1876. NEW ZEALAND.

THE RABBIT NUISANCE IN SOUTHLAND,

(REPORT ON, BY THE HON. SIR J. L. C. RICHARDSON AND MR. W. H. PEARSON.)

Presented to both Houses of the General Assembly by Command of His Excellency.

No. 1.

His Honor the Superintendent, Otago, to the Hon. the Colonial Secretary. Sir,-Superintendent's Office, Dunedin, 25th May, 1876. Enclosed herewith, I have the honor to forward copy of report of the Hon. Sir John Richardson and Mr. W. H. Pearson on the rabbit nuisance presently prevailing in the District of Southland; also sundry documents attached.

The report has been obtained at my instance, with a view to the necessary legislative action being taken towards the abatement of an evil which, it will be seen from the report, has become very alarming,

and which, unless checked, will daily become more so.

As the Provincial Council cannot at present be convened, I hope the Colonial Government will deem the matter of sufficient public importance to make it the subject of legislation by the General Assembly.

I have, &c.,

The Hon. the Colonial Secretary, Wellington.

J. MACANDREW, Superintendent of Otago.

Enclosure 1 in No. 1.

REPORT of the COMMISSION appointed by His Honor the Superintendent to inquire into the Extent of the Rabbit Nuisance in the District of Southland: 10th May, 1876.

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 Colonial Secretary of Tasmania's memorandum of 28th March, 1876, covering memorandum of W. P. Latham (Council Clerk and Secretary Rabbit Trust, Hamilton) of 4th September, 1875.
 Rabbit Destruction Acts—No. 13, of 21st September, 1871; No. 21, of 18th September, 1874; and
- No. 18, of 30th September, 1875.

- 6. "Cross and By-Roads Act, 1870."
 7. Extracts on subject from Hobart Town Gazette.
- 8. Rabbit Destruction Act, South Australia, No. 16, of 15th October, 1875.

REASONS FOR APPOINTMENT OF COMMISSION.

WHEN your Honor constituted us a Commission to inquire into the extent to which the rabbit nuisance prevails in Southland, we were aware that inquiries had been instituted by a Select Committee of the Provincial Council in 1875, and we had been told of the earnest desire expressed by a deputation from certain pastoral tenants of the Crown, that a Commission should be appointed to risit the districts said to be infested, and to report the result of their personal inspection and inquiries. Though many of these Crown lessees were suffering severely from the rabbit nuisance, and were well acquainted with the extent of the evil, they deemed it would be judicious in the Government not to be guided entirely by those more immediately concerned, nor upon the testimony gathered at Dunedin. The reputed rapid and sudden increase of rabbits within the short period of two years, created in some minds a feeling of doubt whether the statement of the case was not somewhat exaggerated by the fears of those who found themselves exposed to the evils resulting from this invasion, and hence the Crown tenants were urgent that facts should be fully ascertained, and the necessary remedies immediately applied.

NATURE OF DUTIES.

In the prosecution of the duty assigned to us, we have ridden over some 300 miles of country, visiting the pastoral tenants and others at their homes, inspecting those portions of the runs of the former considered by them as fair indications of the evils they suffered under, and making personal inquiries of every class as we passed through the infested districts. The result is embodied in this report. While we have not considered it to be within the bounds of our Commission to make any formal recommendation, we have thought it not unadvisable to group together the suggestions we have gathered as a contribution for what it may be worth towards the abatement, if not extermination, of the purisance are have we deemed it obligatory on us to confine our attention to that portion of of the nuisance; nor have we deemed it obligatory on us to confine our attention to that portion of Otago known formerly as the Province of Southland, but have extended our inquiries to other portions of the united provinces; and have, moreover, endeavoured to ascertain what had been done in other colonies similarly afflicted, and with what results. In this direction we have been indebted to the Governors of Victoria and Tasmania, to whom we applied for information; to your Honor, from whom we received communications from the Chief Secretaries of New South Wales, Victoria, South Australia, and Tasmania; the report of the Chief Sheep Inspector; and the report of a Select Committee of the Provincial Council which had been specially appointed to take evidence on the subject.

ROUTE.

With a view of acquainting your Honor with the line of country traversed by us, it may not be undesirable to roughly indicate the route we adopted. On leaving Invercargill we passed through the Lothian and Lindhurst districts to the falls on the Mataura. Following up the right bank of that river to Gore, we proceeded to McCaughan's station, diverging into the Hokonui Ranges to Mount Peel, to ascertain whether the rocky districts were affected. Hence we proceeded up the right bank of the Waimea Stream, a tributary of the Mataura, passing by Young and McKellar's stations to Cowan's station on the left bank of the Oreti or New River, returning down the bank of that river to Webster and Gibbs's station, and thence by Winton, Ryall Bush, and Wallacetown, to Invercargill. This may be termed the Eastern District.

On the 28th March we resumed our inspection and inquiries, and passed through the sandhills to Riverton, and from Riverton up the right bank of the Aparima or Jacob's River, by Gummy's Bush, as far as Otautau. Thence diverging, we left the beaten track to visit Merivale Station, and passed onwards through the Waiau Plains to Clarke's station, on Linton Creek, visiting the eastern slopes of the Takitimos at an elevation of some 3,000 feet. Whence we crossed over to Brown's station at Bellemonte, near the left bank of the Waiau, and Brown and Barnhill's station of Blackmount; and striking northward we visited Dundas Station near the same river, and in close proximity to the Manipori Lake, ascending the Cheviot Hills, which lie half-way up the western ascent of the Excelsior Peak; and then advanced to Hankinson's station, our most northerly point, about midway between the Te Anau and Manipori Lakes, gathering as we went information about the few stations on the right bank of the Waiau River. This portion of country may be termed the Western District.

Having passed the boundary of the former Province of Southland, we struck off along the

Mararoa River, crossed over some intervening ranges to Campbell's station, at Burwood Forest, leaving Central Hill on our right, and the West Dome and Five Rivers Plains on our left to Thornhill's

station, on the Oreti. Leaving this river to the left, we passed through the Wairaki Downs, near Basstian's station and Stevens and Raymond's stations, touching the Aparima again by Johnson's station, near Wroy's Bush, and crossing the Oreti district to the town of Winton, on that river, and

thence to Invercargill. This portion may be called the Centre District.

