Steudener, 10), and it is *a priori* improbable, since the Cestodes (and Trematodes) would thus form an exception to the general rule by which all animals are clad with an epithelium derived from the embryonic ectoderm. The subcuticular layer is described as con­sisting of long fusiform cells (probably modified connective-tissue cells) disposed perpendicularly to the cuticle. It seems possible that they are in direct connexion with the transverse muscles of the body. The matrix of the Cestode body consists of connective tissue, the cells composing which are seldom provided with a dis­tinct membrane, and sometimes can only be separately distinguished by their nuclei. The layer of muscles (see below) separates this matrix into a central and a cortical portion. Distributed in it, and especially in its cortical portion, are numerous calcareous corpuscles, which are generally spheroidal in form, varying up to 0∙019 mm. in diameter and concentrically laminated ; they contain a large amount (often 20 per cent.) of lime salts, diffused through an organic basis, from which the salts can be removed with effervescence by the action of acids. These corpuscles have been variously inter­preted by the older authors as eggs, or as lymph or blood corpuscles, but the only theories which have been seriously maintained in modern times are—(1) that they are skeletal (Von Siebold); (2) that they are excretory (Claparède, Griesbach); or (3) that they form a reserve store of calcareous material to be used either in counter­acting the acid digestive juices of the host or for the production of egg-shells (Leuckart, 1, p. 283).

The muscular system consists of three sets of fibres—longitudinal, transverse, and sagittal. The first are the best developed, and run down the inner part of the cortical layer in the form of strong bands ; the second set lie immediately below them and pass across the body in the form of two flat muscular plates, which converge towards each other as they approach the margins of the proglottis; the sagittal muscles run primitively straight from one flat surface of the body to the other, but their direction is much modified after the growth of the genital organs, between the various parts of which they lie as isolated bundles ; they are the weakest of all the sets. The muscular fibres are non-striated, and when they are fully de­veloped no nucleus can be detected in them. They taper towards the extremities, sometimes branching dichotomously, and, as above mentioned, a connexion has been asserted to be visible between them and the subcuticular cells.

The excretory system in the proglottides consists of two or four longitudinal canals which lie along their two narrow margins (fig. 1, D, *ex.*)*.* The origin of these in the head has been already noted, and they pass continuously down the whole worm until they open into a vesicle at the posterior extremity of the terminal segment. In the hinder part of each proglottis they are connected by a trans­verse vessel (fig. 1, D, *tr*.), immediately above which a valve is formed by a duplicature of the wall, so that it is impossible to inject the excretory system from behind whilst fluid can be readily forced along it from before backwards. Fraipont has drawn a distinction between ascending and descending canals. Excretory openings have been described by various observers in the anterior portion of the worm, near the suckers (Wagener, 11 ; Fraipont, 8 ; Riehm, 12), and, although their presence is denied by Pintner (9), there seems sufficient evidence to show that they are more generally present than was formerly supposed. A ramifying network of smaller vessels connected with the main trunks just described is found in the more superficial parenchyma, and this in its turn gives off still finer capillaries which terminate in ciliated funnels. According to Fraipont these open into the intercellular lacunæ which are the representatives of the cœlom (see above), whilst Pintner maintains that the terminal funnels are completely closed, and are to be regarded as unicellular glands. The subject, however, is one of extreme difficulty and demands further investigation. It is worthy of notice that each of the three systems of canals above described maintains its proper diameter throughout, and that no intermediate sizes can be found. The “plasmatic vascular system” described by Sommer and Landois, and regarded by them as part of the alimentary system, consists partly of some of these delicate canals and partly of the two cords of the nervous system. The main canals open posteriorly into a pulsatile vesicle, at the end of the last proglottis; when, however, some of these have been cast off the opening may be either by a shortened transverse vesicle, as Leuckart (1) maintains to be the case in the present species, or by separate openings, one for each canal.

The reproductive organs are serially repeated in the proglottides, each of which contains a complete set of male and female organs (fig. 1, D). The male organs may be discussed first. The testes *(t., t.)* are very numerous and scattered throughout the greater part of the proglottis; they are round vesicles (0∙15 mm. in diameter) containing spermatozoa, and attached like berries to the terminai ramifications of the vas deferens (*v*.*d.*) ; these gradually unite, form­ing larger and larger branches until they reach the main canal, which runs in a series of coils transversely half way across the joint a little behind its middle, and ends in a common cloaca (*cl*.), which receives both the male and female organs, and is con­nected with the outer world by the porus genitalis. The outer por­tion of the vas has a thickened muscular wall, and this part of it is capable of extrusion and retraction, thus forming the male intro­mittent organ or “ cirrus ” (*c.p.*)*.* The cuticle which lines all the distal portion of the vas deferens is here thin and delicate and armed with a series of minute spines, which are directed backwards (*Echeneibothrium*)*.* The cirrus in the present species is very short, but in other forms its length is sometimes considerable. The protrusion is effected by circular muscles placed around the end of the vas deferens, while the retraction is brought about by special longitudinal fibres, lying along the walls of the evaginable portion.

