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Experimental Gonococcal Infection in the Chick Embryo.

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It has been found that gonococci remain viable within the interior of a hen's egg for several weeks and in certain cases as long as 3 months. Table 1 illustrates the frequency with which the organism was recovered from eggs at varying periods of time after inoculation.

TABLE I.

Time	No. eggs inoc.	No. eggs positive
1 wk.	14	13
2 "	10	9
3 "	7	6
4 "	2	2
2 mo.	9	6
3 "	6	4

Serial inoculations made from egg to egg showed that the organism also multiplied within the interior of the yolk.

Inasmuch as the embryo develops at a temperature of 37°C (and in certain instances hatches) and since the gonococcus seemed to multiply at this temperature within the egg, it appeared possible that during development the blood stream might be invaded by the organism if introduced into the yolk-sac.

Accordingly fertile eggs were incubated at 37°C and when the embryo had grown to the 12-23-day stage the yolk-sac was inoculated as follows:

A strain from a case of vaginitis in a young girl was grown on Bradford's medium and after 48 hours was washed off with one cc. of saline. A small area, one cm. in diameter, on the shell was sterilized with tincture of merthiolate and a very small opening was made through the shell with a sharp sterile probe. Using a one cc. tuberculin syringe and a 26-gauge needle, 0.1 cc. of suspension was introduced into the interior of the egg. By doing the inoculation in a dark room before an egg "candle," it was usually possible to avoid injuring the embryo. The site of inoculation was sealed with collodion and the egg returned to the incubator.

From one to 13 days later the embryos were removed, necropsied, and the yolk, heart's blood and liver were cultured. When

removed, the embryos varied in weight from 7 to 18 gm. The majority had feathers. Table II shows the results of cultural studies.

TABLE II.

Egg No.	Days incubated	Days inoculated	Embryo	Cultures for GC			
				Yolk	Heart	Liver	
1	18	8	Living	+	—	—	Direct smear from eye +
2	13	7	"	+	0	—	
3	13	13	Dead	+	+	—	" " " " "
4	12	5	Living	+	0	0	
5	19	2	"	0	0	0	
6	19	2	"	0	0	0	
7	19	3	Dead	+	+	+	Direct smear from yolk and liver +
8	19	5	Living	0	0	0	
9	19	1	Dead	+	0	0	Large hem. at point of inoc. Probably fatal
10	19	2	Living	0	0	0	
11	17	4	"	+	0	0	
12	23	7	Dead	+	+	0	
13	14	12	"	+	0	0	
14	14	2	"	+	+	—	

At the time of removal of the embryos, 6 were dead and of these 4 yielded viable organisms from the heart's blood. Positive heart's blood cultures were never obtained from embryos which were alive when removed from the shell.

Anatomically, neither the gross nor the stained sections revealed evidence of tissue-reaction to the presence of the organism. Gram-stains of the sectioned material revealed occasional organisms in the liver of one embryo and in the wall of the abdominal cavity in 2 instances.

Whether invasion of the blood stream in the 4 embryos occurred before or after death could not be determined.

The use of the whole egg suggests itself for the purpose of keeping gonococcal cultures in stock and even as a method of cultivating the organism from sources such as joint-fluid. Further observations in this direction are being made.