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Cover drawing by J. Morgan.
WHAT DO YOU MEAN BY "PRODUCTION"?

We all hope that the High Country will make its full contribution towards the well-being of New Zealanders as a whole. Quite apart from recreational use, the area must therefore be as productive as possible. Conservation is not an end in itself. Runholders are often concerned by suggestions that, for various reasons, land be withdrawn from grazing. They feel that land is being taken "out of production".

"Production", however, should not be confused with "wool production". For example, land is not taken out of production when sheep are removed from an area to make way for a soft-wood plantation. Land use has simply been changed from wool to paper production. Again, when sheep and cattle are displaced by flooding for a hydro-electric scheme, land use has been changed from wool and meat to electricity production. Paper and electricity are just as essential to civilised living as wool and meat.

This does not mean that wool and meat production are unimportant and should always take second place to other forms of production. On the contrary, we hope that both pastoral production and runholders' profits will be higher in the future than they are now. But a clear understanding that there are other forms of production besides wool would mean that the future use of high-country land could be decided more dispassionately. The emotional phrase "taking land out of production" has been over-worked and could with advantage be spelled.

DILS REPORT

In June the Institute published "Watershed Management in New Zealand — a report on its status and research needs", by Dr. R. E. Dils. Dr. Dils is a Professor of Watershed Management at Colorado State University, U.S.A. and was with the Institute for nine months as a Fulbright Research Scholar. Copies of the booklet were sent only to a limited number of people and organisations.

Readers who would like a free copy are invited to write to the Institute.
INTerview With Mr Arnold Bain

The runholder is dangerously dependent on wool for his income. The most obvious way of reducing this dependence is to run beef cattle in conjunction with sheep. Mr Arnold Bain of Dumbarston, Roxburgh has done this successfully for years up the face and on top of the Old Man Range. He has kindly agreed to let us interview him about the management of beef cattle.

What advantage is there in running beef cattle with sheep?
They open up the country for sheep. They're particularly good at cleaning out gullies, for instance. They make tracks so it's generally easier for sheep to get about. Some people say cattle eat grass the sheep should be getting but I say they make more grass fit for sheep to eat. It takes a lot of cattle to cut down the number of sheep you can run.

Do they do away with your need for burning?
No; I wouldn't say that. They help to open up snow tussock but we still find we need to get a few burning permits.

One of the big problems with beef cattle is keeping them through the winter. What are your views on that?
If you have stock bred to the conditions, they can stand a fair set-back. I winter my cows out on the hill up to 4,000 ft. and conditions can be pretty rough. They live on snowgrass and pickings on the sunny faces and are standing in snow most of the time. We do lose a few during the winter, but this is only to be expected on this country. However, generally speaking, it is only the weaker types that fall by the wayside and this does help in building up a good constitutioned strain which enables them to stand up to the rigorous conditions.

Usually, then, your stock look well at the end of winter?
No; not in the least. The thing I've learned over the years is how well the poorest looking cows come away in the spring. Don't worry too much how they look at the end of winter; if they've survived they'll come away and produce a good calf all right. A lot of people get the idea you have to winter cows a lot better than I find you do.

If a runholder were thinking of trying beef cattle, what class of stock would you advise him to start with?
I'd say Hereford heifers. Heifers are easier to handle than old cows and if you're new in the game you want to grow up with your stock to get the feel of them.

Why Herefords?
Herefords are probably the quietest to handle. They're hardy and are good fossickers and they'll cross well with all
breeds. When you come to muster, it helps to have stock you can handle easily. But I agree that the other breeds all have their good points and it's a matter of personal taste which you choose.

It's obviously a good thing if your stock are quiet. Is there anything you can do to make them this way?

