

II. THE SOFT TISSUES.

Professor Sollas, in his Preliminary Report on the Tetractinellida of the Challenger Expedition,¹ has proposed to divide the entire body of a sponge into two parts. The first of these, or "*ectosome*," he defines as "the outer layer of the sponge, not containing flagellated chambers," and the second, or "*choanosome*," as "the 'mark' or 'parenchyma,' distinguished by the presence of flagellated chambers." This arrangement we find to be a very convenient one for practical purposes, and accordingly we shall make use of it in this Report; although applied in the first instance to Tetractinellid sponges it is equally applicable to the Monaxonida, or, indeed, to most groups of sponges. So far as the definition goes, the terms *ectosome* and *choanosome* might be used to include the skeletal elements as well as the soft tissues, but, although the two primary divisions of the skeleton into "dermal" and "main" do, roughly speaking, correspond to the two primary divisions of the soft tissues into "*ectosome*" and "*choanosome*," we have found it much the most convenient plan to treat of the skeleton all together and quite separately from the soft tissues.

(a) The Ectosome.

Although varying very much in details of structure the *ectosome* invariably consists of two kinds of elements, ectodermal and mesodermal. The ectodermal element always consists, at any rate so far as is known, of a single layer of epidermic cells—usually flat, as in *Esperella murrayi*, nobis, but in one instance (according to Vosmaer²) columnar. The sponge in which Dr. Vosmaer describes and figures the columnar epidermic cells is *Tentorium semisuberites*, but this must be considered as a great exception to the general rule. In our own sections of *Tentorium*, although they seem to be fairly well preserved, we have not succeeded in detecting the columnar cells. We have nothing new to add concerning the epidermis; it is very difficult to study it satisfactorily in any but specially prepared specimens.

The mesodermal constituents of the *ectosome*, unlike the ectodermal, vary very much in different genera both as regards quantity and character; hence it is upon these that the great diversity of the *ectosome* in different sponges depends. They may be very small in quantity, forming only a thin layer of connective tissue immediately beneath the epidermis, in which case the *ectosome* is reduced to a thin, in most parts pore-bearing membrane (Pl. XLVI. fig. 4, *d.m.*), for which the term *dermal membrane* is a very convenient one,³ or they may be very strongly developed, forming in some instances (Suberitidæ) a thick, fibrous cortex (Pl. L. fig. 1, *ect.*).

¹ *Sci. Proc. Roy. Dub. Soc.*, vol. v., pt. vi. p. 177.

² Sponges of the "Willem Barents" Expedition, 1880-81, p. 19., pl. iii., fig. 23.

³ The term "*dermal membrane*" is also applicable in cases where there is a thick *ectosome*, of which the outermost portion forms a separable membrane distinct from the remainder.