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James Gordon GIBBS, BAgr
MAgrSc PhD, was appointed
the Director of Agriculture on
28 May 1940. He completed
his contract in 1946 and
departed with his family 26
July 1946 for New Zealand
(he was born in Wellington)
In "The Dictionary of Falklands
Biography" edited by David Tatham

R/AGR/GEN/1#1

REPORT OF THE
DEPARTMENT OF AGRICULTURE

1937 to 1946

D^r Gibbs Report
Revised, Amended & Corrected

Index.

by Governor Clifford
But NOT published

There is much of value in the Report.

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Drill
Distributors
Horse hoes and moulding ploughs
Tractors
Harvesting equipment
Ditchers
Drainage

CROPS
Cats
Harvesting cats
Wheat
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Lucerne

PART V
VEGETABLE PRODUCTION
Production of vegetable seeds
Methods used by the Department for
vegetable production
Production
Cabbages
Winter greens
Roots
Swede turnips
Carrots

It is not for Dr. G. to say so?

PART VI
SHEEP PLANTS AND EXPERIMENTAL FORESTRY
Early attempts at afforestation

It is not for Dr. G. to say this

PART VII
RURAL ECONOMY
Living conditions
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PART VIII
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Efforts to carry out innovations
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Proposed legislation
Encourage private enterprise
Concerning the improvement of the present
industries
Concerning the Common
Recommendations concerning industries new
to the Colony

PART IX
MATERIAL COLLECTED
Index to appendices

P R E F A C E

Omit?

When considering this report I should like the reader to ^{Appreciate} ~~recall~~ that in 1940, when I arrived in the Colony, there was less than two acres of ploughed land within reasonable distance of Stanley, and this was infested with spurrey. Neither my foreman, nor any of my labourers mostly men with Camp experience had even seen a ploughed furrow, and ~~there were~~ ^{no horses} ~~which were~~ ^{accustomed} to arable work ^{were} available to me. Ploughing was such an ⁿ ~~innovation~~ that a number of townspeople would stroll out to inspect the first areas that were ploughed; and there was a strong belief that cultivated land would disappear as a cloud of dust borne on the wind. Since then much fundamental ground has been broken, not without many, at one time serious but now amusing contre-temps. The spade work has been well begun but much remains to ~~be done.~~

I venture to think that a considerable improvement in the prosperity of the Colony is possible if some of the leads which have appeared as a result of this work are followed up and applied, ^{difficulties there may be in applying them but} ~~But they represent~~ ideas and practices new to the Colony, and as such must meet with a depeccatory criticism, especially from an industry notorious for its conservative obstinacy. It is well known that human nature prefers first to throw stones at those who provide advanced ideas, even though those same ideas become eventually incorporated in everyday life, and the Department of Agriculture has not escaped such treatment. I would adjure the landowners to consider this and to consider also, how ~~conclusions as are here presented may be applied with profit, for~~ where the will is ~~sufficiently strong~~ the means will be found; ~~or in the words of Mr. Churchill "Do not argue the problem. Get on with the job. The difficulties will argue for themselves."~~

I must ^{record} ~~also give~~ here my deep appreciation of the assistance afforded by His Excellency, Sir Alan Cardinal, ^{KBE. CMG.} Governor of the Colony both in providing ~~funds~~ ^{for} for the prosecution of the work and his deep interest in the work of the Department. Without such interest and support, this work would have been impossible. Acknowledge ^{ment} ~~is~~ ^{also}.

When considering this report I should like the reader to recall that in 1940, when I arrived in the Colony, there was less than two acres of ploughed land within reasonable distance of Stanley, and this was infested with spruce. Neither my foreman, nor any of my labourers locally men with Camp experience had even seen a ploughed furrow, and there were no horses which were available to me. Ploughing was such an innovation that a number of townpeople would stroll out to inspect the first areas that were ploughed, and there was a strong belief that cultivated land would disappear as a cloud of dust borne on the wind. Since then much fundamental ground has been broken up with the aid of one's services but now remaining to the spade work has been well begun but much remains to be done.

Then why say it

The data are highly irrelevant and the tipping is lamentable.

I venture to think that a considerable improvement in the prosperity of the Colony is possible if some of the leads which have appeared as a result of this work are followed up and applied. I must meet present ideas and practices new to the Colony, and as such must meet with a desecratory criticism, especially from an industry notorious for its conservative obstinacy. It is well known that human nature prefers first to throw stones at those who provide advanced ideas, even though those same ideas become eventually incorporated in everyday life and the Department of Agriculture has not escaped such treatment. I would advise the landowners to consider this and to consider also, how conclusions as are here presented may be applied with profit, for where the will is sufficiently strong the means will be found; or in the words of Mr. Churchill "Do not argue the problem. Get on with the job. The difficulties will arise for themselves."

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made of the assistance afforded by the heads and staffs of Government Departments, and of the collaboration usually provided by the Manager and staff of the Falkland Islands' Co. whenever special facilities have been requested; also the hospitality of the managers and the interest of the navvies and shepherds in the work of the Department.

It goes without saying that the work could not have proceeded without the interest and application of my staff, especially during the past nineteen months, during which I have been without qualified assistance, and during which additional responsibilities have been willingly shouldered by the senior men of the out-door staff, without ^{extra} remuneration.

Finally I acknowledge gratefully the help given by Mrs. D. Niddite, Ph.D. who abstracted the Meteorological data cited in the Appendix and who typed many of the Appendices.

DEPARTMENT OF AGRICULTURE

STAFF.

The Department of Agriculture was established in 1937 under the direction of Mr. D.S.A. Weir. The functions of the Department as described by Mr. Weir were:-

- (i) Investigation and control of diseases of animals.
- (ii) Inspection of livestock, meat, slaughter-houses and town dairies.
- (iii) Animal husbandry and advice to stock owners.
- (iv) Instruction on wool growing.
- (v) Administration of the Livestock Quarantine Station.
- (vi) The registration of livestock brands, slaughter-houses and dairies.
- (vii) Agricultural instructions embracing advice in grassland management, top dressing, ensilage making, farm crops etc
- (viii) The fostering of farmers' organizations which would meet periodically and confer with officers of the Department in connection with general improvements of farming; with possibly the information of boys' and girls' or young farmers' agricultural clubs.

In other words this may be summarised as the administration of such ordinances and regulations as relate to agricultural matters, ^{and} the accumulation and distribution within the Colony of useful information on agricultural subjects, in the widest sense of that phrase. This would involve the collection of statistics; the acquisition of a library and technical equipment; the introduction and testing of new varieties and types of plants; the prosecution of practical and fundamental experiments designed to improve stock, forage plants, soil conditions and soil fertility; the study of methods of preparing primary products for market with a view to their modification and improvements; and the distribution of information obtained on these and similar matters by publication, broadcast lectures and practical demonstrations to the people of the Colony.

Mr. Weir, who was the first administrator ^{tra} of the Department left the Colony on the completion of his term of office in February 1940. He was succeeded by Dr. J.G.Gibbs, who arrived in the Colony during May 1940. Since then the staff has been as follows:-

Director.	J.G.Gibbs, Ph.D., M.Ag. Sc., Dip.Agr.
Stock Inspector. (Vacant since 1942)	Vacant. (T.Beaty B.Sc., (Agr.), 1939-42
Agricultural Officer. (Vacant since 1945)	" (T.Beaty B. Sc., (Agr.), 1942-45 resigned 1945).
Government House Gardener, acting as part-time horticulturalist.	H. R. Evans (Kew Certificate).
Common Ranger.	B.Fleuret.
Chief Clerk.	E. E. Enestrom.
Assistant Clerk.	Alva E. Carter.*
Foreman.	J. B. Browning.
Foreman mechanic.	C. Jennings.
Dairyman.	W. Binnie.
Meteorological Observers †	E. Harvey.
" " (jnr.)	J. Newing.

† Since transferred to Meteorological Station
 (* The present holder of the position).

The position of Stock Inspector is to be filled, if possible, by a qualified Veterinary Officer capable of conducting research into animal diseases, and the position will then be designated as Veterinary Officer.

FINANCE.

A statement of the Expenditure and Revenue of the Department is given under various subheads year by year from 1937 to 1945 inclusive, in Appendix I and II. The tables are compiled from the actual revenue and expenditure for each year excepting 1945, for which the Crown Agents accounts are not yet to hand. Consequently, it has been necessary to estimate the expenditure for this year; but the discrepancy between the actual figures and the estimated should not be great. ^{Table I} ~~From the tables~~

It ^{will} ~~may~~ be seen that the total expenditure by the Department since 1937 amounted to £62,638 and the gross receipts collected through the Department to £11,853. ~~See Table I.~~

During the period ^{new} under review the Department has been under the direction of Mr. D.S.A. Weir (1937-39 inclusive) and Dr. J.G. Gibbs (1940-45 inclusive). The expenditure under the different administrations may be analysed separately and this is done in Table I.

It must be remembered that between 1937 and 1939 there was an unemployment problem in Stanley. This latter made it difficult for my predecessor to purchase agricultural implements, since it was the policy of the Government to give employment. Consequently, during the first three years expenditure on labour and establishment subheads was high, while that on experimental work was relatively low. Since the outbreak of war there has been a scarcity of labour in Stanley, and the need to produce vegetables and milk. Consequently, since milk production involved also the production of hay and other supplementary fodders, the expenditure on implements, fertilizers, seeds, fodder etc. has increased considerably, and ^{so} also has the revenue of the Department.

The ^{average} annual expenditure on labour since 1940 has been less than half that for the previous three years, while the expenditure under services

has increased. Under 'services' are grouped those items of expenditure which are of general benefit to the community as a whole though unnecessary for carrying out the work of the Department, for example, ^{Destruction} ~~Diminution~~ of Birds of Prey, Prevention of Animal Disease, Compensation to Stock Owners, Dairy and Vegetable Scheme Guarantees, Upkeep of Government House Gardens, Purchase of Agricultural Produce for ~~Resale~~, and ~~the~~ expenditure on the Stock and Horticultural Show in 1939.

New items of expenditure since 1940 include Dairy and Vegetables Scheme Guarantees and Bonus (production). (fill out)

The first of these was introduced to enable the Department to purchase hay from camp stations for sale in Stanley at not more than £9 per ton. To increase the quantity of hay, growers were encouraged to buy lime in Stanley at cost price and the Government ^{paying} ~~paid~~ freight to their ^{nearest} ~~port~~, ^{this latter concession} ~~The freight was paid from this subhead and served the dual purpose of introducing lime to the camp and of increasing the quantity of hay.~~

The Bonus (production) is distributed among those directly responsible for milking and distributing the milk. The total bonus amounted to 10% of the gross annual revenue from milk, and has provided the recipients with a strong interest in their work. It is, I believe, one of the most economic ^{items of} ~~expenditures~~ in the Government ^{budget.} ~~services~~ ^{commitments.}

In Appendix II is given the Revenue by subheads for each year from 1937 to 1945. Prior to 1940 the main sources of Revenue collected by the Department were from licencing the grazing of animals on Stanley Common, from the cutting of tussac ^{together with} ~~and~~ a small amount from the Poundage of stray animals.*

^{Prior to}
 (* ~~Before~~ 1940 the Department's books did not indicate the subhead to which revenue was credited).

has increased. Under 'services' are grouped these items of an...
which are of general benefit to the community as a whole through an...
necessary for carrying out the work of the Department, for example,
distinction of birds of prey, prevention of animal disease, compensation
to stock farmers, dairy and vegetable scheme, purchase of
Government House Gardens, purchase of Agricultural Progress for disease,
and the expenditure on the stock and horticultural show in 1933.
new items of expenditure since 1930 include dairy and vegetable
scheme guarantees and bonus (production).

The first of these was introduced to enable the Department to pur-
chase hay from camp stations for sale in Stanley at not more than 20
per ton. To increase the quantity of hay, farmers were encouraged to
buy time in Stanley at cost price and the Government paid freight to
their point. The freight was paid from this subsidy and saved the con-
sumers of introducing time to the camp and of increasing the quantity
of hay.

The bonus (production) is distributed among those directly respon-
sible for raising and distributing the milk. The total bonus amounts
to 10% of the gross annual revenue from milk, and has provided the re-
sidents with a strong interest in their work. It is, I believe, one
of the most economic expenditures in the Government expenditure
budget.

In Appendix II is given the Revenue by subsidy for each year from

1927 to 1932. It will be seen that the amount of subsidy collected by
the Department was not sufficient for the raising of animals in Stanley
to the War Dept. was not a proper activity of
Government; neither is Dairy farming!

(Reference to the Department's books did not indicate the
subsidy to which revenue was credited.)

The Financial position may be summarized as follows:-

TABLE I

	PERIOD		
	1937-39. 3 years.	1940-45. 6 years.	1937-45. 9 years.
	£	£	£
Gross Expenditure.	21,356.	41,282.	62,638.
Average gross Expenditure per annum.	7,118.	6,888.	6,960.
Gross Receipts.	495.	11,358.	11,853.
Average gross receipts per annum.	165.	1,892.	1,317.
Total nett Expenditure for period.	20,861.	29,924.	50,785.
Average nett Expenditure per annum.	6,954.	4,987.	5,643.
Less in each year contribution from land sales fund.	1,000.	1,000.	1,000.
Nett Expenditure of tax-payers money.	5,953.	3,987.	4,642.
Proceeds from tax on wool for period.	24,182.	50,409.	74,591.
Average annual proceeds from wool tax.	8,061.	8,402.	8,288.
Nett Expenditure of tax payers money as percentage of wool tax.	74%.	47%.	57%.

The revenue of the Department has increased rapidly since 1940. The increase is attributable in large part to the Sale of Vegetable and Dairy Produce and to the ^{2/3} Resale of ~~Purchased~~ Agricultural Produce.

This last item consists of the revenue from agricultural produce that ^{after the departure of the} ~~is~~ purchased from private growers and sold to the Garrison. ^{represent} ~~consists~~ of the revenue from sale of cattle fodders distributed at cost price to the registered dairies. It was felt that the purchase of stock fodders ^{assisting them} for distribution at cost was a more economic form of ~~subsidy~~ than paying of ~~of~~.

The financial position may be summarized as follows:-

TABLE I

PERIOD

1937-45.
9 years.

1940-45.
6 years.

1937-39.
3 years.

He repeats this claim



62,638.

41,282.

21,356.

Gross Expenditure.

6,960.

6,888.

7,118.

Average Gross Expenditure per annum.

11,823.

11,358.

132.

Gross Receipts.

1,317.

1,892.

163.

Average Gross Receipts per annum.

50,785.

23,924.

20,661.

Total net expenditure for period.

5,613.

1,827.

6,924.

Average net expenditure per annum.

1,000.

1,000.

1,000.

Loss in each year contribution from land sales fund.

4,613.

2,927.

2,923.

Net expenditure of tax-payers money.

74,291.

50,402.

24,182.

Proceeds from tax on wool for period.

8,288.

8,402.

8,661.

Average annual proceeds from wool tax.

57.