I'll say there is. Believe me, cattle are just as quiet or wild as you make them. A lot depends on how you handle them at the start. I've seen people bring a load of new cattle to their place. They let the lorry tailboard down and they never see the stock again for months. This is useless. You must have your yard built before you bring your calves. It doesn't need to be elaborate — 4ft. 6ins. high is enough. When your calves arrive, let them off into the yard and settle them down with a bale of hay or so. After a day or two, let them out into a paddock which will hold them and quietly but firmly work them every day for a fortnight. If you do it this way, they'll handle easily.

But will they stay quiet when they've gone out on the hill?

They will if you run a dog round them occasionally and always take them quietly. You shouldn't gallop round on horseback like a lunatic or have a shower of dogs you can't control. If you do the job properly, they'll be as easy to handle as dairy cows.
Have you any tips about buying a bull?

I always look at the stud breeding cows before buying a bull. Your calves will rely on their mothers for much of their tucker and you must have a strain of cows which milk well. Paddock calves can always get good grass, but calves on tussock can’t. If the milking qualities of the stud cows are up to standard, you can select a bull with confidence.

What age would you commence breeding from your heifers and when would you begin their calving?

Put your heifers to the bull at two years, on no account breed from yearlings. You can get away with breeding from yearlings running on paddock conditions, but it won’t work on high country.

I would suggest October, no earlier, to commence calving. Remember to give your cows a chance to pick up before calving.

You have obviously shown that beef cattle can be run with sheep. But we must remember that run-holders aren’t on the job for the good of their health. The final question, therefore, is “Do beef cattle pay”?

A cow should produce ten or more calves in her lifetime. On present day prices, you can’t go wrong.

Thank you, Mr Bain.

‘GLENROCK’
DEMONSTRATION RUN
By Bruce Withell
Farm Advisory Officer, Fairlie.

In the last 12 years the possibilities for the development of tussock country have changed so rapidly that practice has had little chance of keeping the new techniques completely integrated. There have of course been a few notable exceptions where this has been accomplished and full credit is due to these individuals for their determined progressiveness.

Three years ago the Department of Agriculture decided to extend its tried policy of demonstration units into the high country. The aims of the project were: (1) to carry known techniques as far as possible and to evaluate them fully; (2) to give the lending institutions a sound demonstration of the credit worthiness of this type of development; (3) to assist in demonstrating how much can be expected from tussock country in the way of national increases in meat and wool. The programme for improvement was to be a cooperative effort between the runholder and the various organisations associated with work in
the high country, the Agriculture and Lands and Survey Departments, the Waitaki Catchment Commission and the Tussock Grasslands and Mountain Lands Institute.

Glenrock run was chosen for several reasons. It is compact (10,443 acres) with reasonable access, and composed of a broad range of the land types encountered on most runs. These types vary from the high (4,500 ft.) gravelly snowgrass tops weathered by high rainfall, to shallow and stony alluvial flats inclined to long drought periods. In between is a typical cross section of predominantly fescue tussock faces responsive to topdressing and oversowing, with the good soils on intermediate fans providing scope for lucerne development. Most runs in the area have a range of vegetative cover from well "clothed" to moderately or severely depleted land, and 'Glenrock' is no exception. However, there is a good balance of dark and sunny country.
When Mr France, the runholder, took up the area it was typical of most high-country runs in its subdivision and in its carrying capacity and production. It consisted of four large blocks which resulted in poor feed utilisation. Grazing pressures were severe on the sunny faces and with ineffective rabbit control these areas had little chance of relief. Burning was used to control the growth on dark faces and any cattle grazing was confined to the lowland swampy areas, the only place they could be safely held. Mr France had every incentive to develop this property to its maximum and he was ready to accept the challenge it presented.

The Programme

At the start of development the carrying capacity was some 2,400 ewe equivalents made up of 40 cattle and 3,200 sheep. Production from the Merino was 9lbs wool per head overall; lambing percentage varied between 80 and 90 per cent with a low death rate of between 1 and 2 per cent. Two-tooth ewes were not put to the ram and lambing started in early October. At this stage the hoggets were wintered off the property but this has subsequently been changed as the feed situation has improved.

