So badly compiled as to be useless. →

Publish XX – XVII as a separate report in due course

INDEX TO APPENDICIES.

APPENDIX

ACTUAL EXPENDITURE OF D

SUBHEAD.	1937		1938		1939		1940	
	App.	Act.	App.	Act.	App.	Act.	App.	Ac
P. E. s.	1300	1300	1440	1478	1508	1444	1683	164
Harness.								
Books and Instruments.	90	78	50	42	50	36	50	2
Dimunition of Birds of Prey.	30	19	75	20	50	84	75	5
Prevention of Animal Disease.	50	8	40	39	40	12	35	3
Labour.			3967	4116	3500	5769	1200	130
Fertilizer.			150	39	50	49	50	4
Seeds and Grasses.			200	119	100	104	100	5
Tools and Implements.			70	71	70	58	100	8
Fencing Materials.			113	113	250	214	250	20
Fodder - for cattle.			100	91	100	113	100	8
Fuel and Oil.			70	69	80	72	100	9
Contingencies.								
Dairy Requirements.				17	10	4	10	
Rent of Office.				50	50	50	50	5
Purchase of Livestock.						210		10
Compensation to Stock Owners.						10		2
Upkeep of Motor Vehicles.								
Dairy and Vegetable Scheme Guarantees.								
Tree Seedlings.								
Upkeep of Gardens at Government House.								
Building Materials.				70	300	247	100	7
Purchase of Agricultural Produce for Resale.								
Tractor Spares.								
Smithy Requirements.								
Bonus - production.								
Unallocated Stores.								
Horse Allowance (fodder) and for Carthorses.	42	41	60	60	85	84	96	7
Electric Fence.								
Allowance Care of Stores.								
Printing Materials.			25	2	15	18	15	
Insurance.						10	12	1
Improvement of Grasslands.	5000	4092 *						
Incidental Expenses.							20	1
Miscellaneous, Expenses.	25	25	70	18	100	73	100	8
Stock Requirements.		440		42				
Purchase of Handcraft.				9				
Purchase of Sheep and Horse-Covers.				46				
Carriage for Typewriters.					10	7		
Stock and Agricultural Show and Horticultural Exhibition.					300	65		2
Purchase of Motor Car.						40		
Typewriter.							14	
Microscopic Stains.								
Purchase of Motor Vehicles.								
Hire of Tractor and Expenses.								
Motor Lorry.								
	5537	6003	6430	6580	6618	8773	4160	412

ARTMENT OF AGRICULTURE for:

1941		1942		1943		1944		1945		Total.
App.	Act.	App.	Act.	App.	Act.	App.	Act.	App.	Act.	Actual.
650	1657	1670	1544	1933	2224	2500	2251	2472	2556	16201.
	59	60	56	10	2	10	6	10	7	130.
60	45	59	50	30	23	30	16	30	20	339.
75	52	75	30	70	45	50	62	65	65	428.
40	24	35	61	35	28	35	55	35	25	286.
1200	1584	1800	1711	2077	1896	2020	1973	1890	2660	21018.
70	217	70	563	400	420	650	647	120	325	2307.
150	14	175	83	80	335	200	169	120	120	995.
900	70	690	292	150	231	182	752	145	145	1701.
250	206	100	109	70	35	100	148	100	100	1128.
175	171	280	276	530	553	650	638	650	650	2577.
130	92	190	158	200	199	250	170	250	250	1107.
		100	97	40	82	70	62	70	60	301.
10	7	10	7	15	14	15	15	20	17	84.
50	50	50	46	50	50	50	50	50	50	396.
200	15	15	12	30	6	18	15	10	5	363.
20		20	38	25	6	25	23	25	5	110.
60	103	80	8	80	62	90	117	60	50	340.
		160	34	100	58	100	16	50	32	140.
		30	6	45	1	45	186			193.
		450	447	535	584	552	540	556	556	2127.
		300	203	75	72	75	65	95	95	838.
				1040	474	900	248	1050	1044	1766.
						150		80	25	25.
						35	32	35	25	57.
						80				
		300	198	60	740	500	680	100	100	1718.
60										260.
60	4		82							86.
48	48	48	48	(Henceforth under P.E. salaries)						96.
10		5	1	5	8					31.
18	10	18	9	18	1					41.
										4092.
										18.
100	98									362.
										482.
										9.
50	50									96.
										7.
										89.
										40.
										9.
15										
	25									25.
	70					20				70.
								600	150	150.
4401	4671	6781	6269	7703	8149	9402	8936	8688	9137	62638.

APPENDIX II

RECEIPTS BY THE DEPARTMENT OF AGRICULTURE

HEAD	Year ending 31st December 1937 £	1938 £	1939 £	1940 £	1941 £	1942 £	1943 £	1944 £	1945 £	Total £
Not itemised	152	134	209	-	- ,	-	-	-	-	495
Grazing	-	-	-	116	128	98	110	120	102	674
Poundage	-	-	-	3	2	4	6	3	7	25
Sale of Veg.Prod.	-	-	-	163	152	245	980	628	348	2516
Sale of Dairy Prod.	-	-	-	-	237	346	637	935	1189	3344
Service of Bulls	-	-	-	17	32	15	33	21	12	130
Rents	-	-	-	12	9	4	6	5	3	39
Sale of Stores	-	-	-	2	-	-	421	584	-	1007
Sale of Tussac	-	-	-	5	56	197	1	-	-	259
Unforeseen	-	-	-	39	68	127	143	269	89	735
Sale of Eggs	-	-	-	-	1	-	-	-	-	1
Resale of Purchased Agric.	-	-	-	-	-	-	376	226	780	1382
O.P.R.	-	-	-	78	84	328	9	-	-	499
Deposits	-	-	-	-	-	2	-	-	60	62
Sale of Stores:										
Seeds	-	-	-	-	-	-	-	33	109	142
Hay	-	-	-	-	-	-	-	85	107	192
Fodder	-	-	-	-	-	-	-	165	84	249
Fertilizer	-	-	-	-	-	-	-	25	61	86
Misc.	-	-	-	-	-	-	-	-	16	16
Total	152	134	209	435	769	1366	2722	3099	2967	11853

APPENDIX III

REVENUE FROM WOOL TAX SINCE 1937.

Year.	Amount.
1937.	£ 9,344. -. -.
1938.	7,244. -. -.
1939.	7,594. -. -.
1940.	7,814. 2. -.
1941.	8,496. 3. -.
1942.	8,259.14. -.
1943.	9,526. 6. -.
1944.	8,171. 1. -.
1945.	8,142.16. -.
	£74,592. 2. -.

APPENDIX IV

WOOL EXPORTED IN RESPECT OF DIFFERENT SEASONS

Season	lbs	price in pence per lb
1939-40	3,896,031	11.0093
1940-41	4,264,196	10.833
1941-42	4,444,437	11.045
1942-43	4,620,467	12.645
1943-44	4,534,243	12.595
1944-45	4,613,047	

APPENDIX V

WEATHER MEANS

Note: The Tables below are compiled from observations at Port Stanley between 1895-1943-with the exception of the Wind and Gale figures marked * , which are based on observations made at the Lighthouse.

Month	Air Temps: Mean of: Daily Max	Daily Min	Ext. Max	Ext. Min	Rel. Hum.	Cloud Amount in Tenths	Rain-fall Average Fall in inches	Rain-fall Days of 0.04 or more	Wind * Mean Speed Beauf. Scale	* Days of Gale
JAN.	56	42	67	34	77	6.9	2.7	17	4.5	2
FEB.	55	41	65	34	80	6.9	2.2	12	4.8	2
MAR.	53	40	63	32	81	6.9	2.4	15	4.7	2
APR.	49	37	57	29	86	6.8	2.3	14	4.6	3
MAY.	44	34	51	26	88	7.1	2.5	15	4.5	2
JUN.	41	31	46	22	84	7.2	2.1	13	4.3	2
JUL.	40	31	46	22	90	7.2	2.0	13	4.3	2
AUG.	41	31	48	23	87	6.6	1.9	12	4.3	2
SEP.	45	33	53	26	85	6.9	1.4	12	4.6	2
OCT.	48	35	58	28	80	6.7	1.5	11	4.7	2
NOV.	52	37	63	30	75	6.7	1.9	12	4.8	3
DEC.	54	39	65	33	76	6.8	2.8	15	4.4	2

(Figures taken from the South American Pilot 1946)

APPENDIX VI

1941

Month	TEMPERATURES Mean Daily Max	Mean Daily Min	Ext. Max	Ext. Min	REL HUM	CLOUD in Tenths	Rainfall Total Fall Inches	Days of 0.04 or more	SUNSHINE Total Hours	%	Wind Mean Speed	Gal
JAN	58	43	67	36	77	6	2.91	17	214.6	44.94	4.2	-
FEB	55	43	67	35	84	6	1.33	10	155.9	38.47	4.0	-
MAR	51	41	61	34	84	9	1.86	11	70.0	18.03	4.0	-
APR	46	34	56	21	89	6	5.87	20	103.5	32.86	3.0	-
MAY	43	34	52	23	89	6	3.22	13	72.8	26.77	2.5	-
JUN	43	33	52	25	91	8	2.17	13	58.8	25.04	3.0	-
JUL	41	34	46	27	91	9	2.15	12	14.4	5.62	3.0	-
AUG	42	33	49	29	89	7	3.20	20	75.3	24.87	3.5	-
SEP	44	33	50	28	83	7	2.52	25	100.9	28.59	3.0	-
OCT	49	36	58	28	78	8	3.14	16	128.1	30.14	3.5	-
NOV	51	37	61	27	74	7	1.72	7	170.2	36.40	2.6	-
DEC	54	41	67	35	80	8	1.74	11	153.0	29.67	2.6	-
Totals							31.85 inches		1317.5 hours - 29.71%			

APPENDIX VII

1942

Month	TEMPERATURES Mean Daily Max	Mean Daily Min	Ext. Max	Ext Min	REL. Hum	CLOUD Amnt in Tenths	RAINFALL Total Fall in inches	Days of 0.04 or more	SUNSHINE Total Hours	%	WIND Mean Speed Beauf.	GALES
JAN.	58	43	75	37	68	6.6	2.50	15	208.7	41.8	3.3	-
FEB.	60	45	69	37	74	6.5	2.05	8	186.0	45.9	3.1	-
MAR	52	40	61	34	77	7.0	2.92	13	126.4	32.6	2.9	-
APR.	48	38	58	32	84	8.0	1.69	13	74.1	23.53	2.9	-
MAY.	44.1	33.7	50	20	88	8.0	2.11	14	73.6	27.1	3.0	-
JUN.	41.0	32.7	48	23	85	8.0	1.91	17	50.7	21.59	3.2	-
JUL.	42.5	32.6	47	24	87	7.0	0.866	7	53.2	20.8	3.4	-
AUG.	43.6	32.9	52	27	88	7.0	1.62	9	94.8	31.3	3.1	1
SEP.	40.8	33.5	-	-	87	9.0	3.05	10	50.1	14.2	3.3	-
OCT.	48.3	34.5	60	30	83	8.0	1.18	7	131.1	30.9	3.1	-
NOV.	50.2	37.6	63	33	79	7.0	1.19	6	168.7	36.1	3.1	1
DEC.	61.3	42.4	73	32.6	79	7.0	1.470	7	238.0	46.2	3.4	-
TOTALS							22.556 inches		1455.4 hours = 32.82%			

APPENDIX VIII.

1943

Month	TEMPERATURES Mean Daily Max	Mean Daily Min	Ext. Max.	Ext. Min.	REL. HUM **	Cloud Amnt in Tenths **	RAINFALL Total Fall	Days of 0.04 or more	SUNSHINE Total Hours	%	WIND Mean Beauf Speed **	GALES
JAN.	54.5	43.6	67.0	39.0	74	8	3.950	19	195.7	39.6	3.5	-
FEB	56.7	44.2	61.2	38.0	78	7	3.160	15	135.8	33.5	3.4	-
MAR	55.9	42.6	69.3	34.0	76	7	1.990	9	163.3	42.1	3.7	-
APR.	52.6	39.3	63.0	28.2	84	7	1.670	7	105.4	31.8	2.8	-
MAY.	46.9	36.2	59.0	27.1	84	8	1.948	8	86.5	33.5	3.0	-
JUN.	44.3	34.1	47.9	27.7	86	6	0.907	7	68.0	29.0	3.2	-
JUL.	43.9	33.8	50.4	23.3	87	7	2.910	13	57.1	22.3	2.8	-
AUG.	44.8	33.0	48.1	27.4	88	8	1.930	15	64.3	21.2	3.0	-
SEP.	48.5	33.9	55.3	28.3	86	8	2.570	14	93.8	26.4	3.0	-
OCT.	51.4	37.4	61.2	29.9	79	6	1.010	5	188.5	44.4	3.3	-
NOV.	51.8	38.3	57.3	31.2	76	8	2.121	14	161.4	34.5	3.0	-
DEC.	56.9	42.3	68.6	35.5	78	8	2.725	10	129.4	25.1	3.3	-

Note: All observations were taken at Port Stanley
** Cloud and Wind figures are based on 0900 hour observations.

APPENDIX IX.

1944

Month	TEMPERATURES Mean Daily Max	Mean Daily Min	Ext. Max	Ext. Min	REL. HUM. **	CLOUD Amount in Tenths **	RAINFALL Total Fall in inches	Days of 0.04 or more	SUNSHINE Total Hours	%	Wind Mean Beauf. Speed **	Gale
JAN.	54.4	40.7	65.5	33.9	79	7.9	2.963	15	172.5	34.5	3.6	-
FEB.	56.0	41.9	71.3	34.5	81	5.6	2.213	11	177.4	43.8	3.1	-
MAR.	56.7	42.7	64.9	35.7	83	6.0	1.249	8	167.6	43.2	3.5	-
APR.	49.7	37.7	58.9	32.8	85	8.0	1.378	9	96.2	30.5	2.6	-
MAY	46.3	35.3	57.0	27.5	89	6.0	2.388	13	84.9	31.2	3.1	-
JUN.	39.4	29.1	47.0	22.2	83	7.1	2.824	20	80.6	34.3	2.9	-
JUL.	38.9	31.3	44.9	23.3	87	8.6	2.232	13	33.9	13.2	3.1	-
AUG.	41.9	32.5	48.8	23.9	88	7.6	2.528	15	76.8	25.4	3.2	-
SEP.	45.3	34.0	56.2	27.4	82	6.1	1.022	8	139.5	39.5	3.2	-
OCT.	48.7	36.4	57.9	29.9	80	8.1	2.373	10	123.1	29.0	3.7	-
NOV.	51.8	38.5	62.6	33.1	73	7.8	1.189	6	147.2	31.5	3.7	-
DEC.	54.5	42.3	66.4	37.9	77	8.6	4.667	12	97.3	18.8	3.8	1

** Cloud amount and mean wind speed are based on 0900 hour observations

APPENDIX X.