17.

74.

Net expenditure of tax-payers money as percentage of wool tax.

The revenue of the department has increased rapidly since 1940. The

increase is attributable in large part to the sale of vegetable and dairy produce and to the resale of Government Agricultural produce.

This last item consists of the revenue from agricultural produce that is purchased from private growers and sold to the Garrison. *Often the origin of the latter is* It consists of the revenue from sale of cattle feeders distributed at cost price to the registered dairies. It was felt that the purchase of stock feeders for distribution at cost was a more economic form of subsidy than paying of

a direct subsidy. The method was approved by the main supplier of imported fodder for cattle, whose firm has consistently encouraged local enterprise.

~~It may be noticed also in this table that the development of a productive dairy-herd is a slow operation ^{when} as compared with the production of vegetables. The revenue from this herd should not rise greatly hereafter, because further increase in production is likely to interfere with the sales of the local registered dairies. (Since July 1944, milk has been ^{imported} wholesaled from the Government Dairy to a registered retailer^d at twopence halfpenny per pint. ~~The local prices for retail milk is fourpence per pint.~~)~~

~~This~~ Table (I) shows that the Revenue produced by the Department of Agriculture has materially reduced the real ^e expenditure of public funds. During the past six years the Department has cost the farming community only 47% of the amount paid by the industry in direct taxation. And during this period it has acquired a mass ^{of} information concerning agricultural techniques and practices, so that it is now in a position to advise, with reasonable assurance, on the economics and practicality ^{bi} of improved methods in agriculture.

SERVICES PROVIDED BY THE DEPARTMENT.

Stock Returns. According to the 1944-45 returns the grand total of sheep in the Colony is 619,449 as against 627,779 during the previous year. The loss is due, largely, to a lower percentage of lambs marked, ^{owing} due to unfavourable weather and ^a relatively ^{seven} hard winter.

The total breeding ewes number ^d 221,496 and other ewes ^{ed} 63,360. ~~The~~ lambs marked number ^{ed} 139,764 being 63.26% of the number of ewes put to the rams in 1944. Of these some 12,558 died (possibly ⁵⁰⁰ were used for human consumption) before dipping, representing 9% of the lambs marked, a loss which is not uncommon, but which is usually doubled by the time the lambs are shorn as hoggets. It seems probable that the death rate of lambs between birth and marking is not less than 20%.

imported fodder for cattle, whose King has consistently encouraged local enterprises. The method was approved by the main supplier of a direct subsidy.

~~It may be noticed also in this table that the development of a productive dairy-herd is a slow operation as compared with the production of vegetables. The revenue from this part should not rise greatly hereafter, because further increases in production is likely to interfere with the sales of the local registered dairies. (Since July 1944, milk has been obtained from the Government Dairy to registers at a rate of two pence per pint. The local price for retail milk is therefore 10 pence per pint.)~~

Table (1) shows that the revenue received by the Government of Agriculture has actually reduced the real expenditure of public funds. During the past six years the Department has covered its running costs only 65% of the amount paid by the industry in direct taxation and during this period it has been in a position to make contributions to agricultural research and practice, as stated in the position to advise with reasonable assurance, on the economic and productivity of improved methods in agriculture.

Long disputes this

mc

REVENUE RECEIVED BY THE DEPARTMENT

Stock raising. According to the 1944-45 returns the grand total of sheep in the colony is 612,449 as against 627,719 during the previous year. The loss is due, largely, to a lower percentage of lambs born, due to unfavourable weather and relatively hard winter. The total breeding ewes number 327,450 and other ewes 285,250. The lambs marked number 12,764 being 52.1% of the number of ewes put to the pens in 1944. Of these some 12,250 died (possibly some used for human consumption) before dipping, representing 96% of the lambs marked, a loss which is not unexpected, but which is usually doubtfully the time the lambs are shorn as suggested. It seems probable that the death rate of lambs between birth and weaning is not less than 50%.

Such heavy losses would justify some research, for if the cause is found to be due to malnutrition many of those which survive must also be set back by it. Undoubtedly, an appreciable part is due to animals becoming trapped in ditches, but if animals were better fed there would be less ^{the} loss attributable to unseasonal weather.

Wethers and rams ^{amounted to} ~~total~~ 199,558 and 7,829 respectively. There has been a trend to increase the proportion of wethers since 1935 which now number some 20,000 more than during that year.

The surplus sheep killed during the year were returned as 45,693 while including lambs, since marking, some 79,782 sheep are unaccounted for during the year and presumably died in the camp. Of these, 28,022 or 35.1% were less than fourteen months old at the time of ~~their~~ death. Between marking and shearing ~~the~~ annual loss over the past five years has averaged 19.67% though there are farms where it is probably ^{as low as from} ~~about~~ 3% to 5%. The surplus sheep, mainly aged, ~~and~~ would not normally make good mutton, so that under the present organization of the industry the only real chance of establishing a frozen meat industry would lie in reducing the mortality of young sheep and increasing the numbers of breeding ewes.

The amount of wool clipped during the 1944-45 season was estimated at 4,613,047 pounds.

Agricultural Statistics.

The forms for the stock returns were re-drafted in 1940-41 to obtain basic information concerning the amount of land which had been improved since the Colonization of the Islands. This will afford a means of measuring progress. According to the returns received the area ploughed since the land was taken up during the last quarter of 19th. century was given as ninety-two acres and the area in English grasses amounted to 485 acres of which only 46 acres contained established clovers. These acreages were the totals of some thirteen farms. Of the seventeen returns which showed nil, or blank returns, three are known to have areas which have been culti-

... heavy losses would justify some research, for it is the cause is
found to be due to malnutrition many of those which survive may also
be set back by it. Undoubtedly, an appreciable part is due to
animals becoming trapped in ditches, but in animals were better fed
there would be less loss attributable to seasonal weather.

There has been a trend to increase the proportion of wethers since 1955
which now number some 20,000 more than during that year.
The surplus sheep killed during the year were returned as 15,000
with including lambs since marketing some 13,700 sheep are accounted
for during the year and presumably died in the same. Of these,
12,000 or 13,000 were less than fourteen months old at the time of
death. Between marketing and shearing the annual loss over the past
five years has averaged 15.0% though there are farms where it is pro-
bably about 20 to 25%. The surplus sheep, mainly aged, would not
normally make goodutton, so that under the present organization of
the industry the only real chance of establishing a frozen meat in-
dustry would arise in reducing the mortality of young sheep and increas-
ing the numbers of breeding ewes.

The amount of wool clipped during the 1951-52 season was estimated
at 1,000,000 lbs. Modify }
Agricultural Statistics. The losses for the stock returns were re-
ported in 1950-51 to other basic information concerning the amount of
land which had been grazed since the colonization of the islands.
This will afford a means of measuring progress. According to the
returns received the area grazed since the land was taken up during
the last quarter of 19th century was given as ninety-two acres and
the area in English grasses amounted to 100 acres of which only 40
acres contained established clovers. These figures were the totals
of some 100 farms of the vegetation returns which showed all
or blank returns, there are known to have areas which have been culti-

1849 → D.M.R.

vated and which we have estimated at 680 acres. On these farms unploughed land carrying English ^{grasses} ~~pasturages~~ is estimated at 608 acres.

Thus the total improved pasturage in 1941 was approximately, ploughed ground 772 acres, land carrying English grasses 1,093 acres, of which 450 were predominantly Yorkshire fog. Approximately 300 acres would be carrying white clover the majority being at Port Howard.

Since 1941 approximately 16,700 pounds of grass seeds have been imported, ~~and 6,710 pounds are on order.~~

The area of improved land, about Stanley under control of the Department has been doubled since 1940 to approximately 205 acres; ^{increase representing} ~~the additional areas being~~ ^{both} ploughed land sown to oats, hay, swedes and pasture grasses; or sand areas which have been sown to ~~English~~ pasture grasses and clovers. In addition, clover and fertilizers have been sown by the strip method (~~page 79~~) over some 60 acres of Common or neighbouring ^{urban} lands.

Though most managers have filled in the ^{stock} ~~Agricultural~~ returns conscientiously, ^{neglected that} a few have ~~ignored~~ the part of the form dealing with agricultural development, and the publication of the returns would ^{thus} give an erroneous impression. ^{managers} They have been handicapped by ^{shortage} ~~lack~~ of labour and the difficulty of obtaining implements and materials during the war, ^{years} but with one or two exceptions ^{is shown as yet} they have ~~shown~~ little interest in methods of improving ~~their~~ pasturage, or in the provision of ^{winter} ~~better~~ fodder for the winter. ~~[In fact, there are two or three who go to some trouble to avoid visiting experimental areas about Stanley, on which the Department has established clover and crops successfully.]~~

Stanley Common. The origin of the Common rights to the land about the township of Stanley ^{has} ~~have~~ not been traced, and appears to have been unknown even in the early nineties, but ^{is} probably ^e ~~drived~~ from the rights associated with the allotments made to ~~the~~ Chelsea pensioners in 1839. The Common land was fenced from the township in 1893; and in ^{the following year} ~~1894~~, 73

... and which we have estimated at 100 acres. ...
... is estimated at 500 acres.

Thus the total improved pasture in 1901 was approximately 1,000 acres, of which
about 750 acres, land carrying English grasses, 1,000 acres, of which
approximately 500 acres would be
carrying white clover, the majority being at Fort Lenoir.

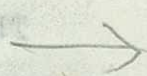
Since 1901 approximately 10,000 pounds of grass seeds have been
imported at a cost of \$1,000.

The area of improved land, about Stanley under control of the
Department has been doubled since 1900 to approximately 2,000 acres; this
additional area has been planted with English grass, Swedish and
purple prairie clover and areas which have been sown to
grass and clover. In addition, clover and fertilizers have been
sown by the strip method over some 50 acres at Fort Lenoir or
neighbouring stations.

The area now has been filled in the ...
... have been ...
... and the difficulty of obtaining ...
... but with one or two exceptions ...
... of improving ...
... avoid visiting experimental areas about Stanley, in which the Department
has established clover and purple prairie clover.

The origin of the Common rights to the land about
the township of Stanley have not been traced, and appears to have been
unknown even in the early nineties, but probably derived from the rights
associated with the allotments made to the Chinese pensioners in 1850.
The Common land was fenced from the township in 1891 and in
the following year.

K.I.V. for new A.O.



the following year

horses and 40 cows and calves ^{were} ~~are~~ recorded as being grazed thereon. It is now administered by the Department of Agriculture under the Trespass Ordinance of 1904, and the rules made in 1909, 1911 ^{and} 1941. In normal times the Common Ranger makes regular inspection tours and notifies owners concerning illness or accident to their animals. He is also responsible for checking the payment of licences and for impounding animals which stray into the township. ~~At present, owing to the shortage of staff he has undertaken part of the duties of the Stock Inspector.~~

The Common, was, Prior to 1924, divided into two sections by a fence from behind Government House to the corner of Mullet Creek Farm. A second subdivision fence was added in 1927 from the east end of the township to Eliza Cove thus dividing the Common into three sections, the middle one being for milking-cows. The Eliza Cove fence was replaced, ~~and~~ a new one added to the west of Sapper's Hill and the southern boundary fence, renewed in 1939. About the same ~~time that~~ ^{the} Mullet Creek ^{fence} was removed and a new fence from Murray Heights to Rookery Bay ~~Point~~ was erected. ~~The western boundary fence erected in 1906 is now in need of renewal.~~

These subdivision fences have enabled the grazing of the pasturage to be controlled ~~and have enabled~~ ^{so that} sections ~~to~~ ^{could be} reserved for ~~use~~ ^{grazing.} during the winter. ~~Though there was some opposition to them at first,~~ ^{advantages of this division are} the ~~benefit that has accrued~~ ^{was at first unaccounted} is now appreciated by most of the stock owners.

Animals are licenced to graze on payment of a fee of five shillings per head per half year, ^{with} heifers under two years ^{at half this} ~~half~~ price and calves under one year of age free.

The Gazette references might be omitted - in fact the whole table wh. has too many gaps in it

It is said that the Common is much improved. Underline →

TABLE II

Animals Grazed on Stanley Common.

		Horses.	Cattle.	Total.
1894.	(Gaz. 43/25/10/94).	73.	24. 40	97. 113
1909.	(Gaz. 9/1/9/09).	37.	99.	136.
1910.	(Gaz. 2/1/2/10).	22.	72.	94.
1911.	(Gaz. 2/1/2/11).	29.	119.	149.
1912.	(Gaz. 2/1/2/12).	32.	104.	135.
1913.	(Gaz. pp. 12, 26, 27, 42).	38.	118.	156.
1917.	(Gaz. 6; 1/6/17).			152.
1918.	(Gaz. 3; 1/3/18).			196.
1919.	(Gaz. 3; 1/3/19).			216.
1920.	(Gaz. 2; 2/2/20).			206.
1921.	(Gaz. 2; 1/2/21).			221.
1924.	(Gaz. 15; 1/12/24).	60.	159.	219.
1941.	(An. Report. Gaz. 16; 1/12/41).	92.	120.	212.
1942.	(Stock Insp. Report Unpublshd.).	100.	140.	240.
1943.	- " -	105.	125.	240.
1944.	- " -	100.	150.	250.
1945.		92 166.	166 92.	258.

Early in 1937 the Department commenced cleaning/making drains on the Common. During the next two years some 28 miles of ditching were completed. These were mainly primary leads that followed the fall of the ground, and they intercept little of the water that moves down the slopes parallel with them. The main channels were opened and cleaned at a cost of approximately ninepence per yard, and the subsidiary ditches cost ^{an} ~~on the average~~ ^{of one point three pence} ~~3d.~~ per yard. Since the acquisition of the mechanical ditcher in 1942, approximately four miles of lateral ditches have been excavated across the fall of the land, and debouch into the existing ditches. The opening of these latter has brought about a considerable improvement within twelve months. The overall cost, including allowances for depreciation on machinery and for the ^{manual} necessary hand labour in joining up ditches has not exceeded one third of a penny ^{per} yard.

During my predecessor's administration probably half a ton of Yorkshire fog seed was sown on different sections of the Common. This has become established on the weathered debris removed in constructing ditches and roads and on some of the tracks through diddle-dee patches. The seed was

virtually wasted where it was broadcast on natural white grass pastures.

Since 1940 approximately eighty-eight acres have been enclosed on different parts of the Common for experimental purposes and the production of hay for use in the town. ~~[In addition, an area of probably twenty acres was enclosed for naval defensive purposes.]~~

To improve the quality of grazing on the Common, strips of clover were sown with fertilizer on the native pasture during February 1945; the first results from this are very promising. Approximately thirty acres have been treated in this way, but the total area of this treatment about Stanley amounts to more than sixty acres, some of ^{it} ~~which is on suburban land~~ ^{under} ~~leased by Mr. Bender.~~

The Trespass Ordinance provides a penalty for negligence in closing gates on or leading to the Common. ~~[At certain times of the year, when peat is being carted, there is a tendency to leave gates open. It was necessary to prosecute two offenders during the autumn of 1944, and since then no trouble has been experienced.]~~

Destruction
Diminution of Birds of Prey. In 1908 at the request of the majority of farmers provision was made to subsidise the destruction of turkey buzzards, corachos and other birds which were becoming a pest in certain localities. Some of these birds are accused of 'hazing' sheep until they become exhausted, when they prey on them. All pick the eyes and tongue from cast sheep. On account of the reported rarity of johnny rooks, payment for their beaks was discontinued in 1931. When the Department was established, the administration of this subsidy, amounting to sixpence per beak, was placed with the Department. Since 1937, 17,120 beaks have been purchased by the Department at a cost of £428 from the land owners who pay one shilling per beak obtained on their farms.