It will thus appear that we have personally visited a very large portion of the Southland country reputed to be more or less infested with rabbits; and those portions which we have not visited, such as the Dome, Long Ridge, and the plains watered by the Five Rivers—which may be embraced in the Eastern and Centre Districts—we have received such reliable information as fully to satisfy us of their condition. We have placed ourselves in communication with all persons, whatever their vocation, from whom it was likely that we should be able to gather authentic data, and we have been much indebted to the pastoral tenants of the Crown for the fulness and confidence of their communi-We should be doing an injustice to some of these gentlemen were we to indicate with any precision the localities most severely affected, nor would any good to the community result from such definition. We have, therefore, deemed it judicious, for the purposes of this report, to divide the country into large areas, and of these it may be sufficient to say that the Western, northern portion of the Eastern, and Central Districts are most severely affected.

DIVISION OF REPORT.

It will perhaps be more convenient, for purposes of reference, that the report should be divided in several distinct branches, viz.:—

- I. The first appearance of the rabbits in Southland, and their progress through the country.

 II. The extent of country occupied by them, and the evils which accompany this occupation. The extent of country occupied by them, and the evils which accompany this occupation.
- III. The peculiar difficulties which attend the attempt to arrest or exterminate them.
- IV. The nature of the methods now in operation, and the apparent results.

 V. The means adopted elsewhere and the results.
- The means adopted elsewhere, and the results.
- VI. The suggestions which have been made towards arresting the evil.

FIRST INTRODUCTION OF RABBITS.

I .-- So far as we have been able to learn, the rabbit made its first appearance about twelve years since among the sandhills in the neighbourhood of Invercargill, on the tract of country immediately contiguous to the sea, on the Riverton Beach Road, which was at that time a finely grassed and valuable sheep country. Here they appear to have remained for several years quietly, and at first almost insensibly disturbing the soil, until, from the increase of their numbers, they not only destroyed the grass, but converted the rolling sward into exposed, shifting, and barren sandhills. From time to time the settlers in more remote parts of the country entrapped and carried with them a few pairs of rabbits to their several localities, considering their presence a desirable acquisition, and thus multiplied the centres of propagation. The main body of the rabbits, having laid waste the country where they first appeared, moved up the banks of rivers and their tributary streams, camping, as it were, on rich wellgrassed lands, and only passing onwards when the pasture became scanty, and the land defiled and poisoned. Gradually, and at first scarcely perceptibly, the rabbits moved from place to place until, during the past two years, there appears to have been a vast impulse given to their migration, when at length their presence has become a subject of bitter regret, and the cause of much and increasing anxiety. They may be found swarming, in suitable places, on the banks of rivers; creating havoc on the sunny grassy uplands; surmounting the highest ranges; and, in smaller numbers, their pioneers have been seen on the banks of the Greenstone River, beyond Lake Wakatipu, on their way to the West We have found them in great numbers on one side of a river, while the other side was comparatively free from them; for, though they follow up the main stream, as a general rule, and turn the head waters, still there are many known instances which indicate that they transfer their ravages from one side to another with great suddenness and rapidity. They chiefly dwell on the banks of rivers and creeks, the outskirts of forests, and the neighbourhood of rocky ranges, whence they can descend into the uplands and grassy plains, from which they return, when disturbed, to their place of refuge.

EXTENT OF COUNTRY AFFECTED BY THEM, AND EVILS ATTENDING THEIR OCCUPATION.

II.—With respect to the extent of country occupied by the rabbits, and the evils which accompany their occupation, we may safely say that, so far as our personal observation has extended, the whole of Southland may be regarded as more or less infested. Where the country is favourable for their occupation—that is, well grassed, well sheltered, and not cold nor damp—there rabbits may be seen in vast numbers; while in the open country, where means are constantly and effectively used to exterminate them, they are kept within moderate bounds; but what may be a true description of the state of any part of the country this year may not be such a year or two hence. In the neighbourhood of Riverton Beach, for instance, rabbits are less numerous than they were; while, in places where only a few were seen a short time back, as in the Dunstan District, they may be now seen in vast numbers. Again, in the Maerewhenua country, in the North of Otago, where they have been known to have existed for thirteen years, they have not increased; while in the Tapanui country they are represented to be alarmingly numerous. It is very evident that the stream of migration from the South is being met by a similar stream from the North.

The evils which result from the occupation of the country by rabbits in considerable numbers are many and varied. It will perhaps suffice that we should state some of the chief of them.

Expense attending Destruction.

The expense of exterminating the rabbit is becoming a very serious item. Take for instance a run where, three years since, scarcely a rabbit was to be seen: there are now sixteen men, with 120 dogs, employed, costing the lessee 2d. for each rabbit skin and 10s. a week for each man. On this run the average number of rabbits killed weekly is between 4,000 and 5,000, and, though 36,000 were killed last year, yet the report is that there is no appreciable decrease. On another run, we learn that close on 16,000 rabbits were killed during the first three months of the present year, at a cost of 2d. a skin. On a third, the expense each week averages £27, and 50,000 rabbits have been killed since last year. On a fourth, we find nine men employed, with sixty dogs, killing at the rate of 2,000 per week. This enumeration might be almost indefinitely extended. It only remains to state that in some cases as much as 3d. a skin is paid, and even a horse and provisions are found; in others powder and shot, averaging 2d. per charge, are given in addition to 2d. per skin. It is to be remembered also that, in some instances, the dogs are fed on sharps, and occasionally on mutton (as feeding on rabbits is apt to give distemper), and, owing to the demand, have risen to high prices, varying from £5 to £15 each. It is generally considered that seventy to one hundred rabbits a day may be reckoned a fair average, supposing the man to be well supplied with ammunition and dogs, which in almost every case are provided by the runholder. So far as any return may be calculated on from the sale of skins, it may be said that the winter skins only are of any value, and that experiments connected with the sale have in this colony hitherto proved a failure. It is also to be borne in mind that, great as this expense is, a diminution in the number of rabbits will not very sensibly decrease it, because, though the men employed may be fewer, the wages of each, or the price per skin, would probably be increased, owing to the lesser number of rabbits that could be killed in a day.

Injury to Quality of Wool .- Decrease in Quantity of Wool.

