Laboratory at Wallaceville and the Dairy Research Institute at Palmerston North.

DR. HERMANN FISCHER, a son of Dr. Emil Fischer, professor of inorganic chemistry at the University of Basle, Switzerland, recently spent a week at the University of Toronto. On February 15 he gave a lecture before the Biochemical Society and on February 19 he spoke before the Chemical Society.

THE William Potter memorial lecture was delivered on February 11 by Dr. Henry A. Christian, Hersey professor of the theory and practice of physic at the Harvard Medical School. His subject was "The Fruition of a Clinician."

DISCUSSION

THE HEN'S EGG NOT FERTILIZED IN THE OVARY

IT is a well-known fact that the hen may continue to lay fertile eggs for two or three weeks or even longer after isolation from the inseminating male. Since it is rarely possible to recover normal, living spermatozoa a day after insemination (Barfurth, Lau, Anderson[1]) Iwanow[2] was led to consider the possibility of synchronous fertilization of a whole clutch of growing oöcytes *within the ovary*. Experimentally he found that hens would lay fertile eggs despite a thorough flushing of the body cavity and the oviduct with an appropriate spermicide. Walton and Whethan[3] were able to corroborate these results in that a lavage of the body cavity and of the oviducts of inseminated hens with such excellent spermicides as hexyl resorcinol or formaldehyde (Voge[4]) did not prevent the subsequent laying of fertile eggs. Nevertheless, these authors were loath to accept Iwanow's explanation of their results on the ground that spermatozoa can hardly be expected to pierce the thick capsule overlying the smaller oöcytes. This contention seems most reasonable.[5] Walton and Whethan furthermore point out that in these "Iwanow" experiments sperms hidden among the folds of the oviduct may well escape contact with the spermicidal lavage.

As the matter stands, therefore, it would seem that preovulatory fertilization in the bird is far from established so far as the foregoing experiments are concerned. It appears to the writer, however, that genetic proof against the Iwanow theory is already existent in the extensive data presented by Warren and Kilpatrick's experiments[6] on fertilization in the domestic fowl. These workers exposed laying hens alternately to males of different strains, all of which possessed dominant characters readily recognized in the chicks at an early stage of development. Thus, for example, in one series, eleven hens were penned with White Leghorn males for 21 days, then with Black Minorcas for 21 days, then again for a similar period with White Leghorns and so on. The results showed that in some cases as early as the second day after changing males the eggs laid had been fertilized by sperms from the replacing male. There was practically no overlapping of the offspring. The conclusion seems inevitable that the clutch of eggs were *not* coincidently fertilized in the ovary.

Harper[7] expressed the opinion that in the pigeon the ripe oöcyte about to rupture from its greatly attenuated follicle might be fertilized in this condition, since the wall is at this time but 3.5 μ thick. But even this seems unlikely, since the egg laid by the hen as much as 24 hours after insemination is always infertile, as has been known for over a century (Coste).

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3 A. Walton and E. O. Whethan, *Jour. Exp. Biol.*, 10: 204, 1933.
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5 *Cf.* G. W. Bartelmez, *Jour. Morph.*, 23: 269, 1912.
6 D. C. Warren and L. Kilpatrick, *Poultry Science*, 8: 237, 1929.
7 E. H. Harper, *Am. Jour. Anat.*, 3: 349, 1904.

STRUCTURAL CONTROL OF THE FORM AND DISTRIBUTION OF SINK-HOLES

MALOTT'S work[1] on Indiana caves shows interesting relations between subsurface forms and surface drainage; structural control of caves is shown remarkably well in McGill's treatise[2] on the Virginia Caverns. Martel's monumental work[3] is profusely illustrated with maps and cross-sections, many of which also show structural control, and Martel emphasizes energetically the tectonic influence in the development of sink-holes and caves, citing many instances of origin on fracture lines. However, specific reference to structural control in the form and distribution of sink-holes has escaped the present writer's notice.

1 Clyde A. Malott, "Handbook of Indiana Geology," Indiana Division of Geology, Indianapolis, pp. 94–98, 187–210, 233–247, 1922; also several papers in the *Proceedings of the Indiana Academy of Science*, notably in Vol. 38, pp. 201–206, 1928 (1929).
2 W. M. McGill, Virginia Geological Survey Bulletin 35, 1933.
3 E. A. Martel, "Nouveau Traité des Eaux souterraine," Paris, Chapter 2, 1921.