from the snow and the necessary prolonged exposure of the Indians to it because of their occupation, places them in need of much higher riboflavin intake than is usually regarded as adequate for unexposed persons in regions of less illumination. Thus in the face of increased need, the Indians are receiving only a small amount of riboflavin. Nor is this the only unusually heavy stress to which the Indian is exposed. The rigorous climatic conditions, the physical labour associated with gaining a livelihood and the almost constant high prevalence of active infectious disease impose extreme stress upon the Indian and conduce to the deterioration of his nutritional status.

It is recognized that there is a diversity of opinion as to the relationship of the tissue changes here observed to nutritional deficiencies. However, if the signs are taken as indicative of nutritional deficiency states, namely, the conjunctival changes as indicative of a lack of vitamin A, the ocular blood vessel changes of a lack of riboflavin, the gum and tongue changes of a lack of ascorbic acid and niacin respectively, the parallel between the prevalence and the severity of these signs and the nature of the deficiencies in the diet is striking.

Although the survey was limited to Northern Manitoba, one of the authors (P.E.M.) has observed similar tissue changes occurring with high frequency and severity in other bands and reservations. The occurrence of tissue changes in such frequency and severity is not peculiar to Indians. Similar conditions in another group have been reported. After a survey of Eskimos in the Canadian Eastern Arctic, Rabinowitch[11] reported that in the vast majority of eyes examined there was intense congestion of the conjunctivæ; pterygium was very common; and snow blindness occurred very frequently during the winter months. He stated that the blepharitis, the dryness of the conjunctivæ, and the sticky shreds of Meibomian secretions on the lid margins were suggestive of vitamin A deficiency. His mention of the occurrence of pyorrhœa indicates that he saw gum conditions comparable to those seen in the Indian in the present survey.

Once again poor nutrition has been found to accompany excessively high morbidity and mortality rates. Voluminous evidence from experiments with animals attests that nutritional status influences these rates. The relatively few human studies on the subject point in that direction. It is not unlikely that poor nutrition is responsible in part at least for many characteristics of the Indian, such as shiftlessness, indolence and inertia which have long been regarded as inherent or hereditary traits. Furthermore, it is probable that their great susceptibility to many diseases, paramount amongst which is tuberculosis, may be attributable among other causes to their high degree of malnutrition arising from the lack of proper foods.

Summary

1. A survey was made of the dietary habits and the nutritional status of more than 400 Canadian Bush Indians.

2. The dietary intake failed to meet the recommended daily allowances for most nutrients. For a number of the nutrients the margin was so far under the recommended levels that it is obvious the diet was markedly deficient. The most pronounced vitamin deficiencies were vitamin A, vitamin B_2 (riboflavin) and vitamin C (ascorbic acid).

3. Multiple and marked tissue changes were encountered in practically every Indian examined, the most marked changes being in the conjunctivae, the blood vessels at the corneal csleral junction and the gums. These changes have been attributed by one of the authors (H.D.K.) to a lack of vitamin A, vitamin B_2 and vitamin C respectively.

4. The parallel between the prevalence and severity of these signs and the degree of the deficiencies in the food supply is striking.