In estimating the approximate loss to the sheepowner, there is also to be considered the decrease in the quantity of the wool. In Southland proper, there were from 700 to 800 bales less this year than the last, though the present was a favourable season. In one case, where 250 bales were shipped last year, there were only 150 this season; and, unless active remedial measures be adopted, it would be hard to say what the export would be next year. In another case, where there were 900 bales last year, there were only 750 this year. And not only do the rabbit ravages affect the quantity, but they injure also the quality of the wool; for as the young grass makes its appearance in the spring it is eagerly devoured by rabbits, and the ewes, with lambs following them, find themselves, when needing the most nourishment, reduced to comparative starvation.

Decrease of Percentage of Lambs.

The deficiency in the increase of lambs shows more clearly still the lessened depasturing capacity of the runs. For instance, one sheep farmer only got 900 lambs from 6,000 ewes, or 15 per cent.; another, 2,500 from 20,000 ewes, or $12\frac{1}{2}$ per cent.; a third, 1,500 from 10,000 ewes, or 15 per cent.; a fourth, 700 from 10,000 ewes, or 7 per cent.; a fifth got no increase at all; while the average increase last year throughout the Western District—an exceptionally good year—was 20 per cent., instead of from 65 to 70.

Decrease of Carrying Capacity.

Equally expressive is the effect on the carrying capacity of the run, as regards stock. In one case, we learn that the flock was reduced from 9,000 to 6,500, or $27\frac{1}{2}$ per cent.; in another, from 16,000 to 5,000, or 69 per cent.; in a third, from 40,000 to 25,000, or $31\frac{1}{2}$ per cent.; in a fourth, there was a loss of 16,000 sheep in eighteen months; in a fifth, a loss of 7,532 in a flock of 43,310, or nearly 18 per cent.; and yet in another, two years ago there were shorn 22,000, last year 19,000 only, showing a decrease of $13\frac{1}{2}$ per cent.; and this present year only 15,000 were shorn, showing a further decrease of 21 per cent., or, in two years, about 32 per cent. of actual diminution.

All this speaks of the past. It would be difficult to anticipate the future. The rapid increase of the scourge, notwithstanding the slaughter, will tell most powerfully on the old ewes and the young lambs: on the former from the absence of the young and succulent grasses, on the latter from deficient nutriment from their mothers. Thus old and young will both suffer, to say nothing of the want of stamina in the remainder of the flock.

Decrease of Fattening Capacity.

We have heard many and serious complaints of the deficiency of fattening capacity on the runs owing to the ravages of the rabbits. In one instance, where three years since 2,300 fat sheep and bullocks were got off a run carrying 16,000, now it barely carries 5,000, and among them scarcely one fit to be killed.

The rabbit is somewhat dainty in its selection of food. It chooses the English and finest native grasses, yet condescends to snatch a meal off the young tussock growth as it springs into existence. Not only does it devour, but it destroys herbage by its pollutions wherever it feeds, driving cattle and sheep away, and rendering the soil a desert. Nor does it confine its devastations to grass, the young trees in the forests being barked, and thereby seriously, if not permanently, injured. And further, we might state what we have ourselves experienced—namely, the danger of riding rapidly across country, and what we have observed in the honeycombing of the railway embankments to an extent which, if not arrested, threatens to be seriously injurious to the travelling public.

Effect on State Revenue.

We might well stop this enumeration were it right to do so, but there is yet another point from which this increasing evil must be viewed, and that is the effect on the provincial estate. In Southland proper, there being an acreage assessment, the effect is not much felt as far as the revenue is concerned; but, if the scourge is not arrested, what will be the value of the estate for leasing, say in 1881, when most of the leases fall in? We do not feel called upon to entertain this question, but it may not be unimportant to observe that in Otago as it existed before the union, where the rabbit nuisance is comparatively not so alarming, the results are nevertheless, it is said, not insignificant.

III.-DIFFICULTIES IN EXTERMINATING THE RABBIT.

Extraordinary Fecundity.

The chief difficulty in exterminating the rabbit arises from their powers of multiplying. Blaine, in his Book of Rural Sports, observes that rabbits will breed at six months old, bear seven times annu-

ally, and bring five young ones each time. Supposing this to happen regularly during the space of four years, and that three of the five young, at each kindle, are females, the increase will be 478,062. Again, Chambers, in their "Information for the People," say, "The rabbit litters seven times in the year, and generally produces eight young at a time. At the age of five months the animal begins to breed, and, taking an estimate perfectly within bounds, it is supposed that a pair of wild rabbits, which breed no oftener than seven times in a year, would multiply in the course of four years to the amazing amount of a million and a quarter, if the young were preserved." If common report be correct, the climate and soil of New Zealand are peculiarly favourable to the domestic habits of rabbits, and they are said to breed at least nine months in each year, having at least six young at each kindle, and the females will breed at the age of three-months. If this be true, then the problem of extermination becomes very difficult of solution.

Peculiar Character of Country.

The most important difficulty attending the attempt to arrest or exterminate the rabbit, after that resulting from its fearful fecundity, arises from the peculiar character of the country. The banks of four main rivers—namely, the Mataura, Oreti, Aparima, and Waiau—which intersect the district, together with their tributaries, formed by loose warm sandy loam and gravel, covered with high flax tussocks, and, in some cases, large patches of scrub, afford comfortable warrens in which whole communities of rabbits can find a safe and almost undestructible shelter, to which they can escape when pursued on the plains, and from which nothing but an occasional very high flood can drive them; while, unlike the usual habit of the rabbit in the Home Country, after having worked their way up the river flats into the interior, their most favourite haunts appear to be the heart of the various mountain ranges—forming the watershed of the rivers—in the scrubs, rocks, and forests of which they find secure shelter, and issuing from which in droves, as we have seen them, they devastate the surrounding country, and reduce first-class fattening sheep land to a wilderness.

Absence of Natural Enemies.

One peculiarity of this colony is the absence of those natural enemies of the rabbit, the presence of which has done so much elsewhere to keep down the nuisance. In Tasmania some of these were valuable auxiliaries, as the weka is near the Waitaki, in Otago; but in the greater portion of Southland the only enemy is the hawk, and that will shortly disappear before the application of strychnine and arsenic. Again, the tax upon dogs is oppressive, and the tax upon powder and shot deterrent.

Want of Unity and Continuity of Action.

