A NOTE FROM THE CHAIRMAN

Since the resignation of Dr Adams an important decision has been reached concerning the future of the Institute. In order to attract a Director with the highest possible qualifications the Department of Lands and Survey has offered to fund a Chair of Range Management at Lincoln College, whose occupant will be the Director of the Institute. This generous offer has been accepted by the Committee of Management and by Lincoln College, and has been approved by the Soil Conservation Council. It has now been approved by Cabinet and the position will be advertised forthwith. It is hoped that an appointment can be made before the end of the financial year. Meanwhile a senior officer, Mr G. A. Dunbar, is in charge and the work of the Institute is proceeding as usual.

D. McLEOD.
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Cover drawing by J. Morgan.
COMMENTS ON, AND PROPOSALS FOR
THE NEW ZEALAND WOOL INDUSTRY

By Dr I. E. B. Fraser
Wool Research Organisation of N.Z. Inc.

During March, 1967, the Wool Research Organisation took the first steps in a programme of research, investigation and collaborative work with the wool trade. Its aim was to improve efficiency, quality control, and methods of marketing within part of the New Zealand wool industry—the part that over the years has earned from $300 million declining to $160 million of our national income; or 97 per cent of our national wool production—namely our raw wool exports.

THE WOOL SITUATION TODAY

Our lowered wool income, with falls in existing markets, and next to no part in new ones, is a grim reminder that New Zealand must look at ways of improving her wool trade in a much more enlightened manner than by just accepting what we have.

There have been attempts to improve the position of wool as a textile fibre for many years, with combined efforts over the last ten by the major wool-producing countries of the world. Such work has cost them a great deal of money. New Zealand alone contributes more than $6 million per year. Most of this outlay has been used to improve wool-textile technology, for product development, and for promoting the image of wool internationally. These efforts are increasing. Currently a large processing and product development section is being set up within the International Wool Secretariat, and development and research programmes stepped up throughout the world. An example of this is New Zealand's new Wool Research Organisation. Its objects are to promote and conduct research in fields of inquiry ranging from the properties of wool through to processing and utilisation.

Despite earlier efforts, the fact that wool still has to fight for its very survival as a textile fibre, reflects both the strength of its competitors and/or the weakness of the wool system itself. Whichever is the case, each of these possibilities must be clearly
understood—particularly if the weakness of wool lies in its marketing. Obviously, the textile fibre industry needs more effort from those trading in wool, than it has had in the past.

The wool-textile research and development work referred to is on similar lines to that being carried out for competitive fibres. While not so well endowed financially, research gains are expected to place wool in a superior demand position. In view of the large sums being spent in this field by synthetic fibres, the wool industry must make every effort to continue this type of work. At present, there is reduced demand and marginally profitable prices to the grower, with wool prices being largely set by synthetic-fibre prices. This reinforces the need not only for more scientific and product development work, but also for studies of how best to market the raw material. It is in this field of marketing that New Zealand has yet to show up-to-date thinking and action.

MARKETING

In New Zealand, wool developed as an isolated, almost entirely primary industry. Marketing methods grew up which suited the times, the buoyant market for wool as a textile fibre, and particularly, the secondary industry in other parts of the world. But with the development of competitive synthetic fibres, and their competitive methods of marketing, the older methods of wool disposal have not only become obsolete but seriously restrict both the use of modern marketing methods and any reduction in selling costs. Experience has taught us that the present marketing system, and the lack of an internal body for selling New Zealand wool to the world, has prevented the producer, and even the preparer of raw wools, from keeping in touch with the present and future demands of the textile trade. For the same reason several trade practices have grown up that could harm the future of the New Zealand wool industry.

It has been New Zealand’s way to merely display wool for purchase. There has never been an active “get-out-and-sell” type of body at a national level. Our passive system of sale itself restricts the introduction of much-needed economies in preparation, presentation and handling. Trade reasons for avoiding change are often biased and growers’ reasons frequently based only on tradition.

The raw-wool industry, unlike competitive fibres, can increase profitability only by reducing production, handling, or marketing costs. Rising costs cannot be absorbed at later stages as so often happens in the highly-organised synthetic-fibre industry. All will agree that every effort must be made to reduce at
least handling and marketing costs, that is, those directly related to the trade, and under their control.

The producer's interest usually ends on the sale floor. Unfortunately, because production and manufacture are separated by intermediary traders, commission buyers, merchants, speculators, etc., a lot of important information is denied him. Whilst the show floor may finish transactions for the grower, it is only the start of transactions with the textile manufacturing industry. This he should know much more about. If not him personally, then certainly his representatives or advisers.

The marketing methods that have grown up with the industry make it very difficult to follow our wools through to different stages of industrial processing. Producers and preparers get very little feed-back information to guide production of, and influence demand for wool. This is a price we pay for a fragmented industry. There are so many between the producer and the processor. Each sectional interest looks for its own profit margin. As a result this prevents them from looking at the industry as a whole. Economics of production do not concern them, and price-paid is only one entry in an equation to express profit. Thus, in most aspects of marketing, producers rely on the counsel of those who have the national industry at heart. At the present, however, few seem to see that experts in production are not necessarily experts in marketing procedures—and "to each his own."

National decisions about production and preparation have always been made after the event. Since we have not been aware of other factors influencing demand, the price the trade has been willing to pay for our raw material has been our main index of users' readiness to buy it. Price paid is also, of course, the reason for production. This was fine in a buoyant market, when there were clear price differentials for type and preparation, and as long as all wool sold and the average price was economic to the producer. But over recent years the price has been set more and more downward by synthetic fibres. It is not related to production costs—which cannot at present be absorbed within the industry. Agricultural diversification is the only way open to the grower and this, unfortunately, in many cases is likely to further weaken wool's position by causing less desirable wool to be grown.

To the above problems has been added the loss of any constant price differential for type and preparation. Even the differences between wide quality-number, or "count," ranges are much less, and not always present. We have recently been reminded that price is only useful for decisions on type and pre-
A wool sample storage bay within the Wool Research Organisation. The wool samples representing lots for sale arrive from brokers in plastic bags. The samples are further subdivided for measurement and scouring.

Photo: Wool Research Organisation

paration when it is within economic production margins; and when price differences reflect different demands. We have been told that, on its own, price is a poor substitute under most marketing conditions for knowing what is required from wool; and that, without stability, it does not forecast future textile trade requirements.

Though the recent slump in prices and demand for New Zealand wool may be partly due to a world-wide recession in the textile trade, it is nevertheless true that even before this, we had no way of objectively appraising our future markets. We
did not know how to plan, as a grower country, for greater acceptance of New Zealand wool. For instance, we have seen recent encouragement to produce the marginally firmer, finer wools (often by dubious practices). There has been, on the whole, little thought of the practicability and not much idea of the result as far as the textile trade is concerned. The subsequent weakening in this market has clearly shown our dilemma.

**COMPARE SYNTHETIC FIBRES**

Any discussions on wool marketing would be incomplete without referring to the methods used by wool's principal competitor—synthetic fibres. Though a number of reasons have been given for wool's weakened position in the textile trade, there is no doubt at all that the major single factor menacing wool's future is competition from synthetic fibres.

It is generally agreed that the success synthetics have had in eroding wool's traditional markets, and excluding it from expanding markets, is not due to their being better fibre. Indeed wool has many superior qualities which are unlikely to be mimicked in the near future. It has often been stated "if wool was synthetically made today it would be hailed as the wonder fibre of the century." Much of the strength of synthetics comes from their methods of marketing, together with their promotion and technical service.

I have already explained that the synthetic fibre industry's efforts in product development and promotion are being matched by grower funds through the I.W.S. and its parent countries. However, in many aspects of marketing, the wool trade is severely limited as a serious competitor. Synthetics lead in controlled and budgeted production; accurate specification and guarantee of the raw material; knowledge and negotiation of outlets (not to mention control of outlets); specific knowledge of manufacturer requirements and end-use; direct salesmanship and technical service to the end-user; immediate availability with selection by sample or written description; and terms of payment for fibre purchases.

Thus we now have a picture of wool—on the one hand internationally active and realistically competitive; with modern methods of textile research, product development and promotion. Yet on the other hand, in that part of the trade from the grower to the end-user—the selling and marketing end—the part that is our own immediate responsibility, we stick to methods, largely traditional, that have no progressive impact on the wool trade at all. And more serious still our efforts are insignificant compared with the efforts and methods of synthetic fibres.
We must fight back in this field of selling and marketing or we will go under.

**ATTEMPTING FUTURE IMPROVEMENTS**

Work started by the Wool Research Organisation in March, 1967, came from proposals for improving handling, classification, and marketing of wool in New Zealand. It was realised that New Zealand must improve her marketing to match efforts already underway in wool-textile research, product development, and promotion. At the same time every effort had to be made to reduce the costs of handling, preparation and marketing of the raw material. These are almost the only means we have at this stage of increasing the growers' profit and our overseas earnings from wool.

One of New Zealand's first steps towards better marketing should be the systematic collection of information about our trading types. We need to know a lot more about the effect of wool-fibre characteristics on preparation, textile processing and end-use. This sort of information will be a guide to production, and will provide an avenue of contact and an understanding between the grower and the end-user of New Zealand wools. Not all of this information can be collected at present and much of it not for some time yet. Not, that is, until the New Zealand primary industry makes closer contact with local and international wool-textile trades, and sets up her own centre for wool-textile processing and end-product research and investigation.

All involved in the wool industry, from the grower on, should in future set their sights on the manufacturer not only accepting but demanding New Zealand wools. Channels of contact with end-users should be as direct as possible. There must be no doubt as to what we have to offer the industry, and how we might satisfy changing demands with accurately stated, preferably guaranteed trade types, recommended wool-processing procedures and end-uses.

Because of the poor "feed-back" of information from the end-user to the local greasy-wool trade, production, wool preparation, and classification at this end cannot be systematically directed to particular processes and end-uses. Still less can it adapt to the changing scene of improved processing and a greater range of end-uses. Whilst work on the suitability of New Zealand wools for these new processes and uses is underway both overseas, and in New Zealand at the Wool Research Organisation, much has yet to be done. If users require particular wools or a combination of wools, these must be catered for
by production and preparation etc. Textile processing requirements will usually determine the choice of wool preparation and classification method. But efforts must be made to accurately define and prepare New Zealand wool types with high repeatability. This will not only give a constant product to test, to recommend and to sell to the trade, but the quantity and quality of it will be known.

There has been constant and fairly long-standing criticism from the trade about our poor and varied preparation methods, the low standard of repeatability, and the poorly-bred wool. Therefore, it seems that preparation and classification methods must be improved considerably if we are to produce and prepare satisfactory trading types. They must be defined in terms of the properties and characteristics required in processing and end-use.

The Wool Measurement and Marketing Section of the Wool Research Organisation is at present concentrating its effort on preparation and classification. Many of the subjectively-appraised (hand and eye) characteristics of wool used in classification, are of direct importance in wool processing. Fibre diameter, for example, is the most important single feature. But because of inconsistencies between wools from different areas, and between different breeds and breed-crosses and ages, hand-and-eye appraisal methods are often inaccurate and require correction by more accurate measurements. The above are not the only causes of inconsistencies. Classification is a manual task and there are variations between people and centres.

With the collaboration of the New Zealand Wool Brokers, the Wool Research Organisation has embarked on a Dominion-wide investigation of New Zealand’s trading wool types. The main aim of this project is the establishment of National Standard Types conforming to certain stated, repeatable, and guaranteed characteristics.

Binned wools prepared by all New Zealand Brokers (42) are being sampled throughout sale-preparation periods, and the final sample, representing the wool type to be sold at auction, is sent to the Wool Research Organisation for accurate measurement. This goes on from sale to sale throughout the season. The measurements at present are those of main importance in wool preparation, namely:—staple length, fibre diameter, yield, and permanency of discoloration. Wool-fibre length will be measured shortly. In collaboration with the trade we compare these accurate measurements with their subjective-appraisal results and constantly correct errors in subjective appraisal. This
leads to an understanding of variations in methods of preparation between brokers, and between centres, at different times during the wool-selling season. I must emphasise that these measurements are not and will not be done by brokers—machines will not replace woolclassers. At this stage the Organisation, as an independent body, is establishing standards for correcting wool-preparation performance. It is aiming for the highest possible level of accuracy and repeatability able to be carried out manually. From this work, recommendations for Standard Types will be made—types which could include blends. Wools other than binned wools are being treated in this way. Quality-control methods will be more easily instituted once woolclasser registration is organised.
We expect that accurate measurements can also be used to support the sale of wool. That is, pre-sale testing of wool types will allow documentation of the lots to be sold. For example, the fibre diameter will be measured in microns, which is also an index of diameter used by the manufacturer and more and more used as a basis for orders. This means there will be less international confusion when the quality number or count (which is the index used in subjective appraisal) is interpreted overseas by the user.

When we reach a system of Standard Types, with accurate documentation and a representative sample of the Type to be sold, the way will be open to use this sample as the basis for sale. Sale-by-sample means that current systems for wool handling and display-for-sale become obsolete. Sale-by-sample is accepted in many sections of the wool trade today, even in parts of the greasy-wool trade. This practice, along with dense-baling of wool from the broker’s store (and perhaps even from the farm shed at a later date) combining both baling and dumping for shipment into one operation, will provide a dense package ready for shipment. The pressing of a package of wool over twice the weight of a conventional bale to higher densities than dumping methods of today, has so far been shown to be practical. The result is a package of excellent shape, with dimensions suitable for pallet or container loading.

The combination of sale-by-sample and dense-pressing could make the cost savings far-and-away greater than any avenues for saving we have now. We must secure these big savings resulting from the scheme for quality control as a whole, rather than being satisfied with merely “nibbling” at savings of marginal importance.

