

one (*Antedon denticulata*), from 49 fathoms at Station 190 in the Arafura Sea, can be called a littoral species. The remainder all belong to the continental or to the abyssal zone. Most of them have covering plates and generally also side plates to the ambulacra; and the two ten-armed forms of *Antedon* from the Challenger dredgings which have plated ambulacra but the rays not flattened laterally (*Acæla*-group) are even more restricted in their distribution. One was found in 140 fathoms at Station 192 in the Arafura Sea, and the other in 500 fathoms off the Meangis Islands (Station 214).

Not only are the ten-armed species of *Antedon* the most widely distributed as a group, but they also have the most extensive individual range. *Antedon eschrichti* and *Antedon quadrata* of the Arctic Ocean were dredged by the Challenger in lat. 43° N. *Antedon phalangium* ranges from the north of Scotland to Morocco and throughout the western basin of the Mediterranean. The Protean *Antedon rosacea* also occurs in the Mediterranean, extends from the Færoe Banks to the Canaries, possibly even to Cape Verde and the equator, and is perhaps also found on the American coast; while *Antedon carinata* is distributed between the parallels of 15° N. and 35° S., through the Indian Ocean from Java<sup>1</sup> to Zanzibar, along the Atlantic coast of South America from St. Lucia to Rio Janeiro, and is also found at Valparaiso.

None of the multibrachiate forms of *Antedon* have anything like this geographical range. In the western North Atlantic there is no species with more than ten arms north of Florida, and the dimorphic *Antedon lusitanica* is the only one known on the eastern side. This last and those from Japan are the most northerly multibrachiate forms, while *Antedon setosa* from off Tristan da Cunha and the various species inhabiting Port Jackson and near the Kermadecs are the most southern representatives of these many-armed types of *Antedon*, which have almost exactly the same range in latitude as the genus *Actinometra*. Examples of each of the two great groups, those with two and those with three distichal joints, occur in the Caribbean Sea, and they are abundant between the Society Islands and the Red Sea. But, as we have just seen, they have a very limited bathymetrical range, only appearing at seven Challenger stations between 100 and 630 fathoms, and at none where the depth exceeded this latter limit.

In some of the *Antedon*-species dredged at all these seven stations the secondary arms consist of three distichal joints, the axillary with a syzygy, but at two of them bidistichate forms also occurred, together with species of *Actinometra*; and the single "Porcupine" *Antedon* with more than ten arms is *Antedon lusitanica* from 740 fathoms, in the North Atlantic, which sometimes has a distichal series of two joints. There are no tridistichate species of *Antedon* in the North Atlantic, outside the Caribbean Sea; though they occur in the South Atlantic at Tristan da Cunha and Ascension, and at five stations below 100 fathoms in the Western Pacific and Australasia.

On the other hand, the bidistichate series represented by *Antedon lusitanica* does

<sup>1</sup> See the remarks on this subject on p. 202.