The annual supply of rainfall was not lost as it is at present through being allowed to flow over the denuded surface into the sea, but was received by the country, in all its abundance, into her bosom, where she stored it in her impervious potter's earth and so was able to discharge the drainage of the heights into the hollows in the form of springs and rivers with an abundant volume and a wide territorial distribution. The springs that survive to the present day on the sites of extinct water supplies are evidence for the correctness of my present hypothesis.

THE OLD TREE SPEAKS.

Feet grounded in Earth's titan heart,
My head wreathed in God's sky,
I see man come, pause, and depart,
As centuries sweep by.

—*Catherine L. Baker.*

OILY WATERS.

(From "American Forests.")

Oil leaks from a thousand and one sources have become a conservation problem of no mean dimension. The needless waste of oil, it is readily apparent, is a factor in shortening the life of our oil resources; but that is not the phase of the problem which legislation now pending in Congress seeks to ameliorate. This legislation, introduced by Representative Grant M. Hudson, of Michigan, and known as Bill H.R. 10625, is aimed to prevent the destruction of plant and animal life resulting from uncontrolled oil leaks and wastage.

One needs only to visualise the hundreds of thousands of places at which oil is used to-day to appreciate the magnitude of the problem of oil wastage and its menace to plant and animal life if not properly controlled. Wasted oil from any or all of these diversified sources finds its way to the ground or into sewers and is washed into streams or lakes. Much of it finally reaches the sea. Oil does not mix with water but is carried by water; and, as almost everyone knows, oil is incompatible to animals, birds and plants. Dr. G. W. Field, an eminent biologist who has made a life study of pollution, says in respect of oil waste in our streams:

"The oil forms a film over the water, spreading to rivers, bayous, marsh lands and the sea coast. It has been proved that an oil film one-millionth of an inch thick is sufficient to ruin the waters for fisheries. This film affects the fisheries in two ways; by destroying the fish eggs or the young fish, and by destroying the food upon which fish feed.

"Most fish deposit 'pelagic' eggs which, at a certain time in their life cycle, rise to the surface of the water. Here they come in contact with the oil and are destroyed. This oil film, too, becomes weighted with dust and minute debris, until it finally sinks through the water, carrying down with it all the microscopic plants and animalcules upon which fish feed, destroying them. This weighted oil film finally comes to rest on the bottom, destroying oysters and shrimps and killing the food plants which grow on the bottom."

These ill effects, Dr. Field says, may sound fantastic, but they have been proved beyond any doubt. Hunters tell of shores strewn with dead ducks which have starved in the midst of plenty. Examination of the birds' feathers revealed a coating of oil heavy enough to keep the birds from flying. With surrounding aquatic and plant life killed, the imprisoned birds succumbed to starvation.

Representative Hudson's Bill is designed to control this situation by making it unlawful for any person to discharge or permit the escape of oil into or upon the navigable waters of the United States. It would further empower the Secretary of Agriculture to prescribe regulations permitting the discharge of oil from vessels only in such quantities and under such conditions as will not be deleterious to health or sea food, to the migratory wild fowl or to the food supply of wild birds protected by treaty acts. While the effect of oil waste on forest growth is doubtless of minor importance, its effect in other fields of conservation, particularly fish and wild life conservation, has become critical in many regions, and the early passage of the Hudson Bill should be encouraged.

(Thin oil coatings of large extent are frequently present in Auckland and Wellington harbours.)

OUR HERITAGE.

Beneath the shadow of the mighty trees
In Tanes' holy woods, we stand and gaze
In silent awe, when, stirred by evening breeze,
The forest children dance on sunlit days.
For who can paint the beauty of the scene?
The rimu's grace? the flaming ratas red?
The feath'ry ferns? the magic hush serene?
The brooding spirit by the silent shed?

Now, "Tanes' flapping children" wake and sing,
And through the forest's green and leafy aisles
The bellbirds' chimes and tuis' voices ring,
Till all the sylvan world seems wreathed in smiles.
To setting sun the robins' vesper hymn
Peals forth and blends with warblers' fairy trill,
While fantails flutter through the forest dim,
Till dusky shadows creep across the hill.

In such a scene there often comes to me
The thought of what we owe the coming age:
The sense of deep responsibility
To keep intact our glorious heritage.
That we may hand it on without a scath
To those who follow us in these fair lands,
When comes the time for us who've kept the faith
To pass the blazing torch to other hands.

—D.L.P.

PUKEKO SURVEY.

