1946.

VICTORIA.

REPORT

of the

ROYAL COMMISSION

to inquire into

FOREST GRAZING

together with

MINUTES OF EVIDENCE

PRESENTED TO BOTH HOUSES OF PARLIAMENT BY HIS EXCELLENCY'S COMMAND

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REPORT

of the Royal Commission to inquire into Forest Grazing

To His Excellency Lieutenant-General the Honorable Sir Edmund Francis Herring, Knight Commander of the Most Excellent Order of the British Empire, Companion of the Distinguished Service Order, upon whom has been conferred the Decoration of the Military Cross and the Australian Efficiency Decoration, Lieutenant-Governor of the State of Victoria and its Dependencies in the Commonwealth of Australia, &c., &c., &c.

May It Please Your Excellency:

Matters for Inquiry.

By Letters Patent, sealed by Your Excellency's command and entered on record in the Register of Patents on the 25th day of June, 1946, your Commissioner was appointed to inquire into and report upon the following matters:—

Grazing upon forest lands in Victoria, more particularly in relation to water catchments and timber producing areas in mountainous regions and, without limiting the generality of the foregoing, to inquire into and report upon the following specific questions:—

1. Whether, and to what extent, grazing adversely affects vegetational and sylvicultural conditions;
2. Whether, and to what extent, grazing accelerates soil erosion and reduces water catchment efficiency;
3. Whether, and to what extent, grazing is related to the occurrence of forest fires; and
4. (*a*) Whether existing measures for regulating grazing on lands held otherwise than by private tenure are effective;
   (*b*) Whether other measures are desirable;
   (*c*) Which Department of the Crown or Authority should administer such existing or proposed measures.

Method of Inquiry.

Your Commissioner informed himself as best he could by hearing evidence, by conversation, and by receiving written communications, from people whose views constituted a very wide area of experience and opinion; by inspections of parts of the country; and by reading certain works upon subjects bearing upon the matters for inquiry. He was greatly assisted by his making two country tours, one of certain parts of the eastern portion of the State and one of part of the western portion. During the eastern tour he heard evidence and made inspections at Licola and the Macallister river valley, Maffra, Lakes Entrance, Orbost, and the lower reaches of the Snowy river, Cann river, Mallacoota, Bruthen, Tambo river valley, Omeo, Cobungra, Benambra, Nariel, Corryong, Cudgewa, the Murray river valley between Corryong and Albury, Bright, Myrtleford, Whitfield, Mansfield, and Alexandra. The western tour comprised investigations made at Casterton, Balmoral, Horsham, Stawell, Hall's Gap, and parts of the Grampian mountains.

Your Commissioner is very greatly impressed by the complexity and urgency of the problems which have been presented for his consideration during an inquiry which has been of compelling interest. He respectfully acknowledges that he is honoured to have been entrusted with the matters in hand.

The terms of inquiry, which are set out above, are clear. Read literally and narrowly, they limit the inquiry to an examination of the effects of grazing upon the several physical conditions and processes therein mentioned, and require a consideration of measures designed to regulate grazing. Grazing, and grazing alone, would appear to be the crux of the matter. But early in the investigation it became clear that the subject of grazing does not and cannot stand alone and apart from other cognate subjects with which it is virtually inextricably involved. The basic questions which must be probed to enable an understanding to be reached upon the particular subject of the inquiry are of such vast importance to every man, woman, and child in this State and to the generations unborn, that your Commissioner feels that, having been given the opportunity of legitimately recording his opinion upon those much wider, transcendently important questions, he would indeed be lacking both in imagination and conscience were he content to confine himself to satisfying the narrowest possible interpretation of the instructions given him. The faithful herdsman, sent to tend one ailing beast and finding the whole herd beset by disease, will surely tell the steward what he has found. And so it is that your Commissioner proceeds to discuss, as compendiously as he can, not only the matters specifically set forth in the terms of Your Excellency's commission, but also those others which cannot be kept out of his consideration.

Amongst the many subjects which fill the field of this inquiry, three stand, pre-eminent, in an inseparable trinity—Forest, Soil, and Water. No one of them can stand alone. No one of them, alone, can be understood. No one of them, without the others, can prosper. Each keeps the others in health. If one is injured, the three must share the injury. A cycle of destruction of all three may begin with any one of them. Destroy your forests and your water will destroy your soil. Destroy your soil and you destroy your forests and your water supply. Destroy the sources of your water storages and your forests and soil will vanish. Destroy any one of them and, by the inexorable cycle which works for health or disease within this fundamental syllogism of the productive physical world, you destroy the well-being of your people. You may even destroy the people themselves. This is no mere pattern of fantasy built into an edifice of words. Civilizations have perished, leaving only the monuments of man's pretentiousness to mock their memory, because in ignorance or wantonness man's impious hand has disturbed the delicate balance which nature would maintain between forest, soil, and water. The active destructive agent in the cycle is man-made erosion, which is his great enemy.

Erosion of this kind is the eating away of the cover of the soil and the soil itself. Its force is cumulatively progressive until, in its latest phase, the so-called living rock is bared to dominate a dying countryside. Its action, in its early stages, is almost imperceptible, but once fairly begun and left unchecked it eats the earth with a rapacious hunger which defies the wit of man to halt it, until, in lands in which its hunger can be fully fed, it drives all living things before it: the mountains and the upland slopes, once greenly clad in their rich forest garments, lie naked, bared to the timeless onslaught of the elements; the deep, rich river flats are buried under sterile sand; the prairies, the tundras, the great grasslands fall sick, and death awaits them in the dust bowls; noble rivers wane and wander, foiled and circuitous, in the deserts which supplant the erstwhile fertile lands; wind and water bear the sands to engulf great cities; and monuments built to mark the imagined greatness of men, stand sand-pitted, the memorials of his folly. Deep beneath the desert lies old Antioch because the hand of man ravaged the forest uplands which governed the impetuous volume of Orontes river. The deserts of North Africa were once fine forest lands. Where but yesterday the countless buffalo were nurtured upon the prairies' opulence, the dust-bowls of America darken the sky whenever strong winds blow. In South Africa, vast tracts of veldt-lands, burnt to death by man, stretch ever northwards towards the northern deserts which, too, were made by man.

The problems of forests, soil, and water are problems of the behaviour of mankind.

To those who are not informed upon these subjects this kind of prelude may seem extravagant. However that may be, they may at least be inclined to draw comfort from the thought that " it can't happen here." We know our country, we

think. We live in it or visit it, and see no signs of Nature's wrath to come. We see it in the green upsurge of Spring or in its boundless Summer brownness. It is as it always was, we think, unchanging and unchangeable. There are the age-old plains and the everlasting hills. In fact, nothing in Nature is static, and there never were any everlasting hills. The great plains were created by volcanic flow or by water-borne soil from the uplands, or by both. The hills are wearing away, however quickly or slowly, and the plains are changing. There always has been a natural erosion which had made parts of the earth uninhabitable before the advent of mankind. That erosion carries soil from the high places to make new lands. Those new lands in miniature can be seen as silt islands, now covered with vegetation, at Mallacoota and Lakes Entrance, and as river flats in the meander plains of the rivers of Gippsland and some northern rivers. Nothing in Nature stands still. The rate of Nature may be hastened or slowed by man's interference. This report is concerned chiefly with man's interference with the work of Nature, and is dominated by the consideration of man-made erosion. Natural erosion is controlled by those forces which control the physical world and which, left to themselves, preserve rich and fertile places for the habitation of mankind. In all parts of the world places such as these have been destroyed or impaired, and are being destroyed or impaired by man's interference. It is idle to say that "it can't happen here." It has not only already begun here; it has made savage headway and must be arrested.

The point which one particularly emphasizes is that vast tracts of land throughout the world which now lie useless, abandoned, and deserted, were once as rich as, or far richer than, this State of ours. The beginning of their decline from a state of full and plenty was the result of man's interference with the works of Nature. The same beginning, born of the same causes, is at work in this State to-day. To enable a better understanding of that statement, a necessarily short excursion into the history of the subject must be undertaken. But to ensure that that excursion shall be profitable, it is advisable to postpone it until a short examination has been made of the principal agents of erosion and of its mechanical action.

It is thought by geologists that the earth consists of an inner molten core covered by an outer crust. According to the nebula theory of the earth's origin, the earth began as a whirling gaseous mass thrown off into space by a large body. As the mass cooled an outer crust formed. As the cooling proceeded, the mass contracted. The contracting, shrinking crust was subjected to tensions which caused it to crumple and take on an irregular surface. Great crust movements and adjustments, heat, cold, ice, snow, frost, water, wind, have all contributed to the making of the configuration and quality of the outer layers of the crust, and are still so contributing. The several erosive agents are forever at their work of attrition of the crust surface. Water and ice action, governed respectively by gravitation and pressure, have dissected and are still dissecting the outermost parts of the crust, denuding its surfaces of its softer portions and forming valleys down which rivers and glaciers flow, continuing, by so doing, the erosion, or eating away, of the crust surface. The basis of the soil is the rock between the core and the surface. The soil is the thin skin formed by the disintegration of the rock surface and the wearing of it down to fine particles by the action of pressure, friction, frost, water, and other agents. The soil-skin is but a skin indeed. For example, the average depth of the soil of the United States of America has been estimated to be but 4 feet. The skin is easily and quickly destroyed, and can be restored by Nature only by the laborious work of centuries.

It is by natural erosion that much of the soil is formed, the softer portions of the uplands being eroded and water-borne to lower levels, and there deposited to make rich, deep lands, Overlying the soil itself and merging into it is the humus.

The humus is necessary to the inert, deeper soil, giving it life and fertility. Without the humus, the soil lies barren. The humus provides the means by which the life-giving properties of the sun are conveyed to the vegetation. It is a layer of decomposing natural waste material consisting of partly oxidized animal and vegetable matter in which fungi and bacteria are active. It teems with the life and activity by which the soil organisms are supplied with energy. It creates the cohesive element which enables the minute soil particles to congregate to make large particles, so forming a porous instead of a solid soil. Amongst the components necessary to make and maintain soil fertility are oxygen and water. When the soil is converted from its

porous condition to a solidified, impermeable mass, oxygen, water, and the salts dissolved by water are excluded, and the soil fertility deteriorates or is totally destroyed. Remove the humus and the soil is on the way to barrenness. It is the outer layer of the earth's skin through which the soil breaths and drinks and prospers.