At present there is great reluctance to change the auction system. But clearly, sale-by-sample and Standard Types with documentation—Standard Types that can be publicised and promoted internationally—could at least make other systems of sale possible. It is largely the absence up to now of any workable alternative that has kept the auction system as it is. If nothing else, we could now have an opportunity to test it in the future.

As was mentioned before, Standard Types can make possible long-term investigations into textile-processing performance and end-uses. Standards may need to change to cater for stated demands. Standard Types for this could be established blends rather than straight types. But the changing of Types will be safeguarded by the established quality-control measurement procedures.
A stage in the development of a rapid, automatic method of fibre diameter measurements. Measurements are made electronically using a television scanning principle. The speed of measurement is at least 20 times faster than any other methods used to measure the same parameters.

INFORMATION

Within the framework of a national body responsible for quality control, there would need to be a group receiving information about textile demands—which would in turn influence preparation. Such information must then be fed back to the producers. This group would also be responsible for finding out textile requirements through new as well as present channels. A further function would be publicising, promoting and advising about New Zealand Types internationally. They could also, to advantage, be active sellers of New Zealand wools overseas.

The establishment of a chain of events and contacts as proposed above will be a very positive move towards much-improved systems for marketing wool. It will still not be as efficient and
vertically organised as for synthetic fibres, but a very marked improvement over our present system.

A highlight of the Wool Research Organisation's programme to date, and worthy of much greater mention than given here, has been the development of instruments for wool measurement. Until now there have been no instruments fast enough to measure wool on a national basis. The achievement of this, particularly for the measurement of fibre diameter, is a "first" of international significance.

The work of the Wool Research Organisation is entering into its second season, and so far is still building a basis for quality control in preparation and marketing. As a summary to this paper, the diagram shows a final co-ordinated system that should be our objective.

**Proposed Integrated Marketing System**

New Zealand is in a position to start a system such as this now. The main co-ordinating centre marked X could represent a section of bodies already in existence. Only changes in their activities would be required.
BEEF CATTLE ON TUSSOCK COUNTRY
By J. C. Aspinall,
Mt. Aspiring Station, Wanaka

Now that wool prices have dropped to a low level, it is natural that more interest is being shown towards increased beef production.

In many areas of the tussock hill country ranging from Molesworth to Lake Te Anau there is surely tremendous scope for breeding store beef cattle.

Any person thinking about running cattle should not delay. The first consideration is to know your country. There must be good water available for cattle close to their grazing areas. We have a 3-yard annual rainfall and don't have to worry on this score, but I can appreciate this difficulty in drier areas.

THE GRAZING COUNTRY
Apart from blue tussock, tussocks generally are not good fodder for cattle but, unlike clover, they are frost resistant and can provide a bare living during the winter when the ground is covered in snow. Naturally, the better the feed and aspect, the more successful and profitably cattle can be run. It is what grows between the tussocks that counts. This can range from nothing to native herbage, to browntop, sweet vernal and so on, up to cocksfoot and clovers. Clovers alone are not so good unless they are used to encourage grass growth such as cocksfoot. Otherwise when the clovers frost off in the autumn, supplementary feed has to be supplied. Topdressing is a big help in getting good clover but you need plenty of cattle to keep the growth down to a suitable state for sheep. However, cattle tend to improve the country both for themselves and sheep as they are good spreaders of grass seed and even put a little manure with it!

My most lasting impression of Otago and Canterbury tussock hill country is one of few cattle and fewer trees. No one should underestimate the value of shade and shelter, especially for cattle.

WHAT BREED?
What type of cattle are best for those that have to buy in to get established in the cattle business? I would say the first consideration is to get cattle that come off similar or harder country than they will be going on to. Lazy cattle that have been reared in lush paddocks would be hopeless at foraging at high altitudes.
Many people will say that their favourite breed is the best and, depending on the country, they could be right. For tussock country in wetter, higher altitudes, I prefer dark-red Herefords with longish coats. Herefords have pioneered many cattle-carrying areas both in New Zealand and overseas. They are quiet by nature, are good foragers and popular in the saleyards. In my area for very many years the Black Poll-Hereford cross and the Shorthorn-Hereford cross were the most sought after in saleyards, but now Herefords are the most popular. Further north on stations, Black Poll cattle are often preferred and appear to be successfully run on rugged tussock country. They are popular, too, in the North Island where, except in the more mountainous areas, the grass grows all the year around. Dairy breeds and Charolais crosses are being experimented with as well.

For general run management, I like a few distinctively-coloured cattle in my herd. You can learn a lot about the
habits and behaviour of cattle by observing, say, blue, white or red beasts. They can also help in recognising various little lots of cattle during mustering, especially in bush, scrub, or gully country.

SORTING OUT A POLICY

The next thing to decide is what your policy will be. This naturally depends on the type of country you have. Whether to run cattle on the hill summer and winter; or summer only; or on sunny faces in the winter; whether to run cows and breed calves; or grow calves for store cattle up to three years. This latter may be best for mountainous country.

I feel the main thing is to breed or grow fit, healthy cattle and not necessarily fat cattle as they can’t get around the hill the same. Fattening is easier done in paddocks on lowland areas.

Cattle need training to go up and stay on hills. Once you have a few doing this don’t sell them until you have to, but just keeping adding your replacements and additions each year, otherwise the training has to be started all over again. Rock salt can help in settling cattle.

COSTS AND RETURNS

The financial part of starting cattle breeding is a hard one with no quick returns. It may be well to think of it as an expensive hobby until you get started. Once away you are right.

Suitable cattle for poorer tussock areas are dear to buy but at times they are profitable to sell, too, particularly if you can hang on to them until prices rise.

When budgeting for a proposed cattle venture—and this is a very wise thing to do—don’t be misled by these budgets you read about in farm magazines. Most of these experts don’t know much about tussock hill country.

I advise adding 20 per cent to perhaps 70 per cent for unforeseen contingencies depending on the locality and nature of your country. While my own gross returns at $12 to $15 per head of cattle may not seem particularly attractive, others in more favoured areas claim up to $40 per head. If one runs cattle only on the better parts of a station their average return could be well ahead of the more adventurous person who uses difficult country that is otherwise producing nothing at all—but where losses can be much higher.
A few expenses I pay are as follows: $300 odd for a good bull and another $50 for cartage and insurance; $3 a beast and $1.75 a calf for cartage to the nearest saleyards; $8 a beast, 60c. a lamb, 83c. an old ewe to the nearest freezing works; $45 a ton for topdressing by the time it is sown; 5 per cent to 10 per cent annual losses through snow and tutu poisoning and occasionally heavier losses still. On top of these I have the other normal run expenses.

In spite of this, cattle profits have, over the past few years, given quite a big lift to our total profit and helped pay for much of our development work.

Any runholder with longer than a six-month growing period, who is less than 200 miles from a port, freezing works and city, or 70 miles from a saleyards, should be able to do very much better than I can.

UNWELCOME PESTS

At least three troublesome plants can cause cattle poisoning. The first of these is tutu. Tutu has been causing severe losses in stock in New Zealand for at least 125 years, yet our scientists don’t appear to have even heard of it.

I know it causes bloat, and tutin poisoning, is dangerous when frosted, and during the first flush of spring growth when cattle are hungry. It is fatal to put hungry cattle out of a yard into a paddock of wet tutu. Any runholder hoping to topdress and increase his cattle numbers on country where large areas of tutu exist is likely to suffer, say, about 4 per cent to 5 per cent annual losses, even up to 10 per cent to 12 per cent, especially among younger cattle. This has just happened to us in one hill paddock we keep and feed our replacement calves in. Several other runholders have been similarly hit last autumn. The problem urgently needs scientific investigation to find an effective, practical, economic answer to it.

Ragwort is another plant that can poison cattle if they are forced into eating it, though usually they won’t touch it. It can completely cover the ground, especially in the heavier rainfall areas. Sheep, however, keep it down and this seems to be a good answer to it.

Several years ago, St. John’s Wort, or Mother Cameron’s weed as it is locally known, used to cause 60 per cent to 75 per cent of my cattle to throw fits when crossing the river. Now, thanks to our scientific friends and the little bronze-coloured beetle that they introduced, I have seen only one beast lightly affected in the past six years.
Naturally, too, noxious animals can seriously affect the financial returns from cattle by competing for food in the late-winter-early-spring period when most stock losses occur. There is no point in paying, as I have quoted, $45 per ton for top-dressing as well as expensive grass seed just to feed hares, rabbits, and deer who naturally eat the sweetest feed they can find.

HANDLING CATTLE

When it comes to shifting cattle it is wise to remember they are not like cars and tractors fitted with brakes, accelerators and steering wheels.

Run cattle, especially, are sensitive and need understanding. When mustering, keep their heads pointed in the right
direction and keep them down to a walk. At this pace they
don't get into trouble so quickly. Never let any get away or
hide in scrub or they will do the same thing during the next
muster and teach others as well.

Try to work dogs without undue excitement unless a recal-
citrant beast needs educating. Then, lucky is the musterer
who has two good dogs in his team, one biting the nose and
the other the tail and heels—a war on two fronts, so to speak.
Don't force cattle on steep or strange country. Take a few
in front and teach them to lead out.

In the yards, draft quickly and quietly and don't allow
nervous people in your yards—nervousness is infectious. Above
all, no "shooing". Any noise resembling a snort is an age-old
danger signal among many animals and instinctively makes
your cattle tense, become frightened and kick and charge
back. This can end in a smother or cause some person to get
hurt. It also makes the cattle harder to get into the same yard
again.

THROUGH THE YEAR

My own year's programme may not be perfect, but gen-
erally, I don't believe in knocking cattle about in yards any
more than absolutely necessary.

During July, August and September we are feeding bulls,
replacement calves and a few old cows on hay and vacuum
silage. The cattle prefer silage to hay.

We feed our silage out with tines on a front-end loader
and like it very much, but have difficulty in keeping the covers
on.

The rest of our cattle are spread over their winter country,
the sunny hill slopes ranging from 1,000 feet at the valley floor
to the snow tussock at 3,500 feet.

It is particularly at this time of the year that deerstalkers
can completely disorganise our stock management by hunt-
ing stock to one corner of a block before a fall of snow when
it is most essential to have stock spread out as evenly as possible.

During October and November we sell a few older steers,
the calves are arriving, and nearly all our cattle come down
off the hill of their own accord.

We dehorn our yearlings and, as soon as the snow goes
back (and, we hope, before tutu appears) we put our year-
lings and two- and three-year-old steers up Mill Creek.

Mill Creek is an old glacial "hanging" valley at an alti-
tude of 3,000 feet to 3,500 feet. The older steers are specially
kept to lead the yearlings out and help educate them to living at high altitude on tussock country.

We don’t put our bulls out until the end of November as an earlier calving, when there is little feed on the flats and the cattle are out in the tussock country, has caused us losses in young calves through snow and cold.

In the first week of January we mark our calves before they get too big and lively and hard to handle.

During late March or early April we muster the young cattle out of Mill Creek, we hope before the snow comes. Usually we hire an aeroplane to look over the higher basins and benches before going up to muster.

On the last two musters we were taken up to 6,000 feet with a dog each in a helicopter and put down alongside the highest little mobs of cattle.
This lift of 5,000 feet in five minutes deprives a young musterer of the thrill and satisfaction of a good climb, but for a person like me, who is each year finding the hills steeper, this method is a great help even if expensive.

April is our busy month on cattle when we muster the whole lot in to wean calves and when we sell cull cows and calves after trucking them to saleyards 70 miles away. I like to get our weaning over and the cows and calves settled down in their winter quarters before the heavy frosts and snow come.

In May and June most of our older cattle go to the hills on their own. It is important to allow these cattle to go to the same country as they have been on before, or they won't settle down, don't know the best places to feed and shelter during the winter, and tend to come back to the flats.

Usually the younger cattle need dividing out between the cows and putting up the hills with them to keep a balance of numbers in each area. This takes supervision to see they go up and stay up without getting above, say, 3,500 feet where they are likely to get snowed in. I have, on occasions, had to bring cattle down from 5,000 feet or more and it is no fun getting up through 2 feet to 3 feet of soft snow.

Our replacement calves are dipped, dosed, inoculated and fed hay and silage all winter. The onset of worms and lice needs careful watching and can take a severe toll on the condition of calves. These can be worse some years than others. All the same, too much pampering and too little culling can eventually seriously affect the constitution of your whole herd.

The last factors I wish to mention are what I consider to be the four vital links in the cattle chain, each dependent on the other.
1. The breeding of fit store cattle on hill and tussock country.
2. Facilities for finishing these store cattle for butchers and freezing works. This could be done on paddocks and flatter coastal areas.

These two need to develop apace or there will be fluctuations in prices through lack of balance of supply and demand.
3. Freezing works to cope with the proposed cattle increase.

This appears to be easy as we already have millions of dollars lying idle for five months of the year and working at two-thirds of capacity part of the other seven months. All the same, I am not happy about the methods used and I feel all meat should be hung for 48 hours before
ELECTRIC FENCING
by L. H. Weston

Error in Diagram

In Figure 10—"Fence Wire Tension Gauge" on page 31, the amount of wire deflection at which the spring balance was read was unfortunately omitted.

Please correct the drawing in your copy as shown below.

![Fence Wire Tension Gauge Diagram]

Fig. 10. FENCE WIRE TENSION GAUGE
freezing. Farm-killed meat is always tough if not hung for a couple of days before cooking or freezing.

Never before has the quality of our meat needed more consideration. There is little reason, except for excess fat, why it should not sell on its merits when competing with overseas competition.

4. Overseas marketing must keep pace with our increased production or we will be no better off.

Quality must be carefully guarded right until it is sold to the consumer.

