Forest and Bird

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(See page 16).

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Waterfowl and Other Wildlife

AFTER many authoritative statements have been given that there would be no shooting season this year, the Department of Internal Affairs has now bent to pressure from the shooting fraternity and decided to allow a season of two weeks. The fact that we are now at war and that ammunition is urgently required should surely have restrained all who have the interest of this country at heart from inflicting death and wounds on inoffensive and particularly valuable wildlife.

Many statements quite devoid of verification have been put forward by hunting organisations to attain their end, such as that ducks are increasing, that ducks have bred well during the past nesting season, and that many pairs have had a second brood. If ducks are increasing under the present method of wildlife management and under the present parlous condition of their food supply, shelter and protection, then it is an unheard-of happening, while the fact that ducks are endeavouring to rear a second brood is an indication that the first brood was lost.

The past nesting season has, moreover, been an exceptionally late one, generally speaking, and when shooting commences it will not be a matter of surprise to learn that many immature birds are being shot.

A two weeks' season may appear to be a concession to the ducks, but the object is undoubtedly revenue, and no great respite will result to the sorely-pressed waterfowl, because more ducks are killed on the first two or three days of the shooting season than during the remaining part of the season. On the opening day, especially, nearly all waters are manned by shooters and the unfortunate birds are killed as they alight by hidden gunners. Some remnants finally seek rest at sea, if the weather permits. But are short seasons or even closed seasons likely to be permanently helpful in preventing the extermination of some species of waterfowl? On account of the weak manner in which the game laws are administered in New Zealand they are probably not likely to be so, but would result merely in bigger bags the following season despite bag limit regulations.

What worth-while attempts have been made in New Zealand at conservation? Considerable sums of money (license-holders' money) have been spent on killing predators, natural and unnatural, much on the least harmful hawk and none on the more harmful rat, which is the common prey of the hawk, and probably the greatest destroyer of ducklings. The result to date is that upland game birds are almost a thing of the past and waterfowl are steadily declining in numbers. No research of the slightest worth-while nature has been undertaken, and thus any steps taken with a view to increasing the stock of game birds have been the result of mere guesswork and surmise. How do the past methods adopted in this country, where the problems are of a comparatively simple nature, compare with the methods of other countries, where the problems are of a much more complex nature owing to non-isolation, a cosmopolitan people and complex forms of government, as for example the United States of America? There it was realised in 1930 that wildlife, especially waterfowl, was rapidly declining in numbers. A special committee of six experts with a senator as chairman and a secretary was immediately set up under Senate Resolution 246, to investigate all matters pertaining to the replacement and conservation of wildlife (including aquatic and all bird life) with the object of determining the most appropriate methods for carrying out restoration. It was recognised that wildlife is dependent on its environment for food, shelter and a place to breed and rear its young.

The Special Committee, early in its investigations, concluded that if waterfowl were not to be exterminated, a national refuge system would immediately have to be undertaken, consisting of strategically placed sanctuaries throughout the land on lines similar to those suggested by the Forest and Bird Protection Society of New Zealand. (A chain of efficiently managed sanctuaries throughout this country was suggested in February, 1938, as the correct procedure for preventing the extermination of our native waterfowl.) President Roosevelt was approached. He immediately recognised the urgent need for sanctuaries and set aside one million dollars to inaugurate the scheme at once.

That was in 1933. Other funds were later set aside by Congress as needed by the requirements. To-day, seven years later, the programme is more than half completed.

The Special Committee made personal investigations of some of the more acute problems. They recognised that research in the wildlife field was indispensible because all the factors affecting problems had to be understood before a comprehensive wildlife restoration plan could be inaugurated. Research is tedious and painful and sometimes requires many years before all the factors become known. Food, habits, disease, migrations, soil and climatic conditions, predators and many other factors influencing wildlife have been and are being carefully examined by the Biological Survey and other organisations.

The results achieved so far are that, despite the rapidly increasing number of hunters in the United States, shooting seasons are being extended, not curtailed, while the sanctuaries set up as waterfowl refuges have proved to be the saving factor in preventing the extermination of some expiring species of non-game birds.

The secretary of the Special Committee states in his report:—

> "Wildlife is an organic resource, a product of the soil inseparable from the land. It depends upon the land for its nourishment, its protection and its very existence, and these essential requirements can be produced only through the wise use of land and water resources. Fortunately wildlife is one perishable natural resource which readily responds to sound management, and many practices which are beneficial to the soil provide the very things needed in wildlife conservation."

Once again therefore we return to the all-essential topsoil and its protector, the native vegetation, in the form of strategically placed native forest and other native plant life, which forms an affinity with the soil and prevents its destruction by erosion.

Let us hope that some day the shooters, fishermen and indeed all those interested in wildlife will recognise that the well-being of each of their particular spheres hinges on the conservation of the topsoil and its protecting factors, that natural resources are inextricably interallied in matters of conservation, and that the work of unravelling the many problems arising is a job for one efficient organisation staffed by a skilled and enthusiastic personnel, whose aim would be to work for the common good. Such an organisation would be found in an efficiently managed Department of Conservation. The need for action is here to-day, nay, the time for action is long overdue. The preservation of the topsoil, upon which all life depends, should have prior attention to anything else and calls urgently for the best brains procurable, or, to put it in the words of a writer in "British Empire," "the greatest problem of all facing the Empire to-day is not political or racial, or is it essential defence by armaments; it is geological, for without arable lands and a good water supply the British Empire would soon cease to exist."

GREY DUCKS ON A SANCTUARY.

[Photo : Rangi Webber.

Forest the Preserver; Fire the Destroyer

(By Lucretius.)

APPROPRIATELY placed native forests are a country's greatest asset; for the forest is the greatest preserver of the soil, and our very existence depends on the soil and its continued fertility.