Upon the humus, where vegetation exists, lie the vegetable and arboreal wastes which rot and are worked upon by the active elements of the humus until those wastes are absorbed into and become part of the enriching humus. It is soft and easily destructible. Its protection against erosion by water or wind is the cover which grows upon it, whether of grasses, shrubs, or trees. Their roots hold the humus and soil against the action of wind and water. The tree canopy and the leaves of lesser growth shield the humus and the soil against flattening, pounding rain, which, if the soil is unprotected, tends to dissolve the crumb-structure of the soil by reducing the large particles to their finest elements, which are washed into the pores, filling them, and thereby obstructing or completely preventing the soil's breathing and drinking. In forest lands, on mountain slopes, the natural litter which lies upon the forest floor, and the cover of vegetation impedes the run-off of rain water, enabling the earth to absorb the water into its subterranean storages from which it emerges later, its flow regulated, in springs and seepages which feed the streams through long periods of dry weather.

If the humus is destroyed, the vegetation dies, and with it, the soil-integrating roots. The sponge-like cover of the humus having been removed, two major evils follow. On sloping lands the speed of the run-off of rain water is unchecked. The absorption of water into the earth's subterranean storages is impaired or destroyed. From the second evil results the failure of the seepages and springs which would have helped the parched earth through its summer travail by maintaining some sustaining moisture in the soil and some volume of river-flow. From the first evil even greater loss ensues. On sloping lands the unimpeded waters form rills; the rills form runnels; the runnels form small streams; the streams form gutters; the gutters form gullies; the land is soon eroded into gulches and crevasses. With every rain vast quantities of infertile earth are carried to the streams. The streams become silted and the level of their beds is raised. Too much water races to them too quickly instead of being more gently delivered. Floods occur, depositing inferior or sterile material upon the rich river flats which in time are buried and made useless. The velocity of the streams causes river-bank erosion. Trees growing on river banks are undercut and collapse into the river. The course is diverted by the obstruction. The river, in its urgency, carves for itself a new career, which is marked by further bank erosion and the rapid destruction, by bank erosion, of riverside lands. Rivers once navigable for miles from their mouths become silted and un-navigable. Bridges, roads, fences, railway enbankments, farm buildings, houses, and all manner of things are damaged or destroyed. Throughout the countryside in Victoria one hears many stories of the increasing frequency of floods, silting of rivers, destruction of river flats, loss of stock, damage to property—all of which have grown in their destructive frequency within the memory of living man. Those who tell of these things are astonished that Nature, so lately rich and benevolent, should have turned her supposed malevolence against the achievements of the pioneers and their children who feel that they deserve well of a country which they have helped to tame and harness. Unfortunately it must be said that the pioneers helped, as they did in America and Africa, to set in train the destruction which now threatens, in many places in Victoria, the fortunes of their descendants. Newcomers, too, have injured the forests, laying them waste in large tracts in their unconscionable scramble to convert land products into money. The grazier is not the only offender, nor is every grazier unmindful of the well-being of the forest lands. He cannot, in justice, be singled out as one to be controlled. Nor can one be content, in commonsense, to suggest a remedy which is not adaptable to control not merely the grazier, but all those whose treatment of the soil works injury against the forests and against their fellow men.

Chapter I.

Man's Destruction of the Soil.

This short chapter is designed to show something of the dire consequences of man's destruction of the soil in both past ages and the present time, and to point the fact that the recent " discovery " of erosion and the awakening of the modern world to its menace is merely a matter of history repeating itself. In ancient Peru, even before the Incas held sway, as they did for many years before the Spaniards saw America, a great population was preserved for centuries because a now vanished people grappled with the problem of erosion in a way which, by its methods and its success, has never since been equalled in the world. Originally their mountains were well forested. As population increased the upland slopes were cleared for agriculture. Here, ancient history anticipated the modern story of soil destruction. Severe erosion of the hillsides and the river valleys ensued, as it always has done when the forest has been destroyed. But, unlike the modern man, sitting superior and stupefied in a world of processed foods and undigested democratic theory, these people dealt with the problem in a way that has never since been known. They terraced their hillsides by means of stone masonry which to-day stands as firmly as the day it was laid many centuries ago, uncemented, each huge block cut to fit into the scheme with a beautiful precision which does not admit of the insertion of a knife blade, even to-day, between the contiguous surfaces of the component members. They knew nothing of iron, of steel, of concrete, of electricity, of steam. They man-handled each great block. They built aqueducts from distant sources of water supply, one of which has been traced for 500 miles. They brought the soil to form the terraces from places as far distant as 700 miles. Their terraces were built on steep valley-sides such as would probably baffle the engineer of to-day if he were asked to copy their work. They flourished as a people for centuries. It is thought probable that their passing was by martial conquest and not by destruction of the soil. They are an almost unique example of a people who, having caused erosion, conquered it, or at least held it in check during a long time. There is probably no people in the world to-day who could do what they did by the methods and materials which they used. Theirs was a truly gigantic problem of the soil. It was solved by truly Gargantuan labours. Compared with them, we have no problem of cure worthy of serious discussion. We do have the beginning of the same kind of destruction which they opposed and vanquished.

In Yucatan, in the sixth century, its area of less than 50,000 square miles supported a population which is to-day estimated to have been 13,000,000 people. To-day its glory is gone, its population a mere remnant of what it was. Its soil is infertile and the country inhospitable. The destruction of its vast pine forests certainly played a major part in the passing of the soil, and with it, its prosperity and its people.

Similarly, in Guatemala, the invasion of the forests by agriculture has obliterated all but the monuments of its former greatness. The invader himself has perished upon the scene of his barren conquest. The rich lands have been destroyed. The great clear-water lakes have become death-spreading fever swamps.

In Mesopotamia, the ruthless exploitation of the forests on the Assyrian highlands, and the intensive agriculture to make way for which the forests were ravaged, accelerated the natural erosive forces. The level of the lowlands was raised by deposits of resultant silt. The lowland irrigation systems spread and deposited the eroded material. As the levels of the plains were altered the course of the rivers shifted and the Euphrates and Tigris drew further apart so that the land between them could no longer be irrigated. Agriculture declined and, without agriculture to bind the soil, the desert conquered mankind. It buried his cities and drove him to seek new lands. The rich river-mouth deposits were settled by the Chaldeans. Their cities are buried to-day by sand borne by wind and water. The destruction of the forests and the overtaxing of the earth's benevolence led to an exhaustion which is now perhaps beyond even the reach of the great curative forces of nature which work quickly when they achieve their purpose in time that is measured by thousands of years.

In Palestine and Syria the same story is indelibly written in the shifting sands of the desert. The uplands were cleared for husbandry. The rape of the forests and the despoiling of the land by agriculture caused violent floods which have denuded the slopes of earth and trees so that the fundamental rock remains a monument to the handiwork of man. The lower reaches of the rivers are silted and difficult, if not impossible, of navigation by even light-draught vessels. Ancient cities, once teeming with their thousands of people, lie buried deep beneath the water-borne debris which was first released by the hand of man in his quest for wealth and the power which it would bring him. The new Antioch, its population less than one-tenth of that of its ancient namesake, is set in a sea of sand, mocked by the bare and rocky hills whose denuded slopes have buried the evidence of the fame of those who destroyed them.

Greece, Italy, North Africa, Persia, Central Asia, India, China, bear upon their scarred bodies the same story as plain to be read as if it were recorded in the writing of some universal language of calamity and defeat.

That is but an incomplete and perhaps unconvincing epitome of a small paragraph taken from the vast book of the earth in which is recorded the history of the ages. It treats of what has passed and, probably, passed far beyond redemption. It is history and it is true. Many there are, one feels, who regard history as a fairy-tale of unreality. Be that as it may. One passes to a short consideration of what is happening in the world about us in the times in which we live.

In South Africa there is a march towards destruction on a large scale. The northern deserts are moving southwards to meet the northern march of the veldts whose fatal progress is impelled by the vicious circle of over-grazing and the burning of the grasses to promote new growth so that the system of over-grazing may be propped up for a little longer. In time the devastated veldt will meet the arid desert in a dreadful union of the forces of erosion. Field-Marshal Smuts has said " Erosion is the biggest question before the country to-day, bigger than any politics. Successive governments have passed laws to regulate burning of the veldts but no government has been strong enough to enforce them." Are politics the same in all countries? And will history of South Africa repeat itself in our community?

China, within a single country, supplies the most effective examples of erosion control and of destructive erosion by man. Its peasant class, with that feeling for the soil which the traditional peasant has the world over, has kept, in parts of China, for century after century, by natural means, their plots of land in good heart and full production. Against that, the Yellow River, flowing from the north-west denuded highlands, denuded, of course, by man, breaks its levee banks with disastrous frequency and takes toll of millions of lives and of the scant possessions of the small farmers, leaving incalculable damage and misery as it subsides. It floods because the silt has raised its bed, over the years, above the level of the surrounding country and its course is sought to be governed by levee banks. It floods because the natural mechanism for regulating its flow has been removed from its upland catchments. Like the Mississippi it is an elevated river, the raising of whose bed has been created by the erosion of the uplands from which it derives. The erosion has been caused by the deliberate destruction of what once were the protecting regulating forests.

Russia emancipated the serfs about the middle of last century. There followed a great expansion of grain cultivation. Forests were cleared, and the soil was grossly overworked. Oppressive taxation made it necessary for the freed men to undertake a different slavery—that of the necessity of wringing the utmost from the land. The forests have been further seriously damaged to serve the needs of the nation. The great arterial river basins are badly eroded. Its experience, although due to different economic causes, is akin to that of the United States of America whose " rugged individualists " have taken the country by the throat in their endeavour to shake the last red cent out of her. And they have, in parts, come close to succeeding. That is why the United States is spending millions of dollars upon reclamation of the soil and on defensive schemes against erosion and flooding caused by the uncontrolled ravages of unregulated private enterprise in the forest uplands.