One of the most serious hindrances to success in extermination arises from the absence of unity and continuity of action. There being no compulsion, every leaseholder, freeholder, or occupier does what he likes and when he likes, or does nothing at all. One may be hearty and energetic in his exertions, while his neighbour may be utterly indifferent, breeding, by his inaction, an abundant supply to replenish the cleared run or holding of the former. Interspersed here and there are Crown lands and other lands, such as educational, municipal, and University, &c., reserves, the rabbit nurseries of the whole country. Again, though the Provincial Council recognized the presence of so severe a scourge, they withheld that practical recognition of subsidizing local efforts which it is thought the expediency as well as justice of the case demanded. We append two returns showing the alienated and leased lands in pastoral districts, and the sold and unsold land in Hundreds, which possibly may be found useful in connection with this point, should the subject be deemed worthy of legislation.

IV .- METHODS AT PRESENT ADOPTED TOWARDS EXTERMINATION.

The methods at present adopted towards the extermination of the rabbits principally consist of hunting them down with dogs on the plains, and shooting and hunting them on the edges of bushes, and in broken ground. There is very little done in the way of trapping, and that, too, confined to the neighbourhood of homesteads. Poisoning in winter has been tried, but the remedy is one of very doubtful propriety, if not decidedly objectionable; for the poisoned rabbit lying exposed affords a ready sustenance to hawks, and those vermin which are the natural enemy of the rabbit. All these efforts combined do not appear to have been attended with any very great success.

V.—METHODS ADOPTED IN OTHER COLONIES.

Victoria.

As regards the steps taken by other colonies to arrest the progress of the rabbit nuisance, a memorandum of March last by the Secretary to the Department of Agriculture in Victoria, obligingly forwarded by the Governor, affords the only information that is available regarding the prevalence of the rabbit nuisance in that colony. From this, it appears that the nuisance has prevailed, more or less, since the first introduction of the rabbit near Geelong many years ago, so that, at the present moment, there is hardly a part of Victoria where it is not to be found. No public steps have been taken to avert the evil, though privately much has been done with varied success. The rapidity with which the rabbit breeds in Victoria bids defiance to the ordinary methods followed in England, of shooting, ferreting, and trapping. Mr. Robertson, of Colac, appears to have been the most successful; but at an expense quite beyond adoption in this colony. Finding that the rabbits had taken possession of numerous wombat holes near Warrion Hill, living in communities, not in families merely, he endeavoured to exterminate them by filling up the holes with basalt boulders; but fruitlessly, for the rabbits burrowed out at the sides, and were as numerous as ever. He then removed the soil until he reached the underlying basaltic rock itself, and built in the rabbits with solid masonry, and not till this was done did he succeed, and then only at the the sacrifice of 10,000 acres of his best land and £35,000 expended during the seven years occupied in the undertaking. The freehold estate is said to amount to 25,000 acres.

Tasmania.

The Colony of Tasmania appears to be in many respects, as regards the question under consideration, not unlike that of New Zealand, and may afford us some useful lessons. The evidence taken by the

Select Committee of the Provincial Council of Otago informs us that the general character of the colony is hilly, wooded, and broken. Prior to 1869, the rabbit was known to exist there, but, as its natural enemies, tiger-cats, devils, eagle-hawks, and wild domestic cats, were numerous, the evil was insignificant: but, many of these vermin being destructive to lambs, they were destroyed in vast numbers; while in 1869 the wild domestic cat was seized with a fatal disease, and almost entirely extirpated. Since then, and in consequence of the diminution of their natural enemies, the rabbits appear to have taken full possession of several parts of the country, so much so as to necessitate action on the part of the Legislature.

Before submitting a concise sketch of this legislation, obligingly furnished by the Governor, it may be desirable to state that the Colonial Secretary, in a memorandum of the 28th March last, observes that "The operation of the laws in force for the destruction of rabbits has on the whole proved of great service in keeping under this serious scourge to the farmer; but it requires united action, and the cordial co-operation of all the infested localities, to secure practical results of a durable

character.'

"The Rabbits Destruction Act" became law at the close of 1871, and was to continue in operation until the end of the first session of 1874, and no longer. In September, 1874, it was slightly amended, and given a further currency to the 31st December, 1877, and, again, in September, 1875, additional powers were given as to altering and re-defining districts. As these three Acts and "The Cross and Byroads Act, 1870," are appended to this report, it will be sufficient to say that a Rabbit District may be proclaimed on the petition of not less than ten persons, being landowners under the Act, should not a counter-petition be presented by landowners in the same district having a greater number of votes. Powers are given for the election of Trustees, who are thereby enabled to impose a rate to the extent of 1s. in the pound in any one year of the annual value of the property in the district: the occupier of Crown land, under lease or license, paying only one-half of any rate. In case of a land-holder neglecting or refusing to destroy the rabbits on his property, the trustees may enter upon such lands for the purposes of the Act, and further may enter to search for rabbits. Accompanying these Acts, and also appended hereto, is a statement by Mr. Latham, Council Clerk and Secretary to "The Hamilton Rabbit Trust." The Hamilton Rabbit District was constituted in April, 1872, and the landowners elected Trustees, who proceeded to levy a rate, and appointed one of their number in each section of their district to purchase skins. These skins were paid for by the Trustees monthly, after audit. In three years there was a sum of 9d. in the pound raised by rate; 347,860 rabbits were killed, and their skins sold; and the proceeds of the sale, together with the rates, left only a very few pounds to debit of the Trust. The skins must be perfectly dry when purchased, sprinkled with diluted carbolic acid on the fleshy side, to prevent the ravages of the weevil, which vermin reduces the value of the skin one-half, and then the skins should be carefully packed in bales and sold.

Mr. Latham further states that there are runs in Tasmania on which a good shot could bag from 300 to 400 daily six years ago, and now you could not meet six. He advocates the introduction of ferrets, obtainable at about 10s. a pair, which should be turned out wild; and feels confident that, knowing New Zealand as well as he does, he "could organize such a system as would exterminate the

rabbits in a very few years."

Report of Chief Inspector of Sheep, Tasmania.

Scarcely agreeing with this statement is the report of the Chief Inspector of Sheep in Tasmania, dated 26th July, 1875. Mr. James Whyte, the gentleman referred to, says: "I regret to say that, from my own observation, while travelling through the country, I cannot state that any diminution of this plague has taken place generally. On the contrary I am disposed to believe that, although their numbers have been greatly diminished in some parts of the Oatlands and other midland districts, where a few years ago they were so numerous, yet, taking the country throughout, there are at the present moment more rabbits than at any former period. They are now to be seen in numbers where a few

years ago scarcely a rabbit could be seen.