Many past civilisations have perished as a direct result of wanton destruction of their forests. Who has not seen pictures of the ruins of fine cities in North Africa, Asia Minor, Persia, China, etc., etc.? Did Darius, the great Persian conqueror, build his huge palace at Persepolis in an uninhabited waste? China 2,500 years ago had abundant forests; to-day wood is very scarce indeed in China, such forest as remains are being confined to almost inaccessible mountains. Destruction of the forest in the catchment areas of the ancient Mesopotamian irrigation system, the finest ever known, resulted in the formation of desert. The Mediterranean countries all show striking evidence of the dire results following deforestation. In Karst, for instance, naked rocks are found where once was forest. The country knows nothing but drought, all the rain that falls being lost in rock fissures or evaporated from the hot rock.

Until 1852 the foothills of the Himalayas in the Punjaub were used as hunting grounds and were covered in forest. In that year the British annexed the Punjaub and handed over these foothills to the villagers. Fire, the axe and the goat soon destroyed the vegetation. This area is now an oft-quoted example of the effects of accelerated erosion — a fertile wooded land which fifty years later was well-nigh useless.

The French Niger Colony is now largely desert, but two hundred years ago this huge tract of land had forests and its peoples were prosperous.

Innumerable other examples of the consequences of spoliation of the forests might be drawn from Africa, Asia, America and Australia. No continent has not suffered.

In New Zealand the impoverishment of our native forest resources by fire and improper management is a matter of immediate concern; it is the concern not only of the timber merchants, but of manufacturers, bankers, farmers and indeed every one of us. Already in this country, barely a hundred years old in white man's history, far too much of it has gone. It behoves us not to be heedless of the lesson of the Punjaub and other places where the forest has been destroyed.

Soil eroded is soil lost, maybe for ever. But it is well to remember that the soil, with its bacterial and other minute life, the vegetative covering and the animals living therein, constitute one whole, whose parts cannot be considered as separate entities. Vegetation certainly grows on the soil, yet were it not for vegetation there would be no soil. Soil consists of more than disintegrated rock and water; it has an organic part, the humus, derived mostly from decayed vegetation.

All vegetation helps to form soil and to protect it from being washed away by excessive rainfall or being blown away by wind, but the best form of vegetation for protecting the soil is forest in its natural condition, especially where the terrain is rough.

Trees, as everyone knows, act as protection against wind, but their action against other erosive agents is not so well known.

The canopy of leaves and branches prevents the beating effect of rain falling directly on the soil. Leaves drip for as long as an hour or more after rain has ceased falling. Dew and mist condensing on the leaves act in a similar manner.

When the water has dripped from the leaves it falls on to the litter of leaves and other debris on the forest floor. This litter, together with the underlying humus, absorbs the water, preventing a rapid run-off, and gradually passes it down to the deeper layers of soil and subsoil, where it is held as an underground reservoir. A large quantity of the underground water is absorbed by the roots and returned to the atmosphere as vapour from the leaves, but most of it seeps through the soil to the streams.

Streams arising in forested regions remain clear, and their water content does not vary much throughout the year. Thus it is that forests are the great controller of floods, and by far the least expensive.

One hundred and fifty years ago the local

laws governing the forests of the French Alps were repealed and clearing for grazing purposes began. Erosion of the soil followed, and in a short time 800,000 acres of farm land were ruined by silt and debris and the population of 18 departments were reduced to poverty. Between 1845 and 1901 the population was reduced by 50,000. In 1856 enormous floods caused great loss of life and damage amounting to close on £8,000,000. In 1860 reforestation measures were begun, but failed; but in 1882 a colossal scheme for restoring the native forest cover at the headwaters of the flooding rivers was evolved in order that the mountain torrents might be curbed. Up to 1900 66 million francs had been expended, with satisfactory results, and it was then estimated that the work would be completed by 1945 with a further expenditure of 115 million francs. At the present time almost all the torrents have been brought under control, and the erosion is now no longer a menace. French engineers after many experiments have come to the conclusion that forest cover is the best way of controlling erosion and that the existence of forested headwaters is the only effective way of controlling river flow.

New Zealanders should bear in mind what happened in France when the forest protecting the headwaters of many of their important rivers was destroyed. A few trees wantonly destroyed cost millions of francs and years of time to replace, and it was necessary for the well-being and safety of the people of France to have them replaced.

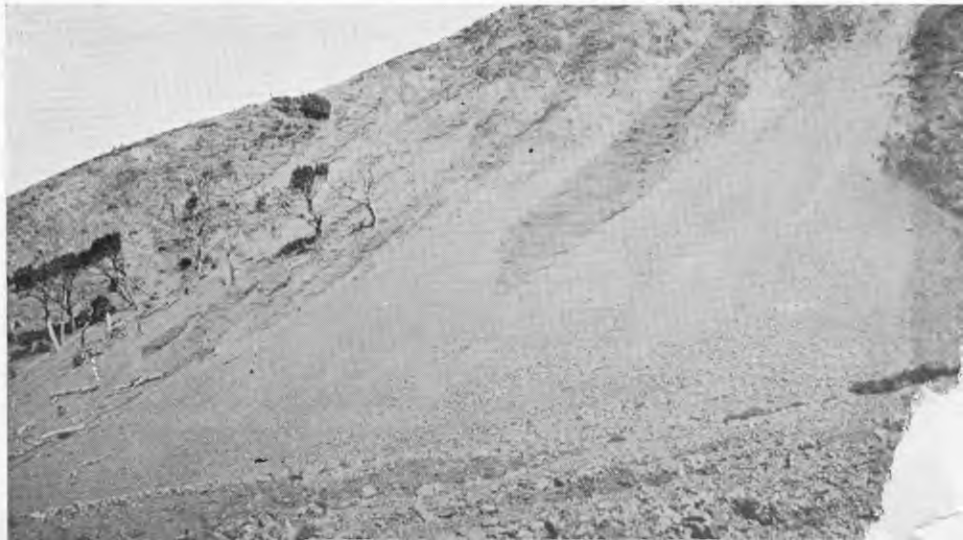
In the higher levels of New Zealand forests prevent the freezing of the ground (a very potent erosive force where the soil becomes exposed) and delays the melting of snow. These two effects of the forest in preventing erosion at high levels and floods lower down are very important, though rarely mentioned.

It is very essential therefore that all high country clothed in natural native vegetation should promptly be declared inviolate reservations.

And now that summer is here, the bush fire is also here. Let people be careful not to start fires which might spread to forest or other vegetative covering of the soil.