Let it be clearly stated that this report is not concerned with political or social theory. Whatever facts appear are set down objectively and upon detailed and careful examination of the authorities which have been relied upon by your Commissioner.

After the Civil War in America, part of the surge of the pioneers across the continent found its way to the Rio Grande valley and the plateaux and uplands which feed the great river. Before their coming, the Spanish-Americans and the Indians had for more than 800 years drawn a bountiful living from the region, cultivating the land to yield but little more than what they themselves required and grazing it practically only for their domestic flocks and herds. They were dispossessed by the new spirit of progress which animated the pioneers. Soon the valley was over-cultivated and the uplands over-grazed by the pioneers who converted the region from an abode of quiet husbandry to a stamping ground of ruthless commercial exploitation. The consequent degeneration of the uplands inevitably led to acute erosion on a grand scale. The warning unheeded, the frantic race for profit went on. From the day that the " sturdy pioneers " entered the Rio Grande country it was doomed. It yielded its life with its treasure. To-day the once richly fertile valley is buried in huge deposits of silt. Its river bed has been raised by silting so that in many places it is higher than the surrounding country which, no longer able to drain into the river, has become waterlogged swamp-land. Flood control dams have been built and are being built. But, in the opinion of informed observers, they will fail in their purpose, because the uplands are not being controlled. Here, as in so many places in America, where tenderness towards the rights of the individual—that is, his right to make money by almost any means—is so very evident, his anti-social activities will no doubt continue upon a course of destruction which cannot be abated until those activities are controlled. Similarly, to take but one more example, the Tennessee Valley scheme is in danger of ultimate defeat. The necessity for it arose out of the uncontrolled exploitation of the land. Its defeat, if it is to be defeated, will spring from the same cause. That cause lies in the failure to recognize that water conservation and river control have comparatively little concern with rivers. Water conservation is the conservation of catchments. Water control is the control of catchments. Catchment control is mainly forest control. Forest control is the control of mankind. Similarly, the problem of erosion is not one of soil. The problem of erosion is the problem of the behaviour of mankind.

Two-thirds of American forests are privately owned, one-third being the property of the State. The privately-owned forests had been, on the whole, better forested lands than those owned by the State. On only about 8 per centum of the privately owned forests is there any semblance of scientific foresty practised. Mostly they are being exploited for private gain, which means that they are " cut over " without selection of trees, without forest culture, and without regeneration, and that they are regularly burnt by graziers. The lumber industry, whose condition for years past has been precarious, works to the slogan, " Cut out and get out." Many of such areas are ruined wastes of abandoned country, laid bare and defenceless to erosive action. These areas, having been good forests, are in the upland country, where good forests are generally to be found. Much of the catchment areas of the Tennessee River consist of such ruined lands or lands in process of similar ruination. The flood control engineers have built numerous great dams along the Tennessee River. Their schemes may yet be defeated by siltation by material carried from the destroyed or damaged watersheds. River control is watershed control, which is the control of man's activities. The proof of this fact lies in the number of completely filled dams to be found on American rivers, where the silting of dams is widespread and rapid. Near Ithaca N.Y., eleven dams were built to serve as reservoirs. Seven are completely filled with silt and have no storage capacity whatever. Of the others, one, the Ithaca city water reservoir, was built in 1910 of 357,000,000 gallons capacity. In 25 years its capacity was reduced to 276,000,000 gallons, a reduction of 23 per centum.

The Schoolfield dam was completed in 1904. It had an area of 540 acres by a depth of 17 feet. In 16 years, 432 acres had been silted to a depth of 19 feet; that is to say, not only had that area been filled, but the silt had mounted above the dam level. A narrow stream trickled through its silt bed.

Perhaps it is felt that this cannot happen here. The bed of the Tambo river at Bruthen was raised 13 feet in a period of less than 40 years preceding 1922. The Laanecoorie Reservoir, built on the Loddon river about 50 years ago, has been reduced in capacity by more than half. The Glenmaggie Weir is silting. H. H. Bennett, who might fairly be called the modern pioneer in soil conservation and its allied subjects, says in his book, Soil Conservation, " The siltation of the Hume Reservoir is of material concern because it is the largest source of irrigation water in the Murray

drainage basin." The Kosciusko area is a major part of the **Murray catchment.** Your Commissioner is convinced that that area is being severely over-grazed and burned and, therefore, eroded. If this be so, the Hume Weir is endangered.

In Gippsland, there is hardly a major river which is not suffering the effects of man-made erosion. The Snowy, the Tambo, the Mitchell, the Macallister, are taken at random as examples of rivers whose siltation and its resultant damage have been caused, in part at least, by misuse of forest lands. The Tambo and the Snowy, once navigable for miles from their mouths by vessels of fair draught are no longer navigable at all. In the northern rivers there are evidences of deterioration similar to those exhibited by the streams of Gippsland. Throughout the great park-like tracts of the Western District are innumerable hills, the summits of which are bare to the earth, having been eaten out by sheep and cattle. Wind and water will increase the area of those denuded summits by sheet erosion. Soon gullying will follow, as it must, and great will be the resultant destruction.

In Victoria, according to the map reports of the State Regional Boundaries Committee, 1944, a great part of the north-west of this State is subject to wind erosion in an acute form and a great part of the north-east to acute water erosion. In that fact is the beginning of a force which, if left unopposed, will grow beyond the power of human means to abate it. It is comfortable to say of such things that they cannot happen here. No doubt the early pioneers of South Africa would have said the same had control of their " rugged individualism " been attempted.

Hear again the words of Smuts:—

> " Erosion is the biggest question before the country to-day, bigger than any politics. Successive governments have passed laws to regulate burning of the velts, but no government has been strong enough to enforce them."

We have in Victoria the beginning of what in South Africa is marching to its end.

Authorities.

Soil Conservation	H. H. Bennett.
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The Rape of the Earth—A World Survey of Erosion	Jacks and Whyte.
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Food or Famine: The Challenge of Erosion	Ward Shepard.
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Report on Regional Boundaries, 1944	State Reginal Boundaries Committee.

Chapter II.

Whether, and to What Extent, Grazing is Related to the Occurrence of Forest Fires.

It is thought to be convenient to deal with the numbered questions upon which your Commissioner is to report, otherwise than in the order in which they appear in Your Excellency's commission. This report now proceeds to a consideration of question (3) which is set forth as the heading of this chapter.

That grazing is causally related to the occurrence of forest fires is true beyond the barest possibility of doubt. There are, of course, other causes of forest fires, but fires lit by graziers are one of the major and most frequent causes. In America, Africa, and Australia the firing of forest lands by graziers is, and has been for many years past, a common and accepted practice. Its purpose is the promotion of the growth of sweet grass for the grazing animals, to facilitate their passage through the bush, and to create scrub-less strips or patches to prevent the spread of forest fires.

The extent to which grazing is related to forest fires cannot be stated with precision. Wherever grazing has been permitted in forest lands it has invariably been accompanied by widespread and repeated destruction of the forest growth by fire. The graziers for the most part have burned with an untroubled conscience. Many of them do not believe and cannot be convinced that burning is harmful to the forest products. It is not difficult to believe in the rightness and goodness of that by which one thinks one will benefit and profit. Furthermore, in the minds of many graziers, the practice is justified by long usage. What was good enough (and profitable enough) for their fathers is good enough for them. Some degree of burning has become necessary to protect the forests. Since the 1939 fires, the number of fires caused by graziers has, on the whole, noticeably decreased. Set out hereunder is a table showing the occurrence of fires in State Forests since the bush fires of January, 1939; that is to say, the 1938-39 summer season:—

FIRE OCCURRENCE IN STATE FORESTS SINCE 1938-39.

Division.	District.	1939-40.	1940-41.	1941-42.	1942-43.	1943-44.	1944-45.	1945-46.
Eastern ..	Bruthen	2	1	11	2	11	1	3
	Cann Valley	..	..	..	1	33	7	16
	Mallacoota	..	..	16	3	10	6	16
	Nowa Nowa	9	6	7	2	7	3	9
	Omeo	..	..	..	..	..	..	..
	Orbost	31	14	57	29	19	5	14
	Totals	42	21	91	37	80	22	58
North-Eastern ..	Beechworth	3	5	5	..	3	2	..
	Chiltern	1	1	..	..	..	..	..
	Delatite	..	..	..	3	..	1	1
	Upper Murray	3	2	14	..	..	2	2
	Upper Ovens	2	5	5	5	5	3	2
	Yarrawonga	4	9	1	..	4	7	1
	Totals	13	22	25	8	12	15	6
Central ..	Broadford	2	2	..	2	2	1	..
	Dandenong	..	1	..	3	6	5	2
	Niagaroon	3	1	1	2	4	2	2
	Toolangi	..	..	..	4	..	8	2
	Upper Yarra	2	1	9	1	6	..	..
	Wood's Point	..	..	1	6	..	..	4
	Totals	7	5	11	18	18	16	10
Southern ..	Briagolong	1	3	1	1	3	2	1
	Erica	6	1	6	3	21	5	16
	Mirboo	..	..	..	..	4	..	.
	Neerim	4	3	11	2	8	1	..
	Yarram	4	3	7	..	3	7	2
	Totals	15	10	25	6	39	15	19
Western ..	Ballarat	4	1	3	8	2	3	4
	Beaufort	..	..	..	..	1	1	..
	Daylesford	..	..	..	..	4	3	3
	Dimboola	..	..	1	..	1	1	..
	Heytesbury	..	..	..	6	6	2	6
	Heywood	7	5	13	6	7	7	2
	Lal Lal	..	4	1	1	2	6	..
	Otway East	3	5	30	..	10	5	2
	Otway West	2	1	..	2	3	1	..
	Scarsdale	2	9	..	..	3	3	1
	Stawell	4	..	3	4	1	6	1
	Wombat	7	23	6	3	3	4	3
	You Yangs	..	1	..	1	1	..	..
	Totals	29	49	57	31	44	42	22

NOTE.—The plains districts of Northern Victoria have been omitted.

