

the exception of the aberrant genera *Heterocidaris*, *Tetracidaris*, and *Diplocidaris*, which retain more or less Palæechinoid characters while taking on a more modern facies.

The relationship of the Echinothuridæ to the Palæechinidæ I have already insisted upon elsewhere, and their affinities to the recent Diadematidæ are most close. The relationship of *Hypodiadema* to *Diademopsis*, *Pseudodiadema*, *Hemipedina*, and to the whole group of Pseudodiadematidæ which culminates in the Chalk, and is only very scantily represented at the present day, is sufficiently near not to need any further elucidation. On the other hand, the development of the Echinidæ is somewhat more complicated, as the affinities of the genera from which we can trace the development of the Echinidæ, the Arbaciadæ, and the Salenidæ is very close in the Liasic, the Jurassic, and the Lower Cretaceous beds; where such types as *Acrosalenia*, *Hemicidaris*, *Glypticus*, and *Phymechinus*, show us how readily we may pass on the one hand to the Salenidæ, and on the other to the Temnopleuridæ, the Echinidæ, and the Arbaciadæ. It is, however, only when the interbranching affinities have not extended in too many directions that we can still easily follow the systematic connection, which is as close as we can possibly desire to have it. In fact, it is so extended that we are at a loss to express it satisfactorily.

A few examples will suffice: from the development of *Salenia*, of *Echinus*, of *Temnopleurus*, and of *Arbacia*, we see that these show a very different degree of complication in their systematic relations to the genera which have preceded them in time. The *Saleniæ* retain the simple ambulacral system of the Cidaridæ, the small number of coronal plates, the small number of large primary interambulacral tubercles, the variable shape of the primary spines, the secondary papillæ, the large plates of the abactinal system, and, as far as these features in the Cidaridæ are related to the Palæechinidæ, the *Saleniæ* retain to a less degree the Palæechinid affinities of the Cidaridæ. But in addition to this we find in the *Saleniæ* the presence of a subanal plate, comparatively large ambulacral tubercles, a slight tendency in the ambulacral pores to deviate from the vertical arrangement of the Cidaridæ, and in the imbricating plates of the actinal membrane an apparently very decidedly different structural feature. These last-named features are all features which tend towards the Echinidæ proper, and which thus far have not appeared in the older Cidaridæ, though we find some of these characters already foreshadowed in the imbricating membrane of the Archæocidaridæ, and in the large primary ambulacral tubercles of the Hemicidaridæ. As far as *Echinus* is concerned, the want of prominence of the principal primary tubercles, as well as the greater uniformity in the structure of the spines, recalls again the earliest Palæechinidæ, while the modifications of the ambulacral system also to a certain extent point back to an ambulacral system made up of a large number of plates, as we find most markedly shown again in the more recent Echinometradæ. The actinal membrane is further altered in the direction of that of *Salenia*; we have a smaller number of plates, which in some genera are reduced to ten, the supports of the buccal tentacles, which are the only remnants of the