Natural regeneration of the tussock sward on the lower country is being assisted by intensifying the sub-division, top-dressing with phosphate and sulphur and the oversowing of legumes. The carrying capacity is being increased as the improvement work proceeds and winter feed is being kept up to requirements, with provision for increasing the area of lucerne for hay. Untopdressed blocks are being spelled to encourage reseeding of native grasses.

This process is the basis of development work on this country and the contributions the Department of Agriculture will make over the first four or five years of development will be channelled towards expenditure on seed, fertiliser and the provision of better subdivision. All this money, however, is taken into account when consideration is given to the economics of the plan. The plan itself has been integrated with the work of the Waitaki Catchment Commission so that full advantage can be taken of any subsidy money which might be available. The remaining development finance will come out of income with the mercantile firm cooperating with temporary overdraft facilities as required.

The Target

It is anticipated that the productivity of 'Glenrock' will have increased by 4,300 ewe equivalents by 1974.
There is no intention at present of changing from the Merino breed for it is felt that this class of stock is hardy, versatile and productive and, as surplus stock, they are commanding an increasing value. The general performance will tend to improve over the period, and as the feeding improves two tooth ewes will be put to the ram which will increase the amount of selection possible.

Stock numbers at June 1973 should be as follows:

- 2,500 ewes
- 800 2th ewes
- 1,200 M.S. hoggets
- 2,500 Wethers
- 300 Other sheep

7,300

and

- 80 cows
- 15 calves
- 2 bulls

97 or 455 ewe equivalents

Total 6,855 ewe equivalents
Three hundred acres at least will have been developed by cultivation, of which two-thirds will be in lucerne, and the balance in sown grass. 2,500 acres of run country will have been developed with oversowing and topdressing. This development will have covered the most productive land and, when this is stabilised, other areas can be improved by the same methods. This will ensure continual sward improvement and maintain relatively high carrying capacity if associated with a sound maintenance topdressing policy. The policy of pest control will be decided by the level of production from swards.

By the end of 1974 there will be 13 major blocks, with lucerne, grass, and holding areas making up a total of 23 subdivisions. This will ensure efficient utilization of the improved feed supplies and sufficient feed for stock needs.

The cattle proofing of existing fences will simplify the management of cattle.

**Present Position**

3,500 sheep and 50 cattle were wintered this season.

Droughts are common in the area and can impede the speed of development. The last two seasons have been an example of this, and stock increases have not proceeded as fast as expected. The influence of more sub-division is being felt however, and the effects of two abnormally dry years have been minimized.

Glenrock cattle wintered on fescue tussock country oversown with red clover.
Labour could have been a real obstacle in the development plan but, for the first five years, the running of ‘Glenrock’ should be possible by Mr France and his sons.

‘Glenrock’ is a pastoral lease and operates under stock limitation imposed by the Crown. However, the Lands and Survey Department are cooperating in the development programme and approving stock increases as they are justified.

**Economics of Improvement**

The development of this country is costly and cannot be achieved as rapidly as many more favoured down-country areas.

The programme for improvement has been estimated to increase the pre-development return to management and capital by over 90 per cent by the year 1974. If this figure is achieved then the economics of this type of investment in the high country will be well proved and the demonstration well on the way to a successful conclusion.

**HIGH COUNTRY PASTORAL PRODUCTION**


Runs in the survey were originally selected by chance and the 26 properties chosen, which have had their production recorded every year, have been unchanged in size over the period.

Although there is danger, because of the very small sample, in using these figures as representative of all high-country runs, they do present an interesting result.