1945

Month	TEMPERATURES Mean Daily Max	Mean Daily Min	Ext. Max.	Ext. Min.	** Rel Hum	** Cloud	Rainfall Total Fall inches	Days of 0.04 or more	Sunshine Total Hours	%	** Wind Mean Speed Beauf.	** Gales
January.	57.5	43.4	71.0	35.3	78	7.6	2.799	10	197.1	39.4	3.5	-
February	56.6	43.7	64.6	36.1	83	8.0	2.759	12	131.2	32.37	3.4	1
March	56.2	41.4	73.1	33.2	79	7.9	2.908	12	139.6	35.97	3.3	-
April	48.4	37.4	57.9	27.6	85	8.4	3.482	15	69.6	22.10	3.0	1
May	44.9	35.3	50.6	26.8	88	7.3	2.708	10	64.1	23.57	3.4	1
June	39.7	30.7	45.5	20.2	88	8.7	3.652	16	41.4	17.64	3.4	1
July	40.2	30.8	45.8	22.0	89	8.6	2.004	12	62.6	24.44	3.0	-
August	42.1	33.2	48.2	27.5	87	7.1	2.755	11	66.5	21.96	3.0	-
September	45.1	34.4	56.3	25.5	86	7.0	3.114	11	91.3	25.87	4.2	-
October	51.3	35.7	59.8	27.8	80	7.4	0.913	7	187.1	44.03	4.9	3
November	52.0	37.1	69.9	28.5	73	7.7	0.879	7	181.2	38.78	4.8	1
December	56.6	42.1	70.2	32.2	81	8.4	3.544	12	146.1	28.33	4.0	-

** Observations marked thus, refer to 0900 hours

APPENDIX XI.

ACREAGE, NUMBER OF CATTLE & SHEEP, AND CONCENTRATION

of Some Falkland Island Farms.

STATION	Estimated Actual Acreage	Cattle 1945	Sheep 1945	Acreage per head Cattle	Acreage per Sheep
Darwin & Lafonia	764,501	3983	170,142	191.94	4.493
Port Stephens	234,910	750	31,628	320.51	7.427
Port Howard	180,000	608	35,242	296.01	5.108
Fox Bay West	168,665	246	28,916	685.63	5.833
Douglas	153,295	292	24,355	524.98	6.294
Fitzroy	152,446	974	37,702	156.52	4.043
Hill Cove	143,124	348	28,787	411.25	4.972
Evelyn	141,701	228	23,868	621.49	5.937
Chartres	131,174	498	24,876	263.39	5.273
Fox Bay East	117,839	357	27,224	330.80	4.328
San Carlos	90,504		25,233		3.588
Port San Carlos	82,880	490	27,459	169.13	3.018
Gibraltar	81,951	174	16,921	469.83	4.843
Roy Cove	77,628	194	15,587	400.14	4.980
Berkeley Sound	52,578	210	15,018	250.38	3.501
Port Louis	39,500	100	11,394	395.00	3.467
Speedwell	33,249	346	12,252		
Saunders	32,000	55	7,753	581.81	4.127
Rincon Grande	24,479	60	11,223	407.98	2.181
Bluff Cove	15,485	22	3266	703.86	4.741
Moody Valley	7,775	19	1,893	409.2	4.107
New Island	5,946	22	2,311	212.83	2.572
Mullet Creek	4,521	24	1,374	188.37	3.290
West Point Island	2,700	20	2,473	135.90	1.092

Concentration of Sheep per Head of Cattle - 57.22
Concentration of Sheep per Horse - 192.00
Concentration of Sheep per Horse and per Head of Cattle - 43.93

APPENDIX XII.

APPENDIX XII — STOCK IMPORTED SINCE 1923

Country of Origin	Stock	1923/24	1924/25	1925/26	1926/27	1927/28	1928/29	1929/30	1930/31	1931/32	1932/33	1933/34
erra del F		75	5131 e									10
ew Zealand				352	262				10			
.Kingdom	Sheep	6	3	20	12		10	30	31			32
ustralia		30										
	Cattle							6	3			
	Horses	124	529	100	23		29	101	105			
	Swine								12			

	1934/35	1935/36	1936/37	1937/38	1938/39	1939/40	1940/41	1941/42	1942/43	1943/44	1944/45	1945/46
SHEEP (Rams)	145	64	379	1008	70	12	19	63	6	27	14	-
(Ewes)	100	43		220	207							
HORSES	164	211	40	17	9	20	71	46	4	55	57	2
GOATS			3									
DOGS	1	2	1				2	4	23		27	60
									Beagles		Huskies	Huskies
IBIS				6	22							
BULLS		1		5	5					1	2	
GUANACO	5	6		5	10							
SKUNKS				3								
OSTRICH				3	20							
FOX	10				6							
PIGS	2				3		3	13	17			
GUINEA PIGS		5										

APPENDIX SHEEP EXPORTED	1934/35	1935/36	1936/37	1937/38	1938/39	1939/40	1940/41	1941/42	1942/43	1943/44	1944/45	1945/46
	-	2331	31328	31709	26285	14117	630	-	-	-	-	-

APPENDIX XIII.

appendix XIII PRODUCTION OF MILK IN LBS PER MONTH GOVERNMENT HERD.

MONTH	1940	1941	1942	1943	1944	1945	1946
JANUARY		4412 (6)	5101 (9)	8803 (14)	11525 (16)	13690 (14)	13726 (16)
FEBRUARY		3147 (6)	3870 (10)	6210 (11)	9448 (14)	13160 (16)	11485 (17)
MARCH		2086 (5)	3837 (10)	5622 (11)	9366 (14)	14563 (16)	10143 (13)
APRIL		1846 (6)	4296 (11)	5797 (13)	7917 (15)	10875 (15)	8665 (11)
MAY		1836 (6)	4622 (11)	5884 (12)	6972 (12)	8404 (13)	
JUNE		1629 (6)	3641 (9)	4900 (12)	7308 (12)	8599 (12)	
JULY		1581 (4)	3094 (9)	4430 (10)	7177 (11)	10590 (14)	
AUGUST		1980 (4)	2683 (6)	4889 (11)	8791 (10)	14830 (16)	
SEPTEMBER	2521 (	2126 (4)	2114 (6)	4451 (9)	9455 (12)	11681 (16)	
OCTOBER	2826	3603 (6)	2322 (6)	7509 (13)	15639 (14)	12939 (17)	
NOVEMBER	4122	5135 (8)	8147 (14)	12740 (16)	15531 (14)	13473 (14)	
DECEMBER	4644	5362 (8)	9531 (14)	12923 (15)	14212 (14)	12202 (15)	
TOTALS		34743	53258	84158	123341	145006	

NOTE: Figures in brackets indicate number of cows milked during the month.

Appendix X

MILK PRODUCTION P

(Recorded in po

	Primrose.	Daisy.	Sunday.	Black Bess.	Fanny.	Daffodil.	Blackie.
940.							
eptember.	679	420	11th. 362				
ctober.	725	508	770	13th. 538			
ovember.	760	487	804	775	1st. 876	13th. 418	
ecember.	774	531	802	760	882	895	
941.							
nuary.	772	473	732	724	840	871	
bruary.	664	294	544	387	624	634	
rch.	448	19	406	252	473	488	
ril.	200	-	358	220	380	421	4th. 267
y.	-	14th. 426	250	223	303	379	255
ne.	-	648	137	80	208	344	212
ly.	398	594	59	-	-	322	207
gust.	929	533	-	-	-	279	239
ptember.	865	538	-	-	-	-	224
tober.	840	552	-	-	-	793	230
vember.	860	544	6th. 656	1st. 947	-	868	166
cember.	866	538	875	854	-	834	
42.							
nuary.	824	434	755	628	-	792	
bruary.	571	214	532	435	-	554	
rch.	514	43	444	421	-	510	
il.	396	205	330	315	-	509	
y.	134	723	268	162	-	481	
ne.	-	639	210	3	-	409	
ly.	306	458	88	-	-	286	

V

R COW PER MONTH

nds.)

Bridget.	Malvina (old)	Buttercup.	Teal.	Keitha.	Gypsy.	Queen.	Friday	
3th. 334	15th. 194							
728	461							
661	433							
544	458	9th. 293						
460	389	471	14th. 348					
357	275	346	209	2nd. 347				
369	93	359	93	193	19th. 498	10th. 456	28th. 42	
296	-	322		292	497	703	429	
183	1st. 817	302		202	350	597	403	
25	788	267		164	316	500	320	

	Primrose.	Daisy.	Sunday.	Black Bess.	Fanny.	Daffodil.	Bridget.	Malvina.	Buttercup.	Keitha.	Gypsy.
ugust.	790	358	-	-	-	90	-	600	108	-	157
eptember.	642	321	-	-	-	-	-	462	-	-	157
ctober.	703	293	-	30th. 57	-	-	-	541	27th. 79	-	99
ovember.	748	285	626	829	-	1131	544	416	756	128	-
ecember.	821	175	826	830	-	1157	932	438	767	674	-
943.											
anuary.	805	117	766	788	-	1063	690	408	723	558	-
ebruary.	665	-	627	541	-	749	593	137	461	329	-
arch.	608	-	589	363	-	753	493		403	221	-
pril.	455	4th. 718	427	270	-	640	356		298	110	13th 38
ay.	83	689	287	27	-	437	329		281		58
une.	-	548	124	-	-	364	235		230		41
uly.	-	465	5	-	-	285	20		155		38
ugust.	1st. 973	396	-	-	-	14	-		-		37
eptember.	880	368	-	-	-	-	-		-		29
ctober.	1001	469	8th. 608	-	23rd. 215	-	143		27th. 122		-
ovember.	878	391	777	274	850	649	761		910		-
ecember.	839	482	745	1043	777	1058	851		899		-
944.											
anuary.	811	455	565	906	748	979	656		755		-
ebruary.	740	209	463	659	516	773	549		553		-
arch.	792	-	392	582	516	879	493		591		-
pril.	709	20th. 313	290	381	455	703	317		431		20th 36
ay.	672	611		356	331	500			402		75
une.	648	604		31	268	20			252		68
uly.	514	491			-	-			-		46
ugust.	-	400			4th. 1273	-			-		42
eptember.	-	406			1356	-			-		42
ctober.	5th. 1130	39			1217	5th. 1076			15th. 575		3
ovember.	1223	-			1027	1167			1181		
ecember.	1089	-			907	1108			1071		

Queen.	Friday.	Ellen.	Yoe.	Mary.	Snowball.	Fairy.	Beauty.	Roberts.	Stocky.	Pepper.	Zeana.
415	165										
377	155										
348	120	28th. 131									
224	-	639	597	616	588						
664	867	669	867	619	592						
139	-	652	865	573	656						
-	-	459	726	429	494						
-	-	575	799	373	498						
-	17th. 325	430	730	304	427						
-	463	350	680	167	379	2nd. 854	17th. 277				
-	362	306	635	-	332	789	557				
14th. 209	347	296	631	-	313	830	491				
818	291	214	415	-	214	738	375	18th. 68			
826	236	160	291	-	85	747	350	217			
913	-	-	7th. 934	3rd. 1403	-	866	391	325			
816	-	1283	1st. 1288	1105	1st. 1202	731	370	350			
799	-	1032	1101	783	923	776	470	363			
716	-	814	1053	591	679	854	524		17th. 419		
592	-	608	962	363	450	619	293		1105		
662	-	707	1010	392	458	585	-		1309		
536	-	556	799	240	247	124	13th. 510		971		
368	-	467	859	-	-	-	683		967		
181	614	505	687	-	-	12th. 1082	706		933	26th. 90	
105	686	448	513	-	-	1574	646		1000	739	
1321	546	-	-	-	-	1557	710		1117	811	4th. 630
1242	420	18th. 520	-	23rd. 360	-	1324	620		1012	822	952
1277	1	1450	1487	2nd. 1147	1297	1363	616		967	763	992
1138		1258	1582	1218	1229	1312	553		906	751	986
1084		1120	1570	1108	1063	1343	481		510	669	970

	Primrose.	Daisy.	Fanny.	Daffodil.	Buttercup.	Queen.	Ellen.	Xoe.	Mary.	Snowball.	Fairy.
45.											
nuary.	1003	-	817	989	940	1001	1075	1380	886	872	1279
bruary.	822	-	638	870	761	805	894	1126	670	751	1171
rch.	884	-	569	793	802	742	828	1246	664	693	1210
ril.	853	-	151	614	609	492	636	1061	417	449	823
y.	503	19th. 257	-	473	476	6	468	828	-	290	165
ne.	313	571	-	78	244	2nd. 1180	-	488	-	-	2nd 1093
ly.	-	648	313	-		1279	31st. 151	-	31st. 42	-	1126
gust.	-	710	203	8th. 574		1589	1524	-	1366	-	943
ptember.	-	629	950	784		945	1156	-	977	-	761
ber.	-	724	980	853		1006	1114	-	866	-	860
vember.	-	696	913	789		929	964	2nd. 1432	603	-	840
cember.	-	737	874	736		845	851	1509	460	91	800
46.											
nuary.	-	699	817	698		758	799	1504	438	720	770
bruary.	-	493	683	508		577	533	1283	295	660	533
rch.	-	48	582	334		57	441	1255	101	693	52
ril.	-	-	524	141		285	161	1229	-	584	69

Beauty.	Stocky.	Pepper.	Zoana.	Princess.	Sunshine.	Trixie.	Betty.	Miggie.	Bess.
22	649	733	829	1205					
-	1375	674	638	1097	15th. 415				
-	1473	731	566	1220	972	15th. 447			
452	1083	628	-	899	789	919			
696	1065	458	-	880	737	677	19th. 422		
564	992	24th. 280	-	745	561	559	931		
706	952	1139	20th. 454	702	639	590	1012	20th. 286	
436	744	986	1188	470	500	452	1003	602	7th. 570
343	635	809	1012	-	379	315	877	540	570
346	666	823	1143	24th. 327	410	406	1030	671	714
122	278	766	1149	1461	100	90	960	734	692
	-	722	1111	1048		-	988	731	699
	7th. 1285	725	1022	1037		-	1023	730	721
	1382	575	813	969		27th. 81	874	598	628
	1345	501	671	972		1233	881	445	532
	1253	512	345	927		1170	752	313	400

APPENDIX

YIELDS OF COW

SEASON.	Primrose	Daisy	Sunday	Fanny	Black Bess	Blackie	Daffodil	Bridget	Malvina
1938-39.		10/3/38 4417	6871		3599				
1939-40.	3884	5297			3877	4/40 1800	11/40 5051		
1940-41.	5840 17/7/41	5467 14/5/41	5224 6/11/41	11/40 4583	10/40 3959 1/11/41	-	10/41	13/9/41	9/41
1941-42.	7197 7/42	5092 4/42	4157 11/42	-	3765 10/10/42	-	6126 11/42	3957 11/42	2303 1/5/
1942-43.	6626 1/8/43	3575 4/4/43	4277 8/10/43	-	3705 11/43	-	6594 11/43	4192 10/43	5361
1943-44.	9457 10/44	5190 4/44	3840	-	4232	-	5561 10/44	3770	-
1944-45.	7820	2853	-	-	-	-	7174 8/45	-	-
1945-46.	-	-	-	-	-	-	5417	-	-

	Fairy.	Fanny.	Stocky.	Beauty.	Pepper.	Zeana.	Princess.	Sun
1943/44.	5/43 8513	10/43 4676	1/44 11216	7/43 4098				
1944/45.	6/44 14221	8/44 7955	1/45 9912	4/44 5530	6/44 7969	8/44 6573	12/44 7337	
1945/46.	6/45 7432	7/45 8173	1/46	4/45 3665	7/45 7838	7/45 8908	10/45	

	Milk Production.	Cows.	Heifers.
1938-39.	14,887	3	
1939-40.	14,858	4	
1940-41.	30,124	6	
1941-42.	36,427	10	
1942-43.	67,598	9	7
1943-44.	103,619	15	4
1944-45.	151,078	15	6

KY

PER LACTATION.