It is to be noticed that Orbost enjoys the infamous distinction of having to its discredit a total of 169 fires. For the 1941-42 season alone the forest division which includes Orbost is to be debited with 91 fires to which score Orbost contributed an approximately disgraceful 57. Other districts have achieved double figures at various times. Omeo, although a district in which there is much grazing, has consistently failed to score. The Western district is discredited with 274 fires since the 1939 fires.

The table shown above and the comment which follows it may be misleading. It is to be noted that the fires referred to are not described as having been caused by graziers alone. They are fires of any and every origin. A very small number, hardly worth consideration, may have begun by legitimate accident. Viewed as a whole, they are to be considered as having been deliberately and unlawfully lit for the purpose of serving the interest of the incendiarist. Viewed again as a whole, they are to be taken to include a high proportion of fires lit deliberately by graziers. In some districts, where the greatly predominant interest is that of grazing, there being practically no other interest whose profit could be thought to be served by burning, virtually all of the blame for fires must be assigned to the graziers. When one speaks of " the graziers ", again a reservation must be made. In some districts where graziers burn the forest there are probably some who refrain.

Amongst those graziers whose real desire it is to protect the forest there are those who advocate protective burning for the purpose of arresting the progress of fires which will inevitably break out in the forests. Opposed to them are the idealists who insist that there must be no burning of forest lands and that, if left to nature, the forests will rid themselves of the scrub growth. The latter argue, it is thought rightly in theory, that in the absence of fire, which kills or cripples tree growth, the canopies will in time re-establish themselves and by so doing subdue the scrub and thin the tree growth by the process of survival of the fittest trees. Their estimates of the time required for the attaining of this natural reformation varies from 40 to 70 years. Their opponents reply that even if the theory is right, the desired end will never be attained because the forests will in the meantime be burnt out on a scale even greater than that of 1939. With those opponents of the natural reformists one finds oneself in unhesitating agreement for these reasons:—It is entirely impracticable to forbid the forests to all people; there will always be people in them: where men go, fire goes; it is a necessary concomitant of living; if every person in the State were wholeheartedly to endeavour to prevent forest fires, still, at some time, there would happen the accidental escape of fire lit for cooking or warmth or smoking: there would still happen the rare but real occurrence of fire by natural causes, such as by lightning: the longer the forest might be protected, the greater would be the devastating effect of the inevitable accidental fire, given the existence of circumstances favourable to the causing of fierce fire on a wide front; those circumstances do arise quite frequently and are of uncontrollable climatic origin; they are caused by a very few seasons of prolific growth followed by winter drought and a hot dry summer; once fire is established in a tinder forest, such as the idealists imagine, in the circumstances described, no human power can oppose it or check it by a yard; hundreds of square miles of our forest country are inaccessible by fire fighters, and will for many years to come remain so because of their size, their density, and their ruggedness—a fact that destroys the counter-argument of the idealists, who are inclined to say that no matter how dense the tinder of the forest may be, fire can be suppressed, before it is established strongly, by men and equipment rushed to the site of the outbreak. It appears to be quite clear that the realists who favour the practice of protective burning by patch or strip are in the right. The forest was made dangerous by " realists ". It must now be protected against " idealists ".

It may well have been thought that the horror and devastation and monetary loss caused by the 1939 bush fires would have burnt themselves upon the minds of men as well as on the countryside, and that for some time afterwards, because of the memory of them, the forests would have been free of fires. Yet, in the very next season, 31 fires occurred in the Orbost district; in the following season, 1940-41, Wombat district contributed 23, eclipsing Orbost with only 14. In the 1941-42 season, the third season after the 1939 inferno, Orbost had 57 and Otway East 30; in the last season recorded, 1945-46, the Eastern Forest Division suffered a total of 58. One feels that some forest officers believe that the praiseworthy efforts which have been made by the Forests Commission to educate the public generally, and forest users particularly,

upon the desirability of preventing forest fires, has had its influence in bringing about the decrease in numbers of fires. But your Commissioner confesses to a real doubt that such is true. It is not unduly cynical, one hopes, to believe that men do not accept and act upon an unfamiliar theory which postulates a course of conduct which is a sharp departure from established practice and which they believe will involve them in immediate monetary loss. Your Commissioner is of opinion that that fear of monetary loss may be made the governing influence in bringing about the observance of the laws relating to fire-lighting; and that it is that very fear which has predominantly caused the lessening of fires since 1939. One has found amongst the graziers a real anxiety lest they should be caused to suffer the deprivation of their forest grazing rights. In some districts those rights are still valuable and are granted upon payment of a mere token. If the methods of the past are to be continued so that a feeling of security of tenure may return to graziers, it is practically impossible to predict the extent which the relationship between grazing and fires will assume, beyond saying that it will grow in its harmful influence. If, on the contrary, there is maintained the more recent state of belief that permission to graze will be revoked if fires become frequent, we may look confidently to a continuance of the present state of decrease in the number of fires occurring throughout the State. The number is still unforgivably large. The improvement is seen by comparison with the extent of the utter untrammelled lawlessness of the period prior to 1939.

It is repeated that it is unsafe to generalize. Nevertheless, one has a strong impression, which falls short of positive conviction, that the breeder causes fewer fires than the dealer; that the permitted grazier of long standing behaves somewhat better than the newcomer; and that those whose cattle graze upon the high plains and in high places are to be preferred to those of the lowland country. The most dangerous class (if there are classes) would appear to be that of the small dealer of insufficient financial stability. He, like the American lumberman, feels the urgency that prompts him to " clean up and get out ". He must have the immediate monetary return. He is not continuously in the industry. He has generally other means of livelihood. He enters the industry and departs from it according to his judgment of movements in the cattle market. He burns to ensure that this year's or next year's profit will be forthcoming. The years beyond do not interest him. It is believed by your Commissioner that the relationship between grazing and forest fires can be bettered to the point of the almost complete prevention of grazing fires. Because of the divided control of the issuing of licences, and, generally, of the supervision of grazing, there has never been any real regulation of the matters involved in forest grazing. The Department of Lands and Survey has repeatedly issued licences to persons whose evil reputation for unlawful burning of the forest has been notorious to their neighbours and to the Forests Commission. The Forests Commission has done a great deal to control grazing under the licences which it has issued, but for years past its efforts have been frustrated by the Department of Lands and Survey. The latter department is not interested in land welfare. Its real interest is in land transactions. The Forests Commission is interested in forest welfare, but has, as to a great deal of the forest, been obliged to remain an appalled spectator of the wanton ravaging of the forests which the Department of Lands and Survey has misguidedly, if unconsciously, permitted. Throughout your Commissioner's inquiry, some of the warmest advocates of the continuance of control of grazing by the Department of Lands and Survey have been those of most evil reputation as forest burners.

The Department's policy of cancelling licences because of the incendiarism of the licensee has been to await a conviction of the licensee by a court of law on a charge of unlawfully lighting a fire. It is virtually impossible to obtain such a conviction against an experienced incendiarist, as anyone interested in the subject is fully aware. While that attitude towards the liberty of the subject is admirable in most of his affairs, it is entirely misguided in a matter where the interests of the whole State are so vastly important by comparison with mere individual interest, which falls far short of legal right. It appears very clear to your Commissioner that forest users must be obliged to police the areas entrusted to them, particularly if the industry which they carry on is one notorious for its destructiveness. They have no *right* in the forest until it is granted to them. Why should not the right be granted only to those whose reputation commends them? And why should not the right be not renewed if they fail to preserve the property

entrusted to them? It may be said, and said in a very high percentage of cases quite speciously, that a licensee's area may be spitefully burned by another. If the licensee attracts fire to the forest, innocently or otherwise, he is a danger to the forest and must be excluded.

In a separate chapter, the general subject of forest grazing management is discussed.

Chapter III.

Whether, and to What Extent, Grazing Adversely Affects Vegetational and Sylvicultural Conditions.

Question (1) of the terms of inquiry is the heading of this chapter. It is construed as meaning whether grazing by animals, including in the word " grazing " the practices associated with grazing, is harmful to the growth of plants and forest trees, and to the natural conditions amongst which they grow.

If the absolute truth which is sought by the scientific inquirer is to be given in answer to the question, then no general answer can embody such truth. If an answer by and large, so to speak, is desired as a guide to what should be done as a matter of expendiency, having regard to the relative values of the interests involved, a generalization may be offered. Even so, that general answer must be restricted and made cautiously. The difficulty of finding an answer has been increased by the fact that much of the evidence which was given before your Commissioner came from witnesses animated by the desire to protect their material interests in the forests. Some of it was absurdly arrayed in the dress of the dispassionate observer, whereas the un-hidden truth was that it was, in its essence, the clamouring of the profit seeker for the right to pillage the forest lands. Some of it was truthful in intention, but, coming from specialists, demanded careful examination. Many graziers shelved the whole of the blame for forest deterioration upon the rabbit. He, no doubt, would have blamed B'rer Fox. From the mass of evidence, the opinions of scientists, and the experience in other lands it has become possible to form an opinion.

Some kinds of animals are harmful to some kinds of vegetation and tree seedlings. Grazing by some animals may be beneficial to a forest. Grazing in some forms can do nothing but harm to both plant and tree growth. The practice of burning to encourage forage growth for animals does harm to the trees and to the superior types of plant growth, while stimulating, in many conditions, the growth of inferior plants and grasses. Burning may also, in some forests, cause the simultaneous germination of tree seeds so that a thick growth of young trees springs up in competition, the one with the other, instead of in that measured order which ensures the maintenance of the forest storeys, the result of whose presence is to bind the soil and conserve water, and to have a succession of young trees growing to maintain the canopy when the matured trees die.

In Victoria the main grazing animals, named in a descending scale of their destructiveness, are rabbits, sheep, and cattle.

