A similar inequality in the development of the genital glands has been noticed by Prof. A. Agassiz as occurring in the Echini.[1]

This frequent difference in length between the anterior and the posterior arms of *Actinometra*, accompanied by the difference in the character of their terminal pinnules, seems to be to some extent dependent upon the condition of the respiratory apparatus occupying their ventral surface. When this is well developed the arm seems to have the power of indefinite growth. For in a great many individuals of various species which have all the arms grooved and tentaculate like those of *Antedon*, there is no very appreciable variation in their length or in the development of their genital glands.

There appears to be no rule of any kind respecting the condition of the arms in any given species of *Actinometra*. In the case of *Actinometra parvicirra*, for example, I have seen individuals with thirty-three arms, all of which were grooved and tentaculate; while in another with thirty-one arms as many as nineteen were grooveless and unprovided with tentacles. All sorts of gradations between these two extremes will be found in any large collection of *Actinometræ*.[2] Half the species of this genus which were dredged by the Challenger have more or fewer ungrooved and less developed arms. They may occasionally be found upon the anterior rays; while in *Actinometra nobilis* and *Actinometra magnifica*,[3] which have one hundred arms or more, several of those on each ray are short and less developed, with neither food-groove nor tentacles on their ventral surface (Pl. LVI. fig. 7).

Even in the normal grooved arms of *Actinometra* the lower pinnules are frequently grooveless and non-tentaculate, just as the hinder arms may be (Pl. LXI. fig. 3). Sometimes only three or four, sometimes as many as forty, are in this condition, being more or less swollen by the development of the genital glands within them; but they do not receive any branches from the brachial ambulacrum, which is itself often but imperfectly developed (see woodcut, fig. 4, p. 113). This ungrooved condition of the lower pinnules may also occur on all the arms of some species of *Antedon;* and it is especially remarkable in types like *Antedon acœla* and *Antedon angusticalyx*,[4] which have a strongly plated ventral perisome. The ambulacral grooves of all the arms and of the later pinnules are well protected by plates (Pl. LIV. figs. 4, 7, 8, 9); but they do not extend on to (about) the first twenty pinnules which contain the large genital glands, though the latter are protected by a very close and regular pavement of anambulacral plates (Pl. LIV. figs. 1–3, 5). In other species, however, which have equally plated pinnules, such as *Antedon incerta*,[5] the ambulacra extend over their ventral surface in the usual way (Pl. LIV. fig. 6).

[1] Revision of the Echini, part iv. pp. 680, 681.

[2] Actinometra, *loc. cit.*, pp. 31–41.

[3] The specific formula of this type is—a.3.2.3.3. $\frac{0}{0}$.

[4] The following are the specific formulæ of these types: *Antedon acœla*,—A.10. $\frac{b}{a}$; *Antedon angusticalyx*,—A.3. $\frac{b}{ab}$.

[5] The specific formula of *Antedon incerta* is—A.10. $\frac{a}{c}$.