Butteroup	Teal	Keitha	Gypsy.	Queen	Friday	Ellen	Yoe	Mary	Snowball
9/12/41	14/1/42								
2703	557								
2 27/10/42		1127	1986	10/3/42	28/3/42	28/10/42	10/42	11/42	11/42
4153	-	2/2/42	13/4/43	4406	1873	4821	7243	3081	4578.
27/10/43		11/42	13/4/43	7/43	4/43	11/43	10/43	10/43	11/43
4915	1799	2799	2430	7436	2024	6420	9213	4877	3959
10/44			3/44	7/44	6/44	9/44	10/44	9/44	10/44
6659	-	-	3142	9213	2253	8249	10768	6780	6789
4/43				6/45		7/45	11/45	7/45	
sold	-	-	-	9165	-	7574		5148	-

hine.	Betty.	Daisy (jr.)	Nigger.	Bess.	Glenis.	Trixie.
						2/45
45	5/45					5625
02	10753					
		5/45	7/45	8/45	12/45	2/46
		6212				

Av./Cow.	Av./Heifer.
4,962	
3,714	
5,021	
3,642	
4,401	3,998
5,008	7,126
7,154	7,251

APPENDIX XVI.

delete

AGRICULTURAL DAIRY HERD.

31st. Dec., 1945

Year - 1938.	39.	40.	41.	42.	43.	44.	45.
Sex -	M F.	M F.	M F.	M F.	M F.	M F.	M F.
Calves - 5.	0 2.	3 4.	4 4.	11 8.	11 7.	12 9.	12 7.

Total -	Male Calves.		53.
"	Female Calves.		41.
"	Unknown Sex.	(1938)	5.
			99.

Average Calves Born 12.37 per annum.

Total Dairy Herd. 57 animals.

Dairy Cows in Milk.	18.
Maiden Heifers.	20.
Heifers in Calf.	10.
Yearing Bull.	1.
Small Bulls.	6.
Dry Cows.	2.
Total animals.	57.

APPENDIX XVII.

PEDIGREE AND PRODUCTION RECORD OF GOVERNMENT HERD

delete

Season	PRIMROSE	NIGGER	PRINCESS
1939/40 ..	3884.....X		
	(KDB)		
1940/41 ..	5840.....m (Fitzroy)		
1941/42 ..	7197.....m X		
	(DKTW)		
1942/43 ..	6626		PRINCESS
	(DKTW)		(KDB)
1943/44 ..	9457	NIGGER	
1944/45 ..	7820.....m T.I.Red.	[illegible]	7334....(F)241
			(KDB)
1945/46		5650 plus	6426....(F)256

MARY

1942/43....	(KTW) 3081 .....mX	
1943/44....	(KTW) 4877 .....m	
1944/45....	(DK) 6725	F 238
1945/46 ...	(DK) 5143 ..... m	
1946/47 ...	Sold to Teal Inlet	

PEDIGREE AND PRODUCTION RECORD OF GOVERNMENT HERD

DAFFODIL

1940/41	(KDB) 5051			FAIRY
1941/42	(KTW) 6126			STOCKY
1942/43	(KTW) 6594	m Daffodil King		(KDB) 8513 X
1943/44	(KTW) 5561 X		(KDB) 11,189 mX	14,221 F
1944/45	(DK) 7174 X		9912 F	(KDB) 7432 F. 223.
1945/46	(DK) 5417 X		(KDB) ? (7/1/46) F	? F

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PEDIGREE AND PRODUCTION RECORD OF GOVERNMENT HERD

	DAISY				
1938/39	4417 X				
1939/40	5297..... X				
1940/41	5467.....mX				
1941/42	5092				BEAUTY
1942/43	3575		ZEANA		(KDB)
1943/44	5190	DAISY JUNIOR			4098 ..... m
1944/45	SOLD FOR BEEF .....F 219	(KDB)	(DK)		(KDB)
			6573		5530 .....F
1945/46		6212	(DK)		(DK)
			8908		3665 .....m
					(inc)
		Sold to Teal Inlet.	(DK)		Sold to The Hon. D. Roberts. OBE
			30/5/46 ..... m		

PEDIGREE AND PRODUCTION RECORD OF GOVERNMENT HERD

BLACKIE

1938/39 ..... QUEEN

1939/40 1800 .....f X

1940/41 .....m X (KDB)

1941/42 4406 ..... mX

1942/43 SOLD FOR BEEF

(KTW)
1943/44 7436 ..... BESS

(KDB)
1944/45 9213 .....mX

(KDB)
1945/46 9165 .....m 5526.....
(DK)

1946/47 .....F

Adele

PEDIGREE AND PRODUCTION RECORD OF GOVERNMENT HERD

BLACK BESS

1938/39	3599.....X			
1939/40	3877.....X			
1940/41	(KDB) 3959.....			JOE
1941/42	3765 .....mX			
1942/43	(KTW) 3705	TRIXIE	7243 ..... mX	
1943/44	4232 ..... fX		(KTW) 9213	F 63
1944/45		(?) 5625 ..... mX	(DK) 10768 .....F 243	
1945/46		(KDB) .....m	(DK) 8213(6 months) .....F 257	

NOTE : Yields are indicated in weights of milk per lactation in lbs.
KDB = Koromiko Dutch Boy
KTW = Dalefield King Trojan Wayne
DK = Daffodil King

PEDIGREE AND PRODUCTION RECORDS OF GOVERNMENT HERD

FANNY

1939/40	7675		
1940/41	(KDB) 4583	FANNY JUNIOR	
1941/42	Killed Aged		
1942/43		(KTW)	
1943/44		4676 .....m	
1944/45		(KDB) 7955 .....m	
1945/46		(KDB) 8173	F 255

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PEDIGREE AND PRODUCTION RECORDS OF GOVERNMENT HERD

	SUNDAY		FRIDAY	
1936/37	3415	X		
1937/38				
1938/39	6871	X		
1939/40	(KTW)			
1940/41	5224	mX		
1941/42	4157	mX	(KTW) 1873	FX
1942/43	4277	mX	(KTW) 2024	mX
1943/44	3840	mX	(KDB) 2253	F 222

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PEDIGREE AND PRODUCTION RECORDS OF GOVERNMENT HERD

BUTTERCUP

1941/42	2703.....FX		**SNOWBALL** (KTW)		
1942/43	4153 .... FX		..... 4578.....	**SUNSHINE**	
1943/44	(KTW) 4915 .....**GLENIS**		..... 3959 ..... mX	(KDB)	
1944/45	(KDB) 6659 .....F 240	(KDB)	..... 6789 .....m to West Point SOLD TO McCARTHY	5502 .....mX	
1945/46	Sold Sea Lion I.	2164(6 months).....F 258			

	MARY		**ELLEN**	**PEPPER**
1942/43	(KTW) 3081 .....mK		4821..... m to T.I.	
1943/44	(KTW) 4877 .....m		6420 ..... mX	
1944/45	(DK) 6725 ..... F 238		8402 .....mX	(DK) 7969 ..... F 224
1945/46	(DK) 5143 .....m		7350 ..... F 251	(DK) 7838 ..... F 253 (inc)
1946/47				

Catalo

APPENDIX XVIII. Delete + publish separately

Report on Visits to Centres of Peat and Hill Reclamation, and its Application to Falkland Island Conditions

The work of the Macaulay Institute at Carnwath Lanarkshire and the Isle of Lewis

Correspondence with Dr Ogg, and Dr Fraser brought forward the information that the Institute is not at present undertaking any peat reclamation work. The area in Lewis where reclamation was attempted has been let to a tenant, and the area at Carnwath Lanarkshire, is being farmed by the Department of Agriculture for Scotland. I was shown over Woodend Farm, Carnwath, by one of the Department's inspectors Mr Sinclair. Dr Ogg advised that a visit to Lewis was not worth while.

Types of Peat

The Lewis experiment was on a highly Colloidal peat of the Scirpus type, varying in depth from 1 to 15 ft, and averaging 3 or 4 ft. Lewis is covered with Blanket moss peat of this type, formed as a result of the prevailing climatic conditions- high rainfall, humid atmosphere, cool summers and mild winters. This peat is plastic and almost impermeable to the passage of water, making drainage very difficult, and this problem has not been satisfactorily solved. It is also difficult to obtain a satisfactory tilth for a seed bed.

The Carnwath area is on a raised moss formed from an oligotrophic (acid) low moor. The peat is 15-25 feet deep, is local in origin, formed in a large basin owing to continuous water-logged conditions. The situation is 700 feet above sea level but the climate is better than Lewis, the summers being warmer and less humid, and the moss is surrounded by good cropping arable land. This is a fibrous Sphagnum-Eriophorum peat derived from sphagnum moss with cotton grass and some heather. The present vegetation is chiefly heather. It is easier to drain and does not require much cultivation to form a satisfactory seed bed. The Carnwath peat is practically useless as fuel, while the Lewis type makes excellent fuel. Both types are extremely low in lime, phosphate, potash and available nitrogen.

Method of Reclamation at Carnwath

(a) Drainage Drainage was the first step towards reclamation and a system was laid down consisting of collecting ditches 6 ft. deep and 200 yards apart, discharging into natural water courses, with subsidiaries 4 ft. deep and 20 yards apart running into these. The ditches were dug out and left for a year or two during which time the peat shrank considerably. They were then cleaned out and deepened to the original depth, wooden box drains were laid in the subsidiaries and these covered over. The wooden drains were made of 4" x ½" planks nailed together to form a continuous channel throughout with the top slightly raised on small strips of wood to allow water to enter.

(b) Cultivation The ground was first burned over, which left it absolutely bare of vegetation except for a few sticks of heather. It was then limed and cultivated with a Fishleigh rotary cultivator behind a Fowler crawler tractor. Phosphatic, potassic and nitrogenous manures were then applied before cross cultivating with a Fishleigh to a depth of 4-6 inches. It was then heavily harrowed to level the ground and prepare a seed bed, and after sowing the seeds, was given a light harrowing to cover the seed. Finally it was rolled with a heavy water-filled roller weighing one ton per yard.

(c) Liming and Manuring. Lime was applied at the rate of 2 tons CaO per acre, either in the form of ground lime or as a waste lime. Other manures applied were 9 cwt per acre of a high grade high-soluble basic slag, 4 cwt per acre of 30% potash salts and 1-1½ cwt per acre of nitro chalk.

(d) Seeds The following two seed mixtures were used per acre: The usual time of sowing being May, but excellent takes have resulted from sowing as late as September.

A.	B.
20 lbs Perennial ryegrass	7 lbs perennial ryegrass
8 lbs Cocksfoot	20 lbs Timothy
4 lbs Timothy	1 lb Rough stalked Meadowgrass
½ lb rough stalked Meadow grass	1½ lbs late flowering Red Clover
1 lb Crested Dogstail	2 lbs Alsike
1½ lbs late flowering Red Clover	1 lb wild white clover
2 lbs Alsike	32½ lbs
1 lb wild white clover	
38 lbs	

Results

The method outlined above was that followed at Carnwath, but similar methods as well as others were tried at Lewis. Dr Ogg advised that although " not exactly a failure " the results there would not justify a visit.

At Carnwath the resluts have been very satisfactory and 250 acres have been reclaimed from practically useless moss to useful grazing. The moss in its original state is not used at all, and all the productivity of the improved part represents clear gain. These 250 acres are now carrying approximately the following stock per acre:

In winter : 1 ewe In summer : 1½ ewes and their lambs
½ 2 year old heifer

During the first year or two the grass tended to get ahead of this stocking and the mowing machine had to be used, but now after 8 years productivity is less and the stock can cope with it easily.

Ryegrass and cocksfoot have decreased considerably and fog is on the increase. The dominant grass is now crested dogstail, and there is a fair amount of Timothy with wild white clover well distributed throughout. Rushes have appeared and are said to have spread rapidly during the last two years. It would appear that the area will soon need re-seeding if it is to be maintained as a really productive pasture. Perhaps if a proportion of the grazing strains of ryegrass and cocksfoot had been included in the seeds mixture and if some attention had been given to further liming and slagging, the pastures could have been made to last longer, but as the drains are still in perfect working order it will not be very costly to re-seed a second time. The effects from draining can now be clearly seen in the undulations of the land, which was flat when seeded down. The ground has sunk by about 18 inches over the drains, and progressively less away from them. The best grass is now that over the drains and the danger of overdraining may have been overestimated; possibly drains every 10 yards instead of every 20 would have been an improvement.

Manurial Trial A small manurial trial with plots receiving lime, slag and potash salts, at the rate used over the main areas, alone

alone....

and in combination with each other proved very instructive. The complete treatment plot showed an excellent award of grasses and clover, the lime plus slag plot was reasonably good but not nearly as good as the complete, and contained considerably less clover; the lime plot alone contained a proportion of sown grasses and all others had reverted to the original vegetation.

Economics The scheme has been an economic success; in 7 or 8 years the additional revenue derived from the farm due to the reclamation work has probably equalled the total cost of reclamation.

The cost of the work is estimated at ~~£2~~ £22 per acre, but this does not take into account depreciation on implements, which might add on another £3 per acre. Of this amount, about £13 per acre was spent on drainage work.

Implements The chief implements used were the crawler tractor and the Fishleigh cultivator and the heavy roller along with ordinary farm implements such as heavy and light harrows, manure and seed sowers. Lime was hauled on to the land on a large sledge behind the tractor and was spread from this with shovels. A draining plough had been used to cut part of the drains, but this was not at hand to be seen.

The value of a really heavy roller for this type of land was stressed.

The Fishleigh rotary cultivator with its dozens of knives revolving on an axle driven by the power take off of the tractor had no difficulty in tearing this land up and obtaining a reasonable tilth in two operations. On a really tough grassy turf it is not very effective.

The crawler tractor used was a Fowler 30 H.P. and although the engine was described as perfect and giving absolutely no trouble, the general performance of the tractor was not considered good, as there was a heavy cost for spares and renewals. The cost of the tractor was about £500 and it was stated that another £500 worth of spares had been necessary. The tractor is certainly worth no more than half its cost price today, so that depreciation and running repairs on the tractor alone work out at £3 per acre for the £250 acres.

Application to the Falkland Islands

The peat of the Falklands is more of the Lewis type than the Carnwath type, being climatic in origin and not local. It is colloidal and plastic and makes excellent fuel when dry as does the Lewis peat, and it is difficult to drain.

It would appear to be best to avoid deep peat in any reclamation work in the Falklands as at best it is likely to prove an expensive business. This view coincides with that of Dr Ogg who writes :

" My own feeling is that you would do well to concentrate in the Falklands on areas where drainage is likely to be easy, e.g. the peat of the thinner type on slopes, or peat of a fibrous nature."

Fibrous peat of the Carnwath type does not occur to any extent in the Falklands, but there are considerable areas covered by thin peat. The whole of the Falklands might be regarded as covered by Blanket moss type of peat owing to the climatic conditions prevailing, but there are areas where because the natural drainage is good, and the rainfall not excessive, the drying summer winds result in land ceasing to be water-logged for fairly long periods during the summer. Such areas are covered by a shallow layer of peat, or rather peaty soil containing a fair proportion of mineral matter. The vegetation usually consists of "white" grass, small fern, Christmas bush and diddle dee.

It is these areas that offer most scope for land improvement, and they can readily be compared with the nardus and bent pastures on the slopes of the mountains of England and Wales, where the rainfall is heavy, but where owing to good natural drainage the land lies fairly dry in summer.

There has been much interest in recent years regarding the possibility of improving these nardus pastures. Prof. Sir George Stapledon and his colleagues at Cahn Hill have done a great deal of pioneer work, and more recently, as a war measure, much has been done by various County War Agricultural Executive Committees, of which perhaps the most noteworthy is the Montgomeryshire Committee.

Dr Ogg advised visiting Dodwell, Cahn Hill, Montgomeryshire, and other counties in the north of England where reclamation work had been done.