"I believe it is no exaggeration whatever to say that at this time rabbits are consuming food

which would support 250,000 sheep, which, at a moderate calculation, is a direct annual loss to the colony of £62,500, without taking into account the money expended in merely keeping them down and mitigating the plague.

"Hitherto the heavy losses sustained from rabbits have been confined to a few localities, and it is only those who have suffered severely who are really fully sensible of the evil. The settlers, as a body, when there are few rabbits, are totally indifferent on the subject, and laugh at the idea of their runs

being invaded.

"It is my belief they are fatally mistaken, and that, ere many years have passed, where rabbits are are now scarcely seen, they will become as numerous and of course as destructive as ever they have been found to be by some of the unfortunate victims in Oatlands, Ross, Campbelltown, Green Ponds, Bothwell, and Hamilton.

"In 1874 rabbit skins to the number of 474,468, valued at £3,725, were exported, principally from

Hobart Town.'

From another reliable authority well acquainted with New Zealand, we learn that in Tasmania rabbits were tolerably well kept down where precautions were taken, that is, in proclaimed rabbit districts; but he confesses he looks with some apprehension as to the future of the large hilly tracts of New Zealand pastoral country, where the soil is loose and rocky.

New South Wales.

From a communication received from the Colonial Secretary of New South Wales it appears that the colony is not troubled with rabbits.

South Australia.

The Chief Secretary in South Australia transmits a copy of "The Rabbit Destruction Act, 1875,"* under which several districts have voluntarily brought themselves, and it is anticipated that the

operation of the measure will be beneficial. This Act is appended to the report. Its main features generally follow the Tasmanian statute, the definition of a landholder being more restricted, and leased Crown lands being rated as other lands. The proclamation into a rabbit district differs from the Tasmanian statute, no counter petition availing in the South Australian Act.

VI.—Suggestions made to Commissioners.

We have before stated that we lost no opportunity in our travels of ascertaining the feelings and views of those concerned in the object of our inquiries, and that, though our Commission does not authorize us to make any special recommendation, yet we should not be fulfilling the duties we have undertaken did we not submit the result of our conversations to your Honor.

Crown should share Expense. Extension of Leases, &c.

We have been particularly struck with one circumstance, and we commend the consideration of it to your Honor. The Crown tenants complain that, as the introduction of the rabbit was not an act of theirs, they should not be left unaided in its extermination. They urge that the Crown has a present as well as a continuing interest in the well-being of the pastoral country: that were they to cease their exertions and close their purses the assessment paid in the northern part of Otago would decrease materially, while in both parts the runs would, on completion of the leases, be a comparatively worthless or certainly a much depreciated possession, as would be shown when submitted for new or renewed leases. They further urge that, while the depasturing capacity is materially affected, they are called upon with diminished means to clear their runs of a nuisance at a time when their leases are about to expire. As a partial recompense for their exertions, and as a stimulus to rid the country of the pest, some point to a five years' extension of their leases; others to an annual subsidy, to repayment of the duty on dogs and powder; and others, again, to the introduction of a law which shall compel the owners or occupiers and lessees of all lands in infested districts to submit to a tax on the nanual value of their property, to be raised and expended by local trustees, or by an inspector, as in the case of the existing Scab Act, under efficient Crown supervision. Stress has been laid on the necessity that this legislation, to be effective, should be compulsory not only on all in a proclaimed infested district, but on all portions of the country where rabbits are known to exist in greater or lesser numbers.

Subdivision into Smaller Runs.

Some of those with whom we have conversed have indicated, as the only effectual method of extirpation, when the leases run out, to subdivide the runs into smaller blocks, and thus people the country. To this it has been answered that the nature of the greater part of the unsold pastoral lands in Southland is not, as a general rule, adapted for such subdivision; that nearly the whole of the land in the plains and uplands commanding the hill country is already sold, and that the higher lands are only of value to those who possess the base. It has again been urged that if the present occupant of the pastoral country, with his accumulated means, employing a large number of men, cannot unaided surmount the difficulty, there would be but little hope for ten times the number of occupants of lesser means or smaller areas to cope with it, considering that, though the rental per acre might be the same, the latter would have extensively to fence their subdivisions to support themselves and families on land ill adapted for cropping, and to carry on continued warfare against the rabbits occupying the country.

Introduction of Natural Enemies.

The expediency of introducing a certain class of natural enemies of the rabbit has been urged on our attention, such as ferrets, stoats, and weasels—but not such as would injure lambs. The use of poisoned grain in winter has been practised, but is strongly objected to, as having a tendency, not only to poison dogs, perhaps sheep and horses, but hawks and such useful auxiliaries.

Establishment of Curing and Preserving Machinery.

The establishment of curing and preserving machinery has been suggested, but it has been stated, in opposition that such a system would not answer unless 5,000 rabbits a day could be procured, and the nature of the country and the distance to be traversed preclude the possibility of putting the cleaned rabbit in the hands of the curer within twenty-four hours after being caught—which is absolutely necessary—to say nothing of the operation being confined to the winter season, when the skin is most valuable, and the meat most likely to be suited for curing. Besides, if the average expense of killing, skinning, and preserving the skin is 4d. each, there is to be added the expense of curing and tinning, which would be about 3d. a pound additional.

Report of Select Committee of Provincial Council of Otago.

The Select Committee of the Provincial Council of Otago, in their report of June, 1875, remarking on "the serious damage done through the ravages of the rabbit," recommended that, with the view to a limitation of the nuisance by repressive action, legislation should be had recourse to; that the machinery of Road Boards should be made available, or, where no such Boards exist, committees should be formed having compulsory rating powers; that Government should grant a bonus per skin; that the skins should be sold; that the rabbits' natural enemies should be introduced; and that gunpowder and shot should be exempt from duty.

Memorandum of Chief Sheep Inspector.

The Chief Sheep Inspector, in his memorandum of 6th April, 1876, expresses his opinion that "some compulsory steps in the shape of legislation should be taken;" otherwise he is certain that "a great portion of the Crown lands, now occupied as runs, and fit for no other purpose, will by the time the leases expire be considerably deteriorated in value, their carrying capacity being reduced; and country situated favourably for climate, and having cover for the pests, will be comparatively value-less."

