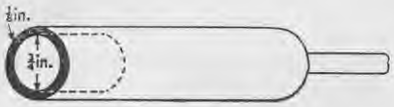
immunity. They may be vaccinated at any age after 4 months provided they are not in calf at the time. The vaccination of all calves is strongly recommended even when there is no contagious abortion in the herd, as the introduction of infection into a herd where no vaccination has been done will result in heavy losses during the first year. Still more satisfactory reduction in the incidence of contagious abortion could be made if all owners of calves would have them vaccinated.

Lead Poisoning

The usual cause of lead poisoning of calves, which is fairly common, is the licking and swallowing of lead paint. Although freshly painted objects and discarded paint tins are the obvious sources, poisoning frequently results from calves chewing objects on which the paint is old and obscured by dirt or whitewash. The source of lead can easily be overlooked. In many cases where analysis has proved the existence of lead poisoning prolonged search has been necessary to discover the origin of the poison. Other possible sources of lead are old car batteries, orchards which have recently been sprayed with lead arsenate, arsenical weedkillers, foot-rot baths, or dips.

Calves suffering from lead poisoning generally die quickly, but excitement, staggering, grinding of the teeth, and salivation are symptoms which may be noticed. There is abdominal pain and blindness and frequently severe constipation. Diagnosis can be confirmed only by laboratory analysis. For this purpose 1lb. of liver and 1lb. of fourth-stomach contents, both specimens unpreserved, are required.

The most effective antidote is Epsom-salt, 2 to 4oz. in water, followed by a pint of medicinal paraffin. The calf may be allowed a liberal diet of milk.



Head of debudding iron.

Copper Deficiency

Copper deficiency may be the cause of scours and unthriftiness in some areas. New Zealand has not been surveyed completely for copper deficiency, but it occurs particularly on reclaimed swamps or peaty soils, on some pumice soils, and on peat and pumice mixtures. Scouring has been reported in calves shortly after they begin to eat grass, but it is at its worst during the winter and spring when the animals reach yearling stage.

Calves on copper-deficient country do not thrive or fill out and are more liable to parasitic and other infections. Usually a diagnosis may be made from the symptoms already described and from the fact that dosing calves with a bluestone (copper sulphate) solution results in improvement. Calves should be given 1 pint of the solution (made by dissolving 1oz. of bluestone in 1 gallon of water) at 2-day intervals for 10 days.

Veterinarians or Livestock Instructors of the Department of Agriculture should also be consulted so that arrangements can be made for pasture analysis and blood or liver assessments.

Other methods of countering copper deficiency are to add bluestone to stock drinking water, by supplying bluestone licks, or by topdressing with bluestone or copperised superphosphate.

Cobalt Deficiency

Loss of appetite, depraved appetite, progressive loss of condition, and sometimes scouring are symptoms of cobalt deficiency. Anaemia may appear at a later stage. Cattle are less susceptible than sheep and if weaned lambs thrive on a property, the cause of unthriftiness in calves on the same property will not be cobalt deficiency. Unweaned calves are sometimes affected, but the condition seldom appears in its acute form until after weaning.

Cobalt deficiency may be diagnosed by dosing calves with 5 fl. oz. of a dilute cobalt sulphate solution twice weekly for 5 weeks, when they should show marked improvement if cobalt deficiency has been the trouble. The procedure for making the solution is as follows: Make a concentrated solution by dissolving 1oz. of cobalt sulphate in 1 pint of water; add 1 fl. oz. of the concentrated solution to 1 gallon of water. This solution is used for drenching as already described.

Veterinarians or Livestock Instructors of the Department of Agriculture should be consulted so that arrangements can be made for diagnosis by other methods and advice received about topdressing with cobaltised fertiliser or the use of cobaltised licks.

Dehorning

Horns add nothing to the value of cattle for the purposes for which they are kept on New Zealand farms; on the other hand, they cause damage and indirectly are responsible for loss of production in milking herds. The disbudding of young calves by any of the recognised methods is the most satisfactory and humane way of preventing horn growth. If all calves were treated in this way, much trouble would be saved later. Calves should be treated before they are 3 days old and there are two methods in common use. The horn buds can easily be felt and the hair round them should be clipped off.