We must also have well-trained young energetic salesmen selling and advertising overseas for us. We don’t want our meat to be like our wool—stored up in the country because it is too poor in quality to sell at the price we want for it.

Without being at all pessimistic or panicky, I can’t see overseas prices for our produce showing any great increase in the next few years. This means New Zealand will have to keep its own internal costs down and still increase production.

THE COST-PRICE SQUEEZE IN HIGH-COUNTRY FARMING

By John Morris, Lincoln College.

"Many go for wool and come back shorn."—Cervantes.

All high-country runholders are well aware that in recent years costs have risen continually while returns have tended to decline. In other words, what is sometimes called the "Cost-Price Squeeze" has been increasing: "Things ain’t what they used to be"—to plagiarise the words of that well-known song.

In this article I will try to define just how much these costs and prices have changed. In short, how many goods and services will one pound of fine wool purchase now compared to what it would purchase yesteryear?

"Costs" can be a confusing word so to keep our terms accurate I will use prices paid (for goods and services) instead of "costs," and prices received (for wool, etc.) instead of just "prices."

HOW MUCH WOOL AND WHAT PRICE PER POUND?

Work of this kind has more meaning if we also distinguish between quantities and prices. For example, total revenue, such as the total wool cheque, has two components—the quan-
Quantity or volume (pounds) of wool produced, and the price received for each unit sold (cents per pound).

That is, Quantity x Price Received per unit = Gross Returns.

Once we separate these two parts out, we can compare total revenue, say, between seasons, or between farms. We can now find the effects of total revenue, of either a change in the quantity of wool produced or a change in the price received for each pound of that wool.

If we do not make this distinction, then the effects of one can hide the effects of the other. For example, if the quantity of wool sold remains constant but the price per pound falls then gross revenue will also fall.

However, in recent years, while the price per pound of wool, especially for the Halfbred type, has tended to slowly decline, runholders have tried to make up for it by increasing their wool production to maintain or improve their total wool cheque. Thus, for many of them, their increased total wool production has tended to mask the drop in per pound price.
ALSO, HOW MANY SHEEP SHORN AT WHAT PRICE PER HUNDRED?

This distinction between quantities and prices also applies to the goods and services used in producing the wool. For example, we can split the shearing bill into two parts—the number of sheep shorn, and the price per hundred paid for the shearing. Obviously, if the number of sheep shorn remains constant between seasons, but the price per hundred increases, then total costs will rise. Or, if the rate for shearing stays constant but the number of sheep shorn increases, this too will increase total costs. The amount of fencing wire used and the price per hundredweight, the tons of super applied and the price per ton are all similar examples of this type of cost breakdown.

In short, we can also separate out the two components of costs—the amounts of goods and services used in running a high-country property, and the price paid per unit of these goods and services.

Or, Quantity x Price Paid per unit = Total Cost.

Both of these can vary independently of each other to give a change in total costs.

In this article we are concerned only with price changes per unit—that is per ton of super, per woolpack, per pound
of wool, etc. We will ignore total price changes caused by variations in the quantities of goods produced, or in the quantities of goods and services used to support that production. It is well known, anyway, that farmers have been producing more output both through using more inputs and through greater efficiency of input use.

**WOOL PRICE CHANGES**

The trends in the price received per pound for fine wool are shown in Table 1.

**Table 1. Average Wool Price (cents per pound Greasy) 1921-22 to 1967-68**

<table>
<thead>
<tr>
<th></th>
<th>Merino</th>
<th>Halfbred and Corriedale</th>
<th>Merino</th>
<th>Halfbred and Corriedale</th>
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<tr>
<td>1921-22</td>
<td>14.4</td>
<td>12.0</td>
<td>14.2</td>
<td>15.0</td>
</tr>
<tr>
<td>1922-23</td>
<td>19.2</td>
<td>17.4</td>
<td>20.8</td>
<td>20.2</td>
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<tr>
<td>1923-24</td>
<td>22.6</td>
<td>21.5</td>
<td>40.0</td>
<td>31.5</td>
</tr>
<tr>
<td>1924-25</td>
<td>17.0</td>
<td>16.2</td>
<td>38.1</td>
<td>32.8</td>
</tr>
<tr>
<td>1925-26</td>
<td>14.0</td>
<td>13.5</td>
<td>49.9</td>
<td>41.9</td>
</tr>
<tr>
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<td>41.6</td>
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<td>7.8</td>
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<td>32.1</td>
<td>51.1</td>
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<td>34.4</td>
<td>33.4</td>
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<tr>
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<tr>
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<td>14.2</td>
<td>15.0</td>
<td>44.0*</td>
<td>34.0*</td>
</tr>
</tbody>
</table>

This table is shown a different way in Figure 1.
We can see that the price received for both types of fine wool fluctuated from season to season in the 1920s and early 1930s, but there was a general downward trend to reach the lowest point in the 1932-33 season. There was then a slight rising tendency before the stabilised prices of the appraisal system. This scheme started in 1939-40 and lasted throughout the war years. During it, there was a 15 per cent increase in average price, from, and including the 1942-43 season. After the end of the appraisal system at the finish of the 1945-46 season, wool prices climbed sharply in the late 1940s to reach a peak in the 1950-51 season. Since then they have tended to decline gradually, except for an upswing in the 1963-64 selling season. The trend since has been downwards, especially for Halfbred wool.

**SHORT TERM CHANGES**

As well as these longer term trends, the table and graph show the marked fluctuations in wool prices which can occur between wool-selling seasons. Two of the more notable of these are the 50 per cent drop in price between the 1950-51 and 1951-52 seasons, and the 10 cents drop in average price between the 1963-64 and 1964-65 selling seasons.

What they do not show are the fluctuations between sales within any one season. These can also be very marked.

Again, these prices are averages for all Merino wool and all Halfbred wool sold in New Zealand. Thus, the big variations in price which occur both between and within seasons for any particular line of wool are not obvious from either the table or the graph.

In all, while fine wool is well known for its price fluctuations, the trend in recent years has been for a decline in average price.

**EFFECT OF WOOL PRICE CHANGES ON INCOME**

Work done by the New Zealand Meat and Wool Boards' Economic Service has shown that there is a very close relationship between net income per sheep and the average price per pound for fine wool. Therefore, declining wool prices have probably paralleled a similar decline in, or "squeeze" on the net income of many runholders. This squeeze has likely been less marked for those runholders who have been increasing their production.

However, the vice of the Cost-Price squeeze has two jaws—Costs and Prices. Both can move. Figure 2 shows that they have done just this. Here we can see the trends in prices received, and prices paid since 1921-22. The price of fine wool is used to represent "prices received." This is reasonable
because most high-country runs largely depend on fine wool for income. On average, 80 per cent of the total income of the New Zealand Meat and Wool Boards’ Economic Service sample of runs, is from wool. On some runs all income is from the sale of wool.

Fig. 2. High-Country Price Trends
(based on 1949-50 = 100)

“Prices paid” are for all goods and services purchased off the farm. They do not include any allowance for the runholder’s own labour, or for imputed interest on his own capital. It is actual cash expenditure incurred in operating the property, plus depreciation at standard rates.

In the graph, the figures for “prices received” and “prices paid” are given as a series of index numbers based on the year 1949-50 being equal to 100 units. One hundred was chosen for arithmetical convenience, and does not mean that 1949-50 was a normal or standard year. All figures are related to those of 1949-50. An index above or below 100 means that either prices received or prices paid in that year were more or less favourable than 1949-50 prices.

THE TREND OF PRICES PAID FOR GOODS AND SERVICES

It can be seen that prices paid tended to decline in the 1920s, somewhat, it appears, in sympathy with declining wool
prices during that time. There was a short period of relative stability in the early 1930s but since the mid-1930s prices paid have been rising steeply, particularly in the early 1950s. Following the very high prices received for one season only in 1950-51, there was a "lagged" effect on prices paid. These rose by 13.8 per cent in the following year, 1951-52, at the same time as wool prices dropped by 50 per cent to below what they had been before the "wool boom."

Since then, despite the downward tendency in wool prices, prices paid have increased at an average rate of 2.4 per cent each year. While these prices paid fluctuate much less than prices received, in recent years they have risen steadily well above prices received. That is, the "Cost-Price Squeeze" has rapidly increased.

SELLING ON THE ONE MARKET AND BUYING ON ANOTHER

The problem is that runholders are selling their produce on a different market from the one on which they are buying their inputs.

On the one hand, fine wool is sold on international markets. The demand, and hence the price received, is determined largely by the level of activity in the economies of those countries that buy our wool. We can have little effect on the price received, although the New Zealand Wool Commission has tried, by its floor-price scheme, with some success, to cushion any major drops in price. However this system can only help to reduce the effects of short term price falls. At present the Commission does not have the resources to greatly affect longer term price trends. But most important, from the runholder’s point of view, is that his cost increases cannot be passed on to the consumer.

On the other hand, prices paid for goods and services used in the production of wool are determined mainly within New Zealand. Their imported content is not great. These prices paid have been subject to internal inflationary pressures such as the development of protected import-replacement industries, a policy of full employment, and price-linked Arbitration Court wage orders. The net result is that, especially since the mid-1930s, the prices runholders have paid for their inputs have borne no relation to the prices they have received for their products.
HIGH-COUNTRY TERMS OF EXCHANGE

This dichotomy of markets—selling on one and buying on another leads us to consider what is known as the "terms of exchange" for high-country farming.

"Terms of exchange" is the ratio of changes in the prices received by runholders for their wool, to prices paid by runholders for the goods and services they use in the production of that wool.

It gives an indication of the purchasing power of a pound of fine wool. In other words, if prices paid rise faster than prices received then runholders are "worse off" in terms of net farm income. Or if the movement is the other way, then they are "better off."

The trends in the terms of exchange for both high-country farming and the New Zealand farming industry as a whole are shown in Figure 3. Here again, index numbers are used for convenience and the base year is 1949-50. This index number for the terms of trade measures the degree of cost-price squeeze because it incorporates a cost index and a price received index.

![Graph showing trends in terms of exchange for farming](image)

**Fig. 3. The Terms of Exchange for Farming**
(based on 1949-50 = 100)

Clearly, the trends in the terms of exchange for high-country farming follow, fairly closely, the trends in wool prices (see Figure 2). This we can expect, because, as I said previously, prices received fluctuate much more than prices paid.
THE TRENDS IN TERMS OF EXCHANGE

In the 1920s and early 1930s prices received fell more than prices paid. But the deterioration in the high-country terms of exchange reached its lowest point in the 1931-32 season. Apart from seasonal fluctuations, there was some improvement in the mid-1930s, but the terms of trade were still at a fairly low level. There was another drop in 1937-38 and again in 1938-39 before the slight improvement in 1939-40 and the relatively stable conditions during the wool appraisal scheme of the war years.

In the late 1930s and over the war years, high-country runholders were at their greatest disadvantage in their terms of exchange, compared with the overall farming industry. For most of this time their terms of exchange were only about half as good as for all farming. After the war their terms of exchange improved rapidly with improving wool prices, to reach a peak in the 1950-51 season. Since then, although there have been large seasonal fluctuations, the overall trend in terms of trade has been downwards—as it has been for wool prices. However, because of the rapid increases in prices paid for goods and services, the decline in high-country terms of exchange has far exceeded the decline in wool prices. In the 18 years from 1949-50 to 1967-68 the price received per pound for fine wool has declined by 20 per cent. However, in the same time the prices paid for the same physical inputs have risen by 80 per cent. Thus, the same pound of wool will today buy only 50 per cent of what it would purchase in 1949-50.

THE EFFECT OF INCREASING PRODUCTIVITY

At the present level of prices paid, the average fine wool price would have to drop to 22.1 cents per pound to return to the terms of exchange of the worst years of the 1930s. However, changes in productivity allow more output to be gained from each unit of input, that is, the whole farming operation is more efficient. Work done here at Lincoln College points to the long term increase in productivity of New Zealand agriculture being about 0.7 per cent per year. Therefore, even if we did return to the terms of exchange of the 1931-32 season today, high-country runholders could reasonably expect their incomes to be about 30 per cent higher because of this productivity increase. In other words, we can nowadays achieve a greater level of production using the same quantity of goods and services. This is largely through better technology.
HIGH-COUNTRY FARMING COMPARED TO OTHER FARMING

From Table 1 and Figure 3 it can be seen that the terms of exchange for all farming are not the same as the terms of exchange for high-country farming. The pattern is similar, but the whole farming industry has, in all years except 1950-51 had better terms of exchange. Since 1949-50 there has been a drop of approximately 50 per cent for high-country farming compared with about 20 per cent for the overall farming industry.

Prices for different products tend to move independently of one another. Thus, whereas for other farming good prices for one product can easily counter-balance poor prices for another, the high-country runholder has only limited opportunities for diversification. He largely relies on his wool income alone, and must put up with fluctuations in wool prices. Therefore, decisions made by Government or farming leaders based on figures for the whole farming industry may bear no relation to the conditions in the high country.

In this uncertain environment, where production and prices received can vary widely within and between years, the type of management which has grown up has been based on a low-input-low-cost system of farming. However, while the actual level of inputs is fairly low, their quantities are "fixed" from year to year. It isn't possible to do much about reducing them when income drops, or, as has happened, when the terms of exchange deteriorate. For example, labour is a major item of high-country expenditure but the sheep still have to be mustered irrespective of the wool price. Little "cost-paring" can be done and unfortunately the usual items to suffer are those which should not be curtailed—such as essential maintenance, top-dressing, and development expenditure, all of which are closely linked to production levels.

WHAT CAN BE DONE?