Destruction
Diminution of Geese. In 1905 the administration made provision to subsidize the reduction of upland geese which were stated to be consumed in great quantities of grass to the detriment of the sheep, by purchasing

limited number of beaks annually (100,000) at ten shillings per hundred. This practice was discontinued ~~by the Government~~ temporarily about 1914 and finally on 27th. December 1924, but land owners continue to purchase goose-beaks at ten shillings per hundred from their employees. There can be no doubt that geese consume a large amount of the young and sweeter grasses, and they are particularly troublesome and destructive on newly sown pastures. On the other hand, their droppings must have a high manurial value. Whether their depredations on native pastures are greater than the benefit they bring is ~~a very debatable point,~~ ^{has yet to be decided.} and ~~one which has not yet been demonstrated satisfactorily.~~

Distribution of Vegetable Seeds for Colonial Requirements. During the autumn of 1942 advice was received from the Colonial Office that Britain would be unable to supply vegetable seeds required by the Colony. Consequently, during this and subsequent years the Department imported, in bulk, the vegetable seeds required by residents (approximately two hundred pounds) packeted them, and arranged for their distribution through the normal commercial channels.

At the outset, in June 1942 all the vegetable seeds in store in Stanley were purchased. The original packets were divided into nine. This seed was supplemented by surplus stock from the Department and, to a small extent, by seeds supplied by the Garrison as part of the terms of their contract for vegetables to be supplied during ^{the} 1942-43 season. Residents co-operated and reduced their purchase to a minimum, using as far as possible seeds left over from previous seasons. Through this, sufficient seed was available to meet all requirements, even though the bulk order placed in the United States ^{was mis-carried} ~~was mis-directed~~ and failed to arrive until mid-summer.

^{Compelled them to buy} ~~Through buying~~ in the United States ^{the Dept. was} ~~we have been~~ unable to obtain the varieties which are known to be suitable for local conditions. The cabbages in particular ^{were} ~~have been~~ inferior to those obtained in previous years from Great Britain, and the American lettuces, though crisp and palatable, ^{a gave} ~~were~~ of much lower yield.

Each year the equivalent of some 13,000 small threepenny packets have been distributed within the Colony. ^{These} They covered some seventeen types of vegetables in nine of which there were usually two or more varieties available.

~~In each year the germination of the seeds was tested before they were distributed.~~ ^{and there were few complaints.} ~~No serious complaints have been received concerning the seeds and except for one or two cases where special packets were made up hurriedly for a private order, mislabelling of seeds has been avoided. This is more of a feat than would appear on the surface, because seed was packeted by inexperienced workers who had not handled seeds previously.~~

~~We understand that most vegetable seeds are again exportable from the United Kingdom and that, in consequence, the local retailers will be able to secure their stock through normal channels. However, should such seed be unobtainable, there is in the Department sufficient seed of high germination for the 1946-47 season's requirements.~~

Purchase of Pasture Seeds in Bulk. ^{similarly,} Owing to the difficulty of obtaining pasture seeds during the war the Department purchased the quantities required by the Stations in bulk and arranged for their distribution. This method ^{was} ~~has been~~ of considerable advantage to the purchasers because only good quality and persistent strains of seeds ^{were} ~~have been~~ ordered. There can be no room for dissatisfaction through dying out of the white clover, red clover or ryegrass because the strain ~~is~~ ^{not} naturally short lived. ~~as might occur if the strains were specified when ordering.~~

The total orders since 1940, including the Departments ^{own} requirements for experimental use, have amounted ^{to} ~~almost~~ 17,000 lbs. ^{most of which} ~~which~~ have been placed in New Zealand.

Purchase of Agricultural Produce for Resale. When the Garrison arrived in June 1942 an appeal was made to owners of gardens or plots to make a special effort to grow more vegetables, potatoes and rhubarb.

The Government guaranteed to purchase all sound vegetables and rhubarb at the prevailing price (June 1942), no matter how great the quantity produced.

To stimulate the production of vegetables a schedule of prices was ^{designed} ~~established~~ ~~in which the scale for~~ ~~out-of-season production.~~ ^{increased price was offered to encourage} Hitherto, vegetables, other than early potatoes, had always been sold in Stanley at twopence per pound, regardless of type or season; and there was little attempt to provide green vegetables during the winter or spring.

SCHEDULE.

Month	Lettuce.	Cabbage.	C.flower.	Turnip.	Swede.	Savoy.	Green.	Potatoes.	Rhubarb
Jan. Jan	2½d. - 2d.	2d.	2½d.	2d.				(now) 4d.	4d.
Feb. Feb	2d.	2d.	2d.	2d.				3d. & 4d.	4d.
March Mar	2d.	2d.	2d.	2d.				2d.	4d.
April Apr	2d.	2d.	2d.	2d.				2d.	4d.
May. May	2½d.	2d.	2d.	2d.	2d.		2d.	2d.	
June. June	4d.	2d.	3d.	2d.	2d.	3d.	2d.	2d.	
July. July		3d.	4d.		2d.	3d.	3d.	2d.	
Aug. Aug		3d.	4d.		2d.	3d.	2d.	2d.	
Sept. Sept		3½d.	4d.		2d.		2d.	(old) 2½d.	4d.
Oct. Oct	4d.	3½d.	4d.		2d.		2d.	2½d.	4d.
Nov. Nov	4d.	3d.	3d.				2d.	2½d.	4d.
Dec. Dec	4d. & 3d.	2½d.	3d.				2d.	2½d.	4d.

A special subhead was made in the estimate for 1943 to enable the Department to purchase these vegetables. During 1943, £474 was spent on this project, £248 in 1944, and a similar amount in 1945. There was some loss due, in part, to a surplus of swedes which could not be disposed of, and during 1943 to losses occasioned by the fact that the contract price agreed upon with the Garrison had not included, allowance for freight of vegetables from ports within the Colony. Heavy loss was experienced in potatoes during storage during 1945.

The following quantities of vegetables were purchased from the public

The Government Department to purchase all kinds of vegetables and fruits at the prevailing price (June 1953), to supply the quantity produced.

To stimulate the production of vegetables and fruits a schedule of prices was established in which the minimum price was fixed for each item. It is always sold in quantity of two dozen per month, regardless of the type of season; and there was little attempt to provide green vegetables during the winter or spring.

Item	Unit	Price	Quantity	Value
Tomatoes	kg	1.50	200	300.00
Carrots	kg	1.00	150	150.00
Onions	kg	0.80	100	80.00
Beans	kg	1.20	80	96.00
Cucumbers	kg	0.60	120	72.00
Peas	kg	1.10	70	77.00
Spinach	kg	0.90	90	81.00
Green Beans	kg	1.30	60	78.00
Peas	kg	1.00	100	100.00
Onions	kg	0.80	120	96.00
Carrots	kg	1.00	80	80.00
Tomatoes	kg	1.50	60	90.00
Beans	kg	1.20	50	60.00
Cucumbers	kg	0.60	100	60.00
Peas	kg	1.10	40	44.00
Spinach	kg	0.90	50	45.00
Green Beans	kg	1.30	30	39.00
Peas	kg	1.00	70	70.00
Onions	kg	0.80	80	64.00
Carrots	kg	1.00	60	60.00
Tomatoes	kg	1.50	40	60.00
Beans	kg	1.20	30	36.00
Cucumbers	kg	0.60	60	36.00
Peas	kg	1.10	20	22.00
Spinach	kg	0.90	20	18.00
Green Beans	kg	1.30	10	13.00
Peas	kg	1.00	40	40.00
Onions	kg	0.80	50	40.00
Carrots	kg	1.00	30	30.00
Tomatoes	kg	1.50	20	30.00
Beans	kg	1.20	10	12.00
Cucumbers	kg	0.60	20	12.00
Peas	kg	1.10	10	11.00
Spinach	kg	0.90	10	9.00
Green Beans	kg	1.30	5	6.50

*Dumpp cherris
(Mm. with ...)*

Special interest was made in the estimate for 1953 to enable the Department to purchase these vegetables. During 1953, 1954 and 1955 on this project, 1953 in 1954, and a similar amount in 1955. There was some loss due to the fact that the quantity of produce which could not be disposed of, and during 1953 to 1954 was included in the fact that the total value stated was with the Government but not included, although the weight of vegetables from ports within the domain. Heavy loss was experienced in purchase during 1953 and 1954.

The following quantities of vegetables were purchased from the market:

<u>Year.</u>	<u>quantity (lbs.)</u>
1941-42.	9,911
1942-43.	58,007
1943-44.	23,130
1944-45.	26,220
	<u>117,268</u>

Sale of Fodder to Dairies. In June 1943 the Department was approached by local dairymen who requested the privilege of purchasing their imported animal foodstuffs from the Government stores as a method of reducing operational costs, and of enabling them to produce milk without increasing its price. This request was made with the knowledge and consent of the merchant from whom supplies were ^{normally} ~~usually~~ purchased.

This merchant has consistently encouraged dairying and was prepared to forego ^{his profits} ~~this trade~~, if by so doing, milk could be produced economically for the ~~local~~ townspeople. The project was ^{approved} ~~favourably received~~ by the Governor who authorised the sale of such supplies as were needed by the registered dairies, without the additional 20% premium usually added to the invoiced price of Government stores.

Between June 1943 and December 1945, 2,906 bags of pollard, linseed cake, maize meal and bran were supplied from the Government stores to the two registered dairies in Stanley and the price of milk has been held at fourpence per pint until the present time.

Prices of fodder have increased considerably since January 1946, (due to world shortage, and droughts in Argentina) and some further methods of subsidizing the industry will be necessary unless the price of milk is to be raised. The following table indicates the movements of prices between 1940 and 1956.

TABLE III

Prices per Bag of Fodder c.i.f. ex Jetty Stanley
(Include Government Rebate on Freight)

<u>Year.</u>	<u>Oats.</u>	<u>Bran.</u>	<u>Pollard.</u>	<u>Maize meal</u>	<u>Linseed cake</u>	<u>Hay per cwt.</u>
1940.	6. 2½d.	3. 9½d.	4. 5½d.	12. 3d.*	5. 6½d.	9. --.
1943.	11. 4d.	5. 7½d.	6. 5½d.	10. 7d.	10. 1d.	9. --.
1946.	16. 1d.	9. 11d.	10. 3d.	16. --d.	14. 10d.	9. --.

(* Crushed maize.)

Sale of Fertilizers. When it became necessary to increase the production of vegetables and hay, the public were advised concerning the use of artificial fertilizer. Hitherto, only whale guano had been available in small quantities but in 1941, there ~~was~~ ^{were found} ~~in store~~ ^{at} in Stanley, several tons of basic slag which had been held for ~~several~~ ^{some} years without finding a market. The quantity was quite in-sufficient to supply ~~the~~ estimated requirements, and as the local merchants were not prepared to stock fertilizers the Department imported what was necessary from Montevideo. Since 1940, three hundred and thirty four tons of lime (ground carbonate); forty-four tons of superphosphate; thirteen and a half tons of nitrate of potash and seven tons ^{of} nitrate of soda have been imported by the Department. Some thirty nine tons of the lime went to camp stations at cost price, freight from Stanley ^{being met} ~~paid~~ by the Department, with the object of increasing the yield of oaten hay so that surplus hay would be available in Stanley. As a result of this special effort by certain camp managers, some fifty-one tons of hay were purchased from the camp between 1942 and 1944. ~~inclusive.~~ ~~A further ten tons offered to the Department could not be lifted through the lack of transport.~~ Since 1944, sufficient hay has been produced about Stanley for local requirements and the need to purchase from the camp no longer exists.

TABLE IV

Sale of Fertilizers to the Public.
(In hundredweight bags)

6

Year.	Lime.	Superphosphate.	Nitrate of -	
			Potash.	Soda.
1940.	58 (58)	-	-	-
1941.	255 (38)	-	-	½
1942.	268 (28)	-	-	-
1943.	555 (110)	29 (9)	-	1½
1944.	506 (86)	13 (13)	1½	-
1945.	27 (27)	15 (15)	4½	-
Used by Department 1940-45.	3968	810	172	123
Balance in hand.	1043	13	92	15
Total Importation.	6680 (347)	880 (37)	270	140

(The figures in brackets signify the number of bags sold within the township of Stanley).

Tussac for Stock. When considerable labour was available, between 1937 and 1939 ^{certain} ~~some~~ coastal areas from Rookery Bay to Cape Pembroke Peninsular were fenced and planted with native tussac (Poa flabellata). Some of these plantations have become well established; others, particularly that on the black ground on the Peninsular, have failed completely.

During 1940-42 tussac was cut on ^{the} better plantations and sold to townspeople for use as cattle or horse fodder. Since then, through the provision of hay by the Department, the problem of winter feeding has been eased. The plantations have been used as winter grazing for animals on the Common especially during periods when ^{the} ground is frozen or ~~covered with snow.~~ ^{covered.}

During 1941 two cutters which brought tussac from the islands in Port William and Berkeley Sound became unserviceable and the supply of tussac from islands ceased. This placed the dairies and carters in a very serious position, and the Department being unable to stimulate local enterprise to fill the gap, was authorised to charter the schooner, Porvenir with the object of maintaining the supply of tussac. In this way an average of 450 bundles per week were made available between 1st. October 1941 and April 1942. The weekly expenditure on wages and hire of the vessel amounted to £11.2.6. The arrangement cost £279.16.6 and produced a Revenue of £273.11.6. leaving a deficit of £6.6.-.

Requisition of Dairy. The Department has endeavoured consistently to stimulate milk production by private enterprise. When, in 1943 a family squabble brought the production of one dairy to a standstill without warning, it meant the loss of about one third of the milk then being supplied in the town. The owner could not be persuaded to carry on even temporarily. Quick action became necessary before the cows suffered. Consequently, the animals, milking equipment and dairy were requisitioned under emergency war-time legislation and run by the Government for approximately a month until a buyer could be found.

Treatment of ^sick ^animals in Stanley.

The Department is freely called on by residents in Stanley to attend to any animals that become sick. Usually from fifty to sixty cases occur during the course of the year necessitating one or more visits. The chief troubles are due to wounds, bruises, alimentary disorders and occasionally to conditions caused by deficiencies of minerals. Infectious diseases are uncommon and occur chiefly in cats (distemper) and poultry ^{which} suffer from most ailments to which they are heir³. This service is supplied free of charge by the Department.