The rabbit, in the country which it infests, offers probably the greatest menace to the well-being of Australia. It crops closely, eating even the roots of the herbage, and so scarifying great tracts of country that in a comparatively short time they are completely denuded of forage grasses and the tender young growth of all kinds. Furthermore, burrowing by the rabbit is a prime cause of soil destruction and loss of soil fertility. By these injurious methods of eating and burrowing, the vegetation is destroyed, as is the soil, by consequent erosion, so that what was once a well-grassed country may become an arid sterile tract. The rabbit is a dainty feeder and prefers the sweet herbage of settled country to the coarser fare which alone subsists in many parts of the forests to-day. He is encouraged to inhabit even the higher mountain slopes by the grazier, with whose interests he successfully competes. By burning the forest floor, the grazier helps to produce the sweet green " pick " which attracts the rabbit by its lusciousness. All over Victoria the rabbit has spread far from the settled areas which he prefers, and is to be found in higher altitudes. He has been seen on the summit

of Mount Hotham, in winter, and on the fringe of the high plains country. His favourite fare is the young sweet grass, in certain seasons the grass roots, and the young tree seedlings which barely show above the forest floor. In hard times he eats the bark of the young growth of trees, thereby " ring-barking " and killing them. He favours the sunny slopes of the mountain sides, always the more susceptible to erosion and consequent loss of vegetation, and in his depredations upon them is either the major assistant of other agents in their work of denudation of growth and soil or else the chief offender in his own right. His elimination would work an enormous increase in our national wealth. The damage which is done by the rabbit is in terms of money literally incalculable. Generally speaking, his numbers have decreased materially in settled country because of the high prices being paid for his skin and carcass. Paradoxically, while the very large gains that are being made by men, women, and children by rabbit-trapping have been an incentive towards the extermination of the rabbit, the fact that the rewards of trapping are so highly remunerative has created yet another " interest " in the country, and already means are being adopted to prevent injury to the " industry ". As long as the rabbit prospers in this country, as he will continue to do as long as existing means of attempting to exterminate him prevail, schemes of water conservation and soil protection must be materially adversely affected. He is the most destructive marauder against the interests of soil, forest, and water, in their fundamental significance, of all the grazing animals. The State could well afford to pay a staggering reward in purchase of a means which would rid us of this prime pest of Australia.

The sheep being a close cropper and sharp-footed is not a desirable grazer in mountain country. He can be a most effective cause of erosion. In the high country of the north-east of Victoria, he gives no offence because he is not generally to be found there. If allowed to over-graze, he can be almost as injurious to growth and soil as the rabbit. The sweet grasses and the seedlings are readily eaten by him. And yet, controlled, he can be of great value in reducing fire risks in certain types of forest.

In the Woohlpooer forest, west of the Grampians, beside the Henty Highway, the good and evil to be had of grazing are impressively to be seen, side by side in dramatic contrast. The forest for the greater part is of red gum of poor quality. For mile upon mile it bears upon it the unsightly evidences of imprudent grazing. Ravaged by fire and over-grazed for years, the stunted, twisted, fire-scarred trees stand in barren, hungry, open country or in a choked tangle of scrub, coarse grasses, and impenetrable rubbish. Some 40 years ago, 5,000 acres of it was bought by the Forests Department. It was then a very dense growth of red gum from 10 to 15 feet in height. It was treated by the arts of sylviculture, drastically thinned, and protected in its early years. Grazing for a time was excluded from it. Later, grazing was permitted, and it is still permitted, to keep in check the grass growth and to prevent the growth of seedlings so that the trees may have that space about them which they like. They do not thrive in thick forest. No burning has been permitted. The result has been twofold. By keeping the grass growth in check the fire danger has been reduced to its practicable minimum. Because the growth of seedlings was prevented, and fire excluded, the selected trees have prospered, standing healthy and strong, their symmetrical canopies spreading above fine straight boles. In health and strength the red gum is a valuable tree and of great nobility. In the Woohlpooer country it has made, with but little assistance and protection, a beautiful park-like stand, whose each tree gives testimony of human prudence. The praise is due to Robert Stephen Code, now Inspector of Forests for the Western District, who 40 years ago began this fragment of forest perfection. In all but its official name it is, indeed, the " Code Forest ".

It is to be noted that the Woohlpooer country is lowland plain.

At Mount Mesley, at Omeo, the Soil Conservation Board has fenced a plot, excluding all grazing from it. It is placed on the mountainside, which is otherwise open to grazing. It has been in existence only a short time, perhaps four years. Nothing has been sown or planted in it. It has been left without interference. It is now strongly grassed, for the greater part, and the old scars of erosion which traverse it are being healed by the natural regeneration of the ground growth. Against each tussock and growing thing can be seen a small mound of hillside debris of the soil, caught and settling to make new soil to fill and heal the earth's injuries. Outside its

fences the hillside face, unprotected and grazed almost bare, is a loose sole of shingle, unbound and incoherent, scored by gutters which will become gulches, and offering but a temporary lodging to the sparse and isolated growth which cannot contend with the moving face on which it rests. Inside the fence is reviving Nature, tending in her own way her own wounds. Outside is Nature in another mood, provoked to destructiveness by the interference she has suffered. Inside is the growing stability of a returning equilibrium. Outside is the escalator face of desiccated soil, moving downwards to the creek, which will become the further instrument of the hillside's malign mobility.

At Dandenong the story is repeated in a different form. There the community planting movement, which has spread throughout the State, had its origin. An area of grazing land has been fenced and part of it planted with trees. In the adjoining grazing paddock from which the area was excised are a few red gum trees. There the grass is cropped closely. There is no scrub or seedlings. Within the planted area there is a strong growth of grass and innumerable red gum seedlings, part of a natural regeneration, which have been allowed to grow. Through both the planted area and the grazing paddock runs a creek which has suffered severe bank erosion. In the paddock the erosion is obviously progressing. In the planted area, natural regeneration is binding and holding the banks with grass and scrub growth.

The Bogong high plains and the mountain slopes in their vicinity, together with nearly a 100 years of local history, afford some evidence of the effect of cattle grazing. Many years ago, the mountain slopes were open, well-grassed, valuable grazing lands. Horses, cattle, and sheep grazed freely and profitably upon them. In the early days of settlement, the stock grazed upon the mountain slopes throughout the winter and, with the coming of warm weather, sought the rich pastures of the high plains where they remained throughout the summer months. When the snows returned the stock retreated before them to the lower slopes, where they were sustained until the warmer weather brought them to the plains once more. Sheep and horses no longer graze there. There, as in every other mountain-grazing region of which one has heard, the slopes were burned, sometimes by fires lit by settlers in the lower country and escaping to the higher altitudes, sometimes by the graziers themselves for the purpose of ensuring a fresh growth of forage for the cattle. With each burning, the growth of scrub was stimulated so that it successfully contended with the grass for possession of the mountain sides. As the scrub increased the fire-stick was used more often to clear the scrub, and in fancied protection and encouragement of grass growth. As with an enthralling drug, the more the hapless patient had the greater the need of it grew. To-day the mountain slopes, in general, have reached such a state of degeneration that they are practically worthless for grazing. It is no longer possible to graze cattle on the high plains country unless provision can be made for them in the lower settled areas during the winter season. That is an inescapable example of the effect of grazing, as it has always been practised in this State, upon the vegetation of the mountain sides. The same is true of the slopes of the Dargo high plains country. The same is shockingly true of vast areas of the mountain slopes of the eastern half of the State. The rabbit has done his share of devastation, it is true. But the grazier and the settler have enjoyed at least an equality of partnership with him, much as they may wish to deny the relationship now that the joint concern is facing bankruptcy. There were other associate members in the ill-starred venture, of whom much the same might truly be said. They, too, it is hoped, will find their place in the plan that is recommended later in this report.

Upon the Bogong high plains investigation of the effect of grazing and fire is being carried on by research officers of the Soil Conservation Board. Their final report will be of great assistance to whatever managing authority may in future be called upon to manage the high plains. At present, such conclusions as they have reached are tentative and cannot usefully be quoted by your Commissioner.

In the north-west of Victoria it has been found that over-grazing has resulted in the dying out of superior forage grasses, which have been supplanted by grasses of inferior type. After experiments and observations extending over ten years, it has been shown that in black box and river red gum country, grazing by sheep and rabbits prevents the seedlings from becoming established. Further, it has been found that although annual grasses can exist over droughty periods as seeds, if the opportunity to form seed is frustrated by severe grazing, the grasses must proceed towards a state of extinction.

The general effects of grazing by cattle, apart from the associated practice of forest burning, are not as clear to your Commissioner as he could wish. It can be said with certainty that in some particular circumstances cattle grazing is harmful both to plants and trees. Over-grazing cannot fail to be harmful to both grasses and seedlings. Grazing where drought conditions exist, which is necessarily over-grazing, can never fail to cause injury. In some cases the bark of trees has been eaten, causing the death of the tree. In times of drought or of conditions approaching drought, the close cropping by cattle and the pulverizing of the tinder-dry soil by the hooves of cattle lead to erosion, which destroys the soil by releasing the humus from it. Shortly and broadly stated, cattle grazing, insofar as it involves over-grazing or forest burning, will almost certainly cause deterioration of the quality and nature of the vegetation, degeneration of types of fodder, removal of humus, thereby causing, by erosion, soil infertility or barrenness and suppression or crippling of timber growth. A forest is a home of growing things and of families of growing things of many kinds, between whom there exists an ecological association. Grazing may interfere with the ecology of the forest and upset the balance between construction and destruction, with most harmful results to the superior types of growth.

It is considered by many that grazing is more harmful to the forest than is timber-getting. It is thought to have destroyed great forests in the British Isles, where large areas which once were forested are unfit for either grazing or agriculture. In France, an age-old fight has waged between politically influential graziers and those who would protect the forests. The graziers have won, at the expense of the forests, upon the attempted rehabilitation of which vast sums of money have been spent. Now, perhaps too late, grazing is very strictly controlled, in an attempt to restore the forests to their former superior condition, and to check the nationally calamitous erosion which resulted from forest mis-management.

The condition of German forests is perhaps the best in the world. The home of the traditional hereditary forester who knew and understood the life and habits of every living thing within the forests, both of flora and fauna, the name of Germany stood for many years for good forestry. She has managed her forests wisely, and has excluded grazing entirely from them whenever it has been considered advisable to do so. Her people have never been permitted to flout her Government, however good or evil the Government has been. One makes that statement realizing the risk that one takes if one dares to suggest that forest laws ought to be obeyed even in democracy.