The following is the result of a stomachic survey of the Pukeko, which was conducted by the Department of Internal Affairs consequent on the earnest solicitations of the Native Bird Protection Society. As will be seen, the result is altogether in favour of the Pukeko:—

District.	Number of Birds taken.	Approximate Date of Capture.	Where taken from.	Stomach contents.
			Manawatu.	
Manawatu ..	2	..	Swamp	Macerated green material, mostly grass.
„ ..	2	6/1/29	„	Macerated green vegetation, and seeds of *Lolium perenne* and buttercup.
Kairanga ..	4	19/2/29	From swamp with crop of partridge peas in near vicinity ..	Macerated vegetation, and seeds of *Lolium perenne, Poa annua, Eleocharis ovata, Carex* sp., and *Glyceria fluitans.*
Karere ..	2	21/5/29	Taken on crop of rape	Macerated vegetation, fat-hen and sedgeweed.
„ ..	2	29/5/29	From swamp area with crop of rape in near vicinity	Macerated vegetation (grass) and duckweed.
			Otago.	
Ranfurly ..	2	5/11/28	From vicinity of cropping-areas ..	Small roots and little macerated green material; also remains of insect-larvae and spider.
„ ..	2	11/12/28	„	Macerated green material and seeds of *Poa pratensis.*
„ ..	2	14/1/29	„	Macerated grass and part of an insect.
Waihola ..	2	12/12/28	„	Macerated vegetation and clover-leaves; also seeds of *Eleocharis ovata.*

Ranfurly ..	2	9/2/29	"	Chewed up vegetation, and seeds of *Eleocharis ovata, Alopecurus geniculatus,* and *Poa annua.*
" ..	2	6/3/29	Swamp	Macerated vegetation.
" ..	2	4/4/29	"	"
Waihola ..	2	18/3/29	"	Few rush-seeds and some rye.
Ranfurly ..	2	1/5/29	Two miles from cropping-area ..	Vegetation, few clover-leaves and rush-seeds.
Lake Waihola ..	2	10/5/29	Berwick	Macerated vegetation and large number of rush-seeds.
Waipori ..	2	13/6/29	At Lake Waipori	Macerated vegetation and rushes; also rush-seeds.
Ranfurly ..	2	11/6/29	From vicinity of cropping-area ..	Macerated vegetation only.
" ..	2	6/7/29	Near cropping-area	Macerated vegetation and oats.
" ..	2	5/8/29	From cropping-area	(*a*) Macerated vegetation and crop half-full of wheat; (*b*) macerated vegetation and one barley-grain.
Waipori ..	1	6/7/29	Waipori	Macerated swamp vegetation and rush-seeds.
" ..	2	16/8/29	"	Macerated black-swamp vegetation.
			Southland.	
Waimea Plains .	4	Dec. and Jan.	From vicinity of cultivated land ..	Macerated vegetation (grass).
Oporo	2	Ditto ..	Shot in oat-paddock	No oats found; stalks and heads of weeds and other vegetation.
Waimea Plains .	2	" .	Twenty-five chains from nearest crop	Macerated vegetation (mostly marsh-fox-tail); *Alopecurus geniculatus.*
" ..	2	18/4/29	From cultivated areas on plains ..	Macerated vegetation (grass) and oat-seeds.
" ..	2	14/5/29	"	Macerated vegetation (grass).
" ..	2	25/6/29	Taken beside an oat-stack	Macerated vegetation; oat and rush seeds.
" ..	2	25/6/29	From swamp, half a mile from cultivation	Macerated vegetation; oat and toad-rush seeds.
			North Canterbury.	
Cheviot ..	2	23/4/29	Alleged to be causing damage to stacks	Macerated vegetation (grass); few clover-leaves.
" ..	2	20/7/29	"	Macerated grass and other vegetation.

THE UNIQUE FLORA AND VEGETATION OF NEW ZEALAND.

For various reasons the plant-life of New Zealand is of peculiar interest, especially its extreme isolation from other land-masses, its flora of diverse origin but with an astonishing number of endemic* species and group after group of wild hybrids, the numerous and often peculiar life-forms of its members, its having developed unmolested by grazing and browsing mammals, and its vegetation, so diversified that only a continent extending into the tropics can claim an equality.

The ferns, fern-allies, and seed-plants by no means make up the whole New Zealand flora, but in addition hundreds of species have been described of the less highly organised plants (the mosses, liverworts, algae, fungi, etc.), but they certainly do not nearly represent the total number of such.