This is a historical record of what has happened in the past, and, as such, is of only limited use for prescribing for the future. But, at present it appears that the seemingly endless increases in prices paid, and the gradual decline in wool prices, could continue. Obviously prices paid have not yet felt the full indirect effects of our devaluation. And the recent announcement by Du Pont that they intend to begin production of a new synthetic which "is better than any other textile fibre" chills the hope of a rapid increase in wool prices.
With this possible continuing adverse trend in the terms of exchange what can a runholder do? Some people suggest that he should reduce his own costs. We have already seen that the opportunities for this are small. The obvious way to reduce cost per unit of output is to produce more units—either by increasing the amount of inputs (land, labour, stock and capital) or by increasing the productivity of the ones we already have. Even the limited opportunities for diversification should also, perhaps, be exploited. Fortunately, our studies, so far, have shown a satisfactory financial return from high-country development, even at relatively low wool prices.

Sheep Grazing Fern-Covered Hill on Makarora Station. Makarora River and Wilkin River (Mt Albert Station) in background.

Photo: D. Osmer
WINTER FEED ON MAKARORA STATION

By Crawford Pennycook, Makarora Station.

The wintering of stock has always been a problem on high-country runs, most of which have an over-abundance of summer country, and a scarcity of winter country. This wintering area is most important, as on it depends the overall carrying capacity of the run.

WINTER HILL

True winter hill country on Makarora Station is almost non-existent, as all of the lower sunny winter faces from Lake Wanaka level to nearly snow level are covered with dense bracken fern, very often up to one’s shoulders under our high rainfall conditions. Burning, topdressing, and oversowing with clovers and cocksfoot are quite successful on this country, although really heavy stocking is necessary to control bracken regrowth. While this fern country gives useful grazing in autumn and late spring months, it is no help for wintering at the present stage of its development. Altogether, 750 acres of this country have been aerial sown, its only drawback being a tremendous growth of tutu, which caused deaths at various times. The problem of tutu poisoning is one which most runholders will agree should be looked into immediately by the scientists, especially with the build-up of cattle numbers now under way on much of this type of country.

WINTER FLAT

I am most fortunate however, in having some 2,000 acres of good river flats at the 1,000ft level, on which at present I am wintering about 8,500 sheep and 350 cattle. One thousand acres of these flats have been ploughed or are at present under the plough, 500 acres have been aerial sown and topdressed, and the remaining 500 acres is still under bracken, matagouri, sweet vernal and browntop, with very little or no clover.

AS IT WAS

When I took over this property seven and a half years ago, it was carrying 200 cattle and 10,000 sheep consisting of 3,500 Halfbred ewes, 500 crossbred ewes, 2,500 Halfbred wethers, 1,500 Halfbred M.S. two-tooths, and 2,000 hoggets. Some 150 acres were in soft turnips and turnips-and-grass, and 4,000 bales of hay were on hand. Only the hoggets were wintered on turnips with hay, and the rest of the hay was fed to the crossbred
ewes, calves, rams and bulls. About 1,000 Halfbred ewes were wintered on 1,150 acres of unimproved flat, as were all the cattle except calves. At that stage, only 850 acres of the flat had been ploughed, and a good quarter of this was badly run-out and reverted to mainly browntop and sweet vernal. The rest of the Halfbred ewes, wethers and two-tooths were all wintered after a fashion on the hill—with a high death rate. The survivors came through the winter in very poor condition, with resulting low wool weights and a low lambing percentage. The soft turnips didn’t seem to do very well as far as bulk of feed was concerned, and rot was a problem by late winter. I found that although grass grew late into the autumn, it was very slow coming away in the spring, and winter could be taken to be more from June to the end of September. Falls of snow on the flats are rare, as are frosts over twelve degrees, although mid-winter sunshine is only six hours.

**SWEDES**

For the next winter, I switched to swedes on ridges, with a few ounces of choumoellier to the acre, and have continued with them ever since. The young grass is still sown with soft turnips. With swedes, I have found 60 to 65 acres will winter all the hoggets and Halfbred two-tooths (about 3,500 head). The swedes are fed off in breaks, with hay in a run-off paddock, and the mob is on the break for about eight hours a day. This move of wintering the Halfbred two-tooths on swedes released another hill-block on which to winter wethers. It thus gave them twice the scope, resulting immediately in more wool and a marked drop in winter death rate. The two-tooths also clipped better, grew into bigger and better sheep, and the death rate was negligible. The second winter on the flats did not seem to adversely affect their climbing out and staying out when they were put on the hill after shearing.

**MORE EWES ON THE FLATS**

About this time, the “powers-that-be” had a re-shuffle of Pastoral Leases, which ended in our losing 7,900 acres, including a block on which I normally wintered up to 1,000 Halfbred ewes. Because of this, I decided to cut back the Halfbred ewe flock by a thousand, and increase the crossbred ewe numbers run all-year-round on the flats. This was done over a two-year period. All the Halfbred ewes were now tupped on the flats, and in July about half of them went out on to saved hill blocks below a snow-line fence. These blocks are not grazed from
Christmas to July and, although small, carry the ewes through in good order until pre-lamb shearing in early September. The rest of the Halfbred ewes (usually the four-tooths and oldest ewes and any in poorer condition) are wintered on the unimproved and oversown flats with hay if needed, depending on the season. The improvement in lambing was sudden and dramatic—an increase of 20 per cent. The crossbred ewes were wintered on hay, with autumn-saved pasture for the last month before lambing. Cattle numbers had also been increasing steadily over this period, and the numbers of calves and 18-month heifers requiring feeding over the winter had gone up considerably. The cows, too, were being used as fern crushers at this stage to get blocks ready for over-sowing and thus needed a fair amount of hay.

**HAY**

These stock increases and different management practices meant I was now making up to 12,000 bales of hay—or rather trying to make that number. Most years, this was a real nightmare, a constant fight against the weather with more often than not the weather coming out on top. Our rainfall averages more than 90 inches per year, with our wettest 125 inches and driest 80 inches over the last seven years. The driest months tend to be in the winter, and the wettest ones can be at any time. Eighteen inches for the month has been our heaviest so far. Making 12,000 bales of hay under the threat of these conditions, is a real heartbreak, even with a roto-baler, and would be well-nigh impossible with a square baler. I recall one January when, with 2,500 bales just baled, the rains started. We did everything to those bales. We turned them, stood them on end, almost lived with them, every time it came fine, but no sooner would they start to dry out than down would come the rain again. Finally we carted a few hundred in at a time, once they became reasonably dry, and stood each one separately in every spare roofed space we could find for further drying. Eventually, five weeks and 19 inches of rain later, we got the last of those bales dry enough to cart and stack. We lost about 200 which were in hollows and at one stage had water running through them. The rest, except for the outer inch or so, were as good as when baled—a great recommendation for roto-balers.

**SILAGE**

This was the time when vacuum silage was first being made and talked about. After attending a demonstration, I thought it might be the answer to the problem, and decided to give it a go. That was three years ago now. It proved to be everything
I had hoped for. The first winter we had 500 tons, last winter 700 tons, this winter 900 tons. We make it ourselves, and find it takes roughly four or five days cutting to fill a 200 ton cattle pack (holding at least 250 tons). This depends on thickness of crop and the length of cartage from crop to stack. It takes one man on the tractor and one or sometimes two men on the stack, and is the equivalent of 3,000 bales of hay. Compare the man hours and tractor hours involved in this, and making the equivalent number of hay bales! The real beauty of vacuum silage is that it can be made in good order in any weather. One fine day and, if the weather breaks, you can put the cover on and compress, and what you have in is kept in first class order until the next fine day, when you can open the stack and continue the filling. It is therefore a job that can be fitted in with other work, especially shearing, far more easily than can hay making. Also, I have found that, for silage, only about half the
acreage need be closed up compared to what we shut for the equivalent amount of hay, and it does not need to be closed up for nearly so long. Thereby far more grazing time is gained from any paddock. With our late spring but strong summer growth, silage paddocks don’t need shutting up until Christmas time. This year we made silage in March and the first week of April from paddocks closed up at weaning time in early February. Not that I have given hay making away altogether. Far from it! I still make 6,000 bales, as it is still more convenient to feed out under certain conditions.

The first winter, the silage went to the hoggets and the cows. It was loaded on to a trailer with a silage fork in place of the bucket on a front-end loader, and fed from trailer to paddock by a man with a pitch-fork. For the hoggets, it went on to the run-off in place of hay, and it was noticeable how quickly they got on to silage compared with hay. After a couple of weeks, they would stream off swedes at the double when they heard the tractor with the silage (something not seen with hay feeding) and they did really well. The cows were wintered entirely on silage on a fenced bracken block. By the end of the winter, the cows were looking well, and the bracken really sick. The block was later aerial sown and topdressed. The beauty of silage feeding in this case is the length of line that can be fed out, enabling the whole block to be covered in the winter period.

Last year, the cows and hoggets were again fed silage under similar circumstances. As well, the older crossbred ewes were fed both silage and hay at the same time. It was always the silage they rushed and cleaned up first, although there were a few which didn’t seem to eat much silage, just as there are some which never seem to touch hay. And the silage really was cleaned up—every wisp of it. Not so the hay. Last year I also self-fed a 200-ton stack to 65 calves. This was not entirely successful as, although they did well, as well as on hay, I felt they could and should have done better. This year, I am trying them again, but instead of it being straight-out self-feeding I will feed them loosened-up silage along the face of the stack every day. In this way, I hope they will eat more and do better.

**STOCK HEALTH**

Two years ago, with the build-up of crossbred numbers, I increased the swedes to about 90 acres, and began feeding the two-tooth crossbred in-lamb ewes on them. Immediately an iodine deficiency showed up, with the resulting goitre lambs,
despite the fact that iodized-salt blocks had been available to the sheep. Last year, all in-lamb ewes, those on swedes as well as those on hay, were dosed with iodate twice during pregnancy, and no goitre lambs were found last lambing.

This winter, the following is the pattern of feeding:

- 2,300 Halfbred wethers wintered entirely on the hill.
- 2,250 Halfbred in-lamb ewes tupped on flats, and from July 1,250 on to saved winter hill blocks, and 1,000 on to flats with hay if needed.
- 1,500 crossbred two-tooth in-lamb ewes on swedes and hay.
- 1,400 Halfbred hoggets
- 1,000 crossbred hoggets
- 1,250 m.s. two-tooth Halfbreds

on swedes with hay and silage.

- 2,300 crossbred ewes on hay, silage and autumn-saved pasture
- 350 cattle on silage
- Rams, bulls, killers on hay.

What advantages and drawbacks have I found with these various systems?

Hay is definitely easier and quicker to feed out than silage (except self-fed) but in our climate is harder, and at times impossible to make.

Stock generally prefer silage to meadow hay, or rather the type of meadow hay we are able to make, and seem to do better on it with the exception of calves self-feeding. When making silage, paddocks are not out of grazing for as long as when making hay, nor need as big an acreage be closed up. Silage making can be fitted into general work far better than hay making.

Swedes, at the moment, while run-out pastures are being renewed and virgin country is being brought in, are practical and work in with the rotation, although goitre can be a problem.

Well, that is where I stand with my winter feeding at the moment. How can I improve it? Maybe self-feeding silage to ewes is the next step under our climatic conditions.
The Memorial to the Working Collie at Lake Tekapo.

Photo: "Timaru Herald"
MEMORIAL TO HIGH-COUNTRY SHEEP DOGS AT LAKE TEKAPO

The address by the chairman of the Mackenzie Branch of Federated Farmers (Mr A. T. Murray) at the unveiling of the memorial by the Governor General on 7th March, 1968.

"It is my honour and privilege to address you today on behalf of the Mackenzie High-Country Branch of Federated Farmers and all those that have contributed to the fund to erect this statue in honour of past and present Collie dogs of New Zealand.

In 1961 a fund was opened to build a statue in appreciation of the Working-Collie dog, and in the same year, the Mackenzie High-Country Branch of the Federated Farmers formed a committee to proceed with the idea. They commissioned Mrs Innes Elliott, a one-time resident of the Mackenzie, to sculpture the dog which was then sent to England and cast in bronze. It was on display in New Zealand House in London where it was most favourably commented upon before being shipped out to New Zealand.

The base and mounting were built by Mr Bill Harris, a stone mason of Fairlie, from stones collected locally. The boulders surmounting them came from the Jollie River.

I would like to take this opportunity of congratulating Mrs Elliott, Mr Harris, and the members of the Committee—Mr Innes, Mr Donald Burnett and Mr Mackintosh for the wonderful work they have all done.

It is a very great honour for us, Your Excellency, that you should be here today to officially unveil the statue. But we also think it is very fitting, as in 1935 His Royal Highness, the Duke of Gloucester, laid the foundation stone of the Church of the Good Shepherd in memory of the early pioneers of the Mackenzie. So down by the lakeshore, within sight and calling distance, we have the Church representing the Master, and this statue—the faithful servant. The early pioneers of New Zealand high country were not long in finding out the value of the Scottish shepherd and his Collies. In 1865, Mr Rolleston, the then Superintendent of Canterbury, requested his agent in England to obtain Scottish shepherds. Moreover, realising they would be unable to be separated from their valuable Collies, he allowed £5 for every animal accompanying its master. These men and their Collies were eagerly sought after on their arrival..."
in New Zealand. Their jobs were to boundary-keep unfenced stations, and droving sheep to stock new stations. For weeks and sometimes months their only company might be their dogs, so a very close understanding grew up between them. This would no doubt account for the faithfulness and remarkable mustering feats of these dogs.

The faithfulness of his dogs probably saved the life of George Grimmer, a Rollesby shepherd who was caught out in a snowstorm while mustering. When he had not returned by the night, a search party was organised. Not thinking he could have lived through the night, they were amazed to find him well, save for a leg he had broken in a fall. His dogs, snuggling around him, had kept him warm. The loyalty of another dog is linked with Dead Man's Creek. In 1876 a dead man was found, but the finders were unable to get close as a fierce dog was standing guard. Beside the body, which had been dead for some days, were several wekas which the dog had killed and brought back for food for his master.

