

Selected reading from....

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EDITOR'S NOTE: The length of the original paper made it necessary to edit it for inclusion in *The Fan Hitch*. Therefore readers are reminded that some data, statements in support of conclusions drawn, along with the list of references, are not a part of what is presented below. Nevertheless, this scientific paper offers insight into the invaluable contribution of both the authors and the dogs. *The Fan Hitch* expresses its profound gratitude to A.R.M. Bellars for sharing his research with its readers. This paper is reproduced here by permission of the Natural Environment Research Council (the parent body of the British Antarctic Survey) who holds sole copyright. We are indebted to them for allow us to share it with you.

**British Antarctic Survey Bulletin,
Number 21, 1969
Veterinary Studies on the British Antarctic
Survey's Sledge Dogs: I.
Survey of Diseases and Accidents**

by A.R.M. Bellars

Abstract

The causes of death in registered Antarctic sledge dogs have been classified under 13 headings. for the most part, these categories are what one might expect from the knowledge of the life and environment of these dogs. The exception is the condition now called "cervical lymphadenitis" since its aetiology is unknown.

From this review it can now be seen that accidents and fights ("extrinsic" causes), and osteoarthritis, are the most frequent reasons for fatalities. together, they account for 67.9 per cent of male deaths and 47.5 per cent of female deaths. However, accidents and fighting have most effect on the juvenile husky, whereas osteoarthritis almost invariably affects huskies older than 5 years.

Culling is the only category showing more female than male deaths. There is a continual tendency to reduce the number of females to that required for breeding purposes. And to replace females with males in sledge teams. Considering that this dog population is closed, one could reasonably expect the figures for culling to be higher than they are. Against this, there is the obvious need for continual replacement of fatalities and an inadequate knowledge of the technique of culling.

Despite the presence of a permanent breeding population of huskies at the British Antarctic Survey stations since 1945, when the original dogs were brought from Labrador, no veterinary information became available until M.F. Godsall visited these stations in the austral

summer of 1963-64. Apart from a few occasional additions from Greenland in 1954 and 1961, and from Canada in 1954, the present dogs are all directly descended from the original imports. The breeding and maintenance of sledge dogs has been well described by Bingham, James, Adie, Reece and Taylor.

Nowadays, mechanical transport has to a large extent superseded the dog team but for field work from Stonington Island in the Antarctic Peninsula and Halley Bay on the Brunt Ice Shelf dog teams are still used extensively, and they have long since proved themselves to be a safe and reliable means of transport in mountainous terrain. In this manner, journeys of 600 miles are still undertaken regularly. Although there is no doubt that, in difficult conditions, a well-fed and well-driven team is a most efficient means of travel, modern demands are such that air support has now become essential if the dog team is to operate to its maximum efficiency.

Previous work

Before 1963-64, all research and medical work on the dogs had been done by medical officers or zoologists, producing very good results particularly on the nutrition and work output of sledge dogs. From their work it was shown that seal meat, with its high fat and protein content, was the ideal dog food. Furthermore, seal blubber is essential to the dog's well-being in conditions of poor weather or hard work. However, away from the coastal areas the dogs are fed on the sledging diet, Nutrican (manufactured by Bob Martin Ltd.). Comparisons of this diet with the previously used dog Pemmican (Manufactured by Bovril Ltd.), and with Pemmican and seal meat, were carried out and the present diet has only been varied on composition when the manufacturers have had to turn to other sources for the basic constituents.

It is now customary to feed at least 1.5 lbs. Nutrican daily when conditions and supplies permit. Feeding at this rate will not stop the members of a hard-working team from losing weight progressively but fortunately the dogs recuperate very rapidly when Nutrican or seal meat is once again unlimited. In 1967 vitamins and minerals were added to Nutrican to supplement the vitamins included after Taylor's work.

Sledge loads

For practical purposes, 120 lb/dog is still considered as a fair maximum sledge load, although air-support facilities often lower this figure. Taylor measured the pull exerted by a dog team; he was able to show daily fluctuations of up to 50 per cent and stressed that many factors including gait,

changes in temperature, diet, snow surface and the psychological effect of long and monotonous journeys affected the dogs' performance.

