

In considering this question of immunity, it is necessary to bear in mind that, although a deficiency or entire absence of fresh vegetable food, of what is frequently termed a succulent character, is an invariable antecedent of scurvy, it does not follow that the disease invariably occurs during this deficiency or absence. Time and accessory antecedents are important elements in the production of the disease; and while it may appear with startling rapidity after the necessary antecedent, or *vera causa*, has come into operation, provided the accessory antecedents are of the kind and present in the intensity required to favour sufficiently the operation of the *vera causa*, it may be delayed greatly, or may altogether fail to appear, even although the *vera causa* be in operation, provided such accessory antecedents as exist are neither of the kind nor present in the intensity required for the early development of the disease, or for its development before the operation of the *vera causa* has come to an end.

3. SUGGESTIONS IN REGARD TO THE PREVENTION AND TREATMENT OF SCURVY, AND THE USE OF LIME JUICE AND OTHER ANTISCORBUTICS.

Prevention of Scurvy.—Although it may sound as a truism unnecessary to be enunciated, the most important consideration in the prevention of scurvy is the maintenance of health at a standard as near the normal as possible. This necessarily implies the avoidance of all causes tending to impair the nutrition of the body; but as the subject of this paper is a special disease of nutrition which occurred in connection with the recent Arctic Expedition, the discussion of such causes may be limited within convenient bounds.

In arctic exploration, as at present pursued, men are exposed to two groups of conditions; the first (*a*) being associated with life on board ship, and the second (*b*) with life when travelling on land or on ice. The chief of the conditions likely to deteriorate health included in each of the two groups, have been referred to in a previous part of the paper. What measures may be taken to avoid or mitigate their injurious effects will now be considered.

(*a*.) Insufficient exercise and personal filth both tend to impair nutrition and thereby to favour the development of scurvy, and the greatest care should be taken to prevent their existing. The prolonged absence of the sun's rays has a deteriorating influence upon the constitution.

The breathing of an impure atmosphere and exposure to dampness are evils which to some extent are inseparable from life on board ship in arctic regions. They both depend on imperfect ventilation; while the great coldness of the external air, which presents a formidable obstacle to the sufficiently frequent renewal of the air between decks, and the limited accommodation at the disposal of the crew, which increases the necessity for frequent renewal, render it difficult to obtain satisfactory ventilation. The former cause of difficulty will probably be found less formidable to encounter than the latter, and a means of successfully doing so is suggested in the evidence (1651, 5034, 5035, 5408, 9076). This is by the adoption of a plan of ventilation frequently employed in dwelling-houses, and exemplified in Galton's ventilating fire-place, which provides for the heating to a convenient temperature of fresh air admitted from the outside, before distributing it throughout the dwelling. By this method, not only might the air of the lower deck of ships be more frequently renewed, but at the same time the warming of the living and sleeping compartments would be effected, and probably without any remarkable increase in the quantity of fuel usually expended for the latter purpose. The adoption of this method would likewise result in lessening dampness and condensation between decks; as warm air is capable of retaining in suspension a much larger quantity of watery vapour, and of being more frequently renewed, than cold air. An adequate accommodation for the crew, considerably above that provided for the men of the recent expedition (*p. ix*), would not only be in itself beneficial, but would also diminish the difficulty of satisfactory ventilation.

The scheme of diet used on board by the recent expedition has met with general approval. Several suggestions have, however, been made with a view to its improvement, and some of these may now be adverted to. These suggestions chiefly relate to the introduction into the dietary of articles not there represented, or to the substitution of various articles for others represented in that scheme.

Among the former, is the suggestion that eggs should be carried and used as freely as possibly on board (700-708, 4127, 4195, 5476). It may be assumed that this addition to the dietary would aid greatly in supplementing any deficiency that may occur in the supply of fresh meat. The reasonableness of this assumption rests on the facts that a single common egg contains the full nutriment of two ounces of fresh beef, and four eggs, therefore, of half a pound, and that by the use of milk of lime, or other