Orkney

Acting on a suggestion from Dr Tempany that Orkney might be well worth a visit, having a climate similar to that of the Falklands, I got in touch with Mr A.R.Wannop, Director of County Agriculture, North of Scotland, giving him an account of Falkland Island conditions and stating that we were particularly interested in reclaiming hill or peat land for pasture establishment, and also in finding a variety of oats suitable for ripening in the Falklands.

Mr Wannop replied as follows:

" While the Orkney Islands are very interesting, I doubt if you would learn very much by visiting them. The cultivated areas are not hilly in the accepted sense, but really gentle slopes. The amount of peat on them is very slight.. It is a very thin layer and is dry. Areas of deeper and wetter peat in Orkney have been left alone. As a matter of fact Orkney has had prominence in the last 30 or 40 years for doing what the rest of the country did a hundred or more years ago. They have not any special technique for bringing the land into cultivation. Most of it was done in the oldfashioned way with horse ploughs, and of cours they always take a rotation of crops. They have no difficulties in getting suitable varieties of oats, though they concentrate mainly on the straw varieties as they need these for fodder. They ripen quite well. Bere, the local form of barley, also does extremely well with them. It has a shorter growing season than oats. The oat varieties favoured are the various strains of potato oats, and also Bell and R 30, both of which are Scottish productions. There is a grey awned oat known as Grey Murtle which is peculiar to Orkney, but this is only used on certain light soils full of shell sand , and which are alkaline. Improved oats will not grow on these soils.

I take it that you would be attempting first the thin layers of peat mixed with mineral soil, and for this I am convinced that the standard methods of cultivation are suitable. "

On the strength of this reply I did not consider a visit to Orkney would justify the expense. The oat varieties mentioned should be worth a trial, although earlier ripening varieties than potato oats have already been tried without success. The barley variety may also

may also....

have possibilities though generally oats will suit Falkland Islands soils better than barley. The Murtle Oats requiring an alkaline soil would hardly suit the Falklands.

Cahn Hill, Dodwell, and the work of the Montgomeryshire and other W.A.E. Committees

Visits to Cahn Hill, Dodwell, and the Montgomeryshire areas were arranged through Mr Moses Griffith, Grassland Officer for Wales; Mr Wm Davies, Assistant to Sir Geo. Stapledon at Dodwell; and Dr Ellison, Chief Technical Officer to the Mont. W.A.E.C. regrassing of old rough hill grazing was also seen in Cumberland, Westmorland, and the West Riding of Yorkshire.

Scope of the work in the areas visited

At Cahn Hill some 250 acres of hilly, stony, high-lying rough pastures have been re-seeded.
At Dodwell, the Ministry of Agriculture's Grassland Research station over 2,000 acres have been reclaimed from derelict scrub to grow crops and grass. This is a heavy clay lowland soil, and such is therefore not similar to Falkland soil. Nevertheless the cost of reclaiming this scrubland is of interest as are the various strains of grasses to be seen in the pastures.

The Mont. W.A.E.C. have ploughed up 6,000 acres of rough hill grazing and of this some 4,000 acres have been sown down to grass. Some of this is on better soil than is available in the Falklands but the higher lying nardus and molinia grazings tackled are quite comparable to some in the Falklands. All this land is between 1,000 and 1,700 feet above sea level. In other counties several hundreds of acres of rough grazing land which have been reseeded were visited.

Cultivations

The technique employed in the cultivation of these areas has become fairly standardised, and involves the use of the plough. Other methods using surface cultivation only, either by disc harrow or rotary cultivator, are not practised to any great extent. To prepare a seed bed satisfactorily with disc harrows, the ground requires repeated

requires repeated...

discings (as many as 8 or 9 may be necessary) and the cultivation costs may in the end be heavier than if the plough had been employed. The disc harrow does not destroy existing vegetation completely, and the resulting pasture is not as good as that obtained by using the plough.

Where there is any tough surface mat, as there usually is on the type of land being dealt with, the rotary cultivator does not work at all satisfactorily.

The sowing of seeds without any surface cultivation is only of value in exceptional cases. Any improvement is very slow in appearing and in most cases it is considered better to plough.

The essential points in the cultivation technique for re-seeding rough grazings are : -

1) To plough deep enough to cover the old turf, ans to enable a sufficiently deep fine seed bed to be prepared.

2) To plough as flat as possible

3) To consolidate thoroughly by the use of heavy rollers

4) To prepare a good tilth by the use of heavy disc harrows followed by spike harrows

5) To make sure that the ground is consolidated .

This technique is that now adopted throughout the United Kingdom . The ground is ploughed, rolled, disced as many times as necessary, lime and fertiliser being applied before the final discing, harrowed, harrowed again lightly after seeding, and rolled until sufficiently consolidated.

Machinery

Tractors For really rough work a crawler tractor is essential At Dodwell and Cahn Hill, Caterpillar D 2's (25 h.p.) were in use and were considered very satisfactory.The Mont. W.A.E.C. had the following tractors in use:-

3 Allis Chalmers H.D.7 (54 h.p.); 2 International T.D. 9 (40 h.p.)
1 Caterpillar D.4 (35 h.p.) 2 International T.D. 6 (30 h.p.)
2 Caterpillar D.2 (25 h.p.) 1 Fordson with "roadless tracks (22 h.p.)

plus several Fordsons and Ford-Ferguson tractors for lighter work. All these tractors had done good work but the Fordson with " roadless tracks" was not considered a very good type of crawler tractor.

Of the other crawlers the Caterpillar tractors were considered to hace given best service, and it was recommended that the D.4 (35 hp) tractor was the most suitable for this type of work- lighter tractors did not have that reserve power so often needed.

Ploughs The essential features of ploughs for this work are weight and strength to enable them to stand the strain imposed, high clearance to avoid choking with trash, and a furrow slice wide enough to be turned over flat when ploughing to the depth of 10 inches. The most suitable ploughs are :-

Ransomes Jumbotrac and Junotrac (3 furrows 16-18" wide)
Massey Harris No 3 Grub breaker (1 furrow 20-24" wide)
Ransomes Solotrac (1 furrow 20-24 " wide)

The Caterpillar D.4 Tractor is capable of pulling the Jumbotrac, and the D.2 tractor the Grub breaker with ease. It appears that a plough turning two furrows about 20" wide, and capable of being pulled by a 30-35 h.p. tractor would be a big advantage. For really rough ground the Grub breaker and Solotrac are the most suitable ploughs at present, and of these the Grub breaker is the better in that it has a longer body and turns a rather flatter furrow.

Lighter ploughs can do very good work where conditions are not so rough, but where the amount of surface mat and old grass roots make it essential to plough to the depth of 10" or so, a good wide furrow is necessary.

No disc plough was seen but I was told that one had been tried and found unsuitable for the work as it could not completely bury the old turf.

Disc Harrows Heavy disc harrows, of the calibre of the Ransome "Baron" are everywhere in use.

Rollers, Harrows, Seed and Manure Broadcasters. These implements are all of the ordinary type. Cambridge rollers are most suitable and these should have plenty of weight. On the hill land where rainfall is heavy, seed is always broadcast but in drier areas it is found to be much safer to drill grass seed. Usually this is done with an ordinary corn drill, cross drilling to ensure an even cover of the ground. At Dodwell a special seed drill with 3" drills has proved very useful.

Tractor Trailers. All trailers seen working were mounted on pneumatic tyres. These were on the whole very satisfactory, though

though...

occasionally the wheels were not strong enough for the loads carried. Extra heavy wheels and tyres are needed, such as those used on heavy transport lorries. One trailer was seen fitted with " Roadless" tracks to carry 4 tons; this trailer was stated to be unsatisfactory as the tracks kept coming off in hilly land and it was laid aside while wheeled trailers were in use.

Excavator. Some drainage work done by a Priestman Cub Excavator was seen; this had made an excellent ditch 3 ft deep and it was stated that the machine was capable of doing 200 yards of such work per day.

Manures

Almost always these rough grazings have been found to be deficient in lime, phosphates, and available nitrogen. The requirements of these are determined by analysis, but in practice the dressings applied are usually 1½-2 tons per acre CaO, 10 cwt per acre high grade slag, and 1-1½ cwt sulphate of ammonia or nitro chalk. Deep peat has been avoided and serious potash deficiencies have not been met with. The above scheme of manuring would I feel sure work very well in the Falkland Islands, but the rates are fairly heavy and in view of freight charges to the Falklands, the position regarding smaller dressings needs attention. The follwoing points summarise the opinions of people undertaking the reclamation of rough hill land:-

1. To reseed without phosphate, even where lime has been applied, is a waste of time and money.

2. Basic slag is the best form of phosphate to use, particularly where lime has not been applied.

3. Basic slag at the rate of 10 cwt per acre and without lime has given results very little inferior to those obtained from slag plus lime in the first year, but there is a greater difference in favour of liming in subsequent years.

4. Where the lime status has been put right, applications of 5 cwt per acre basic slag have given quite satisfactory results, and applications of as little as 3 cwt per acre might be risked. In these cases however it is deemed advisable to give further applications of

further applications of...

slag as soon as possible.

5. Applications of slag less than 10 cwt per acre without lime have not been as successful.

6. Lime in England today is cheap and subsidised and the tendency is to put on all that is required. If slag is being used a dressing of 1 ton per acre of lime will suffice and smaller dressings of 10 cwt per acre might prove quite satisfactory.

7. Other forms of phosphate, super phosphate, triple super and ammonium phosphate- all give satisfactory results where the lime status has been put right; it would be risky to use these without the full application of lime and useless to use them with no lime at all. Triple super and ammonium phosphate being more concentrated have lower freight charges to bear per unit.

8. Some nitrogenous manure (preferably nitro chalk) should be applied at the time of sowing the seed.

Seeds Mixtures

In general the semi-permanent Cockle Park type of seeds mixture is used but there is a tendency to use even simpler mixtures. e.g. Ryegrass for the most fertile land, cocksfoot for drier areas, a mixture of ryegrass and cocksfoot for land of intermediate type, timothy alone or with ryegrass for damp peaty land, and of course with all of them, wild white clover and probably also Montgomery red clover.

A proportion of the Aberystwyth pasture strains of grasses should be included in the mixture. These pasture strains are not as productive as the commercial type during the first years of a new ley, nor are they as early or as palatable, but they do not seed so freely and provide more even grazing throughout the summer and they persist to cover the ground with their leafy growth when the commercial type disappear. The intermediate hay-pasture strain of grasses produced by the Aberystwyth Plant Breeding Station are particularly good, combining as they do high productivity with leafiness. Crested Dogstail is an extremely useful grass on this type of land and should be included in small quantities in all mixtures. The Aberystwyth red fescue S.59 is also well

is also well...

worth including in small amounts, but the seed of this is unfortunately very scarce. As a bottom grass sown in a timothy mixture rough stalked meadow grass is very useful.

The Time to sow the seed on these hills in England is April to July; to sow later than July is risky at high altitudes. It is often better to postpone seeding until July if it cannot be done by early May. In the Falklands the latter part of October and November would very often be too dry for sowing grass seeds while sowing later than mid-January would be running a risk.

Cover of Nurse Crops are not popular. The best nurse is 6-8 lbs per acre of Italian ryegrass with perhaps a light seeding of oats for grazing only

Pioneer Crops

Pioneer crops can play a very important part in the reseeding of rough grazing. By folding these off with sheep or cattle, humus is added to the soil which makes for a better take of the following grass seeds. Various crops have been used, rape, marrow stem kale, turnips, rib grass, rye and Italian ryegrass; the ones most suited to the Falkland Island conditions are probably winter rye and Italian ryegrass. By sowing winter rye and Italian ryegrass in January on land prepared for seeding too late to take the ordinary grass mixture , a good deal of winter and early spring keep could be produced at the same time as the land was being improved. These pioneer crops of course need applications of lime, phosphates, and nitrogen before seeding. Cultivations for the succeeding grass seeds consist of discing and harrowing ; on no account should the old turf be ploughed up again.

Some Results

Results generally have been very good and the proportion of failures small. The chief cause of failure is undoubtedly lack of attention to manuring and limeing; this is an all important factor. Other causes of failure have been sowing seeds at the wrong time, either too late in the year or when the ground was too dry, and the choosing of unsuitable land, difficult to plough

difficult to plough....

on account of slope or rocks with the consequence that cultivation and consolidation could not be properly carried out.

In Montgomeryshire the W.A.E.C. has reseeded some 4,000 acres which originally carried some 3,000 ewes and their lambs in summer and nothing in winter. It is now carrying 2,000 ewes and their lambs all the year round, and in addition 2,500-3,000 cattle during the summer. Individul hills have really startling production records; one block of 85 acres before treatment summered 80 ewes and lambs, rental value 3/- per acre £12-15-0 the hill. After reseeding this hill carried 500 sheep, and 80 cattle from July 24th to October 10th and the following year was let for £500 for 6 months (double its original capital value) This was admittedly one of the better areas and all hills have not given such good results. Others on peatier ground are carrying ¼-⅜ of a beast per acre in summer and are tending to go back to bent and rushes rather quickly.

Regarding pioneer crops, one area of 25 acres Italian rye-grass and 33 acres of rye sown at the end of June on peaty land fattened 50 bullocks from 1st September to end of November.

Great stress is laid by the Montgomeryshire Executive Officers on choosing the right land for this reseeding. It should be as free as possible of rocks and the area should be of considerable size to allow ploughing and cultivating to be done economically. All really difficult and boggy places should be left and not attempted, even if in the middle of a patch to be ploughed.

Costings

As much information as possible was collected regarding the cost of reseeding hill land. Several W.A.E. committees are undertaking the work for farmers on contract at an inclusive charge varying from £12-£15 per acre, but it is generally admitted that there is an element of subsidy in these prices, especially when small areas are being tackled, and the actual costs are probably rather higher.

Mr Willcock, Grassland Officer to the Mont. W.A.E.Committeee estimates the cost of reseeding to be between £14 and £15 per acre but this does not take into account depreciation on equipment which will amount to another £2 or £3 per acre, bringing the total cost to about £17 .

As prices in Britain differ f om prices in the Falkland Is. the actual money cost in Britain does not give a really satisfactory estimate of what costs are likely to be in the Falklands.
The cost of reseeding can be divided into the costs of :-

1. Cultivations (including running costs and depreciation)
2. Manures
3. Seed

The cost of items 2 and 3 can be ascertained at any time, and by adding on the freight charges the costs landed in the Falklands can be arrived at.

The following information supplied by Mr Willcock gives some indication of what cultivation costs are likely to be.

Cost of Reseeding 800 acres in Montgomeryshire

Wages of 9 men for 11 months		£1,795. 16. 8
7712 gals of Pool gas oil	@ 1/1½	433. 13. 2
2904 gals of T.V.O.	@ 1/1½	163. 6. 8
1592 gals of Petrol	@ 2/1½	84. 4. 1
642 gals of Oil and Grease	@ 5/-	160.110. 0
		190. 12. 10
		£2,828 3. 5

That is £3.10.8 per acre running costs. In addition to the running costs given above, repairs and replacements cost £622.17.7 , but the tractors and imple ents were all new and needed comparatively little attention e.g. no new tracks were required (a heavy item on crawlers) and normal repairs would be considerably higher, it is estimated by another £400

On the basis of his experience over four years of this type of work covering some 5 to 6,000 acres, Mr Willcock gave it as his opinion that a medium crawler tractor (35 h.p.) and equipment would be capable of reseeding 125 acres of rough hill grazing per year; that the life of the outfit would be about 8 years ; and the repair and replacement cost during that period would be approxi ately equal to the original cost of the outfit. In other words the depreciation and repair costs to be spread

over 1,000 acres would be twice the cost of the outfit. At present prices in Britain this would be equal to about £3 per acre bringing the total cultivation cost to over £6.10.0 per acre .