Fire, by destroying forest cover, causes excessive water run-off and spells destruction to all forms of wildlife. It kills trees and thus destroys the protective canopy. Those trees it does not kill it damages, and insect pests complete the ruin. It burns the undergrowth, the invaluable litter on the forest floor, and destroys the underlying humus. When the covering is burnt off the soil is exposed and unprotected, so that it soon dries out, its structure and life are destroyed, and it seriously erodes when rain falls or the wind blows. Water is no longer absorbed, but runs off rapidly, an agent of destruction. Silt-laden streams contain little or no aquatic life, the silt is deposited where it is not required, the bed of the stream is raised when the velocity of the water is lowered, floods are caused, etc., etc. One small fire might cause untold damage if allowed to spread.

New Zealanders, don't let your forests burn, keep them growing! They protect the soil, from which we derive our nourishment, and which is our country's and our Empire's first line of defence.



A RESULT OF FOREST DESTRUCTION IN NEW ZEALAND

THE TURNING OF THE TIDE

(By Hugh Ross.)

THE tide had gone out and the mud-flat, its black surface wimpled with countless shell-fish, lay awaiting the encroachment of the channel waters. Yet that big tract of mud, for all its barren appearance, was literally festooned with life. Small scuttling crabs, almost as numerous as the shell-fish, were eagerly foraging for food a short distance from their burrows. At one spot they were packed layers deep in a hideous, pulsating mass; nothing but crabs was visible although a close investigation would have revealed the remains of a fish beneath. There were a great number of red-billed and black-backed gulls, mostly congregated into small flocks, dotted here and there upon the flat. For the most part these birds slept, although odd ones still preened their feathers. Later the flocks would divide, at which time the individual birds ran hurriedly hither and thither to seek meals at the edge of the incoming tide. Solitary birds had already started; they were thoroughly investigating isolated pools to the consternation of miniature inhabitants therein, who, having marooned themselves with the idea of avoiding voracious attacks of larger fish, were now finding themselves at the mercy of foes equally formidable.

Drifting slowly across the estuary was a shadow, whose owner, a harrier-hawk, came down-wind from the west. He was flying at a fairly low altitude, perhaps sixty or seventy feet, a convenient height, too, for it enabled his wide-open yellow eyes to take in every detail of the panorama unfolding beneath him. On he went, searching, searching for the food that past experience had taught him was usually to be found here. At a biggish pool his flight halted momentarily. He twisted about and made a half-hearted dive at something which evidently fled to the safety of deeper water because the would-be marauder straightened from the attack and flew on. At length he came to that place where the crabs feasted. Without the slightest hesitation he swooped down to alight upon the mud near by, sending the crabs scuttling with desperate haste for safety. Hardly had the last of them left the fish than the harrier-hawk commenced his meal.

While the hawk feasted, a change was taking place out in the channel. The current had abated in force until particles of drifting rubbish remained stationary upon an unruffled surface.

Abruptly a soft stirring took place in the waters; three wavelets rippled in quick succession up-stream; water half an inch deep washed from the main channel to froth and hiss upon the hot mud. As though at a given signal those dozing sea-birds, almost without exception, raised their heads and rose with unhurried deliberateness to their feet. Many of them were hundreds of feet away from the swelling flood yet they knew, instinctively perhaps, that the tide was on the turn.

Meal time in the estuary! What symptoms of excitement were being exhibited by the birds! The flocks commenced to break up. They called, sharply and insistently, the harsh notes of the red-billed gulls being almost drowned by the shrill, wierd-sounding "kli! kli! kli's!" of the black-backed gulls, who, opening yellow bills, gave free vent to their vocal organs. Then, one and all, they began to feed. For the main, although spreading out along the channel to some extent, all the birds kept fairly close to one another. Very little fighting and pushing took place, each bird taking care to maintain a prudent distance between himself and his neighbour. Now and again, however, a luckless member of the party, too ardently concentrating upon a succulent tit-bit tantalizingly avoiding his attempts at securing it from the tide-wash, would inadvertently collide with a neighbour. Then there would be a quick burst of temper from the bumped bird and the lightning flash of a bill. "There!" the insulted bird seemed to say, "maybe that will teach you to stop pushing a fellow around." And there was never a doubt but that the lesson served its purpose, because the bitten one would inevitably utter a cry of alarm and hasten away to another place.

There were two or three species of birds who seemed to go daily to meet the tide, birds, moreover, that one would have considered had little place in such incongruous surroundings. There were pipits, or native larks, for instance, and a glance at their corpulent forms made it

obvious that they derived a very good subsistence indeed from their unusual environment. These birds kept well away from the large web-footed ones, and exhibited a wild enthusiasm as they retreated and advanced before the tide. They were never still for so much as an instant. Back and forth they ran at absolutely "flat out" speed seeking food amid the dirty white froth being pushed resolutely forward by the steadily-advancing waters. Minute particles of food they found; but what the food was I have been unable to ascertain, for although I have been privileged to approach quite close it is impossible to tell just what takes their fancies. Comical, too, were their actions. They never for a moment forgot that disaster in the shape of wavelets might overtake them. When a wave came (and they approach with surprising rapidity) the particular pipit whose well-being was menaced would tear along for dear life just ahead of his following foe. He would shoot a quick glance over his shoulder and discover that he was being overtaken. "Cree!" he would call excitedly, "cree-ee!" His diminutive legs would literally appear to twinkle, so rapidly were they moved. He would give another quick glance backwards and seeing himself almost overwhelmed would have to resort to his wings. However, he apparently derived considerable enjoyment from the adventure, for he would alight a yard or two behind the now receding wave and with his triumphant "cree," run hurriedly back to the foam.

By and by the harrier-hawk would come along flying, driven away from his former position by the onrush of the waters, but not deprived of his prey. Gripping the remains of his red cod fast in his claws, he would triumphantly bear it away to high ground. He was indeed a shrewd old hawk. He had learned that profit was to be derived from patrolling that big stretch of mud at low tide, that to do so brought all manner of grist to his mill. I found his nest in the big red tussocks beyond the wi wi (the short rushes growing on the tide-edge) and in it ready for his family's breakfast was a small eel freshly killed. Whether or not he had captured it alive from one of the numerous shallow pools dotting the estuary at low-tide I am unable to say. I am inclined to believe that he did.