A shepherd may address his dogs in terms of hair-raising blasphemy. He may punish them severely when they disobey or misunderstand him. But he will never admit that anyone else's dogs are better than his and he is always ready to talk at great lengths about them. This pride and confidence of the early Mackenzie shepherds in their dogs led to probably what was one of the first dog trials held in New Zealand. It was held at Haldon Station after the autumn muster in 1869.

One must remember that this country was named after the sheep stealer, James Mackenzie, and his dog, Friday. One wonders what he would have done without the help of his dog, without which he would never have taken the sheep where he did, and what name this country may then have taken. Throughout the history of the high country we have seen bullock teams replaced by horses; the horses replaced by cars, trucks and tractors; the station hacks, to a certain extent, by four-wheel drive vehicles, but the Collie dog has been and always will be with us, for without the Collie dogs the runholders of the high country would find their stations impossible to manage.

In conclusion, could I read the last line in the plaque which is in Gaelic—

'Beannachdan air na cu caorach'
translated: 'Blessings on the Sheep Dog.'
MANAGEMENT OF BEEF BREEDING COWS

By G. K. Hight, Whatawhata Hill-Country Research Station, Department of Agriculture.

In this article, I will discuss some features of the management of hill-country beef breeding cows.

BREEDING AIMS

There are three important aims for the efficient management of a breeding herd. These are to grow a large amount of high-quality feed, to consume most of this food directly by grazing animals, and to have animals that convert this feed into saleable lean beef as efficiently as possible. In other words we must breed animals capable of efficient beef production, and feed them on the most economical high-quality feeds we can get. On hill country these aspects are continually changing. Therefore we have to periodically re-look at our ideas of beef cattle management in the light of better pasture productivity and quality. We will also need to test new breeds or classes of cattle on hill country.

As a first step, we must breed more efficient beef-producing animals. The response we get from our better management and better pastures, etc., will partly depend on their inherent capacity for high performance. Ideally, beef cows must be highly fertile, have a high milk production, good mothering ability, a docile temperament and be long-lived. They must be able to suckle calves capable of early sexual maturity and a rapid growth rate but with late physical development. There must be no defects such as bad feet, jaws or udders. The carcasses of the steer, bull or surplus heifers should have a high proportion of tender and flavourful lean red meat.

When breeding higher-performance cattle, we must concentrate mainly on productive features to make worthwhile gains. With beef breeding cows, the ability to rear consistently good calves to weaning, is of first importance. For example, if a 100-cow herd produces 100 per cent of 300lb liveweight calves at weaning, then we have 30,000lb of calf. If this herd weans calves weighing 400lb, then we get 40,000lb of calf—an increase of 10,000lb liveweight. But if the fertility of the beef herd drops to 80 per cent, then we wean only 24,000lb of 300lb calves. The coat colour or breed of these “hill cows” matters little. It is more important that they produce good calves regularly at weaning, adapt well to hill country and are
hardy, active foragers. Their weaned steer calves must also be able to grow fast without laying down wasteful fat at light weights.

These demands have prompted some North Island owners of breeding herds to try Friesian or Friesian x beef breeds as "hill cows." Two years results with purebred Friesians on second-class hill country at the Whatawhata Research Station show that these cattle can forage actively and, even with little or no supplementary food, produce calves with higher weaning weights than the traditional Aberdeen Angus. This indicates that there is a wide scope for improving all types of hill-country cattle. We must be ready to re-examine traditional ideals in the light of the rapidly improving hill-country environment.

GRAZING MANAGEMENT

Once the breed and class of cattle have been selected, then the next most important decision is how to farm them at the highest feasible stocking rate. To make the best use of land, labour and money you may well have to increase the stocking rate until, although production per animal drops, there is the highest possible net return per acre. Only then is the feed grown used most efficiently. In the North Island, at least, high stocking rates are vital to the improvement of hill country and overcome many of the problems of farming this class of land.

Rapid development of reverted North Island hill country is possible with burning, oversowing, topdressing and concen-
trated sheep grazing. But the usefulness of the traditional beef cows for this is limited by their winter carrying capacity. Unless large numbers of cattle can be concentrated on small areas for short periods, particularly in the spring and summer, then much of the advantage of cattle for developing land or controlling roughage can be lost. Furthermore, the number of cows wintered usually decides the number carried throughout the rest of the year.

WINTERING

The winter feeding of beef cows is most efficient when their food supply is restricted to the stage where there is a low cow and calf mortality, high calf growth rates, and unimpaired reproductive performance. This is particularly true when the maximum number of stock is wintered with little or no supplementary feed. If hay, silage or crops are fed to cows with only one calf at low grazing intensities, they are often merely eaten instead of pasture or roughage. There is then little, if any, overall benefit. It is only when most of the feed grown is being used, or when the feed is of poor quality that supplementary feeding is likely to be worthwhile. Beef cows seem readily to adapt their grazing behaviour to the amount of feed available. They graze more efficiently when there is only a limited amount of feed. Therefore, we must breed efficient animals and feed them as economically as possible.

THE EXPERIMENTS

Recently, at the Whatawhata Hill-Country Research Station, we studied the responses of beef-breeding cows to different levels of feeding. We paid particular attention to the effects of high or low levels of feeding over the last 80-90 days or so before calving, and between calving and weaning. We also studied how to lessen the effects of underfeeding during these critical periods.

Figure 1 shows a simplified outline of our nutrition experiments. In late May or June, pregnant Aberdeen Angus cows varying in age from three- to eight-year-olds were sorted into different groups and either fed well or fed poorly before calving. For two years each cow was kept on its treatment until calving, then either fed well or fed poorly between calving and weaning.
In another experiment, cows were drafted to either a fed-well-before-calving group or to fed-poorly-before-calving groups. The cows in the last groups were fed poorly until either eight weeks or three weeks before calving. Thereafter, all got good feed until weaning. We took care to balance the cows in groups for age, calving date, initial cow liveweight, sire of calf, and mating group so that these factors did not bias the comparisons.

All cattle were carried on hill country at a stocking rate of 4-6 ewe equivalents per acre.

High levels of feeding meant offering beef cows ample autumn pasture and as much hay as they could eat over the pre-calving periods, followed by spring pasture sometimes supplemented with hay. In contrast, for low levels of feeding, we confined beef herds to smaller areas of hill country that had been previously closely grazed with sheep or other cattle, and where there was only poor-quality roughage and fern left. No supplementary feed was given to the cows on a low plane of nutrition. The cows and their calves were weighed fortnightly or monthly and the cow-liveweight changes and their behaviour used to decide later feeding levels.

THE RESULTS

The main results of the experiments can be summarised as follows:

(1) Effect of Hard Cow Wintering on Calves

A reduction in cow liveweight of 115lb-136lb (or by 13-18 per cent) during the last 80-90 days before actual calving
reduced the birth weight of calves by 12-13lb or 20-22 percent. It increased calf mortality, and reduced calf weaning weight by 36lb compared with cows fed well before calving. These effects of under-feeding before calving are likely to be the greatest difference one can expect compared to hill-country Aberdeen Angus cattle fed on a high plane before calving. The live-weight of mature cows in the early stages of underfeeding did not drop greatly unless food intake was severely restricted.

(2) Calf Birth and Weaning Weights

The high or low level of feeding of a cow before calving could have the same effect on calf weaning weight as the level of feeding after calving. Both periods are important if you want high calf weaning weights. When the breeding herd was fed poorly both before calving and during the suckling period, the calf weaning weights at the end of January (4½ months of age) dropped by 75lb on average, compared to those from cows fed on a high plane throughout. Poor feeding only before calving, or only between calving and weaning, decreased calf weaning weight by 36-38lb.

(3) Poor Feeding While Suckling Can Depress Next Calving

The fertility level of beef cows is sensitive to the level of feeding, particularly between calving and weaning. Some 45 percent of the cows poorly fed both before and after calving...
were empty the following autumn. In contrast, only 3-9 per cent of the rest of the cows whether fed well before and after calving, fed poorly before calving and then better fed, or fed well before calving and then fed to maintain weight, were not in calf the following year. **This suggests that the fertility level can be depressed and subsequent calving dates delayed by very low levels of feeding after calving and particularly if the cows are in low condition at calving.** Overseas evidence suggests that this effect of nutrition on cow fertility is due to a delayed onset of first oestrus.

(4) Calf Growth After Weaning

Most of the heifer calves from these experiments have been kept at the Hill Station, to find the effects of various levels of cow feeding before and after calving on the calves’ post-weaning growth. **The results show that very poor cow feeding right up until calving may have a quite permanent stunting effect on the liveweight of heifer calves.** This can be avoided however, by feeding cows better for about eight weeks or more before calving, to help them recover their autumn liveweights.

Heifer calves, even if their dams were poorly fed while suckling them, were able to compensate for any nutritional handicap by increased growth rates after weaning, compared with calves from previously well-fed cows. However, **very big drops in the weaning weight of heifer calves, if also accom-
panied by poor liveweight gains during their first autumn and winter, could prevent their successful mating as two-year-olds. This early mating should be the aim in the efficient management of all beef herds.

(5) Eight Weeks or Three Weeks Better Feed

When beef cows were fed well for only eight weeks before calving, the effects of previous poor feeding were largely avoided. No differences were seen in calf mortality, weaning weights, cow liveweight at weaning, or in later fertility between them and other cows fed to gain weight throughout late pregnancy. However, when cows previously on a low plane were fed to gain weight for only three weeks before calving, and did not recover their autumn liveweight by calving, then calf birth-weight was reduced by 8lb.

(6) Young Cows Are Susceptible to Poor Feeding

Our data indicates that three-year-old cows are more susceptible to undernutrition near calving and during lactation than are older cows. Some preferential feeding of these younger animals and older cows in light condition may, therefore, be wise when feed is in short supply if increases in calf mortality and the proportion of cows not in calf the following year are to be avoided.

(7) Compensatory Growth

A feature of Aberdeen Angus cows suckling only one calf has been their high compensatory growth rate or capacity to recover between calving and weaning. Cows that were poorly fed before calving have grown up to ½lb per day faster, when fed well after calving, than those previously fed at a high level before they calved; and they have been able to fully recover their liveweight by weaning. Furthermore, cows which have scarcely gained weight during suckling, have regained any liveweight difference present at weaning, by increased growth rates over the next winter. They have then actually produced heavier calves than those cows previously fed on a high level! This capacity of beef cows to recover could be used to advantage to buffer a varying supply of pasture provided they are not restricted during critical periods. Animals used to a restricted feed supply may perhaps be less affected by later undernutrition, or they may keep a competitive grazing advantage compared with animals which had been previously used to ample food.
FEED SAVINGS ARE POSSIBLE

All these results emphasize the importance of good feeding during critical periods.

Mature Aberdeen Angus cows in good condition in the late autumn may be fed through the winter to maintain weight, or allowed to gradually lose about 10 per cent of their weight until approximately eight weeks before calving. If they are then given more food to fully recover their autumn liveweight, and fed well through to weaning, the winter feed shortage appears to have little effect on their performance. This approach can reduce the amount of supplementary feed and saved pasture needed for a single-suckled beef herd over most of the winter. The regular drafting off and better feeding of cows in poor condition can help to avoid “tail-end” animals. Hay feeding can be delayed as long as possible since, once feeding starts, beef cows tend to gather at feeding points and may graze remote areas less efficiently.

While these experiments do give some guide to the feeding of beef herds on hill country, such management practices must be adjusted to fit the particular farm and stocking rate. Good stockmanship cannot be replaced by the “average” result. There is an urgent need to re-examine all aspects of hill-cattle farming if we are to produce more beef more efficiently. At Whata-whata, we are now looking further at Friesians as beef-producing
“hill cows,” to systems of early weaning, and to studies on the mating behaviour of cattle using a new bull-mating harness, and its use in artificial insemination.

SUMMARY

To summarize, our experiments with beef cows have shown that:

1. Poor feeding of cows in late pregnancy lowered calf birth weight (by 20 per cent) and increased calf deaths (by 18 per cent) compared to calves from well-fed cows. It also reduced calf weaning weights by an average of 36lb at weaning, even though all the cows were fed well after calving.

2. If the cows were also poorly fed after calving the weaning weight of their calves was 36lb lower still. Therefore cow feeding levels both before and after calving can influence calf weaning weights by as much as 75lb.

3. If the cows were poorly fed both before calving and right through to weaning it greatly increased the number of dry cows in the following season. But, if a cow did conceive, poor feeding over one calving did not affect her next year’s ability to wean a good calf (although calving may be later).

4. A short (8 weeks) period of good feeding before calving can make up for earlier poor feeding. This means that it may be wasteful to provide expensive supplementary feed all winter. But three weeks’ extra feeding was too short for recovery in the trial described.

5. Cows have a remarkable ability to recover liveweight when fed well after being fed poorly. Cows poorly fed before calving but fed well afterwards caught up in five months to others fed well all the way through. Mature cows can be “done hard” through most of the winter without ill effect. But young cows and any older cows in light condition should be looked after.

6. More cattle can be carried by using a mature cow’s ability to adapt to the feed supply. But she must be fed well in critical periods—that is for several weeks before calving and particularly from calving to weaning.
BOOK REVIEW

FIELD GUIDE TO THE ALPINE PLANTS OF NEW ZEALAND
By J. T. Salmon. (A. H. & A. W. Reed. 304 pp. $5.60.)

Most runholders and their musterers notice the various attractive plants they tramp over when on the high beats; many wish they knew their names; some even attempt to cultivate them in the homestead garden. All these and many others, including trampers and city gardeners will thank Dr Salmon for producing this book.