Taking the flora as a whole, a large proportion of the species are evergreen; conspicuous flowers are far from common; annuals and plants which die yearly to the ground are rare; water-plants are few in number; turf-making grasses are not abundant; and bulbous plants are almost negligible.

Altitude, on the one hand, and proximity to the coast, on the other, have a profound bearing on the distribution of the species. Thus about 140 species are confined to the coast-line or its immediate vicinity, and 9 families and 35 genera containing 41 species are virtually coastal. Then there are about 560 species which are confined to the lowlands and lower hills, and there are no less than 24 families and 103 genera which are purely lowland. Finally, there is a plentiful high-mountain flora, with about 510 species belonging to 38 families and 87 genera, which never descend to the lowlands, but as compared with the lowland flora the number of genera (only 16) confined to the high-mountain belt is trifling.

Latitude has also a strong bearing on plant-distribution, and, apart from a gradual change, there are three critical parallels of latitude—36 deg. S., 38 deg. S., and 42 deg. S.—near which (it may be somewhat to the north or south of the line) many species attain their southern limit. On the other hand, Cook Strait and Foveaux Strait are of but little moment as barriers to advance or retreat. Far greater is the influence of wet and dry local climates, which is most striking when two such areas impinge on one another as in the case of the wet area which extends from the Tasman Sea to near the eastern base of the Main Divide, which is forest-clad to the timber-line, and the dry area extending thence to the east coast, which is clothed

*Found wild nowhere else.

with tussock-grassland. In the dry area of Marlborough and the contiguous wet western area of north-western Nelson, there are 36 species confined to the dry area (locally endemic) and 39 to the wet area. So, too, dry Central Otago possesses 15 locally endemic species. Speaking of the distribution of the species in a wide sense, there is every transition, from those which extend continuously from the north of the North Island to Stewart Island to those found in only one limited area.

The physical features of New Zealand; its many types of climate, especially with regard to the annual rainfall and the number of rainy days; its varied altitude, ranging from sea-level to the snowfields of the Southern Alps; its many kinds of soils, particularly their water-holding capacity; the diverse frost-tolerating ability of the species; their aggressive powers—largely a matter of their life-forms and inherent plasticity—all these and other factors have led to a most varied *Vegetation* made up of a host of plant communities, some of which appear out of place in the Temperate Zone. Thus between tide-marks in the northern rivers and estuaries there is a true mangrove community—an unexpected occurrence outside of the tropics; and even so far south as north-western Nelson groves of tall palm-trees are a striking feature. But, more than all else of an unexpected character—though familiar enough to all New Zealanders—is the lowland forest, which resembles in no whit the forests of temperate Europe, Asia, or America, but is a true tropical rain-forest. This tropical character is shown in its groups of tall tree-ferns, which may exceed 40 feet in height; in its wealth of ferns of all kinds; in the abundance of woody, ropelike climbing-plants and huge perching-plants far up in the forest canopy; in the several tiers of undergrowth, consisting of low trees and tall shrubs with smaller shrubs and ferns beneath, and the ground clothed with a deep carpet of filmy ferns, liverworts, and mosses, while the tree-trunks are similarly clad: in short, the forest exhibits prodigal luxuriance of growth, and Nature, as it were, runs riot. Rarely does one tall canopy tree dominate, but the uppermost storey of the forest is constructed out of the crowns of various kinds of trees growing side by side, just as the undergrowth is composed of many species. But no forest is homogeneous in its structure, for differences in the topography of the area, in the water content of the soil, and in the relative amount of light in the interior of the forest, lead to various combinations of species. All the same, especially so far as the tall trees are concerned, there is an advance towards stability and uniformity, so that all the forests if not interfered with are progressing towards a "climax association," as it is named, with (as a rule) the tawa (*Beilschmiedia tawa*) dominant

to the north of latitude 42 deg., and the Kamahi (*Weinmannia racemosa*) dominant southwards.

The vegetation of the high mountains is both of great scientific interest and full of rare beauty. It is composed of no less than 966 species, and it is certain that a good many more species will be discovered. How strongly of New Zealand origin is the flora is revealed by the fact that of the 514 purely high-mountain species all except 16 are endemic, and probably 5 of these are endemic also. The headquarters of the true high-mountain species is in the South Island, their total being 473, as compared with 105 for the North Island, a matter which should cause no surprise since the area for plants above the forest-line is far and away less than in the South Island, where also the average height of the mountains is much greater.