At high tide all the gulls have disappeared and with them a wary old paradise drake, who apparently prefers their fellowship to that of his own kind. A scant handful of grey ducks dot the water and perhaps lone pukekos patrol a beat of their own at the water's edge. In the shooting season about a hundred swans seek the safety offered by this comparatively large stretch of water. Directly the season closes, though, these birds depart for what are evidently more favoured haunts. . . . . but see, the tide is turned once more, is going out. Already there are a number of small isolated islands appearing and a good chain of dry land at the edge of the wi wi. The paradise drake comes winging across to alight with a flurry of wings upon an island. A seagull joins him, and then another. Red-billed gulls are gathering on another island. A native lark, corpulent and sleepy upon a large drift-log, rouses himself and walks up and down once or twice. "Cree," he says happily, "it won't be long now till dinner time."

THE BIRDS MOVE OUT TO MEET THE TIDE.

Timber on Farms

(By Rakau.)

The New Zealand farm is too often a bare, unattractive place with barbed-wire everywhere instead of the hedges that would give shelter to animals and enhance the value of the property by increasing its look of comfort and of care for the stock. Even on the largest estates the usual way has been to destroy every scrap of timber. Now, when fencing posts are required, the owner is put to great expense; his ignorance brings its retribution in the place where he feels it most—his pocket. England can teach the colonial much in that particular of country life. New Zealand, after getting rid of its native woodlands, so admirably designed to shelter and nourish the land, has not yet realised that trees are necessary for existence. The old-settled parts of the Waikato and the Canterbury Plains are tolerably well planted with shelter trees, and the tall groves and thick evergreen hedgerows give such expanses of level and gently undulating country an aspect of beauty and of intelligent farming. Grass is not everything; a farm should provide its own firewood and the small timber needful in so many ways. Shelter from wind, frost and sun is as essential as food is for stock.

Forest and Bird Destroyers

AN OLD SETTLER'S VIEWS.

"ONE of the greatest crimes of civilisation has been the way we have dealt with our forests. For the sake of a few, sadly few, years of more or less indifferent grazing we have denuded our steep hillsides of the cloak of beauty that clothed them, and now that the roots are decaying the land is slipping off the hill faces, leaving an unsightly bare ruin, of no value to man or beast, and destined all too soon to become a wilderness of noxious weeds. We have cut out in the most wasteful manner possible our great stands of timber, using perhaps one fourth of it, and allowing the rest to burn and rot. By doing mischief in this wholesale manner we have choked up our river-valleys, flooded our rich alluvial flats, and dried up the spring that means so much to the pastoralist."

Increase of United States Waterfowl

AN increase of 50 per cent. in the waterfowl population of the United States has been effected through Federal restrictions on shooting and establishment of bird refuges, according to Dr. Ira N. Gabrielson, Chief of the United States Biological Survey, in an address before the thirty-fifth annual convention of the National Association of Audubon Societies at the American Museum of Natural History.

The Federal programme for wild life conservation has made such progress during the last six years, he told the convention, that nearly 12,000,000 acres have been added to waterfowl refuges, which now cover 13,500,000 acres, as against 1,600,000 acres in 1933.

As a consequence, he said, the waterfowl population which includes ducks, geese, brant and other birds has practically doubled. To establish more units in sections where there is need, Dr. Gabrielson urged the restoring of marsh ground.

"One hundred million acres of marsh land has been destroyed in the United States in the last 50 years," he declared. "If we can put back 7,500,000 acres, we will be doing well. We feel it is necessary to have at least 3,500,000 additional acres of marsh in strategic points before we can be absolutely assured of the safety of the migratory waterfowl population. This 3,500,000 acres of marsh, if and when it is restored, will also mean much to all of the non-games species which utilise such environment."

("Christian Science Monitor.")

Poor Soil

makes

Poor Communities

and

Poor People

—Patrick Henry

A FAMOUS DOCTOR TO HIS PATIENT, A COUNT

The Doctor: "To think that there are men capable of killing this harmless little songster!"

The Count: "You are an idealist, my dear doctor."

The Doctor: "No, they call it sentimentality and only sneer at it. Let them sneer as much as they like, I do not care. But mark my words! The time will come when they will cease to sneer, when they will understand that the animal world was placed by the Creator under our protection and not at our mercy; that animals have as much right to live as we have, and that our right to take their lives is strictly limited to our right of defence and our right of existence. The time will come when the mere pleasure of killing will die out in man. As long as it is there, man has no claim to call himself civilised; he is a mere barbarian, a missing link between his wild ancestors who slew each other with stone axes for a piece of raw flesh, and the man of the future. The necessity of killing wild animals is indisputable, but their executioners, the proud hunters of to-day, will sink down to the same level as the butchers of domestic animals."

"Perhaps you are right," said the Count, looking up in the sky once more as we turned our horses and rode back to the Castle.

(Extract from "San Michele," by Dr. Axel Munthe.)

Individually the goat is the most destructive of all plant-eating mammals. Owing to its agility it is able to open up tracks into localities which were hitherto inaccessible to animals not so sure-footed and thus assists deer and their like in their destructive work. St. Helena, Cyprus, Greece, Turkey, and many other lands have grievously suffered as the result of the ravages of goats. In New Zealand we have the common goat, angora goat, chamois and thar busy in very considerable numbers, seriously destroying protective forests and much other vitally essential high-country plant life.

Photo courtesy Royal, Nelson.

SOIL EROSION IN GREECE

(From "Soil Conservation," November, 1940.) (By Constantine I. Nevros.)

AN interesting article entitled "Poor Man's Cow" on the position of goat breeding in Greece appeared in "Soil Conservation" for October, 1938. The goat has many virtues, but it should not be forgotten that the goat is the animal responsible for the extensive destruction of Greek forestry, the consequent erosion of the soil of Greece, and the barren and arid character of so much of the country.

