occasionally ocean currents are successful dispersal agents over distances greater than that of the Tasman Sea. The distance between land masses then appears to be the factor governing successful dispersal by ocean currents. The greater distance between New Zealand and South America, to the east, than between Australia and New Zealand, offers an explanation for the high percentage (46%) of endemic species in the New Zealand hydroids, in which approximately half live on seaweeds. The distance between New Zealand and South America is too great for successful dispersal.

Hydroids also grow entwined round other hydroids, on various molluscs, notably mussels, oysters and scallops, on ectoproctans, on and among sponges, on stalked ascidians, and terebellid worms, etc., and while it is possible that during storms these animals could become entangled in a kelp raft and thus dispersed by ocean currents, the latter dispersal mechanism does not offer a satisfactory explanation for the hydroid species not living on seaweed that New Zealand shares with other southern hemisphere areas.

As the dispersal mechanism of ships leaves unexplained the distribution of some cosmopolitan species and the disposal mechanism of ocean currents the distribution of those species not living on seaweeds New Zealand shares with other southern hemisphere areas, the discussion comes back to the possibility of dispersal by means of medusa and planula. For thecate hydroids to have attained their distribution by the agency of these reproductive phases implies that land masses were formerly either linked by land bridges or in juxtaposition and thus provided the necessary continuity of shoreline for hydroid dispersal. Geological evidence indicates that from time to time in the past there has been greater continuity of southern hemisphere and other shorelines than at present. Shoreline dispersal along former land masses probably explains the distribution of species not living on seaweed, New Zealand shares with other southern hemisphere areas. If dispersal along former shorelines is not recognized for these species their distribution is at present unexplained. The undoubted capacity of cosmopolitan species to survive a wide range of climates, probably means they have greater dispersal opportunity than other species and could have attained their world wide distribution by dispersal on ships, as well as by ocean currents for species living on seaweed, and along existing or former shorelines by medusa and planula.

In summary, then, the distribution of the cosmopolitan element (24%) in the New Zealand thecate hydroid fauna is explained by dispersal mechanisms—namely, ships and ocean currents, the latter acting as transport agency both for species living on seaweed, and for medusa and planula along the shoreline of land areas; and the distribution of the southern hemisphere element (30%) by ocean currents either by dispersal of kelp rafts for those species living on seaweeds, or by dispersal of medusa or planula along the shoreline of former land masses, for those species that live other than on seaweed. The high endemic element (46%) is explained by the distance between New Zealand and the nearest land mass to the east being too great for the dispersal mechanism of ocean currents to be successful.

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