Silver-grey Rabbit.

Some persons have pointed to the introduction of the silver-grey rabbit, which, by crossing with the present common wild rabbit, and thereby improving the marketable value of its skin, would materially assist in the expense of extermination. But, so far as our observations and inquiries have extended, the climate in this part of New Zealand is not favourable to the development of this species. Experience has proved this on the eastern slopes of the Hokonui Hills, where the silver-grey rabbit was for years located in large numbers—undisturbed by the common rabbit—till within the last two years it has become almost extinct. This sudden disappearance, it is surmised, is the result of the last two severe winters.

Land in Hundreds.

The land in the Hundreds, it has been suggested, requires a similar treatment to that on the runs, namely, a compulsory unity of action. Here it is found that the holding of large tracts by the New Zealand and Australian Land Company, and others who, it appears, do nothing to exterminate, militates against the endeavours of the smaller holders who are compelled in self-defence to use every exertion, but are paralyzed by the inactivity of their larger neighbours.

Not kept down by Population without Compulsory Action.

That the rabbits are not kept down by population is reported to be apparent from the futile exertions of the farmers to protect their young crops, and this in the infancy of the plague. One farmer on the Limestone Plains, Western District, had, we are informed, six men night and day to protect his barley field till the crop had grown strong enough to resist the inroads of the rabbits. He saved a large portion of it, but at a cost which must have considerably affected the return he obtained from the sale. A large farmer living in the vicinity of Winton informed us he had a hard fight to get his wheat a fair start. Having had it eaten down two or three times, he tried poison with but partial success, men and dogs being unable to cope with the rabbits.

success, men and dogs being unable to cope with the rabbits.

Around the frontage of Long Bush, the sod fences, particularly where sown with gorse, are honeycombed with burrows; the bush itself affording a friendly covert, in which rabbits are rapidly increasing. In the Oteramika and Lothian Districts, particularly in the former, they are swarming, and can be seen in droves on the Company's extensive holdings, in which they disport undisturbed, a cause of large expense and labour to the smaller farmers. Once fairly established in the Seaward Bush and that clothing the left bank of the Makarewa River—which bound these plains on the north and south—their eradication will be almost an impossibility. In the Waianiwa District, on the banks of the Oreti, where the settlement is considerable, all the farmers being small, the best chance the settlers have of keeping the rabbits within bounds is by the frequent flooding of the low lands, when they are easily destroyed as they swim about, and their young are drowned in the holes. And it must be remembered that the loss sustained by the farmers in material and labour has only been felt during the last two years. The numbers of the rabbits have very sensibly increased this year. Indeed, in all parts of the district it is universally recognized that the rabbit nuisance, or, as it might more appropriately be termed, plague, is only commencing.

VII.—SUMMARY.

To summarize: So determinedly and impartially has the rabbit extended its peregrinations that no locality, from the river bank to the highest mountain top, appears unvisited. Already riding after stock is attended with danger, owing to the ground being perforated in all directions with its warrens, and the railway embankments rendered unsafe. The expense to the runholder is becoming one of such serious import, that any sudden fall in the price of wool might determine the conflict with his small pest by his hopelessly withdrawing from the contest from inadequacy of means to continue it. It is not merely the large burden he has to bear in paying away on an average 3d. to 4d. a skin, on which during eight months in the year he can realize nothing, but each month finds him less able to disburse, from his losses in breeding sheep and increase, owing to the impaired capacity of his country, that not eaten up being polluted, while the wool he has is deteriorated in quality.

Export of Wool.

The export of wool from the Southland District has fallen off in one year to the extent of 800 bales, with every prospect of its being further diminished, and that materially. Such a decadence affects not merely a class, but the community. Wool is, and will be for years, the great export of the Southern portion of New Zealand. Any great decrease in it means a withdrawal of large capital, which bears upon the life of every industry, whether in country, town, or seaport, and it becomes a public calamity, which, when continued, no fictitious stimulus can avert.

Loss of Revenue.

The cost to the Government in loss of revenue is already felt in that part of Otago where the stock is assessed: it will become still more apparent when, on the termination of the present leases, the country is again sought to be let. The proposition that by cutting up the large holdings into 5,000-acre lots, and thereby settling a larger population, is stated to be met by the fact that the present holder of, say, 50,000 acres, having means at command, employs from fifteen to eighteen men whose sole occupation is to exterminate rabbits, pays them well for their exertions, finding them in most cases with dogs, ammunition, and sometimes in provisions, and yet realizes the difficulty mastering him. Supply the place of this one proprietor by ten men, and we have a smaller population by five or eight to work out the problem at their own expense, support their families, fence in their holdings (which, after all, as the plains and uplands are already freeholds, can be little else than summer country), and pay the Government a higher rental than that obtained from the present lessees.

Increase of the Rabbit.

The rapid increase of the rabbit, owing to the favourable circumstances of climate, soil, and shelter, coupled with the absence of natural enemies inimical to its development, clothes the danger of its presence with a palpable significance, seeing that, where climatic influences are not as felicitous, the fecundity of the rabbit is the theme of naturalists.

Simultaneousness of Action.

Under these circumstances simultaneousness of action on the part of the Government, pastoral tenants, and freeholders would seem to become a necessity: the first, to insure a future benefit in increased rentals on the expiration of the present leases; the second, to enable them to secure the accumulations of past thrift, industry, and enterprise; the last, to hand down to posterity an improved and unimpaired estate.

VIII.—Conclusion.

On looking over this report, before transmission to your Honor, a fear has arisen that the facts we have adduced, and the inferences we have drawn from them, may be regarded as having been too darkly tinted; and yet, on recalling what we personally observed, the conversations which we have held, the accounts which we have been allowed to examine, and when we remember the agreement of converging statements respecting any particular point, we feel we should be doing our informants injustice did we not faithfully record what we have heard, and that we should be doing your Honor and ourselves an injustice did we not submit what we have ourselves seen, and what we believe. That the case is one which causes much anxiety is beyond all doubt; and we feel assured that if the public estate is to be rescued from serious depreciation, and private interests from calamities and losses, in no small measure the results of an outside visitation of at one time an apparently insignificant but now of an extremely serious character, this can only be obtained by the application of a remedy which shall be immediate, compulsory, and universal.

His Honor the Superintendent, Otago.

