Sir John Murray & Johan Hjort, The Depths of the Ocean: Scientific Researches of the Norwegian Steamer Michael Sars (1912)

position. Ostwald terms this relation the "size of projection," and has asserted that the velocity of sinking decreases in proportion to the increase in the size of projection.[1] Size of projection.

These two principles of "specific surface" and "size of projection" have in a most wonderful manner been employed by organisms for the purpose of developing their faculty of floating. First of all, in organisms which cannot lower their specific gravity by depositing fats or absorbing water, we find a dominant tendency to develop minute forms in specifically light waters. In this connection we may note that small radiolarians are found in shallow water, and large ones much deeper, as

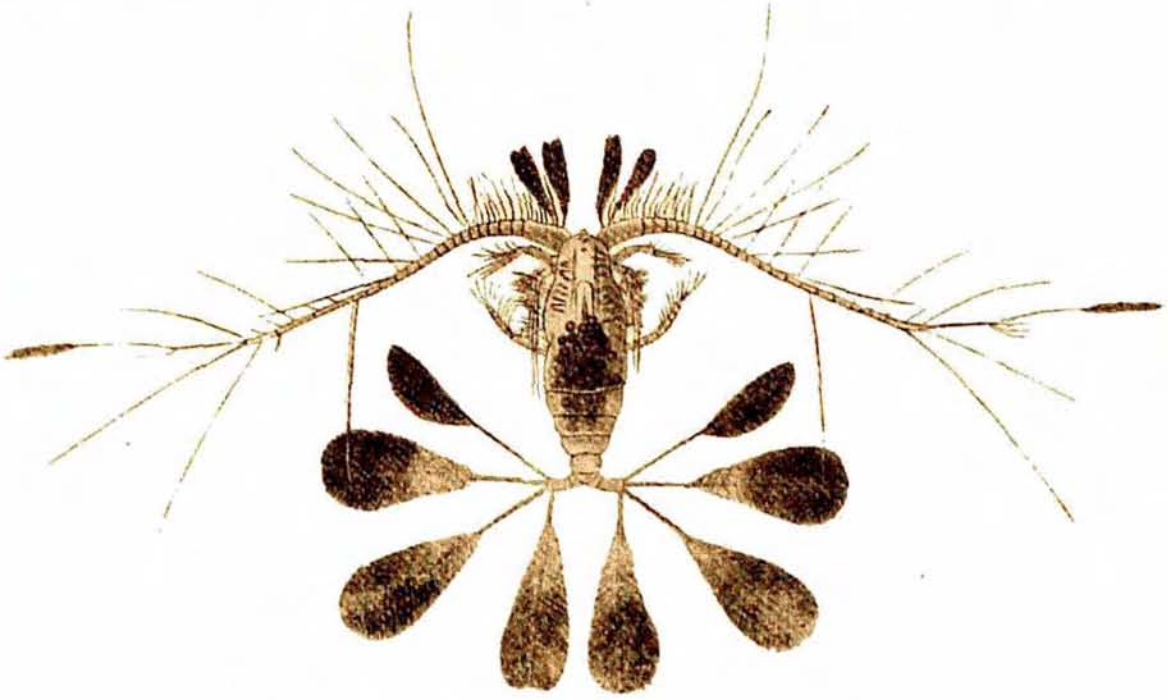

FIG. 503.

Calocalanus pavo, Dana. ♀ (about $\frac{1}{1}^{0}$). (From Giesbrecht.)

mentioned in Chapter IX., and in Chapter VI. Gran refers to the minute coccolithophoridæ of the light oceanic surface-layers. A large "size of projection" is found in countless numbers of crustaceans, especially in warm oceanic waters. The copepoda, for instance, show magnificent devices for enlarging their surface, developing feather, plate, or rod-shaped appendages (see Fig. 503). The surface resistance of these appendages depends on their position in the vertical line, and thus they serve the purpose of vertical locomotion as well.

Ostwald next points out the necessity of studying in nature

[1] Since this was written Sandström has published a paper, "Hydrometrische Versuche," *Meddelanden från hydrografiska byrån*, Stockholm, 1912, showing that the velocity of sinking is not exactly proportional to the size of projection, other circumstances, which are not yet clearly understood, also influencing the process.

http://19thcenturyscience.org/HMSC/HMSC-Reports/1912-Murray/README.htm