1. **The cautery or debudding iron** is ideal. It consists of an electrically heated copper instrument of the shape shown in the diagram on this page or a fire-heated iron of the same shape. The iron should be heated to a cherry red and applied over the horn bud and moved back and forth until a copper-coloured ring of tissue shows right round the horn bud. This destroys the circulation of the developing horn and the bud eventually drops off. There is no wound, no infection, a poll of pleasing appearance, and, most essential, no horn growth.

2. **Chemicals:** Caustic soda or caustic potash are chemicals commonly used for destroying horn buds. A ring of petroleum jelly is smeared round the bud. The moistened caustic stick is then applied to the bud until the skin is red, but not more than slight bleeding should be caused. Calves must be protected from rain for some days, as rain will carry the caustic down the cheeks or into the eyes, causing irritation and sometimes blindness.

Another chemical which may be used when calves are from 1 day to 14 days old is a flexible paint made of antimony trichloride (28 per cent.), salicylic acid (7 per cent.), and flexible collodion (65 per cent.). The hair round the bud is clipped, the horn bud cleaned with methylated spirit, and the paint brushed on and allowed to harden. If the paint is used on an animal more than a week old, the tip of the horn bud should be cut off before the paint is applied.

Meteorological Records for May

Station	Height of station above M.S.L. (ft.)	Air temperatures in degrees (Fahrenheit)				Rainfall in inches					Bright sunshine hours
		Approx. mean	Difference from normal	Absolute maximum and minimum		Total fall	No. of days of rain	Difference from normal	Maximum fall		
				Maximum	Minimum				Amount	Date	
Kerikeri	201	58.1	+ 1.8	72.2	39.5	7.56	18	+ 0.37	3.10	26	75.9
Auckland	160	58.4	+ 1.8	71.2	42.1	7.39	17	+ 2.60	1.84	1	101.6
Tauranga	10	54.5	+ 0.9	68.9	33.8	5.16	12	+ 0.03	1.88	1	120.1
Ruakura	131	52.3	+ 0.9	68.3	24.7	6.73	13	+ 2.13	1.82	1	103.4
Rotorua	969	51.4	+ 1.2	65.4	30.0	7.02	12	+ 1.74	1.76	1	110.1
Gisborne	12	53.4	+ 0.0	71.0	33.0	1.73	12	— 3.04	1.10	1	92.9
New Plymouth ..	160	54.8	+ 1.1	68.0	37.2	5.60	12	— 0.47	1.32	13	123.1
Napier	5	54.0	+ 1.2	72.4	35.0	2.21	11	— 1.13	1.40	1	124.0
Kariol	2125	46.8	+ 1.3	67.0	27.0	6.00	16	+ 1.98	0.84	28	
Wanganui	72	53.6	+ 0.6	69.8	32.9	3.01	13	— 0.11	0.56	14	91.7
Palmerston North .	110	51.6	+ 0.6	65.1	32.2	4.17	14	+ 0.85	0.78	14	97.8
Waingawa	350	49.9	+ 0.4	68.5	28.0	4.38	18	+ 0.33	1.30	16	85.7
Wellington	415	51.2	— 0.1	63.5	38.4	6.27	14	+ 1.71	1.36	15	87.1
Nelson airfield ..	5	50.1	+ 1.6	66.0	28.0	5.01	13	+ 1.97	1.56	26	131.0
Blenheim	12	50.4	+ 0.3	67.1	29.8	3.46	11	+ 0.93	0.78	13	126.2
Hokitika	12	49.4	+ 1.2	69.4	31.0	12.79	19	+ 3.51	3.47	23	95.3
Hanmer	1225	46.4	+ 1.6	67.0	22.0	2.24	13	— 2.24	0.54	2	108.7
Christchurch ..	22	49.0	+ 1.4	70.8	30.8	2.22	12	— 0.63	0.79	16	107.3
Ashburton	323	47.2	+ 0.5	69.0	26.8	1.27	9	— 1.28	0.47	13	119.0
Timaru	56	46.8	+ 0.0	67.8	27.4	1.33	9	— 0.20	0.48	14	126.1
Alexandra	520	43.2	+ 0.4	66.0	20.6	0.67	5	— 0.24	0.46	26	148.8
Taieri	80	44.6	— 1.3	63.3	24.7	0.79	13	— 1.30	0.28	26	99.7
Invercargill airfield	0	43.6	— 1.7	60.6	21.8	2.95	16	— 0.79	0.55	27	94.6