With but few exceptions the most beautiful flowers of New Zealand belong to the high-mountain flora, so that in due season many plant-communities are natural flower-gardens of extreme loveliness. There are the giant buttercups, white and yellow—but nearly all the flowers are of these colours—which may be seen by the acre; the lovely ourisias, with the flowers in whorls round the stem, tier above teir, as in some of the Asiatic primulas, or the glistening green leaves, as in *O. caespitosa,* may form mats on stony ground bearing multitudes of delicate blossoms; the eyebrights—true alpine gems—their flowers white with a yellow eye or purple throat, or yellow altogether; forget-me-nots, yellow, bronze, purplish, or white; the snow-groundsel, its large marguerite-like flowers produced in such profusion that the mountain-meadow glistens like a snowfield; the two kinds of edelweiss, far surpassing their Swiss elder sister in beauty, the flowers of the "everlasting" kind, their outer leaves flannelly and snow-white. But above all other plants of the mountains, not only for their beauty of flower, leaf and form, but for their abundance in all situations, come the various species *of Celmisia.* "Go where you will"—to quote from "The Vegetation of New Zealand" (ed. 2, p. 238)—"on sub-alpine and alpine herb-field and their silvery foliage strikes the eye, it may be in stately rosettes of dagger-like leaves, in circular mats trailing over the ground, or in dense cushions. Their aromatic fragrance fills the air; from early till late summer some of their white heads of blossom may be seen, while in due season, gregarious species clothe both wet herb-field and dry stony slopes with sheets of white."

. . . . Finally, in course of time, a state of stability will be reached, and a new flora, composed partly of exotic plants and partly of those indigenous to the soil, will occupy the land, and *save in the national parks and scenic reserves, but only if these are kept strictly in their natural condition as to both plants and animals,* this new flora will build up a vegetation different from that of primeval New Zealand.

—Extract from "The New Zealand Official Year-Book, 1930, by Dr. L. Cockayne, C.M.G., Ph.D., F.R.S.

FOREST RANGERS.

Every public schoolboy in New South Wales is virtually a forest ranger, and within an area of two miles adjoining every public school in New South Wales is a sanctuary for native birds and animals.

Prompted by the Australasian Society of Patriots, the State Government recently declared an area of two miles adjacent every school in New South Wales a sanctuary for native birds and animals.

The declaration means that animals and birds, with the flora peculiar to Australia, must be protected within these areas.

STATE-WIDE SANCTUARY.

By declaring a two-mile sanctuary in the vicinity of every school, the Government, perhaps unwittingly, has made practically the whole of the populated portions of the State an area in which wild animals must be protected. In the coastal districts, particularly, where schools are encountered frequently, miles and miles of territory, without a break, automatically becomes a sanctuary.

The Australian Society of Patriots is hopeful that native bears, kangaroos, and other denizens of the Australian bush, will eventually come in closer to the schools in search of the food which the children are to be encouraged to provide. In this way first-hand natural history lessons will be obtained.

FRANCE TO PLANT TREES IN WAR AGAINST FLOODS

The Minister of Agriculture of France has sent instructions to local authorities for replanting forests with a view to preventing floods like the one in March last, which took a large toll of life and property in central and southern France. Reforestation is one of the features of the economic reconstruction plan announced by the Premier. It is believed that replanting of the stripped forests will aid in preventing a repetition of the disaster.

Extracts from debate at

55th ANNUAL MEETING OF AMERICAN FORESTRY ASSOCIATION.

"Conservation means a sustained effort to make good the mistakes of our pioneer forefathers, who were content to take all they could out of their immediate environment and then move on to fresh fields of exploitation. The pioneer left us not only the physical heritage of denuded and disorderly landscapes, but, what is still more serious, the psychological heritage of a lazy willingness to tolerate denuded and disorderly landscapes."

"We are challenged to substitute the psychology of conservation for the psychology of conquest. We must substitute stable and scientific agriculture for an unintelligent raping of the soil. We must substitute rational forestry for reckless timber slashing. We must learn to dress the land we have deflowered. We must become high-minded statesmen of our resources. With respect to all our natural resources we must exalt the common lot above the common loot."

"The kind of mind upon which the conservation movement must depend for its continuing vitality must be a mind that takes long views—a mind that can think in terms of the next generation as well as in terms of the next election. It must be a mind that realises the complexity of the conservation problems as well as a mind that works for a co-operative leadership of the nation rather than competing leaderships in the nation."

