

to differentiate and subsequently acts as an inducing agent for the differentiation of the nervous system both in the grafts and in the normally developing embryo.

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An Inquiry into the Cause of Congenital Absence of the Gall Bladder.

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Out of some 2700 cats examined during the last few years, the writer has noted 3 kittens (2 females and one male) in which no trace of the gall bladder could be found. In one of these there was a large empty *fossa vesicae felleae* suggesting that perhaps the gall bladder had once occupied it and then been absorbed. In the other 2 there was neither fossa nor any fibrous remainder to indicate that the gall bladder had ever been formed; so that we may assume that it either failed to develop in the embryo or had disappeared before birth. According to Golob,¹ known instances of a congenitally absent gall bladder in man do not exceed 40. In some species of animals, as in the pigeon, a biliary vesicle is formed embryonically but its duct subsequently atrophies, leaving a detached bladder that soon degenerates; in others, as the rat, it is doubtful whether any anlage ever forms (Scammon²). But in rats, according to McMaster,³ the loss of the biliary reservoir is compensated for by an increased concentration of bile, the bilirubin concentration being 8 times that in the hepatic ducts of the mouse—an animal having a gall bladder. In this connection it is interesting to note that one of the 3 cases of congenital absence of the gall bladder in cats was found in a kitten which was being operated upon. When a sample of the hepatic bile from this animal was examined with a colorimeter it was seen to be 2.2 more concentrated than a sample of hepatic bile from a control kitten, suggesting that if the gall bladder is lost early enough in fetal life, the deficiency is partly overcome by a compensatory mechanism.

In the hope of finding a possible explanation for this anomaly the

¹ Golob, Meyer, *J. Am. Med. Assn.*, 1927, lxxxix, 691.

² Scammon, R. E., *Anat. Rec.*, 1916, x, 543.

³ McMaster, P. D., *J. Exp. Med.*, 1922, xxxv, 127.

writer examined serial sections of some 200 cat embryos of appropriate age in the Huntington Collection of Columbia University, and to his great surprise found a gall bladder in a 10.5 mm. embryo which was in the very act of disappearing. Indeed, the cystic duct had already atrophied, leaving the terminal vesicle isolated in the ventral body wall at a point just medial to the place where the right umbilical vein enters the liver. From this early embryonic position the gall bladder normally recedes. But in this particular embryo, withdrawal of the gall bladder had apparently been prevented by a circlet of veins which enclosed the neck of the organ, as a result of which the cystic duct would seem to have first thinned out and then ruptured. Two of these veins were of unusual interest since they exhibited an anomalous forking of the central end of the vitelline vein; so that instead of following its usual circuitous course to the liver through the portal mesentery, this vein had bifurcated, one limb of it anastomosing with the adjacent right umbilical vein and the other extending straight through the *septum transversum* to that portion of the left common cardinal vein which is destined to become the coronary sinus. Whether the actual rupture of the cystic duct was due to the pressure of these anomalous veins is, of course, a matter of conjecture. But at least it shows the very early period at which the gall bladder disappears and indicates that the method is not unlike that which normally occurs in the pigeon, namely, isolation and atrophy following rupture of the cystic duct.

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Observations Upon the Nature of the Virus of Hog Cholera.

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Although hog cholera has been the subject of extensive investigation by immunological methods, little has appeared in the literature concerning the nature of the specific virus, aside from the discovery of DeSchweinitz and Dorset¹ that the causal agent is filtrable through Berkefeldt and Chamberlain candles. This paper records certain observations made with the virus in the course of an experimental study.

The virus in the blood of hog cholera withstands rapid desiccation

¹ DeSchweinitz and Dorset, Cir. No. 41, Bureau of Animal Industry.