He set out to illustrate in colour, in flower or fruit or both, the plants most commonly seen in our mountains. Each of the 479 photographs has with it a brief description and notes on distribution. They are arranged by a simple ecological grouping; subalpine and alpine scrub, tussock grasslands and carpet grasslands, screes and rocky places, herbfields and fellfields. The last section, entitled "Ecology," has illustrations of plants growing in natural associations.

To help the amateur, the author in each case lists a "common" name with the scientific name, the latter sometimes misspelled. Where there was not already a popular name, Dr Salmon has created one. This has not always been successful and is sometimes confusing.

The author is a notable photographer and some of his finest work appears in this book. His aim has been to show the main identification characters and in most cases he has done it admirably. There are a few failures, mostly with the grasses which are, however, notoriously difficult subjects. (Many readers will be puzzled over No. 114, labelled Silver Tussock.) Close-up photographs help to identify difficult species but unfortunately we have no idea of scale. Certainly, measurements such as height and leaf size are given but they are metric and how many New Zealanders can readily convert these figures when examining a plant on a mountain side?

The quality of the colour varies; most reproductions are exceedingly good; many are superb; a few are a complete failure. But anyone realising the difficulties of checking colour work done in Japan will forget the failures and make full use of the others to enhance his enjoyment of our very remarkable alpine flora.

—L.W.McC.
INSECTS AND TUSSOCK GRASSLAND DEVELOPMENT

By J. M. Kelsey, Entomology Division, Dept. of Scientific and Industrial Research, Lincoln.

It is distinctly encouraging to see tussock country being developed by some progressive farmers in both the North and South Island. This article is an effort to help these farmers maintain the pasture production resulting from their oversowing and topdressing.

IMPROVED AND UNIMPROVED PASTURE BOTH SUFFER

Of the 45 species of insects recorded feeding on tussock (Kelsey, 1957) the common grass grub (Costelytra zealandica White) and porina caterpillars (Wiseana spp) that are major pests of lowland pastures, are also those causing most damage in tussock grassland. Unfortunately, it is the progressive farmer who is hit hardest by these insects. As far as natural regeneration from seed is concerned, it is unlikely that there could be any good permanent establishment of seedling plants beyond three years wherever grass grubs and/or porina are present. This was shown in experiments in the Ashburton and Rakaia Gorges and also in the Mackenzie Country. Twenty-four months after insecticide treatment, the intertussock growth had formed a continuous mat on previously bare ground. But untreated plots, both inside and outside netting fences, still had only bare ground, or at best a very poor cover of sickly plants between tussocks.

Furthermore, improved land we saw 3-4 years after the start of oversowing of seed and fertilisers, showed that grass grub and porina populations had increased to well above levels normally present in unimproved land. This increase with improvements in vegetative cover is to be expected because grass grubs become cannibals when little root growth is left for them to feed on. This would occur less on oversown areas where there would be more roots to feed higher numbers of grubs. With porina, extra cover would give better protection for surface-laid eggs and young caterpillars than on unimproved areas. Most of the improved, but insect-damaged, land we saw still had good grass/clover composition. However, root damage made it unlikely that there would be any real grazing value from these pastures. Even 3-9 grass grubs per square foot can prevent leaf growth of more than one inch in the same time and soil where leaf length should be 6in-8in.
The remedy is simple—treat the land with insecticides.

EFFECTIVE SPREADING

Most of the improved land inspected had been treated with insecticides, or rather, the farmers had paid to have the paddocks treated by aeroplanes. By this remark I mean that the insecticide had been dropped from such an altitude and in wind conditions that made it almost certain that most, if not all the insecticide (and superphosphate) would not land on the paddocks or even the farm of the owner who had paid for it. Our D.S.I.R. Entomology Division Sub-station in Canterbury has carried out two big trials with 'plane-applied, fertiliser-based insecticides using the conventional vertical super hoppers, and also with the fishtail or venturi type of horizontal distributor under the vertical hopper. It has also checked distribution by ground topdressers.

All machines had weaknesses but these lay mainly in the operators' ideas of effective width of spread, or in their calibrating of machines for different materials, rather than in the machines themselves. But when weaknesses are known and remedied they cease to remain real problems.

Where they can be used, star feed, Monro drag-feed, spinners, and oscillator type machines all give reasonable spread if operators (particularly contractors) realise that the effective swath widths of machines are almost always less than those which they use. For example, spinners and bulk topdressers usually run at 20-foot centres. But the effective swath width—based on insect control—is usually not more than 12-14 feet.

'Planes have played a very important role in the development of tussock grasslands—in fact such development could not have been done economically without them—but too many operators are flying too high and at swath widths that are too wide. This has often resulted in lanes of good pasture alternating with poor and even no pasture establishment.

DRIFT

Very few feeder mechanisms on 'planes can give good distribution beyond the wing spans of 'planes used. While this was important with application of seed and fertilisers, it becomes of even greater importance when insecticides are being used, because with them there must be almost perfect distribution without drift. Some forms of insecticides are fine and can drift for miles in relatively still air (0-5 m.p.h.). For example the Canterbury tests referred to above showed that for each mile of
Wind velocity up to 3½ m.p.h. 10 per cent of the dry and wet mix DDT supers drifted off a flagged 7-acre target when planes flew at only 50 feet altitude.

When it is realised that in most districts in New Zealand there are fewer than 15 complete daylight days in which winds are under 5 m.p.h. during the 273 days from 1st September-31st May when most fertilisers are applied (Kelsey, 1963), it becomes obvious that the drift problem is a real one—particularly to contractors who, of course, must use every daylight hour if they want to make a profit. They cannot, on arrival at farmer Jones’ property on a windy day, agree to come again when conditions are better, because they have a waiting list of other farmers booked for those days. The result is that contractors sometimes place farmers in the position of saying either: “Don’t apply it” or “Apply it even though conditions are wrong.”

A partial solution of this problem is to use coarser materials that will not drift so far, and this is why chemicals and fertilisers are now prepared in prill, pellet and granular forms. All these can be applied in winds up to 15 m.p.h. There are, on average, 200 days in the 273 of the September-May period during which winds are less than 15 m.p.h. all day, so the advantages of these preparations are obvious not only for insecticide but also for fertiliser application.

These changes in formulation, however, lead to other problems. Granulated forms cannot be applied evenly by machines designed for, say, fine superphosphate—alterations to machinery are necessary or swath widths must be changed. Thus if granulated DDT super is applied by the usual vertical-hopper topdressing plane, the result will be a “gravel pathway” about 6 feet wide. The only existing planes that could apply such granulated super would be those with a horizontally mounted “fishtail” or venturi, and possibly the Swathmaster type, but operators of even these machines should check effective width of runs. I still think it very unlikely that these swath widths will be wider than wing spans, which are usually 35ft-42ft.

THE CHOICE OF INSECTICIDES

There are many insecticides that kill or incapacitate grass grubs and porina caterpillars. But so far as the majority of tussock grassland is concerned, the choice is limited by velocities of winds, type of country, and duration of effectiveness of insecticides against both insects. These factors mean that insecticides should be in granular form and ‘plane-applied.
The following insecticides have proved themselves in tests over many years against grass grubs and porina: DDT, lindane, diazinon, fenitrothion and trichlorphon, all at dosages of 1-2lbs active ingredient (a.i.) per acre. For best results the 2lb/acre dosage of all these materials should be used. Costs of these per acre for 2lb of active ingredient in pellet or granular forms are 82 cents for DDT in granulated super; $2.10 for DDT in prill form; lindane $5.12; diazinon $8.80; fenitrothion $6.40 and trichlorphon $10.00 per acre. So on initial cost alone the choice is obvious—granulated DDT super. Choice becomes more definite still when it is known that DDT is the only one that lasts against both insects for longer than one generation of insects. Several of them (DDT, lindane) last for up to four years against grass grubs, but lindane lasts only one year against porina, whereas DDT lasts for three years against this caterpillar. The July 1968 cost of the DDT in Hornby granulated DDT super is 82c an acre. Since it will also control some of the other pasture pests such as army caterpillars, does not require separate operations for fertiliser and insecticide treatment, and is the safest of the above insecticides, it has so many advantages that its choice should be automatic.
The only disadvantages in using DDT (and the other long term residue chemicals above) is that its use could, if stock withholding periods are not adhered to, result in residues in our export meat and other farm produce. This is a threat we must avoid. Even this disadvantage however, would not be a real one if scientific evidence was used and applied to the DDT residue question. There is no scientific evidence that the residues being found would in any way adversely affect human health. In fact there is an overwhelming literature to the contrary. The use of DDT in large quantities each year for 25 years in malarial countries has resulted in the saving of millions of lives, reduced hospitalised cases to a very small figure, doubled life expectancy in countries such as India, brought tens of thousands of acres of rich agricultural land under productive farming, hydro-electric and irrigation schemes, and more than doubled food production wherever it is used properly. Such factors should carry more weight than a nebulous fear that there may be some as yet undiscovered ill-effects from DDT usage. Dr J. M. Barnes, Director of Medical Research Council’s Toxicology Research Unit (Barnes, 1967) stressed the unreality of the present insecticide-in-food tolerances (usually fixed by over-fed, over-producing countries) when there are so many poorly-fed countries. They should not be denied access to food with such low residues of the safer insecticides such as DDT, malathion and lindane.

It is true that there are big gaps in our knowledge of entomological aspects of tussock grassland development. However, there is ample evidence that in DDT at 2lbs a.i./acre in granulated super, there is a low-cost solution for control of the four main insect pests (grass grub, porina, army caterpillar and tussock moth). Now that the rabbit problem is under control these are probably the most important single factors preventing long term establishment of continuous pasture on much of our tussock grassland.

REFERENCES
<table>
<thead>
<tr>
<th>Material</th>
<th>Form</th>
<th>Concentration</th>
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<th>Price of 1lb active ingredient</th>
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<tr>
<td>DDT</td>
<td>Prills</td>
<td>20%</td>
<td>$10.50/50lbs</td>
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<td>Lindane</td>
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<td>Trichlorfon</td>
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<td>Lepidex</td>
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<td>Trichlorfon</td>
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<td>Fenite 80</td>
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<td>Fensulfothion</td>
<td>Granule</td>
<td>5%</td>
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<td>Diazinon</td>
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<td>5%</td>
<td>22c/lb or $1 for 50lbs</td>
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<td>Granule</td>
<td>10%</td>
<td>$15 for 50lbs = 30c lb</td>
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Therefore the extra cost for the 2lb of active DDT is 80 cents.
CHEMICALS FOR THE CONTROL OF GRASS GRUB AND PORINA

By F. B. Thompson, Registrar, Agricultural Chemicals Board.

GRASS GRUB

DDT is still the only insecticide firmly recommended for general use to control grass grub. Pelleted forms, such as granulated DDT/superphosphate, and DDT prills, pellets or granules, can be used either alone or mixed with superphosphate. They may be applied without permit on pastures (other than those grazed by dairy cattle) subject to the following conditions:

(a) **Stock must be removed before application, and the treated areas must not be grazed for two weeks afterwards.**

(b) **The application must not exceed 2lb of DDT per acre.** There are several grades of DDT/superphosphate available in the South Island, and the maximum rate of application for these is either 1, 1½ or 2cwt per acre, depending on the amount of DDT in the superphosphate. Users should check with the label to be sure that they do not exceed the correct rate of application. If the material comes in bulk, refer to the particulars in the Advice Note, which the seller is required by the Fertilisers Act to give to the buyer.

(c) **No area may be treated twice in the same year.**

(d) **The pasture must be dry and short** (not more than 1 inch high for sheep pasture and 3 inches for cattle pasture).

(e) **Not more than one-third of the farm may be treated at any one time.** But further portions may be treated after a lapse of twelve weeks since the last application of DDT.

*Where grass grub is resistant to DDT, lindane pellets* may be applied if a permit is obtained from the Department of Agriculture. Withholding periods of lindane are being reviewed and the user should refer to the conditions on the permit instead of instructions on the labels.

Grass grubs which are resistant to DDT are also susceptible to **diazinon**. The Board has accepted a tentative recommendation for its use to control grass grub only. Diazinon can be bought under the trade name of “Gesapon.” It may be applied as granules, or as an emulsifiable concentrate or wettable-powder in a spray. Pay particular attention to the label directions about applying when the soil is moist or when rain is expected. No permits are required to use diazinon and there is no withholding period before grazing, provided that the recommended rates of application are not exceeded.
A new material, fensulfothion, is available in small amounts for field assessment for the control of grass grub. It is very toxic and there are several restrictions on its use.

Another new material, namely, Bayer 5860, is much less toxic. It is also promising for the control of grass grub, and is available in small amounts for experimental use. Anyone interested in using either of these two new materials should apply to the proprietors, Messrs Henry York & Co., for further information.

PORINA

The Agricultural Chemicals Board has given full registration to three materials, namely, diazinon, fenitrothion and trichlorfon, for the control of porina. Permits are not required for these insecticides. Diazinon has been discussed already under Grass Grub.

Fenitrothion can be bought under the trade names “Fenite,” “Folithion,” “Gramothion,” “Tartan Fenitrothion,” “Verthion” and “Winstones Fenitrothion.” It is available as pellets or as an emulsifiable concentrate. There is a 7-day withholding period before grazing for pelleted materials and 14 days for spray applications.

Trichlorfon can be bought as “Dipterex” granules with no withholding period before grazing, and as “Dipterex” and “Lepidex” liquid for spraying. There is a 5-day withholding period after these spray applications.

To reduce to a minimum the contamination of the environment with DDT residues, it is Agricultural Chemicals Board policy that DDT be not used if other materials are available. Therefore, DDT is no longer recommended for the control of porina.

For further details about the use of any of the materials mentioned, refer to the local Farm Advisory Officer.