All over the world, wherever uncontrolled forest grazing has occurred, it has caused forest destruction.

As has already been related in this report, the graziers have converted vast tracts of grassy African veldt into desert country. In India the hills of the Punjab and the Deccan have been denuded by over-grazing, adding thereby, by natural consequence, to the privations of the populace. A small part of the story of the United States of America has already been told. Specific findings in the United States reveal that the effects of over-grazing are progressive, beginning with the thinning of the under storey of small trees and ground vegetation, proceeding to the thinning of the litter of the forest floor, the compacting of the soil surface, and destruction of surface roots of vegetation, which bind the soil and help it to breathe and drink. Regeneration is retarded and later prevented, old trees ail and die, as at last does the forest. In California, by grazing and burning for grazing, some forest borders have receded a distance of 30 miles. Where over-grazing has occurred in America, the higher types of native grasses have disappeared, supplanted by the almost worthless sage brush. America is facing great loss, great expense, and great economic frustration caused by the necessity to spend money on the necessary restoration of too much of her land and the delay which must occur before the injured land, or any appreciable part of it, can be restored even to convalescence. Grazing played its part in bringing America to this pass.

One is aware of the danger of being led by what appears to be analogy drawn from data relating to other countries in which the circumstances present in Victoria may not exist. But the fire-stick is the fire-stick the world over. Sheep and cattle graze as closely and, at times, as greedily the world over. Man's nature is the same the world over. Humus is destructible the world over.

Whilst one feels that the material to hand would not justify an attempt to make a scientific finding of truth absolute, still one does feel that the evidence proves beyond all reasonable doubt that the effect of grazing in mountainous forest lands in Victoria can be, and very frequently is, most harmful and that, while the extent of its harmfulness cannot be precisely measured, it must be said that its extent is very great—so great that the setting up of control of grazing calls for the most urgent action. The extermination of the rabbit is a matter of even greater urgency.

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Chapter IV.

Whether, and to What Extent, Grazing Accelerates Soil Erosion and Reduces Water Catchment Efficiency.

Question (2) of the terms of inquiry forms the heading of this chapter.

It will have been seen that questions of land user and usage, forest management, soil protection, water conservation, and erosion, are inseparably connected and that no one of them can be satisfactorily discussed alone. Therefore, much of what might have been said in this chapter has already necessarily been said in the introduction and the chapters which follow it. What now appears will be confined to a more particular examination of the matters which fall under the heading of this chapter.

It is repeated that grazing, with its associated practices, is by no means the sole cause of man-made erosion. Too frequently it does play a part, sometimes a predominating part, as an accelerating cause of a great deal of the erosion which occurs in Victorian water catchments.

To recapitulate briefly, where grazing causes erosion it does so by the destruction of the humus and by the pulverizing or impacting of the soil. The humus may be destroyed by the eating out of the cover of vegetation, by burning of the forest floor to promote grass growth or for forest protection or by being pulverized and released by the feet of animals. The soil may be impacted by animal traffic. Whatever the cause, the result is an increase in the speed of water run-off and a decrease in the volume of water absorption. The ensuing damage has been described earlier in this

report. It is to be noted that any one of the methods of causing erosion need not be very widespread in its results to be most damaging. One does not suggest that to be injurious a forest floor must become impacted or pulverized over wide areas, or that the humus must be destroyed on a vast scale. Destruction and damage may result from very small beginnings. This is especially so where the small beginning occurs on high sloping places or on mountain sides. For example, sheep, who seek high country at evening, take the easy path up a hillside gully. Soon they wear a track, denuding the soil of its binding cover. One heavy rain-storm bringing a fall of several inches within a day, such as sometimes occurs in the north-east of Victoria, will, if the soil is loose and friable, bring down many tons of earth to the lower levels or the river courses. The same may be said of erosion however it is caused.

Much of the eroded material which reaches the streams is carried in suspension until the speed of the stream is checked. The stream's speed is slowed when, emerging from the narrow confines of the river banks, it spreads its volume in the broad storage basin. There, the suspended material is deposited as silt on the basin floor. There is always a slow siltation of storages by natural erosion alone. Where external forces interfere adversely with the processes of natural erosion, the rate of siltation may become disastrously accelerated.

In some catchment areas, grazing is a predominant agent of external interference.

Here, again, one finds it impossible to generalize by giving one definite answer to the question which heads this chapter. For that reason, this part of the report will be unsatisfying to those who believe that any question can be answered plainly and unequivocally. The difficulty of answering the question arises from the complexity with which it is invested. The water catchments of Victoria differ, one from another, in many ways. They differ in area, configuration, geological structure, rainfall, climate, kinds of soil, types of vegetation, types of forests, natural regenerative ability, area held by private tenure and therefore uncontrollable, the industries carried on and the manner of conducting them, and the importance to the State, or to the subject, of the natural resources and products existing in them. Each one of those elements in the entity can and generally does have an effect, for good or bad, upon the amount of erosion occurring in the catchment. Control of water catchments must be a matter of particular regional control.

Your Commissioner believes, subject to one limitation, that the forests are for all men, and that in them all men should be permitted to carry on their lawful occupations. The limitation upon that generalization is that where there is a conflict between the interests of a few and the interests of a great many others, upon a matter of fundamental importance to the means of subsistence of the many, the interests of the many must prevail.

This report now proceeds to a consideration of a matter of fundamental importance to the means of subsistence of a great many people.

The importance of protecting water supplies may be gathered from the following facts. In Victoria we depend precariously upon a supply which is not bountiful and which is not regular throughout the year. Frequently, in the productive areas of the State, disastrous drought occurs. We lack one great source of regulated supply —the permanent mountain snow field. Our rainfall varies in volume as between districts. In part of the Otway ranges the fall is 80 inches; in the north-west Mallee, 9 inches. The mountains which provide the catchments are near the coast. Most of the fall is on the coastward side of the mountains. On the inland side the fall is light and irregular and droughts are frequent. It is necessary to catch and store water by means of river dams and by diversion to other storage sites. The State Rivers and Water Supply Commission has constructed 35 large reservoirs and 225 smaller storages. The water stored in them is delivered to towns and the countryside through 15,000 miles of channels and 1,000 miles of pipe-lines. The volume of water which could be stored by the Commission is equivalent to a volume one foot in depth over approximately 2,000,000 acres. The Melbourne and Metropolitan Board of Works, on whose supply Melbourne's 1,200,000 people depend, has several large dams fed by catchments of 145,000 acres in area. And yet, in dry seasons, there is in the country districts a disastrous inadequacy of supply and the City of Melbourne must submit to

restrictions upon the consumption of water. Already the most suitable sites for the effective storage and distribution of water have been converted into artificial storages. There are available no more sites comparable with those already taken and used. When the amount of silt deposited in them decreases their efficiency to the point of their being unable to store the volume of water necessary as their contribution to the total State storage, new storages must be built. It is generally considered by water conservators that it is impracticable to remove the silt from dams made inefficient by silting. Such new storages as may become necessary will call for a huge expenditure of money and labour, and may not be as efficient as the less silted of those now in efficient use at present.

It appears to your Commissioner that it is not necessary to record here the amount or rate of silting of all the storages in Victoria. To do so would not of itself help to a general conclusion, and might well be falsely reassuring. For instance, the rate of silting of the Eildon Reservoir, fed by the Delatite and Goulburn rivers, up to the present time has not been alarming. What is alarming is that throughout its catchment areas a great deal of erosion is occurring partly as a result of cattle and sheep grazing. The burning and over-grazing of large areas have contributed to the causes of a beginning of erosion which is always cumulatively and increasingly progressive. The effect of forest fires on its catchments was noticed after the 1939 bush fires, but before the occurrence of the heavy rain-storms of the following autumn. It was then seen that the rate of siltation had temporarily increased by more than 300 per centum of its average rate before the happening of the 1939 fires. A test made late in the autumn, after heavy rains, showed an actual deposit, during the period of fourteen months following the fires, of over 900 acre feet. In that period of fourteen *months* there was deposited an amount of silt which was equal to a little more than half the amount which had been deposited during fourteen *years* before the 1939 fires. Graziers were partly responsible for causing the 1939 fires.

The Hume Weir is fed by the Murray and Mitta Mitta rivers, both of which have their sources in mountain country in which grazing of cattle and sheep occurs over huge tracts of upland forest. All through the mountainous country by whose run-off and seepages these most important rivers are fed are evidences of severe erosion. From Limestone creek near the source of the Murray, to the Weir, and from Livingstone creek near the source of the Mitta Mitta, and throughout its whole course, erosion is to be seen on the high mountain tops, through all the intervening terrain, to the rivers themselves, which are silting, meandering, bank cutting, and becoming more and more susceptible to flooding as each year of the progression of the erosion disease goes by. The rate of silting of the Hume Weir is thought to be not at present alarming. Nor, one supposes, were the early recordings of the silting of the now useless American dams or of our own Laanecoorie reservoir which has lost more than half its storage capacity. What is really alarming is that the beginning of serious impairment of the Hume Weir is most probably now in being. Such is the area and character of the catchment and of the disease which is eating into it, that it must be studied and treated before the malady races to a stage beyond cure. It is almost certain that grazing of the catchments and the practice of burning by graziers is a material, contributing factor to the state of soil impairment which threatens to diminish the efficiency of the Hume Weir which constitutes the largest storage in the State.