The above costs relate to 800 acres of land 1,300 to 1,700 feet above sea level, with the original herbage consisting of nardus, molinia, bracken and heather. The whole area was ploughed, rolled three times, disced four times, lime, slag and nitrogen sown, chain harrowed, and seeded in 11 months. The average number of tractors used was 7 medium-heavy crawlers and one Fordson.

I believe one might reasonably expect the output per tractor in the Falklands to be similar to this, that is about 125 acres per year per crawler tractor. To obtain the cultivation costs in the Falklands, the landed prices of the various items listed, and of a tractor and implements would need to be known.

Other estimates of depreciation costs were obtained from Mr J.Pearce, Machinery Officer at Dodwell, and from Mr Phillips, Manager at Cahn Hill. Mr Pearce stated that from his experience at Dodwell he would estimate the life of a crawler tractor and equipment to be about 10,000 hours, that is with normal everyday use about 6 years, and in that period repairs to be equal to the original cost of the outfit. The area of land that could be directly reseeded during the life of the outfit he estimated at 1200 acres. These estimates are based on Caterpillar D.2 tractors and indicate a higher output for a lighter tractor than that obtained in Montgomeryshire, but conditions at Dodwell are easier.

At Cahn Hill the Caterpillar D.2 tractor is 12 years old, and although still in working order is nearly finished and has been replaced. The amount of work this tractor has done is as follows:-

is as follows:-

Reseeding at Cahn Hill 240 acres (some twice) say		300 acres
Reseeding by contract for farmers	about	400 "
Other seasonal work on 70 acres of hay tillage, etc, say equivalent of reseeding about		300 "
		1,000 acres

Mr Phillips considered that repair costs for the tractor during its life would equal one half the original cost, and repair costs for the imple ents would equal one quarter their original cost. He also estimated that the maximum output from a D.2 tractor would not exceed 150 acres reseeded per year.

(signed) T. Beatty.
Agricultural Officer
Falkland Islands

16th July 1945

Omit

APPENDIX XIX.

VARIETIES OF CABBAGE - Planted 5/1/43- notes made 28/4/43

Three Rows each variety. Thirteen plants per row. From the South side, moving East to West. Figures in parenthesis indicate the number of plants that produced heads in different replicates at the date of examination.

JANUARY KING (18) (13) (27)	Very short stalks, deep blue leaf, drumhead type. Four bolted to flower, could be planted 15'' x 18''. Six ready for cutting now 28/4/43
SELECTED DRUMHEAD (nil)	Lage-leaved type. Late maturing, could be planted ~~EE~~ 2' x 2' , upright growth, leaves light blue-green, just turning in. None-bolting (to flower).
SUTTON'S MAIN CROP (34)(35)	Practically the same as Enfield Market, including puckered leaves.
PRIDE OFTHE MARKET (43) (29)	Green-blue leaves, solid drumhead, spherical type, short stems, rosette type growth.
Christmas DRUMHEAD (16) (6)	Four bolted to seed-,deep blue-green leaves, small rounded hearts, practically identical with JANUARY KING
LARGE DRUMHEAD (nil)	Leaves turning in, plantings 18" x 18" satisfactory. Blue-green leaves, very uniform, looks like heavy yielding variety. Produced very large leaves, but did not heart.
IMPROVED WINNIGSTADT (nil)	More even in type than next variety same stage of maturity, should not be planted closer than 18" x 18" , very late maturity.
WINNIGSTADT (nil)	Very late, Green-blue leaves, upright growth, 21" x 21" is satisfactory. 18" x 18" appears too close. Leaves just turning in, conical heart.
FAVOURITE (42) (19)	Deep green leaves, smaller hearts than Enfield Market, immature, planting 12" x 12" satisfactor Conical hearts, not good variety (though preferred at North Arm)
ENFIELD MARKET (37) (39)	Quite mature, should be 14" x 14" apart, 18" x 18" is too far. More stumpy hearts than Model. Puckered leaves with backward curl, prominent white veins
SUMMER DRUMHEAD (23)	Not quite mature, blue-green leaf, very short stems but bolted. 18" x 18" apart satisfactory. Looks good maincrop type. Short stems like PRIDE OF THE MARKET, though not so even.
CARTER'S MODEL (34) (38)	Early,short stalks, mature, small beef heart type. Almost as early as Sutton's Earliest. Now fully matured. 15"x15" satisfactory. Green shiny leaves with prominent white mid ribs. Two bolted.

ROUNDHEAD MAIN CROP (nil)	Blue leaf type, no hearts. Leaves turning in, purple on veins sometimes. 18" x 18" or 21" x 21" would be satisfactory.
FLOWER OF SPRING (12) (7)	Does better when sown in autumn. Larger unfilled hearts, green, conical and immature 18" x 18" satisfactory. Seems better yielding than most so far. Nearly all well formed, but soft.
WHEELER'S IMPERIAL (42) (35)	Crinkled deep green leaf, Rosette type growth, conical heart, short stems. 12" x 12" apart satisfactory. Early.
EXPRESS (42) (32)	Very small hearts, very early, next to SUTTON'S EARLIEST, all ready now 28/4/43 12" x 12" apart satisfactory.
DOBBIES EARLIEST (34) (14)	Not so early as Sutton's, greener leaf, veins not prominent, leaves larger, 15" x 15" satisfactory.
McEWAN'S EARLY (25) (16)	Like early Market, but not quite so early. 18" x18" satisfactory, Heads formed but soft.
ELLAM'S EARLY (20) (11)	Green leaf, earlier than Early Offenham, conical hearts, not quite ready 28/4/43 Possibly heavier than Offenham.
EARLY OFFENHAM (32) (12)	Similar to Early Market, but smaller. (not so early as same variety in my garden) Short stalks, 15" x 15" apart satisfactory. Not mature.
SUTTON'S EARLIEST (21) (26 plus 11)	Earliest, with Velocity, of all varieties, but is increased in weight by being left too long. Green leaves with white veins, short stem, conical heart. Patch of poor ground
EARLY MARKET (30) (11)	Does better when autumn sown. A larger ~~EARLY~~ variation than CONQUEROR . Beefheart type. Not mature 28/4/43 , Deep green leaf, 18" x 24" satisfactory.
VELOCITY (42) (21)	Blue-freen leaf, drumhead heart, earliest ready mid-March. Very solid hearts, but has bolted. Patch of poor ground, 15" x 15" satisfactory.
CONQUEROR (44) (30)	Leaves deeper green, open hearts with whiter midRibs than Heartwell Early Marrow and type of growth more Rosette. Short stalks, conical heart
HEARTWELL EARLY MARROW	Short stems, upright variety, small conical heart, very early variety green leaves , Ready February. Should be planted 15" x 15" apart.

VARIETIES OF KALE - examined 18th May 1943

EXTRA CURLED	Tall, growing very vigorously, very curled, good bulk, not bolting.
HUNGRY GAP	Like sheep kale, commencing to produce sprouts from base of stem. Leaves tend to be tough and bitter.
ASPARAGUS KALE	Rather like Thousand Headed Kale , but commencing to produce many small shoots at base which are rather sweet and tender.
RUSSIAN KALE	Very decorative and good leaves, not tough but sweet, tender and form hearts, no great bulk.
DRUMHEAD	Sweet fleshy leaves, not tough, resembles cabbage. Thick mid-ribs , one third bolted. Forms a heart.
DWARF GREEN CURLED	Very early, just bolting to seed. Good yield, many well curled leaves. Should be cut now 18/4/43

VARIETIES OF CARROTS (examined 10th March 1943)

NEW IMPROVED EARLY HORN	1"-2" diameter at the top, 4½"-6½" long. These are more Early Market type roots than Early Horn, less shoulder at base of root, pink salmon colour, better than Early Horn
CARTER'S EARLY MARKET	⅝"-1½" diameter at top, occasionally 2", 4"-5" long, pale salmon, not as heavy as following varieties, contaminated with Short Horn types.
EARLY SHORT HORN	1"-2" at the top, 3"-4½" long, bright salmon, more variable in type than others, colour even, very few bolted.
EARLY NANTES	More even in type than previous varieties. 1½"-1⅝" diameter at top, 5 inches long. Colour even, pale salmon, several bolting.
EARLY GEM	Roots stumpy and conical. 1⅝"-2½" diameter at top. Colour from pale whitish pink to salmon. Two bolting. Could be used now 10/3/43 (Earliest of these varieties)

VARIETIES OF LETTUCE (examined 10th March 1943)

a) Cos Types

LEVIATHAN (COS)	Leaves tinged with bronze, bronze mid-ribs, mature, just bolting to seed, not self curling, coarse leaves, bitter.
C.G.A. IMPROVED SELF FOLDING (COS)	Leaves deeper green than Hardy White Cos, but bright green mid-ribs. A few folding. Not mature, and not bitter. Less coarse than Leviathan.

HARDY WHITE COS	Broad white mid-rib, bright green leaves, not self folding, not mature, leaves thick and taste bitter.

b) Cabbage types

FAVOURITE	Very curled type. Very poor germination, looks more succulent than Hercules about same stage of maturity, but more even. Bitter taste, outer leaves brittle.
ALL THE YEAR ROUND	Non-curled type, past maturity and gone to seed, a few hearts remaining, pleasant taste, not sweet. Leaves flabby, not brittle.
HOLBORNE STANDARD	Purple tip to the leaves (sun red?). Poor germination. Hearts 4-6 inches in diameter. Mature. Brittle leaves and pleasant taste.
HERCULES	Large crinkled type, poor germination. Hearts 3-5 inches in diameter. Not yet mature Hearts grow to 3 lbs or more. Very brittle leaves, sweet tasting.

VARIETIES OF SAVOY CABBAGE

REARGUARD	Satisfactory growth, not heading. Blue-green leaf, (usually commences to head in August)
NEW YEAR	More crinkled leaf than Rearguard, smaller variety. Leaves are blue-green, showing first signs of hearting.
DRUMHEAD	Not very satisfactory, many misses. Leaves more upright than New Year, blue-green in colour. Does not heart in Stanley.
DWARF GREEN CURLED	Green, very crinkled leaves, leaves curled in but still open at top. Vigorous growth.
PERFECT GEM	Small low-growing variety, thick blue-green leaves. Very horizontal type of growth.

WINTER GREENS VARIETY EXPERIMENT

CHOU DE BURGHLEY	Only four plants left. Very hardy like Enfield Market cabbage, with bigger leaves, but does not heart.
ROSETTE COLEWORT	Like Drumhead cabbage, hearts not completely closed. Four hearts firm, eight hearting and three bolted. Useful for winter.
HARDY GREEN COLEWORT	9 rows- Small cabbage, conical heart. Four plants bolted to seed. Unlike above variety except in date of maturity. Useful for winter.

BRUSSELS SPROUTS VARIETY EXPERIMENT. NO 4 BUNGALOWS

(examined May 1943)

GOLIATH	34 plants, 21 sprouting. Hearts on top of stalks. Sprouts small, shaded by fence
HOLBORNE EXHIBITION	40 plants, 27 sprouting. Earlier than Goliath. Sprouts not so crinkled as Goliath. Some very good stalks. Forming hearts at apices. One bolting.
REARGUARD	39 plants, 33 sprouting . Later than above variety. Small neat rounded sprouts. Three bolting. Not hearting at apices.
SCHYMMAGERS GIANT	42 plants,15 commencing to sprout. Much later than Rearguard. Three bolting.
AIGBURTH	30 plants, 23 sprouting. Very uneven maturity. Some plants approach Goliath, others like Scrymmager though 23 sprouted, yield very light.
PERFECTION	28 plants, 15 sprouting, tending to heart at apices, later than most. Growth more open than above.
WROXTON	20 plants, some 12 sprouting. Seems very late, but four plants at one end well advanced, forming large hearts at apices.

APPENDIX XX. Omit + publish separately

REPORT ON EXPERIMENTAL TREE PLANTING 1940-1946.

It has been generally accepted that soil and climatic conditions in the Colony are totally unsuitable for the growth of any tree. Nevertheless, many trees are to be found growing successfully in cultivated garden throughout the country, the most prominent being Cupressus macrocarpa which has generally attained an appreciable height. One or two Pinus sylvestris have reached fair demensions but in the main, they remain stunted. Broad leaved species are somewhat shrub like in habit but this fact should not be taken to indicate that such species are not likely to attain height. The shrub habit is not so much induced by wind, but by lack of pruning during early stages of growth. Undoubtedly, all these species are growing in cultivated soils and have been afforded shelter during their infancy, which is a factor contributing to their establishment. At the same time, one of the evergreens show any serious wind injury after having passed beyond the shelter boundary, and continue to grow vertically. This is especially the case with Cupressus macrocarpa.

Now these trees are not growing in dense groups but as isolated specimens, and therefore, it is almost certain that the most promising species of our gardens could be utilized for the information of shelter belts on exposed situations throughout the country. Moreover, this suggestion has already been proved a possibility as a result of our experimental work. A shelter belt is simply a narrow belt of closely planted trees solely designed to protect farmsteads, stock, cultivated areas and less hardy trees, against wind. Once such shelter belts are established, it will be possible to establish other more tender species, which, though suitable to our soil conditions, are unable to withstand consistent winds.

During April 1939, the Department of Agriculture decided to experiment with trees under forest conditions in exposed situations, the sole object of which was to locate a species, or number of species that could be utilized in forming shelter belts. This, of course, was sown

policy, because it is absolutely futile to experiment for other purposes when no other natural shelter was available. Until natural shelter belts can be established throughout the Colony, afforestation on any scale cannot be attempted.

Provision of Stock and Nursery Treatment.

At the commencement, as may be imagined our stocks of trees, cuttings and seeds were almost negligible. Cuttings or Populus alba numbering seven hundred were made from local stock plants. Plants and seed were donated by the Director of the Royal Botanical Gardens, Kew. With these and one small packet of Cupressus macrocarpa seeds, the venture was born. From then on, our sources of supply extended and became continuous, so much so, that it was impossible to handle the quantities of seed with the existing propagating facilities. In addition to the donations from Kew stocks of seedlings and seeds have also been donated by the Department of Forestry, Uruguay, and purchases of the same have also been made from that source. Other donations of seeds have been received from the Forest Research Officer, Edinburgh; the U.S. Forest Service; the New York Botanical Garden; the New Zealand State Forest Service and the Newfoundland Department and Agriculture. Considerable purchases of trees, large and small have been also made from private sources in Punta Arenas, Chile and the Director personally collected one thousand Nothofagus betuloides, and a small number of other species during a visit to Puerto Arturo in February 1946.

As suitable nursery space was unavailable, it was decided to utilize a small portion of Government House Gardens for the purpose. This area was sufficient to permit an annual output of approximately four hundred trees. Imported living species were usually large enough to plant in proptions immediately, thereby conserving our nursery space for our own production.

Lack of mycorrhiza has been suggested as the possible cause of tree failures, especially among pinus. The failures of the past may have been due to absence of suitable mycorrhiza but efforts have been

made to overcome this in the present experiments and seedlings have been imported from established nurseries or transplanted into beds previously used for imported tree seedlings.

If at any time, a new nursery were to be made, the subject of my corrhizal inoculation of the seed beds would have to be considered.

Cuttings, with the exception of Willow which were inserted directly in place were always propagated in the nursery, and were allowed to remain thus for two years before planting in permanent positions. As it was not possible to transplant the rooted cuttings during the nursery period to encourage vibrous rooting, severing of the roots with a sharp spade, while the plants remained in the ground, was resorted to as an alternative.

