is ciliated all over. The interior of the body is composed of granular nucleated cells, and it contains a double eye-spot, composed of two crescentic masses of pigment. There are also two ciliated funnels forming the rudiments of the excretory system and a granular mass behind the head-papilla, probably representing the digestive tract. The embryo swims actively about, but if it does not succeed in meet­ing the appropriate host for its next stage of development (*Limnæus truncatulus,* a small pond snail) its period of vitality seems to be limited to about eight hours. If it should meet with one of these snails it applies the head-papilla to some part of its surface and begins to bore, twisting round and round on its axis by means of its cilia, the head-papilla becoming pointed and elongated to four or five times its original length. Eventually the tissues of the snail are separated as if by a wedge, and a gap is formed through which the embryo forces an entrance into its body. Here it under­goes a metamorphosis, losing its organs of locomotion and becom­ing what is termed a “sporocyst” (fig. 2, B). This is an elliptical sac, which commonly attains a length of 07 mm. Its wall con­sists of a structureless cuticle, beneath which are external, circular, and internal longitudinal muscle-fibres. These are succeeded by an epithelium, the elements of which vary greatly in size. These sporocysts may be produced by a process of transverse fission. Within the sporocyst rounded masses of cells are formed (morulæ), which undergo a process of invagination, producing a gastrula, which again develops by the formation of a digestive tract into what is known as a “redia” (fig 2, C, D). This forces its way through the wall of the sporocyst, which heals up immediately, and then wanders through the tissue of the snail, most commonly finding its way to the liver. If many rediæ are present the snail usually perishes. The adult redia may attain a length of 1∙6 mm. It has an elongated cylindrical form, and near its posterior extremity are two processes directed backwards, which probably serve as aids to locomotion. At the anterior extremity is the mouth, leading into a muscular pharynx, followed by a saccular digestive tract. A ring-shaped thickening is seen a little way behind the mouth, and immediately posterior to this a special aperture for the exit of the germs formed within the redia. About a score of these are usually to be found in all stages of development, the earliest being a rounded mass of cells (morula), which elongates, one end at the same time becoming more attenuated than the other, and gradually forming an elongated tail, while the body becomes oval and de­pressed (fig. 2, E). Two suckers and the rudiment of the future digestive tract make their appearance. As soon as the “cercaria,” this being the name given to the present organism, has attained this stage of development it emerges from the redia, and by the aid of its suckers and tail wriggles its way out of the host, swimming freely about in the water. Like other cercariæ developed in rediæ this one has no head-spine, but in mature examples the anterior of the body often exhibits a number of very minute spines. An interesting feature in the animal is the presence of the “cysto- genous cells,” two lobate masses arranged one on each side of the body. These cells contain small rod-like bodies, whence they have been termed “cellules à batonnets,” and similar bodies have been found in the protective cyst which they excrete ; Sonsino (28) has suggested that they may assist in imparting stiffness to this struc­ture, and has noticed that they are more abundant in those forms which encyst in the open air. When the cercaria has swum about for a short time it finds its way to the water-plants, and encysts itself on their stems and leaves. During this process the tail is swung vigorously about, until finally a more violent motion de­taches it ; at the same time the cells just mentioned throw out a gummy secretion, which rapidly hardens and encloses the cercaria in a kind of case. It is in this condition that the larvæ are swallowed by the grazing sheep to form sexually mature flukes in their livers.

The life-history of a typical digenetic Trematode may be summed up as follows:—(1) the *egg,* produced sexually; (2) the *ciliated embryo·,* (3) the *sporocyst·,* (4) the *redia,* produced asexually ; (5) the *cercaria,* produced asexually; (6) the *adult Trematode.* Hence it would appear that the digenetic forms have at least one, usually many, asexual generations before the sexual one appears. The embryo may form either a sporocyst or a redia, these two forms being distinguished by the presence of a digestive tract and of a special birth-opening in the latter. Within these parent forms the germs may arise from two sources,—the cells which occupy the central region of the young sporocyst or redia, or the epithelium lining the body-walls. “ The germs to which a sporocyst gives origin may develop in some instances into sporocysts, in others into rediæ or into cercariæ. And it does not seem certain that there is any limit to the possible number of successive generations of rediæ. Both cercariæ and rediæ may occur side by side in the same nurse. The last term in the series is, however, invariably a cercaria.”

Pagenstecher, Ercolani (29), and others have stated that the tail of a cercaria may become a sporocyst and produce germs, but this has not met with general acceptance, and the supposition is not supported by the structure of the tail, which consists of a “ con­tractile substance, occupying the axis and periphery, with large vesicular cells between ” (Schwarze, 13). Ercolani (29) has also published striking statements to the effect that the structure of these entozoa is so profoundly modified by their habitat that what have been hitherto described as distinct species may be only “local varieties”; thus he finds that *Cercaria armata* develops in *Tropi- donotus* into *Distomum signatum,* whilst in *Mus musculus* and *Μ. decumanus* it becomes a distinct dwarfed form, *D. muris.*

*Pathological and Economic Relations.—*Although the number of Trematodes which have been recorded from the human body is about equal to that of the Cestodes, the medical significance of the former is much less than that of the latter, because as a rule they occur in smaller numbers and are less apt to invade organs of vital importance. The Trematodes which have been found in man are—

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| *Fasciola hepatica,* Linn., | in the liver. |
| *Distomum lanceolatum,* Mehlis, | ,, liver. |
| *D. ophthalmobium,* Diesing, .... | ,, lens of the eye. |
| *D. heterophyes,* Bilharz | „ small intestine. |
| *D. crassum,* Busk=*D*. *buskii,* Wedl, | „ intestine. |
| *D. capense,* Harley, | ,, eggs in the blood. |
| *D. spatulatum,* Leuckart, | ,, liver. |
| *D. endemicum,* Baelz, | ,, liver. |
| *D. hepatis innocuum,* Baelz, .... | ,, liver. |
| *D. rathouisi,* Poirier (42), .... | „ liver. |
| *Bilharzia hæmatobia,* Cobbold, ... | ,, veins of bladder, &c. |
| *Monostomum lentis,* Nordmann, | ,, lens of the eye. |
| *Hexathyridium pinguicola,* Treutler, | ,, ovary. |
| *H. venarum,* Treutler, | ,, veins. |

For the general principles which govern the pathological effects of Trematodes in common with other entozoa, reference may be made to the article Tape-Worms ; only a few special cases need be alluded to here. The occurrence of most of the forms in the above list has only been recorded very few times, and in many cases the effects produced were very inadequately studied, so that we can hardly be said to possess a knowledge of their individual pathology. In a case of *Distomum lanceolatum* which occurred in Bohemia, the liver was enormously enlarged and the contracted gall-bladder contained eight calculi and forty-seven flukes ; the symptoms during life were emaciation, pain over the liver, and distention of the abdomen.

The effects produced by *Bilharzia hæmatobia* are very well de­fined and exceedingly disastrous. The mature worms in couples