It is by the water drawn from the catchments of the Wimmera-Mallee water water supply system that a great part of the Wimmera and Mallee districts are made habitable. The area occupied by the catchments and their vitalizing distributing channels is about 13,000 square miles, being about one-seventh part of the area of the whole State. Eleven thousand square miles of farm lands are supplied with water from the artificial storages, through 9,000 miles of channels which, a life-giving nerve system, carry the means of subsistence to 16,000 domestic earth-tanks and 42 town reticulation systems. Supplementing this supply as an insurance against failure in dry seasons, water stored by the Eildon Weir on the Goulburn river, 400 miles distant, is by means of an extension of channelling also used in this system. The main supply of this huge service derives from five storage reservoirs at the foot of the Grampian mountains and other ranges in their vicinity. No further words are necessary to demonstrate the importance of maintaining this great, fundamentally necessary service. The Grampians and the surrounding ranges and lowland country

have been burned again and again for years past. The greater part of that burning has been done by graziers. It is true that the structure of the Grampians is such as to make them naturally easily erodible. But there can be no doubt that repeated burning has aggravated that natural condition and greatly accelerated the rate of erosion. Above Lake Lonsdale, one of the chief storages of the Grampians, 6,000 acre feet of silt has been trapped. Had it been allowed to enter the storage, Lake Lonsdale's capacity would have already been reduced, by its entry, by eleven per centum, and would of course have been further reduced with the passage of time.

The Wimmera-Mallee system is not an irrigation system; it is a conveyor system to storages, privately or publicly owned, from which the water users must arrange their own means of using the stored water. The irrigation areas must not be forgotten. By means of irrigation, large tracts have been made habitable and their people prosperous. Each person on each irrigated farm or orchard looks to a water catchment for his future subsistence.

Another matter of very great importance to the community and which depends upon the preservation of water catchments is the supply of electrical power for industrial purposes. Yallourn to some extent and the Sugarloaf-Rubicon and the Kiewa schemes of the State Electricity Commission depend upon water derived from many thousands of acres of catchment. The impairment of the catchments will impair the efficiency of these schemes upon which millions of pounds have been expended.

It is unnecessary to give further examples of the importance of catchment areas and of the injury, accomplished or threatened, to which they are subject. It is submitted that if it has been shown that grazing is an activity which accelerates soil erosion and reduces water catchment efficiency or merely tends to reduce it, or constitutes a possible cause of reduction of such efficiency, then an unanswerable case for the control of grazing and all other activities which beget like results has been made. In your Commissioner's opinion, it is well proved that grazing is an activity which does accelerate erosion and which, in some cases, is adversely affecting water catchment efficiency and, in other cases, is constituting a highly probable cause of future reduction of such efficiency.

Chapter V.

Whether Existing Measures for Regulating Grazing on Lands Held Otherwise than by Private Tenure are Effective.

Question 4 (*a*) of the terms of inquiry forms the heading of this chapter.

Much that might have been said under this heading has been said, on the question of the existing dual control of grazing, in chapter II. Sufficient has been said of the divided control which exists in Victoria to condemn that method of control without further proof or argument.

Some further criticism, not intended to be exhaustive, may be shortly stated.

Under the existing system of control, if " control " may be appropriately used at all, the following deficiencies exist:—

With certain minor exceptions, there has been no attempt to regulate the number of cattle grazed under a licence or lease or on a given area. The number of cattle grazing under licence or lease in Victoria cannot be ascertained. Such lack of control may lead to over-grazing, which is generally harmful, or to under-grazing which, by failing to prevent coarse growth, may also be harmful, both directly and by tempting the grazier to burn injuriously for forage or protection.

As has been said in chapter II., licences and leases are frequently granted indiscriminately, often without consideration of the reputation of the grantee as a forest burner.

Generally speaking, no officer of either licensing authority patrols or supervises the grazing area. Illegal grazing by trespass is common!

There is, in general, no control of the grazing animals, either by the grazier or by any officer of the licensing authority. Attracted by superior forage to one part of the grazing area, cattle will eat out that area, bringing the results of over-grazing to it.

There is, in general, no efficient patrol of officers to prevent burning of the forest. At present, watch is kept by forest officers for the outbreak of fires, which of course are not lit within easy distance of the watcher.

The method of granting licences by the Department of Lands and Survey, on private tender, where there is competition for the grant, appears to be entirely unsatisfactory. It frequently leaves out of account the reputation of the applicants. The same applicant repeatedly succeeds against his competitors, generally without appreciably raising the token bid which he makes for the licence.

No further elaboration of this question can be necessary. The answer is that existing measures of regulating grazing on public lands are entirely ineffective.

Chapter VI.

Whether Measures of Regulating Grazing, other than Those Existing, are Desirable

and

Which Department of the Crown or Other Authority Should Administer the Control of Grazing.

The sense of questions 4 (*b*) and (*c*) is expressed in the heading of this chapter.

Measures other than those existing are desirable and urgently necessary. It is submitted that sufficient justification of that answer appears in the last preceding chapter.

It is recommended that the Forests Commission be the sole authority to regulate grazing in all forest lands.

It is recommended that the Forests Commission be the sole authority to regulate all other activities in all forest lands, except those of established water supply authorities. Unless the Forests Commission has this power it cannot properly regulate grazing.

It is recommended that the exercise of authority by the Forests Commission be subject to the limitations which would be imposed upon it by a Land Utilization Authority, the creation of which is hereinafter recommended.

The first and second of those recommendations arise out of your Commissioner's opinion that the Forests Commission is, by comparison with other departments and authorities, pre-eminently the body within whose jurisdiction the forest, the predominant member of the inseparable trinity, forest, soil and water, is of paramount importance; it is the body which is best fitted to guard the welfare of the forests. Furthermore, there exists in the Forests Commission the germ, at least, of a traditional regard for the forests' welfare, although unfortunately the pressure of expediency has not always permitted its encouragement. The water conservator, the hydro-electrical engineer, the farmer, each person in the State, is dependent upon the forests for the fulfilment of his plans and for his subsistence; but each is well advised to leave the care of the forests to a body which, whatever its shortcomings, is the appointed guardian of a great protion of the forest lands. That it ought to be the guardian of all forest lands appears to be beyond argument. At present its dominion over reserved forests

is complete but incomplete over protected forests. It has been ousted from national parks and similar reservations. That is probably why the Mount Buffalo area has been so badly treated and why Wilson's Promontory is the ghost of its former self. In passing, it is suggested with respect that all grazing and other harmful activities should be excluded from such areas, some of which are being ruined in the quest of a miserable revenue won at the expense of their beauty and well-being.

It is recommended that the Department of Lands and Survey continue to administer matters relating to land alienation and tenure as between the Crown and the subject, but that such administration be guided, on broader issues, by the directions of the suggested land utilization authority.

It will have been apparent that your Commissioner has been dominated, one might almost say oppressed, by the realization that grazing is but one of many activities which injure the forests and, by the natural extension of forest injury, cause damage to land outside the jurisdiction of the Forests Commission. That damage may well affect adversely the efficiency of the undertakings of such bodies as the Melbourne and Metropolitan Board of Works, other town-water-supply bodies, the State Rivers and Water Supply Commission, the State Electricity Commission, the Railways Department, the Country Roads Board, and probably other bodies and authorities; and may injure and adversely affect the property and interests of thousands of individual people. In many cases, because the injury which has passed beyond the jurisdiction of the Forests Commission is also beyond the jurisdiction of the body or person who is being hurt by it, it is virtually impossible to abate it or to take measures, physical or legal, to protect those whom it injures. Its effects may spread through land held by private tenure, but in such circumstances that no means, by process of law or otherwise, are available to cause it to be checked.

It may be that its real source is in the fact that an area of land is being used for purposes for which that area is not suitable, or, being suitable for a certain purpose, is being misused by the methods employed in trying to achieve that purpose. It may be that the damage and injury derive from any one of many sources all which are beyond the power of the law or of self-help at present. Those are considerations which are not relevant to the terms of this inquiry but which are stated for their persuasive value in relation to the recommendation that a land utilization authority be created. On the contrary, it is strictly relevant to question 4 (*c*), which asks which Department of the Crown or authority should administer regulatory measures, to suggest that no one department should be invested solely with authority but that the regulating department should be fitted into a broader scheme. A typical reason why that broader scheme is suggested is that it appears to your Commissioner to be most desirable that, for example, grazing should be viewed in its relation to the whole of land user and usage and that the interests of graziers should not be dependent upon decisions of a body whose pre-occupation with a special interest may render it less acute to see, and acknowledge the validity of, interests of a different kind. That is an impersonal statement which takes account of the possible future trends of forestry doctrine in the minds of those who do now or in the future may occupy high places in the Forests Commission. To focus attention upon grazing alone or to suggest measures of controlling it alone is to suggest a mere tinkering with that whole of which it is but a part.

There is, it is true, a Soil Conservation Board in Victoria. Its technical members are admirably fitted to deal with problems of soil conservation when permitted to do so. But each already has a responsible position in one or other of the State Departments or authorities and can give only a small portion of his time to his duties as a member of the Board. It lacks effective authority and is rather a make-shift body. On the whole, to use a sailor's expression, it is down by the head and making water—but not soil. Its condition of ineffectiveness is partly inherent in its charter and is not to be attributed to the conduct of its highly qualified technical members.

It is suggested that the Soil Conservation Board be either reorganized or abolished in favour of a Land Utilization Authority. However constituted, such a body should be the supreme authority over land user and usage in the State. Its

importance should over-tower that of any other land management body. It would exercise functions more important than that of any other department or authority. It is suggested that it should consist of a chairman and two technical members, probably an engineer and an agricultural scientist. Its chairman would rank, in point of the onerous responsibility which would rest upon him, with the Chief Justice of the State than even whom he would, in some respects, carry a much heavier burden and whose judicial qualities he would need to possess.

The main functions of such an authority would be:—

To act as a permanent board of inquiry with power to summon witnesses;

to decide what unalienated lands might be alienated and for what purposes;

to decide what lands of a department of the State ought to be transferred to the jurisdiction of any other department or public authority;

to decide to what use land not in use might be put;

to prohibit the use of any land for harmful purposes or the harmful use of any land for a proper purpose;

to resume in the public interest alienated land;

to protect the natural resources—forest, land, and water.

It should be within the jurisdiction of a Minister of State who would act as its spokesman to the Government.

It should be independent of the Public Service and free to engage its technical staff from outside the Public Service, which is finding it increasingly difficult to attract to it or retain in it persons of technical qualification.

It should enjoy a large measure of freedom from political control.