A NEW LOOK AT CONSERVATION RUN PLANS

During 1967 a Technical Committee appointed by the Soil Conservation & Rivers Control Council investigated farm plans of difficult high-country runs. They met many interested bodies including the High-Country Committee of Federated Farmers and received submissions from the Institute.
The members of the Committee were:
A. F. Greenall—Chief Soil Conservator, Ministry of Works (convener).
R. W. Wilson—Chief Pastoral Lands Officer, Lands and Survey Department.
D. K. Crump—Farm Advisory Officer (Economics), Department of Agriculture.

Their report and recommendations were considered by the Council. It has now issued the following statement.

**NATIONAL WATER AND SOIL CONSERVATION ORGANISATION**
**WELLINGTON, NEW ZEALAND**

**CIRCULAR INSTRUCTION 1968/25**
**25 July, 1968**

To: All Catchment Authorities

**CONSERVATION PLANS OF TRUE HIGH COUNTRY RUNS**

The nature of many high country runs requires that conservation plans of such runs be designed, programmed and financially assessed in much greater detail and with more caution than is usually needed, if the objectives of the Soil Conservation and Rivers Control Council, Catchment Authorities, and the runholders are to be achieved smoothly and effectively.

For those reasons, the Council requires the use of the procedures set out below for all farm plans of runs which come within the following definition.

**Definition** of those high country conservation run plans which in future are to be prepared in accordance with the following recommendations and procedures:

"Runs where soil conservation measures are necessary in the national interest to combat erosion and depletion and on which substantial areas of Class VIII land should be retired, thereby requiring changes in run and stock management.

"These changes require financial and economic evaluation having regard to possible needs for additional financial assistance for development of a unit of at least equal strength."

**Recommendations and Procedures**

The recommendations are based on the principle that the runholder must not be penalized due to accepting and completing a run plan.

A (1) In order that there be a frank disclosure of the runholder’s financial situation there be a strict provision for secrecy.

(2) The Catchment Authority must establish that the runholder can finance the proposed plan.

(3) The Catchment Authority prepare an economic report. The profitability of the proposed plan should be determined by conservative budgeting to the time when a static phase of development has been reached. The budgeted cash surplus before and after the plan has been executed should be compared. Interest on the
runholder's capital input should be included in the expenditure of the final static budget.

(4) The estimated level of indebtedness of the farmer must be calculated for each year of the proposed farm plan.

(5) The progress of the farm plan in any one year should be dictated by the availability of finance. The Catchment Authority in consultation with the runholder should adjust the plan according to changes in the availability of cash funds.

(6) Where desired the first 5-year plan may be restricted to a small pilot scheme to gain knowledge and confidence. Annual programmes of conservation works must be conservatively planned in relation to the runholder's financial resources.

(7) A balance must be maintained between the erosion control needs and works which bring in a rapid return. Those works which show the highest return should be given priority.

(8) The Catchment Authority must establish a team approach in which in particular the runholder but also the Departments of Lands and of Agriculture play a full part not only in the design of but also in the carrying out of the farm plan. Where this has not already been done procedures for teaming up with the Pastoral Lands Officers at the earliest possible stage and in the most constructive way should be implemented.

(9) The proposed plan must provide adequate time for development of offsite grazing before programming for permanent retirement or for spelling of severely eroded lands.

(10) Consideration of and provision for the control of fire, noxious animals and weeds must be made.

B (1) As soon as the L.U.C.S. Handbook now being prepared for publication is available, Land Use Capability Surveys (L.U.C.S.) by Catchment Authorities conform strictly to National standards and procedures. Particular care is necessary in determining class VIII boundaries.

(2) Procedures should be introduced for greater consultation and for report and recommendation between officers within each department at the planning and job level and at the District and Catchment Authority level similar to that operative within Lands Department.

Full attention is to be given to the following matters:

(3) (i) Methods alternative to grant fencing for retirement of Class VIII land.

(ii) Prompt payment of subsidy.

(iii) Expression of subsidies on a percentage of total cost basis, total cost to include on-cost and soil conservation fee.

(iv) More frequent and detailed assessments of stock performance and progress in respect to conservation, production and profitability.

N. C. McLLEOD
Director of Water and Soil Conservation.
Per: A. F. GREENALL.
Black Stilt on nest. The pale face and speckled forehead is quite common among Black Stilts.

THE BLACK STILT
(Himantopus novaezealandiae)
By Mrs G. Hamel, 42 Ann Street, Roslyn, Dunedin.

Over the past three years, members of the N.Z. Ornithological Society have been searching the Ohau-Omarama area for Black Stilts, a bird which seems to be rapidly approaching extinction and now ranks as one of our rarest birds.

These Black Stilts are probably the descendants of an early invasion into New Zealand of the ordinary Pied Stilt stock which has a world-wide distribution. For some reason these birds changed gradually from pied to black. More recently, we think that there has been a second invasion of Pied Stilts probably from Australia and these produced our present Pied Stilt stock.

Unfortunately Black and Pied Stilts can interbreed and seem to do so quite commonly, but we are not certain what the hybrid plumage pattern is. The matter is complicated by the
fact that young Black Stilts pass through a series of black and white stages and we are not yet certain that we can distinguish these stages from the true hybrids in the field. We are starting to colour-band Black Stilt chicks in the Ohau-Omarama area and hope that sightings of banded birds will help solve this problem.

The extinction of the pure Black Stilts may be due to two processes. Breeding back into the Pied Stilt stock may be causing them to lose their separate genetic status; or they may be losing the battle for breeding and feeding sites with the very adaptable and successful Pied Stilt. For various reasons neither explanation seems adequate, though the two together may be crucial.

We are not so optimistic as to expect that our work will save the bird from extinction, but we do hope that our information may be useful in saving other desirable rare birds. Also we realise that we may be watching evolution going into reverse. After all, the basic process of evolution is the formation of a new species and here is a bird, which was almost a proper species, apparently merging back into its parent stock—a rather unusual event.

The breeding area of the Black Stilts is rapidly shrinking, and now seems to be centred on the Mackenzie Country. The Wildlife Service, with the help of Ornithological Society members, will be doing a survey of all riverbed birds in the Upper Waitaki Catchment in October; and O.S.N.Z. members will also visit the area independently on weekends during November and December. We would like to call on as many farmers as possible while we are in the area to gather up any information they can give us about Black Stilts. If any farmer outside the Mackenzie Country has ever seen a Black Stilt on his farm we would be very glad to hear about it. As well as simple records of sightings, the sort of thing we want to know is:

—numbers of Black Stilts seen over the years at particular sites,
—anything that you have noticed about their decrease in numbers,
—when they arrive in spring and leave in autumn,
—and if you have even seen them in the breeding areas during winter.

Any information that farmers can give us will be most gratefully acknowledged.
A vivid story of island life and the hardships caused by lack of proper food was given to a Daily Times reporter last night by Messrs John and Arthur Warren who, with Messrs Harry Warren and Spence, were brought to Bluff on the steamer Tamaroa from the island, more than 400 miles south-east of New Zealand. The several syndicates and owners who held the lease employed shepherds to muster and shear their sheep. These men lived on the island for at least a year at a time, often in very primitive conditions. The last shepherds were marooned there for two years when no steamer was sent down for them.

We have been lucky to meet Mr Alex Spence of Goodwood, near Palmerston, the only one of that party still alive. Mr Spence is a quiet, now-elderly man but we think readers will understand the hardships these men put up with from his story. We are sure you will enjoy this tale of sheep farming nearly forty years ago.

"Southland Times", 4th August, 1931
I had been working on Redcliffs station for five years and since I’d come out from Scotland just after the First World War, I thought I would make the trip back to see the Edinburgh Exhibition of 1930. Then I saw an advertisement saying they wanted an extra shepherd on Campbell Island for eight months. They would pay £2/10/- a week wages plus an extra £1/10/- a hundred for shearing and 5/- a skin sealing bonus. What better chance to save a bit of money and still be back in time to go to the Exhibition? Wright, Stephensons took me on.

I was told I’d return when a steamer called some time in March (1930) but the agreement also said “or until such time as it can be arranged to bring him back.” A fellow didn’t think twice about those words at the time. We were told to have 400 wethers mustered in and ready for the steamer to pick up—and, of course, the wool.

SOUTH

I sailed south in May 1929 on the “Kotare,” a small coastal steamer of 130 tons. It wasn’t supposed to carry passengers so I was signed on as a steward. Harry Warren was with me. Harry was the brother of John Warren who with his nephew Arthur leased the island for a rent of £50 a year. Arthur, a young man about 25 years old, first went down in December 1927. Jack followed later. He was 50 but he could run like a hare. Harry was about 42 years old. He had been down before but was going back. This was his second try. He’d gone south in December 1928 in the “Eleanor Bolling”—a supply ship of the Byrd Expedition—but the weather was so bad and the visibility so poor that the captain decided it was impossible to put in.
Harry and I never got there this time either. The “Kotare” got lost even though it had three spare captains aboard for the trip, and we were out for a fortnight. Such foul weather blew up that in the end we had to turn back. The little boat nearly foundered. At one stage I remember the old cook came down with his false teeth chattering. He said, “The Captain says the boat’s sprung a leak and won’t last half an hour. Have you got a whisky?” “No,” I says, “it’s down in my gear.” The boat rose up sharp on a wave. I crashed down the ladder I was holding on to and hit my head on a stove. I woke and felt the water sloshing around me and a light bulb above me and I thought, “What the hell’s happened? I must have got drunk and fallen down in the gutter somewhere under a street lamp.” I got back to my bunk. The alarm clock fell off the shelf, hit the floor and started ringing. After a while it rolled against the wall and stopped, then it rolled and started ringing again. I took it into bed with me.

Luckily the wind eased and the seas dropped a bit and we eventually got back to Bluff.

It wasn’t until August 1929 that we finally landed on the island. We had our dogs, a year’s food and clothing and spare parts for the island’s launch. It had a broken clutch and had been laid up on the slip for thirteen months. We got it fixed in the first few days after we arrived. Then we floated it off and had a bit of an argument whether to put it back on the slip or leave it riding at anchor. We left it. During the night a proper gale blew up and when we got up in the morning there was no launch. We found her wrecked later on Kelp Point. It was a great loss—it would have saved us miles of walking to start mustering. All we had left was a dinghy and a punt like a big square box. The wool was usually stacked in this, 20 bales at a time, and the punt pulled out hand over hand along a line from the jetty to the steamer. It had pens on it, too, for sheep.

THE STATION

Well, we loaded the last season’s wool on to the steamer and it sailed off leaving us alone on the island.

Campbell Island is about 28,000 acres in size. I would say over a third of it, all the lower slopes, was covered in dense scrub, thinning out to big tussocks and Campbell Island lily as you got higher. Those snow tussocks would get up round your waist when they weren’t burnt. We burnt when we could but it was generally too wet to do much. It was just like the country in the back of the Lammerlaws and Lammermoors—peat swamps and such like.
The northern end of it was the best—it was limestone, and the few wild cattle lived there. They didn’t breed much and looked like a Shorthorn type.

It was a rough, hilly island with several rocky peaks—the highest was Mount Honey which would be a little under 2,000 feet. There were three or four others only a bit lower than this. I was told the island had been an old volcano once.

One day after we’d been there a while, Arthur and I climbed up one of them called Dumas. When we got high enough to look out to sea, away to the south-west we were surprised to see what looked like a full-rigged sailing ship. But after peering through the telescope we realised it was a huge iceberg hull down on the horizon. When we got to the top, we saw another only six or seven miles away to the north-east. And further round there was yet another, the largest of the three—it looked like Mt Cook gone for a swim. Broken ice had stacked up all along the rocks.

The main harbour was called Perseverance Inlet, after the name of the vessel that discovered the island. It was an inlet about seven miles long and at the head of it, in the fork of two arms, was our homestead and buildings.

The old weatherboard house had been built about the turn of the century as a two-room cottage, and four bedrooms were added later along the back. One of the rooms was almost full of books; I think every boat that came in had brought some. Another room was a grocery store. We had tanks for rain water and a wood-burning stove. We cut the wood for it from a sort of she-oak scrub about two miles down the inlet and we ferried it back in the punt towed by the dinghy. The rest of the buildings were another storeroom, a woolshed which could hold about 300 sheep, and a shed with a couple of tons of petrol for the launch, stacked in tins. There was also a sheep dip and yards.

There were quite a few holding paddocks around the homestead and a couple of fences to cut the island in three. We put one of them up. It was only a mile long because of the way the main inlet went right into the island.

THE SHEEP

There were about four-and-a-half thousand sheep on the island, about half of them wethers. We kept the wethers on one side of the dividing fence after we built it and the ewes on the other. But there was the best part of a thousand more wild sheep there too and the wild rams caused us a good deal of trouble. We must have had every different breed of sheep on that island. The early sheep would have been Merinos or Half-
breds but I think Romney and Lincoln and Corriedale rams had all been used at one time or another. When I was there there'd been no rams taken down for ten years. We just used to sort out the best looking ram lambs when they came in and cut the rest.

The sheep were very bad with hydatids. It was the hardest thing in the world to get a decent liver—the worst I've ever seen, and the lympho was something terrible. The big boils would break open on the flanks of the sheep. I don't think there was any active footrot but the feet used to grow like boats, though, on the peat. Without a word of a lie the feet of the wild sheep were sometimes eight inches long and they'd grown out and turned round. When you clipped their toenails and let them go it was the funniest thing you ever saw—they'd run away with their feet going right up past their ears.