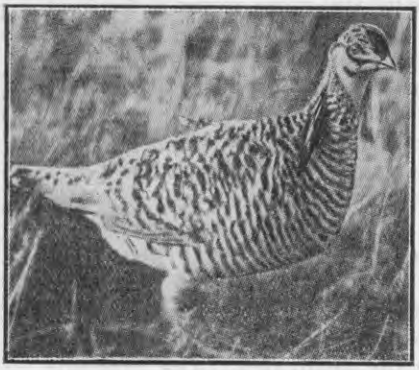
"Men and women as individuals are too concerned with individual advantages to be influenced greatly by considerations of general welfare.

"There is little justification for scolding our pioneers for their shortsightedness unless we show ourselves possessed of more vision—unless we take steps to prevent so far as we can a repetition of the old blunders. We are feeling the increased economic pressure which is the penalty the sons in the third and fourth generation are paying for the sins of their fathers. We should be recreant if we did not avoid the errors which, if continued, will cause even more serious visitations upon our children.

"But if those visitations shall be averted, it will be because of a new attitude on the part of the governmental bodies and not to any great degree because of a change of practice on the part of individuals. For the individual is motivated by his immediate rather than his remote incentives. He holds the penny of to-day too close to his eyes to see the dollars which might be made to represent to-morrow's prosperity."

THE LAST HEATH HEN.

From American Nature Magazine.



THE SOLE REMNANT OF A DYING RACE.
The Last Heath Hen.

The last of his race. Solitary, conspicuous, with never a sound, he feeds quietly on the farm of James Green near Tisbury, Martha's Vineyard Island, while bird lovers come from far and near to study him and to pay him homage before death blots out his species.

To the traditional "booming" ground, where, in former years, flocks of his kind gathered to carry on in the early morning and late twilight hours that curious courtship performance, he came once more this spring, perhaps for the last time. But the warming days meant nothing to him. Not once did he inflate his curious orange sacs. Not once did he boom majestically, as males have been wont to do to attract a mate. He knew. There was no female to admire him; no male to challenge him to such exertion. So he contented himself with quiet feeding, now crouching invisible against the ground as a hawk's shadow floated by, now erecting his head carefully to scrutinise the surroundings—a pathetic figure.

Once so plentiful in the East that servants in their contracts with their masters stipulated that its flesh should not be served more than twice a week, the heath hen has gradually dwindled. Legislation in the past was inadequate and irregular. Though as early as 1839 Lewis rated it as a rare species, it was continually shot down and destroyed. Completely exterminated on Long Island and in New Jersey, where it had formally been abundant, it made a last stand on Martha's Vineyard Island. The State of Massachusetts, through its Division of Fish and Game, generously aided in the fight to save the species, and up to 1925 had expended more than 56,000 dollars on this work. But a series of disastrous springs, fires and epidemics cut down the brood, and by 1927, only three birds were left. The last two annual heath bird censuses, taken by Dr. A. O. Gross of Bowdoin College, have revealed but one lone individual.

This single bird has been accorded all the honour and attention due to a sole representative of a dying race. For more than a month this spring extensive observations and photo-

graphic records were taken, so at least in books the species will be preserved. It may seem ironic to some that so much fuss is made over him now when a little less neglect in years gone by might have kept his kind alive. And still more ironic is the fact that he has been allowed to live out his natural existence amid the scrub oaks and fields instead of being killed. This privilege of life and liberty has too seldom been accorded his brethren—if it had, a different story would now be told.

He is a symbol, this last heath hen, silently living out his few remaining days amid the scenes of former heath-hen glory—a symbol of the slowly but steadily departing wild life. His pathetic figure carries the tragic story of the passenger pigeon, the great auk, the Carolina paroquet—and the heath hen. For these only one epitaph need be written—"Created by Nature's bounty, destroyed by the wantonness of man."

The State of Massachusetts has helped conservation immeasurably by its efforts to save the heath hen. The dramatic passing of the last specimen may so stir the imagination of men as to make it impossible for other dwindling races to be exterminated at the hands of humans. If so, the last heath hen will have done his share; his race will have been exterminated not entirely in vain.

BIRD-ENEMIES.

Bird-enemies are legion—bird-enemies are everywhere. One wonders how the little birds can have the grit to throw back their heads and sing when death continuously hovers over them.

Birds respond more quickly to protection from enemies than to any other factor. Where enemies are few, birds abound. The converse of this is true also, however; where birds abound, enemies will assemble. A Bird Sanctuary that does nothing towards lessening bird-enemies cannot expect to have very many more birds than the surrounding country because, as soon as the bird-life increases, a "feeding station" for cats, rats, weasels, etc., has been automatically set up and they are just as sure to move in as were the birds when their food was increased. Especially is this true of stray cats which will come from miles around in the hope of catching some of the birds. It is very often necessary to reduce their numbers.