Teams

The standard survey team consists of nine dogs, the leader often being a bitch. The lighter, more responsive dogs are usually in the lead and the heavier workers in the rear. Pups are trained to harness from 6 months onward and they are usually in full work shortly after reaching the age of 9 months. A normal health husky dotes on human company and gives every appearance of thoroughly enjoying its work. The present dogs average between 70 and 95 lb. in weight when well fed and exercised, with bitches weighing 10-20 lb. less than the dogs. As a general rule, the Labrador type, with its long strong back and powerful relatively shorter legs, is found to be ideal for the work.

At all of the stations except Halley Bay the dogs are "spanned out" in the traditional manner at all times, the only exception being whelping bitches. At Halley Bay the dogs are put into ice tunnels when the winter temperature drops below -30C.

Harnesses

Each dog has its own tailor-made harness from 1.5 inch wide lampwick, which is soft and strong, and spreads the load across the shoulders and chest. There are several methods of attaching the harnessed team to the sledge but the commonest method is the centre trace. Occasionally the fan method has found favour.

Distances

There is considerable variation in distances travelled on field journeys but a round haul of 900 miles is not unusual. A good dog might cover at least 8,000 miles during its working life; one litter of pups covered 1,000 miles before they were 1 year old, having started full work at 6 months of age. Much time is wasted because of bad weather, with the resultant boredom in both men and dogs during these lie-up periods. Under good conditions in the Antarctic peninsula a sledging party may average 16 miles/day.

Retirement

The older dogs are usually incapable of further useful work by the time they are 8 years old. They are then destroyed or retained for breeding, or for pup training. Many dogs become too slow before they are 8 years old. It was mainly because this had been observed that M.F. Godsall toured the stations and determined that the reason for this slowing was osteoarthritis.

Present work

Osteoarthritis was found to be a major problem in Antarctic sledge dogs and it was investigated during two summer tours of the Survey's stations. One season was devoted to a pathological survey and another to a clinical approach involving x-radiography. In addition, entropion of the eyelids was found to exist in the dogs and surgical correction was carried out where necessary. In 1967-68, true haemophilia was encountered in two related litters at

one station. As both of these conditions are thought to be hereditary in origin, the complete genealogy of the British Antarctic Survey sledge dogs was traced with the aid of G.K. McLeod.

Where a condition had been reported in the past, advice was given as to its possible cause, treatment and further investigation. Among these were a disease known as "Signy Neck" (but referred here to as cervical lymphadenitis), a condition erroneously called "ringworm", pyometra and endometritis, and corneal opacity.

By far the largest part of the work involved the examination of every dog at each station, the instruction of medical officers and stations members on aspects of the veterinary treatment of dogs (particularly the treatment of wounds), distribution of appropriate drugs to each station, surgical treatment of individual dogs, and finally, advice on many of the subjects involved with the maintenance of a large colony of dogs. It was a privilege, as novices to the Antarctic, to learn a very large amount from dog drivers and their dogs.

As a result of these visits, great emphasis was placed on the many advantages of carrying out complete post-mortem examinations, and the advisability of continued veterinary investigation at regular intervals. Following recommendations, it is hoped that more dogs will be introduced from the Arctic in the near future.

SURVEY OF DISEASES AND ACCIDENTS

BREEDING AND PUP MORTALITY: 1950-1968		
Number of litters	224	Causes of pup mortality: exposure and chilling (at bases and in the field), destroyed by the bitch, killed by adult males, culled.
male pups	567	
female pups	499	
Mortality (died or destroyed)	634	

CLASSIFICATION OF FATAL ACCIDENTS			
	Males	Females	Total
Sledging accidents (loss of whole or part of team)	34	6	40
Missing presumed dead	11	3	14
Fractures	7	2	9
Drown	5	3	8
Strangled on span	1	3	4
Anesthesia	2	-	2
Dislocated shoulder	1	1	2
Killed in crevass	9	1	10
Total	70 (22.4%)	19 (13.5%)	89

AGES OF DOGS THAT DIED FROM UNKNOWN CAUSES		
Age (years)	Males	Females
0-1	5	2
1-2	3	-
2-3	3	-
3-4	2	-
4-5	4	3
5-6	6	4
6-7	7	1
7-8	-	-
8-9	-	1
9-10	-	-
10-11	1	-
Total	31 (9.9%)	11 (7.8%)

