

of great cold, it is probable, not only that the quantity of food properly assimilated and used in the system should be large, but also that fats and perhaps carbohydrates should be largely present in the food. It is further probable that during considerable physical labour in the presence of great cold, health may be maintained either by a dietary in which the total quantity of food is very large, without any remarkable increase in the proportional amount of fat; or by one in which the total quantity of food, though large, is not very remarkably so, but in which the fats are represented in much greater quantity than in ordinary or standard diets.

The following table, extracted from the evidence, permits of a contrast being made between the ship and sledging dietaries in respect to their more important nutritive constituents (4999, 5000):—

SHIP DIET.

Constituents.	oz. water-free.	Ratios : albuminates = 1.
Albuminates ..	4.76	1.00
Fats ..	4.18	0.88
Carbohydrates ..	16.84	3.54
Salts (mineral) ..	1.66	0.35
Total ..	27.44	

SLEDGE DIET.

Constituents.	oz. water-free.	Ratios : albuminates = 1.
Albuminates ..	7.99	1.00
Fats ..	11.65	1.43
Carbohydrates ..	15.22	1.90
Salts (mineral) ..	0.79	0.10
Total ..	35.65	

The quantity of nitrogenous material (albuminates) is large in the sledge diet, and the fats, while in more than ordinary amount in both, are in considerable excess in the diet scheme of the sledge parties. Whether this excess of fat, taken in conjunction with the somewhat large total quantity of nutritive material renders this dietary a sufficient one for men engaged in severe physical work in extreme cold may best be decided by experience; but it would appear that in previous arctic expeditions, such as those of Sir Leopold M'Clintock, a dietary essentially the same succeeded in maintaining health in a generally satisfactory state, in the presence of severe cold and considerable physical exertion.

In these previous expeditions, the cold experienced did not differ very materially from that experienced by the recent expedition (3100, 3242, 3685, 4648), but judging from published narratives and the evidence laid before the Committee, the physical exertions undergone by the men were greater in the recent expedition, or at any rate in the chief sledging journeys of this expedition, than on any previous occasion.

In the case of two of these journeys, estimates have been made of the work done, according to the method usually adopted; and it would appear that in the Northern extended sledge journey the average work done daily per man was equivalent to 534 foot-tons, and on the Western extended sledge journey to 432 foot-tons (Appendix No. 24). It has already been stated that the productive work which can be done on the sledge diet has been estimated at 585 foot-tons. The work done in these two expeditions was not therefore greatly below the calculated productive value of the food, provided this food were all consumed and used in the system to the best advantage. The evidence, however, shows that for several days the men were unable to take their full rations. It is probable also that the extreme cold to which the men were subjected would absorb a greater proportion of the total potential energy of the food in maintaining a normal temperature than has been allowed for, and would thereby reduce the amount available for productive work below 585 foot-tons. It is further probable that the physical work has been under-estimated, so exceptional were the difficulties encountered by the men.*

The conditions of the Eastern sledge journey seem to have been similar to those of the Western.

* The embarrassment caused by these difficulties is in a measure illustrated by the remarks made by Captain Markham on Dr. De Chaumont's corrected estimate of the work done by the Northern sledge party (Appendix No. 24). The mean work done by each man has been estimated at 534 foot-tons, and the productive value of the food at about 450 foot-tons, during the time at any rate when the full allowance of pemmican was not eaten. Captain Markham considers the former estimate an erroneous one, and gives in his remarks a number of reasons in support of this view. He, however, proceeds to state that "the coefficient of resistance for the sledges is in all probability nearly correct, but I consider the coefficient of resistance for the men marching to be infinitely greater than that of the sledges." If the estimate of the work done be modified in accordance with this statement, even although at the same time the other corrections are taken into account, it will be found that the mean is raised much above Dr. De Chaumont's estimate. Indeed, if the coefficient of resistance for the men marching be merely increased to that for the sledges, and not above it, the mean work done would appear twice as great as the highest estimate, or about 1000 foot-tons per man daily.

Commander Aldrich has made a statement on this point also indicating that the coefficient of resistance