It should work as far as possible in regions, by means of regional committees of local residents representing the several interests of the region and having definite executive power, subject to there being a right of appeal to the Authority against any decision of the committee. Merely advisory committees are generally quite useless. The chairman of the committee should be an officer of one of the State Departments having interests in the region and should be permanently resident in and become part of the community. Country dwellers are justifiably resentful of and irritated by a sense of being governed from Melbourne by people who frequently appear to the governed to know nothing of their problems and to care as little for the people. The regional committee would be valuable in that it would be democratic, would give greater satisfaction by being a local government, and would bring together various interests which at present are in harmful conflict throughout the State and which seldom meet together in discussion of the problems and injuries which arise out of that conflict. Australian people can govern themselves. They cannot be governed by what appears to them to be a remote implacable force which appears to be opposed to the interests of the governed.

The regional committee would, in the first instance, implement, in particulars, the broad policy laid down by the Authority in respect of a region. It would also act as the means of concerted expression of opinion against the activities of a person or a public department in the region. For example, if the Forests Commission were, by permitting over-grazing, to create danger to water supply or private lands, the committee could protest to the Commission or apply to the Authority for a direction to the Commission to cease its dangerous practice.

Your Commissioner is convinced that there is need of such an authority, having its existence beyond the limits of the Public Service and enjoying as great a freedom from political control as possible, to stand, by itself and its regional committees, between public departments and the sometimes hapless people who are subjected to danger, loss, and inconvenience by " departmental action "—or inaction; to protect resources controlled by public departments against injury by individuals; and to preserve the soil against all persons and bodies in the State, be they high or low. The sanctions by which its authority could be made effective would be easy to devise.

It is acknowledged that the foregoing is an incomplete sketch and, because of its incompleteness, open to valid criticism. It is presented as an idea rather than a plan and specifications of something seen in all its detail.

In the event that the suggestion that a Land Utilization Authority be created should not be acceptable, it is recommended that the Forests Commission be the sole authority to regulate grazing in forest lands, but subject to its ascertaining the views of graziers and other interested people in the districts affected and acting upon those views as far as is safely possible. That recommendation arises out of what your Commissioner has learned of the Cattlemen's Committee which is taking a part in self-government of its members' grazing rights and obligations in respect of the Bogong high plains. The recommendation is, as to the proviso concerning safety, a prelude to the suggestion that wherever cattlemen have shown by their past behaviour that they are not to be entrusted with the management of their cattle in forest lands, a system of agistment of cattle by the Commission be instituted and managed carefully and in accordance with definite principles ascertainable by all who wish to learn what those principles are.

Your Commissioner has ventured to suggest that there are certain classes of graziers; furthermore he is convinced that the general standard of care of or indifference towards forest welfare differs sharply as between the graziers of different forest districts.

It is because of those beliefs and of the desire both to safeguard the public interest and to give due recognition to individual liberty that it is not recommended that a sweeping change to grazing by agistment be instituted. The change, if made universally, would give rise to justifiable dissatisfaction and resentment. It is better, it is suggested, to allow the behaviour of the graziers in any one district to determine what method of management shall be instituted. For instance, there could be no legitimate dissatisfaction if grazing in the forests of most of the eastern district were absolutely prohibited. It would be unjust to prohibit it or to change the system of management in certain other districts.

Chapter VII.

The Management of Forest Grazing by Agistment.

This short chapter might have been written in answer to question 4 (*b*), which asks whether other than existing measures of regulating grazing are desirable. It is included in this report as being one of the methods which may well be adopted for the purpose of preventing damage to forest growth and preventing forest fires and erosion. By the method of agistment, control of the number of cattle admitted to the forest and of their movements in the forest is made possible.

Agistment is created by the taking upon one's land of the cattle of others, for a fee, for the purpose of their grazing there. The cattle owner has no right to go upon the land. The land owner becomes the custodian of the cattle. The system of agisting cattle is in force in part of the Forest Commission's territory. It is widely practised in the public forests of the United States of America. It has the advantage that the land owner is in a position to protect his property and to charge for the real use made of his property, which he does by exacting a fee per head of cattle. By uncontrolled leasing or licensing, the property may be eaten out, in the cattle-owner's desire to get his money's worth. Under agistment there is control of the places where the cattle may graze, what tracks they may take or make, what forage areas they may graze upon and how long they may graze in one place. It is part of a system of animal husbandry by which both cattle and land may profit.

It has been suggested that the system of agistment might be introduced in districts where experience has shown that the general body of graziers are not to be trusted to protect the forest. It at once occurs to one that forest burning may still be practised where agistment is in force, since the cattle-owners may naturally desire to bring on grass growth for the agisted cattle. In such a case, the area may be closed to grazing to allow of its regeneration and as a deterrent to the continuing of the practice. Better still it may be granted under licence to a reputable grazier or graziers. A good tenant of the forest is a good guardian.

It is thought to be desirable that the maximum number of animals to be admitted should be fixed in advance of each grazing term or season and that none in excess of that number should be excepted.

The selection of graziers to whom grants of agistment rights are to be made should be done with care, both in justice to the individual and in the interests of the cattle industry and the general public. The needs of the individual, in relation to his use of other land, should be of primary importance; the small man who is regularly a member of the industry should be encouraged, thus guarding against the creating of monopolies at whose hands the public generally suffers.

Those who control public resources do well to consider as part of their stewardship the protecting of the legitimate interests of all men. They gain in usefulness and authority whenever they invite the opinion, the assistance, and the guidance of those whose interests are likely to be affected by what the administrator may do. Where there is an association of men who engage in a common calling, the administrator will benefit by hearing what that association may wish to say. Wherever it is possible to do so with justice, it is wisdom to let men settle their own affairs. It is true that the ultimate decision may often necessarily rest with the administrator. But as often as he can accept the decision of those interested in enjoying the use of public resources, his hand will be strengthened and his responsibility will be made less burdensome. It is that general belief that has led your Commissioner to recommend that whether grazing is to be by agistment, licence, or lease, the responsible type of cattlemen must be allowed a part in resolving those problems which will arise. Whether a decision comes from a regional committee of a Land Utilization Authority, a cattlemen's committee, or any other similar source, it should be carefully examined, and acted upon by the administrator wherever it is safe and expedient to do so. Self-government is good government. The administrator must ultimately govern, but it is his good fortune if others lift from him some of the burden of governing.

Chapter VIII.

The Questions for Inquiry and Short Answers Thereto.

Question 1.—Whether, and to what extent, grazing adversely affects vegetational and sylvicultural conditions.

Answer.—The effect of grazing in mountainous forest lands can be, and very frequently is, most harmful. The extent of its harmfulness cannot be precisely stated. It must be said that such extent is very great (*vide* Chapter III.).

Question 2.—Whether, and to what extent, grazing accelerates soil erosion and reduces water catchment efficiency.

Answer.—Grazing accelerates soil erosion. In some cases it is adversely affecting water catchment efficiency; in other cases it is constituting a highly probable cause of future reduction of such efficiency (*vide* Chapter IV.).

Question 3.—Whether, and to what extent, grazing is related to the occurrence of forest fires.

Answer.—Grazing has been a regular, recurrent cause of forest fires. The extent of the relationship between grazing and forest fires may best be expressed by stating that wherever grazing has been practised in mountain forests it has been one of the major and most frequent causes of fires (*vide* Chapter II.).

Question 4. (*a*).—Whether existing measures for regulating grazing on lands held otherwise than by private tenure are effective.

Answer.—Existing measures are entirely ineffective (*vide* Chapter V.).

Question 4. (*b*).—Whether other measures are desirable.

Answer.—Other measures of regulating grazing on lands held otherwise than by private tenure are desirable and urgently necessary (*vide* Chapter VI.).

Question 4. (*c*).—Which Department of the Crown or Authority should administer such existing or proposed measures.

Answer.—The Forests Commission, exercising authority subject to the directions of a Land Utilization Authority, and acting, as far as it may safely be able to act, on the advice of associations of graziers, should administer measures for regulating grazing on lands held otherwise than by private tenure (*vide* Chapter VI.).

Recommendations.

Your Commissioner has the honour to make the following recommendations:—

1. That a land utilization authority, charged with the duty of protecting all land, be created. (Chapter VI.)

2. That, subject to the directions of a land utilization authority, or failing the creation of such a body, the control of all forest lands and of all activities in the forests be vested in the Forests Commission. (Chapter VI.)

3. That in exercising control of grazing the Forests Commission be guided as far as is safely possible by the advice of graziers, preferably to be given by their representative associations. (Chapter VII.)

4. That in forest grazing districts in which graziers have shown that they are not to be trusted to protect the forest, a system of agistment of cattle by the Forests Commission be instituted. (Chapter VII.)

5. That wherever the forest has been materially injured by fires, it be closed to all possibly injurious activities pending its regeneration.

6. That the happening, in the assigned area of a lessee or licensee, of injurious fires which cannot be fairly considered to have been lit for a reason not related to the grantee's rights or interest in the area, be sufficient ground upon which to deprive the grantee of his grazing rights, without further proof of the causes of the fires. (Chapter II.)

Conclusion.

Your Commissioner's gratitude is expressed to all those who assisted him in his inquiry. He is especially indebted to Mr. Douglas Menzies, of the Victorian Bar, who was briefed to assist your Commissioner; to Mr. L. G. McDonald, Reader and Clerk of the Record in the Legislative Assembly of Victoria, who acted as secretary to the Commission; to the Honorable P. J. Clarey, Minister of Labour, whose official car was used throughout your Commissioner's tours; to Mr. W. Whyte, whose duties as chauffeur to the official party were admirably discharged; and to Mr. Frederick Rowe, of Omeo, who placed his car and services as driver at your Commissioner's disposal during part of his tour of the far North-East.

Especially is Mr. V. W. Officer, Secretary of the Graziers' Association of Victoria, to be commended upon the very able manner in which he represented the members of the Association.

All of which your Commissioner has the honour to submit for Your Excellency's consideration.

As witness my hand and seal this sixteenth day of September, One thousand nine hundred and forty-six.

(Signed) L. E. B. STRETTON.

[*Minutes of Evidence are not printed.*]

By Authority: J. J. Gourley, Government Printer, Melbourne.