The history of soil erosion in Greece is not without interest. In classical times large portions of Greek forests were felled to provide lumber for the construction of Athenian triremes, but even before that time, according to Plato, forests were destroyed and in mountainous regions were often razed for various reasons. Even so, the phenomenon of erosion was of a rather local character. The goat was not so important as a destroyer in those days. The nomadic stock breeders of antiquity had at their disposal, in a country more or less thinly populated, sufficient valley land to allow them to remain in the lowlands.

The serious destruction of Greek forests appears to have started during the Roman invasion in Macedonia. The Greeks lost their fields in the fertile plains, and took refuge in the mountains, where they were forced to become stock breeders. The goat was to them the ideal animal because it can feed on twigs and shrubs unsuited to sheep and cattle. The descendants of these refugees appear to be the modern nomad Greek mountaineers.

The Turkish domination of Greece had a similar effect. On a larger scale than during the Roman occupation, the Greeks lost their fields and took refuge in the mountains where stock breeding was the only possible occupation. Arboriculture was out of the question because cultivation of trees requires a high agricultural standard and sufficient means of transport to markets.

The "poor man's cow," now in large domesticated herds, set about its destructive work. Every shoot and twig was nipped off as food as soon as it showed. When the large trees died they were not replaced and the hillsides gradually become bald spaces at the mercy of the winter rains. Erosion followed the dainty cloven-hoofed prints of the goats.

Owing to the country's mountainous formation, the destructive effects of erosion in Greece were unusually rapid. Without vegetation the sloping sides of the mountains were incapable of holding together the soil, which was carried away by the torrential rains to the plains, which in turn became flooded marshes in the spring.

Few efforts were made to check the deadly work of erosion. In the Greek islands and along the coast, where climatic conditions favoured the production of valuable agricultural products such as currants, olive oil and fruits, terraces and drains were built. The restricted areas of plains available in the islands did not permit the abandonment of the soil. It was found possible to hold it together by terraces up to the summits of the mountains.

Only within recent years, and especially under the present Government, did Greece perceive the danger and take steps to combat it. To-day a systematic programme for planting trees on the slopes of mountains and channelising the torrents is being carried out.

The goat was recognised as the evil genius of erosion in Greece, but the problem was not an easy matter in view of the income derived from goat breeding. This is estimated to be about 738,000,000 drachmas (100 drachmas equals about 3/-) annually, while the aggregate value of goats in Greece is estimated in the neighbourhood of 1,600,000,000 drachmas. Some other means of livelihood must be found to replace the goat. Their mountaineer owners could not readily be absorbed on the plains.

The present National Government, after careful investigation of the question, seized the problem by its curving horns and passed the Compulsory Law No. 875 of September 28, 1937, by which it is provided that the goat will disappear gradually within a period of ten years from those regions where it is injurious.

The Greek soil, if cultivated systematically, can feed double the number of the present population (about 7,200,000). To do this, however, every square inch of soil must be preserved.

DEATH SENTENCES By Blind Judges and Deaf Juries (By Waiatua.)

BIOLOGISTS and ecologists are revolting, in ever-increasing degree, against the passing of death sentence on any animal species the case against which is incomplete.

A complete case against the New Zealand shag would require, among other things, proof by anglers that the shag destroys more trout, by eating them, than the trout he saves by eating eels. The anglers have no such proof.

A complete case against the New Zealand hawk would require, among other things, proof by gunners that the hawk destroys more game birds by eating them than the game birds he saves by eating their enemies. The gunners have no such proof.

HARES AS FORESTERS.

If it were possible to appeal from the anglers and the gunners to a court of science for review of the convictions and death sentences passed on the shag and the hawk, the court of science would find the case not proven; and it might possibly recommend the anglers and the gunners to read the following statement by Edward H. Graham, biologist of the United States Soil Conservation Service, on the place that the much-abused hare occupies in forestry operations in parts of the United States:—

"The snowshoe hare of our Lake States is often blindly charged with intolerable injury to young trees. This is especially true on clean-cut or burnt-over areas where natural reproduction (of trees) results in very thick stands. Now the hare is a highly cyclic species, with 'highs' of large populations occurring at ten-year intervals. When the hare population is at its peak, the animals eat, girdle, or prune the young trees until the stand is so open that the hares may be easily seen by predatory mammals, owls and hawks. The hares must then retreat to thicker stands for protection. They may return at intervals of a few years whenever the trees have again thickened enough to form protective cover, and may thin out the stand recurrently until the bark becomes too thick to be palatable. Instead of being an unmitigated evil, however, the opening of the stand in each case permits the remaining trees to recover from their stunted condition, helps to reduce the fire hazard, and minimises insect damage. In northern Minnesota the value of the thinning operations of the snowshoe hare is set at a high figure."

It should be added here that the snowshoe hare is indigenous to North America; and Mr. Graham's finding concerning this particular hare would not necessarily apply to any hare or other creature that had been imported. Between the native and the imported, biologists generally find it necessary to draw a definite line.

NO INDEPENDENT BIOLOGIST.

Many generations of foresters in America have failed to value at a high figure the thinning operations of the snowshoe hare, and many generations of anglers and gunners have failed to value at a high figure the thinning operations of shags and hawks, which always take the weakest victims first, and which prey not only on game but on game-enemies. The reproof handed out to American foresters by an American biologist like Edward H. Graham might also be handed out to anglers and gunners by a biologist of similar capacity and independence—if New Zealand possessed one. The lack of an independent ecological biologist is very serious in this country. Scientific societies composed of Civil Servants who are forced to consider departmental interests are a poor substitute.

The Court of Science to which reference is made above (imaginatively, of course) would be a misnomer if the word "Science" were interpreted on narrow conventional lines, as is usual. Graham, in the article quoted above, deals mainly with ecology, and he writes: "In a broad sense, ecology is much more a process of thought than a science. To think ecologically requires only a knowledge of facts and an ability to relate them correctly."