All seeds were sown in seed boxes under glass, either in heated or unheated houses, depending upon the nature of the seed to be propagated; here the seedlings were permitted to remain an inch or two of growth has been made. They were then placed in an open cold frame to harden off. Often they remained thus for one year, after which time they were removed from the seed boxes, rogued, bunched, the roots reduced and then planted in the nursery where they would remain for two growing periods before planting in place. Cupressus were the only species receiving different treatment. They were kept under glass until they had made about six inches of growth and were then potted up into tins of not less than four inches in diameter, keeping them under glass if possible for a further fortnight before placing them in an open frame outdoors. Here they would remain for a further growing season, before being planted in place, but it was found that the complete removal of the plants from the tins was essential. Removal of the bottom only was entirely unsatisfactory.

By the winter and spring of 1941 we had one thousand and sixty-nine trees with which to commence our first plantation.

Plantations.

At the present time there is approximately three quarters of an acre planted with young trees on a variety of soil types. The first two sites had been portions of well grazed fields and carried a pasture of bent /

of bent grasses. The third is commonage and carried a white grass-bent mountain berry pasture. All are situated immediately behind Government House.

No. 1 Plantation. The site of this plantation was on a rocky hill-side with a northerly aspect. The surface soil was composed of fairly well drained, consolidated peat with a gravelly, sandy clay subsoil and carried a good bent pasture. In places an iron pan had formed between the surface layer and the subsoil; this pan had, therefore, to be broken before planting could be effected. Preparation of the area was performed by digging trenches eighteen inches wide, one spade deep and three feet asunder in a north and south direction. However, this method of soil preparation was not considered satisfactory because the trenches served to act as drains which were not required on such a slope and the depth of a spade did not open the subsoil. Therefore, at planting time, the pit system was adopted throughout; a system which permitted more thorough preparation to the actual planting position by breaking up the subsoil and iron pan where encountered. Basic slag and lime were applied to the strips immediately after their preparation at the rate of two ounces and four ounces per square yard respectively. The trees were planted three feet either way, using the triangular system.

No. 2 Plantation. This site was prepared and planted during 1942, being parallel with the first plantation, though about 100 yards further west. The site was composed of peat and a fibrous loam, being better supplied with moisture than the original plantation. It carried a similar pasture. There was only one rock outcrop, and no evidence of pan formation was observed, but in the loamy area the subsoil consisted of close clay. A soil preparation experiment was carried out here; one third of the area being ploughed, one third trenched and the remainder pits. Though the results of this experiment upon the young plants seem to indicate that the ploughed portion favoured quicker establishment, it should be remembered that our soils do not permit easy access to the plough and even if they did, ploughing would be too costly when connected with any afforestation scheme. No distinct advantages have been recorded as a result of the other two methods of preparation.

It is interesting to note that Cupressus macrocarpa and Cupressus lambertiana established themselves more quickly than in the first plantation even though the situation here was more exposed. In this instance, however, the improved soil and moisture conditions must be appreciated.

No. 3 Plantation. Planting was commenced during 1944 but as the area enclosed covers about three and a half acres, some years must elapse before planting is completed, that is, if the present planting rate is not increased. The whole site is characterized by rock outcrops which provide considerable shelter in certain locations. The soil is of a raw peaty nature, not being so consolidated by stock as the two former plantations. The peat is deeper, in most places a good eighteen inches and covers either solid rock or friable clay.

Soil preparation was carried out during the winter; this was deemed imperative due to the raw peaty nature of the soil. The pit system was adopted throughout, but the planting distance varies, being influenced by the rocky nature of the soil, both above and below the surface. Heavy applications of ground limestone, at the rate of eight ounces per square yard were applied at the time of preparation, plus basic slag at the rate of two ounces; superphosphate was applied at the rate of two ounces per square yard at planting time.

Care and Management of Plantations. Whenever possible, but more especially during the first three years, the undergrowth has been removed from the immediate vicinity of the trees. At no time during the growing season has this important operation been omitted even though it was possible only once each season. Clearance of undergrowth is desirable at least twice during the growing season, preferably during November and February.

Staking was essential for Cupressus macrocarpa, but other coniferous species did not require such support. Ties, however, must be examined frequently, as movement of tree and exposure, very soon cause them to break. Tarred string, was used for this purpose.

Pruning was attempted upon the deciduous species to encourage height but was discontinued to encourage branch development and the ultimate meeting of the branch system, both in the rows and between. By encouraging such development as quickly as possible, undergrowth will be destroyed and upward growth automatically assured.

Due to the favourable aspect of all the experimental plots, no drainage has yet been necessary; small drains will, no doubt, be required in the third plantation to drain small depressions which hold water during the winter months.

AVERAGE ANNUAL GROWTH RATES FROM TIME OF PLANTATION.

Species.	Plantation No. 1, 6 year period.	Plantation No. 2, 3 year period.	Plantation No. 3, 2 year period.	*Mortality during first year in permanent location.
Cupressus macrocarpa.	7 inches.	9 inches.	-	5.9%
Cupressus lawsoniana.	1½ "	-	-	-
Cupressus lambertiana.	2 "	-	-	-
Cupressus glauca.	-	4 inches.	-	45.4%
Populus alba.	2 inches.	2¾ "	-	1.45%
Populus alba var Nivea.	-	2¾ "	-	-
Populus nigra var sempervirens.	-	2 "	-	-
Pinus radiata.	4 inches.	-	-	-
Pinus contorta.	-	-	4½ inches.	-
Pinus pinaster.	-	5 inches.	-	23.3%
Picea sitchensis.	-	-	5 inches.	-

(*Mortality is negligible to date after this period).

An interesting comparison is available of two C.macrocarpa grown from seed, and planted at the same time (1940), one in the shelter of a three-foot-six stone wall in cultivated soil, the other in exposed situation in virgin soil. The first made robust dense growth attaining a height of five feet six inches. The latter made three feet eight inches but with open growth caused by the retardation of shoots by wind

The largest number of species under trial are coniferous; broad-leaved species being confined mainly to Populus and varieties. Of the forty three species under trial, comprising eighteen genera only Cupressus macrocarpa can, with absolute certainty, be listed as entirely satisfactory for planting in fully exposed situations. Incidentally it would be of great value to experiment with varieties of C.macrocarpa some of which have a reputation of being quicker and more hardy. There are three other species which possess outstanding possibilities namely, Pinus contorta, Picea sitchensis and Pinus radiata sometimes known as insignis. As yet the two first mentioned are too young to make any conclusive statement but since being planted in place during 1944, they have not suffered any serious injury from wind, and both appear to be vigorous and healthy. In addition, they both transplanted exceptionally well, so much so, that no deaths have been recorded among either species, which is all the more striking in view of the fairly ray, peaty state of the soil. Pinus radiata was one of the consignment of growing plants sent to us from Kew, and though growth has been exceptionally slow, the tree has withstood wind as well, if not better than any of the aforementioned named species. It is extremely robust and healthy. Its chief defect may be the earliness with which it commences growth, a defect which might make it subject to frost injury and then opens the way to die back.

The species which proved complete failures are as follows:-

Alnus maritima.
Alnus ruguso.
Amelanchieri laevis.
Acacia pauedo-acacia.
Cupressus horizontalis.
Salix coerulea.
Nothofagus antartica.*
Picea ormika.
Prunis communis.
Populus carolina.
Quercus robus.
Tilia vulgaris.
Thuya orientalis.
Ulmus excelsior.
Ulmus alba.
Fagus sylvatica.*

(* Failure due possibly to injury by salt spray).

Experiments on Waste Sand Areas.

During the past three years simple trials have been carried out in the Yorke Bay area, but none have been entirely satisfactory. In view of the fact that overseas, many such areas had been successfully afforested, it was decided to use Pinus pinaster as a trial plant because of its adaptability to such soil conditions. A hundred seedlings about six inches in height were conveyed to the area being planted in and around the base of the dunes. Unfortunately, few survived the transplanting, and the number of living plants gradually decreased and at the moment only one survives, which looks extremely healthy having made six inches of growth this season. Those planted about the base of the dunes gave most promise when first planted, managing to survive longer than those situated higher up. It must be said, however, that the site was ill chosen due to the considerable movement of stock which undoubtedly contributed greatly to the failure. Moreover, this particular species did not withstand transplanting at all well, the root system being incapable of retaining soil. Therefore, it should not be completely accepted that failure was entirely due to the unsuitability of the species, but rather to method of transplanting and stock. A much more satisfactory method of transplanting would be to put the seedlings into tins and when sufficient growth has been made, transplant direct from the receptacle, thereby eliminating undue root disturbance. Three pounds of P. pinaster seed was also sown at the same time. The germination was good, but of the thirty three groups located none can be traced. No mycorrhiza were introduced to these areas and stock probably had much to do with failure.

Further sowings of the same species were made in the same area a year later, during 1944, though in a different location believed to be comparatively free of stock. The seedlings have germinated freely, but give little promise.

No soil preparation of any kind was carried out in either location and no fertilizers were supplied. It is highly probable that if mycorrhiza had been introduced the results would have been more satisfactory.

Though Sitka spruce has not been tried in sand here, it has a reputation for adaptability on such areas. It is possible, that as the plant moves with a good ball of earth, establishment may be assured though fencing to prevent entry of stock is imperative.

The factors which appear to limit the types of trees that have become established in previous attempts at afforestation may be summarized as:

(a) Raw acid peat soils often impervious to surface water.

(b) Water-logging of prepared holes in which trees are planted.

(c) High winds which become laden with salt after passing over hundreds of miles of ocean.

(d) Lack of mycorrhiza.

(e) Late frosts, and low summer temperatures.

However, if soil is prepared, it is possible that some trees that grow under somewhat similar and rigorous conditions might be worth trying in future experiments. Among these may be included the following selected from Sudbury's (1907) forest trees of the Pacific Slopes.

Abies lasiocarpa.	Betula alaskana	Picea canadensis.
Acer glabrum.	Chamacyparis nootkatensis.	Pinus muricata.
Alnus tenuifolia.	Cupressus pygmea.	Populus balsamifera.
Alnus sitchensis.	Larix larinina.	Populus tremuloides.
Betula kenaica.	Picea mariana.	

In addition to these it is possible that trees which grow on the eastern coast of Newfoundland or Nova Scotia and are there subjected to heavy salt laden winds, may be found suitable in the Falklands. They would certainly be worth trying.

Skottsberg 1942: Recommends Pilgerodebdron (Lebocedrus) uviferum, Nothofagus antarctica, Drimip winteri, Maytenus magellanica in addition to pinds and species of Betula and Sorbus.

APPENDIX XXI

REPORT ON EXPERIMENTAL PLANTATION NO. 1.

Mortality.

Cupressus glouca.	42.5%
Cupressus macrocarpa.	9.9%

Growth. Average rate.

Cupressus macrocarpa.	13 inches.
Cupressus galuca.	9 inches.
Populus rosado.	3 inches.
Populus blanco.	3½ inches.
Populus alba.	3 inches.

Species.	Remarks.
Populus alba.	No severe blackening of foliage this season but there was slight wind effects. Growth becoming more dense through average rate not increasing. Very little die-back.
Populus blanco.	Growth sparse but wind has little effect upon the plants which are showing signs of establishment.
Populus rosado.	Where exposed, wind has serious effects. Growth continues to be slow and is very sparse.
Pinus radiata.	Doing exceptionally well maintaining an almost upright position, incidentally the only species with the exception of Sitka spruce to withstand wind without support. Gorwth healthy. Eight inches.

Cupressus galuca. A few plants have now become established and making top growth. Little wind effects, though frost injuries the leader.

Cupressus lambertiana. Has made good top growth this season. Two plants having made eight inches and fifteen inches. The leader is strong and shows no wind effects though lateral growth on windward side are seriously affected.

Cupressus lawsoniana. Remains stunted. Lateral growth slow. Two inches though strangely enough wind has no apparent effects on windward side.

Sorbus aucaparia. Growth nine inches. Sparse and as a result wind effects are detrimental to the plants

Cupressus macrocarpa. All are finely established. Tallest specimen in the plantation is now four feet and eight inches in height, having been raised from seed sown in 1939. Staking is essential if trees are to be retained in an upright position.

Salix caprea. Cannot now be considered satisfactory in this location. Growth very slow, nine inches.

Pyrus sucaparia. Growth seven inches. Continue to be cut back by wind, though effects did not appear so serious as last season.

Berberis aristata. Growth slow. Cannot be considered suitable for planting in exposed condition.

Ribes magellanica. Though slight increase in growth, must still be considered slow, four inches. No wind effects.

REPORT ON EXPERIMENTAL PLANTATION NO. 2.

Mortality.

Cupressus glauca.	12.4%
Cupressus macrocarpa.	7.1%
Pinus pinaster.	5.3%

Growth. Average rate.

Cupressus macrocarpa.	8 inches.
Populus alba var Nivea.	6 inches.
Populus nigra var sempervirons.	5 inches.
Populus deltoides.	5 inches.
Cupressus glauca.	5 inches.
Cupressus lambertiana.	5½ inches.
Pinus pinaster.	3 inches.

Species.	Remarks.
Cupressus glacua.	Makes strong dense base growths but leader suffers injury from wind. It is possible that even if this species be of any use, it will become shrub-like in habit when grown in exposed position.
Cupressus lambertiana.	Does reasonably well, though wind has serious effect upon windward side of the plants which are almost completely denuded. The situation here is much more exposed than in No. 1 Plantation.
Cupressus macrocarpa.	Have done exceptionally well, establishing themselves more rapidly than in No. 1 plantation. The plants are planted on ploughed land. Wind effects not severe though trees are fully exposed to pre-

vailing winds.

Pinus pinaster.	Appear to be establishing themselves having recovered the severe set-back of transplanting. No wind effects as yet, receiving much shelter from long grass. Extremely healthy.
Populus deltoides.	Growth though sparse, is fairly good. No wind effects. Slight die-back.
Populus rosado.	Does not appear to be established. Lateral growth strong, though slow, two inches. Wind effects severe.
Populus nigra var sempervirons.	Have made strong healthy growth. Little wind effects. Shoot tips slightly touched by die-back.
Populus alba var nivea.	Growth fairly strong and healthy, little wind effects but at present shelter is provided by long grass.
Populus nigra.	Top growth nil, but strong dense base growth if ten and eleven inches. Does not appear to be injured by wind.
Ribes magellanica.	Little progress over last season. Growth rate is not more than two inches. Quite unsuited for purposes for which it was planted quick shelter belt. May be successful in in the other situations.
Salix caprea.	Entirely unsatisfactory. Growth arising from base only six inches.

REPORT ON EXPERIMENTAL PLANTATION NO. 3.

This year (1944-45) further plantings were carried out consisting of:-

57 Sitka spruce.	18 Pinus larcicio.
48 Pinus contorta.	12 Populus alba.
45 Red willow.	6 Populus canadensis.
400 Salix caprea (cuttings).	5 Hybrid larch.

Species.	Remarks.
Nothofagus pumilio.	Though plants gave much promise when in the bud stages all plants suffered severely during the early spring which came in with drought and excepionally high north wind to which the plants were exposed. As a result, the buds withered and complete die-back almost to the base resulted. Death rate 1.6%.
Populus nigra.	All have done exceptionally well. In the main most are completely sheltered from the south wind. Growth three inche This tree may not be entirely satisfactory due to the early opening of the buds.
Populus corrientes.	Died back after transplanting, but base growths developed and slow no wind effects.
Pinus pinaster.	Only six of the original forty four planted survived transplanting. These seem to have established themselves, on having made a growth of three inches. No frost

effects.

