

in the various species examined (over 60) is so varied as to supply valuable characters for the identification of species. It must, however, be stated generally that the spines vary very considerably in length and shape in almost every species examined. Whatever may be the form of spine possessed by any particular species, whether triangular, cylindrical, or knobbed, the specific features are never well marked at the apex of a branch. If one follows the contour of the spines from the apex of a branch downwards to its base, and on to the main stem if need be, a variety of outline is presented which may be conveniently divided into two sections, progressive and retrogressive. In the Schizopathinæ, in which the apical portion of a branch is usually membranous for a considerable distance, the first formation of spines is more easily traced. They arise first as longitudinal thickenings of the sclerenchyma, which are usually very narrow. The deposition of additional layers causes an increasing thickening of the central portion of each ridge, so that gradually a spine is evolved which varies in size, shape, &c., according to the species. The longitudinal ridges may remain, connecting a series of spines in irregular longitudinal series, or may become lost altogether. In any case the spines become elaborated up to a certain point, which may be considered "normal." The distance from the apex at which the first normal spines occur is very variable, and is certainly much greater in most Schizopathinæ than in the Antipathinæ. From this point onwards for a variable distance the normal character is maintained, although irregularities of arrangement may occur. In still older portions of the corallum the normal character is lost and the retrogressive period sets in. Perhaps the most typical form of retrogression is to be found in such forms as *Parantipathes laria*, in which the normal spines are elongate, somewhat cylindrical, and tapering. In this case each new layer of sclerenchyma adds a new film to each spine, which in consequence becomes gradually reduced in length, and assumes a more stunted form with a broader apex. A continuation of this process may reduce the spines on the stem to the form of granules, or they may be obliterated completely as in *Leiopathes glaberrima*. This, however, is not the only means by which the "normal" character is lost. In some cases it appears as if the secretive power of the axis epithelium of a spine more than keeps pace with that of the general surface of a branch, and that additions may be made to the apex of a spine without materially increasing its thickness below. For example, in *Antipathella subpinnata* the spines on the main branches are longer and relatively more slender than those above. In other cases the spines near the base of a colony become much elongated and dendritic; such is the case in *Antipathes spinosa* and *Antipathes myriophylla*. Forked spines are of frequent occurrence in many species as an abnormality (?), but in *Stichopathes gracilis* this feature is normal, and leads to the formation of double spines. At first all the spines are simple and subtriangular, a little lower down certain spines become bifid at the tip. The layers of sclerenchyma subsequently formed make this bifid character more pronounced, and also tend to cover up the