J. RICHARDSON. WALTER H. PEARSON.

APPENDIX.

AREA OF RUNS, PROVINCE OF SOUTHLAND.

Run.	Gross Area.	Alienated.	Leasehold.	Run.	Gross Area.	Alienated.	Leasehold.
	Acres.	Acres.	Acres.		Acres.	Acres.	Acres.
112	46,250	19,303	26,947	191a	4,204	614	3,590
116	26,000	16,555	9,445	195a	26,980	13,150	13,830
119a	25,000	16,535	8,465	195в	16,000	8,381	7,619
119в	22,000	18,540	3,460	198	37,000	1,150	35,850
133	11,750	4,754	6,996	207	13,200	6,023	7,177
135	16,120	9,861	6,259	207A	6,500	250	6,250
135a	5,350	860	4,490	207в	10,950	10,120	830
142	2,900	403	2,497	208	26,180		26,180
143	24,000	4,838	19,162	214	29,000	8,804	20,196
143a	11,400	1,347	10,053	300в	7,800	1,250	6,550
143в	11,600	2,730	8,870	302	26,636	2,583	24,053
146	21,150	12,969	8,181	302A	6,720	98	6,622
148	56,185	34,330	21,855	302в	7,200		7,200
149	22,800	5,912	16,888	329	9,500	330	9,170
150в	12,800	6,963	5,837	352A	30,000	430	29,570
153	26,900	7,382	19,518	352в	10,000		10,000
154	23,500	6,677	16,823	394	22,500	690	21,810
154a	2,480	1,592	888	395	3,800		3,800
1561	15,000	4,360	10,640	396	15,000	7,272	7,728
156A2	12,400	4,815	7,585	417	1,900		1,900
156в1	11,200	9,659	1,541	418	4,000		4,000
156 B2	8,200	7,220	980	419	120	50	70
159	24,600	15,407	9,193				
165	19,000	8,750	10,250		-		
166 _A	25,200	2,419	22,781	Total	1,096,475	348,725	747,750
166в	10,000	2,260	7,740	415	44,640		111,100
173	40,000	820	39,180	397	27,360		• • • • • • • • • • • • • • • • • • • •
176A	21,270	8,318	12,952		500,935	1,000	Stewart
176в	17,280		17,280		000,000	2,000	Island.
181	65,000	41,880	23,120		279,444	Bush on ne	storal coun
187	58,000	7,912	50,088		,		ccupied.
188	39,500	10	39,490			1 2.5 and	ocapiou.
190	20,300	670	19,630			1	
190A	1,080	•••	1,080		1,948,854	Total area	of province
191	25,070	1,479	23,591		1,020,009	out of H	

AREA OF SOUTHLAND HUNDREDS .- To 26th April, 1876.

	Hundred.			Are	8.	Sol	d.	Balance for Sale		
r ••				A.	R. P.	A.	в. Р.	А.	R. P.	
Invercargil		•••	•••	89,272	3 36	86,740	1 25	2,532	2.11	
Jacob's Ri		•••	••• }	92,214	3 36	89,404	1 15	2,810	2 21	
New River		•••	•••	84,340	1 13	77,291	2 20	7,048	2 33	
Campbellto		• • •		60,510	1 17	30,293	2 25	30,216	2 32	
Oteramika	•••	•••	•••	91,658	2 31	54,019	0 17	37,639	1 14	
Mataura		•••	.,,	12,185	2 18	11,094	2 18	1,091	0 0	
A parima	•••			46,576	0 30	46,576	0 30	0	0 0	
Mabel				28,450	0 14	25,360	1 21	3.089	3 33	
\mathbf{W} inton				41,994	0 21	41,671	1 24	322	2 37	
Lothian	•••			25,868	2 3	21,290	$3\hat{2}1$	4,577	2 22	
Waimumu			İ	61,568	0 0	45,859	2 1	15,708	1 39	
Lindhurst				51,834	0 28	30.184	3 12	21,649	2 16	
Foresthill				77,380	1 14	56,313	1 14	21,067	0 0	
Oreti		•••		68,243	$\frac{1}{2}$ $\frac{1}{19}$	46,123	$\frac{1}{2}$ $\frac{1}{19}$	22,120	o o	
	Totals		,	832,098	1 0	662,223	3 22	169,874	1 18	

Enclosure 2 in No. 1.

The CHIEF SECRETARY, Victoria, to His Honor the Superintendent, Otago.

Chief Secretary's Office, Melbourne, 31st March, 1876. SIR.-

In reply to your letter of the 8th instant, asking for information on certain points as to the extent to which the rabbit nuisance prevails in this colony, and whether any steps have been taken to avert it, I have the honor to enclose herewith a copy of a report on the subject which has been furnished by the Secretary to the Department of Agriculture.

No steps of a public nature have yet been taken to avert the nuisance referred to, but large sums have been expended by private individuals in endeavouring to extirpate the rabbits, and in some cases, as the enclosed report will show, with success.

I have, &c.,

His Honor the Superintendent of Otago, New Zealand.

JOHN MACPHERSON.

Sub-Enclosure to Enclosure 2 in No. 1.

REPORT furnished by the Secretary to the Department of Agriculture, Victoria, in answer to the following questions:

- If the rabbit nuisance prevails in Victoria, to what extent and when it commenced.
 If any public or private steps to avert it have been taken, and with what effect.
- 3. What were the means adopted, and, if of a public nature, how the expense was provided for.
- 1. It prevails to a considerable extent in some districts, more particularly on the stations to the west and north-west of Geelong. The nuisance has prevailed more or less from the day that the rabbit was first introduced by the late Mr. Thomas Austin, of Barwon Park, Winchelsea, about thirty miles west of Geelong; from which place as a centre, the nuisance spread until now there is hardly a part of Victoria where the rabbit is not to be found.
- 2. I am not aware of any public steps having been taken to avert the evil: privately much has been done to avert it, with varied results.
- 3. Various means have been adopted to keep down the nuisance, but the rabbit breeds so rapidly in this country that the ordinary methods of shooting, ferreting, and trapping, usually adopted in the Old Country, have been found of little or no avail in this. Of all who have had to contend with the rabbit nuisance in Victoria, the Robertson Brothers, of Colac, have, I believe, been the most successful in battling with it. They tried the methods above alluded to, but without any apparent good results. The rabbits had taken possession of the wombat holes that existed in such great numbers on that portion of their run which abuts upon the Warrion Hill, and lived there in communities, not in families merely. After some consideration, the Robertsons decided that the only plan would be to fill up the holes with boulders of basalt: they did so, but the rabbits burrowed out at the sides and were soon as troublesome as ever, and they were compelled eventually to dig away the soil to the basaltic rock that underlays it, and build in the rabbits with soil masonry. It was not until they did this that they were able to rid themselves of the nuisance. Mr. George Robertson has assured me that the rabbits rendered 10,000 acres of their run valueless, as neither cattle nor sheep would graze where the rabbits were so numerous; and further that it took them seven years to free themselves of the nuisance, during which time they expended £35,000 upon the undertaking.