Pinus laricio. These withstood transplanting exceptionally well. Not one has died. Establishment is slow, though most of the plants appear to be quite healthy. No frost effects. Growth not more than one inch.

Larix leptolepsis. Suffered much injury from high winds and drought during early spring just as the buds were opening resulting in complete die-back of terminal shoots. No deaths or apparent frost effects.

Picea sitchensis. All have done exceptionally well. Transplanting was 100% successful. Wind effects almost nil. No injury from frost. All plants healthy. Growth four inches. Several have been pilfered.

Pinus contorta. Gives great promise. Transplanting one hundred per cent successful. Growth healthy four inches. No frost effects. Staking may become necessary as plants develop.

Cupressus glauca. Though these were planted in complete shelter, all except ten failed to withstand transplanting. Even those still alive give little promise. Evidence indicates that this species does not transplant well, either direct from the nursery bed or from tin cans.

Hybrid larch.	Did not do so well as Japanese larch, but suffered also, from the high spring wind and drought, though die-back was not so serious in this instance. No apparent frost effects.

REPORT ON TREES RECEIVED FROM KEW 1939.

Species.	Remarks.
Arbutus unedo.	Suffered a severe set-back on transplanting and frost has caused much injury. It does not appear to be a suitable tree for this country.
Pinus radiata.	Doing exceptionally well, maintaining an almost vertical position, incidentally the only species apart from Sitka spruce to withstand wind without support. Growth healthy eight inches. No further reports.
Sorbus aucaparia.	Growth nine inches. Sparse, and as a result, wind effects are detrimental to the plants. Cannot be considered for planting in exposed positions. No further reports.
Sambuscus nigra.	See 1943-44 report. No further report.
Cupressus macrocarpa.	Now firmly established. This plant is the only species capable of establishment in a position continually swept by baffling winds. Growth ten inches. No further reports.
Taxus baccata.	Has done exceptionally well this year. Growth six inches. No frost effects.

TREES ON GROUNDS OF GOVERNMENT HOUSE AND SURROUNDS 1945.

Species.	Remarks.
Malus prunifolis.	Gives no promise whatever in exposed situations, growths are out right back each year. Plant does well in sheltered position and would be a welcome addition to town gardens. No further reports.
Pyracanthea leylandii.	Cannot be considered for planting in exposed situations, though does exceptionally well in shelter. No further reports.
Euonymus europoeus.	Unfortunately, after having been accepted as established, was uprooted during severe gales of April 3rd. Replanting was unsuccessful, and resulted in death.
Cotoneaster frigida.	The plants are not more than six inches high after being raised fromseed during 1939. Growing in exposure, but does well when shelter is provided. No further reports.
Populus nigra var sempervirons.	Entirely unsatisfactory in this situation Some sign of growth up to half an inch but this has been addected by die-back. No further reports.
Populus alba var nivea.	Showing signs of establishment though evidence of die-back. Growth slow but rebust, four inches.

Populus rosado. Is not at all satisfactory. Growth sparse, one inch. No die-back of frost effect, but wind is injurious when plant in leaf.

Ribes sanguineum. These have beenrrenewed, to sheltered positions in garden shrubbery.

SHRUBBERY.

Betula spp. Growing in complete shelter, shows every sign of establishment though this is only their first season. No evidence of die-back or frost injury.

SERVICE DRIVE.

Picea excelsa. These have not shown great promise, but establishment will probably be slow due to setOback after transplanting. All except two appear to be in good health though evidence of wind injury. No frost effects.

Nothofagus betuloides. Do not give promise of establishment. Wind has serious effects upon the plants which have been cut back considerably. Deaths, one.

MAIN DRIVE.

Picea excelsa. All but three show signs of promise and appear to be progressing better than

Populus rosado. Is not at all satisfactory. Growth sparse one inch. No die-back of frost effects but wind is injurious when plant in leaf.

Ribes sanguineum. These have been removed, to sheltered positions in garden shrubbery.

SHRUBBERY.

Betula spp. Growing in complete shelter, shows every sign of establishment though this is only their first season. No evidence of die-back or forst injury.

SERVICE DRIVE.

Picea excelsa. These have not shown great promise, but establishment will probably be slow due to set-back after transplanting. All except two appear to be in good healthy though evidence of wind injury. No frost effects

Nothofagus betuloides. Do not give prâmise of establishment. Wind has serious effects upon the plants which have been cut back considerably. Deaths one.

MAIN DRIVE.

Picea excelsa. All but three shows signs of promise and appear to be progressing better than those in Service Drive. Deaths, one.

Nothofagus pumilio.

These were cut right back almost to the base just after bud-break as a result if spring drought and high north wind (possibly salt spray injury). May break from the base during the coming season.

Nothofagus betuloides.

These also are doing better in this situation, though wind has caused much injury to the plants. Deaths one.

Betula spp.

Shows little sign of establishment. Wind has serious effects upon plants which have been cut back to within one foot of their base.

Appendix XXII (Speculative - cont)

NOTES ON TREES RECORDED FROM THE PACIFIC SLOPES OF NORTH AMERICA WHICH SHOULD BE WORTH TESTING UNDER LOCAL CONDITIONS.

Pinus muricata.
Don.
(Pricklecone pine; Bishop's pine).

Peat swamps 25°-95°F. High moisture.

Pinus contorta.
London.
(Lodgepole pine).

1,900 feet Alaska.

Larix laricina.
(Du Roi) Koch.
(Tamarack).

Larix alaskensis.
Wight.
((Larch) (Alaska))

Sphagnum swamps and mustegs. -80°F. to 100°F. 12-50" rain. Very wide range.

Picea mariana. (Mill) B.S. & P. (Black spruce).	Interior of Alaska. Swamp tree. -60°-100°F. Growing season is four months to three weeks.
Picea canadensis. (Mill) B.S. & P. (White spruce).	Drier soils, otherwise as above.
Abies lasiocarpa. (Hook) Nuttall. (Alpine fir; Balsam fir).	Endured very rigorous climates. Loose deep moist soil but also in soils too wet for Englemanu spruce and on Douglas fir, soils where spruce will not do.
Thuja plicata. Don. (Western red cedar; red cedar).	Alaska south coast, range up to three thousand feet in fog belt. B. C. Kicking Horse Lake six thousand feet. Must have abundant precipitation and wet or constantly humid locations. Persists as shrub in mountains at 35°F. Severe climat and short summer.
Cupressus pygmea. (Lemn) Sargent. (Dwarf cypress).	Coastal plant. Cal. Navorro R. are for three quarter mile from coast. Peat swamp in wet soil of stiff yellow clay hard-pan, growth stunted but capable of 10-25, rarely thirty feet.
Chamacyparis nootkatensis. (Lamb) Spach. (Yellow cypress; Alaska cypress).	Seventy five to eighty feet and two to five feet diameter. On expose summit ten feet; up to three thousand feet to seven thousand five hundred feet (best growth Alaska 1,000 to 2,000 feet) Washington. Very like western

cedar in requirements. Stands zero temperature and dry conditions.

Chamaecyparis lawsoniana. (Murr) Parlator. (Lawson cypress; Port Orford cedar).

Ten to forty miles from coast in Cal., reaches 5,000 feet. Moist atmosphere necessary. Grown on sand dunes, narrow damp ravines and swampy places near sea. Grows on almost any porous soil except cold peat. 10-95 F. Sensitive to sudden change in humidity, and temperature and frost resistant except in early youth.

Populus tremuloides.

Sixty to eighty feet. 14-20" diam. More commonly 30-40'. Alaska 2,000 - 3,500 feet. Washington 7,000 feet. South exposures in Alaska and sheltered places.

Populus balsamifera.

Seventy five to hinety feet. 30" - 6' diameter. Pulp and timber. Alaska to Newfoundland and south Dakota; within forty miles of Arctic ocean above lat. 68°. Lakes and swamps in moist sandy and gravelly soils, short growing season and long severe winters.

Betula kenaica.

Twenty to thirty feet. 12-18" diam. Only on sea slopes of coast mountains to probably 3,000 feet. Trees at Kodiak village on Kodiak Island. Also in valley at head of English or Womens Bay, eight miles south.

Betula alskanna. Sargent. (White birch).	25-35 ft. 6" - 1' diam. Probably not a sea side of coast mts, except Lynn Canal and west of it. Common in interior valleys. 3,400 ft. on Tanana River. Kenspenn. reaching timberline. Near streams with spruce and conifers.
Alnus tenuifolia. Nuttall. (Mountain alder).	6 - 15 feet. At best 25 ft. 6" diameter. Yukon to Lower Cal. Springy slopes, gulches, borders of high meadows. Abundant water saturation in soil essential. Aspen black cotton wood etc.
Alnus oregona. Nuttall. (red alder).	80 - 90 ft. Usually 30 to 40 ft. 10-15" diam. Sitka, Alaska to Santa Inez Mts. near Santa Barbar Abundant soil moisture necessary. Black-cotton-wood, broad-leaf maple drier than above.
Alnus sitchensis. Sargent. (Sitka alder).	Very like tree at Punta Arenas. Western red cedar to timberline i Alaska. 3,000 - 4,000 ft. Tre size mainly in Alaska.
Acer glabrum. Torrey. (Dwarf maple).	20 - 30 ft. 4 - 12" diam. Oft 4 - 12' high with slender trunk. From south-east Alaska to Vanc. Island. Shrubbery in Alaska. Tree at Vanc. Island, and Blue Mts. Conditions as for Aspen.
Yellow cypress. (Alaska cypress).	

Pinus lambertiana. Dougl. (Sugar pine).	3 - 4 months season. Max. temp. 90°F. Min. temp. 60°F.
Pinus albicaulis. Englemann. (White bark pine.)	Timberline 60°F. to 100°F. Survives under heavy snow and winds.
Larix lyallii. Parlatore. (Alpine larch).	Timberline tree in Washington and B. C. Intolerant of shade.
Picea engelmann. Engelmann. (Engelmann spruce).	Timberline tree. Colorado to Yukon. Requires moisture. 40°F. to 95°F.
Picea sitchensis. Trautvetter and Mayer. (Sitka spruce; Tideland spruce).	Doubtful on borderline but does well on Alaska's Islas warmed by Jap. currents.
Tsuga mertensiana. (Bong) Sargent. (Mountain hemlock; Black hemlock).	Probably too wet in Falkland Islands soils.
Pseudotsuga taxifolia.	Washington 6,000 feet. Avoids saturated poorly drained heavy soils. Drought resistant.
Abies amabilis. (Loud) Forbes. (Amabilis fir).	Requires good drainage or free flowing soil moisture. 0°F to 90°F.
Abies nobilis. Lindley. (Noble fir).	Washington 5,000 feet. Abundant soil moisture. Mild climate.

Abies magnifica. Murray. (Red fir).	Oregon 8,000 feet. Moist porous gravels.
Sequoia washingtoniana. (Winsl) Sudworth. (Bigtree).	Long mild winters. Soil does not matter so long as moisture is present.
Sequoia sempervirens. (Lamb) Endicher. (Redwood).	Sea level to 2,500 ft. Oregon and Cal. 50-60°F. Moist atmosphere necessary, rain chiefly as winter rains. Moist floor intolerant.
Libocerdus decurrens.	Oregon 2,500 ft. to 6,000 ft. in fog belt, requires cool moist soils and if moisture present quality of soil less important. Probably too cold here for it. South slopes.
Cupressus macrocarpa. Hartweg. (Monterey cypress).	Cal. coast at Monterey Bay to Carmel Bay. Forms transition belt between sea beach and Monterey pine belt. Never freezing point. Rarely above 90°F and 17" rain. Foggy days and sea winds. Air humid for most days of the year. Grows from cuttings from twigs, but trees thus raised are less vigorous, branch more and are shorter lived than those raised from seed.
Juniperus occidentalis. Hooker. (Western juniper).	Exposed mountain sides and crevices in rocks. 6,000 ft. in Oregon cascades. 20 - 30 ft. high. Rarely sixty feet.

Salix amplifolia. Coville. (Broadleaf willow).	20 - 25 ft. 8 - 12". Alaska near coast region on beaches and dunes with Alaska willow. See Black cottonwood.
Salix hookeriana. Hooker. (Hooker willow).	6 - 10" diam. Van. Is. to Oregon coast region near underwater streams and salt marshes. Climate similar to Sitka spruce. Seeds abundantly.
Salix sitchensis. Sanson in Bongard. (Silky willow).	Alaska to Santa Barbara. Often in rich mucky soil.
Salix alaskensis. Coville. (Fetleaf willow).	Alaska, Alexandria Archipelago to McKenzie River Bay shores in newly deposited gravel (shrub) in older gravel as a tree with amphlifolia climate.
Populul trichocarpa. Torrey and Grey. (Black cottonwood).	Alaska, Oregon and Montana. 10 - 125 feet. 12" - 4' diam. Sand bars, sandy humous rich soils. Higher levels in canyon bottoms and gulches. Sea fogs, intolerant. Good seeder, reproduces ~~good~~ well in moist bare humous or sandy soil.
Betula fontinalis. Sargent (Mountain birch).	B.C. and Edmonton. 4,200 feet. Washington. 10,000 feet Cal. Sierras. Possible more readily available than some others.

Malus rivularis. (Dougl) Roemer. (Oregon crab apple).	Alentians to Cal.	Sitka spruce and Red alder.
Prunus emarginata. (Dougl) Walpers. (Bitter cherry).	Forms cover on dry rocky and springy slopes at high elevations. 3,000 ft. Montana 9,000 ft. So Cal	

APPENDIX XXIII.

Omit but enact

DRAFT OF A BILL

TO ENABLE THE GOVERNOR IN COUNCIL TO MAKE REGULATIONS CONCERNING THE IMPROVEMENT, MOVEMENT, MARKETING AND SAFE-GUARDING OF ANIMALS, AGRICULTURAL CROPS AND HOLDINGS AND THEIR PRODUCE.

BE IT ENACTED by the Governor of the Colony of the Falkland Islands with the advice and consent of the Legislative Council hereof as follows:

(1) This Ordinance may be cited as the Agricultural Regulations Ordinance 1944.

(2) Definitions:-

Sheep	means everything in the nature of a ram or ewe and their progeny, and includes goats.
Cattle	means everything in the nature of a bull or cow and their offspring, and includes related animals.
Horses	means everything in the nature of a stallion or mare and their offpsring, and includes mules and donkeys.
Dogs	means everything in the nature of a dog or bitch and their offspring, and includes related animals, e.g. foxes and dingos.
Animal.	means any member of the vertebrates and insects and includes mammals, birds, bees but excludes man.
Primary produce	means anything grown on or derived from the land (not being mineral) or from animals either domestic or wild, which possesses intrinsic value and includes wool, skins, mutton, poultry and dairy produce, vegetables, fruit and seeds etc.

Spray material	means substances specially prepared for use as dusts, solutions, suspensions and emulsions for the purpose of preventing or limiting the ravages caused by pests and disease on plants.
Insecticides	means any materials designed or intended to be used to kill or control ecto-parasites of animals and plants, though the parasites may not belong to the family Insects.
Fertilizers	means any substance which is sold for application to the ground or to seeds, in order to produce an increased yield of vegetable matter or to change the reaction of the soil (soil acidity).
Dip	any material used as a dust, solution, suspension or emulsion for the purpose of killing or reducing ecto-parasites on animals.
Drench	any material intended to be used for internal application to animals to control or eradicate internal parasites.
Fungicide	any substance whether it is a chemical compound or propietary preparation that is intended to be used to prevent damage to primary produce by fungi or bacteria.
Weds	any species of plant, which if introduced to the Colony, would increase the costs of Agricultural and Horticultural products without providing any economic or aesthetic return (such as ornament, fodder, shelter or timber) or which is injurious to stock or primary produce.
Vermin	ay animal which is injurious to Agriculture and includes mite, ticks, rabbits, hares foxes and such birds and insects as are

harmful to Agricultural animals or primary produce.