Extension and Educational Activities.

Oral advice has been given by officers of the Department to farmers and kitchen gardeners as requested. A monthly Agricultural News Sheet (cyclostyled) was commenced in September 1941, but owing to the pressure of war-time work was allowed to lapse. From time to time cyclostyled pamphlets have been issued on matters of moment e.g. vegetable production, animal diseases, production of vegetable seeds, soil analyses etc.

The Director of Agriculture and the Government House Gardener ^{commenced} ~~have made~~ monthly broadcasts on Agricultural and Horticultural matters ⁱⁿ ~~since~~ July 1945. Through these means some of the work and findings of the Department have been spread among the public.

In October 1939 the Department collaborated with the Education Department ^{in arranging} ~~and arranged~~ for the Government House Gardener to supervise and instruct school children on ^{their own} ~~school~~ vegetable plots. Each plot was worked by two boys from the senior classes and the opportunity was taken to instruct them in cultural operations, planting, succession of vegetables and the use of fertilizers. In 1942 at the request of the Education Department the Department of Agriculture provided an instructor in course work; and regular weekly classes were conducted until the end of 1944, when the departure, on leave, of the Agricultural Officer threw extra work on the staff. ~~The courses are being continued by the Education Department with the assistance of notes supplied by the Department.~~

No longer relevant

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Meteorological Records. The Department is responsible for taking the civil Meteorological records which are sent to the Meteorological Office in Britain. When the Royal Naval established a Meteorological Office in Stanley it was housed in the Agricultural Department, and until its equipment arrived, used the instruments in the civil station. Two local men have been seconded to the Naval Station for training, and one has made the forecasts during the temporary absence of the Forecasting Officer. Since the secondment of these officers the Government records are taken simultaneously with these from the Naval Station and from the same instruments. The Station has been moved twice since 1940, both occasions on advice of the Naval Officers in Charge. The process of co-ordinating the readings from the last and the present site of the Station is being undertaken at present. The present Station is situated on Murray Heights near Look Out Rocks and is very well equipped.

In the Appendix III to VIII is given in tabular form the averages of the meteorological observations taken between 1895 and 1943 inclusive, and also the monthly averages of observations made during the period 1941-45. From these it is apparent that the winter of 1942 was very mild, but September was cold and the spring was backward until December, during which the average of the maximum daily air temperatures was some 7°F above the forty-nine year mean. The following year, 1943, was on the average about two degrees above the long term mean. The winters 1944 and 1945 were slightly colder than the average, and during both, the ground was frozen for about seven and ten days in succession respectively, which caused a set-back to stock. In addition 1945 was exceptionally wet (31.617 inches) and followed a December during which the rainfall was 1.8 inches in excess of normal. The recorded direct sunlight during the first half of the year was low, and considerable trouble was experienced in saving hay. Several stations were compelled to leave parts of their crops unharvested. The year 1945 brought further troubles for though the temperatures that were recorded during November were about the average, unseasonal snow lay on the ground every morning for the first twelve days, and the winds, being continually from a southerly direction, were laden with sleet and hail. This seems to have caused rather heavy losses in young sheep.

Soil Temperatures, rainfall etc

Soil temperatures were kept from July 1942 to July 1944 when the thermometers became broken. ~~Replacements were received broken and so far have not been replaced.~~ The readings, which are tabulated here under, were taken at 9 a.m. local time, and ^{one} probably approximately the minimum for each day. They appear to be, in general, 4°F to 5°F below the mean monthly maximum air temperature during the period when temperatures are falling, and 6°F to 7°F below these when the temperatures are rising.

TABLE V

SOIL TEMPERATURES FROM JULY 1942 TO
JUNE 1944.

(Taken in consolidated cultivated soil)

Month.	Four Inches.		Eight Inches.	
	<u>1942</u>	<u>1943</u>	<u>1942</u>	<u>1943</u>
July.	37.4	37.5	36.8	39.1
August.	38.6	37.0	37.4	38.0
September.	37.3	37.7	39.1	39.0
October.	41.0	42.5	42.1	44.2
November.	44.3	44.5	45.0	47.0
December.	51.3	48.0	52.7	50.0
	<u>1943</u>	<u>1944</u>	<u>1943</u>	<u>1944</u>
January.	49.0	47.3	51.0	50.2
February.	49.0	47.0	50.0	50.0
March.	49.0	48.4	50.0	50.6
April.	44.0	43.3	46.8	45.5
May.	40.3	40.5	41.8	42.0
June.	38.5	37.0	40.1	35.0

Frosts of 20°F have been recorded at Stanley on two occasions since 1940, and June or July are usually the coldest months. December re-

ceives the heaviest rainfall and is correspondingly low in recorded direct sunlight, while precipitation is least during September, October and November. In general, the monthly rainfall has been within 1.2 inches of the monthly mean since the beginning of 1941, and during the sixty months under review has exceeded this variation on only seven occasions, the greatest being in April, 1941 when the rainfall was 140% above the forty nine year mean. (inc. since 1895 when records were first kept)

Frosts rarely occur in Stanley between 10th. November and the beginning of May, though they may occur in some parts of the Colony at Christmas and early in April.

Such records as have been taken by Station Managers indicate that West Falkland receives about half the rainfall that is recorded in Stanley. The climate on the north west of West Falkland is warmer and the growing season longer than that of Stanley, for the buds of Willows and Poplars at Hill Cove burst at least three weeks before those of the same species growing in Stanley.

in
Wind/the Falklands is persistent and ~~not~~ trying, but though it is colder I do not think it more severe than is experienced during the summer and autumn in Canterbury, New Zealand. There, however, wind-breaks of pines give shelter to stock and man. In this Colony, the absence of shelter, other than that afforded by the topography makes the force of the winds more noticeable. Certain trees become windswept in appearance, particularly Beech and Hawthorne, but there is little evidence of broken branches due to high winds, and structural damage is quite insufficient to prevent the growth of suitable varieties of trees. ^{I contend that it is not the wind which} ~~The wind does not prevent~~ the growth of trees in the Colony, ^{despite what} ~~as~~ has been stated in early reports ^{on} ~~concerning~~ the Islands.

Plant growth is almost imperceptible in Stanley until the beginning of October, when grass begins to grow. Vegetables and seedlings make very little growth until the beginning of December and most growth occurs during January, February and March, though crops (swedes and kale and pastures containing certain English grasses) may continue a slow growth

...the heaviest rainfall and is correspondingly low in recorded
direct sunlight, while precipitation is least during September, October
and November. In general, the monthly rainfall has been within 1.5
inches of the monthly mean since the beginning of 1941, and during the
sixty months under review has exceeded this variation on only seven oc-
casions, the greatest being in April, 1941 when the rainfall was 100%
above the forty nine year mean.

Frosts rarely occur in January between 10th November and the begin-
ning of May, though they may occur in some parts of the Colony at
Christmas and early in April.

Such records as have been taken by Station Managers indicate that
West Falkland receives about half the rainfall that is recorded in
Stanley. The climate on the north west of West Falkland is warmer and
the growing season longer than that of Stanley, for the beds of Willows
and Poplars at Hill Cove burst at least three weeks before those of the

Transplant problem altogether too tricky. M.C.

in the Falklands is persistent and ~~trying~~, but though it
is colder I do not think it is so bad as the weather in
summer and autumn in Canterbury, New Zealand. There, however, wind

This is surely not a Departmental liability? M.C.

breaks of gales give shelter to stock and man. In this Colony, the
absence of shelter, other than that afforded by the topography makes the
force of the winds more noticeable. Certain trees become windwept in

appearance, particularly Beach and Hawthorn, but there is little evi-
dence of broken branches due to high winds and structural damage is
quite insignificant (to prevent the growth of suitable varieties of trees.

It is not the wind which prevents the growth of trees in the Colony. It has been stated in early reports concerning the islands.

Plant growth is almost imperceptible in Stanley until the beginning
of October, when grass begins to grow. Vegetables and seedlings make
very little growth until the beginning of December and most growth occurs
during January, February and March, though crops (seeds and pots and
greenhouses containing certain English Grasses) may continue slow growth

until mid-May or later. But the season is short and experimental results accumulate but slowly.

Owing to the low rainfall during the spring small seeds must be sown either late September while the ground is wet, or early in December, which latter is preferable for pasture seeds. ~~Our experience does not, at present extend to sowing conditions as experienced in other parts of the Colony.~~

POLICY OF THE DEPARTMENT.

I COWS.

1. Milk production for Stanley.

- (a) Milk 60 cows during the winter (including ^{those owned by} Registered Dairies)
- (b) Fodder required: hay 130 tons approximately 65 acres.
Swedes required: 250 tons, approximately 16 acres.
Imported fodders required: 28½ tons.

II POTATOES.

- ##### 1. Develop a line of potatoes suitable for certification for export as seed to South American ports.

III VEGETABLES.

- ##### 1. About 20 to 25 tons required annually, and ~~15 tons potatoes for Naval establishment.~~

IV GRASS AND PASTURE.

1. Develop areas for production of grass seeds.

- (a) White clover.
- (b) Suckling clover.
- (c) Crested dogstail.
- (d) Red fescue.
- (e) Brown top.
- (f) Meadow foxtail.

2. Develop area of 200-300 acres of good pastures for use of local dairies.

3. Experimental.

- (a) Economic methods of establishing pastures.
- (b) Manurial treatment of.
- (c) Management and rotational grazing of native pastures.
- (d) Drainage, (methods and results).

Mem. To ask Henderson re local manufacture of
'Dumlop' cheeses. *bc*

NB
~~Travelling companies to check round expansion
in the Camp; local men from ad overseas~~

We could possibly do something in this way when the
Settlement Schools are established, obtaining suitable films
from U.K (16 mm). *MC*

V STOCK.

1. Production of milk for local requirements.
2. Feeding and improvement of ~~milk producing animals.~~ *cattle*
- ~~3.~~ *4* Establishment of Pedigree flocks of Romney Marsh, and Corriedale breeds.
- ~~4.~~ *5* Instructions in wool classing and presentation ^{of} clip.
- ~~5.~~ *3* To make the Colony ultimately independent of imported dairy products.

added

6. *Survey of animal diseases with special emphasis on internal parasites.*

VI DEVELOPMENT OF INSTRUCTIONAL SERVICE IN FIELD.

1. News sheet.
2. Demonstration plots.
3. ~~Portable cine projectors etc. etc.~~ *Instructional Films.*
4. Broadcasts ^{talks} on local radio service.

VII PROVISION OF TUSSAC OR OTHER FODDER FOR TOWN.VIII EXPERIMENTS ON CROPS AND VARIETIES OF THESE.

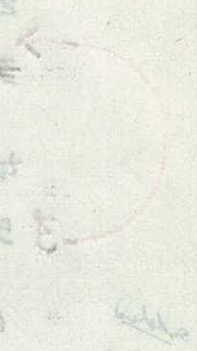
1. Oats - for hay, green fodder and seed production.
2. Wheat - for fowl food.
3. Legumes and oats in combination for fodder.
4. Rates of seeding of oats and turnips.
5. Fertilization of above crops.
6. Distances apart crops should be sown.
7. Dates of sowing.
8. Influence of minor elements.
9. Study of weed seeds in crop seeds.

IX CULTIVATION OF SOIL.

1. Economics of different methods.
2. Consolidation by stock "crushing".
3. Consolidation and breaking of turf by stock through feeding of crops (hay and turnips).

STOCK V

1. Production of milk for local requirements.
2. Feeding and improvement of milk producing animals.
3. Establishment of pedigree flocks of Romney Marsh, and Cornish Game Hens.
4. Instructions in wool classing and presentation ^{of} clip.
5. To make the colony ultimately independent of imported dairy products.



Transfer of normal disease with special emphasis on influenza

DEVELOPMENT OF INSTRUCTIONAL SERVICE IN FIELD VI

1. News sheet.
2. Demonstration plots.
3. ~~Workshops and projects etc. etc.~~
4. ~~Progressive on local radio service.~~

REVISION OF LITERATURE ON OTHER TOPICS FOR THE TIME BEING VII

This seems very ambitious to the uninitiated reader and will provoke deep belly laughs. MC.

REVISION OF LITERATURE ON OTHER TOPICS FOR THE TIME BEING VIII

1. Oats - for hay, Green fodder and seed production.
2. Wheat - for fowl food.
3. Legumes and oats in combination for fodder.
4. Rates of seeding of oats and turnips.
5. Fertilization of above crops.
6. Distances apart crops should be sown.

The ones recently imported for the Department were both expensive and poor quality. Study of weed seeds in crop seeds. MC.

CULTIVATION OF SOIL IX

1. Economics of different methods.
2. Consolidation by stock "crushing".
3. Consolidation and breaking of turf by stock through feeding of crops (hay and turnips).

4. Uses of different implements and the order of their uses.
 Roto-tiller, Swamp plough, Disc plough, Board, Roller,
 Ditchers (of two or three types), Lime distributors,
 Seed drills, Mowers, Subsoilers, Cultivators, Harrows,
~~Disc plough~~, Ordinary plough, Horse versus Tractor.

X INSPECTION SERVICES.

1. Animal quarantine.
2. Seed analysis and inspection.
3. Fodder inspection.
4. Meat and Milk inspection.
5. T.B. testing of animals.
6. Lice and stock inspection.

XI AFFORESTATION.

1. Collecting and testing different species of trees and shrubs,
 and methods of establishing them in Islands,
 (a) For shelter.
 (b) ~~For timber, fencing posts, etc.~~

TO ASSIST

XII SUBSIDIES / ON DEVELOPMENT OF: -

1. Meat industry.
2. Potato industry.
3. Small fruit industry (out of season for S. America).
4. Weaving and home spuns.
5. Grass seed production.
6. Importation of Pedigree (but not necessarily expensive-)
 rams and ewes.
7. Pasture improvement (through reduced freights on materials).

4. Uses of different implements and the order of their uses.
Hoe-tiller, Sward plough, Disc plough, Board Roller,
Discs (of two or three types), Lime Distributors,
Seed drills, Mowers, Subsoilers, Cultivators, Harrows,
Disc plough, Ordinary plough, Horse versus tractor.

SECTION SERVICES X

- 1. Animal quarantine.
- 2. Seed analysis and inspection.
- 3. Fodder inspection.
- 4. Meat and milk inspection.
- 5. T.B. testing of animals.
- 6. Lice and stock inspection.

What is the reason for this decline of 25%?

APPRECIATION XI

- 1. Collecting and testing different species of trees and shrubs, and methods of establishing them in islands.
- (a) For shelter.
- (b) For timber, fencing posts, etc.

SUBSIDIES OR DEVALUATION OF XII

- 1. Meat industry.
- 2. Potato industry.
- 3. Shell fruit industry (out of season for S. America).
- 4. Weaving and home spins.
- 5. Grass seed production.
- 6. Importation of pedigree (but not necessarily expensive) rams and ewes.
- 7. Pasture improvement (through reduced freight on materials).