Over the 26 survey runs from 1952/53 to 1961/62, on average:

- Sheep deaths fell by nearly 6%
- Lambing percentage rose by 10%
- Wool production rose by 27%
- Sheep sales rose by 45%
- Cattle sales rose by 80%
- Lamb sales rose by 230%

When weighted by the proportion of total income which sales of each contribute, lamb, sheep, cattle and wool sales figures represent a compounded production increase on these properties of just short of 3½ per cent per annum.
L. W. McCASKILL
On His Retirement

The first Director of the Institute, Mr L. W. McCaskill, retired on 31st May. It was a retirement in name only, for his vigour and mental energy are the envy of many men but half his age. Whether talking to a garden club, or arguing the case for the high country with Ministers of the Crown, everything has been hallmarked with the same enthusiasm — the dedication which he has applied for most of his life to the preservation of New Zealand’s scenic and national resources. To see him address a meeting and witness its response is to feel the spell of his commanding voice and personality. He had an early career as an Education Board agricultural adviser after gaining a master’s degree in agricultural science, and as a Teachers’ College lecturer. Later as Associate Professor of Rural Education at Lincoln College, he was in the forefront of its extension activities and bound a close link between the staff and the farming community. To his former students he is known as a dynamic advocate of soil conservation — the sense of social worth which he gave it persuaded many young men to make it their vocation.

He is a winner of the Bledisloe medal as an outstanding old student of the College and of the Loder Cup for his contribution to the protection of New Zealand flora.

Over the last four years he has worked specifically and with success for the betterment of the tussock grasslands and mountain lands region. His position has not been to him a job, nor yet a vocation but rather the means of furthering a lifelong affection for the high country and its people.

Like a true fighter he revelled in being at the centre of controversy. In fact, he would no doubt agree that often his most effective work has come from storms caused by his single-minded and fearless advocacy of some chosen cause. He has been impatient of procrastination and of what seemed to him to be the devious ways of government departments; he has never hesitated to denounce those people and organisations who would use the resources of the run country for their selfish interest; and anyone who dared to doubt its importance, or unthinkingly criticise its runholders earned his scorn.

As Director of the Institute he built up a working organisation. He formed a small staff around him which he stimulated by his vigorous thought and example. Because he regarded people as the key to all problems and team spirit to be prized, he was a leader rather than a director.
Diploma Courses for Farming

by D.B. McSweeney, Senior Lecturer in Rural Education, Lincoln College.

There have been some marked changes in the courses offered at Lincoln College in recent years. In some cases these changes have led to difficulties, especially in the case of students whose entry qualifications have been too low. The position is:

The Courses: There are two which are especially designed for students who are likely to return to the home farm - the Diploma in Agriculture and the Certificate in Wool Classing. The wool classing course lasts twelve weeks and is held in the winter term (May until August). Twenty percent of the students taking it come from home farms and their primary purpose in taking it is get enough knowledge and skill to handle a clip confidently and efficiently. Students entering the course should have a good general education and some previous experience in working with wool (preferably in the Stores).

The Diploma: This is the only course offered at the College specifically to prepare young men for the practical business of farming. There has recently been a great upsurge of interest in the course with over 150 applications for 1966 and standards expected in practical and course work are very high.

Entry Qualification: School Certificate and at least two years of practical farm work after leaving school. In fact over two-thirds of the entrants have spent at least one year in the sixth form. This sixth form work entitles students to substantial bursaries.

The pre-entry farm work is mandatory and its quality will have a marked influence on a student's work in the diploma course. Ideally this work should be done away from the home farm - one year on a mixed cropping farm and the other on a sheep farm.

Course Design: The course starts in late February and runs through until August. Students then do another six months farm work for private farmers and return to the College the following February. The course concludes in August. No farm work is done at the College. Emphasis at this stage is placed on lectures, on technical work (engineering, welding, wool-classing, etc) and on farm inspections.

Higher Courses: Students who perform well in the Diploma may gain entry to the one year Diploma in Valuation and Farm Management.

Accommodation: This is far exceeded by student numbers. In general, an attempt is made to see that Diploma students are able to live at the College for at least one part of their course. Students make private arrangements for the remainder.