Agricultural produce — anything that is grown in the soil or derived from animals, and includes any product manufactured on a farm from primary produce, butter, cheese, tinned and dehydrated foodstuffs.

Returns — contain tabulated data concerning various branches of agriculture, agricultural produce and includes information concerning the operation and development of holdings and the distribution of Agricultural products.

Agriculture and its gramatical variations — means animal husbandry, field husbandry and forestry, and includes bee keeping, horticulture, fruit growing, market gardening and arable and pastural farming.

(3)

(4) The Governor in Council may make regulations for all or any of the following purposes:-

(a) prohibiting or controlling the importation of sheep, cattle, horses, dogs and any other animal into the Colony.

(b) making the conditions under which hay or other substances used for the bedding or feed of animals may be imported into the Colony

(c) controlling the production, quality, registration and marketing of primary produce, agricultural products or animals intended for sale in local or overseas markets.

(d) controlling the quality, sale or use of drenches dips, insecticides, fungicides, fertilizers and animal food-stuffs.

(e) preventing the introduction of weeds, as seeds or living plants, in soil, hay, agricultural or horticultural seeds, packing materials or by any other means.

(f) eradicating, or controlling the spread of weeds within the Colony.

(g) prescribing the methods and treatment for the control of exterminantion of vermin which reduce the quality or yield of pastoral, agricultural or horticultural products.

(h) prescribing the forms and subjects of pastoral agricultural or other returns which may be required from primary producers or from persons who handle, sell or transport primary products.

(i) branding and marking of animals.

(j) prescribing the powers and duties of Inspectors, experts or other officers appointed under this ordinance.

(k) registering and supervising persons or groups of persons engaged in the production and distribution of primary produce.

(l) generally for the improvement and welfare of pastoral, agricultural and horticultural activities in the Colony.

PROVIDED THAT: any regulations made under this Ordinance must be laid before and approved by the Legislative Council at its next following meeting.

5. The Governor may from time to time appoint inspectors, experts and other officers as he deems necessary for the purpose of the Ordinance and may also prescribe their powers and duties.

6. The officer in charge of the Agricultural Department and Inspector of Stock shall be deemed to be Inspector under this Ordinance.

7. Every Inspector under this Ordinance shall have all the powers of entry and search that are necessary to enforce the provisions of this Ordinance.

Quit Rent Arrears 228 6

The following draft Regulations concerning the quarantine of stock have received the approval with one minor exception of the Falkland Islands Woolgrowers Association, Stanley.

REGULATIONS MADE BY THE GOVERNOR IN EXECUTIVE COUNCIL UNDER SECTION 45 OF THE LIVE STOCK ORDINANCE, 1901 FOR THE PREVENTION OF THE INTRODUCTION OF ANY CONTAGIOUS OR INFECTIOUS DISORDER INTO THE COLONY OR DEPENDENCIES.

1. These Regulations may be cited as "The Live Stock Quarantine" Regulations 1942.

Short Title .

2. Any person intending to import any animal shall before such animal is ordered, give notice by telegraph and in writing to the Chief Inspector of Stock, stating the number, description, from whence imported, where purchased and the probable date of arrival in the Colony.

Notice to be given of intention to import stock before animals are ordered.

3. Ships carrying animals shall enter at Port Stanley for the purpose of examination, except where the importer of such animals or his agent has previously obtained special permission from the Government to enter at some other port. This special permission may be granted when a definite date of arrival is stated.

Importing vessels to enter at Port Stanley except by special permission.

4. The proposed port of entry and the first port at which it is intended to land any animal should be stated in the form of Schedule B hereto. Seven days of grace will be allowed, after which the permission so granted shall be cancelled and a fresh application made.

Port of entry to be notified.

5. Every animal so imported into the Colony from a British or Colonial port shall be accompanied by a health certificate signed by a qualified veterinary surgeon of the district in which the animal was purchased, and if imported into the Colony from a foreign port, shall be accompanied by a written declaration from the exporter made before a British Consular Officer to the effect that the animal is free on embarkation from any infectious or contagious disease and has not, within thirty days preceeding shipment, been in direct or indirect contact with infected stock.

Certificates of health to be furnished.

6. Sheep must be accompanied by a certificate signed by a veterinary surgeon (or if none resides in the district, a Stock Inspector) of the district from which the animals where purchased, certifying that within thirty days before shipping each animal was drenched twice for the eradication of stomach intestinal and lung worm and liver fluke, and the certificate must specify the treatment used.

Sheep must be drenched for worm and fluke before shipping.

7. Bovine animals must be accompanied by a certificate signed by a qualified veterinary surgeon (or if none resides in the district, a Stock Inspector) of the district from which the animal was purchased certying that within thirty days preceding shipment each animal has been subject to secorological and/or bacteriological tests for, and has been found to be free from tuberculosis, contagious abortion, contagious mammitis and any other disease which the Inspectors may designate.

Cattle must be tested and found free from tuberculosis, contagious abortion.

8. Canine animals must be accompanied a certificate signed by a qualified veterinary surgeon certifying that within thirty days preceding shipment, each has been immunised to distemper, drenched to eraddcate stomach and intestinal worms and is free from ecto-parasites and the certificate must indicate the treatment used.

Dogs must be vaccinated against distemper, drenched for worms and free from fleas and lice.

9. The Inspector may, within seventeen days after receiving notification prescribed by Regulations 2, require the animals to be accompanied by such additional evidence of freedom from specific diseases as the conditions in the exporting country for the time being make desirable.

Further evidence of freedom from specific diseases.

10. If transshipped at an intermediate port or ports, each consignment of animals must be accompanied by a declaration made before a British Consular Officer at each port of transhipment, stating the precautions that were taken to prevent the animals from contracting any disease during transhipment, and describing the manner and place in which the animals were held and fed pending re-shipment.

Certificate of quarantine during transhipment.

11. Any person who shall import any animal without due notice as provided in Regulations 2, or without a health certificate as provided in Regulations 5, or without a certificate and declarations required by Regulations 6, 7 and 8 and 10 shall be liable on conviction to forfeit the stock, or to a fine not exceeding £50 in respect of each animal so imported.

Penalties.

12. No hay, straw, fodder or other similar substances that ha been used for the food or bedding of animals being imported, or otherwise for or about such animals shall be imported, but unbroken bales to which the stock have not had access may be imported, subject to conditions imposed by the Inspector, if accompanied by a written declaration from the exporter made before a British magistrate or a British Consular Officer at the port of shipment certifying that the produce is from a district which has been free from foot and mouth disease for the past twenty four months.

Importation of fodder and litter restricted.

13. Notwithstanding anything to the contrary in the Quarantine Ordinance of 1908 or any other Ordinance, an Inspector shall board and inspect every stock carrying vessel and shall examine every animal and all fodder and litter accompanying the imported stock or that is consigned to an address within the Colony or Dependencies.

Duties of Inspectors.

14. An Inspector shall have power:-

Powers of Inspectors.

(1) to prohibit the landing of any animal, which in his opinion would be source of danger to other animals in the Colony.

(2) to order any animal to be destroyed, either on board ship or after being landed, but such order in all cases must be santioned by the Governor before being carried into effect.

(3) to order any animals to be conveyed or driven to and confined in any area set apart as a quarantine station, to treat such animal or animals for the eradication of any disease, and too keep such animal in quarantine until a written order for irs release is given by him, or until its destruction is sanctioned by the Governor.

(4) to order that all or any parts of any stock carrying vessel shall be throughly cleansed and disinfected to his satisfaction.

(5) to prohibit the landing of fitting, pens, hurdles, utensils, or other articles which have been used for or about the animal.

(6) to prohibit the landing of any hay, straw, fodder or any article which in his opinion may carry disease and to order its destruction.

15. All expenses incurred in the destruction or keeping in quarantine by order of an Inspector or in dipping, attendance on or feeding of any animals enumerated in Schedule A hereto, or in the destruction of any hay, straw or other article under these regulations, shall be payable by the importer and the Government will not compensate the importer for any loss sustained thereby. Expenses payable by importer.

16. The foregoing regulations shall apply to the importation of sheep from South America subject to the following provisions:-

Importation of sh... from South America.

(1) The exporter of the sheep shall make a declaration in the form annexed hereto (Schedule C) with respect to the sheep which is intended to import and the declaration shall be made before a British Consular Officer and countersigned by the Inspector before the sheep are landed.

(2) The sheep shall ve landed on a quarantine station or an Island approved by the Inspector, and shall remain in quarantine for ninety days.

(3) The sheep shall be dipped a first time within a week of being landed at the quarantine station, and another three times at intervals of ten to fourteen days.

Provided the Inspector may at his discretion postpone the first dipping and have the sheep shorn in which case the wool so removed must be destroyed.

(Note The sheepowners objected to the destruction of the wool)

(5) Before the sheep are released from quarantine they shall be marked with a yellow ruddle.

17. The minimum periods of quarantine for each type of animal will be as indicated in Schedule A.

18. Repeal Livestock Regulations 1923 and Dog Importation Regulations 1928.

SCHEDULE A

Cattle	28 days, or until July (Warble).
Horses	14 days.
Sheep	28 days.
Pigs	30 days.
Goats	30 days.
Dogs	90 days.
Other animals	30 days.

The initial date of Quarantine may be taken from the date of departure of the ship from the port at which the stock were last loaded if the Inspector considered such a step expedient.

SCHEDULE B

I hereby give notice that I propose to import into the Falkland Islands the following live animals.

Number and description:
Where purchased (Country and locality):
Port whence shipped.
Port at which vessel will enter Falkland Islands:
Approximate date of arrival:
First port at which any animal will be landed:
Name of person in the Falkland Islands to whom the animals will be consigned:

N.B. - This notice, of which printed copies may be obtained on application, must be made out in duplicate and forwarded to the Chief Inspector of Stock, Stanley, in order to reach him AT LEAST TWO MONTHS' before the Livestock is expected to arrive in the Colony.

SCHEDULE C

I .....

do solemnly and sincerely declare that the undermentioned sheep are to the best of my knowledge and belief free from all infectious and contagious diseases and were so at the time of shipment to the Falkland Islands and have not within six months immediately preceding the date hereof been in direct or indirect contact with stock infected with any such diseases and consist of :-

Number.	Sexes.	Breeds.	Brands and Marks.

and I further solemnly and sincerely declare that to the best of my knowledge and belief no disease of any animals has existed for six months previous to the shipment of the above mentioned sheep at the place or adjacent thereto from which the said stock are bought and that they {have / have not} on the way to the port of shipment been driven over any roads open to any sheep which may have been infected with any contagious or infectious disease and/or that the vehicles in which they have been transported to the ship were disinfected with a scab and lice killing preparation before the sheep were loaded thereon, and I make this declaration conscientiously believing the same to be true.

Declared at this day of

(Signature) .....

Omit but enact.

III

D R A F T P L A N T D I S E A S E R E G U L A T I O N S

REGULATIONS MADE BY THE GOVERNOR IN COUNCIL UNDER SECTION OF THE PLANT DISEASE REGULATIONS ORDINANCE 1944 FOR PREVENTING THE INTO-DUCTION OF PESTS AND PLANT DISEASES INTO THE COLONY.

1. These regulations may be cited as the Plant Disease Regulations 1944. — Short title

2. The Department of Agriculture shall be the authority and subject to this authority all Customs Officers and any other person speciafically appointed by the Governor to carry out the provisions of the Plant Disease Regulation Ordinance shall be Inspectors for the purpose of administering and enforcing the provisions of this Ordinance and any other regulations that are, or may hereafter be made, under it. — The authority that administered the ordinance and Inspectors.

3. An inspector shall inspect all plants and seeds set out in the first schedule hereto and may inspect any other plant, seed, container, or covering that is imported into the Colony. — Duries of Inspectors

4. The Director of Agriculture and all inspectors shall exercise all the powers of entry and search conferred by the Customs Ordinance 1943 on Customs Officers and by the Live Stock Act of 1901 on Inspectors. — Powers of Inspectors

5. An Inspector may:-

(a) detain any plant, seed, container, or covering which, if permitted to enter, would, in his opinion, bring about the introduction of pests or plant disease that would endanger the healthy growth of the plants customarily grown in the Colony or that it is planned to grow therein:

(b) with the approval of the Director of Agriculture order any plants to be planted for a period not exceeding twenty four calendar months in a specified place set apart and used for the time being, as a plant quarantine station:

(d) order or apply any treatment that may be necessary to destroy any pest or disease which he identifies or believes to be present on or in any plant, seed, container, or covering, and if no such treatment exists, or if there is danger that a pest or plant disease may escape into the Colony before such treatment can be applied, he shall order the destruction by burning of such plant, seed, packing material, container or covering as is necessary to ensure the complete destruction of the pest or plant disease, bearing in mind the significance of physiological races of these.

6. (1) Applications for permits to import plants shall be made in writing to the Director of Agriculture and shall state:- Permit necessary to import plants.

(a) the full name, residence, and postal address of the applicant:

(b) name and address of the person from whom it is proposed to obtain the plants and the source of the plants, including locality and nursery if any.

(c) the botanical or the generally accepted popular names of the plants, and the number of each variety it is desired to import.

(d) the locality in which it is proposed to grow the plants.

(2) The applicant shall supply the Director of Agriculture with any other particulars which he may require.

7. No soil, plants, or seeds, ~~or soil~~ except those specified in under the second schedule hereto shall be imported into the Colony except on a permit signed by the Director of Agriculture and under the conditions specified therein.

Plants which may be imported without permit.

8. Plants specified in the third schedule hereto may be imported into the Colony, only if accompanied by a certificate signed by a qualified plant pathologist or similar officer employed by the Government of the country from which the plants were originally dispatched stating that the plants were free from pests and plant diseases (including virus disease) when examined by him not more than fourteen days before the date of shipment and that reasonable precautions had been taken to prevent them becoming infected since that time, and they may be imported the, only if there is

Plants to which special conditions are applied.

in the Colony, an officer competent to identify pests and plant disease on the plants when they arrive in the Colony.

Provided that plants certified by the Director of any official British or United States of America (Federal or State) research organizations as being free of all economic pests and plant diseases at the time of shipment, may be imported into the Colony during the absence of such an officer.

9. All reasonable costs incurred in the examination, treatment, or destruction of plants shall be born by the importer notwithstanding that the plants or seeds have been /destroyed. The cost may be recovered summarily.

Costs of examination and treatment recoverable from importer.

Provided that the Governor may, if he sees fit, direct that no charges be made.

10. No claim for compensation shall lie for any loss incurred through the action of any Inspector acting in good faith under the authority of the Plant Disease Regulation Ordinance.

No compensation.

11. Plants and seeds shall be imported into the Colony via Port Stanley; but may be imported via any other place under such conditions as the Director of Agriculture may impose, and may be recovered summarily.

Ports of entry.

12 Any person who shall import any plant or seed without conforming to these regulations shall be liable on conviction to the forfeiture of the plants etc, and to a fine not exceeding £100.

Schedule I Seedlings & plants of forest trees
Plants & stocks & cuttings of fruit trees
Plants & cuttings of small fruits (for example currants strawberries raspberries gooseberries)
Agricultural seeds (pasture & crop)
Potatoes & other Tubers.

Schedule II

Vegetable Seeds
Flower seeds
Agricultural seeds (pasture & crop)
Seeds of small fruits

Schedule III

Potatoes
Jerusalem artichokes
Strawberry plants
Raspberry plants
Currant plants.