Looks as though we did not import from S. America
of Dinosauric Mc.

PART IIS T O C KEARLY HISTORY.

Bougainville introduced cattle, sheep and horses in 1764 and others were brought by later settlers. In 1846 there were approximately 60,000 wild cattle, 3,000 wild horses and probably less than 100 sheep in the Colony. Sheep farming was developed after 1870 in which year the cattle numbered about 13,000. The sheep population rose from 64,000 in that year to 807,000 in 1898. Since then they have diminished to 601,000 in 1939. The present number is approximately 620,000.

The sheep industry was controlled through the Sheep Ordinance of 1870, which was combined with the Scab Ordinance of 1895 and various amendments to form the Live Stock Ordinance of 1901 under which the industry is at present regulated. This Ordinance deals exclusively with sheep and certain specified ecto-parasites. Provision was made for the compulsory annual dipping of sheep ⁱⁿ 1907 with the object of preventing the spread of lice. Several farmers failing to realise the advantages to be gained by compulsory dipping, petitioned against the Amending Ordinance. Only in that it authorises the proclamation of regulations concerning quarantine of horses and other animals on their importation, does the Live Stock Ordinance affect other stock. Nevertheless, it has served its purpose well.

It was through the Scab Ordinance of 1895 that sheep farming was placed on a sound footing. The first requirements in the eradication of scab were the registration of ear marks so that sheep could be identified, and the erection of boundary fences to prevent infected sheep from wandering at large over another property. (Boundary fences were not recognised as permanent improvements on crown lease-holds until 1897).

Scab re-appeared again in 1924 following the importation of some thirty rams from Australia, transhipped in Montevideo, but was eradicated within a few months. A second short lived out-break occurred on Beaver Island in 1928 after ewes had been imported from Tierra del Fuego.

The predominating breeds are Romney and Corriedales though there has been a smattering of Merino, Cheviot and Lincoln. The wool clip was stated to average $8\frac{1}{2}$ pounds, 9 pounds and $8\frac{1}{2}$ pounds per head respectively for 1905, 1908 and 1909. For the past three years it has averaged approximately 7.8 pounds per head, but the wool is now much finer.

The maximum production was in 1918-19 when 4,860,000 pounds were exported, representing 8.60 pounds per head, and the minimum in 1929-30 3,730,000 pounds representing 6.92 pounds per head - the lowest since 1903. The average yield of wool for the ten year periods 1916-17 to 1925-26 and 1926-27 to 1935-36 was 7.83 pounds and 7.24 pounds respectively.

During 1905 and for several years ^{there} after fairly large numbers of sheep were exported to South America for breeding purposes. The greatest number appears to have been 39,003 in 1914.

Two meat canning factories were opened during the autumn of 1911 and ^{disposed of some} ~~canned~~ ^{carcases} 30,000 ~~sheep~~. In 1913 the Darwin factory canned 1,000 head of cattle for the first time in ^{the} history of the Colony. The factory at Port San Carlos closed down after the 1912 season owing to the uncertainty of export. Ten shillings was paid during 1914-15 for wethers and seven shillings and threepence for ewes. ~~No beef was canned.~~ The number of sheep ^{canned} ~~rose~~ ^{year by year} ~~annually~~ during the ~~years~~ of the first world war until 1917-18 when the tally was 61,181; the average price paid per sheep being ten shillings and three-pence halfpenny. Forty two thousand were canned the following year at an average ^{price} ~~return~~ ~~to the farmer~~ of ten shillings and tenpence threefarthings per head, ^{the following year although} ~~but~~ ^{for that} only 24,832 were canned in ~~1919-20~~. ^{rose to} ~~was~~ eleven shillings and one penny per head. The losses which were sustained by the Company during this season caused the plant to be closed down and the industry has ^{since} ~~not~~ been resumed.

From 1936-37 until 1938-39 from 26,000 and 32,000 surplus sheep were exported annually to Chile for freezing. The conditions of ~~tran~~

The predominant breeds are Romney and Dorset, though there has been a smattering of Merino, Cheviot and Lincoln. The wool clip was stated to average 25 pounds, 2 pounds and 3 pounds per head respectively for 1902, 1903 and 1904. For the past three years it has averaged approximately 7.8 pounds per head, but the wool is now much finer.

The maximum production was in 1918-19 when 4,800,000 pounds were exported, representing 8.50 pounds per head, and the minimum in 1920-21, 1,750,000 pounds representing 6.92 pounds per head - the lowest since 1902. ^{How are the skins cured? When are they sold?} The average yield for the period 1918-19 to 1925-26 was 7.17 pounds and 7.38 pounds respectively.

During 1902 and for several years thereafter fairly large numbers of sheep were exported to South America for breeding purposes. The greatest number of cars to have been 12,000 in 1914.

Could not the 'soup' be utilized and used?

The most curing factories were opened during the autumn of 1911 and covered 20,000 sheep. ^{factories} In 1913 the Derrin factory covered 1,000 head of cattle for the first time in history of the colony.

Factory at West Hill closed down after the 1912 season owing to the uncertainty of export. Ten shillings per head during 1912-13 and six shillings and seven pence during 1913-14. ^{year for year} The number of sheep rose ~~from 1912 to 1913~~ during the year of the first world war until 1917-18 when the tally was 61,184; the average price paid per sheep being ten shillings and three pence half penny.

Forty two thousand were canned the following year at an average price of the former of ten shillings and six pence three-quarters per head. ^{But following year although} Only 24,825 were canned in ~~the~~ ^{the} season. ^{for that} The price paid ~~was~~ ^{was} seven shillings and one penny per head. The losses which were sustained by the company during this season caused the price to be close down and the industry has not been resumed.

From 1926-27 until 1930-31 there were 25,000 sheep and 20,000 were exported annually to Chile for tanning. The conditions of

transport have not been good and the nett return to the exporters averaged between three and six shillings perhead. This method of disposing of surplus stock has not been available during the war, through lack of shipping.

The average lambing between 1901 and 1909 has been reported as 71.9% ranging between 70% and 77% with the exception of 1902 when it dropped to 55%. The average lambing from 1911 to 1916 was 66.8%, from 1934 to 1940 ^{it was} 65% and from 1940 to 1945 ^{was to} 66.67%.

At present surplus sheep are killed for their skins or rendered down for tallow. In the former case the carcasses are often spread on the oat field where they attract large numbers of gulls. The ground is greatly enriched by the droppings of the gulls and the manurial value of the carcasses is evenly distributed by them; more evenly ^{indeed} than when portions of ~~the carcasses~~ are buried under the furrow. When the carcasses are rendered for tallow considerable loss results, for the soup is allowed to run to waste and only the solids are spread on the ground.

On one or two stations the stud flock consist of pure bred ewes, and on several the lambing percentages rise high enough to enable culling of the flock ewes to be practised. These stations show ~~the~~ results in the uniformity of the stock, in the better quality of the wool and in ^a the higher ^{wool} production per animal. But too many sheep ^{show} exhibit too much ^{great a} diversity of type, constitution and wool to be impressive. On some camps the young sheep are poorly grown and are ^{also} small for their age.

With four or five exceptions the sheep on the different stations consist of a mixture with little uniformity in type of animal or quality of the wool. This is largely the result of importing pure bred rams, which are mated with selected flock ewes to form the stud flock. From time to time another breed has been introduced to produce vigour, or to fine up the wool etc. There has been little opportunity to cull since the low lambing percentages and high mortality of young sheep during the first twelve months, leaves only sufficient maiden ewes for replacement of the breeding flocks. The result is that almost all gimmers in

transport have not been good and the net return to the exporters averaged between three and six shillings per head. The method of disposing of surplus stock has not been available during the war, through

Some very good animals have been impaled usually by Farmers M.C.

The average lambing between 1904 and 1909 has been reported as 74.9% ranging between 70% and 77% with the exception of 1902 when it dropped to 55%. The average lambing from 1911 to 1916 was 66.6% from 1924 to 1930 65% and from 1931 to 1935 66.6%.

At present surplus sheep are killed for their skins or rendered down for tallow. In the former case the carcasses are often spread on the flat where they attract large numbers of flies. The ground is greatly enriched by the droppings of the flies and the manure value of the carcasses is evenly distributed by them; more evenly than when portions of the carcasses are buried under the tallow. When the carcasses are rendered for tallow considerable loss results for the body is allowed to run to waste and only the solids are spread on the ground.

On one or two stations the stud flock consist of pure bred ewes, and on several the lambing percentages are high enough to enable a study of the flock ewes to be practised. These stations show the results in the uniformity of the stock in the latter quality of the wool and in the higher production per animal. But too many sheep exhibit too much diversity of type, constitution and wool to be representative. On some farms the young sheep poorly grown and generally sex their age.

With four or five exceptions the sheep on the different stations consist of a mixture with little uniformity in type of animal or quality of the wool. This is largely the result of importing pure bred rams, which are mated with selected flock ewes to form the stud flock. From time to time another breed has been introduced to produce vigour, or to line up the wool etc. There has been little opportunity to cul since the low lambing percentages and high mortality of young sheep during the first twelve months, leaves only sufficient material for replacement of the breeding flocks. The result is that almost all flocks

cluding those which are backward in development are of necessity put out for breeding.

~~Attempts have been made recently to import pure bred Romney and Corriedale ewes, as foundations of stud flocks but the venture has been hindered through shipping difficulties.~~

~~It is encouraging to know that special paddocks of English grasses are being prepared for these sheep.~~

Unless pure bred ewes are available it would seem to be a waste of money to import high priced Pedigree rams for use with ewes of mixed breeding, especially when one considers the time that must elapse before the influence of individual sires can be observed in flocks numbering 20,000 or more. Where pure bred ewes are not kept it would be ~~more economic~~ ^{Sounder economy} to import large numbers of good flock rams of a uniform type. By this method the type and strain would be introduced to the flock very much more rapidly. Culling is a very important part of breeding. During this operation all the aberrant types are discarded from the breeding flocks and the retention of sheep of a uniform type with good frame and well-wooled will eventually produce a flock that is a credit to the breeder.

Breeding ewes constitute about 36% of the total sheep in the Colony. During the past ten years the death rate between marking and dipping, and dipping and shearing of hoggets has ~~slowly but continually~~ ^{steadily} increased. The result is that, on the average, only sufficient lambs are produced to maintain the flocks at their present levels.

The death rate in young stock has varied during the past ten years from 20% to certain camps to less than 3% on others.

DISEASES OF STOCK.

Stock in the Colony usually appear to be very healthy. Whether this is actually a fact or whether it is due to lack of knowledge con-

cluding those which are backward in development are of necessity put out for breeding.

Attempts have been made recently to import pure bred Romney and Corriedale ewes, as foundations of stud flocks but the venture has been hindered through shipping difficulties.

It is encouraging to know that special packages of English grasses are being prepared for these sheep.

Already stated on p 25

Unless pure bred ewes are available it would seem to be a waste of money to import high priced pedigree rams for use with ewes of mixed breeding, especially when one considers the time that must elapse before the influence of individual sires can be observed in flocks numbering 20,000 or more. There pure bred ewes are not kept it would be more economic to import large numbers of good flock rams of a uniform type. By this method the type and strain would be introduced to the flock very much more rapidly. Culling is a very important part of breeding. During this operation all the spurious types are discarded from the breeding flocks and the retention of sheep of a uniform type with good frame and well worked will eventually produce a flock that is a credit to the breeder.

What do S.O.A. say about this? If correct the

... would be considerable. There should be no difficulty about quarantine. ... dipping, and shearing of hoggets has already been mentioned but continually increased. The result is that, on the average, only sufficient lambs are produced to maintain the flocks at their present levels.

The death rate in young stock has varied during the past ten years from 20% to certain camps to less than 5% on others.

DISEASES OF STOCK.

Stock in the Colony usually appear to be very healthy. Whether this is actually a fact or whether it is due to lack of knowledge con-

cerning symptomatology and diagnosis remains to be seen. Undoubtedly, stock suffer considerably through lack of suitable fodder during the later winter.

SHEEP.

Sheep have at times suffered from scab (Psoroptes scabies); lice (Trichodectes sphaerophalus); and keds (Melophagus ovinus).

Scab. Scab was eradicated within five years after the Scab Ordinance was passed in 1895 and the Colony was free from the disease from May 1900. Some forty orders were promulgated which placed the whole or part of eighteen properties in quarantine for varying periods. In only one case was it necessary to take action in a court for failure to comply with the terms of the Ordinance. = Fresh outbreaks occurred in 1924 and 1928 following the importation of sheep from South America, but ~~was~~^{were} eradicated within a few months.

Lice. Sheep were reported to be free from ecto-parasites in 1908, but lice were not eradicated finally until 1939 when the last of five stations which had been quarantined between 1931 and 1935 was released.

Keds. Keds are still prevalent, but could be eradicated very readily by concerted action on the part of the sheep owners. If this parasite were eradicated the need to dip annually would ~~not~~^{no longer} arise, and, provided the quarantine of imported animals were efficiently maintained, the cost and labour of dipping could be eliminated. (This has been proved at Estancia Fenton in the Magallanes Province of Chile).

Malignant Oedema (blood poisoning). This was recorded in 1910 as serious on certain farms following lamb markings. The trouble was greatly reduced when practices advised by the Stock Inspector were adopted (1912).

Comment is made by Weir in an unpublished report concerning the manner in which lamb marking is carried out in the same yards year after year without serious losses. It is probable that losses from this

This is the popular theory - a lot get lost on the
beaches too; go out to feed on the Kelp at low tide and
then get washed away. Inadequate shepherding.

Dean suggested to me that the proper ratio of shepherd to
sheep is 1:5,000 which appears to me to be nonsense
in such wild country. 1:1500 or a most 2000 and

losses would be greatly reduced? But where are the men to
be got?
MC

cause are greater than is realised, for the death rate has been reduced since bloodless forms of castration have been introduced from an average of 13% to 8.3% over three different farms. The loss of lambs between marking and dipping has averaged 10.3% during the past five years and the range has extended from 3% to 20% on different camps over the past ten years. There is no specific knowledge concerning the cause of these losses. Possibly half the loss may be attributed to lambs ~~becoming stuck~~^{foundering} in natural ditches.

Pulpy Kidney. This disease was recorded by Weir as causing the death of 'a fair number of lambs' on Pebble Island in 1936, (unpublished report 24th. November 1936).

Piners. There is considerable loss of piner hoggets. The disease was described by Weir in 1936, as follows:

"Healthy young sheep are put out to pasture, and when they are gathered at various periods of the year a certain percentage, in some instances higher than 10%, are so weak they can hardly walk.

"They will, however, live indefinitely in this condition. There is no scouring nor internal parasite infection, at least of any consequence. The ground in winter was very wet for lying and there was not much shelter from cold winds. The food is plentiful but of a fibrous nature..... On post-mortem examination the rumen is full of food of this description, but, the animal is apparently receiving no benefit from it. There is a good deal of clear fluid in the belly cavity and some similar fluid in the heart sack. The livers are dark in color and very friable. Kidneys appear normal, the intestines and stomachs normal, no inflammatory patches."