Further Information: Those who are likely to have sons entering the College should write for detailed information to avoid wrong decisions about school courses or practical work.
In retirement he is carrying out a survey of all scenic reserves for the National Parks Authority, of which he is a member.

One of the greatest contributions which Lance McCaskill makes to the conservation of our national resources is that he forces men to think. In future debates and discussions on the subject his name will be often quoted. Not everyone may agree with his views, but then he probably prefers it that way. J.G.H.

L. W. McCaskill.
North Canterbury Catchment Board

DR. S. N. ADAMS

Dr. Adams, the new Director, was born in 1926 at Ilkeston, Derbyshire, England. After attending the local Grammar school, he read chemistry at New College, Oxford. He then did a D.Phil. in the Oxford Department of Agriculture on the use of radioactive phosphorus in fertilizer experiments.

From 1951 to 1956 he was at the West African Cocoa Research Institute in the Gold Coast working on the fertilizer requirements of cocoa. He then returned to England to investigate the manurial requirements of sugar beet at the Rothamsted Field Station near Lincoln.

In 1961, he took an appointment with the Commonwealth Scientific and Industrial Research Organisation at Hobart, Tasmania, to work on the soil aspects of cobalt and copper deficiency. Here he remained until taking his present appointment.

Dr. Adams is married and has three children. He is keenly interested in hill walking and natural history, so he expects that his business in the High Country will also be a pleasure.
WOOL SEEKS AN IDENTITY

How — and how long — can consumers be persuaded to go on paying extra for the luxury of feeling woolly?

If wool had only just been thought of, and one tried to launch it today as yet another wonder fibre, what chance would it stand against the nylon, acrylics, polyesters and others that are already familiar? "Nice stuff", the textile magnate might say, "Protein fibres have always had a good handle but they've never caught on; too difficult to make, I should imagine. Do you remember Ardl?" The ardent young inventor was too young to be discouraged by that memory. "Still, it's good fibre," the millowner concedes, "How do you make it? You what . . . ? Extrude it through the skin of a sheep . . . ." He looks around nervously, muttering "Mad". The inventor, like all woolmen, is too much of an enthusiast to be put off by a lack of enthusiasm in other people and continues: production is in batches of 10lb with a production cycle of a year — small by the standards of the chemical industry but with capital costs low, replacement costs lower and maintenance negligible. It must be admitted too that the unit sheep works with low raw material conversion factors; but by-products, if plentiful, are not troublesome. "You can't have everything", the inventor says dismissively, "and wool is a quality product with a high added value".

Hope blossoms briefly, but it seems that you can't get the quality or the value without much more work: the wool has to be cleaned, sorted and blended to make a uniform product. "You mean that it's not even uniform?" "Dear me, no", the inventor chuckles, "As far as I've been able to count, there are 2,600 types and grades of wool; it comes in all shapes, lengths, thicknesses and colours. That's what makes it so fascinating". "Fascinating? I should think so. What's the price? It ought to be cheap with all this handling". "On the contrary" (rather sniffily), "wool is a quality fibre and you don't get that for nothing. It almost always costs more than other, equivalent fibres . . . as it should", he adds, "It's better. However, it sometimes costs much more, sometimes only a little more". "You'd
better explain yourself, young man. Sometimes more, sometimes less; how do you expect me to plan production on that basis?" "Can't help it. Production varies. Raw material supplies depend on the weather and you can't mess around with the rate just like that. I mean, there's no question of altering production to match demand except over a period of years—and then it would probably be too late". "Still, it's a quality product", the magnate says with a thin smile, pressing a red button. "That's right", the inventor cries as he is dragged through the door. The magnate, stimulated by the encounter, sits down to write a letter to his favourite producer of sensible, conventional, safe synthetic fibre, listing some further properties that his market research department would like to see engineered into the product.

