

first stage of transition instead of an oxytylote, not a great difference, and we shall also admit that the number of spines may at first have been less definite in number than they are now in the fully established triæne. If this is the teaching of ontogeny we might expect to find it confirmed by the occasional occurrence of spicules persisting in the intermediate stages of development, and these are not necessarily to be sought for in closely related families, for if the evolution of spicular forms has been due to the action of general causes, we should expect under similar circumstances to find similar forms evolved. The existence of the intermediate forms which theory predicates is a matter of notoriety: thus in the Desmacidinæ, which have probably descended from the same branch as the Tetillidæ, two closely related species have been described as possessing spicules which differ from the strongyloxeas (*Rhaphidotheca marshall-halli*, Kent,<sup>1</sup> and *Rhaphidotheca affinis*, Carter<sup>2</sup>) forming the greater part of the skeleton, by the presence of a large tylus in place of the usually oxate distal termination. Again in the Suberites, which are probably not very closely related to the Tetractinellida, two quite different species (*Prototeleia sollasi*<sup>3</sup> and *Radiella schoenus*<sup>4</sup>) have been adduced as furnishing similar evidence; in the latter of the two species the tylotoxea, which forms the chief radiating spicular fibres of the sponge, occasionally becomes enlarged at its distal end into a large tylus, of more or less irregular shape, but sometimes almost spherical and always roughened by an irregular and minute spination; in the first-named species a minute cortical spicule is present, sometimes of a tylote form, sometimes with the distal tylus produced into an unascertained number of recurved spines. The resemblance of this spicule to an anatriæne is obvious, though the number of the cladi, for such the recurved spines may be fairly termed, does not appear to have attained that constancy which usually distinguishes the triæne; Dendy and Ridley state that though they could not quite convince themselves yet they believe the number to vary from three to four. In *Acarnus innominatus*, as Dendy and Ridley point out, a tyloclad exists with a cladome of four cladi, and in *Acarnus ternatus* a similar spicule with three. These instances, however, only suggest the independent origin of cladose spicules in different groups of sponges, and do not furnish us with persistent intermediate stages, as do the distally tylote rhabdi of *Esperia marshall-halli* and *Radiella schoenus*; to guard against misconception I may as well add that I do not for a moment suppose that the spicules last alluded to stand in any close genetic relation to the true triæne, as it exists in the Tetractinellida, they also are independently evolved forms, but persist in a stage through which we may assume the triæne to have passed. In the succeeding chapter on the origin of spicular forms I shall attempt to show that a rhabdal origin of the triæne is not inconsistent with a general theory of spicules.

<sup>1</sup> *Ann. and Mag. Nat. Hist.*, ser. 5, vol. i. pp. 4, 6, pl. xv.

<sup>2</sup> *Journ. Roy. Micr. Soc.*, vol. ii. p. 497, pl. xvii. figs. 1-34.

<sup>3</sup> Dendy and Ridley, *Ann. and Mag. Nat. Hist.*, ser. 5, vol. xviii. p. 153, pl. v.

<sup>4</sup> Sollas, *op. cit.*, ser. 5, vol. ix. p. 163.