Weir recorded (in unpublished reports) the presence of lung worms in sheep on several stations, but left a specific record concerning twenty piners examined at Darwin. In these, he recorded, whip worms in the caecum of most piners examined, and possibly Ostertagia circumcincta in the fourth stomach of two of them, but he did not consider that worm infestation was sufficiently severe to cause pining and felt the trouble ~~was~~^{must be} due to another cause associated with the dark color of the livers.

Internal Parasites.

Very little is known concerning the in-

cidence and identity of internal parasites of stock in the Colony.

Townson (1910) reported that intestinal parasites were common in sheep and lung worms slightly less so. Cheverton (1936) submitted specimens to the British Museum of Natural History which were identified by Dr. H.A. Baylis as follows:

- Lung. Dictyocaulus filaria (Rud. 1809). Port Howard, Port Stephens, Roy Cove, Chartres.
- Large Intestine. Chabertia ovina (Malin, 1790). Port Howard, Roy Cove, Chartres, Fox Bay.
- Oesophagestomum venulosum (Rud. 1809). Roy Cove (this species now appear to be common throughout the Colony and has ruined the gut forecastings).
- Small Intestine. Nematodirus. Fox Bay.
- Caecum. Trichuris ovis (Abildg. 1795). Roy Cove.
- Fourth Stomach. Ostertagia circumcincta (Stadelm. 1894). Chartres, Fox Bay.

These are common parasites in sheep throughout the world but though recorded here there are no notes concerning their incidence in the Colony.

During 1941 the Stock Inspector examined the gut and carcasses of some sheep that were killed for tallow at Darwin. His report reads as follows:

TABLE
WORM INFECTION OF SCROGS AT DARWIN 1941.

Type of sheep	Number.	Part Examined.	Parasites Observed.
Ewes.	100.	Gut.	Tapeworm cysts in 14. Caseous lymphadentitis in 10.
	50.	Intestines.	Tapeworms in 3.
	50.	Carcass.	Jaundice in 1. Caseous lymphadentitis in 3.
Wethers.	50.	Gut.	Tapeworm cysts in 5. Caseous lymphadentitis in 3.
Sheep.	100.	Livers.	13 black in color but apparently sound otherwise.
	2,000.	Livers.	1 full of unilocular cysts (no scolices could be found.)

(* Note by present writer).

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vidence and identity of internal parasites of stock in the Colony. Townson (1910) reported that intestinal parasites were common in sheep and lung worms slightly less so. Chaverton (1936) submitted specimens to the

British Museum of Natural History which were identified by Dr. H.A. Baylis as follows:

Lung.	<u>Dictyocaulus vivax</u> (Rob. 1809).	Fort Howard, Fort Stephens, Roy Cove, Chatteras.
Large Intestine.	<u>Chabertia ovis</u> (Muller, 1790).	Fort Howard, Roy Cove, Chatteras, Fox Bay.
	<u>Geophasastomum vanuxemi</u> (Rob. 1809).	Roy Cove (this species now appear to be common throughout the Colony and has ruined the gut for casing).
Small Intestine.	<u>Haematodius</u> .	Fox Bay.
Caecum.	<u>Trichouris ovis</u> (Abildg. 1795).	Roy Cove.
Fourth Stomach.	<u>Dactyloscopus circumcinctus</u> (Stadelin, 1834).	Chatteras, Fox Bay.

These are common parasites in sheep throughout the world but though recorded here there are no notes concerning their incidence in the Colony.

During 1934 the Stock Inspector examined the gut and carcasses of some sheep that were killed for mutton at Darwin. His report reads as follows:

Points to need for systematic soil & plant analysis?

Type of sheep	Number	Part Examined	Parasites Observed
Wool	100	Gut.	Tapeworm cysts in 14. <i>Trypanosomiasis</i> in 10.
	50	Intestines.	Tapeworm in 3.
	50	Carcass.	Found in 1. Carcass found. <i>Trypanosomiasis</i> in 3.
Wethers.	50	Gut.	Tapeworm cysts in 5. <i>Trypanosomiasis</i> in 5.
Sheep.	100	Livers.	15 black in color but apparent by sound otherwise.
	2,000	Livers.	1 tail of unilocular cysts (no section could be found).

John seems high; how close to compare with N. 2?

(* Note by present writer.)

mc



A high mortality of lambs was experienced on Carcass Island during the 1940-41 season. Post-mortem revealed a heavy infestation of Haemonchus contortus. The animals were treated successfully with the copper-nicotine treatment. *

Evidences of serious worm infestation sufficient to cause scouring have been observed on two or three farms on the East Falkland.

Scrofula (Mycotic dermatitis). This disease was reported on sheep in 1911 but is rare at the present time. During 1937 some forty eight sheep of a consignment of three hundred and seventy nine, imported from South America were condemned in quarantine because they were suffering from this disease or Caseous lymphadenitis. A ram imported from Britain in 1940 also suffered from this disease and was condemned.

Specific ophthalmia. This disease was reported in 1913 (Townson). It occurs in sheep after a spell of dry weather but is neither contagious nor serious, and disappears with the advent of wet weather. It still occurs among sheep mustered from the Wickham Heights during the autumn.

Ante partum paralysis. This was recorded by Weir on several stations.

Mineral Deficiencies. During 1924 arrangements were made with the Rowett Institute to make analyses of samples of pasture herbage. These indicate that the native pastures were deficient in most minerals. The Stock Inspector reported (1930-31) that sheep showed no indication of mineral deficiency, for, having acquired the taste of minerals, they did not develop a craving for them (see page 58). (This may be explained by the fact that most animals have access to the coast where they consume large quantities of kelp).

The death rate between lambing and marking is decidedly high. Figures supplied orally by one manager in 1940 revealed that approximately 90% of lambs were dropped but that only 75% survived until marking. This was on paddocks where ditches were not a source of loss.

(Copper sulphate 1 oz. - Nicotine sulphate (40% solution) 4 oz. water 1 gallon)

Furthermore, there is definitely a very slow rate of maturity in sheep throughout the Colony, and the best breeding grounds are those which include a large amount of accessible coast.

These symptoms when associated with the knowledge that the soil and herbage are low in lime content, and that turnips respond to small dressings of copper sulphate and boron, infer that further work on mineral nutrition might bring valuable information.

CATTLE.

Tuberculosis was reported in cattle in 1911 and 1914 but the incidence was low (2%). The imported Pedigree Dairy Shorthorn bull, Frosty Morn, appears to have died of the disease in 1927, following which all his progeny were killed with the exception of one small calf. In 1936 the Senior Medical Officer, Dr. Cheverton, tested milking cows about Stanley for tuberculosis and found several reactors which were destroyed. Weir made similar tests of cattle at camp stations during 1937, but did not find reactors.

Since 1940 all animals in the Government herd and on Stanley Common have been tested at approximately six monthly intervals by the double intradermal method. Six reactors were found among the eighty six animals tested in 1940 and on post-mortem lesions in the lungs and mesentery.

The following test in June 1941 produced no reactors, but in April 1942 fifteen reactors were found (nine cows and six calves) all from one dairy. It is thought that this infection might be traceable to one of the milking assistants, who was admitted to hospital shortly after the tests were completed. No other source appeared possible since all eleven animals brought in from the camp gave negative reactions before they were released on the Common.

The last ~~two~~ tests (~~June and December 1945~~) have ~~failed to reveal~~ ^{two} reactors, ^{and} consequently, ^{though} the Stanley area ^{is not yet} may be considered as being supplied with milk from cattle that are free from tuberculosis.

The results of the tuberculin tests may be summarized as follows:

TABLE VII

RESULTS OF TUBERCULIN TESTS SINCE 1940.

Date of Test.	No. of animals tested.		No. of reactors.	Remarks.
	Camp.	Stanley.		
June 1940.	-	86	6	1 severe infection and 2 slight in lungs; 2 lesions in mesentery.
June 1941.	121	-	4	1 calf lesions in partid, pre-scapular and mesentery; 1 cow, possible infection udder and pre-scapular.
June 1941.	-	169	0	
October, 1941.	69	-	0	
January 1942.	122	-	1	
April 1942.	-	217	15	<i>including 6</i> Also doubtful, all in one dairy.
June 1942.	-	20*	9	Also 2 doubtful (repeat of 9 reactors and 6 doubtful of previous test). Of 6 P.Ms. 2 lesions in lungs, 1 lugs and liver, 1 mesentery.
June 1942.	135	-	6	Including 3 doubtful.
December 1942.	-	220	1	
May 1943.	-	203	2	
June 1943.	6	-	0	
December 1943.	-	225	8	Mainly in calves that had been shut in a shed which had been used for a reacting cow twelve months previously.
June 1944.	-	44	1	
November, 1944.	-	208	2	
June 1945.	-	54	0	
December, 1945.	-	156	2	
Total 1940-45.	453	1602	57	2.3% of all animals tested (deleting 9 repeats) reacted positively.

(* Includes a repeat test of 2 positive cases from previous month).

The Stock Inspector, (Mr. Beaty) who made all tests up to and including November 1944, considered that a possible source of the infection recorded in December 1943 was an old milking shed in which an infected animal had been isolated for a short period some twelve months before the calves were born. Three calves kept in the shed reacted positively though they had never been in contact with other than their ~~three~~ ^{dam's} mothers, ^{had all given} all of which gave negative reactions.

The results of the tuberculin tests may be summarized as follows:

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RESULTS OF TUBERCULIN TESTS SINCE 1940.

Remarks.	No. of reactors.	No. of animals tested.		Date of Test.
		Camp.	Stanley.	
1 severe infection and 2 slight infections in mesenteric lymph nodes.	3	86	-	June 1940.
1 calf lesions in pericardium, pleura, and mesentery; 1 cow possible infection under and prescapular.	1	-	121	June 1941.
Also doubtful, all in one dairy.	1	-	-	June 1941.
Also 2 doubtful (repeat of previous test).	2	20*	-	October, 1941.
Also 1 doubtful of previous test.	1	-	-	January 1942.
Also 1 doubtful of previous test.	1	-	-	April 1942.
Also 1 doubtful of previous test.	1	-	-	June 1942.
Including 3 doubtful.	3	-	138	June 1942.
Mainly in calves that had been kept in a shed which had been used for a reacting cow twelve months previously.	3	225	-	December 1942.
	3	203	-	May 1943.
	3	225	-	June 1943.
	3	225	-	December 1943.
	3	208	-	June 1944.
	3	208	-	December, 1944.
	3	24	-	June 1945.
	3	150	-	December, 1945.
2.5% of all animals tested (deleting 3 repeats) reacted positively.	27	1602	155	Total 1940-45.

Repaired on 2 children at Douglas this year.

Mc

(* Includes a repeat test of 3 positive cases from previous month).

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Reactors are usually isolated and retested a month later before being destroyed. Any animals which give a doubtful reaction are also retested after a similar period using both bovine and avian serum. No animal has reacted positively to the avian serum.

Ringworm. A very virulent form of ringworm has been present ⁱⁿ on calves and young cattle about the settlements at Douglas and Fitzroy and has been transmitted to children. The disease was perpetuated by the practice of crowding young calves into sheds overnight. It may be eradicated by complete disinfection of the shed and floor during the winter, using strong carbolic solution or painting out with tar, and by the use of biniodide of mercury ointment on the lesions. The disease has not been observed or reported since June 1943, at the above settlements, but has been reported from three settlements or houses in the N.W. of East Falkland Islands since that date.

Lice. Cattle throughout the Colony become infected with lice during the winter. These parasites may be controlled with a paraffin emulsion wash, or with ~~Kymac~~ ^{ac} or certain fluid dips, among which Little's is particularly efficacious.

Mastitis. Several cases of Mastitis have been observed but all appear to ^{have} ~~be~~ ^{en} of traumatic origin. No cases of an infectious nature have been observed.

Post-partum paralysis. One case which was attributed to this disease has been observed in a cow, six to seven days after calving. It responded to treatment with magnesium sulphate.

* (Paraffin emulsion is prepared by dissolving 1lb. soft soap in a gallon of water and stirring in vigorously $\frac{1}{2}$ to 1 pint of paraffin).

Navel Ill. ~~One case was observed in a three day old calf due~~^{to}
 tying the cord with a dirty string. When first seen the calf was
 very depressed, the knee joints were swollen and the swelling was
 spreading downwards; there was ^{also} a hard swelling the size of a hen's egg
 at the navel. Treatment was commenced at 6 p.m. on 19th. July 1945,
 and a complete cure was effected by the morning of 21st. idem. The
 treatment consisted of sulpha pyridine, 1 gram. at 6 p.m. and 8 p.m.
 each in four ounces of warm milk, followed by $\frac{1}{2}$ gram. at hourly
 intervals until a total of 20 grams. had been administered. The
 treatment was completed at 8 p.m. on 20th. July. The calf was
 constipated during treatment, but commenced suckling at noon on 20th.
~~and the bowels moved naturally on the following morning.~~

Deficiency ^d Diseases. Between two and four cases of milk-
 fever are encountered annually in Port Stanley. They respond to
 inflation, feeding of acid-calcium-phosphate, or ground carbonate of
 lime and cod liver oil.

Rickets. Two calves apparently suffering from rickets have
 been treated successfully with ground carbonate of lime and cod liver
 oil. Young pigs have also responded to similar treatment after they
 have gone down in the hind quarters.

Unthrifty ^{Unthrifty} Coats. There is unthriftiness in the coats of cattle
 during the winter and early spring which has not been accounted for.
 Experimental feeding with crude limonite appeared to bring about a
 partial amelioration; potassium iodide improved the quality of the
 coat considerably and was stated by the milkers to have increased
 milk production of one of the animals by about a gallon per day.
 Later experiments using potassium sulphate, iodine and cobalt
 chloride gave inconclusive results. At present most animals on
 Stanley Common are receiving considerable quantities of fodder im-
 ported from Montevideo and their condition is greatly improved, but
 the condition of their coats has not been remedied completely.

HORSES.

Lice are comparatively common on horses during the winter and early spring, but disappear with the change of coat and the heat of working in the spring. Cooper's Milk Fluid Dip was not satisfactory for controlling them at the concentration one to twenty five, but, Little's Fluid Dip at the same concentration was lethal instantaneously and was also effective in curing a mild form of ringworm which was encountered at the Quarantine Station.

Strangles. This disease was introduced with a shipment of horses from Montevideo in August 1944. The disease affected a number of horses on the West Falkland. Advice concerning sanitary measures was given to managers orally, by typed and cyclostyled pamphlets and through the weekly paper. The disease was allowed to run its course but was long excluded from two or three stations by strict sanitary measures. It was reported from the North Arm Camp during the spring of 1945.

Ticks (Boophilus micronata). Ticks were imported to the Falkland Islands by the same shipment of horses that brought strangles. They were observed by the importat as a heavy infestation on one cart mare some three weeks after landing, but the report did not reach the Department until three weeks had elapsed. All the horses were loose together in the ship's hold during the five day passage from Montevideo. A single tick of the same species was found on one horse which arrived from Montevideo a month later and which travelled in the same hold as the previous shipment of horses.

