Zoology Part IX: Report on the ECHINOIDEA. By Alexander Agassiz, Bound in Volume 3,1881.

Young specimens of *Asthenosoma pellucidum* (Pl. XVIII. figs. 1, 2) show how close is the relationship between the genera *Phormosoma* and *Asthenosoma* in spite of the apparently great structural differences existing between the adult of such species as *Asthenosoma grubii* and *Phormosoma luculentum*. It is mainly from the comparatively larger number of coronal plates in the former genus that the young of the two genera can be satisfactorily distinguished, the other characteristic features, the lapping of the plates appearing only in larger specimens. There is nothing in the growth of *Asthenosoma* corresponding to the splitting up into separate plates of the primary coronal plates so characteristic of *Phormosoma* when seen from the interior of the test (Pl. XVIII.[a] figs. 4, 5, 7, 8).

Each primary plate of *Phormosoma*, consists of a number of plates most irregular in shape (Pl. XVIII.[a] figs. 4, 7), held together quite loosely by the inner integument of the test, the joints of the plates are often foliated, and the centre is strengthened by a thicker deposition of calcareous matter forming a sort of button extending beyond the level of the plate towards the interior of the test. This thickening which corresponds to the lower side of one of the primary tubercles I have described more in detail in the description of *Phormosoma tenue*. This species differs from both *Asthenosoma hystrix* and *Asthenosoma fenestratum* in having a smaller number of coronal plates, these are consquently higher; in *Asthenosoma pellucidum* this difference becomes very striking in the height of the plates of the ambulacral areas. The open spaces between the coronal plates are largest on the actinal surface where they appear first in the younger stages and gradually extend to the abactinal surface with increasing size. In a small specimen measuring 36 mm. in diameter, the coronal interstices are limited to a narrow line parallel to the edge of the plates. In specimens measuring 44 mm. the coronal interstices assume already the elongated form represented in Plate XVIII. fig. 4. In the smallest specimen of this species examined, measuring 36 mm. in diameter, the gills are reduced to a small forked appendage protruding between the edge of the coronal plates and the mailed actinal membrane. In the older specimens of *Asthenosoma pellucidum* there is a decided thickening of the epidermis of the test, which tends gradually to obliterate the outlines of the coronal plates. We have this character developed to a great degree in *Asthenosoma coriaceum*. Unfortunately, the largest specimens of *Asthenosoma pellucidum* are so much smaller than the smallest *Asthenosoma coriaceum* or the single specimen of *Asthenosoma tessellatum*, that I am unable to satisfy myself that the present species (*Asthenosoma pellucidum*) may not be the young of *Asthenosoma coriaceum*. In the only species of the group of which the Challenger collected a complete series (*Phormosoma tenue*) there was little difficulty in recognising the young as belonging to the adult, the same was the case for *Phormosoma luculentum*. The changes in the coronal plates are not as great, and the arrangement of the pores does not seem to vary as much in *Phormosoma* as in *Asthenosoma*.

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