

LETTERS TO THE EDITOR

I was interested to read Dr Colin Bertram's note on the use of fuel in polar sledge travel. I admire the ingenuity with which he argues the case for carrying sufficient additional oil to permit him to avoid the accumulation of ice which adds so much to the discomfort of the polar traveller, when it is not possible, as in winter journeys, to evaporate the surplus ice sufficiently quickly by exposure to the air and sun. He may rest assured that the discomforts in the Antarctic are very real, and would not be tolerated if it had been possible by carrying additional oil to avoid these conditions, which do not, of course, arise during the Antarctic summer months.

In winter conditions, every article of clothing a layer or two away from the skin is near or below freezing-point and therefore will collect ice. One remedy for such conditions is a change of outer clothing for the night; drying of the discarded gear by the use of oil would improve matters further. The other remedy (not alternative) is to arrange that the frozen moisture from the breath shall not enter the bag at night. There are times when it takes some courage to refrain from using the heat of condensation and warmth of the breath to warm one's chilly feet, and in really cold weather this temptation could not be resisted. However, I see no reason why suitable head covering could not have been designed to permit one to keep the head outside the bag even in the coldest weather.

Dr Bertram goes on to a comparison of dog versus man power, a question which is not really relevant. As Professor Debenham points out, the main journeys of the Scott-Shackleton type had to be carried out under exceptional circumstances with no weight to spare or to allow for unforeseen contingencies.

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July 2, 1939.

I read with interest Dr Bertram's article on the use of fuel in the polar regions in *The Polar Record*, No. 17, and also the editorial comment which followed. You call your comment "the first reply", and I hope

that one may take this as an invitation for others. The article and comment expressed very clearly most of the factors involved in this complicated and interesting question, but I hope I may be excused if I say that two important factors appeared to me to be insufficiently stressed. These factors are due to two of the fundamental differences between dog-sledge and man-hauling parties.

The first of these Dr Bertram mentions, but to my mind he hardly emphasises it enough, although in his recently published book (*Arctic and Antarctic*) he has treated the whole matter in more detail. This point is that the load of a man-hauling party consists solely of their own food, equipment and fuel, whereas for the dog-sledgers these comprise only about a third of the total weight, at any rate at the beginning of a long journey. The remaining two-thirds are of course dog-food. Hence the addition of a given weight of fuel to the dog-sledgers' load has proportionally about one-third the effect that it has on the man-haulers' load. Failure to take this into account tends to invalidate the calculations contained in the comment.

Incidentally I suppose that the 160 lb. mentioned there is meant to be twenty days' ration for four men and not ten days'—or were pre-war rations really on this generous scale?

The precise effect, in lengthening the party's time in the field, of exchanging this extra fuel for food cannot be easily calculated unless we know exactly how the number of dogs is going to be cut down. Only if the party finishes as a man-hauling unit, having killed all its dogs, can it have the effect described in the comment.

The second difference between man-hauling and dog-sledging parties receives no mention at all. It is this: that, generally speaking, the former party must be larger, and yet the extra man or men provide no extra scientific results. Three men are quite enough for a dog-sledging unit, and except for very long journeys or dangerous conditions, two seem to be the best number. On the other hand, most of the long-distance man-hauling expeditions have consisted of at least four men, to say nothing of supporting parties. It is very doubtful, however, if this extra personnel increased the scientific value of the journeys.

To sum up, it seems to me that purely as between man-haulers and dog-sledgers, the latter can afford some extra fuel because it increases their load proportionally very much less, and since they have eliminated at least one unnecessary man they ought in a fair comparison to count the weight saved of his ration of food and fuel.

It must be remembered also that the more detailed and precise observations demanded by modern exploration require that one's brain be not altogether numbed by cold and discomfort. For explorers before the Great War travel was the main object, but now most of the work is more detailed. To travel in cold conditions is one thing, to explore in the best sense of the word nowadays is quite another.

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February 25, 1939.

Following my recent short article in *The Polar Record* on fuel in polar travel there have been notes or letters from three fellow travellers, two like myself with Antarctic experience, and one with Arctic, stressing points in the article with which they agree or disagree. The whole technique of polar travel, both theoretical and practical, is a subject of great complexity. There are so many interrelated factors to be considered that the subject may well be likened to an unfinished network, whose weavers are still busy extending it round the edge. My writing an article on fuel was as if with a great pair of shears I had rashly cut out an area from near the middle of that net: inevitably there are stray ends of argument, some of which, like the dog-man controversy, I tried to tie loosely together. I cannot here complete the network of closely woven argument: that I have attempted to do elsewhere in a recent publication mentioned in Mr John Wright's letter.

But a few points I would like to make or reiterate. One is that we can each legitimately continue to think our own analysis of the subject is more nearly correct until the different techniques have been tried out under severe conditions, on the same ground and at the same time. This has never yet been done.

Another point is that, try as we will to compare the relative efficiencies of dog-drawn and man-drawn sledging units, for most purposes we cannot really approach a satisfactory solution unless we reduce them both to some directly comparable basis. That I have tried to do by using the conception of "potential ration calories per unit weight of the total that is dragged", not forgetting that dogs, when used as motive power, are themselves an additional source of calories, so far left out of the comparison. Others may think of a still more helpful and none the less precise method

of comparison, though we must all bear in mind the psychological factors which clearly cannot be estimated direct in any such system of comparison.

My last point is in connection with what Mr C. S. Wright says at the end of his first paragraph. The "new school" methods using somewhat more fuel than in the old days have actually been used in very low temperatures, not only in the summer, both in Greenland and in the south. I am well aware that "the discomforts in the Antarctic are very real", but I believe, and indeed I think I know, that the new technique can remove them to a very large extent not only without impairment but with improvement of real efficiency. I conclude with the suggestion that the final paragraph of the original article be read again.

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