

the liver. Some believe that the capsule must be digested off by the gastric juice and the psorosperms set free. At any rate, if placed in water at 37° C. or at the room-temperature, in the former instance in twenty-four hours, in the latter within a few weeks, the granular mass in the cells may be seen to undergo a change, resulting in its division into four sporocysts or sporoblasts. These sporocysts or psorosperms become enclosed within a thin, delicate membrane, and within their substance is developed a crescentic rod nobby at one extremity.

The lesions due to these coccidia occur in the bile-ducts, and consist in the production of a cystic condition, while from the cyst walls may be seen the most beautiful papillomatous growths. The walls of the older ducts may become eventually transformed into an almost non-recognizable cicatricial tissue.

In the specimen presented the bile-ducts may be seen in some cases to be filled with coccidia, the walls presenting beginning papillomatous changes in the form of small projections of connective tissue into the lumen of the already dilated and cystic duct, the projections being knot-like in character and lined with a small amount of delicate epithelium. About the ducts is an increase of connective tissue, which, however, varies in amount at parts. The character of this tissue is such that directly under the epithelial lining many round cells may be seen, but further out it appears much older. At intervals accumulations of round cells in nests may be noticed, as if an irritant were acting at that point. The early stage seems to be an inflammatory condition, which precedes the dilatation and cystic condition. From the walls of the ducts there pass in the lumen many papillomatous growths, which may be seen to branch out in different directions. The connective tissue bearing these growths appears to rapidly assume the characters of fibrous growth. The coccidia within are of a round or oval shape, the latter predominating. Some of these protoplasmic masses were seen to be pear-shaped, the small end of the pear pointing towards the nucleus of the cell near the basement membrane, as if extruding itself from the cell.

What might be taken to be fusions of the papillomatous projections may be seen, for one may grow inwards from either wall, and, meeting in the centre, become intact. Instances were noticed where these growths had met, and the epithelium already destroyed on the extremity of the papilla, presumably by pressure. At other parts it may be seen where three of these projections have grown together and a small triangular area of the duct cut off. These papillæ, or parts of them, may at times become necrotic. Passive congestion is marked in places, and many vessels much engorged.

The demarkation of the connective tissue, surrounding the