Small ticks which had bred in the paddock in which the mare was isolated at Roy Cove, were observed during October and again during December 1944; but the parasite has not been since observed.

Lampas. This disease is fairly common among horses and interferes with their normal feeding, since they have difficulty in retaining food in their mouths for mastication. The trouble may be cured readily by

pricking ^{the} swelling, draining off the fluid, and hard feeding.

Impaction of the Small Intestine. This trouble is not uncommon and is usually due to feeding unwisely after a long ride. If treated early, the results are not usually serious. Unfortunately, many owners ^{on} observing the distress and straining of the animal consider that there is a blockage of the urethra, and attempt to flush the kidneys with a half pint of neat gin. Death has supervened in at least two cases following this treatment. The correct ^{remedy} treatment should ^{comprise} include frequent enemas of two or more gallons of luke warm soapy water and a purgative of turps and linseed oil (1 to 2 ozs. to 1 pint respectively).

Great care should be taken when feeding a hungry tired horse on oats especially if no fibre (tussac, hay or grass) is available.

Deficiency Diseases: ← (Osteoporosis), Two cases of this have been observed in colts. It appears as a hard swelling on either side of the bridge of the nose and is said to be fairly common on certain camps in the Colony. It is believed by the Islanders to be due to mechanical injury caused by peat dust. On the other hand by no means do all dusty areas produce the disease, and it is probably due to some mineral deficiency.

There is an impression that two forms of this disease exist; the first is described above in young horses and the second is seen in older horses as ^a softish painful swelling right across the bone of the face. When this swelling occurs on the nose of the animal often recovers, but if it is high up on the forehead between the eyes it is usually fatal. ↩

It is said that the frontal bones of the skull of a horse which has died from this usually appear to be eaten right across, and this has led to the belief that the casual agent is some insect. ↩

This latter form was recorded by Townson in 1912 when he attribute

DOGS.

Distemper caused considerable losses among dogs in 1891 and again in 1927-28 since when it has not been observed in the Colony. Dogs occasionally become infected with lice, but fleas are unknown. No other diseases appear to have been recorded on dogs within the Colony, but lice and acarine mites have been intercepted on huskies in the quarantine Station during 1945 and 1946 and lice and ascarid worms in pet dogs during 1944-45. The mange responded to two dips with Kymac, at the strength used for sheep, followed by lime sulphur containing approximately 0.3% polysulphides; and the worms to oil of chenopodium.

ANIMAL QUARANTINE.

Animals entering the Colony are subject to inspection and quarantine under the Provision of the Live Stock Regulations (Consolidation) 1923 or the Dogs (Importation) Regulations 1928.

Before 1937 the quarantine Station was situated at the East end of the township, but it was removed to the Naval Reserve at Navy Point during 1936, and was ready for use at the beginning of 1937. The area, about 100 acres, is double fenced along the boundaries, divided into five paddocks and two holding paddocks, and equipped with a stock shed containing four loose boxes and store. A 240 gallon sheep dip and small yards were provided. Three kennels with runs completely netted in were built for dogs. Since 1944 a horse corral and additional storage space have been provided. Approximately three acres have been cultivated and will be sown in English pasture grasses and fenced to provide small paddocks in which stock can be isolated.

The natural pasturage has been improved by heavy stocking with sheep during each autumn of the past two years; and was ^{further} improved by stocking with cattle in 1940-41 and by the consolidation effected by horses, which were held for three months during 1943 because of ringworm infection. The area is, however, too small at present for a

consignment of more than 100 or 120 sheep, but when the pasturage is improved, a larger number of sheep could be maintained. ~~Of course if hand feeding is practised many more animals could be accommodated.~~

There is a similar area at Fox Bay which has been double-fenced and has been reserved for a Quarantine Station. A small dip has been installed, but there are no yards, buildings or subdivisions. The material for a stock building was placed on the location in 1940 but labour has been scarce, ^{so} and the building has not been erected.

Personally, I foresee difficulty in administering a Quarantine Station at Fox Bay where there are no stocks of fodders and where drug instruments, library and technical knowledge would have to be duplicated, for there is no ready access between the East and the West Islands. Furthermore there is no ready means of landing large animals on the Quarantine Station, unless they swim ashore. Even when the jetty at Fox Bay East is improved animals would have to traverse about a mile of private camp to reach the Quarantine Station, and might leave infectious discharges in places accessible to the station stock. Though the alternative might involve the paying of freight from Stanley to the West on such animals as may be imported by vessels making Fox Bay their first port of call, I would prefer to see all animals quarantined at Stanley or on some Island within reasonable reach of headquarters, ^{e.g.} {for example Phillimore Island}.

Several complaints have been made by the sheep owners concerning the administration of the Quarantine Station, especially concerning the diagnosis of diseases, but ~~since no manager nor any person representing a manager~~ ^{or his representative} has examined diseased animals, while in quarantine, or requested permission to do so, ~~the complaints must be figments of imagination, founded perhaps on annoyance at the inconvenience caused by quarantine.~~ Before 1937 stock were often quarantined on an island nominated by the importer, subject to the approval of the Governor. The Stock Inspector may or may not have supervised the dippings, but he was not responsible for the feeding of the stock, and had only to examine the animals at the time of their release. Obviously this

was inefficient for since 1920 four areas have been quarantined because of scab, and five stations have been placed in quarantine for lice; ^{white} and distemper, tuberculosis (bovine), ringworm, strangles and the tick Boophilus mirronata have penetrated the quarantine Service; ~~the last two diseases since 1940, partly because of the pressure exerted by the industry concerning the administration of the quarantine Service.~~

The following diseases have been intercepted in the Navy Point quarantine Station since 1940; mycotic dermatitis, braxy, Melophagus ovinus, Linognathus pedalis, and unidentified intestinal worms in sheep; Haematopinus suis in pigs; warble fly in a bull (two separate occasions) ringworm on horses; Sarcoptic mange, lice and ascarid worms ⁱⁿ on huskies and pet dogs; ~~Haematopinus suis on pigs;~~ chicken pox and various ecto-parasites on poultry. In addition a consignment of horses was held on suspicion of infectious stomatitis.

We ~~have found~~ ^{have been found} the following treatments to be completely satisfactory for the undermentioned diseases:-

Linognathus pedalis on sheep.
Melophagus ovinus on sheep.
Lice (Trichodectes) on dogs.

Kymac fluid or paste as recommended on the package for keds. One dip of two minutes killed all eggs.

Sarcoptic mange on huskies.

Kymac as above two dips followed by lime sulphur made by the open pot method, broken down to a dip containing approximately 0.3% polysulphides one dip of two minutes.

Haematopinus suis on pigs.

Painting of the body with crude fuel oil three times at intervals of 7 to 10 days.

Mycotic dermatitis on sheep.

After several materials had been tried without success a paste of Cooper's Dipping Powder rubbed on the affected area caused a deep burn. After healing no recurrence of the disease within seven months.

Ringworm on horses.
Lice on horses.

Little's Fluid Dip 1 part to 25 water as directed on container Cooper's Fluid Dip not satisfactory.

In addition to dipping for observed parasites the Regulations specify compulsory dipping of all sheep from South American ports to prevent the introduction of scab and lice. A two minute dip in Cooper's Powder has usually been made for this purpose repeated after a

ten to fourteen day interval; but in January 1943 five of twenty seven rams succumbed following the second dipping. This was attributed later by Dr. Cahn of the Cooper Technical Bureau to absorption of arsenic through the skin, but neither Messrs. Coopers nor the Department is able to suggest a cause for the fatal degree of absorption. The arsenic concentration of the dip was 0.182% as As_2O_3 .

It had seemed possible that sea salt carried by high winds to the roof from which water for dipping was collected, might have influenced the permeability of the arsenic; but the whole operation was repeated twice with run sheep, each time with and without the addition of 50 gallons of sea water without loss or apparent distress to the sheep. Two dippings at the full strength as directed on the packet caused skin injury - a hardening and scabiness - and a third dipping caused cracking which made the back tender and caused congestion. But even the third dipping did not cause the sheep noticeable distress.

It became evident however that the solid matter that lodged on the back hindered the growth of wool so that the growth on the back after even the first dip was only half that on the flanks. The retardation of the growth of wool did not occur after dipping with either Kymac or lime sulphur (0.3% polysulphides).

Sheep from Patagonia frequently enter the Colony in very poor physical condition, due to the fact that they are unaccustomed to hand feeding, and take little food on the journey. The quality of the natural pastures in the Colony is low, and they have to accustom themselves to it, so that hand feeding in the Quarantine Station is kept as low as possible. The result is that they are healthy and hard when released from quarantine, but usually not fat. Most when they leave the Station are in better condition than when they were admitted. ~~We had~~ ^{have} ~~no difficulty~~ ^{has been experienced} in teaching them to accept hand feeding if they are offered it immediately on arrival ~~in quarantine~~ when they are hungry.

Quarantine Practices.

The description of all animals is recorded immediately on arrival and is checked with the consignment notes. Simultaneously, they are examined for ecto-parasites and blemishes, and any necessary treatment is prescribed.

Though drenching has not been practised regularly in the past, it should be ~~practised~~^{effected} immediately on admission to the Station to eradicate internal parasites. It was impossible to improve the condition of one shipment of rams until this action had been taken.

To avoid accidents in dipping, the dip is emptied and cleaned after each dipping, and filled immediately before the next. The dip is always mixed under the supervision of the officer responsible for quarantine. This ensures that the strength of the dip is as intended.

Sheep are grazed in the Quarantine Station paddocks, different consignments being kept separate, and ^{all} ~~as is necessary~~ with concentrates. ^{as necessary.} If climatic conditions change suddenly for the worse after dipping, every effort is made to dry the sheep quickly, ~~and in one case they were placed for a few hours in the shed which had been previously warmed with a brazier.~~

Animals in quarantine receive daily attention during the quarantine period, and are housed only if climatic conditions and the history of the animal make it desirable. For example, animals which have travelled through the tropics, or which are imported from Montevideo after the commencement of the Uruguayan spring, have a summer coat and are not fit to stand exposure to the hail and sleet squalls that are characteristic of the Falkland Island climate.

ECONOMICS OF SHEEP FARMING.

The carrying capacity of the land is on the average 4.767 acres per sheep and 227 acres per head of cattle. +Considerable variation

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Nobody seems to be able to agree as to the number of carcasses required to feed a freezer. I imagine it would need a minimum of 50,000

MC

The carrying capacity of the land is on the average 1.707 acres per sheep and 227 acres per head of cattle. Considerable variation

occurs in the ^{carrying} capacity of the different stations. On the best outlying island a sheep is carried to every 1.092 acres and this is certainly not overstocked. It is capable of carrying a sheep to about 0.9 acres. On the poorest ^{station} 7.43 acres are required for each sheep. The best mainland station carries a sheep to 2.181 acres, but there are only six stations which carry a sheep on less than four acres.

The income from farming naturally varies with the price of wool, skins and tallow. The gross average return per sheep from wool is in the neighbourhood of 6/9 per head, but the range is probably from 4/- to 9/- or 10/- per head on different stations. The return per acre is low being on the average about 1/6, but this depends on the fertility of the land and varies from station to station from probably about 7/- per acre on the best land (Island) to less than 1/- per acre on the poorest.

^{In} About 1938 the cost of placing wool on the London market was assessed at approximately 6½d. per lb., but a few years previously the costs were stated to range between 7½d. and 8½d. Expenses would have increased considerably during the war years had it been possible to secure all the labour and shepherds which were desired, but as there is a deficiency of some 150 men in the camp and as freight on wool from Stanley to the United Kingdom has been paid by the British Government, which purchased the wool ex Store Stanley, the costs have probably remained steady.

The industry is at present organized purely for wool production. There are few surplus sheep of suitable quality for a frozen meat trade. Most of those disposed of annually are aged. An increase in the number of breeding ewes, and a reduction of the death rate of lambs and hoggets, would provide a large proportion of the sheep necessary to support a meat industry.

In the first place it would seem wiser to export such animals to the freezing works of Chile until the numbers and quantity justified the erection of a freezing plant locally. The prices paid for sheep

occurs in the capacity of the different stations. On the best only-
ing island a sheep is carried to every 1.000 acres and this is certain-
ly not overstocked. It is capable of carrying a sheep to about 0.9
acres. On the poorest 7.50 acres are required for each sheep. The

best mainland station carries a sheep to 2.181 acres, but there are only
six stations which carry a sheep to 1.000 acres.
*I have been told the same thing
and am prepared to support it if my own will agree.*

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In the first place it would seem wiser to export such animals to
the freezing works of Chile until the numbers and quality justified
the erection of a freezing plant locally. The prices paid for sheep

could be relatively low at first, as surplus sheep are now worth little, if any, more than the price of their skins; and owners would sell surplus stock for three shillings to five shillings per head. I am informed from an authoritative source in Chile that the erection of the freezers in the Magallanes Province brought about a great ^{and} beneficial change in the economy of the Province, ^{with the result} ~~to the end~~ that frozen lamb and mutton are now at least as important as wool production. The same authority assured me that the lifting of frozen mutton from a Falkland Island port would offer little difficulty since ships would pick up a full load from the Magallanes area with little additional cost.

Cattle are kept for milk production for the camp houses and are used on few stations for pasture management, or for reclaiming poor camp; but they are usually spread about the camp and compete with sheep for feed throughout the year. Greater benefit would accrue if sheep were grazed in larger mobs and rotated from paddock to paddock as the grazing was exhausted. Cattle should follow to eat the rank grasses left by the sheep. By this means there would be no need to burn the white grass, for if judiciously managed, there would be no rank grass to carry a fire. The cattle would not thrive and would have a rather hard time, but this would be offset by the additional sheep which could be carried.

Electric Fence.

As evidence of the above ^{there is} we have a small area of sixty acres on the Common which was completely eaten out by ^{2,500} ~~2,500~~ sheep in May 1945. The area was not stocked again until 27th. April 1946 when 890 cast sheep were enclosed on twenty three ^{acres} with an electric fence. After five days there was still at least one day's grazing left. The sheep were well filled and in good condition. The land was dry at this period and no grazing was lost through soiling or tramping such as would happen during the winter. The important point is that the area grazed bare in May 1945, grew enough fodder in twelve months to maintain 38.7 sheep per acre for at least five days. Theoretically seventy three similar areas would provide the grazing throughout the twelve months if each were grazed just once in the period, but soiling of the fodder in wet weather would make a greater area necessary. Feed is not entirely lost through

could be relatively low at first, as surplus sheep are not worth little
if any, more than the price of their skins; and owners would sell any
plus stock for three shillings to five shillings per head. I am in-
formed from an authoritative source in this that the erection of the
transverse in the Kaitiaki province brought about a great beneficial
change in the economy of the province, ^{with the result} ~~to the~~ that frozen lamb and
mutton are now at least as important as wool production. The same
authority assured me that the lifting of frozen mutton from a Zealand
Island port would after little difficulty since ships would pick up a
full load from the Kaitiaki area with little additional cost.