Ecology despises blind adhesion to conventional rules. Example: The gardener, in his weeding operations, removes the weeds from a shade-loving species, which therefore nearly dies. The gardener, after one or two experiences of this sort, leaves a little oasis of weeds in the long sweep of his border, and beneath

the weeds the delicate species is surviving a long dry summer. In other words, the gardener has correctly related observed facts. But the owner, seeing the weeds and not the thing they shelter, considers the gardener is shirking and sacks him. The owner has incorrectly related the observed facts, missing out the most important. The owner's thinking is of the angler-gunner type. The gardener, probably without knowing it, is an ecologist.

"MERELY WEEDS."

Ecology has been defined as the science of the relation of living things to their environment. The man to whom all weeds are just weeds, to whom all shags are just trout-killers, and all hawks are just quail-killers, is the reverse of an ecologist.

In predatory nature there are few all-innocent species, few all-guilty species. Guilt or innocence is a question of balance. Balancing the virtues and the vices of a species is very complex, and only simple minds can unravel the complex in simple ways. To draw conclusions from single acts of predation is an over-simplification that always ends in error.

It is on record that one simple soul introduced a lantana species to Hawaii. He never thought that this plant would become aggressive, but it did. Another simple soul introduced to Hawaii the cooing turtle dove from China and the Indian mynah; he never thought that they would become agents disseminating lantana, but they did. But the mynah had a virtue—it protected the Hawaiian grasslands and young sugar-cane from army worms. A third soul, perhaps not as simple as the two others, imported foreign insects to eat lantana seed and to check lantana's spread. The insects succeeded in this, and also in reducing the seed food of the mynahs, which began to decrease. Then back came the army worms.

To deal with problems of this kind requires more ecology than to write an annual report for an acclimatisation society.

"PURE STANDS" AND BIRD LIFE.

How many generations of forestry were required in order to discover that pure pine stands are an afforestation error? According to Graham, "soils are depleted under a uniform type of forest cover, and disease is prevalent because it can spread more easily than in mixed stands."

Nature herself does not grow trees in pure stands, and New Zealand birds have not been brought up to trees growing in pure stands, much less to exotic trees in pure stands. Graham records that in European pure stands of spruce or pine "insect damage is so widespread that bird boxes are being installed in an attempt to restore artificially some semblance of the biological balance which was lost by man's failure to think ecologically." That is to say, the creators of an unnatural forest—a forestic monotone—ignore the birds' part in forestry, and now seek to remedy their ignorance. Bird-loving men who have queried the wisdom of one-type birdless forests have been derided as hobbyists. They were, in fact, ecologists, whom time has avenged.

Nature consists of "many facets related not as single species, but as a mosaic, the pattern of which is not appreciated at first glance, but must be seen in different lights to disclose its true design and its real worth." Public policy in New Zealand is made either by first-glancers or by people who, on second glance, find the pattern too complex, so they shut their eyes, make a blind plunge with a pin, and found public policy on that facet on which the pin happens to strike, ignoring the rest of the mosaic. By this kind of blind man's buff a nation can gamble away its soil, and also its soul. Some nations have done so. America and New Zealand are well on the road, but America at least has the merit of an earnest seeking after ecological truth and a new attitude to Nature's resources.

NATURAL NATIVE FORESTS CONTROL SOIL EROSION

In a good forest the tree tops usually are close enough to touch and form a closed canopy; and frequently small trees, shrubs, and other forms of lesser vegetation make up a thin or thick undergrowth. Anything less is not first-class forest and is not likely to provide such good protection for the land beneath.

The leaves, the twigs, branches, and stems of a forest expose innumerable little surfaces, aggregating, under good conditions, an area several times greater than that of the ground beneath. This loosely thatched roof, often 100 feet or more in thickness, is the first line of protection against soil erosion and excessive runoff. Driving rains beat upon this roof; the raindrops spatter, and the water slips gently down the stems or drips intermittently to the ground. As much as half an inch of rainfall may be completely intercepted by this intervening thatch. Part of this intercepted water is lost by evaporation and so never reaches the ground.

The main forest bulwarks against erosion and runoff, however, are still lower down. Covering the forest floor is a blanket of woods litter —a mass of leaves, twigs, and fragments of bark, in various stages of disintegration. It is not always a smooth blanket, for beneath it are an endless series of little depressions. These catch part of the water that penetrates the thatched roof overhead and restrain much of it from running away. The blanket performs a double function—that of absorbing part of the water and like a sieve directing the remainder downward to filter slowly to the soil beneath. This all-important blanket of vegetative material exerts a powerful influence on the soil in several ways, making it more permeable to water. The surface of the soil is kept moist and absorbent, even in winter when exposed soil is deeply frozen. The litter and humus form the principal habitat for a vast population of organisms important to soil building and conditioning. From the standpoint of soil protection, this covering of the forest floor is the most effective element of the forest complex. Here is the gateway to water storage in soil and underground channels. Its function is to filter water, keep it clear, and so keep it moving downward into the soil. Muddy water, such as gathers on bare surfaces, clogs the channels, slows infiltration, and changes beneficial percolation to harmful runoff.

In any system of sound land use, it is essential that excessively steep slopes, such as usually prevail about the headwaters of numerous streams, be kept in some dense cover, perferably forests or grass. Trees make the most effective cover for vast areas of mountain and hill country, where it is not easy to establish and maintain an adequate cover of grass. The contrary is true, of course, with respect to the use of grass in those areas not climatically suited to rapid tree growth. Combinations of trees and grass, as well as combinations of trees and shrubs, have important places for special conditions in the control of runoff and erosion.

(From "Soil Conservation," by Dr. H. H. Bennett, Chief of Soil Conservation Department, U.S.A., Publisheres, McGraw Hill Book Coy., New York.)

New Zealanders ~ ~

YOU ARE DEPENDENT UPON the PRODUCTIVITY OF THE SOIL. FIRE DESTROYS SOIL FERTILITY.

The New Zealand mountain forests are the finest in the temperate zones as protection forests, on account of their undergrowth and the thick water-holding bryophyte carpet, or cushions, of the floor. —vide L. Cockayne, Ph.D., F.R.S

Photo: A. Northwood, Kaitaia.

THE NORTH ISLAND WEKA

(By Wesley Sanderson, of Mata, North Auckland, a pupil at Dilworth School, Epsom, Auckland.)