We had a fairly set pattern of work for the year—at least, that is, when the weather would let us. We didn't go round the sheep at lambing. There were no horses, it was all walking, and since the ewes were separated from the wethers only in the
last year we were there, it would have been hopeless to think of lambing them. We marked most of the lambs at shearing time but the lambing percentage wasn’t very high. I’d say about thirty to forty per cent was all we’d get. The ewes were lambing practically all the year round with the wild rams, and the lambs had quite a lot of natural enemies. Although we had no wild dogs or pigs there were “sea hens”—big brown birds (skuas) that used to get down on quite a few lambs. We killed them if we could. They’d dive at you and you could hit them with a good stick.

We’d start shearing about January but the weather was so wet that you might take a cut in off the hill today, they’d get wet on the way in, and it could be three weeks before you got them shorn. Sometimes with bad weather you might start a muster and then not get back again for a week or ten days and have to straggle all the block you’d done before. It wasn’t always like that though, but I never shored a really dry sheep all the time I was there.

The rainfall wasn’t exceptionally high. It would be about 50 or 60 inches a year. But there were often sort of sudden squalls and a lot of sea fog. Sometimes you could have a beautiful clear day and then a heavy squall would come in from the sea and that would be that. We got very strong winds with these squalls but otherwise there didn’t seem to be much more wind than you’d get in the south of New Zealand itself.

The sheep were mostly good shearing—clean, soft-cutting sheep. We four did the shearing ourselves and now and again I managed over a hundred a day. We could be shearing two to three months all told—if we had a good run with the weather we got done in good time but mostly it was a long-drawn-out business.

There was a good woolpress and the last season I was there we were running short of woolpacks so we took the false bottom out of it and gave the big old packs the full length of the box. The bales were all over 4 cwt. We shored fairly heavy fleeces by the standards of those days and quite a few doubles because the year before, when we couldn’t get down, the two Warrens had been able to shear only about 900 of the 3000 or 4000 sheep on the island.

There were all kinds of wool, fine and coarse. There was a bit of cotting in the fleeces, mainly in the coarse ones, though. Most of the wool was every bit as good as New Zealand wool, if not better, but the inbred sheep—the bush sheep—had a fine, fluffy sort of wool and not much of that. There were also the ones that had got away before—some of them had their fleeces
trailing on the ground. We sometimes used to catch them on the muster if we could and "bag shear" them. We pressed about 60 bales each shearing and took out about 120 bales altogether when we finally left.

We'd turn the sheep back after shearing and muster them in again in the fall for dipping. This muster wouldn't take much more than 10 days because the lambs were bigger and we didn't have to wait for the sheep to dry this time. We used to use Robertson's powder dip, I remember. We didn't wean the lambs because there was nowhere to wean them to anyway. We'd put the rams out after the dipping but didn't go near the sheep again from then until the shearing muster.

SEALING

Most of the winter we spent sealing. The owners had the right to take 400 skins a year. We'd go down the ledges on a rope to get at the fur seals under the cliffs which were up to 800 feet high. One bluff was 100 feet straight down. We were all new chums at skinning seals and pretty slow and awkward at the job. We'd pull ourselves back up the cliffs on the ropes carrying the skins in sacks on our backs. The skins weighed only about 2-3lbs each. When we got them back we'd salt them down in barrels.

There were a lot of seals and sea lions, sea elephants and sea leopards on the island. It was nothing unusual to find a sea
elephant lying right up on the verandah of the cottage at night. We saw quite a few whales too, even in the inlet itself, and here and there around the coast there were these trypot boilers still sitting there, and the foundations of old whaling huts. At one place there was the remains of a big whaling station. We sometimes used one shed as a back hut when mustering.

On the way down we had called in at Port Ross in the Auckland Islands, though nobody lived there then. There were quite a few graves, some of them of fellows wrecked on the Adams Island. I think they had been the survivors of the wreck of the ‘Dundonald.’ We cleaned the graves—you know how superstitious sailors are, they reckoned it was their duty. There were a few graves on Campbell Island too. You have probably heard of the legend of the Scottish princess who was deliberately marooned on the island. There was a grave by the remains of an old hut that we knew as hers, with quite a bit of heather growing by it and the only flax bush on the island.

There was also another grave with an iron cross on it and an inscription reading “Remember Your Sleeping Brother.” We found two other graves too, one of them with beach stones around it, after we had burned off the tussock once. The cross had fallen down and we couldn’t tell what had been written on it.

THE LONG WAIT

As I told you we went down in August 1929 with enough food for a year. We mustered the sale wethers in for the boat in March as we’d been told to do but it didn’t come. We held the sheep in the holding paddocks; there was plenty of feed and we just shifted them from one paddock to another.

We didn’t worry to any great extent when no boat came—we always expected one to come in any day. When we’d left to go down it looked as though the Russians were going to start a fight and we thought there must have been a war on. We didn’t have a radio. So we held the sheep in until about June and then let them go. Eventually we shore two seasons there and still no boat came down to relieve us. We just carried on the same each year and took the sheep down to the jetty again next March and once more turned them out in June—June 1931 that is. What had happened was that with the slump, the price of wool had dropped so low that the stock firm didn’t reckon the wool would be worth enough to send a boat down for it. We were told later that people were writing to the papers saying the Government should send a boat for us but the Government said it was none of their business.
Before I was there, Norwegian whaling boats going south used to call and collect about 400 sheep to freeze on the way down for stores, and would call again on the way back for more. But something went wrong—perhaps they'd had some tough ones rung on to them. They never came back and that was another disappointment to us too.

Royal Albatross Chick with Arthur Warren in Background

Photo: A. Spence

SHORT OF FOOD

When the steamer didn't turn up that first March and the months went by, we realised that we'd have to start rationing ourselves. Some of our stores started to run out. I wouldn't like to say how long we were out of tinned milk and flour but it would be a good twelve months I suppose. For a while we used to grind up split peas and rice and sago with a mincer and make porridge out of it, and we baked a sort of doughboy from it too. Eventually, even with rationing, we cut out of that. We had tea and sugar right to the last and plenty of salt which we'd brought for salting skins. And of course there was the mutton. We ate it in every way it was possible to do mutton. We did our last shearing on mutton and tea alone. In fact we, had nothing much but mutton for the last eight months. We used to catch the blood and make blood puddings for a change but the livers were useless. We even ate shags. But we never killed an albatross—we were very kind to the albatross. We were rather proud of him. Our island was his main nesting ground. The other chaps tried seal meat but I didn't like it much—it was a bit like steak with a fishy taste. We used to catch rock cod in summer with a line. We couldn't grow vege-
tables—the Warrens had tried before but they didn’t grow and the rats got what did. There were rats all over the island. We did kill a couple of wild cattle though and packed the beef in the seven miles on our backs. We were told that years ago pigs were put on the island for food for castaways but they must have died out.

In spite of the lack of variety in our food we never got sick. We didn’t even get a common cold. Jack and Arthur hadn’t had a cold for 13 months before we came, but they got one off the sailors from the ship that brought us. We got soaking wet almost every day. I don’t think there was one really dry day all the time I was there. If you didn’t get wet from the sky you got wet from those Campbell Island lilies. It was like walking through a paddock of big wet turnips. I’m quite convinced now you can get a cold only off somebody else—you can’t get it yourself.

The weather wasn’t really cold and the snow never lay to any depth. The worst we had lay only about a week at the homestead just before we came off, but it wasn’t much more than three inches. It stayed on the hills longer in the winter though.

We had no accidents except once when I went to castrate a big old brush ram and it kicked and the knife went through my hand. But it got better. Jack Warren dislocated his ankle once jumping off a bank when mustering. He found himself stranded in the creek bed and us well away. So he turned his foot round and hit it with the palm of his hand and it went back in again. But his leg was black for weeks.

Luckily we had plenty of tobacco—Welcome Nugget plug and big round tins of Capstan. There was a large box of it. We didn’t have to ration ourselves for tobacco but the funny thing was we’d talked about doing just that only the night before the boat came in. We reckoned if we were going to knock off we’d have to do it gradually. We ran out of matches early on. We made our own out of brown paper and sulphur and you could strike a flint stone and steel and get a spark.

Our kerosene ran out too but we found we could make candles from tallow.

Even with things getting a bit tough at times, we got on great together. There were never any disputes or arguments. Terribly nice fellows they were.

There wasn’t a great deal of other work you could do to fill in the time when you weren’t with the sheep, but for the two years we were there we didn’t know the rest of the world
The "Tamatea" Loading Wool from the Punt

A Wild Ram in the Dip Draining Pens

existed. We always seemed to be making or patching something. Our clothes fell to bits and we just had to patch the old things up that we had. We were like scarecrows but there was nobody there to see us anyway.

It was hard on boots too, and mine broke open with the wet. In the end I had to make a pair of my own. Luckily, there was a book on bootmaking amongst all the rest and I found out how to make them from it. I used seal-hide skin for the leather and sewed them up with cobblers' wax and thread from our stores.

There were plenty of books to read, and I read books there that I'd never have thought of reading anywhere else. There was an old gramophone with records, and we wore the spots off the playing cards until they were useless. We made a scallywag set out of scraps of wood and balls pressed into shape with tar, and held competitions, too.

THE RESCUE

One day in the March when we'd been there 18 or 20 months, Jack set out for the old whaling station to get a barrel to put seal skins in. When he climbed out above the homestead, he saw seven Norwegian chasers lying in a bay in the shelter of the island. He stood and he looked at these chasers. They were right out of sight of the homestead where they were but he
thought one of them would be going round to the harbour to load our wool for sure. He could have signalled them easily with three fires. He didn’t, and when he got his barrel and climbed back to the ridge—it was a seven-mile walk—the boats were right away out on the horizon. By cripes, he was popular!

We were all out mustering on the back of Filhol Peak when the boat finally came in. It was August 1931. I think from memory it was a Sunday. We were four or five miles away from the homestead. I saw these two, Arthur and Harry, running up through the sheep and wondered what had happened. They told us a boat was on the way in. Jack and Arthur went on home and Harry and I gathered up some sheep for mutton and dog tucker and drove them back.

The steamer, the old “Tamatea,” had been out for 16 days from Invercargill and was out of tucker too! They’d expected to get some from us! They’d sheltered near the Auckland Islands from a big storm and then hadn’t been able to get bearings from the sun and had gone away south of us. They came in and landed and saw no launch (you’ll remember it was wrecked) and no dogs. They reckoned we must have tried to get back to New Zealand and foundered. But at the homestead they found the range was still warm and the clock ticking so they knew we must be somewhere about.

They took us on board and gave us a feed of what they had. About the only thing we had left was a packet of cornflour we’d kept in case someone took crook.

The weather was bad and we didn’t leave until the Thursday. The actual loading of the wool took us only two or three hours, but we also had to cart fresh water to the ship. We filled the punt three times with water and took it out to the ship’s side and they pumped it into their tanks with their own pumps. It was a terrible rough trip back. The captain said it was the worst he’d known in 37 years. It was so bad that I lost some dogs drowned and they’d been tied up high on the boat deck. It wasn’t worrying me. I was as sick as a dog myself.

When we finally got to Bluff the captain signed the crew off. But during the night he found the boat was sinking at the wharf with the pounding which the wool bales in its holds had given it. So he had to dig some of his crew out of bed and sign them on again to go back to the ship and pump it out.

The final irony was that they only got enough for their wool, in the end, to barely pay for the boat going down to get it. There was nothing left over for the Warrens or for me. I spent about three months trying to get my wages out of the stock firm
but I gave it up in the end. The old solicitor said, "It’s a blue duck, but you’ve had a holiday for nothing!"

Nothing?—450 quid it cost me and that’d be nearer £1,500 today. Well, I ask you—what would you have said?

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**TWO NEW POST-DRIVERS**

*J. G. Hughes*

In the September, 1966, issue of the Review, six post-drivers then on the market were described. Two more machines have now come to my notice.

(1) **Donald’s Post-Driver**

Made by Donald Presses Ltd., Masterton. Price $280, freight paid to nearest railway station. Linkage mounted.

The tractor p.t.o. shaft drives a twin V pulley. Slack V belts pass around this and another twin V pulley directly connected to a winch drum. A wire rope from the winch passes over the top of the column and down to a "monkey." When a hand lever forces a jockey pulley against the V-belts, tightening them over the pulleys, the winch winds in the rope and the "monkey" rises. When the jockey pulley is released the "monkey" drops and drives the post.

*Weight of "monkey"—3½cwt.*

*Drop to top of 6ft post—3ft 10in.*

*Has post guide bracket and spring steel holding strap.*

*Has cog and rack-bar rapid - levelling device and spirit-level tubes.*

*Has stainless steel rule to show post length.*

Donalds also make 32lb and 47lb tubular hand post-drivers.

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*Donald’s Post-Driver*

*Photo: J. Barton*
(2) Park Automatic Post-Driver

Made by Park Bros., Goodwood, Palmerston, Otago. Price $350 freight paid. This is the only fully automatic post-driver known to be on the market. Linkage mounted.

The tractor p.t.o. shaft rotates a pulley, and V-belts passing around it in turn drive another pulley. This pulley is fixed to a sprocket which has a roller chain passing around it, and around another sprocket mounted lower in the casing of the driver. As the chain rotates, a pin fixed to it rises and catches a lug on the “monkey.” The “monkey” rises. When the pin has reached the top of its travel it passes away over the top sprocket, and releases the “monkey” which falls and drives the post. Eventually the pin comes around the bottom sprocket and picks up the “monkey” again. The action is then repeated. The V-belt drive to the top sprocket absorbs most of the shock load.

Weight of “monkey”—2½ cwt.
Drop to top of 6ft post—about 2ft 6in.
Number of blows per minute—about 60, but variable.
One lever controls drop, or stops drive and locks “monkey.”
No post clamp—but bar supplied to true-up post while driving.
Special high “monkey” can be supplied for cattleyard posts.

McDowell Post-Drivers. These are now made by Burnett’s Motors, Ashburton.
TUSSOCK GRASSLANDS AND MOUNTAIN LANDS
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