Cattle are kept for milk production for the camp houses and are
used on the stations for pasture management, or for maintaining
camps; but they are usually grazed about the camp and contacts with sheep
are kept throughout the year. Greater benefit would accrue if sheep
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there still at least one day grazing and the sheep were well
filled and in good condition. The lamb was dry at this period and no
grazing was lost through soiling or trampling such as would happen during
the winter. The important point is that the area grazed here in May
1945, grew enough fodder in twelve months to sustain 10.7 sheep per
acre for at least five days. Theoretically seventy three similar acres
would provide the grazing throughout the twelve months if each were
grazed just once in the period, but soiling of the fodder in wet weather
would make a greater area necessary.

Maintenance?

Was dry fodder presumably?

Me

soiling for the dirt is washed off by rain and sheep may be returned to the area to complete the grazing. The carrying capacity of the land in this trial was at the rate of a sheep to 1.88 acres and the pasture was some of the poorest on the Common. Simultaneously the land has been consolidated by the tramping and within a few years will change to a bent-pig vine pasture which has much greater productive power than white grass. Only experiments over two or three years will prove the economics of such an intensive system of stock management, but there is no doubt that if it were adopted on blocks of such size that a mob of sheep would graze them out in four to six weeks, the carrying capacity of the land would be more than doubled.

Controlled over-grazing of this nature can bring only improvement to the native pastures, chiefly ^{through} consolidation, removal of surplus growth and the concentration of animal manure.

In this experiment the sheep were confined by an electric fence of two No. 8 wires supported on split stabs costing about sixpence each at seven yard intervals. Within twenty four hours the sheep had a healthy respect for the fence and could not be driven within twenty yards of it without dogs. The sheep were directly from the camp; and the fence proved completely satisfactory. This is the first time an electric fence has been used ^{in the Colony} for sheep.

The general adoption of electric fences would revolutionise farming in the Colony, for two wires would do the work of six, battens are unnecessary, and since there is no rubbing on the fences or reaching through for the fodder on the other side, posts can be lighter and maintenance is reduced.

DAIRY.

Since 1937 the methods of dairying used in Stanley have been changed completely. Weir, in an unpublished report dated 11th. March 1937, left the following account of the method of milk production in the Colony which was practised universally, with slight modifications in individual cases.

waiting for the dirt is washed off by rain and sheep may be returned to the area to complete the grazing. The carrying capacity of the land in this trial was at the rate of a sheep to 1.58 acres and the pasture was some of the poorest on the domain. Simultaneously the land has been consolidated by the trespassing and within a few years will change to a best-pig vine pasture which has much greater productive power than white grass. Only experiments over two or three years will prove the economics of such an intensive system of stock management, but there is no doubt that if it were adopted on blocks of such size that a top of sheep would graze them out in four to six weeks, the carrying capacity of the land would be more than doubled.

There is no surplus milk!
Mc.

Controlled over-grazing of this nature can bring only improvement to the native pastures, chiefly consolidation, removal of surplus growth and the concentration of animal numbers.

In this experiment the sheep were confined by an electric fence of two No. 8 wires supported on split stabs costing about sixpence each at seven yard intervals. Within twenty four hours the sheep had a healthy respect for the fence and could not be driven without injury to it without dogs. The sheep were directly from the camp; and the fence proved completely satisfactory. This is the first time an electric fence has been used for

The general adoption of electric fences would revolutionize farming in the country. The sheep are unobedient and therefore take no notice of reaching through for the fodder on the other side, goats can be lighter and maintenance is reduced.

I have had some excellent butter in the Camp
Mc.

Since 1927 the methods of dairying used in Stanley have been changed. In an unpublished report dated 1st March 1937, it is stated that the following account of the dairying in the Colony which was produced entirely with slight modifications in individual cases.

Of no great value?
Mc.

Briefly, the calves are shut up at night. In the morning the cows are brought in for milking. To encourage the cow to let her milk down, her calf is allowed to suck each teat until the milk is running freely. The calf is then tied up until the milker milks three of the teats, leaving one untouched for the calf, which is ^{then} released and allowed to run with the mother during the day. Weir remarked that the sucking of the calf apparently serves also as a method of cleaning, as water is not used for the purpose. The milk is strained through muslin, scalded and allowed to set in pans until the cream rises. Today, in Stanley, cows are milked twice daily at the registered dairies and usually the calves are hand fed. ~~The surplus milk is separated.~~

Weir recorded that separators in the Falklands were few and far between. One manager informed him that his principals would not let him have a separator at the home settlement, much less the shepherds at their houses.

~~Anent this,~~ Weir commented that separators should be used ^{by} ~~everyone~~ ^{wherever} milking more than one cow, ^{is milked,} especially as most dairies that he had seen were unsuitable for the setting of milk, in that the milk was often exposed to flavours which were readily absorbed.

The failure to make good quality butter is attributed locally to the pasturage, and to flavours produced by the native feeds. I am not aware of any evidences in support of these opinions and believe the troubles lie more in the methods of butter-making.

Butter is often rancid, streaky, contains butter-milk and is greasy. Each of these defects may be due to one or more of several

^{The Department has}
 (We have found this to be impracticable with calves bred from local bulls, and have been unable to teach any of the three born in our herd to drink from a bucket, even after persisting for 10 days. On the other hand all calves sired by the imported Friesian bulls have learnt to drink within 48 hours. Difficulty is being experienced to ^{teach} ~~teach~~ some of the calves sired by a son of the imported bull to drink. This attribute, would almost appear to be an inherited character).

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he had seen were unsuitable for the setting of milk, in that the
milk was often exposed to flavors which were readily absorbed.

The most excellent Dunlop cheeses were made
at Vann (Nigeria) during the war. I will ask Henderson to send details.
I am sure that you will be interested in the pasturage, and to the
not aware of any evidence in support of these opinions and believe

It should be self supporting, but is ridiculous that we
should spend foreign currency on such inputs.
A few small-holders could satisfy local requirements.

(We have found this to be impracticable with calves bred from local bulls
and have been unable to teach any of the three born in our herd to drink
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sired by a son of the imported bull to drink. This attribute would al-
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factors, such as failure to ripen the cream, failure to stir it while ripening, failure to strain cream before churning, uncleanliness, over-churning, churning at too high a temperature, insufficient washing or washing at too high temperature, and insufficient working.

Cream should be kept in a cool place; but in the Falklands the temperature of a 'cool place' is normally well below 60°F. Consequently, the development and growth of the lactic acid organisms which bring about ripening is hindered. These thrive best between 65°F. and 70°F. though cream will ripen if the temperature is between 60°F. and 70°F. To ripen satisfactorily, the cream must not be too thick and must be stirred regularly. It is essential that it be kept away from anything that might flavour it; and it may be of interest that in New Zealand the taint from a nearly empty linseed sack thrown carelessly into a corner of an otherwise clean dairy has been detected by professional graders, in cream which was exposed in the dairy overnight. Churning should proceed at a temperature between 54°F. and 62°F. The best butter is made from cream that is not too thick and into which a little cool water is added when the first granules appear. Obviously, a dairy thermometer is very desirable when butter-making.

Few other dairy products are made in the Colony. Cream cheese is made ^{at} on one or two stations and I have heard recently that Cheddar type cheese was made experimentally with success.

There is no doubt that if the Colony were cut off from outside sources of dairy produce it would, in time, become self supporting in milk, butter and cheese. It requires only courage and organization to develop this aspect of agriculture, which would provide a satisfactory living for fifteen to twenty families, and reduce the expenditure of foreign currency.

Improvement of Dairy Stock. The first attempt that appears to have been made by the Government to improve the quality of dairy stock in the Colony was in 1922 when two Pedigree Shorthorn heifers and a Shorthorn bull were imported from the United Kingdom. Unfortunately, the strain

contracted tuberculosis and all animals were destroyed in 1927. It was not until 1938 when the Department imported two Friesian bulls from New Zealand, that a further attempt was made by the Government to improve milk production.

These bulls were landed at a total overall cost of £142.18.6. A service fee of ten shillings per heifer calf and five shillings for each bull calf has been charged. To date £142 has been collected in service fees, and £60 from the sale of young stock in addition to which the Government herd at present contains fifty five animals which, at local prices (much below their real value) should realise £212 in the open market.

Town Milk Supply for Stanley. Prior to 1938 there was no official control over the sale of milk in Stanley. A number of people kept cows for their private use and a few sold surplus milk to neighbours. Probably less than ten gallons of milk were available for sale daily during the summer while the quantity in winter would be negligible.

The Dairy Produce Ordinance and Regulations were passed in 1938. These restricted the legal sale of milk to registered dairies which were subject to regular inspection to ensure quality and cleanliness of milk and health of both workers and animals; milk offered for sale must contain 3% of fat.

The importation of evaporated, condensed and dried milk in 1940 was equivalent to 40,700 gallons annually or approximately 111 gallons per day. As a result of the Governor's instructions to make the Colony as independent as possible of imported milk the following scheme was proposed in June 1941, and after deleting the pasturizing plant was approved within ~~fourteen days.~~ ^{aiming at a production of} It aimed to produce approximately half a pint per head per day for an estimated population of 1,600.

1. The Government to request the collaboration of registered dairies in providing approximately 40,000 gallons of milk annually for Stanley.
2. The Government to assist by:
 - (a) Endeavoring to provide sufficient stock foods at reasonable costs to maintain stock in production during autumn and winter.
 - (b) Increasing its own herd slightly, but without the intention of competing with local dairies to their detriment.
3. In return for collaboration by the local dairies the Government will do its utmost to produce or provide:
 - (a) Root crops for autumn and winter use, for sale at a price not exceeding £1 per ton.
 - (b) A supply of hay at the rate of one ton per cow milked at a price landed at Stanley not exceeding £9 per ton.
 - (c) A supply of pollard and linseed cake at current ruling prices, sufficient to feed a ration of $2\frac{1}{2}$ lbs. of the mixtures daily per cow.
 - (d) Three hundred bundles of tussac weekly (or more if root crops fail).
The stock food available to be divided between the registered dairies in proportion to the number of cows in milk from time to time.
4. The Government to subsidise the scheme by meeting any charges on stock food in excess of those mentioned above. (This was estimated to involve the possible expenditure of about £90 for freight on hay, part of which might be recovered by profits on sale of roots).
5. The provisions of the present Ordinance concerning the sale of milk to be observed; the cows to be tested with tuberculin at six to twelve month intervals and, if desired, a pasteurizing unit to be installed.

To implement this policy would, ~~in 1941~~, have required the full production of some sixty-five cows during the summer, and eighty cows during the winter. There was insufficient food available near Stanley to feed such ^a herd. Consequently, an appeal for hay was made to the managers of stations on which cultural operations have been practised. The Department offered to supply ground carbonate of lime at £3.12. per ton, freight free from Stanley and a limited quantity of basic slag at £7 per ton, with the object of increasing production on the areas which each farm would normally harvest. (Lime had not been used previously in this Colony, to assist hay production excepting in experiments by the Department where it had brought an increase of about one ton per

one tons of hay during the years 1942 to 1944 inclusive. A further ten tons was offered to the Department, but, lack of transport prevented lifting it. Since the beginning of 1944 the Department has been able to provide, in Stanley, all the hay that is required by the dairies even though little or no tussac has been provided; but, during 1941-42 it was necessary to charter the schooner, Ervenir, to cut and freight tussac from the islands in Port William and Berkeley Sound, to provide the fodder necessary for the scheme (page 17). A hitch occurred when a family quarrel caused the closing of a dairy overnight. These difficulties were overcome and the success of the scheme came to depend on the number of animals that were available; but it is at present jeopardised by the very high costs of fodders imported from Montevideo. However, these ^{trouble} could be overcome if the dairies were situated on small farms where the provision of supplementary forage crops (e.g. barley, soft turnips and swedes) could be provided and used more economically than is possible at present.

Progress of the Scheme for Providing Fresh Milk for Stanley. The annual sales of fresh milk in the town of Stanley since 1939-40 for the twelve months ending 30th. June for each year have been as follows:

<u>Season.</u>	<u>Total Production.</u>	<u>Average per Day.</u>
1939-40.	5,155 gallons.	14 gallons.
1940-41.	7,571 "	24 "
1941-42.	12,230 "	33.5 "
1942-43.	16,060 "	44 "
1943-44.	18,300 "	50 "
1944-45.	21,651 "	60 "
1945-46.	26,186 "	73 " (estd.)

The present population of Stanley is approximately 1,250 so that the present production of fresh milk amounts to an average of 0.456 pints per head per day. This is approximately the figure that was aimed at originally, when the population was estimated to be in the neighbourhood of 1,600. There is still insufficient milk available during the winter, and a further quantity is desired to permit the issue of free milk to school children. By plotting the monthly production on a graph, the weaknesses of the current production become obvious and may be remedied easily by the addition of a few more cows to the winter milking herd.

* Since this was written production has increased so that there is

The drop in the average production per cow during the seasons 1939-40 and 1941-42 was due to the introduction of local animals to the herd in order to increase total production. ~~All but one of these animals, which had Ayrshire blood, have now been disposed of.~~

~~Data concerning the production of individual animals will be found in the appendices to this report, (xiii to xvii).~~

Feeding of Dairy Animals. To maintain production at the maximum it has been necessary to import pollard, maize meal and linseed cake from Montevideo and to provide hay and succulent fodders locally. During the summer the cows graze in the Government House Paddocks and receive, during milking, a supplementary production ration. This contains the imported foodstuffs in the proportion of 2: 1: 1; respectively and minerals. It is fed at the rate of four pounds of mixture for each gallon after the first ~~produced~~. The milk yield begins to fall away early in February as the pasturage becomes less succulent. Turnips or other succulent fodders are very desirable at this time. During the winter the Government herd obtains no natural fodder in the paddocks and all food has to be provided. The animals are never housed and are ruged only during the worst weather.

As a result of the success obtained by feeding the Government herd, the local registered dairies have adopted similar methods. The result is that the animals remain in better condition and health, and they do not have to forage so widely on the Common. In consequence, the quantity and quality of the grazing on the Common is increasing.

As the development of the Colony proceeds it should be possible to provide, locally, more of the fodders required by the dairies.

Prices of Milk.

~~Milk is delivered in Stanley at fourpence per pint, or sold at the dairy at threepence halfpenny per pint. The Government called for tenders in 1944 for the purchase and delivery of the milk produced in its dairy and now supplies a registered retailer, at twopence halfpenny per~~

~~pint. This charge is almost sufficient to balance the cost of production in normal times, but is insufficient to meet the present costs due to the increased prices of imported fodders.~~

It is the Government's policy to prevent ^{a rise in} the cost of living ~~risi~~
~~ing~~ and the Department will, consequently, stand ^{any} the loss on milk
production. The revenue from the sale of milk since 1940 amounts to
~~£3,544~~ and is now approximately £1,100 per annum.