DEATHS AND DESTRUCTIONS AS A SEQUEL TO FIGHTING		
Age (years)	Males	Females
0-1	3	1
1-2	3	1
2-3	3	1
3-4	1	-
4-5	3	-
5-6	3	-
6-7	2	-
7-8	1	1
8-9	-	-
9-10	1	2
Total	20 (6.4 %)	6 (4.3%)

DEATHS DUE TO "CERVICAL LYMPHADENITIS"		
Age (years)	Males	Females
0-1	-	2
1-2	2	1
2-3	1	-
3-4	-	1
4-5	1	-
5-6	1	-
6-7	-	-
7-8	-	1
Total	5 (1.6 %)	5 (3.5 %)

DOGS DESTROYED DUE TO NEOPLASIA			
Cause	Number	Sex	Age (years)
"Cancer" mouth	2	Male	6.8
"Tumour" spleen	1	Male	5.6
"Cancer" liver	1	Male	6.9
Total	4 (1.3 %)		

Only 4 cases of neoplasia have been recorded. None were confirmed by histopathological examination but all seem to have suffered from malignant neoplasia.

DOGS DESTROYED DUE TO FAILURE OF CONFORMATION		
Reason	Males	Females
Poor conformation	5	7
Culling	6	5
Temperament	-	4
Over-long hair	1	3
Total	12 (3.8 %)	19 (13.5 %)

This is a most important process in the maintenance of a healthy, relatively closed population of dogs. Although "poor conformation" covers all possibilities in this group, temperament and over-long hair have been separated as they are more specific problems. The term "cull" itself has been reserved here for dogs destroyed for reasons such as station evacuation. One bitch was destroyed because it continually slipped its harness and was "uncatchable". One dog was destroyed because it killed four well-grown pups, both of these cases are included under "temperament".

DOGS DESTROYED DUE TO BLINDNESS		
Age (years)	Males	Females
3-4	2	1
4-5	1	-
5-6	2	-
6-7	1	-
7-8	-	1
8-9	-	1
Total	6 (1.9 %)	3 (2.1 %)

Cases included are those where blindness appears to have been the main reason for destruction. One dog was blind in one eye only. The others were bilaterally blind and two were senile as well. The aetiology of these cases is problematical. In some instances they were probably due to corneal opacity cause by foreign matter in the eye. Godsall found this was a recurring clinical problem with some of the dogs at the northern stations, where the spans were on volcanic dust or loose rock. Corneal opacity could also have been caused by hereditary entropion, diagnosed in eight huskies at survey stations but it is possible that the other cases have not been diagnosed except as "terminal blindness".

DEATHS DUE TO CARDIOVASCULAR DISORDERS			
Age (years)	Males	Females	Comment
0-1	2	none	This general description covers those cases where post-mortem examination following the collapse and death of a dog was reported was showing apparent disorders of the cardiovascular system.
1-2	1		
2-3	-		
3-4	-		
4-5	-		
5-6	1		
6-7	-		
7-8	1		
8-9	-		
9-10	1		
Total	6 (1.9 %)		

DEATHS DUE TO INTESTINAL OBSTRUCTION		
Age (years)	Males	Females
0-9	11 (3.5 %)	7 (4.9 %)

In some cases foreign bodies such as bone fragments or lampwick caused obstructions. Other cases were diagnosed as intussusception but, since this is likely to occur in young dogs, it is probable that cases in older dogs were true foreign body obstructions. Also in this category are three cases of gastric dilatation, one of which died from rupture of the stomach, and one case of perforation of the intestine. One young bitch died from choking on a bone fragment.

DEATHS DUE TO ENDOMETRITIS AND PYOMETRA	
Age (years)	Numbers
3-4	1
4-5	-
5-6	2
6-7	2
7-8	3
Total	8 (5.7 %)

**DEATHS DUE TO PNEUMONIA
AND/OR SEPTICAEMIA**

Age (years)	Males	Females
0-8	4 (1.3 %)	7 (4.9%)

**PERCENTAGE LOSSES DUE TO OSTEOARTHRITIS (OA)
IN REGISTERED BAS SLEDGE DOGS**

	Males			Females		
	Total	OA	%	Total	OA	%
Deaths due to OA expressed as a % total mortality	312	107	34.3	141	39	27.6
Deaths due to OA expressed as a % mortality due to "intrinsic" causes	207	107	51.7	113	39	34.5
Deaths due to OA expressed as % mortality due to "intrinsic" causes in BAS dogs older than 5 years	147	105	71.4	71	37	52.1