The same may be said for the powerful and ever present Norway rat—it often becomes a fierce bird-killer and destroys every nest it can reach.

The slingshot and air-gun do not kill many birds, but they certainly can disturb the peace of mind of birds and keep them ever timid. They should naturally be discouraged everywhere and especially near a Bird Sanctuary.—*Bird Lore.*

BILLY AND BOBBY.

(By Leo A. Luttringer, Junr., Harrisburg, Pa.)

Most any kind of wild creature can be tamed if one has the patience to attempt it. This is why Billy, the Broad-winged Hawk, and Bobby Bozo, the Robin, became fast friends, instead of Bobby finding his final resting-place within the confines of Billy's usually empty stomach. And why he didn't is still a mystery to me, especially when I think of the unusual conditions to which both birds were constantly subjected.

Billy, the Broad-wing, came into my household first, having been shot from a migrating flock which passed over our town. He was brought to me, as it is generally known that I am a lover of birds and have raised many kinds in captivity. Billy had a badly shattered wing, but I managed to get it into such shape that he could fly, at least a little. The bone mended just a wee bit crooked, however. My first few days' acquaintance with Billy were not so friendly and I was clawed considerably. But before the first week was over he was eating from my hand and soon came to look for me at meal-times, when he would fly to my arm and whimper for food. Billy's domain consisted of the entire cellar, where he was left to roam at random and where he selected the top of the coal-pile as his "throne," so to speak. Here he was the "boss" of all he surveyed.

Billy had no sooner got into fair shape than some "kind" friend, who thought I hadn't anything else to do, brought me two baby Robins, so young that they had to be fed nearly every minute. I wasn't much inclined to add to my miniature zoo but couldn't refuse the little creatures. Moreover, my position with our State Game Commission calls, in part, for this sort of work.

So I took charge of the young Robins and at once set about getting their "grub." In a few days I had the entire lot back of our home looking like a series of front-line trenches. I dug here, there, and everywhere in an effort to locate worms for two bottomless stomachs. They wouldn't eat anything but worms, while Billy, the Hawk, liked nothing better than his daily ration of beefsteak and an occasional mouse, when I could get hold of one.

I had been keeping the Robins in a basket in the kitchen, but their cries for food were so shrill and constant that my wife politely informed me they would "be missing" some day unless I found another place for them. I therefore transferred them to the cellar to determine whether all I have heard about the bad habits of our Hawks were true. Billy inspected them very carefully the day they entered his domain, but after that hardly ever

paid any attention to them. Even when hungry he would not eat the Robins.

Time passed and both Billy and Bobby waxed fat and so friendly that sometimes the Robin would sit on the Hawk's head.

Soon Bobby was able to fly, and I let him go outdoors, placing a little cage on the back porch for him to go into when tired of searching for food. He was away most all day, as a rule, but would always return at evening and roost in his cage. One day he came home appearing somewhat ill. Later he became worse, and finally died. Examination showed the presence of many long, thin, white worms in his windpipe.

—*Bird Lore.*

WINTER AIDS FOR BIRDS.

The Poroporo (Bullibull) is a very valuable fruit-bearing plant for bird food. It fruits in its first year and in the winter when the need is greatest. It loves a well drained, moist situation, and grows with great rapidity. Its life is but three years, but it readily seeds itself. Tuis in particular love the fruit as do all birds.

The exotic tree lucerne furnishes nectar in abundance just when many birds require food. Stock love it, and it can be made a valuable aid if fed to sheep and cattle in times of hardship. It is also an excellent firewood, but should be cut up green as it becomes exceedingly hard when dry. It is a soil improver being of a nitrogenous nature. If fenced from stock it will perpetuate itself and supply an unending source for firewood, cattle food, bird food, and shelter. This tree matures in three or five years and lives no longer than 15 years under favourable conditions. If constantly cut it lives even less. Its only fault is that no matter how closely planted it will not adopt a pole form but sticks to its spreading nature and kills the less virile plants of the same species around. Tree lucerne has been successfully used to afford the necessary shade and shelter when establishing native tree plantations. When so used the lower branches should be removed from time to time and the tree kept in reasonable subjection by lopping. When the native tree plantation is fully established, the tree lucernes are removed.

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