maturition of the male and female elements of the Coccidiidæ. Siedlecki (11) has endeavoured to trace the changes taking place in the germ nuclei during fertilization in a coccidium of the octopus, to see whether a true process of reduction occurs here. While he has been unable to establish this very definitely the problem, as he remarks, being "difficile à trancher," he has rendered it more than probable that a true process of reduction really takes place here. In the macro gamete or ovum, he suggests that this reduction is effected by means of numerous small bodies of darkly staining substance, which are extruded from the nucleus during fertilisation, and are seen for some time outside the nucleus in the cytoplasm, finally disappearing, being probably broken up by the cell and excreted. In the formation of the microgametes or spermatozoa, no polar bodies are found similar to the ones in the malarial organism, the reduction being here "probablement lieu par le fait de leur formation en nombre considérable aux dépense d'une cellule," a reason more than once put

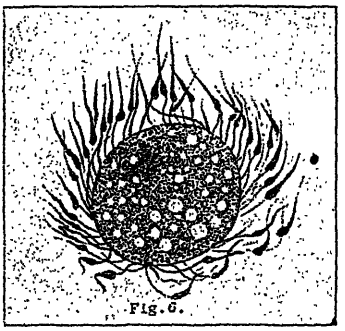

FIG. 6. Formation of spermatozoa in the coccidium of the octopus, later stage than Fig. 5, spermatozoa nearly mature. (Siedlecki.)

forward to explain reduction in the male elements of higher animals. In the infusoria we undoubtedly get a process of reduction, the nucleus dividing up into several pieces, one of which only takes part in conjunction, the other degenerating and perishing like the polar bodies. In Paramœcium caudatum Hertwig (15) tried to count the chromosomes. While he was unable to do so with absolute certainty, he found that before reduction there were approximately eight to nine, after reduction four to six, practically a halving of the chromosomes. In the Gregarinidæ, a closely related class to the Hæmamœbidae, Wolters (16), while he was unable to count the number of chromosomes, has observed the formation of an actual polar body, cast off from each of the animals at the time of their conjunction. Here the process would seem to be identical with the condition in the malaria parasite. In some of the