OFTEN known as a woodhen, the beautiful weka, coloured like autumn leaves, is a light, very strong, stream-lined bird. It is flightless but has highly developed legs which it uses to great advantage when pursued. The beak is fairly long and thick, with the nostrils placed half-way down. There are four species of weka but it is of the North Island one that I am writing.

The weka is a creature devoted to its own kind but it is the "Evil One" to most other animals. Sometimes it has been regarded as one of man's enemies, but it does far more good than harm. It might occasionally attack the unprotected young birds of other species, and steal an unguarded egg or two, but it lives almost wholly on insects, snails, etc., and is the arch enemy of rats and mice.

I was once an interested observer of the weka's method of despatching a rat. The rat was about five feet away from the bird, in whose cruel red eyes shone a devilish light. The weka stalked its prey stealthily until it was within about two feet. Then there was a rush and the rat was dangling from the weka's beak, its head squashed flat. Next, the rat was placed on the ground and with a quick movement the weka ripped it right up the belly with the middle claw. The skin was torn from the body and left attached to the head only. The weka picked the flesh from the bones and then swallowed the ribs. After this, the skin was manipulated so that the hairy outside was turned inwards and suddenly, to my great amazement, the remains of the rat, skeleton and all, was bolted at a gulp.

BETTER THAN A CAT

A weka will swallow whole young live mice and adult dead ones; but a large mouse is always thoroughly wetted before an attempt is made to swallow it. The weka, incidentally, does not possess a crop, the food when swallowed passing straight into the stomach.

As the rat destroys countless eggs and young birds, it will readily be seen that the weka, by destroying rats, is a very great friend and a protector of other birds. Let sportsmen ponder on this before they condemn the weka for attacking young pheasant chicks! How many of these chicks are destroyed by the ubiquitous rat or the stoat? I have every reason for believing, as the result of observations, that the weka is an enemy of the stoat, which will attack most other small animals, especially birds, but will not attack a weka.

Although the weka does not possess webbed feet it swims well, and in fact seems to enjoy a dip in the water even when this is icy cold. I have seen them swimming in both salt and fresh water. I remember a little stream running through a bunch of tall, open tea-tree near the beach at Mata on the shores of Whangarei Harbour. In this stream was a hole about eighteen inches deep which was the favourite bathing place of the weka. The number of trails in the mud leading to this hole showed that about a dozen birds must have visited it each night.

One morning when I went to this place I was thrilled to see a number of feathers and a lot of beaten-down scrub, which told of a fierce battle. Although I have never actually seen wekas fight I have seen them chase and jump at one another like steel springs suddenly let loose and then run off into the scrub, giving harsh, loud grunts of "uemm—uemm—uemm" (the "u" and "e" are run together, sounding deeply in the throat).

One day when walking through some scrub I was attracted by a weka's call. The bird was in a clump of bracken and on my approach moved away. I followed it to a small clearing, when to my astonishment a magnificent weka

emerged from the scrub on the opposite side. I stopped still, hardly daring to breathe. The weka stood erect with its tail almost between its legs and with its neck stretched straight up. It thrust its head forward at right angles to the neck and uttered its wild, ringing call (when calling, the weka opens its beak wide and sometimes stretches its neck considerably wider than is normal when it is hunting). In a couple of seconds another weka appeared, which was smaller and also lighter in colour. When it came face to face with the first bird and uttered its call I noticed that the pitch of the call was much higher. I concluded that this second bird was a female, the first a male. I was only about seven feet from the birds and what I saw made me tremble with excitement; the birds were crouching, their necks thrust out straight in front of them, their feathers on end and their wings stuck straight out each side with the feathers pointing upwards. Their red eyes glowing, all of a sudden they sprang at each other and met about three feet up in the air, each pushing the other back with its feet. As soon as they landed they raced one after the other into the protection of the tea-tree. In a couple of minutes the place seemed alive with wekas. I could easily discern the whereabouts of seven, and often saw four at once. I can still see as plainly as ever the mental picture of those two happy birds that staged such a great mock-fight almost at my feet.

Wekas always go around in pairs and are very brave in defence of eggs, young or even nest. One day I was watching a pair of wekas going into a clump of rushes with nest material and decided to investigate. I poked my head into the rushes and met one old weka face to face. I gave her a push before she could peck me, but as her mate was already doing his best to make a hole in my feet, I beat a hasty retreat.

Wekas build a variety of nests, the majority of them being built on a slight rise. These nests are about nine inches across and made of grass built up to the height of three or four inches. The hollow is very shallow. (They are early layers, starting in July and August, and they stay with their young many months.) In the 1935-36 nesting season (North Auckland) there were a great number of nests, some quite close to our homestead. On the dry hills the wekas, which were very numerous, made no proper nests, but just scratched a hole in the ground and piled in a lining of whatever happened to be near, then laid their three, four, five, six or even seven dirty white, purplish brown splotched eggs. In a few weeks during which time the parents brood closely over the eggs, the young birds hatch out and after a few hours they go exploring. It is a sight to see the little birds in the sooty black down that clothes them so perfectly. They are entirely black, legs and beak being a shining black, while the eyes are black with a touch of green. The young birds are slow growers, but slow growth means great strength, and so it is with the weka.

In about six weeks the feathers begin to appear and by the end of five months they are fully fledged and are small replicas of their parents. Their eyes change from black to green and then from green to scarlet, while their legs and beak also develop a ruddy tinge. It is about this time the young leave the parents and seek other domains. During the next summer the young ones are still growing in strength and height, and by the following spring they are adults. Each then seeks a mate to whom it will keep true until either of them dies. It is not until they are quite old that they come to the height of their beauty. Then the outer wing feathers are brightly barred and the neck is so strong that the weka is fit to do battle even with a cat.

Towards the end of 1935 the wekas in my district began to decrease in numbers, and by the end of 1936 there were very few of them. Whereas in 1935 the weka yelled his great call from every direction and one could often hear more than a dozen at one time, by the end of 1937 this wild call, that is music to my ears, was not to be heard. By 1938, however, a few wekas were heard once again a mile or two from our place, and this year, 1940, my joy is great, for once more, almost at our very door, I hear that clear, wild call which shall ever be so dear to me.