It is just as well, perhaps, that the wool does not have to start from scratch. Far from having to carve out a domain from other fibre's kingdoms, it already has a citadel, if an increasingly beleaguered one. Its greatest strength has been the bare fact of having been there first; of giving rise to a complex and mysterious technology based on its own curious properties and, more than anything, of setting the standards in its own field. If other fibres compete with it, they mostly do so on its terms, by being "woolly". As a result wool, like most natural commodities, has not had to do much to defend itself, leaving the initiative to its synthetic competitors. But this situation is about to change. This autumn, the International Wool Secretariat will start the promotion of wool on an international scale, just like any other fibre, complete with Woolmark, image-creating advertisements and quality control schemes. Moreover, ways are being sought to give wool properties that its competitors have, of setting in creases and preventing shrinkage. Wool is having to meet other fibres on their terms because of their success in adapting themselves to its standard. Not that the wool industry itself is suffering yet from these incursions. The wool textile manufacturer provides what the market wants, and this can include many fibres other than wool. And the wool-growers in Australia, New Zealand, Uruguay, South Africa and the other major producing countries have no reason to complain at the steadily increasing consumption of wool; world production has increased by 1,000 million lb since 1950.

The campaign is being mounted to counter the constant, not very obvious erosion of wool's market which is cushioned by a general increase in demand for textiles. Its share of world markets is falling as other fibres gain ground; production of all "soft" fibres increased by 80 per cent between 1950 and 1963,
twice the rate for wool, while production of man-made fibre increased two and a half times. In the British wool textile industry, a fifth of the fibres used are man-made and the share is increasing. In America the proportion is a quarter. The attacks come from all sides; even where wool has felt most safe, fifth columns are at work.

Most wool is destined for use in clothing, two-thirds of that used in America and more than four-fifths of consumption in Britain. It is hard to imagine that it will be driven from this height easily; in clothing, worn next to the skin, constantly touched and looked at, standards for textiles are very high. Elsewhere, its outlets are more vulnerable. Carpets account for much the greatest part of this other demand and the low price of the rayons and the very hard wearing properties of nylon have loosened wool’s hold. In America, where carpets use more than a quarter of the wool, the weight of fibres used in carpet production increased by a third between 1956 and 1962 and the increase was entirely made up of man-made fibres. In Britain the same thing is happening, but it is still at an early stage. In both places this has been helped by the growth in production of the much cheaper tufted carpets (where the tufts are pushed through a woven backing and secured with latex, instead of being woven into place) which are heavy users of the man-made fibres. The other main non-clothing use is in blankets, where the difficulty of washing wool provides a ready gateway for an effective substitute, such as acrylic fibres.

These are relatively simple issues, where the outlets are quasi-industrial and fibres are chosen on straightforward cost and performance data. The coarser grades of wool will be the first to suffer. Finer grades, used in clothing, are more strongly placed. The clothing outlets are necessarily consumer orientated and there is only one question to be asked: what does the customer require. This was asked in many countries by the International Wool Secretariat before deciding where to pitch its campaign. The answer was, doubtless to its relief, a string of “don’t knows”. Relief because wool, like most natural products, offers a whole range of properties, none of them dominant, whereas the synthetic fibres — perhaps a reflection of their relatively simple chemical structures — tend to be very good at only a few things. Nevertheless, the consumer does seem increasingly to want one thing that the synthetics are good at: mainly being easy to look after. This has driven wool out of the children’s clothes market in America, where it now accounts for only 6 per cent of the fibres used. The same effect is more subtly
noticeable in Britain where it has made a nylon corner in hand-knitting yarns, most of it for baby clothes. And in seven years nylon has taken 60 per cent of the market for socks.