Enclosure 3 in No. 1.

The COLONIAL SECRETARY, Tasmania, to His Excellency the Governor, Tasmania.

(Memorandum.) Colonial Secretary's Office, Hobart Town, 28th March, 1876. In compliance with His Excellency's wishes, as notified in the Private Secretary's memorandum of the 23rd instant, the Colonial Secretary has the honor to transmit the undermentioned documents relating to the destruction of rabbits in this colony:

1. Memorandum by Mr. W. P. Latham, Council Clerk and Secretary to the Hamilton Rabbit

2. Acts of Parliament—35 Victoria, No. 13; 38 Victoria, No. 21; 39 Victoria, No. 18; 33 Victoria, No. 8, "The Cross and By-Roads Act, 1870."
3. Hobart Town Gazettes of 28th May, 1872, and 18th June, 1872.

The operation of the laws in force for the destruction of rabbits has, on the whole, proved of great service in keeping under this serious scourge to the farmer, but it requires united action and the cordial co-operation of all in the infested localities to secure practical results of a durable character.

His Excellency the Governor, &c., &c.

THOS. D. CHAPMAN.

Sub-Enclosure 1 to Enclosure 3 in No. 1.

Mr. LATHAM to Mr. CHAPMAN.

Hamilton Rabbit District.

The Hamilton Rabbit District was proclaimed in April, 1872. A meeting (public) of ratepayers was held on the 6th day of June following, when five Trustees were elected, in accordance with "The Cross and By-Roads Act, 1870," which must be read with the Rabbit Acts, 35 Vict., No. 13, and 38 Vict., No. 21, by which it will also be seen that the ratepayers have the power to elect seven Trustees, if they deem it expedient.

After the public meeting the Trustees met, when they appointed a permanent chairman, treasurer, and secretary, the latter to be also collector; they directed the secretary to provide a minute and a cash-book, &c. They fixed a rate of 3d in the pound for the year ending the 31st December, 1872, according to the Municipal Valuation Roll. The following prices were decided on for rabbit skins, viz., 2s. per dozen for large paling-stretched or pegged-out skins; 1s. per dozen for small ditto ditto. A Trustee in each section of the district was appointed to purchase skins, as was also the

The Trustees met the first Tuesday in each month, when those gentlemen (Trustees) who had purchased skins were paid for them by cheque—i.e., the accounts first having been examined and passed

by the Finance Committee.

No other rate was levied until the 7th of April, 1874, when 6d. in the pound was fixed for the year ending the 31st December, 1874. Hence there was only 9d. in the pound levied and collected in three

During the three years ending the 31st of December, 1874, there were 347,860 rabbits killed and paid for by the Trustees.

		Receip	ts.			•		
Amount of Rates levied and	collected.	Total		£. s.	d.	£.	s.	d.
1872.—3d. in pound 1874.—6d. "		•••		214 14 414 0	7 7			
,	•					628		2
Received on account of skins	s shipped t	to England	• • • • • • • • • • • • • • • • • • • •	•••	•••	1,238	4	6
		Total	•••		•••	£1,866	19	8
		Expendi	ture.			£	8.	d.
Total paid for skins			•••	•••		1,488		11
" overdraft		. • • •	•••	•••	•••	389	_	_
Collection (5 per cent.), inter	rest, books	, stationery	r, &c.	•••	•••	59	2	5
		Total	•	•••		£1,937	11	0

Deficiency £70 11s. 4d., against which there are 2½ bales of skins to be shipped, which will considerably reduce that amount.

The skins should be perfectly dry when purchased, sprinkled with diluted carbolic acid on the fleshy side (if not, the weevil will so damage the fur as to reduce the value to half), placed carefully one upon the other, and weights put on them. As soon as there are sufficient, they should be put into a wool bale and pressed. When there are two or more bales ready, they should be shipped through an agent to England, who will give an advance on them, say two-thirds, which would give funds to go on with; it depends on the London agent to put them in a good market, or they can be sold to a local

merchant, which I should advise if practicable.

The Act here has worked well, although at first a grave error was committed in paying too much for the skins, and receiving and paying for ones not half-grown, also in neglecting to have skins properly dry, and not protecting them against weevil, all of which should be guarded against to insure a good sale.

There are runs here on which a good shot could bag 300 to 400 daily six years ago, and now you could not meet six. Ferrets should be introduced: any number could be procured in this district at about 10s. per pair. I would suggest that several of them be turned out wild. I have seen it to answer well here, and no injury to the poultry. Tame or domestic cats are useless for destroying rabbits; so long as they can procure birds they rest satisfied. A man with a gun, two or three ferrets, nets, and a half-dozen terriers and greyhounds, would exterminate a warren in a very short time, particularly in a country like the plains of New Zealand, where there are no logs or old fallen trees to protect them. Knowing New Zealand as well as I do, after so many years' sojourn there, I have no hesitation in saying I would organize such a system as would exterminate the bunny in a very few years. This country is different: the gigantic fallen trees and thick scrub protect them, notwith-standing the number of enemies they have here.

Hamilton, 4th September, 1875.

W. P. LATHAM, Council Clerk and Secretary Rabbit Trust.

Sub-Enclosure 2 to Enclosure 3 in No. 1.

THE following Tasmanian Acts,*-

"The Rabbits Destruction Act, 1871:"

"The Rabbits Destruction Act Amendment Act, 1874."

"The Rabbits Destruction Act Amendment Act, 1875."

"The Cross and By-Roads Act, 1870."

Sub-Enclosure 3 to Enclosure 3 in No. 1.

EXTRACTS from the Hobart Town Gazettes of 28th May, 1872, and 18th June, 1872.*

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