

Physical measurements of the Indians were not taken. The Indian today however is smaller than 40 years ago. The shirts sold then were sizes 16 to 17, now the common sizes are 15½ to 16; the pants were sizes 38 to 44, now 34 to 38. Furthermore, in the past the Indians are said to have been energetic and accounts of their remarkable vigour have been perpetuated by both legend and record. In contrast, at present they generally show listlessness, indolence and inactivity. There is no doubt in the opinion of the older white inhabitants that there has been in the past 40 years a marked deterioration in the physical condition of the Norway House Indian.

No single classical deficiency disease was seen. However, every Indian observed had some abnormality of the conjunctivæ, ocular limbic blood vessels, tongue or gums. The most marked changes were in the conjunctivæ, ocular limbic blood vessels and gums.

Conjunctival changes.—As the changes which have been ascribed by one of the authors (H.D.K.) to a lack of vitamin A develop in the conjunctiva it becomes over-vascularized, thickened, at first translucent, then, opaque, discoloured or even pigmented. Of 194 adult Indians whose conjunctival examination was recorded, all had advanced changes in their conjunctivæ characterized by thickness, opacity and discoloration. The thickening was first obvious in children between 10 and 15 years of age, and became progressively more marked with increasing age. In 11 per cent pterygia were also present.

Neurological signs.—It is generally recognized that the early signs of beri-beri include calf tenderness, diminution or loss of vibratory sense, and modification or reflexes, such as hyperactivity, hypoactivity or complete loss. It is obvious that each of these individual signs can occur in conditions other than beri-beri. Nineteen per cent of the persons examined showed neurological signs, chiefly modified or lost reflexes. Because of language difficulties the test for vibratory sense could not be reliably conducted.

Changes in the blood vessels at the corneal scleral junction.—Normally the blood vessels of the ocular limbic plexus do not extend into the cornea. It has been reported^{2, 3} that a lack of riboflavin in the diet results in the engorgement of the limbic plexus and vascular proliferation with invasion of the cornea. Coincident with this there may be tiredness of the eyes, sandy sensation under the lids, lachrymation and photophobia.

The only voluntary symptomatic complaints obtained from the Indians were referable to the eyes. The ocular symptoms were distinctly troublesome. Many complained of lachrymation and photophobia and lack of sharpness of vision. Prominent among the complaints were a burning sensation and a gritty feeling in the eyes. Considering that the ground everywhere for several months had been and was covered with several feet of snow, the presence of sand or any other foreign body in the eyes was most unlikely.

The symptoms of snow blindness are essentially the same as those just described but of greater intensity. The condition usually develops in February, March and April, when the days are beginning to lengthen and the amount of light reflected from the snow is becoming very great. The patient has usually been exposed to this bright light for some days. Suddenly, without warning, usually on a day when the sky is a little hazy, he develops in a matter of one to two hours intense pain in the eyes, described by some as a burning sensation, by others as a stabbing sensation, a gritty feeling under the eyelids with swelling, headache, extreme lachrymation and photophobia. In severe cases the conjunctivæ become intensely red due to congestion of the blood vessels. The condition may develop so suddenly that the individual has difficulty in getting back to his shelter or habitation. The treatment employed is simply to lie in a dark room with cold compresses over the eyes. In the course of one to two days the