It is significant that these are knitting uses. Wool is virtually unapproachable, except through blends (where ICI sells 30 million lb of Terylene a year) in the woven field. And the demand for the fancy worsteds, made with all the ancient craft of Bradford, rises constantly with people’s craving for luxury. Synthetics cannot compete here because they are not so comfortable in the woven construction. But the elasticity, lightness, suppleness — and so, comfort — of a knitted construction is not lost when synthetics are used, and other, desirable, qualities are gained. More than a fifth of the estimated 550 million lb of wool used in Britain last year was knitted. This is directly vulnerable to the Gothic hordes of Acrilan, Orlon, Nylon, Courtelle and the rest, waiting outside the gate. And the drift to more comfortable clothes, certainly to increased sales of “casuals”, perhaps in the end to knitted suits for men as well as women, could throw the gate wide open.

The wool-growers, for years skirting the problem with promotional gestures like, “there is no substitute . . .” (plainly not true) are at last facing this competition squarely. The IWS campaign will open in seven countries, later more, paid for by a special levy on the growers that has increased the Secretariat’s income from £4 million to about £14 million. Some changes cannot be stopped: but the managing director Mr W. Vines, hopes that the campaign will give wool the luxury image that it needs to continue to claim a premium over other fibres. If it succeeds in this the wool-growers will have every reason to be happy — since, as far as volume is concerned, they must expect to live on a shrinking share of a growing market and their product, being labour-intensive, has time working against it too. By contrast, the synthetic fibre industry is only in its infancy and ways of giving its fibres more attractive properties, or suitting new versions to demand, are only just being devised. Prices must fall as competition increases — the increased competition in nylon in Britain is only the beginning — so that people will have to be willing to pay a relatively larger premium for the luxury of wool. Those that are used to it may be happy to do so. But what of the generation whose baby clothes were made of synthetics?

— Reprinted from the “Economist” by kind permission of the Editor.
PRODUCTION AND THE FUTURE

With the kind permission of the Chairman, Mr P. C. Ensor, we reprint here part of his Annual Report to the 1965 Conference of the High Country Committee of Federated Farmers.

As a result of the Agricultural Development Conference all thoughts are turned to the problem of increased production from the land so it is appropriate that we should have a look at the high country against this background.

I believe that in the long term view the pastoral resources of the South Island High Country are as yet virtually untouched and it would be only wild speculation to suggest what the ultimate development may be, but because of the many limiting factors involved in any rapid development at the present time, increased production from the high country must of necessity be a relatively small share of the national increased production looked for.

During the past ten years production from the high country has increased very substantially, wool alone by some 24% and there have been other examples of spectacular increases being achieved, so it may well be asked why we should not look to further spectacular increases in the next ten years.

I would expect an overall steady increase in production but the fact remains that the increased production already achieved has in the main been achieved through animal unit production as against an increase of stock numbers and this phase of development must inevitably slow down.

The next step must be through increased stock numbers and there are major problems yet to overcome before this can take place on an overall scale, or before it is desirable.

The major problem facing the high country is that of soil conservation and all that it means to the high country. Until a great deal more knowledge has been acquired concerning all aspects of erosion and soil conservation as it applies to New Zealand and sound long term plans laid down, the stage will not be set for an overall stock increase on the high country grazing lands. Even then time and much capital will be required.

This does not mean that development will not proceed in the meantime but it is becoming more and more evident that development must not be allowed to get ahead of conservation and water-shed management if we are to avoid further serious mistakes in the overall management of our mountain lands.

Still looking towards the future I believe it is more than ever necessary for all high country men, however remote their situation may be, to take a lively and intelligent interest in all
that is going on around them and to emphasise this necessity I can do no better than to quote some words of Mr J. T. Holloway in a paper read last year:

"We (the general public) have chosen not to consider the essential inter-dependence of lowlands and highlands.