WEKAS FEEDING ON SKIM-MILK

CHILDREN'S PAGE

MOTHER LOVE—*A True Story*

(By Ruth Hertslet)
(See cover picture)

TIMOTHY rode proudly beside farmer Bill. It was good to be astride Toby, his little chestnut pony, cantering with Bill over the tussocky paddocks! It was good to be able to open gates without dismounting—and once—once he had jumped a low fence! Perhaps Bill would let him jump the fence again to-day! His thoughts were suddenly interrupted by a queer noise. Looking down, he saw before him a strange bird crying piteously, its wing dragging helplessly on the ground.

"Oh, poor thing! It's broken a wing," cried Tim; and in a moment he was off his pony, stooping to pick up the wounded bird. It fluttered just out of reach and Timothy ran after it as fast as his chubby legs could carry him. For a chain or more he chased it, but always the bird eluded him. At last, to his utter amazement it flew away, only to return and flop once more in front of Bill. Tim's face was a picture as he watched the bird's antics.

"It's a dotterel," Bill said, "and it's only pretending." *(See cover picture.)*

"But why?" persisted Tim. "I was sure its wing was broken, but it can fly perfectly well. Why does it behave in such a funny way, Bill?"

"It must have a young one somewhere near," Bill replied. "It pretends its wing is broken to entice us away."

"How clever, how brave," murmured Tim.

"There it is," cried Bill suddenly, and Tim saw a tiny ball of yellow fluff moving with incredible speed. Indeed, he could hardly believe that anything so small could move so rapidly.

"Chuck!" the mother dotterel gave a warning sound, and the youngster disappeared into the middle of a yellow tussock. Try as he might, Tim could see no trace of the baby dotterel, though he stood quite near to the tussock into which it had disappeared. Bill's sharp country eyes, however, missed nothing. Swinging himself leisurely from his horse, he walked to the tussock, and soon had the little yellow ball in his hand.

"Isn't it cute!" cried Tim in delight. "It's so small and quick and dainty. Oh, Bill, can I have it for a pet?"

"Yes, you can," replied Bill. "There's a spare cage at home, and I'm sure we could rear it."

"Oh, thank you," answered the little lad, his eyes shining with pleasure.

Carefully Bill put the small bird in his big coat pocket and buttoned down the flap.

"Well, Tim, we'd better be making tracks for home if we want any lunch," said he, and off they set at a swinging canter. Timothy's heart was filled with delight. Oh, the joy of cantering over those tussocky paddocks; the thrill of feeling Toby's warm body beneath his chubby legs; and now, to crown it all, this fluffy pet for him to care for!

On they cantered, but round and round them flew the grey bird with its banded breast—crying piteously. Several times it darted at Bill's pocket. Nearer and nearer it came, seeming to lose all fear in its anxiety for its baby. They cantered on for three miles, but the grey bird never left them. Dismounting at the stable door, Bill led his horse to the farthest stall. After the brilliant sunshine, the interior of the stables seemed quite dim, but the mother dotterel did not hesitate. This man had her baby, and in she went after him right into the darkness of the farthest stall.

"Bill," called Tim softly, "could I have the little dotterel now?"

"Here you are," came the cheery reply, and Bill put the little yellow ball into the boy's hand. "Carry it gently, won't you?"

Tim looked longingly at the tiny bird, and the mother, seeing her baby, cried louder than ever. Quietly Tim walked to the stable door, then set the wee bird on the ground. In the twinkling of an eye the mother was beside it, and off they ran, so fast that Tim could scarcely believe his eyes. He was looking after them, smiling gently, then Bill came out.

"Where's the bird? Did it get away?" he asked in surprise.

"I'm sorry, Bill," Tim answered softly. "The mother needed it more than I did."

"I'm glad you feel like that, Tim," said the big farmer, as he watched the proud mother swiftly disappearing with the tiny yellow ball of fluff. "Such mother love certainly deserved to be rewarded."

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FOREST AND BIRD PROTECTION SOCIETY

OF NEW ZEALAND (Inc.)

APPEAL FOR BEQUESTS.

Is there any cause more worthy of bequests by public-spirited citizens than the objectives of the Forest and Bird Protection Society, which is working wholly and solely for the welfare of New Zealand, present and future? Here is a suggested form of bequest:—

"I give and bequeath the sum of ..... to the Forest and Bird Protection Society of New Zealand (Incorporated), and I declare that the receipt of the Treasurer for the time being of the said Society shall be a complete discharge to my executors for the legacy hereby given to such Society.

The work and record of the Society, the personnel of its membership and Executive are a good guarantee that the best possible use will be made of such bequests.

CALL FOR SANCTUARIES.

The Society would also welcome the responsibility of administering suitable sanctuaries for land or sea birds, provided that a small annuity is added for the payment of a caretaker. *Such sanctuaries could be named after the donor, and would thus be a perpetuation of his name as a saviour of New Zealand's forest and bird life.* It is suggested that such sanctuaries should be administered in a manner to ensure their return to their original and natural conditions as nearly as possible.

OBJECTS.

To advocate and obtain the efficient protection and preservation of our native forests and birds, enlisting the natural sympathy of our young, unity of control of all wild life, and the preservation of sanctuaries, scenic reserves, etc., in the native state.

Affiliated with the Society for the Preservation of the Fauna of the British Empire (Patron, His Majesty King George VI.) and with the International Committee for the Protection of Wild Birds.

The Forest and Bird Protection Society (of N.Z. Inc.), invites all those who have respect for our wonderful and unique native birds, all those who realise the great economic and aesthetic value of birds, all those who wish to preserve our unrivalled scenic beauties, to band together with the Society in an earnest endeavour to fully awaken public interest and secure efficient preservation, conservation and intelligent utilisation of our great heritage.

The subscriptions are—Life members £5, Endowment members £1 per annum, Ordinary members: Adults 5/-, Children 1/-. Endowment members comprise those who desire to contribute in a more helpful manner towards the preservation of our birds and forests. Besides this, we ask for your co-operation in assisting to conserve your own heritage. Is it not worth while? This Magazine is issued quarterly to all subscribers without further charge.

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