sensitivity which occur during the day are independent of the factors causing the observed changes in sensitivity which were specific to 'salt'.

Since losses in body-salt, which result in a fall in the concentration of sodium in the extracellular fluid, were accompanied by increases in sensitivity to salt, and losses in body-water, which result in a rise in the concentration of sodium in the extracellular fluid, were accompanied by a decrease in sensitivity to salt, it appears likely that these changes in sensitivity are related to the concentration of sodium, and possibly the osmotic pressure, of the extracellular fluid (the osmotic pressure is usually, but not always, dependent on the concentration of sodium in the extracellular fluid). Changes in the volume *per se* of the extracellular fluid would not appear to be related to the sensitivity changes, since under both conditions reductions occurred in the volume of the extracellular fluid.

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Nitrite Accumulation in the North-East Tropical Pacific

DURING two oceanographic expeditions in waters off the Mexican and Central American coast, nitrite analyses were made on water samples from between the surface and 800 m. depth in order to obtain information on the decay process of planktonic material.

Because of the intermediate position of nitrite in the nitrogen cycle between ammonia and nitrate, its concentration is determined by the ratio of ammonia oxidation to nitrite oxidation, in case of nitrification. The bacteria responsible for the oxidation of ammonia do not occur freely suspended in the open ocean but are attached to plankton organisms. Dying plankton often accumulates in the thermocline, and in culture experiments large quantities of nitrite appear soon after the cultures die¹. Many investigators have found a nitrite peak associated with the thermocline layer. In highly productive, tropical areas² conditions are especially favourable for a strong decay of planktonic material. As a result of this decay all 20 stations occupied 50–650 miles off the American coast from the Gulf of Panamá (4° N.) to the southern tip of Baja, California (23° N.), show this nitrite accumulation in the thermocline layer (Fig. 1).

Denitrifying bacteria also exist in the sea, some of which are able to reduce nitrate to nitrite under anaerobic or nearly anaerobic conditions in the

Fig. 1

presence of abundant organic matter. In most areas of tropical oceans there is, even in the oxygen minimum layer, some oxygen present. Wattenberg³ reported 0.37 cm.³/l. as the lowest oxygen value measured on the *Meteor* Expedition in the South Atlantic. Due to the weaker subsurface circulation in the Pacific and a relatively high production in its eastern part, a large body of water is found within which the oxygen content is almost zero⁴. This water of low oxygen content extends off the American coasts between 8° N. and 21° N. in an intermediate layer between 150 and 1,000 metres. Fig. 1 reveals that only the area with very low oxygen content is also a region with a second, deep nitrite maximum, with values up to 2.5 μgm. at./l. Both features, low oxygen and high nitrite concentrations, are found between 150 and 500 metres.

From an oxygen versus nitrite plot the two nitrite maxima are clearly distinguishable. Nitrite from the upper maximum is found within a wide oxygen range from about 1 to 5 cm.³/l., due to the very sharp thermocline with which this maximum is associated. The nitrite values of the deep maximum occur only in water with less than 0.10 cm.³/l. oxygen, which suggests that the deep nitrite maximum is produced by reduction of nitrate to nitrite. Similar observations of a deep nitrite maximum were made by Gilson¹ in the eastern Arabian Sea, but at that time could not be explained.

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