These attitudes of mind cannot long continue. Step by step as lowland resources are developed and our population grows, pressure on the mountain lands must also grow. There must inevitably be demands for increased pastoral production, for the further realisation of hydro-electric potentials, for more water for cities and farms, for better flood control, and for additional mountain land sport and recreation, and because these various demands, each legitimate in itself will not everywhere be mutually compatible, there must inevitably be recurrent controversies. I venture to forecast that, from this date on, there will rarely be a time when an acrimonious battle is not being fought, somewhere in New Zealand, on some mountain land issue".

AERIAL PHOTOGRAPHY

By R. C. Barrett, Asst. Chief Photogrammetrist
Lands & Survey Department, Wellington.

The aerial photo can play an important part in farm management. Besides providing a picture of the whole run, planning for such things as roading, fencing and aerial top-dressing often can be carried out more easily on the photo with its many recognizable features than on an actual map of the area. Aerial photography is also playing a more and more important role in the development of New Zealand. No major schemes for power investigation, roading, forestry, etc., are undertaken without aerial photos being called for and often the completely detailed topographic map that can be produced from them, is required also. The 1 inch to the mile topographical map of New Zealand (N.Z. Map Series 1) is being produced from aerial photos. Special aerial surveys are usually taken for these purposes. Many schemes also make use of the vertical aerial photo not the least of which is land development and utilization.

Besides this special purpose photography it is the Lands and Survey Department’s policy to have photographs available of all of New Zealand and to rephotograph developing areas at least every ten years.

Although aerial photographs can be used for producing extremely accurate plans, individual photos cannot be considered
as a map. If the area photographed is flat and the camera truly vertical then it can be used as a map or plan and measurements taken directly from it. Where however there is a change of height in the area the higher points will be displaced radially from the centre of the photo. This is easily understood when it is realized that the closer a point is to the camera, the larger is its scale.

Aerial photos can be viewed stereoscopically (3D) where adjoining photos with 60% overlap are available. This allows detail to be seen more easily than on a flat picture.

**Present Photo Cover:**

Photography of the whole of the North Island has been available for the last year or two but the South Island has had
considerable "gaps". A number of these were completed last year and the remainder could be completed this year depending on the suitability of the weather and the availability of the aircraft at the same time. Only two general areas remain to be flown and these are shown on figure 1.

The information that can be seen at various scales is illustrated by the two photos, one at 20 chains and one at 80 chains to an inch.

**Purchase of Photos:**

Copies of the photography which is held by Lands and Survey Department can be purchased at the following rates.

*Prints* —

These are normally 7in. x 7in. or 7in. x 9in. and can be bought at 18/4 each for the first copy and 4/4 for each additional print of the same photo.

*Enlargements* —

Where the scale of the print is too small enlargements of up to six times the original scale can be made and these cost from £1/12/8 for a 9in. x 14in., to £6/15/6 for a 40in. x 40in.

*Mosaics* —

Where a property is extensive, more than one photo may be required to complete the coverage. In these cases the photos can be joined together to make a mosaic of the area. This is then copied and prints supplied. If required, boundaries, fences, areas etc., may be added before copying.

There are several companies engaged in taking aerial photographs, and copies of their work which is not held by the Lands and Survey Department can be obtained directly from them.

**Editor's footnote:**

One commercial firm quotes prices for mosaics ranging from £112/10/0 (9d per acre) for a 3,000 acre property to 3d per acre for 20,000 acres or more. For this, they supply one copy mounted on hardboard and framed. Additional copies can be supplied for a nominal £3/11/0 each. Fence boundaries, dams, gates, names and acreages of paddocks are all marked. Other details such as pipe lines, culverts and field tiles as well as tracks that have been added since the photograph was taken can also be shown. These mosaics are prepared to 5 chain or 10 chain to an inch scale depending on the size of the farm. Only properties covered by f. 8¼ photos can be done satisfactorily but other areas can be specially flown.
SPRINGFIELD AREA

At 80 chains to an inch

At 20 chains to an inch
TUSSOCK GRASSLANDS AND MOUNTAIN LANDS INSTITUTE

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