The female organs may be most conveniently studied by tracing them inwards from the cloaca. The vagina (*v.*) opens immediately posterior to the vas deferens, and like it is lined by a continuation of the external cuticle. After passing about half-way across the segment it bends backwards and terminates in a small cyst, the receptaculum seminis (fig. 1, E, *r.s.)*; this receives and stores up the male fertilizing elements, retaining them until the ova are ripe. From its posterior extremity there passes a thin-walled canal, wider than the vagina (*f*.), which serves to convey the spermatozoa to the ova, and hence is termed the “fertilizing canal” (Befruchtungs­canal of German authors). It unites with the common oviduct, a tube formed by the union of the two oviducts *(o.d.),* and the two together pass backwards into a spherical glandular structure, called from its discoverer “ Mehlis’s body” or the shell-gland (fig. 1, D and E, *sh.g. ).* Within this apparatus it receives the duct of the yolk-gland (*y.g.*), and then passes directly forwards to open into the uterus. The ovaries (*ov.*) are two in number, situated one on each side of the middle line of the body; they are fan-shaped, and consist of a system of blind tubules situated on a branched efferent duct. The cells of the ovary (primitive eggs) have a sharp contour and a large nucleus; the yolk-gland *(y.g.)* is very similar to the ovaries, behind and between which it is situated, but is distinguished by various histological details (it is called “ ovary ” by Moniez). The shell-gland, formerly regarded as the ovary, consists of closely compressed nucleated cells, and is provided with small thin ducts opening into the narrow internal cavity of the organ. The uterus *(ut.),* in its early stage of development, is a long straight tube, lying almost in the longitudinal axis of the proglottis, and receiving posteriorly the oviduct after it emerges from the shell-gland (fig. 1, E, *ut.*)*.* From what has been said it will appear that the ova on their way down the common oviduct are impregnated as they pass the end of the fertilizing canal, and then receive in succession, first their supply of food-yolk and their shell, during their sojourn in Mehlis’s body, after which they go forwards into the uterus, where they undergo the first stages of their development. The uterus assumes a very different shape as it becomes distended with eggs, which are far too numerous to be contained in a simple straight tube ; small protuberances arise from its walls, growing rapidly and bifurcating here and there, so as to produce the complicated branched appearance seen in fig. 1, F. As the uterus grows, the male, and later the female, genitalia degenerate and disappear, and in the proglottides which are ready to be liberated the only organ visible is the distended uterus. One of the most characteristic peculiarities in the sexual system just de­scribed is that there is no passage by which the ripe eggs can make their exit from the proglottis ; these are therefore extruded only on its rupture ; a very different state of things obtains in the genus *Bothriocephalus* (see below). Self-impregnation certainly occurs, and is probably the rule ; it is obvious that the contrary case can only happen where two individuals lie side by side within the same host. Furthermore, the cirrus has been seen protruded into the vagina of the same joint, and the emission of sperm has been witnessed (Leuckart, 1; Van Beneden, 13, p. 601).

The eggs are ovoid or spherical, and consist of the germ-cell (nucleus and protoplasm) with an albuminous enveloping substance, which is again surrounded by a thin transparent skin. The shell frequently presents one or more appendages, probably the secretion of the shell-gland drawn out into threads. The structure of the egg has been best studied in *Tænia serrata* (Van Beneden, 14), where it consists of a delicate shell containing a germ-cell, with a quantity of secondary yolk ; the former divides into a “granular” cell, which segments no further, and an “ embryonic” globe, which again divides into a number of cells, of which three are larger and constitute the “ albuminogenous layer,” whilst the remainder are smaller and form the “ embryonic mass,” and secrete a delicate superficial cuticle, the cell-limits being indistinct. In the embry­onic mass from three to five flattened cells form a chitinogenous layer, and give origin to a superficial homogeneous coat, a shell of radially disposed chitinoid cylinders, and an internal faintly striated lining, whilst the remaining cells become the six-hooked embryo or proscolex, a superficial layer to which the hooks belong, and a central mass of clearer cells. When the proscolex is mature the original egg-shell and the albuminogenous layer disappear, and only the chitinoid coats remain.

The proglottides are cast off by muscular action ; the fibres are not continuous between the successive segments, so that these are con­nected merely by soft connective tissue, which readily gives way; the